



# Site 2 – Sydney Olympic Park: Archaeological Report

FINAL REPORT

Prepared for Ecove Group

14 August 2019

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## Glossary

<b>ACHA Report</b>	Aboriginal Cultural Heritage Assessment Report
<b>AHIMS</b>	Aboriginal Heritage Information Management System
<b>Consultation requirements</b>	<i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i> (DECCW 2010a)
<b>DA</b>	Determining Authority
<b>DECCW</b>	Department of Environment, Climate Change and Water (now OEH)
<b>DP</b>	Deposited Plan
<b>EP&amp;A Act</b>	<i>Environmental Planning and Assessment Act 1979</i>
<b>GDA</b>	Geocentric Datum of Australia
<b>GPS</b>	Global Positioning System
<b>GSV</b>	Ground Surface Visibility
<b>ICOMOS</b>	International Council on Monuments and Sites
<b>LALC</b>	Local Aboriginal Land Council
<b>LEP</b>	Local Environmental Plan
<b>LGA</b>	Local Government Area
<b>NPW Act</b>	<i>National Parks and Wildlife Act 1974</i>
<b>NPWS</b>	National Parks and Wildlife Service
<b>NSW</b>	New South Wales
<b>OEH</b>	NSW Office of Environment and Heritage
<b>PAD</b>	Potential Archaeological Deposit
<b>SEARs</b>	Secretary's Environmental Assessment Requirements
<b>SEPP</b>	State Environmental Planning Policy
<b>SSD</b>	State Significant Development
<b>Study area</b>	Defined as Lot 71 DP 1134933
<b>the code</b>	<i>Code of practice for archaeological investigation of Aboriginal objects in NSW</i> (DECCW 2010)

## Summary

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Biosis Pty Ltd was commissioned by Ecove Group to undertake an Aboriginal archaeological assessment to support an Environmental Impact Statement (EIS) for the hotel, serviced apartments and commercial development with plaza at 2 Australia Avenue, Lot 71 DP 1134933, Olympic Park Sydney, New South Wales (NSW) (Figure 1) (the project).

The project will be assessed as a State Significant Development (SSD) under part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (SSD 9383), Schedule 2 of the State Environmental Planning Policy (SEPP) (State and Regional Development) 2011, and Schedule 3 of the SEPP (State Significant Precincts) 2005.

Secretary's Environmental Assessment Requirements (SEARs) were issued for the project on 6 July 2018. In accordance with requirement 19 of the SEARs, an Aboriginal cultural heritage assessment is required in order to assess any potential impacts to Aboriginal cultural heritage the project may have.

This assessment has been conducted in accordance with the EP&A Act and the *National Parks and Wildlife Act 1974* (NPW Act). This assessment has been undertaken in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011), and the *Code of practice for archaeological investigation of Aboriginal objects in New South Wales* (DECCW 2010b) (the code).

A desktop assessment was conducted as part of this Aboriginal archaeological assessment in accordance with requirements 1 to 4 of the code. No previously recorded Aboriginal sites, objects or areas of archaeological sensitivity were identified during the desktop assessment.

An archaeological survey of the study area was conducted on 6 September 2018 by James Cole (Biosis archaeologist) and Kevin Telford (Metropolitan LALC).. No Aboriginal sites, objects or areas of archaeological sensitivity were identified during the archaeological survey.

Due to the high levels of previous ground disturbance present, the entire study area was determined to have low archaeological potential. Further archaeological works will therefore not be required.

Strategies have been developed based on the archaeological (significance) of cultural heritage relevant to the study area. The strategies also take into consideration:

- predicted impacts to Aboriginal cultural heritage
- the planning approvals framework
- current best conservation practice, widely considered to include:
  - the ethos of the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter
  - the code

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

### **Management recommendations**

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

#### **Recommendation 1: Works may proceed with caution**

No Aboriginal objects, sites, or areas of sensitivity were identified within the study area. No further archaeological works are required. The proposed works may proceed with caution.

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## **Recommendation 2: Discovery of unanticipated Aboriginal objects and/or Aboriginal ancestral remains**

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 OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

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

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



# 1 Introduction

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## 1.1 Project background

Biosis Pty Ltd was commissioned by Ecove Group to undertake an Aboriginal archaeological assessment to support an Environmental Impact Statement (EIS) for 2 Australia Avenue, Lot 71 DP 1134933, Olympic Park Sydney, New South Wales (NSW) (Figure 1) (the project).

The project will be assessed as a State Significant Development (SSD) under part 5 of the EP&A Act (SSD 9383), Schedule 2 of the State SEPP (State and Regional Development) 2011, and Schedule 3 of the SEPP (State Significant Precincts) 2005.

SEARs were issued for the project on 6 July 2018. In accordance with requirement 19 of the SEARs, an Aboriginal cultural heritage assessment is required in order to assess any potential impacts to Aboriginal cultural heritage the project may have.

This assessment has been conducted in accordance with the EP&A Act and the NPW Act. This assessment has been also undertaken in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011), and the code.

## 1.2 Study area

2 Australia Avenue (the study area) is located in Sydney Olympic Park, approximately 13 kilometres to the west of Sydney Central Business District (CBD) (Figure 1). It consists of Lot 71 DP 1134933, and is bounded by Murray Rose Avenue to the north, Australia Avenue to the west, and Parkview Drive to the south (Figure 2).

The study area is within the:

- City of Parramatta Local Government Area (LGA)
- Parish of St John
- County of Cumberland.

The study area measures 7,711 metres square (m<sup>2</sup>) and is currently used as a car park known as P6d.

## 1.3 Planning approvals

The proposed development will be assessed against Part 5 of the EP&A Act. Other relevant legislation and planning instruments that will inform this assessment include:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- NPW Act
- *National Parks and Wildlife Amendment Act 2010*
- SEPP (Infrastructure) 2007
- Auburn Local Environmental Plan 2010 (LEP)
- SEPP (State and Regional Development) 2011
- SEPP (State Significant Precincts) 2005.

## 1.4 Objectives of the investigation

The objectives of the investigation can be summarised as follows:

- To identify and consult with any registered Aboriginal stakeholders and the Metropolitan Local Aboriginal Land Council (LALC).
- To conduct additional background research in order to recognise any identifiable trends in site distribution and location.
- To search statutory and non-statutory registers and planning instruments to identify listed Aboriginal cultural heritage sites within the study area.
- To highlight environmental information considered relevant to past Aboriginal occupation of the locality and associated land use and the identification and integrity/preservation of Aboriginal sites.
- To summarise past Aboriginal occupation in the locality of the study area using ethnohistory and the archaeological record.
- To formulate a model to broadly predict the type and character of Aboriginal sites likely to exist throughout the study area, their location, frequency and integrity.
- To conduct a field survey of the study area to locate unrecorded or previously recorded Aboriginal sites and to further assess the archaeological potential of the study area.
- To assess the significance of any known Aboriginal sites in consultation with the Aboriginal community.
- To identify the impacts of the proposed development on any known or potential Aboriginal sites within the study area.
- To recommend strategies for the management of Aboriginal cultural heritage within the context of the proposed development.

## 1.5 Investigators and contributors

The roles, previous experience and qualifications of the Biosis project team involved in the preparation of this archaeological report are described below in Table 1.

**Table 1 Investigators and contributors**

Name and qualifications	Experience summary	Project role
<b>Samantha Keats</b> BA (Hons)	Samantha is an archaeologist with Biosis Wollongong office. Samantha has two years' experience as an archaeologist, with a particular research focus on rock art assemblages and ochre in the north-west Kimberley region of Australia. Samantha has experience in conducting desktop assessments, archaeological survey and Aboriginal and historical excavation as well as consulting with Traditional Owners. She has participated in a number of European historical excavations and monitoring programs in NSW and has authored several Statement of Heritage Impact reports and Heritage Assessments.	<ul style="list-style-type: none"> <li>• Project manager</li> </ul>
<b>Taryn Gooley</b> BA.Sc (Hons)	Taryn is a consultant archaeologist with seven years'	<ul style="list-style-type: none"> <li>• Report preparation</li> </ul>

	<p>experience across south eastern NSW and Western Australia. Taryn has a particular interest in Aboriginal archaeology of North Western NSW, and the Hunter Valley and Newcastle regions. Taryn has experience in the successful completion of Aboriginal Cultural Heritage Assessments, archaeological surveys, test excavations, and salvage excavations, as well as Aboriginal community consultation. She is also accomplished in obtaining approvals under the NSW <i>National Parks and Wildlife Act 1974</i> and NSW <i>Heritage Act 1977</i>.</p>	
<p><b>Ashleigh Keevers-Eastman BA (Hons)</b></p>	<p>Ashleigh is a field archaeologists with one years' experience. Ashleigh is proficient in desktop research. Ashleigh has also undertaken field work in Gotland, Sweden, as a volunteer. She is now looking forward to developing her professional career with Biosis with an interest in Aboriginal Cultural Heritage and Archaeology.</p>	<ul style="list-style-type: none"> <li>• Background research</li> </ul>
<p><b>James Cole BA (Hons)</b></p>	<p>James is an archaeologist with five years' experience. James has had experience working as an archaeologist and project manager on a number of Aboriginal and European heritage projects across New South Wales, Victoria, and Tasmania, and is skilled in both excavation and field recording.</p> <p>James has well developed skills in Aboriginal archaeology, serving as a key team member and project manager on a number of projects in Sydney, the Illawarra, the Hunter Region, and in Western NSW.</p>	<ul style="list-style-type: none"> <li>• Field investigation</li> </ul>

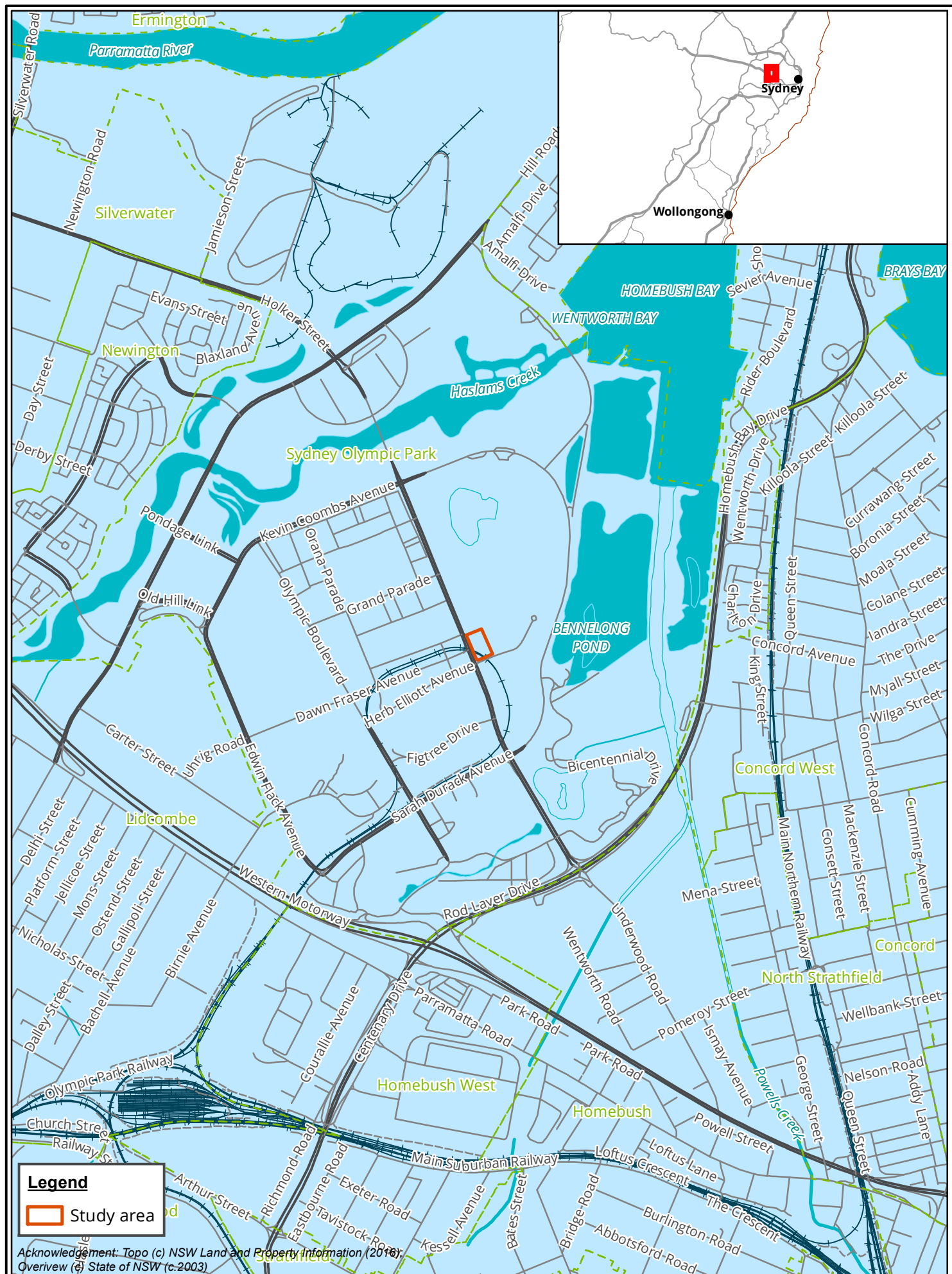
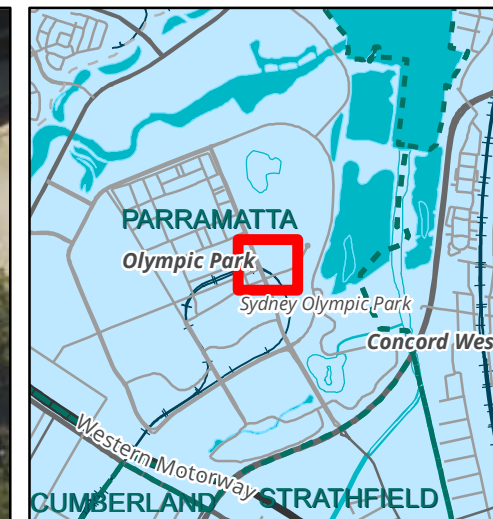
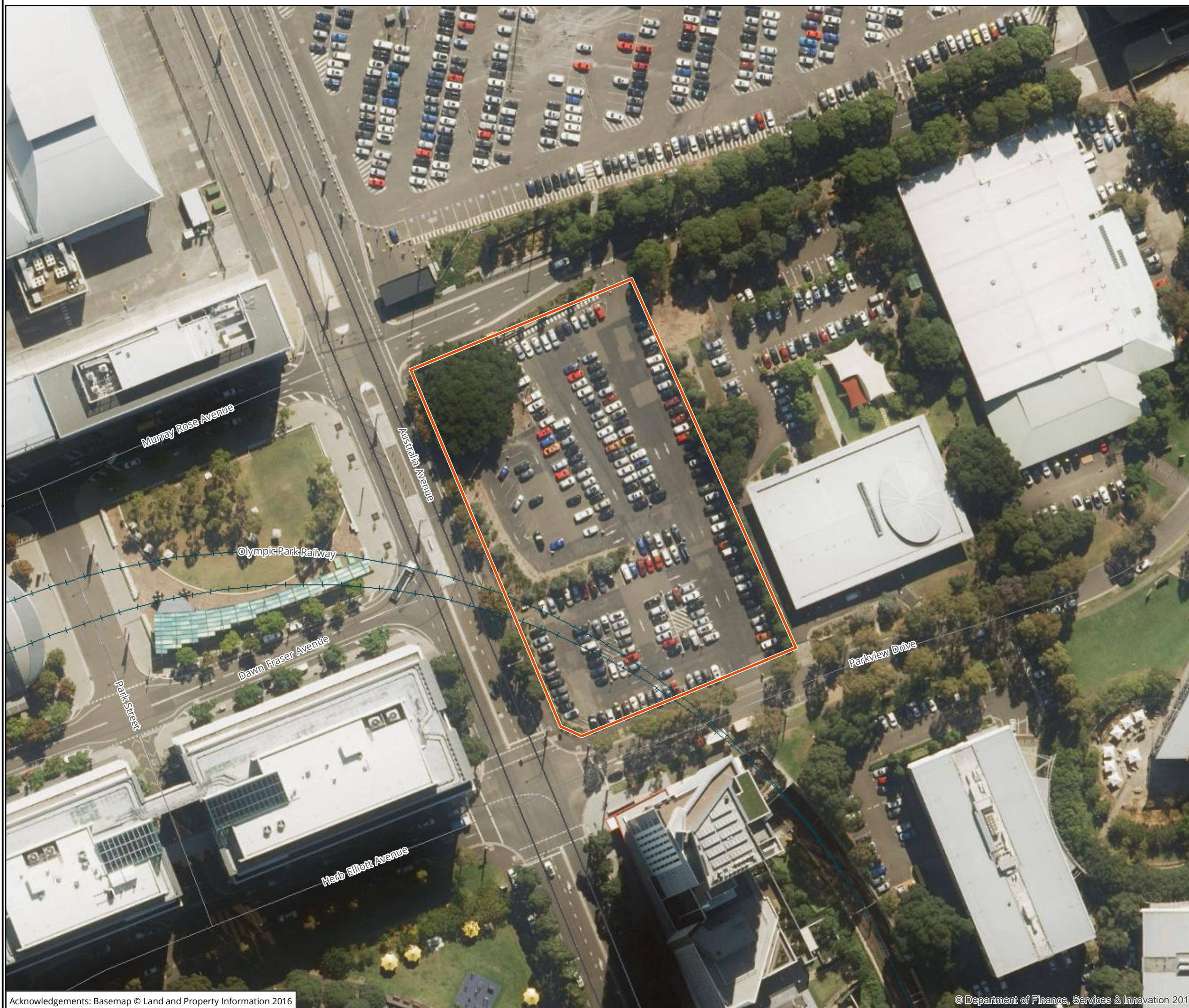


Figure 1: Location of the study area

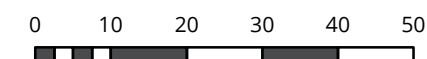




#### Legend

Study area

**Figure 2: Study area detail**



Metres  
Scale: 1:1,000 @ A3  
Coordinate System: GDA 1994 NSW Lambert



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

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Checked by: AV, Drawn by: LW, Last edited by: lwilson  
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## 2 Proposed development

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The proposed state significant development will consist of two buildings that will accommodate a hotel, serviced apartments, commercial offices, retail outlets, and basement car parking. There will also be a large outdoor plaza at Site 2 Australia Avenue.

SSD application by Ecove Group will seek consent for the following:

- One 31 storey mixed use tower above a maximum of four levels of basement car parking
  - the Site 2A tower to provide a mix of hotel, child care facility and office and conference room
  - a maximum of four levels of basement car parking spanning across Site 2A and under the extension of Dawn Fraser Avenue.
- One 14 storey commercial building (2B)
  - Includes commercial office space totalling 19,982 sqm and 691 sqm of ground floor commercial space.
- Extension of Dawn Fraser Avenue east of Australia Avenue to dissect site and connect with a new service street also to be constructed that connects Murray Rose Avenue to Parkview Drive.
- Creation of a large activated outdoor urban plaza located in the frontage area between the proposed buildings and Australia Avenue.

## 3 Desktop assessment

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The desktop assessment involves researching and reviewing existing archaeological studies and reports relevant to the study area and surrounding region. This information is combined to develop an Aboriginal site prediction model for the study area, and to identify known Aboriginal sites and/or places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the code.

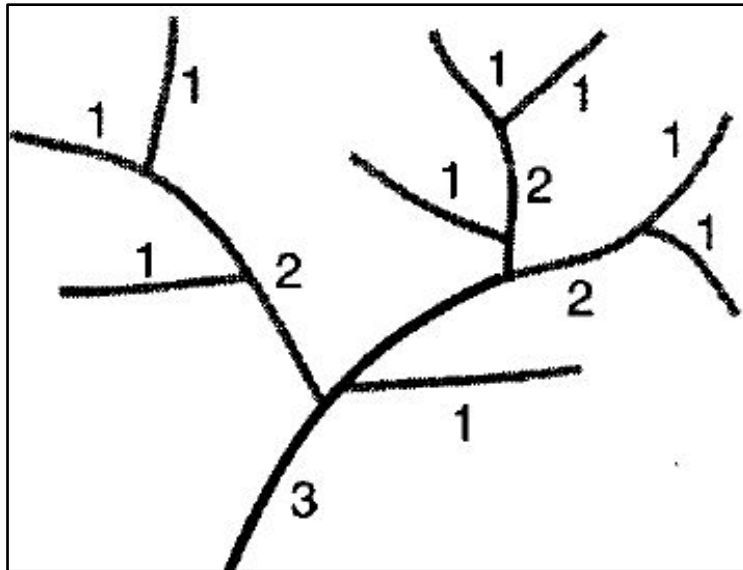
### 3.1 Landscape context

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

#### 3.1.1 Geology and hydrology

The study area is located within Cumberland Lowlands physiographic region which consists of low lying, gently undulating plains and low hills atop Wianamatta Group shales and sandstones with a dense drainage net of predominantly northward flowing channels (Bannerman and Hazelton 1990, p. 2) (Figure 4). The study area falls within the Wianamatta geological group which is Middle Triassic in age (245-235 mya). The Wianamatta geological group is divided into two formations, the Ashfield Shale and the overlying Bringelly Shale formations. The Ashfield Shale consists of black to dark grey siltstone and laminite and is located on ridgetops. The upper part of Wianamatta Group is Bringelly Shale that occurs extensively throughout the Cumberland Lowlands. It consists of a shale (claystone and siltstone), carbonaceous claystone, laminate and fine to medium-grained lithic sandstone (Bannerman and Hazelton 1990, p. 3).

Stream order is recognised as a factor which helps the development of predictive modelling in Aboriginal archaeology in NSW (White, B & McDonald, J 2010). Predictive models which have been developed for the region have a tendency to favour permanent water courses as the locations of campsites as they would have been more likely to provide a stable source of water and by extension other resources which would have been used by Aboriginal groups.



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

The stream order system used for this assessment was originally developed by Strahler (1964). It functions by adding two streams of equal order at their confluence to form a higher order stream, as shown in Plate 1. As stream order increases, so does the likelihood that the stream would be a perennial source of water.

The study area is located between two tributaries of the Parramatta River, Haslams Creek and Powells Creek. Haslam's Creek is a perennial watercourse located approximately 800 metres north of the study area, running south-west from Homebush Bay. Powells Creek is located 700 metres east of the study area and is also a perennial creek that drains water from the lower slopes in the study area. Both creeks flow towards the north and eventually drain into Bow Bowing Creek and the Georges River (Figure 5).

### 3.1.2 Soil landscapes

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. Because they are defined by a combination of soils, topography, vegetation and weathering conditions, soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure.

The study area is located within the Blacktown soil landscape (Figure 6). The Blacktown soil landscape is characterised as a residual landscape and consists of gently undulating rises, broad rounded crests and gently inclined slopes with a gradient of less than 5 %. Local relief within the Blacktown soil landscape is up to 30 metres and rocky outcropping is absent (Bannerman and Hazelton 1990, p. 23). Dominant soils consist of shallow to moderately deep podzols. Due to their age and slow accumulation, residual soil landscapes have reasonable potential to contain archaeological deposits in an open context, such as stone artefacts derived from occupation sites. Other occupation evidence might include scarred trees where remnant vegetation survives. However, the slow accumulation and high impact of extensive land clearing (usually associated with pastoral and civic development) during more recent times often results in poor preservation of archaeological material.



**Table 2 Blacktown soil landscape characteristics (Bannerman and Hazelton 1990, p. 23-25)**

Soil material	Description
<b>Blacktown 1 (bt1)</b>	Friable brownish-black loam. This is a friable brownish-black loam to clay loam with moderately pedal sub-angular blocky structure and rough-faced porous ped fabric. This material occurs as topsoil (A1 horizon).
<b>Blacktown 2 (bt2)</b>	Hardsetting brown clay loam. This is a hardsetting brown clay loam to silty clay loam with apedal massive to weakly pedal structure and slowly porous earthy fabric. It commonly occurs as an A2 horizon.
<b>Blacktown 3 (bt3)</b>	Strongly pedal, mottled brown light clay. This is a brown light to medium clay with strongly pedal polyhedral or subangular-blocky structure and smooth-faced dense ped fabric. This material usually occurs as subsoil (B horizon).
<b>Blacktown 4 (bt4)</b>	Light grey plastic mottled clay. This is a plastic light grey silty clay to heavy clay with moderately pedal polyhedral to sub-angular blocky structure and smoothfaced dense ped fabric. This material usually occurs as deep subsoil above shale bedrock (B3 or C horizon).

### 3.1.3 Landscape resources

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

The Blacktown soil landscape has been almost completely cleared of tall open forest (wet sclerophyll forest) and open-woodland (dry sclerophyll forest). Prior to European settlement and clearing activities, wet sclerophyll forest within the area would have contained Blue Gum *Eucalyptus saligna*, and Blackbutt *E. pilularis* (Bannerman and Hazelton 1990, p. 23).

Many of the plants found within the area were important to Aboriginal people and could be used for numerous purposes. These include using the wood to make implements, berries leaves and tubers for food and medicines as well as bark for shelters. One of the plants exploited may have been the eucalypt, whose leaves can be crushed and used for medicinal purposes, while the sap can be used as a sweet sugary food source and the bark could be used to make bowls and shelters (Rhodes, J & Dunnett, G 1985).

The various fauna species present within the study area would have provided a range of resources for Aboriginal people. Terrestrial and avian resources were not only used for food, but also provided a significant contribution to the social and ceremonial aspects of Aboriginal life through their use as ritual implements or even simply through fashioning as personal adornments (Attenbrow, V 2010, pp.107–110). Mammals such as kangaroos and wallabies and arboreal mammals such as possums were used as a food source, and for tool making. Bones and teeth were also used as points or barbs for hunting spears and fishing spears. Tail sinews are known to have been used as a fastening cord, whilst 'bone points' frequently occur in rock shelters (Attenbrow, V 2010, p.109). Animal skin, fur and sinews were also used for personal adornment and in making cloaks. Animals such as Brush-tailed Possums were highly prized for their fur, with possum skin cloaks recorded by the first settlers in the area. The cloaks were worn fastened over one shoulder and under the other. Kangaroo teeth were

incorporated into decorative items such as head bands and beads were made from reeds and teeth. Aquatic species such as freshwater crayfish, fish and eels would have been easily accessible in larger waterways, such as the Nepean River (Rosen, S 1995).

The geology of the region also provided raw materials resources. According to Attenbrow (2010, p.9) the Wianamatta shales at Newtown and Homebush Bay contained small scale deposits of silcrete, which would have been an important raw material source for Aboriginal tool manufacturing.

### **3.1.4 Land use history**

The study area is located within the traditional lands of the Wann clan, known as the Wann-gal (Urbis 2016, p.13). As noted above the study area likely provided a vast array of resources for the Wann-gal to exploit. The earliest known radiocarbon date for the Aboriginal occupation of the Cumberland Plains is associated with a cultural / archaeological deposit at Parramatta approximately six kilometres to the west of the current study area, which was dated to  $30,735 \pm 407$  BP (Jo McDonald Cultural Heritage Management Pty Ltd (JMCHM) 2005a, Jo McDonald Cultural Heritage Management Pty Ltd 2005b) Archaeological evidence of Aboriginal occupation of the Cumberland Plains indicates that the area was intensively occupied from approximately 4000 years BP (Dallas 1982, p.7).

After the arrival of European settlers in the area, the movement of Aboriginal hunter-gatherers became increasingly restricted. European expansion along the Cumberland Plain was swift and soon there had been considerable loss of land to agriculture. At the same time diseases such as small pox were having a devastating effect on the Aboriginal population. Death, starvation and disease were some of the disrupting factors that led to a reorganisation of the social practices of Aboriginal communities after European contact.

The earliest records of the Homebush area come from a European scouting party in 1788, who described the area as extensive tidal wetlands which they subsequently named 'The Flats' (Urbis 2016, p.15, Artefact Heritage 2016, p.9). The loss of Wann-gal land to European settlers and ex-convicts occurred early in settlement history, with land ranging from 10 to 100 acres being granted in the Homebush area between 1788 to 1831 (Urbis 2016, p.14, Artefact Heritage 2016, p.9). The first land grant in The Flats was given to Thomas Laycock who had acquired 318 hectares of land by 1803; this land grant was named Home Bush (Urbis 2016, p.15, Artefact Heritage 2016, p.9). Home Bush and the surrounding land grants were generally used for agricultural purposes throughout the late 18<sup>th</sup> century (Urbis 2016, p.15). In 1810 D'Arcy Wentworth acquired 370 hectares of land which encompassed Home Bush Estate and the current study area. Wentworth gradually acquired land surrounding his Home Bush Estate, increasing his land holding to 920 hectares (Artefact Heritage 2016, p.9). Wentworth's estate remained largely undeveloped and was used primarily for pastoral or agricultural purposes until the late 19<sup>th</sup> century (Urbis 2016, p.16). Records of conflicts between Europeans and Aboriginal people in the area indicate that while the land had been granted to European settlers, the Wann-gal people continued to utilise their land throughout the end of the 18<sup>th</sup> century and into the early 19<sup>th</sup> century (Urbis 2016, p.14).

The government resumed 367 hectares of the Home Bush Estate in 1907 in order to construct the State Abattoir in response to rising health concerns regarding the Glebe Island abattoir (Urbis 2016, p.17, Artefact Heritage 2016, p.12). The State Abattoir opened in 1913 and included 44 slaughter houses, by-product treatment buildings, administration buildings, latrines, stabling facilities, roads, and drafting yards (Urbis 2016, p.16). The State Abattoir remained open until 1988.

A portion of the abattoir was resumed for the State Brickworks in 1911 (Urbis 2016, p.22, Artefact Heritage 2016, p.12). The State Brickworks included a clay pit and kilns. The State Brickworks closed in 1940 for a period and was reopened after the end of World War II. Like the State Abattoir, the State Brickworks remained open until 1988, however sandstone continued to be extracted from the site until 1992. The clay pit was used as a Municipal waste depot from the 1960s (Urbis 2016, p.17).

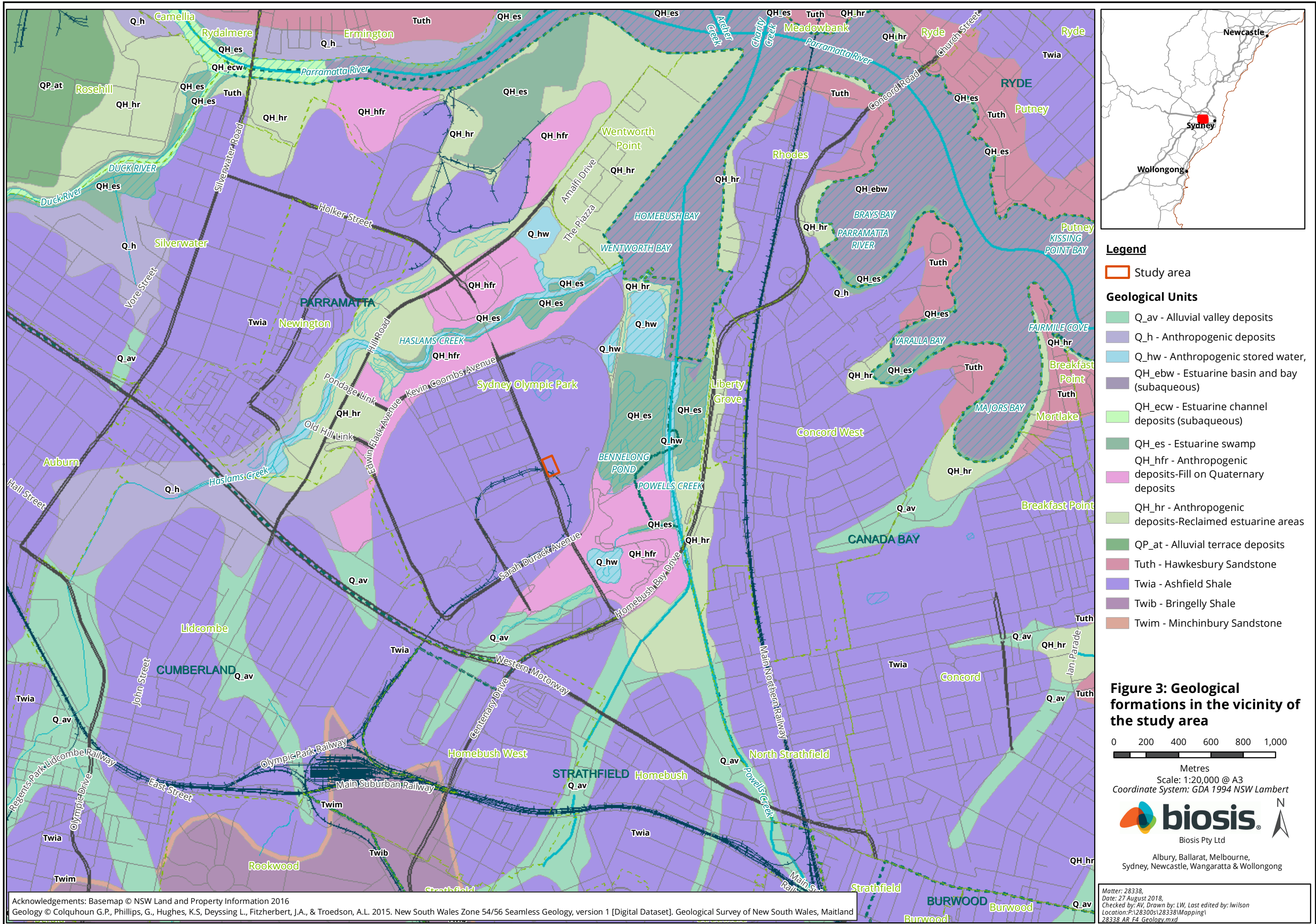
From the 1920s the waterfront at Homebush was used for industrial and chemical manufacturing purposes. By the 1950s much of the wetlands and mangroves had been reclaimed in order to create more waterfront industrial land (Urbis 2016, p.17).

Throughout much of the 20<sup>th</sup> century, Homebush suffered from industrial pollution including contamination from paint, chemical, and pesticide production; and effluent waste from the State Abattoir (Urbis 2016, p.17, Artefact Heritage 2016, p.13). The land reclamation activities also had a significant impact on the environment in the Homebush area and its surrounds. Approximately nine million cubic metres of waste and contaminated soils covered over 400 hectares of land at Homebush by 1988. In 1991, remediation of the land began. In 1995, the area fell under the responsibility of the Olympic Coordination Authority as the planning and development of Sydney Olympic Park at the site commenced (Urbis 2016, pp.18–22, Artefact Heritage 2016, p.13).

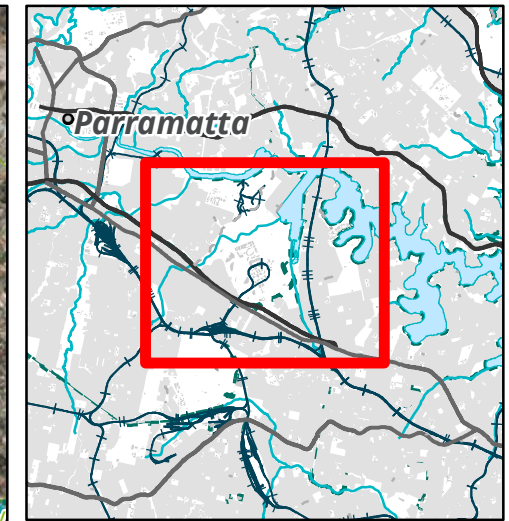
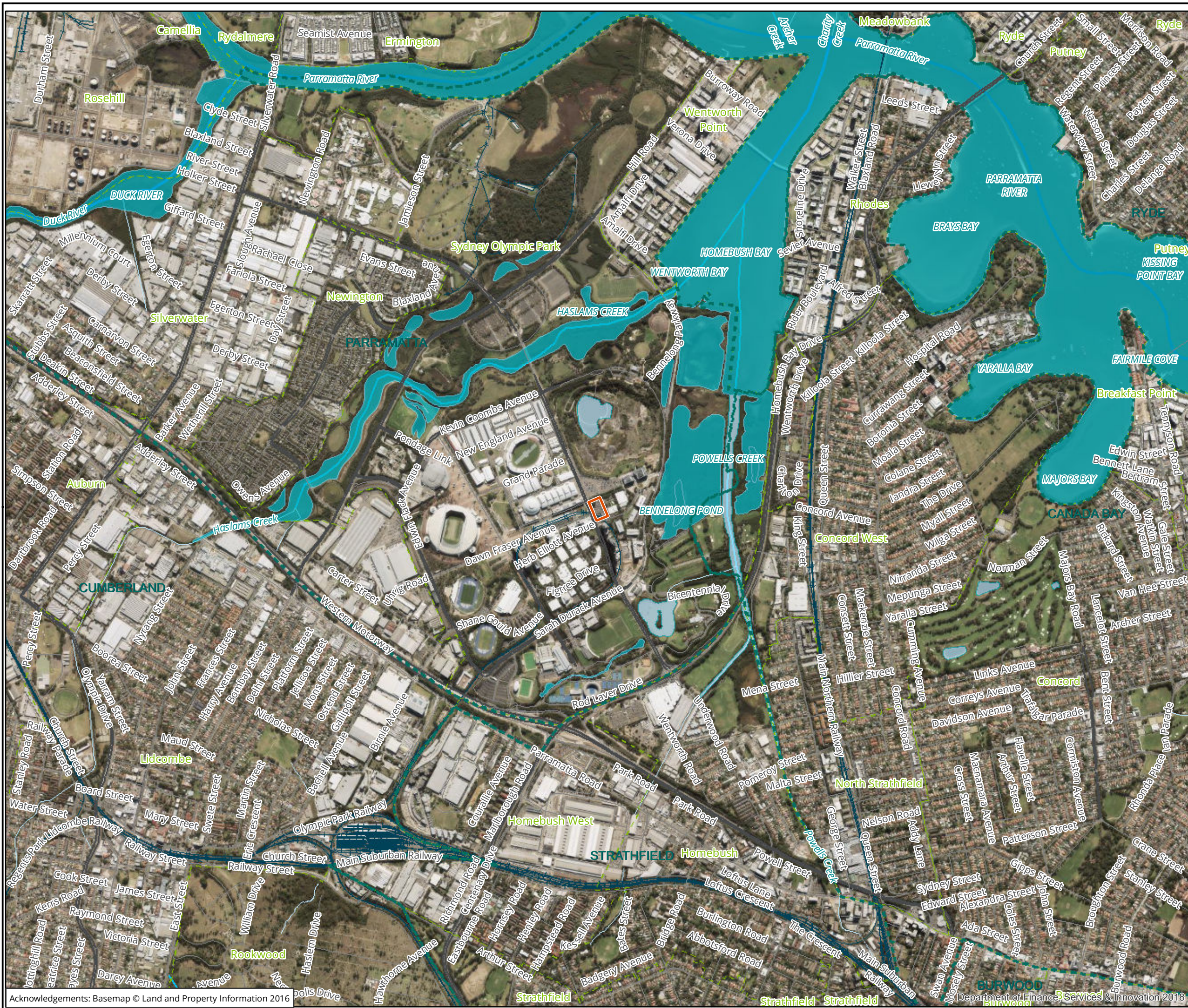
In 1997, archaeological testing was conducted at 2 Figtree Drive, located approximately 250 metres to the south west of the study area (Steele, D. and Carney M. 1997). The archaeological testing indicated that soils present within the study area consisted of reformed top soil which was introduced to the site after erosional processes, or attempts to remove contaminated soils, stripped the original soil deposits (Steele, D. and Carney M. 1997, Urbis 2016, p.28). The testing concluded that there was no potential for Aboriginal archaeological deposits to remain within the study area (Steele, D. and Carney M. 1997, Urbis 2016, p.28).

Today the study area is utilised as a carpark, and consists of an asphalt lot with introduced plantings along the study area boundaries. The Sydney Olympic Park train loop has been constructed immediately below the study area (refer to Figure 2).









**Legend**

Study area

**Hydrology**

Canal-Drain

Natural watercourse

**Strahler Order**

1

2

3

4

**Figure 4: Hydrology in the vicinity of the study area**

0 0.2 0.4 0.6 0.8 1

Kilometers

Scale: 1:20,000 @ A3

Coordinate System: GDA 1994 NSW Lambert

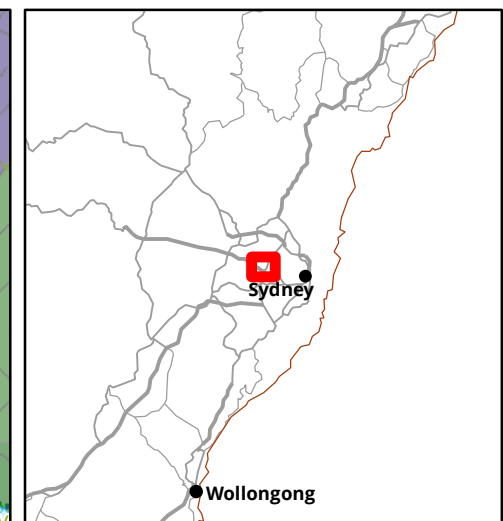
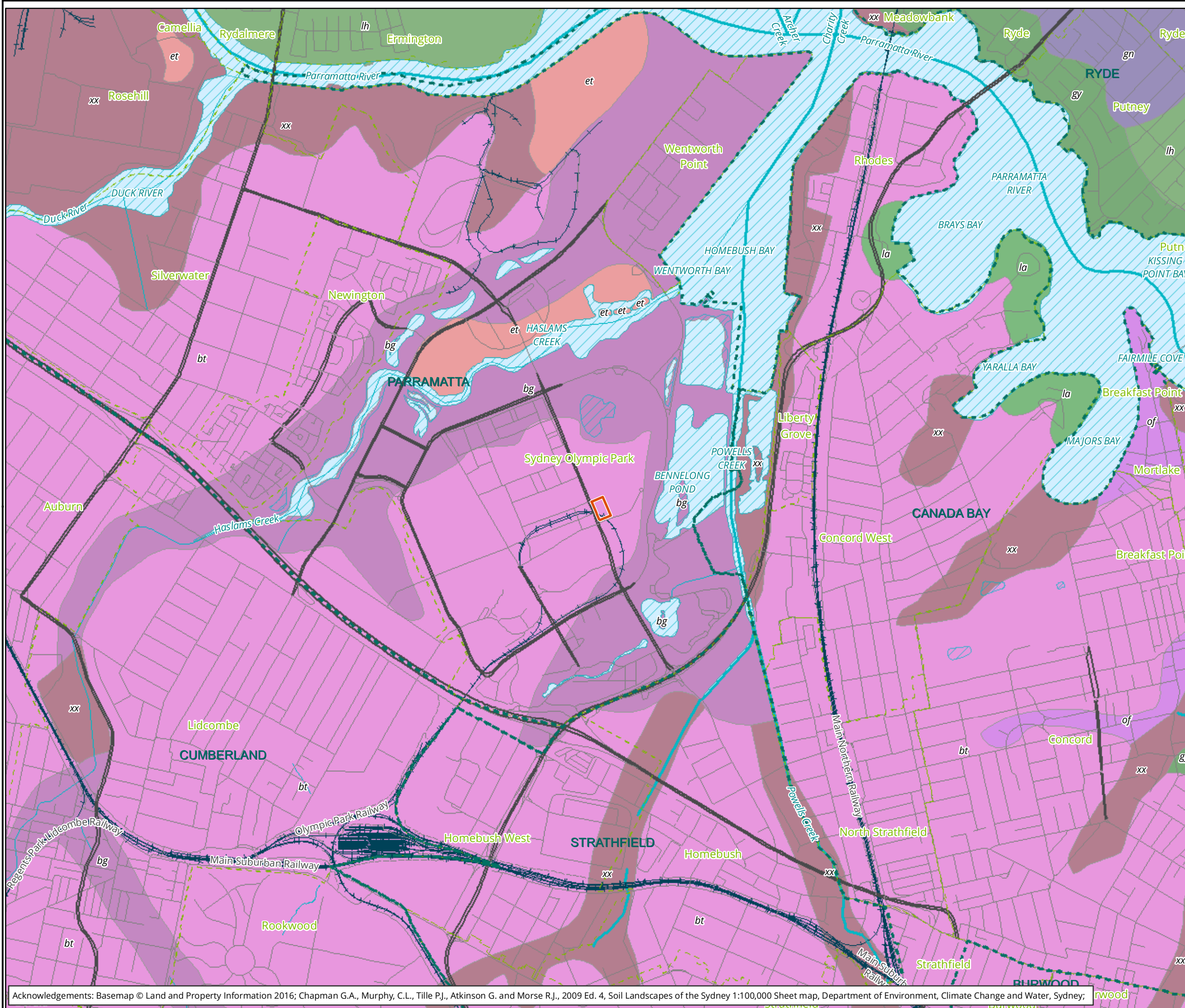
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Location: P:\28300s\28338\Mapping\28338\_AR\_F5\_Hydrology





### Legend

Study area

### Soil Landscape units

- bg - BIRRONG
- bt - BLACKTOWN
- et - ETTALONG
- gn - GLENORIE
- gy - GYMEA
- la - LAMBERT
- lh - LUCAS HEIGHTS
- of - OXFORD FALLS
- WATER - WATER
- xx - DISTURBED TERRAIN

**Figure 5: Soil landscapes in the vicinity of the study area**

0 200 400 600 800 1,000  
Metres

Scale: 1:20,000 @ A3  
Coordinate System: GDA 1994 NSW Lambert



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Date: 27 August 2018,  
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Location: P:\28338\28338\Mapping\28338\_AR\_F6\_Soils

## 3.2 Previous archaeological work

A large number of cultural heritage surface (surveys) and sub-surface (excavations) investigations have been conducted throughout the Cumberland Plain region in the past 30 years. There has been an increasing focus on cultural heritage assessments in NSW due to ever increasing development, along with the legislative requirements for this work and greater cultural awareness of Aboriginal cultural heritage.

Consequently, the archaeology of the Sydney Basin has been well documented through a large number of academic and heritage assessment investigations over the past three decades (Haglund, L. 1980, Kohen, J. 1986, McDonald & Rich 1993). Aboriginal occupation of the region extends well back into the Pleistocene period (i.e prior to 10,000 years BP). This is evidenced by radiocarbon dates retrieved from excavated sites at Shaw's Creek K2 (14,700 years BP) (Attenbrow, V 2010, p.18) and a site in the immediate area of the current study, George and Charles Street, Parramatta (approximately 25,000-30,000 BP) (Jo McDonald Cultural Heritage Management Pty Ltd 2005a).

### 3.2.1 Regional overview

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

Kohen (1986) conducted a regional study of the Cumberland Plain's archaeology and made a number of observations regarding site location patterns in the broader Sydney Basin. The results of this assessment are summarised here:

- Proximity to water was a significant factor in both site pattern and location, with 65% of open artefact scatter sites being located within 100 metres of permanent fresh water. Open site artefact scatters are larger, more complex and more densely clustered around permanent water sources.
- The greatest proportion of sites were located on Wianamatta Shale substrates.
- Three site types were identified from observations of surface archaeology and classified according to function: camping sites, woodworking sites and hunting sites.
- Silcrete and chert were the most common materials used to manufacture stone artefacts. Silcrete comprised 51% of artefacts identified during Kohen's survey, and chert 34%. Other materials included quartz, basalt and quartzite.
- There was relationship between the amount of ground disturbance and the visibility of artefacts. The more disturbance which had occurred at a site, the more artefacts were visible.

Although Kohen's observations about the archaeology of the Cumberland Plain have been generally supported by subsequent investigations, the 1986 study relied heavily on surface evidence in formulating its conclusions. In the three decades since Kohen's study, a large number of archaeological excavations have been undertaken across the Cumberland Plain (Jo McDonald Cultural Heritage Management Pty Ltd 2005a, White, B & McDonald, J 2010, McDonald, J. & Rich, E. 1993), which have demonstrated the existence of sub-surface deposits buried beneath current ground surfaces. This is a critical consideration in aggrading soil landscapes, such as those commonly found across the Cumberland Plain.

JMCHM (1997) expanded upon the work done by Kohen. Her investigation at St Marys (approximately 20 kilometres west of the current study area) presents a number of detailed conclusions about the



broader archaeology of the Cumberland Plain, in particular, the potential for subsurface deposits in the absence of surface archaeology. McDonald's findings are summarised here:

- Sites cannot be adequately characterized on the basis of surface evidence alone, with 17 out of 61 excavated sites having no surface artefacts before excavation. The ratio of recorded surface to excavated material was 1:25.
- Open sites with subsurface archaeological deposits were the most commonly occurring sites.
- Open sites found in stable and aggrading landscapes may be intact and have the potential for internal structural integrity. Sites located in alluvium and other depositional environments contain the best potential for intact archaeological remains and stratification.
- Environmental factors can influence site patterning, with sites on permanent water being more complex than those situated on ephemeral or temporary water lines. However, there is not always a direct correlation between site location and the environment.
- Proximity to water, major water course confluences, and underlying geological units are key factors in site distribution.
- Stream order is an important factor in measuring the distribution of sites. Sites located in close proximity to established, permanent, and drainage channels (e.g., 3rd and 4th order creeks) are more likely to have higher artefact densities and a greater diversity of tools than sites associated with lower order water courses. Temporary water sources and minor gullies tend to have single-use or occasionally repeated visits and hence lower density sites. Locations between creeks, such as ridge-tops and spurs, may possibly contain archaeological evidence, which may vary according to proximity to water sources.
- Sites in close proximity to an identified stone source will contain a range of size and cortex characteristics in their assemblages. As distance increases from the source, artefact size and percentage of cortex in the assemblage will decrease.

White and McDonald (2010) undertook a review of previous work in the Rouse Hill development area, discussing lithic artefact distribution in previous excavations carried out by JMCHM. The study considered a number of factors including stream order, distance from water, landform, aspect, and distance to silcrete sources. As a result of the assessment, the following statements were made:

- 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 to 100 metres from water.
- Landform: Artefact density was considered to be lowest on upper slopes and ridgetops, with density increasing on mid and lower slopes. Density was highest in terrace landforms, and lower on creek flats, likely due to repeated flooding events and the erosion 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 the preference being for slightly elevated, well-drained areas in the lower parts of valleys.

### **3.2.2 Local overview**

A large number of Aboriginal cultural heritage investigations have been conducted within approximately five 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.

Haglund and Associates (2004) undertook a series of excavations at the Parramatta Children's court, George Street, Parramatta, as part of an overall heritage assessment of the site. The site is approximately five kilometres west of the current study area. During excavations, a total of 21 trenches were dug to a maximum of 60 centimetres. Despite extensive modification and disturbance of the upper layers, including the removal or fill of original soil profiles, a number of Aboriginal artefacts were recovered (unfortunately the report does not contain exact numbers), at depths ranging from 30 to 60 centimetres. A variety of materials were retrieved, including silcrete, chert, quartz, and basalt. Surprisingly tuff is not mentioned (Haglund and Associates 2004, pp.11–12). The presence of a sand layer was also noted during excavations, which may comprise part of the Parramatta Sand Body.

JMCHM (2005a) drew on earlier stream models and the results of excavations in Parramatta in order to develop a predictive model that has informed many subsequent studies in the region. McDonald's model discussed the importance of the Parramatta Sand Body, higher order streams and alluvial deposits in retaining evidence of Aboriginal occupation of the Sydney Basin extending into the Pleistocene. The following predictions were made regarding both Aboriginal occupation and the potential for archaeological materials to be present in the landscape:

- The likelihood of archaeological material being found is determined by the soil profile, the landform and geomorphology of the area and the extent of previous land use disturbance.
- Archaeological evidence of Aboriginal occupation could be extensive in the near vicinity of permanent watercourses supporting a wide range of natural resources (i.e. plants, fish, game).
- Evidence of prehistoric and long term Aboriginal occupation will be found on the Parramatta Sand Body, in close proximity to permanent freshwater sources, such as the Parramatta Rive. These areas are "likely to contain archaeological evidence for repeated use, of both short and long term duration, by small and large groups of people," (Jo McDonald Cultural Heritage Management Pty Ltd 2005a, p.37)
- The Parramatta Sand Body comprises a stratified deposit, and has the potential to preserve long term Aboriginal occupation and changes in climatic and other environmental conditions.

Irish (2004) undertook an assessment of Aboriginal scarred trees at Sydney Olympic Park as part of the Aboriginal History and Connections Program (AHCP), established by the Parklands Unit at Sydney Olympic Park. The purpose of the AHCP was to explore Aboriginal connections to the Homebush Bay area of Sydney from the earliest occupation until the present day. The ACHP found that the Sydney

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

KNC (2014) undertook an Aboriginal archaeological assessment for the Westconnex M4 Widening from Pitt Street, Parramatta to Homebush Bay Drive, Homebush. The assessment area for this assessment is located approximately one kilometre to the south of the current study area. KNC found that artefact scatters were the most common Aboriginal site type identified within proximity to the proposed works. PADs, scarred trees and isolated artefacts had also been recorded, however at slightly lower levels. KNC determined that the absence of previously recorded Aboriginal sites within one kilometre of their study area boundary was a result of intensive modification to the current landscape. KNC noted that Aboriginal archaeological sites were however likely to be identified in residual areas of low modification. An archaeological survey was undertaken by KNC as part of this assessment. No Aboriginal sites or areas of archaeological sensitivity were identified, and the entire study area was found to be heavily disturbed by previous road construction works and residential and commercial development.

Artefact Heritage (2016) undertook an archaeological assessment of Site 9, Sydney Olympic Park located approximately 600 metres to the south west of the current study area. The assessment found that the study area has undergone a large amount of landform modification as a result of agricultural activities throughout the 19<sup>th</sup> and 20<sup>th</sup> centuries, late twentieth century contamination fills, and subsequent urban redevelopment for Sydney Olympic Park. Geotechnical testing conducted at the site indicated that the top three to seven metres of soils at the site were manmade contaminated fill, which overlaid clays and shale bedrock (Artefact Heritage 2016, p.17). Background research conducted as part of this assessment found that prior to the development of Sydney Olympic Park, extensive earthworks were conducted over an area of 60 hectares north of Boundary Creek in order to remediate the contaminated soils present in the Homebush area (Artefact Heritage 2016, p.21). The assessment found that the study area had low potential for containing Aboriginal archaeological site or deposits due to the extensive levels of previous ground disturbance and landform modification present throughout the study area (Artefact Heritage 2016, p.27).

Urbis (2016) was engaged by Mirvac to conduct a historical and Aboriginal Archaeological Assessment to for 2 Figtree Drive, Sydney Olympic Park located approximately 350 metres to the south west of the current study area. No Aboriginal sites or areas of archaeological sensitivity were identified by Urbis. The study area was found to be heavily disturbed by historical, and more recent development, as well as previous historical archaeological excavations conducted at the site prior to the current building in the study area being constructed.

Steele and Carney (1997) conducted the previous Aboriginal and historical heritage assessment of 2 Figtree Drive, Sydney Olympic Park. Steele and Carney (1997) surveyed the site which was at the time a vacant lot or truck parking area. Steele and Carney did not identify any Aboriginal sites or areas of Aboriginal archaeological sensitivity. Carney and Steele did however determine that there was the potential for historical heritage relics or archaeological deposits to be present within the study area. Archaeological excavations were conducted on the site prior to the construction of the current

building in the site. They found the soils present within the study area consisted of reformed top soil which was introduced to the site after erosional processes as a result of European settlement stripped the original soil deposits (Steele, D. and Carney M. 1997, Urbis 2016, p.28).

### 3.2.3 AHIMS site analysis

A search of the OEH Aboriginal Heritage Information Management System (AHIMS) database (Client Service ID: 366293) identified 94 Aboriginal archaeological sites within a five by five kilometre search area, centred on the proposed study area (Table 3). None of these registered sites are located within the study area (Figure 7). AHIMS search results are provided in Appendix 1. Table 3 provides the frequencies of Aboriginal site types in the vicinity of the study area. The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. These descriptions and maps were relied where notable discrepancies occurred.

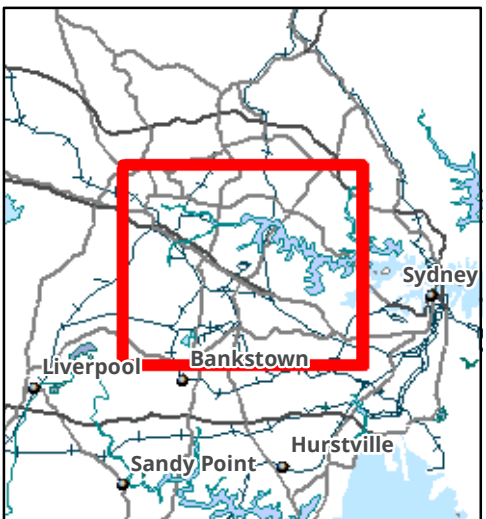
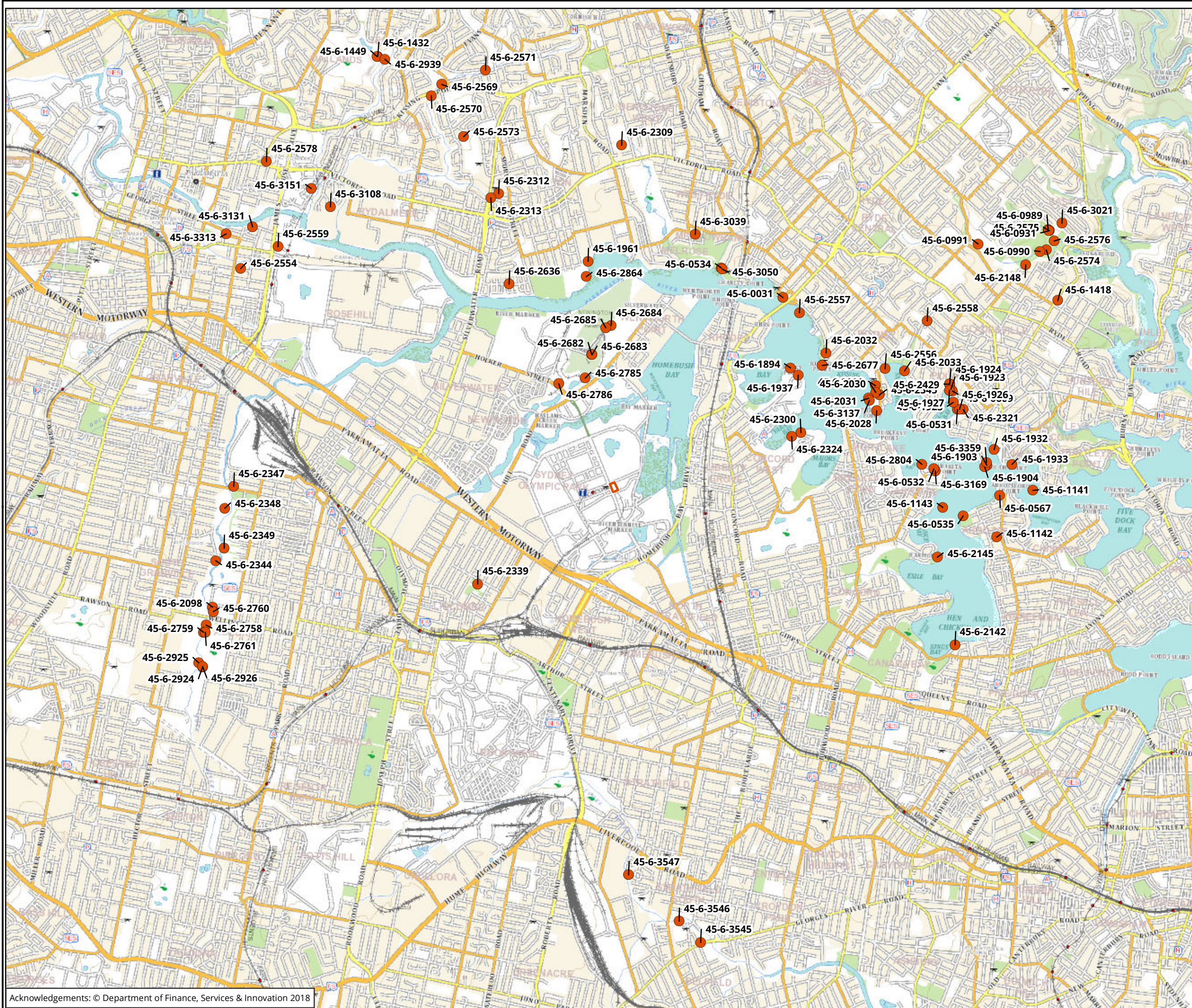
It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area. Some recorded sites consist of more than one element, for example artefacts and a modified tree, however for the purposes of this breakdown and the predictive modelling, all individual site types will be studied and compared. This explains why there are 143 results presented here, compared to the 94 sites identified in AHIMS.

**Table 3 AHIMS site type frequency**

Site type	Number of occurrences	Frequency (%)
Artefact	66	46.15
Shell	33	23.08
Grinding Groove	4	2.80
Art (Pigment or Engraved)	10	6.99
Rock Shelter	18	12.59
Potential Archaeological Deposit (PAD)	10	6.99
Aboriginal Resource and Gathering	1	0.70
Burial	1	0.70
Total	143	100.00

A simple analysis of the Aboriginal cultural heritage sites registered within a five kilometre buffer of the study area indicates that the most common site type is artefact sites, representing 46.15% (n=66). This was followed by shell and rock shelter sites which constituted 23.08% and 12.59% respectively (n=33 and n=18). Potential Archaeological Deposits (PADs) and art (pigment or engraved) sites each comprised of 6.99% (n=10) of the site types identified, and grinding grooves 2.80% (n=4). Burial and Aboriginal Resource and Gathering sites have also been recorded within the search area, representing 0.70% of the total site type each (n=1). Most of these site types were located within close proximity to Parramatta River or one of its tributaries, and Rock shelter sites and grinding groove sites would have been identified within areas where suitable sandstone outcrops or escarpments would have been present.





**Legend**

- Study area
- AHIMS record

**Figure 6: AHIMS records near the study area**

**NOT TO BE MADE PUBLIC**

0 0.45 0.9 1.35 1.8 2.25  
Kilometers

Scale: 1:47,000 @ A3  
Coordinate System: GDA 1994 NSW Lambert

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Matter: 28338  
Date: 27 August 2018,  
Checked by: Iwilson, Generated by: Iwilson  
Location: P:\28300s\28338\Mapping\28338\_AR\_F7\_AHIMS.mxd



### 3.2.4 Predictive statements

A series of 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 have been 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.

Table 4 below indicates the site types most likely to be encountered during the archaeological investigations across the study area. The definition of each site type is described firstly, followed by the predicted likelihood of this site type occurring within the study area.

**Table 4 Aboriginal site prediction statements**

Site type	Site description	Potential
<b>Flaked stone artefact scatters and isolated artefacts</b>	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 across a wide range of landforms. Due to the high levels of previous ground disturbance within the study area it is unlikely that artefact sites are present in the study area.
<b>Shell middens</b>	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	Low: Shell midden sites have been previously recorded in the region in close proximity to reliable water sources. Due to the high levels of previous ground disturbance within the study area, and previous modifications to creek lines in the local area, it is unlikely that midden sites are present in the study area.
<b>Potential archaeological deposits (PADs)</b>	Potential sub surface deposits of cultural material.	Low: PADs have been previously recorded in the region across a wide range of landforms. Due to the high levels of previous ground disturbance within the study area it is unlikely that PAD sites are present in the study area.
<b>Modified trees</b>	Trees with cultural modifications	Nil: No old growth native trees exist within the study area. There is therefore no potential for modified trees to be present

Site type	Site description	Potential
		within the study area
<b>Axe grinding grooves</b>	Grooves created in stone platforms through ground stone tool manufacture.	Nil: The geology of the study area lacks suitable horizontal sandstone rock outcrops for axe-grinding grooves. Therefore there is no potential for axe grinding grooves to occur in the study area.
<b>Burials</b>	Aboriginal burial sites.	Low: Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. The soil profiles associated with the study area are not commonly associated with burials. The high levels of previous ground disturbance also indicate that the potential for Aboriginal burials in the study area is low.
<b>Rock shelters with art and / or deposit</b>	Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground characterised by cliff lines and escarpments. These naturally formed features may contain rock art, stone artefacts or midden deposits and may also be associated with grinding grooves.	Nil: The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not present in the study area.

## 4 Archaeological survey

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A field survey of the study area was undertaken on 6 September 2018. The field survey sampling strategy, methodology and a discussion of results are provided below.

### 4.1 Archaeological survey objectives

The objectives of the survey were to:

- undertake a systematic survey of the study area targeting areas with the potential for Aboriginal heritage
- identify and record Aboriginal archaeological sites visible on the ground surface
- identify and record areas of potential archaeological deposits (PADs).

### 4.2 Archaeological survey methodology

The survey methods were intended to assess and understand the landforms and to determine whether any archaeological material from Aboriginal occupation or land use exists within the study area.

#### 4.2.1 Sampling strategy

The survey effort consisted of one meandering transect over the entire study area. All landforms present were inspected targeted in order to determine if any Aboriginal sites or objects will be impacted on by the proposed works.

#### 4.2.2 Survey methods

The archaeological survey was conducted on foot by James Cole (Biosis archaeologist) and Kevin Telford (Metropolitan LALC). Recording during the survey followed the archaeological survey requirements of the code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey
- survey coverage
- any resources that may have potentially have been exploited by Aboriginal people
- landform
- photographs of the site indicating landform
- evidence of disturbance
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

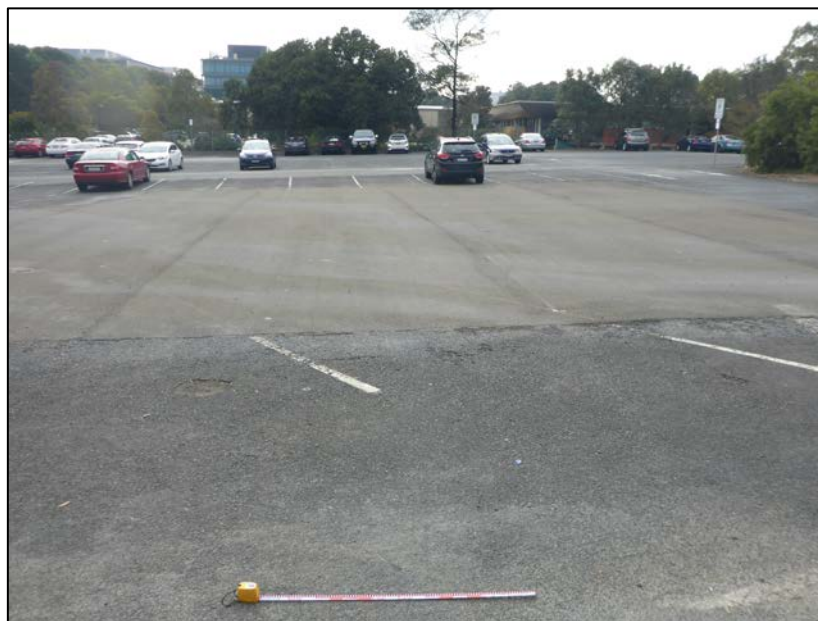
Where possible, identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, ground surface visibility (GSV) and the recording of soil information for each survey unit were possible. Any potential Aboriginal objects observed during the survey were documented and photographed. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements were recorded using a hand-held Global Positioning System (GPS) and the Map Grid of Australia (MGA) (94) coordinate system.

### 4.3 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 factor that contributed most to the effectiveness of the survey within the study area was ground surface visibility (GSV).

### 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). Visibility across the study area was generally nil, due to the entire study area being covered with asphalt (Plate 2), and heavily mulched garden beds (Plate 3).



**Plate 2** Example of ground surface visibility across the study area (facing north)

### 4.5 Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed, and attempts to describe the relationship between those conditions and the likelihood the prevailing conditions provide for the exposure of (buried) archaeological materials. Whilst also usually expressed as a percentage estimate, exposure is different to visibility in that it is in part a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke & Smith 2004, p.79, DECCW 2010b). Overall, the study area displayed low levels of exposure throughout (Plate 2 and Plate 3). The majority of the study area has been covered in asphalt, while the areas which haven't been asphalted are manmade garden beds covered mulch. The surveyors' ability to identify any Aboriginal objects or areas of subsurface archaeological potential was therefore highly limited.





**Plate 3** Example of low level of ground exposure in graden beds (facing north)

## 4.6 Disturbances

Disturbance in the study area is associated primarily with human agents. The entire study area has been subject to very high levels of previous ground disturbance associated with 19<sup>th</sup> and 20<sup>th</sup> century agricultural activities, industrial activities associated with the State Abattoir, contamination remediation works, and the construction of Sydney Olympic Park. The entire study area had been asphalted and is currently used as a car park (Plate 4), a number of garden beds have also been constructed in the study area (Plate 5).



**Plate 4** View of the study area facing south east



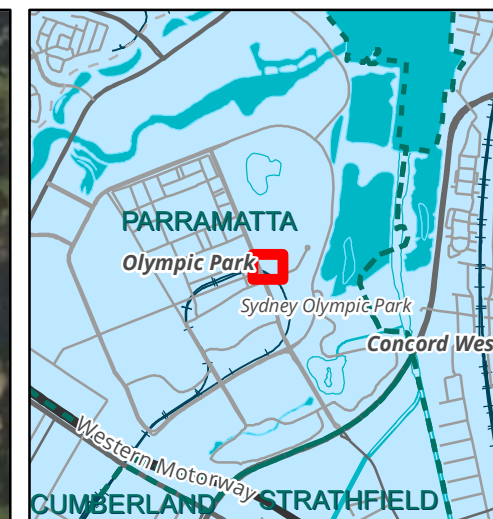
**Plate 5      Garden beds and plantings within the study area**

## **4.7    Archaeological survey results**

One meandering transect was walked across the entire study area (Figure 8). The surveyors walked between two and five metres apart. This follows the methodology set out in Burke and Smith (2004, p.65) which states that a single person can only effectively visually survey an area of two linear metres.

Generally the survey was hampered by poor GSV due to the presence of asphalt across the majority of the study area and mulch within garden beds which obscured visibility. No Aboriginal objects, sites, or areas of archaeological sensitivity were identified during the survey.





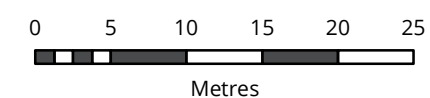
#### Legend

- Study area
- Survey track

#### Archaeological potential

- Low

**Figure 7: Survey results**



Scale: 1:500 @ A3  
Coordinate System: GDA 1994 NSW Lambert



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

Matter: 28338  
Date: 24 September 2018,  
Checked by: AV, Drawn by: LW, Last edited by: lwilson  
Location: P:\28300s\28338\Mapping\28338\_AR\_F8\_SurveyResults



## 5 Analysis and discussion

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A review of previous assessments conducted within the local area and the wider Cumberland Plain region, along with AHIMS search results, indicates that artefact scatters, and midden sites are the most prevalent site types present within the local region. While shelter sites, scarred trees, PADs, art sites, and burials have also been recorded in the local region at much lower frequencies.

Most of the Aboriginal sites identified within the local region were located within close proximity to the Parramatta River or one of its tributaries. Rock shelter sites and grinding groove sites were identified within areas where suitable sandstone outcrops or escarpments were present. Previous regional predictive models established by Kohen (1986), JMCHM (1997) and White and McDonald (2010) have been thoroughly tested and are widely accepted for the Cumberland Plain. These assessments found that landform and distance from water had an impact on Aboriginal site distribution. Artefact sites are found on all landforms, however, Aboriginal sites are more frequently identified within slightly elevated, well-drained areas in the lower parts of valleys. Artefact density was considered to be lowest on upper slopes and ridgetops, with density increasing on mid and lower slopes. Density was highest in terrace landforms, and lower on creek flats, likely due to repeated flooding events and the erosion they caused (White, B & McDonald, J 2010). Water supply is 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 (White, B & McDonald, J 2010, Jo McDonald Cultural Heritage Management Pty Ltd 1997).

The study area is situated within the Blacktown soil landscape which has the potential to contain residual soils capable of preserving Aboriginal archaeological deposits. The study area is also located within close proximity to reliable sources of water such as the Parramatta River, Haslams Creek and Powells Creek. However, a review of the land use history of the study area along with current aerial imagery indicates that the study area has been subject to high levels of previous ground disturbance (Urbis 2016, p.28, Artefact Heritage 2016, p.21, Irish, P. 2004, p.59). Previous assessments within Sydney Olympic Park (Urbis 2016, KNC 2014, Irish, P. 2004, Steele, D. and Carney M. 1997) found that Sydney Olympic Park has been subject to very high levels of previous disturbance as a result of 19<sup>th</sup> and 20<sup>th</sup> century agricultural and industrial activities, land reclamation, and soil contamination remediation activities. Archaeological assessments conducted in close proximity to the current study area found that soils consisted of between 3-7 metres of contaminated fill which overlies clay and shale bedrock (Urbis 2016, p.28, Artefact Heritage 2016, p.21).

The archaeological survey conducted on 6 September 2018 confirmed the level of previous disturbance within the study area. No archaeological objects, sites or areas of archaeological sensitivity were identified during the survey. The level of previous ground disturbance throughout the entire Sydney Olympic Park area indicates that there is low potential for the proposed works to impact on Aboriginal archaeological deposits, sites, or objects (Figure 8). Irish (2004, p.59) states that the only area within the Sydney Olympic Park which contains potential for Aboriginal archaeological material to be present is the relict Cumberland Woodland known as the Wanngal (Newington) Woodland, within the Newington Nature Reserve. This supports the argument that Aboriginal sites or objects are unlikely to be present within the study area.

## 6 Recommendations

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The following management recommendations have been developed relevant to the study area and are influenced by:

- predicted impacts to Aboriginal cultural heritage
- the planning approvals framework
- current best conservation practise, widely considered to include:
  - Ethos of the Australia ICOMOS Burra Charter (2013)
  - The code.

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

### **Recommendation 1: Works may proceed with caution**

No Aboriginal objects, sites, or areas of sensitivity were identified within the study area. No further archaeological works are required. The proposed works may proceed with caution.

### **Recommendation 2: Discovery of unanticipated Aboriginal objects and/or Aboriginal ancestral remains**

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 OEH. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the OEH and Aboriginal stakeholders.

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:

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

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## Appendices

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## Appendix 1 AHIMS results

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**THE FOLLOWING APPENDIX IS NOT TO BE MADE PUBLIC**