NORTHERN BEACHES HOSPITAL
CONNECTIVITY AND NETWORK ENHANCEMENT WORKS (SSI 14_6434)

Aboriginal Archaeological Survey Report
Stage 2 PACHCI

Prepared for Roads and Maritime Services

Warringah Local Government Area

October 2014

Ref. 1309

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Executive Summary

Roads and Maritime Services (Roads and Maritime) is seeking approval for the Northern Beaches Hospital – Connectivity and Network Enhancements Project. The approval is sought under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The project comprises road upgrades to enhance arterial and sub-arterial road network connectivity in the Northern Beaches Hospital (NBH) precinct at Frenchs Forest, within the Warringah local government area (LGA) on Sydney’s Northern Beaches.

The Northern Beaches Hospital Connectivity and Network Enhancements Project is proposed to be assessed in stages under section 115ZD of the EP&A Act. An Environmental Impact Statement (EIS) is being prepared to provide an assessment of the concept proposal for the whole of the project and a more detailed environmental assessment of the Stage 1 works. This would enable Stage 1 to proceed to construction (subject to approval). Stage 1 Hospital Connectivity Works aim to enhance the existing road network to facilitate the opening of the proposed Northern Beaches Hospital by 2018. Stage 2 Network Enhancement Works is directed towards broader network capacity enhancement particularly along Warringah Road.

Kelleher Nightingale Consulting Pty Ltd was engaged by Roads and Maritime to undertake an Aboriginal heritage assessment as part of the EIS being prepared for the Concept Proposal and Stage 1. The assessment has been prepared in accordance with the Roads and Maritime Services Procedure for Aboriginal Cultural Heritage Consultation and Investigation and the requirements of the Director-General (NSW) Planning and Infrastructure (the Director General’s requirements) issued on 17 April 2014.

Two previously unrecorded Aboriginal archaeological sites were identified during field survey of the study area. Trefoil Creek 1 is a rockshelter with art located east of Wakehurst Parkway and Trefoil Creek 2 is a rockshelter with potential archaeological deposit (PAD) approximately 60 metres south east of Trefoil Creek 1. These two sites are not within the proposed construction footprint for the concept plan, Stage 1 or Stage 2 works proposal. Previously recorded site Blue Stone Cave (AHIMS 45-6-1004), a rockshelter with art, was not relocated at the AHIMS registered location during the field survey and it has been determined that the registered site coordinates on AHIMS are incorrect. Blue Stone Cave is not located within the project study area and would not be impacted by the proposed works.

No Aboriginal archaeological objects, sites or potential archaeological deposits were identified in the proposed construction footprint for the concept plan, Stage 1 or Stage 2 works proposal. It is recommended the location of Trefoil Creek 1 and Trefoil Creek 2 should be considered during the detailed design phase to ensure they are avoided by construction works. If they remain outside the construction impact area, there will be no impact to Aboriginal objects, sites or potential archaeological deposits.

There are no Aboriginal archaeological heritage constraints to the Northern Beaches Hospital Connectivity and Network Enhancement Works project under the current concept plan, Stage 1 or Stage 2 works proposal.
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1 Introduction

Roads and Maritime Services (Roads and Maritime) is seeking approval for the Northern Beaches Hospital – Connectivity and Network Enhancements Project. The approval is sought under Part 5.1 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The project comprises road upgrades to enhance arterial and sub-arterial road network connectivity in the Northern Beaches Hospital (NBH) precinct at Frenchs Forest, within the Warringah local government area (LGA) on Sydney’s Northern Beaches.

The proposed NBH development was announced in October 2012. The NBH has also been categorised as SSI through the effect of State Environmental Planning Policy (State and Regional Development) 2011. The aim of the NBH development is to consolidate a number of medical and ancillary services, currently dispersed over a number of areas, into one facility at Frenchs Forest. An increase in the number of vehicle trips to and from the area is expected as a result of the NBH development. To support the demand created by the NBH and the future development of the area, significant road upgrades will be required. Roads and Maritime is proposing a staged development program of road upgrades to address this need.

Roads and Maritime engaged Kelleher Nightingale Consulting Pty Ltd (KNC) to prepare an Aboriginal archaeological survey report to inform the Environmental Impact Statement (EIS) being prepared for the Concept Proposal and Stage 1 of the project.

The assessment was carried out in accordance with the Director General’s requirements (DGRs) for the project EIS issued on 17 April 2014 and the Roads and Maritime Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) (November 2011).

1.1 Staged Project Application

The Northern Beaches Hospital Connectivity and Network Enhancements Project is proposed to be assessed in stages under section 115ZD of the EP&A Act.

The EIS provides an assessment of the concept proposal for the whole of the project and a more detailed assessment of the Stage 1 works. The concept proposal for the whole Northern Beaches Hospital Connectivity and Network Enhancements Project includes two stages:

- Stage 1 Hospital Connectivity Works which aim to enhance the existing road network to facilitate the opening of the proposed Northern Beaches Hospital by 2018.
- Stage 2 Network Enhancement Works is directed towards broader network capacity enhancement particularly along Warringah Road.

The EIS assesses both stages at a concept proposal level and provides more detailed environmental assessment of the Stage 1 works. This would enable Stage 1 to proceed to construction (subject to approval). The need for the remainder of the infrastructure, which is directed towards broader network capacity enhancement (Stage 2 Network Enhancement Works), particularly along Warringah Road, has been identified at a strategic level and developed as a concept proposal only (so far).

The staged approval approach would enable construction of the Stage 1 Connectivity Works to commence (subject to planning approval) in a timely fashion providing adequate connectivity to the hospital by 2018, while the design of the Network Enhancement Works is being refined and assessed.

1.2 Concept Proposal Description

The Northern Beaches Hospital – Connectivity and Network Enhancements Project aims to:

- Assist in the management of journeys in connection with anticipated future intensification of medical, commercial and residential land uses surrounding the new hospital.
- Mitigate the worsening of traffic congestion on the Warringah Road and Wakehurst Parkway arterial road corridors and their principal feeder roads.
- Enhance access arrangements by car, bus and active transport for the NBH’s employees, patients, outpatients and visitors.
- Facilitate improved access to the NBH and the surrounding employment precincts.
- Have key infrastructure components in place for the proposed hospital opening in 2018.

The location of the Concept Proposal (the ‘study area’) is shown in Figure 1.
Figure 1. Location of the Concept Proposal
Figure 2. Strategic design for the Concept Proposal
The strategic design of the Northern Beaches Hospital Connectivity and Network Enhancements Project in its entirety is referred to in this EIS as the Concept Proposal. The Concept Proposal is proposed to be carried out generally within the following parts of Frenchs Forest:

- Warringah Road from its intersection with Maxwell Parade to its intersection with Courtley Road.
- Forest Way from around Adams Street to its intersection with Warringah Road.
- Naree Road/Frenchs Forest Road from its intersection with Forest Way to its intersection with Warringah Road.
- Wakehurst Parkway from about 500 metres north of Frenchs Forest Road to about 500 metres south of Warringah Road.
- Allambie Road from its intersection with Frenchs Forest Road East to its intersection with Aquatic Drive.
- Rodborough Road from its intersection with Warringah Road to its intersection with Allambie Road.
- A new connection of Aquatic Drive with Wakehurst Parkway (left in left out).

The first stage of the Concept Proposal, the Stage 1 Hospital Connectivity Works (the project), comprises the provision of essential road works to enhance connectivity to the hospital. Further design development would inform a more detailed description and assessment of the project for Stage 2, comprising network enhancement works to improve the broader network capacity. An assessment of the Stage 2 concept design would be the subject of a separate EIS.

A strategic design for the Concept Proposal is described in Table 1. An indication of the staging of key project elements is also included.

**Table 1. Concept Proposal scope including proposed project staging**

<table>
<thead>
<tr>
<th>Key feature</th>
<th>Stage 1</th>
<th>Stage 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Widening and intersection upgrades along sections of Forest Way between Warringah Road and south of Adams Street.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Upgrade of the existing bus stop fronting the Forest Way shopping centre on Forest Way, to accommodate two buses within the bay.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Widening of Naree Road, Frenchs Forest Road West and a section of Frenchs Forest Road East from the Wakehurst Parkway intersection to Allambie Road.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Provision of a new signalised intersection on Naree Road and Forest Way; on Narre Road, Frenchs Forest Road West, and Rabbett Street; on Frenchs Forest Road West at a new access to the hospital opposite Gladys Avenue; on Frenchs Forest Road East and Romford Road; and on Frenchs Forest Road East, Patanga Road and Allambie Road.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Provision of dedicated kerb side bus lanes along approaches and departures to the Frenchs Forest Road intersection with Wakehurst Parkway.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Widening and upgrades to the intersection of Frenchs Forest Road and Wakehurst Parkway.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Widening of Wakehurst Parkway from about 330 metres north of the intersection with Frenchs Forest Road to the intersection with Warringah Road.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Widening of Allambie Road to the north of the intersection with Warringah Road.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Widening and upgrade to the Warringah Road and Allambie Road (north) intersection.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Widening of Warringah Road west of Allambie Road for about 700 metres just to the east of Courtley Road.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Widening of Warringah Road from west of Fitzpatrick Avenue East (and Fitzpatrick Avenue West) to the west of Allambie Road to include:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Subsurface eastbound and westbound through lanes in slot (underpass), through the middle of the Warringah Road corridor, generally from west of Forest Way through to east of Wakehurst Parkway for more than one kilometre.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>- Surface eastbound and westbound lanes running parallel to the slot as part of the Warringah Road corridor to provide access to side roads and the Northern Beaches Hospital.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- The provision of a new pedestrian overbridge across Warringah Road on the western side of the intersection with Hilmer Street.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>- The removal and replacement of the existing pedestrian overbridge across Warringah Road west of the intersection of Forest Way.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Widening of Wakehurst Parkway from the intersection with Warringah Road to south of Aquatic Drive.</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Upgrades to Warringah Road and its intersection with Forest Way, Hilmer Street and Wakehurst Parkway at surface level to provide for all traffic movements and provide for subsurface grade separated through traffic.</td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>
Key feature | Stage 1 | Stage 2
--- | --- | ---
Upgrades or adjustments to existing intersections of Warringah Road with the following local roads and approaches:  
- Fitzpatrick Avenue East.  
- Bantry Bay Road (including closing of the left turn into Bantry Bay Road from Warringah Road eastbound.  
- Rodborough Road.  
- Allambie Road.  
- Forest Way. | X |  
Provision of a new connection at Aquatic Drive and Wakehurst Parkway. | X |  
Substantial utility relocations, including water, sewage, telecommunication, electricity and gas services, along Warringah Road, Wakehurst Parkway and a number of surrounding local roads. | X | X  
Ancillary works during construction including, but not limited to, construction compounds, sedimentation basins, batch plants and stockpile sites. | X | X

The Stage 1 project would also include drainage works, landscaping, property acquisition and adjustments, utility relocations (which may be required to extend into surrounding streets), as well as ancillary works during construction. For the purposes of this report, the scope of the project would not include ongoing maintenance works.

A schematic of the Concept Proposal is shown in Figure 2.

1.3 Director-General’s Requirements

This assessment addresses the Aboriginal heritage requirements identified in the Director-General’s requirements (DGRs) for the staged development of the Northern Beaches Hospital Connectivity and Network Enhancement project including Concept Proposal and Stage 1 hospital connectivity enhancement works, as detailed in Table 2.

Table 2. Director-General’s Requirements - Aboriginal Heritage

<table>
<thead>
<tr>
<th>Director-General’s Requirements</th>
<th>Where addressed</th>
</tr>
</thead>
</table>
| Concept Proposal  
- Details, informed by surveys if required, of Aboriginal and non-Aboriginal heritage items likely to occur within the proposal area. | Sections 2-6 |
| Stage 1 Hospital Connectivity Works  
- Impacts to *Aboriginal heritage* (including cultural and archaeological significance), in particular impacts to Aboriginal objects and potential archaeological deposits (PAD), should be assessed. Where impacts are identified, the assessment shall:  
  - outline the proposed mitigation and management measures (including measures to avoid significant impacts and an evaluation of the effectiveness of the measures) generally consistent with the *Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation* (Department of Environment and Conservation 2005);  
  - be undertaken by a suitably qualified heritage consultant(s);  
  - demonstrate effective consultation with Aboriginal communities in determining and assessing impacts and developing and selecting options and mitigation measures (including the final proposed measures);  
  - assess and document the archaeological and cultural significance of cultural heritage values of affected sites; and  
  - develop an appropriate assessment methodology, including research design, in consultation with the Department and the Office of Environment and Heritage, to guide physical archaeological test excavations of sites and areas of PAD identified in a manner that establishes the full spatial extent and significance of any archaeological evidence across each site/area of PAD, and include the results of these excavations. | Sections 5 and 6 |
1.4 Summary of Findings

Two Aboriginal archaeological sites were located within the Stage 1 area. Trefoil Creek 1 is a rockshelter with art located approximately 25 metres east of Wakehurst Parkway, north of Frenchs Forest Road. The site has been assessed as displaying moderate archaeological significance. Trefoil Creek 1 would not be impacted by the current proposal for Stage 1 works. Trefoil Creek 2 is a rockshelter with Potential Archaeological Deposit (PAD) located approximately 60 metres south east of Trefoil Creek 1. The PAD has been assessed as displaying moderate potential. Trefoil Creek 2 would not be impacted by the current proposal for Stage 1 works.

It was determined that the previously recorded site Blue Stone Cave (45-6-1004) is not located within the study area and has erroneous coordinates registered on AHIMS.

Based on the current concept proposal design for the proposed road upgrade works for both the Stage 1 works and the wider concept proposal area, no impacts to Aboriginal heritage have been identified and no further management measures are necessary for the project.
2 Existing Environment

2.1 Review of Previous Archaeological Investigations

2.1.1 Database Search (AHIMS)

The Aboriginal Heritage Information Management System (AHIMS) is a database operated by OEH, regulated under section 90Q of the National Parks and Wildlife Act 1974. AHIMS contains information and records related to registered Aboriginal archaeological sites (Aboriginal objects, as defined under the Act) and declared Aboriginal places (as defined under the Act) in NSW.

A search of the AHIMS database was conducted on 7 March 2014 (AHIMS Client Service ID 127587) to identify any registered (known) Aboriginal sites or declared Aboriginal places within or adjacent to the study area.

The AHIMS database search was conducted within the following coordinates (GDA zone 56):

333000E to 340000E
6262000N to 6267000N

Number of sites within AHIMS database: 104

The distribution of those recorded Aboriginal sites within the AHIMS search area is shown in Figure 3, with site types and features provided below in Table 3.

One site, 45-6-1004, a shelter with art, was listed on the AHIMS database as being located within the study area (Figure 3).

Table 3. Frequency of site types from OEH AHIMS database search

<table>
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<tr>
<th>Site Context</th>
<th>Site Features</th>
<th>Frequency</th>
<th>(%)</th>
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<tbody>
<tr>
<td>Open Site</td>
<td>Art (Pigment or Engraved)</td>
<td>57*</td>
<td>54.8%</td>
</tr>
<tr>
<td></td>
<td>Art (Pigment or Engraved); Grinding Groove</td>
<td>2</td>
<td>1.9%</td>
</tr>
<tr>
<td></td>
<td>Art (Pigment or Engraved); Grinding Groove; Water Hole</td>
<td>1</td>
<td>1.0%</td>
</tr>
<tr>
<td></td>
<td>Artefact</td>
<td>4*</td>
<td>3.8%</td>
</tr>
<tr>
<td></td>
<td>Artefact; Shell</td>
<td>3</td>
<td>2.9%</td>
</tr>
<tr>
<td></td>
<td>Potential Archaeological Deposit (PAD)</td>
<td>1</td>
<td>1.0%</td>
</tr>
<tr>
<td></td>
<td>Stone Arrangement</td>
<td>1</td>
<td>1.0%</td>
</tr>
<tr>
<td></td>
<td>Aboriginal Resource and Gathering</td>
<td>1</td>
<td>1.0%</td>
</tr>
<tr>
<td></td>
<td>Aboriginal Ceremony and Dreaming</td>
<td>1*</td>
<td>1.0%</td>
</tr>
<tr>
<td>Closed Site</td>
<td>Art (Pigment or Engraved)</td>
<td>11</td>
<td>10.6%</td>
</tr>
<tr>
<td></td>
<td>Art (Pigment or Engraved); Artefact</td>
<td>4</td>
<td>3.8%</td>
</tr>
<tr>
<td></td>
<td>Art (Pigment or Engraved); Artefact; Shell</td>
<td>4</td>
<td>3.8%</td>
</tr>
<tr>
<td></td>
<td>Artefact</td>
<td>5</td>
<td>4.8%</td>
</tr>
<tr>
<td></td>
<td>Artefact; Shell</td>
<td>9</td>
<td>8.6%</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>104</td>
<td>100%</td>
</tr>
</tbody>
</table>

*45-6-1373 (artefact) and 45-6-1160 (art) not Aboriginal sites, 45-6-2788 (ceremony) has status 'deleted'

2.1.2 Discussion of AHIMS Search Results

Results of the AHIMS register search demonstrate the predominance of open art sites, namely rock engravings. Grinding grooves also occur, as do open context artefact scatters and midden sites. One stone arrangement and one Aboriginal resource and gathering site are also registered within the search area. Closed context sites (i.e. rock shelters) represent 31.6% of recorded sites, associated with art, occupation deposit in the form of artefacts or middens, or a combination of these features.

In summary, the AHIMS search area demonstrates a wide variety of site types and features, reflecting the diverse physical environments present within the search area. While only one site has been previously recorded within the study area itself, AHIMS results indicate that archaeological evidence of a range of Aboriginal landscape uses and activities exists in the vicinity.
Figure 3. AHIMS site locations
2.1.3. **Previous Archaeological Investigations**

A number of archaeological investigations have taken place in the vicinity of the study area and range from opportunistic or isolated site recordings to systematic surveys. In particular, rock engraving sites have long been a focus of fascination, with many sites in the area originally recorded by surveyor W.D. Campbell in the late 19th century. Studies conducted in recent years have been prompted by various development and planning projects taking place within the local area. A review of previous investigations provides a useful framework for assessing the known archaeological resource around the study area, and offers insight as to regional patterns or trends that are made evident in the archaeological record. Areas of National Park close to the current study area have been a particular focus of investigation, as these are generally free of development and are less affected by the various land use practices that have attenuated the archaeological record of the wider Sydney region.

One of the earlier scientific studies conducted was an archaeological survey of the Magazine Reserve on Bantry Bay, south of the study area, in 1976. As the prior government use of the site had precluded public visitation, it was believed that any archaeological sites in the area would be relatively undisturbed (Ross & Specht 1976:14). Three out of the four rock engraving sites previously identified in the area by Campbell in 1899 were relocated and two previously unrecorded shelter pigment art sites were identified. In addition, text excavation was carried out at three rockshelter sites considered likely to retain occupational deposit. One of these sites, Bantry Bay 3, demonstrated a deposit containing charcoal, shellfish remains and stone artefacts. The majority of the stone artefacts were flakes made from quartz derived from pebbles naturally occurring in the local sandstone. Smaller frequencies of quartzite and a grey chert were also noted. The mollusc remains were from locally available species: mud oyster, rock oyster, Sydney cockle and smaller quantities of gastropods. No faunal remains were identified. The shellfish assemblage was found to be broadly similar to other excavated midden sites along the shores of Port Jackson, and was considered representative of casual, repeated use of the shelter and accumulation of various discard episodes. A radiocarbon date obtained from a sample of oyster shell returned a date of 4520 ± 100 years before present (BP), suggesting a long history of Aboriginal use of the local coastal resources in this location.

While coastal sites such as Bantry Bay 3 are relatively well documented in the Sydney region, the differing landscape context of the ridgetops more removed from coastal areas on the Hornsby Plateau has also been investigated. The Garigal National Park, north of the current study area, was subject to an archaeological study for the NPWS (Gunn 1992). The area investigated during the project included an area of 900 hectares to the north and west of Wakehurst Parkway, including the majority of the Deep Creek catchment area and the lower valley of Middle Creek to the south. The study aimed to relocate previously recorded sites within the National Park and survey a sample of the terrain to search for previously unrecorded sites. The majority of previously identified sites within the Park consisted of rock engravings recorded decades earlier by surveyor Campbell. The distribution of known sites throughout the Park suggested previous investigations had covered the majority of the area.

The study concentrated on relocating a proportion of the previously recorded sites to check the reliability of existing records and also aimed to identify any unrecorded sites, particularly open artefact scatters and shelters with deposit. In total, 17 sites were located – 12 previously recorded and five new recordings. New recordings included two shelters with art, two shelters with archaeological deposit and one engraving site. An additional 23 sites were known to have been previously recorded within the Park but the location of eight of these was considered unreliable and in need of further investigation. All sites identified in the Park were located on either the ridge top or slope landforms, with none located along the creeklines and drainage flats. Engraving sites were identified predominantly in ridge top contexts, with shelters containing art and/or archaeological deposit more common on the slopes. The land use model developed following the survey suggested that the main focus of Aboriginal occupation would have been along the Narrabeen Lakes and coast, with people making short forays into the hills and creeklines of the Park to obtain seasonally available resources. The ridgelines would have acted as a ‘transit zone’ allowing easier travel to areas further inland (Gunn 1992:29) and were also likely visited for purposes associated with the rock engraving sites.

Further systematic archaeological survey and investigation around the study area has primarily taken place ahead of land development or infrastructure installation due to increasing urbanisation of the Frenchs Forest area over the last three decades. While these studies are by nature confined to small areas or corridors of land, they help to illustrate the remaining archaeological resource that may be located within the current study area.

Survey north of the study area was carried out along Wakehurst Parkway, following the route of a proposed pipeline from Oxford Falls Rd to an existing pipeline access tunnel 3.4km to the north (Haglund 1982). The pipeline route for the most part followed the existing alignment of Wakehurst Parkway through rock cuttings into the underlying Hawkesbury sandstone. Sandstone outcrops in areas away from the road were inspected and found to be tilted and uneven with pitted, irregular surfaces. The infrequent outcrops present along the proposed pipeline route were small and generally damaged. Rockshelters occurring along the route were inspected where possible but a number were screened by lantana or honeysuckle. These shelters were considered unlikely to have been used by Aboriginal people, being small and close to the damp and narrow gully floors. A number of large old growth trees along the Parkway were also inspected, many of which carried scars. In all cases these were found to be either of natural origin or European
surveyor’s marks. It was concluded that construction of the pipeline was unlikely to affect any Aboriginal sites unless the route was modified significantly, in which case further survey would be required.

A survey along a ridge spur above Oxford Creek and Snake Creek, near the end of Perentie Rd to the northwest of the study area was undertaken for a proposed telecommunications cable route (Williams Barber Archaeological Services 1995). As the cable was to follow an existing services easement, the potential for unrecorded sites was assessed as low and the route had suffered severe disturbance due to rubbish dumping, installation of services and use as a vehicle track. No shelter sites or rock engravings were identified along the route, with the majority of the visible sandstone slabs found to be coarse and uneven, unsuited to engravings. One isolated artefact, a red indurated mudstone flake, was found in a highly disturbed context at a distance of 10-15m from the proposed route. The site was assessed as being of moderate archaeological significance despite its disturbed context, given that open campsites are rare in the region, and it was recommended that the area containing the artefact be fenced off during construction.

More recent investigations to the south west of the study area above Bantry Bay have included a number of archaeological field surveys conducted ahead of bike and walking track construction and realignments within Garigal National Park. A survey along a proposed mountain bike track route revisited three previously recorded engraving sites and a shelter with deposit and identified one additional site, a rock engraving of an unidentified marine creature (Epacris Environmental Consultants 2011). Potential impacts to previously recorded sites were identified during the survey and it was recommended that the track be re-routed to avoid impacting the sites. Further survey of the proposed realignment of another mountain bike track identified three rockshelters with confirmed occupation deposit in the form of stone artefacts and a fourth rockshelter with potential archaeological deposit (PAD) (Jackson 2013). All shelters were located off the main ridgeline, in mid slope contexts above gullies containing tributaries draining to Bantry Bay. The ‘Rose Quartz Shelter’ contained a core and a proximal flake fragment of rose quartz. ‘Honeycomb Ceiling Shelter’ contained two quartz artefacts, a sandy surface deposit with charcoal fragments and a possible remnant of rock art in the form of a short, thick horizontal black line on the back wall of the shelter. ‘Broken Glass Shelter’ contained a quartz core fragment and a possible circular scratched rock art image, badly faded. Broken Glass Shelter was considered unlikely to retain further archaeological deposit due to a thin sandy layer over visible sandstone bedrock. ‘Curry Street PAD 01’ contained an apparently intact sandy surface deposit with charcoal fragments but no visible artefacts or other occupation deposit. Three of the sites were at risk of direct impact from the proposed bike track and it was recommended that the alignment be moved away from the shelters. None of the sites appear to have been registered on AHIMS but all are located outside of the current study area.

To the north west, a survey undertaken by Byrne in 1992 of six portions of land within the proposed St Ives to Dee Why transport corridor identified one rockshelter with art and potential archaeological deposit in the back garden of a house on Dawes Road (Byrne 1992). At least six faded hand stencils in white and red were observed, as well as traces of red and black drawings and an engraved oval shape. A timber framework erected inside the shelter was considered to have disturbed the floor deposit to some extent but there was considered to be potential for archaeological deposit, despite the absence of artefacts on the surface and the fact that a large part of the floor was obscured by timber. None of the sandstone platform exposures inspected within the transport corridor displayed evidence of engravings or grinding grooves and the potential for further unidentified sites to exist along the transport corridor was considered to be low. A review of Byrne’s work was undertaken ahead of rezoning by Helen Brayshaw Heritage Consultants (2004), who disagreed with Byrne’s descriptions of land disturbance levels but concurred with the assessment of low potential for further archaeological sites to exist.

To the east of the study area, an archaeological survey was carried out on a block of land proposed for rezoning and subdivision on Willandra Road at Beacon Hill (Dallas 1988). One rock engraving site of a macropod, originally recorded by Campbell in 1899, was relocated and found to be in excellent condition. It was recommended that a Covenant should be placed on the block, and the eventual owner made aware of the site and their responsibilities. It was recommended that if this management strategy was followed, the rezoning/subdivision could proceed. No other parts of the block displayed any archaeological potential. Other engraving sites are known to be located within private properties further north in the Cromer area (Mary Dallas Consulting Archaeologists 2005:16-17) and further to the south east, although archaeological survey in the area has also often failed to identify sites due to disturbance factors or the unsuitability of sandstone outcrops for engravings or shelter sites. Attenbrow’s (1980) survey of a proposed retirement home site in Cromer Heights identified shell material that may have originally been from a midden site but was so dispersed by clearance and bulldozing of the lands that it could not be determined to be archaeological (or even Aboriginal) in origin. A survey carried out as part of a rezoning study of the Cromer Golf Club surplus lands did not identify any sites or areas of potential archaeological deposit (Mary Dallas Consulting Archaeologists 2005) and it was noted that the sandstone present in their study area had not weathered to form overhangs suitable for use as rockshelters. Similarly, a survey carried out along the proposed route of a road at Red Hill located no archaeological sites or areas of potential, with the sandstone exposures along the route found to be coarse and uneven, unsuitable for engravings (Mary Dallas Consulting Archaeologists 1993) and devoid of overhangs suitable for rock shatters.

Recorded sites to the north east of the study area are generally widely distributed throughout the Narrabeen Lagoon catchment, with clusters of engraving sites on ridgetops and shelters located along creeklines and sideslopes with underlying sandstone geology. Adjacent to the eastern boundary of the current study area, three AHIMS site
recordings are located within private properties along Ellis Road, just below the main ridgeline running along Warringah Road (see section 2.1.4, below).

More recently, an Aboriginal heritage impact assessment has been completed for the proposed Northern Beaches Hospital Development site, comprising two areas within and adjacent to the current study area (AMBS 2012). A large portion of land between Wakehurst Parkway, Warringah Road and Frenchs Forest Road West (east of Forest High School) and a smaller portion of land on Aquatic Drive were subject to an archaeological field survey. No Aboriginal archaeological sites were identified during the survey. The area on Aquatic Drive was found to be extensively modified, with evidence for artificial terracing and introduction of fill to create a flat area. The area east of Forest High School was found to have been disturbed by the construction of residential properties, with evidence of historical disturbance from timber-getting and brick making also observed. While ground visibility was low due to vegetation, soils were found to be generally shallow and considered unlikely to retain any subsurface archaeological deposit. Outcropping sandstone benches on the north eastern margins of the area were found to have been extensively disturbed by road cuttings associated with Frenchs Forest Road West and Wakehurst Parkway, although it was considered possible that engraving sites were present on the uninvestigated portions of the sandstone slabs further from the road. It was recommended that if these portions of the slabs were to be exposed during future construction, they should be inspected by an archaeologist. Overall the investigation areas were considered to display very low potential for Aboriginal archaeological sites due to disturbance from various land use practices.

2.1.4. Registered Aboriginal sites within and close to the study area

One registered site (45-6-1004) was located within the study area. The site is a rockshelter with art called Blue Stone Cave, and the registered AHIMS coordinates place it within the property to the north east of the Wakehurst Parkway/Warringah Road intersection. The site was registered in 1979 and is described as a shelter measuring 32 feet long by 6-7 feet deep, with a ceiling height between 3-5 feet. The art consisted of “figures, traces in charcoal and red ochre”. The location description on the AHIMS site card places it “150 yards north of previous [i.e. likely site 45-6-1003] near head of gully and at a slightly lower level. Above it is a prominent cliff with large, very shallow overhangs”. A site visitation conducted by Roads and Maritime as part of the Preliminary Environmental Investigation for the current project in 2013 did not relocate the site at the registered location, and based on the description of the site’s position beneath a cliff line it was considered that the registered coordinates were incorrect. It was considered likely that the true location of the site was further south, on the western side of Wakehurst Parkway in the vicinity of other recorded rockshelters (Roads and Maritime 2013:43). The registered location of site 45-6-1004 should be inspected during the field survey component of the current investigation.

Three AHIMS entries representing rock engraving sites are located close to the eastern boundary of the study area, on the margin of a shale/sandstone interface, within private properties along Ellis Road north of Warringah Road. Site 45-6-0753, originally recorded by Campbell in 1899 was a large group of engravings on a broad, gently sloping sandstone platform ledge located on the western side of Ellis Road (then unnamed). The position of the platform afforded views to the north and northeast, with the ocean visible through the tree canopy. Campbell recorded numerous human figures, fish, macropods, sharks, shields, spears, a wombat, a dingo and various other unidentified motifs (see Figure 4). One of the human figures was engraved in combination with a fish (the “fishman”), so that the inner lines of the figure’s legs formed the sides of the fish, with a tail added between the feet. Campbell’s original recording also noted “four hands cut in the rock” along with a hand and partial forearm and the outlines of feet. Close to the hands, several small potholes in the rock were located near a “trickle” of water and appeared to have had channels cut around them, in order to direct water flow. Campbell considered that “the figures of this group are evidently not all of the same workmanship nor age” but that as a whole, the group was “unusually well preserved”. Later additions to the AHIMS site card, made during revisitation of the site in the 1970s and 1980s, note that “carvings have been rechipped with a steel axe”, and, later, that “the rock is very eroded and other associated carvings are no longer visible”. The majority of the platform now lies beneath the house and lawn at number 10, Ellis Road, with a portion of the platform exposed in the front garden at number 8, Ellis Road, where engravings have been truncated by the installation of a sewer trench (Stanbury and Clegg 1990).

Site 45-6-0752 was also recorded by Campbell, and published in the same monograph as 45-6-0753. This site was located upon the same ledge of sandstone as 45-6-0753, “but within the road-line, on its eastern side” and consisted of a single engraving of a macropod (see Figure 5). At the time of Campbell’s original recording, the portion of the slab within the road alignment (and hence the engraving) was visible due to the unsealed nature of the road. Later road-building and sealing activities have likely either destroyed or buried this site beneath Ellis Road.

Site 45-6-0824 was recorded at number 3 Ellis Road in 1974. The engraving appeared to have originally been a human figure but construction of a garden wall had destroyed the figure above the waist, with only the legs remaining (see Figure 6). No rock surface was evident on the other side of the wall, possibly having been removed.
Figure 4. Sketch diagram of engravings at site 45-6-0753 (from AHIMS site record)
While these three engraving sites are relatively well described, given the uncertainty of older site recordings listed on AHIMS, their location should be verified during the field survey component of the investigation to ensure they are not located within the current study area.

2.2 Landscape Context

The study area is located on the south eastern margins of the Hornsby Plateau, a broad, elevated dissected plateau forming one of the main physiographic regions of the Sydney Basin. Underlying geology of the Hornsby Plateau is comprised chiefly of Hawkesbury Sandstone (Rh), a geological formation of the Middle Triassic. Hawkesbury Sandstone consists of medium to coarse-grained quartz sandstone with minor shale and laminate lenses. One of these lenses occurs on the ridge crest occupied by the study area, and is described as a mudstone facies (Rhs), as shown in Figure 7. These lenses commonly contain grey to black mudstones and occasional grey siltstone, in places slightly carbonaceous and often laminated with fine grained sandstone (Herbert 1983). While the dominant geology of the ridgeline is shale-based, outcropping sandstone occurs in isolated contexts and along the ‘fringe’ of the shale-to-sandstone geology transition which closely follows the edges of the narrow ridge crest plateau.

Archaeologically, Aboriginal rock engravings and markings generally occur on sandstone outcrops around Sydney Harbour, thus the dominant shale geology within the study area makes Aboriginal engravings and rock markings less likely than is the norm for the area.

The study area is located on the gently undulating to flat crest and steep to gentle gradient upper slopes of a ridgeline running approximately east-west between Forestville and Beacon Hill. This ridgeline forms part of the watershed between the Middle Creek catchment to the north and the Manly Creek and Brookvale Creek catchments to the south and south east. West of Wakehurst Parkway, various first and second order creeks drain through the Garigal National Park to Bantry Bay and Middle Harbour. The closest waterways to the study area are Trefoil Creek, a first order creek running through Nandi Reserve near Frenchs Forest Road East, and Manly Creek, which flows south through Manly-Warringah War Memorial Park into the Manly Reservoir.

The various soil landscapes around the study area are influenced by both underlying geology and topography. Present along the ridgetop and underlying the majority of the study area is the residual Lucas Heights soil landscape (Figure 8). Lucas Heights soils occur on the gently undulating crests and ridges on plateau surfaces, where sandstone and shale/laminites are interbedded (Chapman & Murphy 1989). Soils consist of moderately deep hardsetting yellow podzolics and soloths, with yellow earths occurring on outer crest edges. Rock outcropping is absent although soils may be stony. Soils are generally stable but display moderate susceptibility to erosion. Bordering the Lucas Heights soils to the north and east is the colluvial Hawkesbury soil landscape, which occurs on the steeper slopes below the plateau, where the underlying geology is Hawkesbury sandstone. Rock outcropping is common and generally greater than 50%, occurring as broken scarps and horizontal benches along steep sideslopes. Soils are shallow lithosols and siliceous sands, with earthy sands and podzolics located inside of rock benches and in drainage lines. This soil landscape is susceptible to extreme erosion and mass movement (rock falls) especially where slopes are precipitous.
Figure 7. Geology of the study area and surrounds

Figure 8. Soil landscapes of the study area and surrounds
Small areas of the erosional Lambert soils occur where slope gradient is shallower, and consist of shallow earthy sands and yellow earths on crests and inside of rock benches, siliceous sands and lithosols on leading edges, and shallow to moderately deep grey earths and gleyed podzolics where areas are poorly drained. Where shale lenses occur in the underlying sandstone, as in the study area, yellow podzolics occur. This soil landscape has a very high erosion hazard, rock outcropping greater than 50% and seasonal waterlogging. The shallow Lambert soils primarily support heathland vegetation with occasional low eucalypt open woodland. Similar in composition, the erosional Gymea soil landscape occurs on broader, convex crests and gentle to moderate slopes. Rock outcropping is much lesser than in the Lambert landscape, generally less than 25%. Localised steep slopes carry the potential for rock fall hazards, and while soils are generally stable they are highly susceptible to erosion by both concentrated and non-concentrated flows. The study area also intersects two large portions of land mapped as Disturbed Terrain, characterised as land that has been extensively disturbed and modified by various human activities. Original vegetation and often soils and substrates have been completely cleared and the area may be covered by turf, grassland, or subsequent urban development. Former quarries and rubbish disposal dumps are often filled, grassed, and used as recreation areas or sports fields, usually landscaped and artificially drained.

Archaeologically, the soils within the study are less conducive to the survival of Aboriginal stone objects due to high levels of movement and erosion.

Former and current land uses have resulted in varying levels of disturbance throughout the study area. The road corridors are generally urbanised, with a mixture of residential and commercial properties and business parks. The major road corridors of Wakehurst Parkway and Warringah Road have borders of vegetation and public reserve land. Historical land use includes timber-getting, dairy, poultry and pig farming, market gardening, a large orchard on the present-day site of Forest High School, a brickworks west of Wakehurst Parkway and widespread clearance of original vegetation. Landscaping has also taken place across the study area, particularly on upper slopes to create flat areas for recreational usage (sports fields etc.). Areas of potential fill of unknown origin have also been identified during the Preliminary Environmental Investigation (PEI) along the southern side of Warringah Road and the eastern corner of the Warringah Road/Forest Way intersection (Roads and Maritime 2013:71).

2.3 Regional Character

Previous archaeological field surveys and investigations on the south eastern margins of the Hornsby Plateau have provided data on site distribution, site typology and lithic raw material use that aid in assessing the archaeological character of the wider region.

The underlying Hawkesbury sandstone geology of the area is conducive to the formation of rockshelters and this site type is well represented among previously recorded sites in the region. Shelters containing art, archaeological deposit or a mixture of both are numerous around the study area. Many of these contain evidence for historical and contemporary visitation, with graffiti, rubbish and fires often causing damage or disturbance to both art and deposit. Well preserved examples are located in National Parks or other areas where access has been restricted, whether due to environmental factors (heavy vegetation and general physical inaccessibility) or due to conditions which have restricted visitation by the general public (e.g. Magazine Reserve or shelters protected in private property).

Artefacts identified in archaeological deposits in the local area are predominantly quartz, presumably sourced locally from occurrences in the Hawkesbury sandstone. Quartzite, chert and mudstone artefacts have also been identified. Preservation of archaeological deposit in open contexts (i.e. artefact scatters and isolated finds) is relatively rare in the region. This is partially due to environmental conditions unfavourable to their survival such as steep slopes and erosional soils, but may also relate to the generally easy availability of rockshelters in areas of Hawkesbury sandstone. Environmental contexts that would have been more favourable to preservation of open context sites such as flat ridge tops and plateaux with more stable residual soil landscapes were however the focus for initial European settlement of the region, and have a long history of European disturbance.

The Hawkesbury sandstone also outcrops as benches and slabs which can provide flat or gently sloping surfaces suitable for engraving sites and grinding grooves. Grinding grooves occur on suitable sandstone outcrops that also offer a source of water, whether within or adjacent to creeklines or due to seepage and collection on the rock surface after periods of rain. Engraving sites are the most commonly identified site type in the wider region and occur widely across the ridge and spurs above tributaries draining to Middle Creek and Middle Harbour. The suitability of local sandstone outcrops for engraving sites is varied, with numerous archaeological studies commenting that sandstone outcrops inspected during field surveys were found to be coarse and uneven. Additionally, issues of exposure and visibility have been documented, with slabs partially buried or heavily vegetated and the possibility exists that further engravings are located in these areas.
2.4 Predictions

The information outlined in previous sections allows several predictions to be made about the nature of the archaeology that may be expected in the study area.

- Archaeological sites are likely to consist of rock engravings on exposed level, relatively smooth sandstone platforms, in both ridge crest and slope contexts.
- Rock shelter sites are likely to occur where suitable overhangs have formed in the local sandstone bedrock. Overhangs are more likely to occur on the steeper slopes of a ridgeline, but may also form beneath outcrops in flat to gently sloping crest contexts.
- Shelters may contain pigment art and/or archaeological deposits where depth of sediment exists.
- Open artefact scatters and/or isolated finds are less likely.
- Shell midden sites are unlikely given the distance from the coast or other significant bodies of water.
- Grinding grooves may exist on sandstone outcrops. Especially in association with water.
- Vegetation clearance and urbanisation lessens the likelihood of culturally modified trees, but old growth trees may be present in the more heavily vegetated parts of the study area and have the potential to display scars of Aboriginal origin.
- Archaeological sites are more likely to be identified in areas that have been subject to less intensive disturbance. Conversely, identification of open context sites may be aided by some measure of ground disturbance where this has increased the visibility and exposure of archaeological material.
- It can be expected that locally derived quartz and occasional chert will be the most commonly encountered artefact raw materials.
3 Assessment Methodology

The assessment methodology for the wider concept proposal area and the Stage 1 works was comprised of similar elements and was conducted as a single assessment. For the wider concept proposal, the aim of assessment was to characterise the Aboriginal heritage likely to occur within the study area and to identify any Aboriginal heritage items present within the study area.

For the Stage 1 works, the assessment aimed to complete the same tasks and to complete an additional impact assessment if impacts to any items of Aboriginal heritage were identified during the assessment. The core element of assessment for both the concept proposal and the Stage 1 works was analysis of background information, as presented in the preceding chapter, followed by an archaeological field survey. Sampling strategy and field methods for the archaeological survey component are presented below.

3.1 Survey Sampling Strategy and Field Methods

The aim of the archaeological survey was to identify any Aboriginal archaeological sites or areas of archaeological potential that would be affected by the proposal and revisit areas where Aboriginal sites have been previously recorded to confirm their locations. All survey units were inspected by pedestrian survey. The survey team consisted of a team of two people: Mark Rawson (KNC) and Lee Davison (MLALC). Survey took place over three days: Wednesday 9, Thursday 10 and Friday 11 April 2014. Matthew Kelleher (KNC) and Mark Rawson also undertook following up survey on 12 April and 29 April.

The survey team was equipped with aerial and topographic maps showing the boundaries of the study area and the location of the previously identified sites. The survey aimed to confirm whether site 45-6-1004 (Blue Stone Cave) was located within the study area, as background research suggested that the registered AHIMS location was erroneous and the site was not located there. The registered AHIMS locations of three further engraving sites (45-6-0752, 45-6-0753 and 45-6-0824) placed them close to the eastern boundary of the study area and the survey also aimed to confirm their location outside the study area.

The study area includes a large number of residential properties and businesses, with business park development particularly prevalent in the eastern portion of the study area. Areas of private property were generally not available for inspection, however the archaeological potential of all property was assessed.

The study area was divided into four survey units broadly reflective of the existing environmental contexts of the study area (Figure 9). Each survey unit contained a combination of slope and ridge landforms. Each survey unit was divided into transects that followed the existing alignment of the road corridors contained within it. Both sides of the roads in each survey unit were subject to inspection.

Based on the archaeological background and landform context of the study area, the survey team closely inspected all visible sandstone outcrops and the tops of benches and overhangs for any rock engravings or grinding grooves. The interiors of sandstone shelters and overhangs were inspected for art and/or archaeological deposit. Areas of ground surface exposure were inspected for artefacts and mature old growth trees were examined for evidence of Aboriginal bark removal. The sandstone beds of minor creeklines were also inspected for grinding grooves. Assessments of soil and substrata rock disturbance were also made during the survey, as well as recordings of vegetation and historical and current land uses throughout the survey unit. Visibility and exposure were also characterised for each survey unit along with an assessment of remaining archaeological potential based on the factors outlined above.
Figure 9. Survey units and landforms
3.2 Aboriginal Stakeholder Consultation

Roads and Maritime has developed the PACHCI to provide a consistent means of effective consultation with Aboriginal communities regarding activities which may impact on Aboriginal cultural heritage and a consistent assessment process for Roads and Maritime activities across NSW. In accordance with the PACHCI, the early stages of Roads and Maritime projects involve consultation with Local Aboriginal Land Councils and registered Native Title Claimants.

The project has been conducted in consultation with the Metropolitan Local Aboriginal Land Council (MLALC). No Native Title Claimants are currently registered for the study area. The MLALC was contacted at the commencement of the project to discuss the proposed road upgrades and invite the MLALC to participate in the archaeological survey of the study area.

The archaeological survey of the study area was arranged with MLALC for Wednesday 9th, Thursday 10th and Friday 11th April 2014. Lee Davison from MLALC participated in the survey. Subsequent to the field survey, MLALC provided a survey and cultural assessment report for Roads and Maritime in accordance with the Roads and Maritime PACHCI. Key comments are reproduced below, with the full report included as Appendix A.

The MLALC report noted the access restrictions that prevented intensive pedestrian survey of the entire area, in particular the limitations of assessing “houses, business parks, shops and Frenchs Forest High School grounds” but also considered that “comprehensive coverage of the accessible areas was achieved as waterways and sandstone outcrops were expected to be identified and were of particular interest in this assessment”.

The report notes the targeted nature of the survey, intended to inspect those landscape features where sites were predicted. Where sites were identified, the MLALC report expressed the high cultural heritage significance of sites, in particular that of Trefoil Creek 1, stating that “the site is of great significance and importance to Aboriginal cultural heritage and should be registered and treated as a protected site”. The site will be registered on AHIMS.

Elsewhere a tree was identified as displaying a mark from a possible European survey blaze. The archaeological interpretation was that the tree was not culturally modified, based on visible evidence. MLALC recommended that “further inspection should be made to confirm the cause of scarring and significance” and noted the possibility that the scars were of European origin, likely survey blazes. Subsequent email correspondence confirmed that MLALC was of the opinion that the tree markings were in fact European blazes and not of Aboriginal origin.

Overall, the MLALC considered it highly likely that the study area was used by Aboriginal people and that traces of this use and archaeological sites would remain where disturbance was low. It was recommended that further survey/monitoring should be carried out during ground disturbance activities which might uncover archaeological material. The report also underscored the contemporary cultural importance of the landscape, stating that:

"Hunting, food gathering and the use of waterways for drinking water are examples and are important aspects of Aboriginal life, past and present... these resources such as waterways, native foods and shelters were of great importance to Aboriginal people of the past, who used them in daily life, and are of equal importance to present Aboriginal communities, as they represent our cultural heritage".
4 Survey Results

Two previously unrecorded sites, one rockshelter with art and one rockshelter with PAD, were identified within the study area as a result of the survey.

The rockshelter with art was named Trefoil Creek 1 and was identified in the northern portion of the study area, east of Wakehurst Parkway. Full details of Trefoil Creek 1 are provided in section 4.1, with site location shown on Figures 10 and 11.

One rockshelter with PAD was also identified in Survey Unit 1 and was named Trefoil Creek 2. Trefoil Creek 2 was identified approximately 60 metres south east of Trefoil Creek 1, also on the eastern side of Wakehurst Parkway north of Frenchs Forest Road. Details of Trefoil Creek 2 are provided in section 4.2, with location shown in Figures 10 and 11.

Previously recorded site 45-6-1004 (Blue Stone Cave) was not found within the study area (see section 4.3). Based on background research and field inspection, it has been confirmed that the registered AHIMS coordinates for this site are incorrect.

Previously recorded sites 45-6-0752, 45-6-0753 and 45-6-0824 were visited and were confirmed to be located outside the study area, as shown in Figure 10 (see section 4.4).

One tree marked with a possible European survey blaze was identified within the study area. No Aboriginal cultural markings were evident on the tree. The tree was not recorded as an Aboriginal site.

The study area was assessed based on the four survey units shown in Figure 9. A description and representative photos of each survey unit are presented in section 4.5. The description of each survey unit includes details of landform, vegetation, a brief description of the survey unit and estimations of overall visibility and overall exposure.
Figure 10. Survey results
Figure 11. Location of Trefoil Creek 1 and Trefoil Creek 2
4.1 Trefoil Creek 1 (AHIMS number TBC)

AHIMS Number: TBC
Site Type: Shelter with Art
Coordinates: 0336531E 6264357N (GDA 94)
Shelter Length: 13.8m
Shelter Depth: 3.5m
Shelter Height: 3m
Survey Unit: 1

Trefoil Creek 1 was identified approximately 25m east of Wakehurst Parkway, in the eastern portion of Survey Unit 1. The shelter was located beneath a sandstone overhang above the steep slope leading down to the Trefoil Creek gully. The shelter faced NNE and looked out across the creek gully. Above the larger overhang was a small area of sandstone exposure leading to a gently inclined vegetated area, which abutted the steep bank leading up to Wakehurst Parkway.

Two overhangs were present, with the art located under the larger northern overhang. Potential for archaeological deposit within the shelter is low. The majority of the floor is exposed sandstone and has also suffered disturbance, having been cut away and excavated at the northern end. Evidence of recent and likely ongoing visitation includes wooden pallets, milk crates, and other assorted rubbish throughout the shelter. Pampas grass is growing up through the floor in several locations.

The art was located on the back wall of the shelter and consisted of a panel of hand stencils executed in red ochre, and a faint charcoal line beneath. The panel measured approximately 1600mm x 400mm and was located approximately 1100mm above the shelter floor. Seven whole and partial stencils were visible at the time of inspection, and the shelter likely once contained more, as visible patches of red ochre below and to the left of the main art panel are likely eroded stencils.
4.2 Trefoil Creek 2 (AHIMS number TBC)

AHIMS Number: TBC
Site Type: Shelter with PAD
Coordinates: 0336553E 6264287N (GDA 94)
Shelter Length: 9m
Shelter Depth: 2m
Shelter Height: 1m
Survey Unit: 1

Approximately 60m to the south east of Trefoil Creek 1, a second overhang was inspected. The overhang was located beneath a benched outcrop approximately 35m from Wakehurst Parkway. The overhang measured approximately 9m long by 2m deep and was approximately 1m in height. The shelter faces NE and is located on the upper slopes of the Trefoil Creek gully north of the main ridgeline.

The shelter functions as an effective rain cover and the floor deposit was observed to be dry. No archaeological material or traces of art were observed, but the potential for intact archaeological deposit (i.e. PAD) to exist in this shelter is high given its apparently undisturbed state and proximity to identified shelter Trefoil Creek 1. North of the overhang, the remnants of a series of 3 steps have been cut into the rock to allow access to the top of the rock shelf containing the overhang but this cutting disturbance does not extend into the shelter itself.
4.3 Previously recorded site Blue Stone Cave (45-6-1004)

AHIMS Number: 45-6-1004  
Site Type: Shelter with Art  
Coordinates on AHIMS site record: 0336473E 6263801N (AGD 66)  
Shelter Length: 32 feet (approximately 9.8m)  
Shelter Depth: 6-7 feet (approximately 1.8–2.1m)  
Shelter Height: 3-5 feet (approximately 0.9-1.5m)  
Survey Unit: 4

The coordinates registered on AHIMS for this site place it within the study area, in a block of land to the north east of the Warringah Road/Wakehurst Parkway intersection. Previous visitation by Roads and Maritime in 2013 did not relocate the site at this location. The site record describes the shelter being located beneath “a prominent cliff with large, very shallow overhangs”. Cliff landforms do not occur within the study area and the registered location of the site is upon a ridge landform, on a flat part of the ridge crest. The registered location was visited during the survey to confirm that the site is not located within the study area.

The cleared area of land containing the registered site location was found to be severely disturbed, with evidence for bulldozing/grading in the form of a large artificial berm between 2 and 3 metres high created at the north eastern part of the clearing. Sand and gravels have been dumped throughout the clearing, with concrete slabs visible beneath the grass cover. The heavily vegetated remainder of the block was closely inspected but no shelters or landforms matching the site description were identified. Sandstone exposures on this part of the ridgeline are small and of generally poor quality and have not weathered to form overhangs suitable for use as shelters.

Field survey did not relocate the site at the recorded location. The AHIMS site record was originally entered in the late 1970s, using coordinates from a 1:63,360 ‘inch to the mile’ military survey map. These were converted to a reference on the Sydney 1:250,000 map in use in the 1970s, from there to AGD 66 coordinates and finally updated to GDA 94. It is likely that an error in the original recording has been magnified by each conversion operation, resulting in a recorded site location some distance from its true position. This site is not located within the NBH Connectivity and Network Enhancement Works study area.
4.4 Previously recorded sites 45-6-0752, 45-6-0753 and 45-6-0824

Site 45-6-0752 was a single engraving of a macropod recorded by Campbell in 1899. The engraving was located on a sandstone ledge within the eastern half of the road line of (present day) Ellis Road, approximately 40 metres north east of the current study area boundary. The western portion of the same ledge contained a large grouping of engravings (registered as site 45-6-0753). The eastern part of the sandstone exposure containing the macropod engraving has long since been covered over or destroyed beneath the sealed road or adjacent houses and was not relocated during the field survey.

Site 45-6-0753 was a large group of engravings on the western portion of the same sandstone ledge as 45-6-0752, to the west of the road. Campbell recorded over 70 engravings including various animals, human figures, shields and other motifs (see Figure 4). Subsequent development including levelling, paving and construction of houses and gardens has covered over or destroyed the majority of the western exposure. The majority of the engravings are no longer visible but some may be preserved beneath the house, lawn and gardens located at number 10 Ellis Road. The southernmost engravings of the group are still visible on an exposed portion of the slab measuring approximately 6m x 7m in the front garden of the house at number 8 Ellis Road.

Site 45-6-0824 was recorded at number 3 Ellis Road in 1974. The engraving appeared to have originally been a human figure but construction of a garden wall had destroyed the figure above the waist, with only the legs remaining (see Figure 6). The AHIMS site record does not state whereabouts in the property the engraving was located (i.e. along which garden wall). An examination was conducted from the street but no exposures were visible. The engraving may have been covered over or may be located elsewhere within the property. This site was not relocated during the survey but has a confirmed location within the property at number 3 Ellis Road, outside of the current study area.
4.5 Survey Coverage

Survey Unit 1

Survey Unit 1 comprised the northernmost portion of the study area, encompassing the vegetation corridor along either side of Wakehurst Parkway, north of Frenchs Forest Road. Landform in this survey unit was slope, generally tending north and east from the main ridgeline near Warringah Road. This survey unit was approached from the southwest, heading down from the main ridge crest south of Frenchs Forest Road West. The southwest corner of the intersection between Frenchs Forest Road West and Wakehurst Parkway demonstrated exposures of sandstone which had been cut into during road construction, leaving a truncated bench. The exposures were inspected but no natural undisturbed sandstone was identified. A high bank cutting has been created during road construction on the north eastern side of the intersection, placing the carriageway at a lower elevation than the slope above and to the west. The cut forms steep sandstone walls on either side of the road corridor.

Survey proceeded north along the western side of Wakehurst Parkway, following the roadside along the cutting. Sandstone exposures became more pronounced and visible with increasing distance down the slope to the north. Heavy weeds along the roadside limited visibility. Stepped sandstone benches were identified further up the slope to the west and these were inspected for possible overhangs/shelters and for engravings. Further sandstone exposures were identified along a services (gas and electricity) easement along the more elevated slope bank approximately 25m west of the carriageway. These exposures had been disturbed by installation of services. Outcropping benches were also visible in the back yards of houses further to the west. Visibility along the easement was limited by weeds and vegetation cover.

On the eastern side of Wakehurst Parkway, the slope fell to the east towards the Trefoil Creek gully. Visibility was low, hampered by thick sandstone bushland including banksia, angophora, bracken fern, persoonia, bloodwoods and stringybarks. A small number of sandstone outcrops were identified east of the cutting formed by Wakehurst Parkway. These were closely inspected and found to be of poor quality, with lumpy uneven surfaces and ironstone layers visible within the rock. The tops of these outcrops were generally small and due to the poor quality rock, unsuited to engravings. The very small overhangs formed beneath were inspected for possible shelter use. Further to the south, sandstone outcrops were arranged in sets of benches or steps, with larger overhangs present beneath. These were inspected and two previously unrecorded sites were identified (Trefoil Creek 1 and Trefoil Creek 2, see section 4.1 and 4.2).

Two archaeological sites were present in Survey Unit 1.
Plate 17. Looking north to Oxford Falls along pipeline. Sandstone exposures in midground.

Plate 18. Sandstone at rear of houses, western portion of Survey Unit 1.

Plate 19. Sandstone visible in cutting on east side of Wakehurst Parkway.

Plate 20. Thick vegetation on eastern side of Wakehurst Parkway. Benched sandstone outcrop at right.

Plate 21. Thick vegetation bordering electrical easement west of Wakehurst Parkway.
Survey Unit 2

Survey unit 2 comprised the southern portion of the study area, from Warringah Road in the north, extending down Wakehurst Parkway to the Warringah Aquatic Centre. A portion of Fitzpatrick Avenue East and Aquatic Drive were also within survey unit 2. The primary landform in this survey unit was slope, tending south towards Bantry Bay and Manly Creek. A small elevated area was present in the south east of this survey unit near the Warringah Aquatic Centre and has been classified as a ridge landform based on the topographic differentiation from the surrounding ridge slope. Survey commenced at Warringah Road on the western side of Wakehurst Parkway through the Brick Pit Reserve. A vegetated gully (possibly the headwaters of a tributary creek to Bantry Bay) was examined for sandstone exposures for possible grinding grooves. No sandstone was identified. Large areas alongside the gully have been disturbed by the construction of bike jumps, and have been excavated by hand tools to form dips and ramps. Exposures were visible around the bases and edges of the excavated areas offering excellent visibility of the ground surface and sediment profile. Observed soil profile was of grey loamy topsoil grading to yellow clay, characteristic of podzolic Lucas Heights soils. Other large excavated pits were filled with vegetation, ironstone and rubbish or water and aquatic weed species. These pits are likely related to extraction activities carried out during the Reserve’s eponymous historic use as brickworks.

Further to the south, the vegetated areas on both sides of Wakehurst Parkway were inspected. Ground surface visibility was poor, obscured by leaf litter and vegetation with few exposures encountered. Larger trees were examined for evidence of Aboriginal bark removal. Near a cleared area, a tree with three scars was inspected as a possible culturally modified tree. The tree was a dead eucalypt displaying three scars approximately 60-70cm above the ground surface. Scars were roughly oval to triangular in shape and were arranged facing north-northeast, west and south-southwest. The tree and scars were in poor condition, having been damaged by fire and insect attacks. While the scars are unlikely to be Aboriginal in origin, they may be European surveyor’s blazes, as have been documented on trees on the northern side of the ridgeline along Wakehurst Parkway.

The eastern portion of the survey unit contained several blocks of bushland surrounding the Aquatic Centre. The easternmost of these blocks, between the Aquatic Centre carpark and Aquatic Drive was heavily vegetated with persoonia, bloodwoods, stringybarks, angophora costata and various shrubs which obscured the ground surface and offered very poor visibility. No sandstone outcrops were identified in this block, and no large trees with scars were encountered. North of Aquatic Drive, the majority of the area is disturbed and contains a high artificial mound which has been revegetated with plantings and natural bush regrowth, and various commercial buildings and offices.

The vegetated block to the north of the Aquatic Centre appears to be intact native bushland. The small ridge landform within this area slopes to the east, with a drainage line below it. The drainage line was inspected but it did not contain any sandstone suitable for grinding grooves. The channel carries stormwater and has been modified in the past, possibly excavated to enlarge the original natural feature, and has had cement culverts installed. Visibility away from the drainage line was close to zero with heavy vegetation present. Ground surface exposures were small in size and limited to occasional patches along tracks. Soils appeared shallow and gravelly. The frequency and size of sandstone exposures increased to the south towards the Aquatic Centre. All exposures were examined for engravings but none were identified and no overhangs were found.

No archaeological sites were identified in Survey Unit 2.
Plate 22. Bike jumps in Brick Pit Reserve

Plate 23. Exposed soil profile in side of excavated pit

Plate 24. Non Aboriginal scarred tree (probable European survey blaze)

Plate 25. Thick vegetation north of Aquatic Centre (low visibility)

Plate 26. Sandstone exposures in creek/stormwater channel

Plate 27. Gravely exposures along track
Survey Unit 3

Survey Unit 3 comprised the western portion of the study area, from Wakehurst Parkway in the east to two branches extending along Warringah Road to the south west and Forest Way to the north west. Landforms within survey unit 3 included the crest of the main ridgeline and a flat portion of ridgetop abutted by gentle to moderate slopes falling to the north, west and south. The survey unit included the lands between Warringah Road in the south and Frenchs Forest Road West, on either side of the grounds of Forest High School. Tall, mature specimens of *Angophora costata* and stringybarks with an understory of native vegetation were present on both sides of the road. Disturbance was evident, with dumped mounds and some areas of excavation. Ground surface exposures were limited to areas alongside the road and around the bases of trees. No sandstone exposures were identified in this area.

A large portion of the study area to the west is residential in nature. While private properties were generally not entered during the survey, an assessment of the area was made by walking the residential streets of Holland Crescent, Rabbett Street and Naree Road. Small sandstone outcrops were identified in this portion of the study area. The stone outcrops were mostly of poor quality and partially obscured by lawns or vegetation. Ground surface visibility was limited due to houses, gardens, paved roads and paths, landscaping and grass cover along road verges.

Both sides of Warringah Road between Wakehurst Parkway and Forest Way were surveyed and found to display no archaeological potential, having been extensively landscaped. Some small exposures of soil were visible on the southern side but due to landscaping these are unlikely to represent the original ground surface. The north eastern branch of the study area along Forest Way was surveyed up to the intersection with Adams Street. Moderate density residential development has taken place along this section of the ridge, along with construction of a shopping centre and parking facilities on the eastern side of Forest Way. No sandstone exposures were identified along this part of the ridge top and archaeological potential is considered to be low.

To the south west the ridge drops off to moderate slopes to the south along Warringah Road. On the eastern side of Warringah Road, a walking track crosses a large area of landscaped lawn with some large specimens of *Angophora costata*. Small exposures of lateritic soils were evident where turf cover was not maintained and these were examined for open sites, but with none identified. Further down slope to the south west, sandstone exposures were visible in cuttings along the western side of Warringah Road. Sandstone benches were observed in the front gardens of houses along the road. The majority of these had been disturbed by cuttings or house and driveway construction, leaving remnants of platforms visible beneath lawns and gardens. No overhangs were identified in this survey unit.

No archaeological sites were identified in Survey Unit 3.
Plate 30. Sandstone exposures on Naree Road, looking east down hill slope

Plate 31. Naree Road, looking east to ridge crest

Plate 32. Looking east down Warringah Road. Forest High School grounds at left

Plate 33. Sandstone exposure in front garden along Forest Way

Plate 34. Truncated sandstone bench exposure, Naree Road

Plate 35. Cut sandstone bench on Warringah Road, south of Forest Kirk
Survey Unit 4

Survey Unit 4 comprised the eastern portion of the study area, from Wakehurst Parkway in the west, along Warringah Road to Ellis Road in the east. The survey unit also included the lands between Warringah Road and Frenchs Forest Road East. This survey unit contained both ridge and slope landforms, with the main ridgeline narrowing from west to east, surrounded by descending slopes to the north, east and south.

Previously recorded site, 45-6-1004 (Blue Stone Cave), was recorded as occurring in Survey Unit 4. This site was not relocated during the current survey and it has been determined that the coordinates listed on AHIMS are not correct (see section 4.3). The bushland block to the north of the recorded site location was inspected but was heavily vegetated and visibility was generally poor. Some small outcrops of sandstone were observed within this bushland area and all were inspected for Aboriginal sites but none were identified.

To the east of this block, between Warringah Road and Frenchs Forest Road East is a large business park, with various offices, warehouse/distribution buildings and paved parking lots. The business park area was found to be disturbed, with portions of the ridge top levelled off to allow the construction of large buildings. The northern side of Frenchs Forest Road East is lined with houses and shops. Open areas of land free from construction were covered with lawns, and no sandstone was observed in these areas. Likewise, ground surface visibility was generally poor. Occasional large exposures were identified to the south of the market parking lot and these were inspected for artefact. Visibility on the exposures was good at approximately 50% but no artefacts were identified.

South of the business park along Warringah Road, the road verges have been extensively landscaped and grassed with no exposures of soil. Some undeveloped bushland was present on the corners of the block between Warringah Road, Rodborough Road and Allambie Road near the substation. Visibility in this area was very poor, with introduced weed species such as lantana and privet as well as leaf litter obscuring the ground surface. Some large stringybarks were also observed. Further east along the southern side of Warringah Road, a long landscaped mound has been created between the carriageway and the business park buildings to the south. The mound is grassed and extends as far as Jones Street. This portion of the ridge is elevated and offers views east to the ocean. Occasional small patches of exposure were examined for artefacts but the remainder of the area is grassed and offers poor visibility.

No archaeological sites were identified in Survey Unit 4.
Plate 36. Thick vegetation north of incorrect recorded location of 45-6-1004

Plate 37. Warringah Road, looking west from Government Road to crest

Plate 38. Large exposure south of market parking lot, looking east

Plate 39. Looking east along southern side of Warringah Road. Landscaped bank runs parallel to road

Plate 40. Looking west down Frenchs Forest Road East. Skyline shops at right.

Plate 41. Looking east down Warringah Road towards Allambie Road. Landscaped verges and footpaths
### 4.6 Survey Coverage Analysis

Overall surface visibility and exposure across the study area was moderate to poor. Details of survey coverage are outlined in Table 4 below and details of landform coverage are outlined in Table 5. A further descriptive analysis of survey coverage follows.

#### Table 4. Survey Coverage

<table>
<thead>
<tr>
<th>Survey Unit</th>
<th>Landform</th>
<th>Survey Unit Area (m²)</th>
<th>Visibility (%)</th>
<th>Exposure (%)</th>
<th>Effective Coverage (m²)</th>
<th>Effective Coverage (%)</th>
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#### Table 5. Landform Coverage

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<tr>
<th>Landform</th>
<th>Landform Area (m²)</th>
<th>Area Effectively Surveyed (m²)</th>
<th>% of Landform Effectively Surveyed</th>
<th># of Sites</th>
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</table>

Survey coverage varied throughout the study area. Large parts of the area, primarily the slopes off the ridge crest, have underlying sandstone geology and survey in these areas targeted exposures of sandstone. Every exposure and outcropping of sandstone encountered in the study area was inspected for engravings, grinding grooves or shelters and consequently survey coverage of these rock exposures can be considered high. Thick vegetation in undeveloped areas of bushland obscured visibility of the ground surface but rock outcrops were readily apparent. Surface disturbance in these areas was generally low, apart from within the Brickpit Reserve and along the northern portion of Bantry Bay Road. Previously unrecorded sites Trefoil Creek 1 and Trefoil Creek 2 were identified east of Wakehurst Parkway. Archaeological potential for further sites is considered to be moderate to low.

In areas of slope where residential and commercial development has taken place, survey coverage was lower due to the presence of buildings, carparks, gardens and large areas of lawn. Where sandstone outcrops were located in public lands or were visible from the street these were examined but in most cases found to be disturbed by cuttings or erosion. Archaeological potential is considered to be low.

The majority of the ridge landform has been developed and contains both residential and commercial areas, along with the main road corridors. Private properties were generally not entered during the survey but road corridors were walked and assessments made of ground disturbance. Large tracts of land on both sides of Warringah Road have been landscaped and turfed. Soil exposures were infrequent, apart from a large eroded exposure near the market carpark which offered good visibility. Smaller patches of exposure were visible where grass had died. Overall, surface disturbance along the ridge landform (within developed and undeveloped portions) was high due to landscaping and development. Archaeological potential is considered to be low.

Overall surface visibility and exposure across the entire study area was low. However, the low visibility did not significantly impede the assessment of Aboriginal archaeology as the prime areas of archaeological potential were able to be assessed (i.e. sandstone platforms, overhangs, shelters, exposed areas on ridge crest).
4.7 Analysis and Discussion

AHIMS records identified one previously recorded Aboriginal site (45-6-1004, a shelter with art) within the study area. Archaeological field survey did not relocate this site at the registered coordinates and background research and the field visit confirmed that the registered location of this site is incorrect. Moreover, no landforms such as those described by the AHIMS site card are located within the study area. All overhangs were inspected during the survey and no shelter matching the site card description was identified. The precise location of this site, while unconfirmed, is outside of the current study area.

Field survey also recorded two previously unrecorded Aboriginal sites (Trefoil Creek 1, a shelter with art, and Trefoil Creek 2, a shelter with PAD) within the study area on a slope above the Trefoil Creek gully, east of Wakehurst Parkway.

The location of previously recorded sites 45-6-0752, 45-6-0753 and 45-6-0824 was verified to be outside the study area.

No other Aboriginal archaeological sites were identified within the study area.

4.7.1. Aboriginal Settlement History of the Study Area

The principal remaining physical evidence of Aboriginal landscape use around the study area consists of shelters with art and archaeological deposit, and rock engravings located on outcropping sandstone slabs and benches. Within the study area, one shelter with art and one shelter with PAD have been identified. Trefoil Creek 1 is located in a slope context, above the gully formed by Trefoil Creek, a minor order tributary draining north to Middle Creek and Narrabeen Lagoon. The floor of the shelter has been subject to disturbance, removing any deposit that may once have been present, with the only remaining traces of Aboriginal use consisting of a panel of hand stencils executed in red ochre with a faint charcoal line beneath. Trefoil Creek 2 is located to the south of Trefoil Creek 1, in the same slope context above the Trefoil Creek gully. Trefoil Creek 2 retains apparently undisturbed floor deposit; however, no archaeological material was identified. It is possible that this shelter was also used as an occasional camp site and contains PAD relating to this use.

No engraving sites were identified within the study area. The dominant shale geology was not conducive for engraving. Where sandstone existed in the study area, platforms were found to have been subject to cuttings and disturbance, which may have removed any engravings. Alternatively, unrecorded engraving sites may be located beneath houses and lawns that have since been built. In large parts of the study area, sandstone outcrops were found to be coarse and uneven, unsuitable for engraving sites as has been similarly documented to the north and northeast. Large, flat exposures east of the study area may have acted as a focus for engraving activities, and people may have travelled up from coastal areas to create and revisit engravings. Site 45-6-0752 on Ellis Road, originally recorded by Campbell, was considered likely to represent the workmanship of numerous people over a potentially long period of time.

The chief ridgeline within the study area was likely not a focus for intensive Aboriginal occupation, being removed from the major resources of the coast. Instead, it may have functioned as a transport route between the coastal areas to the east and the hinterland to the west towards the Lane Cove River, as has been suggested for prominent ridge lines further north in the Terrey Hills area. Archaeological evidence of this type of landscape use is frequently in the form of open artefact scatters or isolated finds, representing isolated discard events or single use campsites while travelling. While these sites may have originally existed along the flat ridge top of the study area, historic and contemporary land use practices have led to substantial landscape modification and remaining potential for these sites to occur is low.

On the slopes, steep gradients preclude the accumulation of archaeological material in open deposits. In any case, rock shelters formed beneath sandstone overhangs on the slopes would have been a more attractive prospect for a campsite, offering shelter and protection from prevailing south westerly winds, especially on the northern side of the ridge such as at Trefoil Creek 1 and Trefoil Creek 2.
4.8 Scientific Values and Significance Assessment

One of the primary steps in the process of cultural heritage management is the assessment of significance. Not all sites are equally significant and not all are worthy of equal consideration and management (Sullivan and Bowdler 1984, Pearson and Sullivan 1995:7). The determination of significance can be a difficult process as the social and scientific context within which these decisions are made is subject to change (Sullivan and Bowdler 1984). This does not lessen the value of the heritage approach, but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why, also changes over time.

Significance assessment can generally be described under three broad headings (Pearson and Sullivan 1995:7):

- Value to groups such as Aboriginal communities;
- Value to scientists and other information gatherers; and
- Value to the general public in the context of local, state and national heritage.

4.8.1. Social Significance

This area of assessment concerns the value/s of a feature or site to a particular community group, in this case the local Aboriginal community. Aspects of social significance are relevant to sites, objects and landscapes that are important or have become important to the local Aboriginal community. This importance involves both traditional links with specific areas as well as an overall concern by Aboriginal people for sites generally and their continued protection. Aboriginal cultural significance may include social, spiritual, historic and archaeological values. Aboriginal cultural significance is determined by the local Aboriginal community.

4.8.2. Scientific Significance

For archaeologists, scientific significance refers to the potential of a site to contribute to current research questions. Alternately, a site may be an *in situ* repository of demonstrably important information, for example rare artefacts of unusually high antiquity.

Scientific significance is assessed using criteria to evaluate the contents of a site, state of preservation, integrity of deposits, representativeness of the site type, uniqueness and potential to answer research questions on past human behaviour. Guidelines recommended criteria for assessing archaeological significance include:

- **Archaeological Research Potential** – significance may be based on the potential of a site or landscape to explain past human behaviour and can incorporate the intactness, stratigraphic integrity or state of preservation of a site, the association of the site to other sites in the region, or a datable chronology;
- **Representativeness** – all sites are representative of those in their class (site type/subtype) however; the issue here relates to whether particular sites should be conserved to ensure a representative sample of the archaeological record is retained. Representativeness is based on an understanding of the regional archaeological context in terms of site variability in and around the study area, the resources already conserved and the relationship of sites across the landscape; and
- **Rarity** – which defines how distinctive a site may be, based on an understanding of what is unique in the archaeological record and consideration of key archaeological research questions (i.e. some sites are considered more important due to their ability to provide certain information). It may be assessed at local, regional, state and national levels.

High significance is usually attributed to sites which are so rare or unique that the loss of the site would affect our ability to understand an aspect of past Aboriginal use/occupation of an area. In some cases a site may be considered highly significant because it is now rare due to destruction of the archaeological record through development. Moderate significance is attributed to sites which provide information on an established research question. Low significance is attributed to sites which cannot contribute new information about past Aboriginal use/occupation of an area. This may be due to site disturbance or the nature of the site’s contents.
4.8.3. **Statement of Significance**

**Trefoil Creek 1**
This site is a shelter with art recorded on the northern slopes of the main ridgeline, west of a gully containing the headwaters of Trefoil Creek. The site includes a series of red ochre hand stencils and a faint charcoal line. The art at the site is in moderate condition and the site is representative of its type. Shelter sites are common regionally but none have been recorded in association with the prominent ridge of the current study area, being more common in mid to lower slope contexts. In this sense the site is rare and offers archaeological evidence of Aboriginal landscape use that differs from the more common open context rock engraving sites in the region. Shelter sites containing art tend to be particularly vulnerable to weathering, bushfires and vandalism. The moderate condition of the remaining art in the shelter underscores its value. While sandstone outcrops are abundant in the study area, rock engravings and grinding grooves have not been identified, leaving Trefoil Creek 1 the only remaining confirmed archaeological resource in the study area. MLALC assessed Trefoil Creek 1 as exhibiting great significance and importance to Aboriginal cultural heritage. Based on these factors, site Trefoil Creek 1 demonstrates moderate significance.

**Trefoil Creek 2**
This site was a shelter with PAD recorded to the south of Trefoil Creek 1. It has been identified that shelter sites are rare within and around the elevated context of the study area and Trefoil Creek 1 has a disturbed shelter floor which is unlikely to retain any archaeological deposit. By contrast, Trefoil Creek 2 appears relatively undisturbed, with some depth of deposit present and the PAD has the potential to inform on Aboriginal land use of the upper slope landform. MLALC stated that shelters in the area such as Trefoil Creek 2 which may have been used by Aboriginal people exhibited great significance and importance to Aboriginal cultural heritage. Based on these factors, Trefoil Creek 2 demonstrates moderate archaeological potential.

4.9 **Statutory Requirements**

The **National Parks and Wildlife Act 1974** (NPW Act) is the primary statutory control dealing with Aboriginal heritage in New South Wales. Items of Aboriginal heritage (Aboriginal objects) or Aboriginal places (declared under section 84) are protected and regulated under the NPW Act.

Under the Act, an “Aboriginal object” is defined as “any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises New South Wales, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains”. As such, Aboriginal objects are confined to physical evidence and are commonly referred to as Aboriginal sites.

Aboriginal objects are protected under section 86 of the Act. It is an offence to harm or desecrate an Aboriginal object, either knowingly [section 86 (1)] or unknowingly [section 86 (2)].

There are offences and penalties relating to harm to, or desecration of, an Aboriginal object or declared Aboriginal place. Harm includes to destroy, deface, damage or move. Penalties are tiered according to offences, which include:

- a person must not harm or desecrate an Aboriginal object that the person knows is an Aboriginal object;
- a person must not harm or desecrate an Aboriginal object (strict liability offence);
- a person must not harm or desecrate an Aboriginal place (strict liability offence);
- failure to notify Office of Environment and Heritage of the location of an Aboriginal object (existing offence and penalty); and
- contravention of any condition of an Aboriginal Heritage Impact Permit.

Under section 87 (1) it is a defence if “(a) the harm or desecration concerned was authorised by an Aboriginal heritage impact permit, and (b) the conditions to which that Aboriginal heritage impact permit was subject were not contravened”.

Section 87 (2) of the Act provides a defence against prosecution under section 86 (2) if “the defendant exercised due diligence to determine whether the act or omission constituting the alleged offence would harm an Aboriginal object and reasonably determined that no Aboriginal object would be harmed”.

Section 89A of the Act relates to the notification of sites of Aboriginal objects, under which it is an offence if the location of an Aboriginal object is not notified to the Director-General in the prescribed manner within a reasonable time.

Under section 90 (1) of the Act “the Director-General may issue an Aboriginal heritage impact permit”. The regulation of Aboriginal heritage impact permits is provided in Part 6 Division 2 of the Act, including regulations relating to consultation (section 90N). An Aboriginal Heritage Impact Permit (AHIP) is required for an activity which will harm an Aboriginal object.
5 Potential Impacts

5.1 Potential concept proposal impacts

Two Aboriginal archaeological sites were identified within the wider concept proposal study area. These sites, Trefoil Creek 1 and Trefoil Creek 2 are situated within the Stage 1 works investigation area and are discussed below in section 5.2. Within the remainder of the concept proposal study area, no items or areas of Aboriginal heritage value have been identified and there are therefore no potential impacts to Aboriginal heritage.

5.2 Potential Stage 1 works impacts

Two Aboriginal archaeological sites have been identified within the wider study area for the proposed Stage 1 hospital connectivity works. Trefoil Creek 1 and Trefoil Creek 2 were identified to the east of Wakehurst Parkway, north of Frenchs Forest Road. Planned works in this part of the Stage 1 works study area include the road widening of Wakehurst Parkway. A section of the road extending approximately 400 metres north from the intersection with Frenchs Forest Road is proposed to be widened to accommodate the construction of a right turn lane from Wakehurst Parkway into Frenchs Forest Road west and a left turn slip lane over approximately 200 metres into Frenchs Forest Road east.

While detailed construction designs are not available at this stage of planning, the proposed construction impact area for the Stage 1 works are shown on Figure 12. The majority of the road widening construction work is expected to take place on the western side of Wakehurst Parkway, on the opposite side of the road to identified sites Trefoil Creek 1 and Trefoil Creek 2. The location of the sites in relation to the proposed construction impact footprint is shown in Figure 13. Based on the existing construction impact footprint boundary, the sites will not be impacted by the proposed works.

Best practice is to avoid archaeological sites, especially where impact to sites cannot be mitigated. Based on the current design plan, both sites will be avoided by the proposed works.

Table 6. Impact assessment based on Stage 1 construction impact area

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<tr>
<th>Site Number</th>
<th>Type of Harm</th>
<th>Degree of Harm</th>
<th>Consequence of Harm</th>
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Figure 12. Construction impact footprint for Stage 1 works

Figure 13. Construction impact footprint and identified archaeological sites
6 Management Measures

Based on the assessment of the study area detailed in this Aboriginal archaeological survey report, no potential impacts have been identified to Aboriginal archaeological sites or heritage values by the wider concept proposal or the proposed Stage 1 works of the proposed Northern Beaches Hospital Connectivity and Network Enhancement Works project.

One moderate significance archaeological site, Trefoil Creek 1, and one moderate potential PAD, Trefoil Creek 2, are located within the wider Stage 1 works study area but are outside of the proposed construction impact footprint.

Both sites should be identified on the Construction Environmental Management Plan (CEMP) as no-go zones, in order to avoid inadvertent impact during construction.

If changes to the current construction impact footprint are made during the detailed design phase and the proposed changes would cause an impact to identified sites Trefoil Creek 1 and/or Trefoil Creek 2, an updated impact assessment should be undertaken and appropriate management and mitigation measures formulated at that time.

If buried Hawkesbury Sandstone platforms are uncovered during clearing works for construction, these platforms should be assessed for possible Aboriginal engravings or rock markings.

If the management measures described above are implemented, no additional management of Aboriginal heritage is warranted for the proposed NBH Connectivity and Network Enhancement Works project.
References


Byrne, D. 1992. Survey for Aboriginal archaeological sites in the St Ives to Dee Why Transport Corridor. Report to the Department of Planning.


Appendix A  Metropolitan Aboriginal Land Council Report
Lee Davison
Cultural Heritage Sites Officer
leedavison@gmail.com

RMS – NBH
Aboriginal stakeholder cultural heritage
primary survey report
APRIL 2014

A primary cultural heritage assessment for Roads and Maritime Services
1. Purpose of this assessment

This assessment’s purpose is to determine whether any features of cultural heritage significance occur within the study area of this project being carried out by RMS, and whether they would be affected by the project. This assessment will be used to assist the RMS in determining whether further assessment and consultation will be required for this project.

2. Project details

a) Project title:

RMS – NBH
Aboriginal stakeholder cultural heritage primary survey report

a) The study area is located in French’s Forest, Sydney. In particular, the streets and bushland that surround the junctions of Warringah Road, Wakehurst Parkway and Forest Way.

b) Lee Davison is the Aboriginal site officer completing this assessment.

c) The Metropolitan Local Aboriginal Land Council is represented by this assessment.

d) Lee Davison was the Aboriginal site officer who undertook this survey.

e) This survey/assessment was carried out on the 9th, 10th and 11th of April, 2014.
3. Methodology

a) Approximately 50% of the total study area was surveyed due to inaccessible properties such as houses, business parks, shops and French’s Forest High School grounds. Comprehensive coverage of the accessible areas was achieved as waterways and sandstone outcrops were expected to be identified and were of particular interest in this assessment.

b) The survey was conducted on foot over three days.
Mark Rawson, senior archaeologist for Kelleher Nightingale Consulting Pty Ltd was also present during the survey.

4. Results

a) The boundary of the study area was centred by a ridge that Warringah Road runs along. The area is heavily covered by built areas such as roads, houses, business parks, offices buildings, a school and a shopping centre. With sections of bushland surrounding built and heavily disturbed areas, the main focus of this survey was to seek out creeks and sandstone outcrops that provide water and overhangs for shelter. The overhangs/shelters were of particular interest as they often contain artwork such as painting and rock engraving.

See maps for exact location of the study area boundary.

b) During the survey there were two sites of interest identified.

SITE 1

The first was a sandstone shelter containing art, to be specific, hand stencils with red ochre. The site is located approximately 25m east of Wakehurst Parkway, in the north eastern corner of the study area boundary. The shelter was measured at 13.8m long, 3.5m deep and 3m high. There were 7 hand stencils sited, with excellent visibility, and it is likely there are more that may have been damaged or simply faded over years of exposure. Traces of charcoal are also visible on the shelter face, but may be of no significance or relation to the original artwork.
The condition of the artwork is very good considering the site is frequently visited by people who have clearly had fires, left rubbish and graffitied on the shelter face, but no over the hand stencils. This site is of great significance and importance to Aboriginal cultural heritage and should be registered and treated as a protected site.

Photo 1: Hand stencils on shelter wall

The GPS co-ordinates are as follows: E 0336525 N 6264351

SITE 2

The second site of interest is a mature tree which contains three scars that may or may not have been caused by Aboriginal persons. These scars may have been caused by English blazes. The tree is located in Bushland (original site of the French’s Forest brick pit) between Wakehurst Parkway and Bantry Bay Road, inside the study area boundary. Further inspection should be made to confirm the cause of scarring and significance.
Photo 2: Scarred tree

The GPS co-ordinates for the tree are as follows: E 0336415 N 6263726

Site 45-6-1004 (Blue stones cave) could not be relocated, but further research should be able to confirm its location.

An engraving site located outside of the study area boundary was also identified. This site contains the engravings of two human male figures, a shield and potentially a boomerang.
As this site lies outside of the study area boundary it does not affect the project area.

c) It is likely that features such as stone tools or flakes, hearths, middens, shelters, significant spiritual or social areas are present in the study area, despite not being positively identified during the survey. There are areas where little or no ground visibility is available, making identification of such features difficult. Restricted access to private backyards and business grounds that may harbour cultural features also restrict potential site identification.
d) It is highly likely that many areas within the survey area were occupied by Aboriginal people and used in day to day life.

Hunting, food gathering and the use of waterways for drinking water are examples and are important aspects of Aboriginal life, past and present.

The identified hand stencils at SITE 1 point out the importance and regular use of such a place by the local Aboriginal people that lived within the study area.

These resources such as waterways, native foods and shelters were of great importance to Aboriginal people of the past, who used them in daily life, and are of equal importance to present Aboriginal communities, as they represent our cultural heritage.

e) A large portion of the study area has past disturbance in the form of roads and buildings, such as houses, businesses and a school ground.

It is likely that there were Aboriginal cultural heritage features present before construction activities took place.

It is possible that there may have been a well used thoroughfare present where Warringah Road is located, due to its geographical positioning (along a ridge, heading east and west).

If features such as artefacts, hearths, scarred trees, bora circles, art sites, shelters, significant spiritual or social areas or significant cultural landscape areas were present before construction activities of the current roads and buildings, they may have been destroyed or misplaced.
4. Conclusion

This survey identified one significant site (SITE 1), and one potentially significant site (SITE 2).

The study area also consists of areas that are likely to be used for hunting, food gathering and camping due to the location of waterways and surrounding landscape.

It is my recommendation that SITE 1 is registered as a significant Aboriginal cultural heritage site and be protected under the National Parks and Wildlife Act 1974. Buffer zones should be placed on SITE 1, SITE 2, if confirmed as a cultural heritage site and Blue stone cave, if relocated, for the protection and preservation of these culturally significant sites.

The engraving site which is outside of the study area boundary should not be affected by the project.

It is also my recommendation that further surveying be conducted during ground disturbance activities, as objects such as stone tools, flakes and hearths are likely to be uncovered and identified if present.

Note: More photos are available on request.

This report has been completed by Lee Davison, cultural heritage site officer, for the Metropolitan Local Aboriginal Land Council on Monday 14th of April, 2014.
Email from Lee Davison, Sites Officer, Metropolitan LALC

From: Lee Davison
Sent: Friday, 25 July 2014 11:36 AM
To: LESTER Mark W
Cc: Nathan Moran
Subject: NBH Survey - Scarred Tree

Hi Mark

As discussed earlier, I conducted a survey with Mark Rawson, senior archaeologist for Kelleher Nightingale Consultants in April, earlier this year for the RMS Northern Beaches Hospital development.

During the survey we observed a mature tree containing scarring and agreed that it may have been caused by either Aboriginal ritual or an English Maze.

I confirm and agree with Mark’s report that the scarring was in fact caused by an English blaze and not for Aboriginal ritual purposes.

I hope that this assists in the forward development of the project and resolves any issues that RMS have with my previous report.

Kind regards

Lee Davison
Cultural heritage Sites Officer
Metropolitan Local Aboriginal Land Council
Appendix B  

AHIMS Search Results
### Extensive search - Site list report

#### Northern Beaches Hospital Connectivity and Network Enhancement Works: Aboriginal Archaeological Survey Report August 2014

<table>
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<th>Easting</th>
<th>Northing</th>
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<th>Site Features</th>
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*Report generated by AHIMS Web Service on 07/03/2014 for Crystal Millrath for the following areas at Datum: GDA, Zone: S6, Eastings: 333350 - 340500, Northings: 6242000 - 6267000 with a Buffer of 50 meters. Additional Info: Aboriginal Archaeological Assessment Number of Aboriginal sites and Aboriginal objects found is 194.*

*This information is to be treated as confidential by the person to whom it is supplied. The Office of Environment and Heritage (NSW) accepts no liability for any action or omission made in the absence of or consequences of such action or omission.*
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This information is not guaranteed to be free from error and cannot, as a whole or in part, be relied upon for any action or omission arising out of the information and consequent of such action or omission.
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#### Extensive search - Site list report

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Report generated by AHIMS Web Service on 07/03/2014 for Cristine Millich for the following area at Datum 6, Zones: 56, Eastings: X: 3000 - 340000, Northings: 6260000 - 6267000 with a Buffer of 0 meters. Additional Info: Aboriginal Archaeological Assessment, Number of Aboriginal sites and Aboriginal objects found is 104. This information is guaranteed to be free from error or omission, Office of Environment and Heritage (NSW) and the responsible Officer liaise for the information and the correctness of such action or omission.

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Kelleher Nightingale Consulting Pty Ltd

Page 5 of 8
### AHIMS Web Services (AWS)

#### Extensive search - Site list report

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| 45-6-0005 | Semi-Remote Site          | ANU            | 8635496       | 8635496        | 8635496        | 8635496        | 8635496        | 8635496                | 8635496               | 8635496        | 8635496        | 8635496        | 8635496       |
| 45-6-0007 | Semi-Remote Site          | ANU            | 8635496       | 8635496        | 8635496        | 8635496        | 8635496        | 8635496                | 8635496               | 8635496        | 8635496        | 8635496        | 8635496       |
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| 45-6-0013 | Semi-Remote Site          | ANU            | 8635496       | 8635496        | 8635496        | 8635496        | 8635496        | 8635496                | 8635496               | 8635496        | 8635496        | 8635496        | 8635496       |
| 45-6-0014 | Semi-Remote Site          | ANU            | 8635496       | 8635496        | 8635496        | 8635496        | 8635496        | 8635496                | 8635496               | 8635496        | 8635496        | 8635496        | 8635496       |
| 45-6-0015 | Semi-Remote Site          | ANU            | 8635496       | 8635496        | 8635496        | 8635496        | 8635496        | 8635496                | 8635496               | 8635496        | 8635496        | 8635496        | 8635496       |

Report generated by AHIMS Web Services on 07/03/2014 for Chris Rowling for the following area at Datum: E:612, Zone: 56, Easting: 2304000 - 3404000, Northing: 6242000 - 6247000 with a Buffer of 0 meters. Additional Info: Aboriginal Archaeological Assessment. Number of Aboriginal sites and Aboriginal objects found in 124.
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Report generated by AHIMS Web Services on 7/03/2014 for Grattan Milich for the following area at Datum 6TA, Zone: 36S, Eastings: 6264000 - 6264000, Northings: 35580000 - 35580000 with a Buffer of 0 meters. Additional Info: Aboriginal Archaeological Assessment - Number of Aboriginal sites and Aboriginal objects found is 114.

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### AHIMS Web Services (AWS)
#### Extensive search - Site list report

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Report generated by AHIMS Web Service on 07/03/2014 for Crystall Milich for the following area at Datum: 6.16a, Zone: 56, Easting: 235000 - 340000, Northing: 6262000 - 6267000 with a Buffer of 0 meters. Additional Info: Aboriginal Archaeological Assessment; Number of Aboriginal sites and Aboriginal objects found is 194.

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