Appendix H

Aboriginal cultural heritage
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

Aboriginal Archaeological Survey Report

Report to Roads and Maritime Services (RMS)

October 2012
Executive Summary

The NSW Roads and Maritime Services (RMS), previously known as the NSW Roads and Traffic Authority (RTA) proposes to upgrade 15 kilometres of The Northern Road between The Old Northern Road, Narellan and Mersey Road, Bringelly (to be referred to hereafter as the proposal). Artefact Heritage has been engaged by Sinclair Knight Merz (SKM) to conduct the Aboriginal archaeological survey and assessment for the proposal in accordance with Stage 2 of the RMS Procedure for Aboriginal Cultural Heritage Consultation and Investigation 2010 (PACHCI).

The aims of the study were to accurately locate previously registered Aboriginal sites and identify new sites, and to assess their archaeological significance. For sites that cannot be avoided by the proposal, preliminary recommendations have been made regarding management and mitigation measures appropriate to the proposed impacts. Twenty-four Aboriginal sites are currently known to be located within the study area (the proposal impact area and a buffer of 20m). A further eight sites were considered in this study as they were either in the original study area (including the Peter Brock Drive intersection), or were recorded during this study outside the study area.

The study found that fifteen Aboriginal sites would be directly impacted by the proposal. Ten of these sites were assessed as having low archaeological significance, while five have been assessed as having a moderate archaeological significance.

This study recommends that salvage excavations should be conducted for a representative sample of sites with a moderate archaeological significance which cannot be avoided by the proposal. Five sites of moderate archaeological significance have been recommended for salvage excavation. One site, with a low archaeological significance, but a relatively high number of recorded artefacts should be hand collected by the Aboriginal stakeholder groups if they wish to do so.

Sites which cannot be avoided by the proposal would require an Aboriginal Heritage Impact Permit (AHIP) prior to any impacts. Before works commence on the road upgrade an area based Section 90 AHIP should be sought for impacts on all Aboriginal sites within the proposal impact area that cannot be conserved, and for any required salvage excavations or hand collections. A number of Aboriginal sites are currently listed on existing AHIPs. Before an AHIP application can be submitted by RMS for the proposal, the permit holder for the current AHIPs and the Office of Environment and Heritage (OEH) should be consulted to ascertain the current status of these Aboriginal sites.

Scarred tree NRST1 should be conserved and protected from impacts associated with the proposal. The tree should remain in situ with a sufficient buffer to protect it from impacts by the road construction and use of the road into the future.
Scarred tree NRST2 was assessed by an arborist to ascertain the probability that it is culturally scarred. It was found that the age of the tree and the nature of the scar indicates that the tree is not culturally scarred. This conclusion was supported by the Aboriginal stakeholder groups. A site update card recommending that the tree is not a site has been prepared and will be submitted to OEH.

This Aboriginal Archaeological Survey Report (ASR) complies with the Stage 2 PACHCI. Further work has been recommended by this report, which would address requirements of Stage 3 PACHCI including comprehensive Aboriginal consultation. The cultural significance of the study area would be addressed during this Stage 3 consultation. The information gained during consultation and the recommended archaeological work would be added to an updated report, being the Aboriginal Cultural Heritage Assessment Report (CHAR).

Please note: Site co-ordinates and maps showing the locations of Aboriginal sites have been removed from this version so it is suitable for public display.
## Contents

1.0 Introduction and Background ........................................................................................................ 1  
   1.1 Description of proposal .............................................................................................................. 1  
   1.2 Scope of the study ..................................................................................................................... 1  
   1.3 Objectives of the study ............................................................................................................. 5  
   1.4 Development context ................................................................................................................ 5  
   1.5 Investigator and contributions ................................................................................................... 5  
   1.6 Aboriginal community involvement ......................................................................................... 6  
   1.7 Report structure ....................................................................................................................... 6  
2.0 Environmental Context ..................................................................................................................... 7  
   2.1 Landform units .......................................................................................................................... 7  
   2.2 Geomorphology ....................................................................................................................... 7  
   2.3 Natural resources ..................................................................................................................... 7  
   2.4 Hydrology ................................................................................................................................ 8  
   2.5 Land use history ....................................................................................................................... 8  
3.0 Aboriginal Historical and Archaeological Context .......................................................................... 10  
   3.1 Aboriginal material culture ....................................................................................................... 10  
   3.2 Aboriginal histories of the locality ............................................................................................ 11  
   3.3 Registered Aboriginal sites in the local area – AHIMS search .................................................. 12  
   3.4 Site types .................................................................................................................................. 16  
   3.5 Previous archaeological work within the study area ............................................................... 17  
4.0 Predictions ..................................................................................................................................... 20  
   4.1 Aboriginal land use ................................................................................................................... 20  
   4.2 Predictive model ....................................................................................................................... 20  
5.0 Field Methods .................................................................................................................................. 22  
   5.1 Site definition ............................................................................................................................ 22  
   5.2 Survey methodology ................................................................................................................. 22
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

5.3 Site recording ................................................................................................................................................. 23
6.0 Results ............................................................................................................................................................... 24
6.1 Effective survey coverage ................................................................................................................................. 24
6.2 Previously recorded Aboriginal sites ...................................................................................................................... 24
  6.2.1 52-2-1819 (IF1) ........................................................................................................................................ 25
  6.2.2 52-2-3799 (OPW-D4) ............................................................................................................................... 25
  6.2.3 52-2-3623 (NRPAD1) ............................................................................................................................... 26
  6.2.4 52-2-1808 / 52-2-1812 (HP1) ....................................................................................................................... 26
  6.2.5 52-2-3331 (O-OS-2) .................................................................................................................................. 27
  6.2.6 52-2-3330 (O-IF-2) .................................................................................................................................. 27
  6.2.7 52-2-3329 (HP01) .................................................................................................................................... 27
  6.2.8 52-2-3803 (O-IF-3) .................................................................................................................................. 27
  6.2.9 52-2-3538 (OPM-I) .................................................................................................................................. 27
  6.2.10 52-2-3535 (OPD-14) .............................................................................................................................. 27
  6.2.11 45-5-3800 (TNR2) .................................................................................................................................... 28
  6.2.12 45-5-4035 (PAD 2038-6) .......................................................................................................................... 28
  6.2.13 45-5-3542 (NR4) .................................................................................................................................... 29
  6.2.14 45-5-3543 (NR5) .................................................................................................................................... 29
  6.2.15 45-5-3546 (NRST1) .................................................................................................................................. 29
  6.2.16 45-5-3545 (NRPAD2) .............................................................................................................................. 31
  6.2.17 45-5-3547 (NRST2) .................................................................................................................................. 31
  6.2.18 45-5-3544 (NR6) .................................................................................................................................... 32
  6.2.19 45-5-3886 (BRP-IF-16) ............................................................................................................................ 32
  6.2.20 45-5-3888 (BRP-S-01) ............................................................................................................................ 33
  6.2.21 45-5-3889 (BRP-S-02) ............................................................................................................................ 33
  6.2.22 45-5-3890 (BRP-S-03) ............................................................................................................................ 33
  6.2.23 45-5-3891 (BRP-S-04) ............................................................................................................................ 33
  6.2.24 45-5-3895 (BRP-S-08) ............................................................................................................................ 33
  6.3 Newly recorded Aboriginal sites .......................................................................................................................... 34
Figures

Figure 1: The proposal impact area indicated by red line. ................................................................. 3

Figure 2: NRPAD1 approximate extent outlined in red with the approximate proposed impact footprint of the TNR upgrade shown in blue (north to top of page): background source is Nearmap. ....................... 26

Figure 3: Mud map from Biosis 2008 site card showing location of NRPAD1. ................................. 26

Figure 4: PAD 2038-6 outlined in blue with former road alignment shown by red line: north to top of page. ........................................................................................................................................... 28

Figure 5: 1930 aerial with approximate location of PAD 2038-6 outlined in blue: north to top of page. 29

Figure 6: Site NRST1 in relation to concept design (SKM sketch). ....................................................... 30

Figure 7: Location of NRPAD2 (outlined in red). ............................................................................... 31

Plates

Plate 1: Site NRST1 (Artefact Heritage 27/9/12). ............................................................................... 30

Plate 2: Site NRST2 (Artefact Heritage 26/9/12). ................................................................................ 32

Plate 3: TNRU1 location: facing north-east. ...................................................................................... 34

Plate 4: Artefact at TNRU1. .................................................................................................................. 34

Plate 5: TNRU2 location: facing west. .................................................................................................. 35

Plate 6: Artefacts at TNRU2. ................................................................................................................ 35

Plate 7: TNRU3 location: facing south. ................................................................................................. 36

Plate 8: Artefact at TNRU3. .................................................................................................................. 36

Plate 9: TNRU4 location: facing south-west. ...................................................................................... 37

Plate 10: Sample of artefacts at TNRU4. ............................................................................................ 37

Plate 11: TNRU5 location: facing south. .............................................................................................. 37
<table>
<thead>
<tr>
<th>Plate</th>
<th>Description</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Artefact at TNRU5</td>
<td>37</td>
</tr>
<tr>
<td>13</td>
<td>TNRU6 location: facing south-east</td>
<td>38</td>
</tr>
<tr>
<td>14</td>
<td>Artefact at TNRU5</td>
<td>38</td>
</tr>
<tr>
<td>15</td>
<td>TNRU7 location: facing north</td>
<td>39</td>
</tr>
<tr>
<td>16</td>
<td>Sample of artefacts at TNRU7</td>
<td>39</td>
</tr>
<tr>
<td>17</td>
<td>Site TNRU8 location: facing north</td>
<td>40</td>
</tr>
<tr>
<td>18</td>
<td>Isolated find at TNRU8</td>
<td>40</td>
</tr>
<tr>
<td>19</td>
<td>Site TNRU9 location: facing west</td>
<td>40</td>
</tr>
<tr>
<td>20</td>
<td>Artefact at TNRU9</td>
<td>40</td>
</tr>
<tr>
<td>21</td>
<td>Site TNRU10: facing north</td>
<td>41</td>
</tr>
<tr>
<td>22</td>
<td>Isolated find at TNRU10</td>
<td>41</td>
</tr>
<tr>
<td>23</td>
<td>Site TNRU11 location: facing north</td>
<td>42</td>
</tr>
<tr>
<td>24</td>
<td>Artefact at TNRU11</td>
<td>42</td>
</tr>
<tr>
<td>25</td>
<td>Site TNRU12 location: facing west</td>
<td>42</td>
</tr>
<tr>
<td>26</td>
<td>Isolated find at TNRU12</td>
<td>42</td>
</tr>
<tr>
<td>27</td>
<td>Site TNRU13 location: facing north-east</td>
<td>43</td>
</tr>
<tr>
<td>28</td>
<td>Artefacts at TNRU13</td>
<td>43</td>
</tr>
<tr>
<td>29</td>
<td>Site TNRU14 location in foreground: facing south</td>
<td>44</td>
</tr>
<tr>
<td>30</td>
<td>Isolated find at TNRU14</td>
<td>44</td>
</tr>
</tbody>
</table>
Tables

Table 1: Previously recorded sites and PADs within the vicinity of the study area including those sites listed on AHIMS that have been destroyed which are shaded in orange. ................................................................. 14

Table 2: Survey coverage ......................................................................................................................................................... 24

Table 3: Corrected AHIMS site co-ordinates for 11 AHIMS entries found to have inaccurate locations. ...... 24

Table 4: Summary of Aboriginal sites within the study area: excluding sites that have previously been destroyed. .................................................................................................................................................. 45

Table 5: Summary of significance values. ........................................................................................................................................ 51

Table 6: Impacts and mitigation/management measures: sites which would be impacted are shaded in orange. ........................................................................................................................................ 56

Table 7: Archaeological sites which will not be impacted by the proposal and do not require mitigation measures. ........................................................................................................................................ 61

Table 8: Archaeological sites which may be subject to indirect impacts and should be fenced off during works. ........................................................................................................................................ 61

Table 9: Archaeological sites which would be impacted by concept design and require an AHIP. ............... 61

Table 10: Scarred trees. ......................................................................................................................................................... 61

Table 11: Archaeological site requiring surface collection. .............................................................................................. 61

Table 12: Archaeological sites requiring salvage excavations. .......................................................................................... 61

Table 13: Archaeological sites requiring site card update and no further mitigation measures. .................. 61
1.0 Introduction and Background

1.1 Description of proposal

The NSW Roads and Maritime Services (RMS) propose to upgrade about 15 km of The Northern Road between The Old Northern Road, Narellan and Mersey Road, Bringelly (the proposal). The proposal would be undertaken within the Camden and Liverpool local government areas (LGAs) in the RMS Sydney region. The proposal does not include the upgrade of the Oran Park Link Road 1 (Peter Brock Drive) intersection, which is about 450 m in length. A separate review of environmental factors (DPS 2012) was determined for this intersection by RMS in May 2012.

The main features of the proposal include:

- An upgrade of the existing two-lane road to a four-lane road (two lanes each way) divided by a wide central median.
- Posted speed limit of 80 km/h.
- Provision of a three metre wide off-road shared pedestrian/cyclist path on the eastern side of the proposal, with space provided on the western side of the proposal for the future construction of a path if required.
- A typical lane width of 3.5 metres (3.3 metre lanes for turning lanes) with two metre outside shoulders and 0.5 metre inside shoulders.
- Bicycle and pedestrian crossing provisions at traffic lights.
- A bus priority lane on the approach and indented bus bay on the departure side of the signalised intersections on The Northern Road.
- Upgrade and/or tie in with 20 local roads including realignment of six local roads.
- Upgrade of eight existing intersections to include seven four way signalised intersections and a signalised T-intersection.
- Upgrade of nine unsignalised T-intersections.
- A new unsignalised T-intersection at Oran Park Link Road 3.
- Five new signalised intersections with link roads to provide for future connectivity.
- Designated turning lanes at all signalised intersections.
- U-turn facilities at Lowes Creek Link Road, Belmore Road, Greendale Road and Derwent Road.
- Tie in with The Northern Road at the start and end of the proposal and the Oran Park Link Road 1 (Peter Brock Drive).
- Retention of the existing bridge over Narellan Creek for the southbound carriageway and provision of a new three span bridge over Narellan Creek for the northbound carriageway.
• Retention of the existing bridge over Thompsons Creek for the southbound carriageway and provision of a new single span bridge over Thompsons Creek for the northbound carriageway.
• Upgrade of the culverts within Lowes Creek.
• Scour protection works at Narellan Creek and Thompson Creek bridges and the Lowes Creek culvert.
• Upgrade of cross drainage to meet flood immunity for a 1 in 100 year average recurrence interval (ARI) flood event.
• Provision of street lighting.
• Seven permanent spill basins.
• Batters required for cut and fill areas.
• One major fill location and seven major cut locations.

Construction of the proposal would be undertaken by or on behalf of RMS in staged sections as developments along The Northern Road are approved and precincts within the South West Growth Centre are developed.

The proposal has been designed to allow for future upgrade within the median to a six-lane road (three lanes each way). This would be achieved by widening into the central median.

1.2 Scope of the study

This study would form part of the Review of Environmental Factors (REF) for The Northern Road upgrade project. The current investigation has been based on the preliminary Aboriginal heritage assessment which was undertaken by Biosis in 2008. The Biosis assessment was part of the Preliminary Environmental Investigation (PEI) which informed the development of the concept design.

The concept design that was subsequently developed by RMS included a further 3.5 km of The Northern Road to the north of Bringelly Road. This section of the study area was addressed for the first time during this study.

This Aboriginal Archaeological Survey Report (ASR) complies with Stage 2 of the RMS Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI). Stage 3 PACHCI includes comprehensive Aboriginal consultation and assessment of cultural significance. The information gained during consultation would be added to an updated report, the Aboriginal Cultural Heritage Assessment Report (CHAR).

The study area is defined as the proposal impact area (marked in red in Figure 1) with a 20 m buffer.
Figure 1: The proposal impact area indicated by red line.
1.3 Objectives of the study

The objectives of this study are to comply with the RMS PACHCI, and the Office of Environment and Heritage (OEH) regulations, including the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010 (‘the Code of Practice’), and the Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010. The main objectives of this study include:

- A description of the proposal and the extent of the study area.
- A description of Aboriginal community involvement and Aboriginal consultation.
- Discussion of the environmental context of the study area.
- Discussion of the Aboriginal historical context of the study area.
- A summary of the archaeological context of the study area including a discussion of previous archaeological work in the area.
- Development of an archaeological predictive model.
- Description of Aboriginal sites and areas of archaeological potential located within the study area.
- Development of a significance assessment for these sites addressing archaeological values.
- Impact assessment for the recorded Aboriginal sites and areas of archaeological potential.
- Providing recommendations for management and mitigation measures for Aboriginal sites and areas of archaeological potential.

1.4 Development context

The study area is within a locality that is undergoing rapid development. There are a number of major development areas that overlap with the current study area such as the Harrington Grove, Oran Park east and Oran Park west precincts. The associated infrastructure projects in these areas include construction of the Sydney Water sewerage and potable water pipelines, and the Endeavour Energy electrical feeder line and substation works. The Bringelly Road upgrade would also impact on a section of the study area around the intersection of The Northern Road and Greendale/Bringelly Road. Some of these developments are in progress so it is important that consultation with the parties managing these developments is ongoing in relation to heritage impacts and the status of planned mitigation measures.

1.5 Investigator and contributions

Dr Sandra Wallace, Principal Archaeologist at Artefact Heritage, undertook this study along with archaeologist Adele Anderson. Dr Sandra Wallace wrote this report. Sandra’s qualifications and experience satisfy the minimum standards for practitioners as stipulated in the Code of Practice.
A number of Aboriginal representatives attended the site survey, Roy Murray from Gandangara Local Aboriginal Land Council; and Donna Whillock and Alfred Fazldeen from Tharawal Local Aboriginal Land Council (LALC).

### 1.6 Aboriginal community involvement

Aboriginal consultation has been conducted in accordance with Stage 2 of the RMS PACHCI. A Native Title search was conducted on the 4 August 2011 by Artefact, which indicted that there were no Native Title claims granted or registered for consideration within the study area. The study area includes sections within two LALC boundaries; Gandangara LALC to the north of Bringelly Road, and Tharawal LALC to the south. Representatives from both LALCs were contacted by the RMS Team Leader Aboriginal Cultural Heritage Advisor and were invited to participate in the Stage 2 survey. Further Aboriginal consultation under Stage 3 PACHCI has been initiated by RMS. This would be discussed in detail in the Aboriginal Cultural Heritage Assessment Report (CHAR) report.

### 1.7 Report structure

The study has been divided into the following sections:

<table>
<thead>
<tr>
<th>Section</th>
<th>Overview</th>
</tr>
</thead>
<tbody>
<tr>
<td>Executive Summary</td>
<td>Summary of the ASR findings.</td>
</tr>
<tr>
<td>1. Introduction and background</td>
<td>Introduces the document and proposal.</td>
</tr>
<tr>
<td>2. Environmental context</td>
<td>Discusses the environmental context of Aboriginal occupation.</td>
</tr>
<tr>
<td>3. Aboriginal historical and archaeological context</td>
<td>Summary of the history of Aboriginal occupation.</td>
</tr>
<tr>
<td>4. Predictions</td>
<td>Provides a predictive model for distribution of archaeological material.</td>
</tr>
<tr>
<td>5. Field methods</td>
<td>Outlines the methods and processes used during the ground survey.</td>
</tr>
<tr>
<td>6. Results</td>
<td>Outlines the results of the desktop study and ground survey.</td>
</tr>
<tr>
<td>7. Statutory requirements</td>
<td>Discusses the implications of statutory requirements relating to Aboriginal heritage.</td>
</tr>
<tr>
<td>8. Significance assessment</td>
<td>Assessment of the archaeological significance of Aboriginal sites.</td>
</tr>
<tr>
<td>9. Impact Assessment</td>
<td>Assessment of the proposed impacts on Aboriginal sites and areas of archaeological potential.</td>
</tr>
<tr>
<td>10. Management and mitigation measures</td>
<td>Discussion of appropriate management and mitigation measures for Aboriginal sites.</td>
</tr>
<tr>
<td>11. Recommendations</td>
<td>Presentation of recommendations arising from the study.</td>
</tr>
<tr>
<td>Appendix 1 Aboriginal heritage maps</td>
<td>Maps the locations of all sites within the study area.</td>
</tr>
</tbody>
</table>
2.0 Environmental Context

2.1 Landform units

The study area is within the southern Cumberland Plain which is typically comprised of an undulating landscape of hills or low ridges with occasional more prominent rises. Several major creeks and associated tributaries and drainage lines transect the study area. This study presents an opportunity to investigate a cross section of a number of landform units across a large area.

2.2 Geomorphology

The study area is primarily underlain by Bringelly shale which forms part of the Wianamatta Group, consisting of shale, carbonaceous claystone, claystone, laminate, fine to medium grained lithic sandstone, rare coal, and tuff (Clark and Jones 1991).

The primary soil type across the study area is the Blacktown soil landscape. The Blacktown soil landscape is typified by shallow duplex soils over a clay base. The biomantle is underlain by heavily textured subsoil with a depth of generally less than a metre, and most commonly less that 30 cm. The archaeological implications of this soil landscape are that intact deposits are likely to occur in the A horizon, which is generally up to 30 cm depth, although stratigraphic potential would be limited.

The area around Lowes Creek is within a South Creek soil landscape. The soil profiles of the South Creek soil landscape generally comprise an A1 horizon of brown sandy loam with an A2 horizon of more compact bleached clay loam with gravels. This is underlain by a yellow to brown clay B horizon with high gravel content. The fluvial Theresa Park soil landscape is found in association with Narellan Creek. The area around Narellan Creek is flood prone with deposition and scouring events affecting the soil profile. Archaeological deposits would be unlikely to occur close to the creek, or within the flood plain area, but would be more likely on terraces and lower slopes on the edge of the active floodplain.

2.3 Natural resources

The study area would once have been covered by open Cumberland Plain Woodland, which is typical of the Wianamatta Group shale geology. Tree species would have included Forest Red Gum (E. tereticornis), and Grey Box (E. moluccana). Honey Myrtle (Melaleuca decora) and Prickly Leaf Paperbark (Melaleuca nodosa) would have been present on the floodplain at Bells Creek (Benson and Howell 1990).

Aboriginal people were highly mobile hunter-gatherers utilising different landform units and resource zones.
Different resources may have been available seasonally, necessitating movement or trade (Attenbrow 2010: 78). Aboriginal people hunted kangaroo and wallaby and snared possums for food and skins. In marine or estuarine environments Aboriginal people caught fish and collected shellfish. There are many accounts by Europeans of Aboriginal people in canoes on rivers and the ocean, fishing and cooking the fish on small fires within the vessels (e.g. Collins 1798).

Plants were an important source of nutrition, common edible species being *Macrozamia*, a cycad palm with poisonous seeds that were detoxified and ground into a paste and *Xanthorrhoea*, or grass tree. The grass tree nectar was a high-energy food, the resin a strong hafting glue, and the flower spikes used for spear barbs. From observations by early European colonists, only about twenty species of plant are identified as being used for food or manufacture by Aboriginal people of the Sydney region (Attenbrow 2010:41). It would be likely that this is only a fraction of what was actually used.

There are no known suitable stone sources for artefact manufacture within the study area (JMcDCHM 2007:17). Resources for tool manufacture would have been brought in from areas such as Mulgoa Creek, approximately 10 km north of the study area, or from the Plumpton Ridge and Marsden park silcrete deposits 20 km north-east of the study area. Raw materials such as silcrete and tuff cobbles are also found in the Nepean River gravels and have been recorded at the confluence of South Creek and Badgerys Creek 10 km north-east of the study area.

### 2.4 Hydrology

The Nepean River runs to the west of the study area, from two kilometres distant in the south of the study area to up to 10 kilometres distant in the central and northern sections of the study area. Four major creeks transect the study area along its length. From south to north, these include Narellan Creek, Cobbitty Creek, Lowes Creek and Thompsons Creek. A number of associated tributaries and drainage lines also criss-cross the study area.

### 2.5 Land use history

The study area has been heavily impacted by agricultural use and semi-rural development. Some areas have recently been developed as residential estates, or are in the process of such changes.

The Narellan and Bringelly areas were predominately part of a wider an agricultural district until very recently and even now agricultural activities play a major role in the local area. During the 1840s, wheat cultivation was a major industry in the district and several flour mills were established to process this wheat (Atkinson 1988:31). However, in the early 1860s, an outbreak of rust destroyed the wheat industry and landholders diversified into other avenues of agricultural production (Atkinson 1988:95). These included sheep, cattle, dairying, crops such as oats, and fruit and vegetable cultivation. During the 1930s depression, many of the large properties in the area were subdivided and smaller farms for orchards or poultry became more common (Willis n. d.).
Since the 1950s, the development of the Camden region has been strongly affected by state government planning policies. The 1968 Sydney Region Outline Plan encouraged the growth of Narellan (Willis n. d.) and from the 1970s, urbanisation in the area rapidly increased. A large portion of the study area is currently within the Sydney South West Growth Centre.
3.0 Aboriginal Historical and Archaeological Context

3.1 Aboriginal material culture

Aboriginal people have lived in the Sydney area for more than 20,000 years. The oldest securely dated site in the greater Sydney region is 14,700 years before present (yBP), which was recorded in a rock shelter at Shaw’s Creek (Nanson et al 1987). Evidence of Aboriginal occupation has been found dated to 50-60,000 yBP at Lake Mungo in NSW, so it would be likely that Aboriginal people have lived in the Sydney region for even longer than indicated by the oldest recorded dates available at present. The archaeological material record provides evidence of this long occupation, but also provides evidence of a dynamic culture that has changed through time.

The existing archaeological record is limited to certain materials and objects that were able to withstand degradation and decay. As a result, the most common type of Aboriginal objects remaining in the archaeological record are stone artefacts. Archaeological analyses of these artefacts in their contexts have provided the basis for the interpretation of change in material culture over time. Technologies used for making tools changed, along with preference of raw material. Different types of tools appeared at certain times, for example ground stone hatchets are first observed in the archaeological record around 4,000 yBP in the Sydney region (Attenbrow 2010:102). It has been argued that these changes in material culture were an indication of changes in social organisation and behaviour.

The Eastern Regional Sequence was first developed by McCarthy in 1948 to explain the typological differences he was seeing in stone tool technology in different stratigraphic levels during excavations such as Lapstone Creek near the foot of the Blue Mountains (McCarthy 1948). The sequence had three phases that corresponded to different technologies and tool types (the Capertian, Bondaian and Eloueran). The categories have been refined through the interpretation of further excavation data and radiocarbon dates (Hiscock & Attenbrow 2005, JMcDCHM 2005). It is now thought that prior to 8,500 yBP tool technology remained fairly static with a preference for silicified tuff, quartz and some unheated silcrete. Bipolar flaking was rare with unifacial flaking predominant. No backed artefacts have been found of this antiquity. After 8,500 yBP silcrete was more dominant as a raw material, and bifacial flaking became the most common technique for tool manufacture. From about 4,000yBP to 1,000yBP backed artefacts appear more frequently. Tool manufacture techniques become more complex and bipolar flaking increases (JMcDCHM 2006). It has been argued that from 1,400 to 1,000 years before contact there is evidence of a decline in tool manufacture. This reduction may be the result of decreased tool making, an increase in the use of organic materials, changes in the way tools were made, or changes in what types of tools were preferred (Attenbrow 2010:102). The reduction in evidence coincides with the reduction in frequency of backed blades as a percentage of the assemblage.
After European colonization Aboriginal people of the Sydney Basin often continued to manufacture tools, sometimes with new materials such as bottle glass or ceramics. There are a number of sites in Western Sydney where flaked glass has been recorded, for example at Prospect (Ngara Consulting 2003) and Oran Park (JMcD CHM 2007).

### 3.2 Aboriginal histories of the locality

Aboriginal people traditionally lived in small family or clan groups that were associated with particular territories or places. The language group spoken in the Narellan/Bringelly area is thought to have been Dharawal (Tindale 1974). The Dharawal language group is thought to have extended from the Shoalhaven River, north to Botany Bay and then inland to Camden. Some sources also describe the Narellan area as being home to the Murringong people, speakers of the Darug language group (Mathews and Everitt 1900:265).

There is also some evidence that Aboriginal people around Narellan spoke a distinctly separate language group and their tribal area was known as Cubbitch-Barta after its white pipe clay (Russell 1914). Government records from the 1830s and 1840s identify an Aboriginal group known as the Cobbiti Barta as associated with the Camden area (JMcDCHM 2007:21).

Historical records also show that Gandangara people came into the Narellan/Bringelly area. It is not known whether these visitation represented recent displacement patterns as a result of European colonization or were part of a longer term interaction with the Dharawal (Karskens 2010:496).

Laila Haglund has suggested that at contact the area would have been near the border of the Dharawal, Darug and Gandangara territories and that the Narellan Valley may have been part of a ‘travel corridor’ facilitating movement between the northern Cumberland Plain and the Illawarra (JMcDCHM 2007:21 after Haglund 1989).

Historical observations suggest that Aboriginal people lived in the Narellan/Bringelly area in relatively large numbers. Lieutenant Dawes observed that a number of bark huts, about seventy in all, located close to the river between the farms of Mr Wentworth and Mr Campbell at Narellan (Barton 1996).

British colonization had a profound effect on the Aboriginal population of the Sydney region. In the early days of the colony Aboriginal people were disenfranchised from their land as the British claimed areas for settlement and agriculture. The colonists, often at the expense of the local Aboriginal groups, also claimed resources such as pasture, timber, fishing grounds and water sources.

It is thought that during the 1789 smallpox epidemic over half of the Aboriginal people of the Sydney region died. The disease would have spread southwest to the Narellan/Bringelly area. This loss of life meant that some of the Aboriginal groups who lived away from the coastal settlement of Sydney may have disappeared entirely before Europeans could observe them, or record their clan names (Karskens 2010:452). This may have been the
precursor to Watkin Tench’s observation that he did not encounter Aborigines during his exploration of the Camden region during the first years of the colony (Tench 1793).

Some Aboriginal people of southwestern Sydney may have seen cattle before being first confronted by the colonists. Two bulls and four cows escaped from the Sydney colony in 1788 and were not recovered. In 1790 a group of cows were observed grazing near Camden in what became known as the ‘Cowpastures’. The herd expanded and by 1801 were thought to number in the hundreds and efforts were made to recapture them (Turbet 2011: 88, Kayandel 2010:23).

In the early 1800s relationships between the Aboriginal people of the area and the European settlers were in general amicable. Grace Karskens notes several examples of close relationships between land owners and local Aboriginal people, including John Kennedy who gave the Dharawal protection on Teston Farm at Appin in later, not so peaceful, times (Karskens 2010).

Relations between Aboriginal people and colonists did not remain amicable. A sustained drought during 1814 and 1815, and continued disenfranchisement lead to tensions between farmers and Aboriginal people who remained to the southwest of Sydney. The Aborigines were accused of stealing corn and potatoes and spearing cattle. A number of farmers were killed on their properties. In a dispatch Governor Macquarie wrote that ‘The Native Blacks of this country…have lately broken out in open hostility against the British Settlers residing on the banks of the River Nepean near the Cow Pastures’. Aboriginal people were targeted and it was ordered that Aboriginal men be strung from trees when they were killed as an example (Turbet 2011:234).

In 1816 the tensions culminated in the Appin massacre when Aboriginal people where pursued by a detachment led by Captain James Wallis. Fourteen Aborigines of the Dharawal nation were shot or driven over a cliff to their deaths by the soldiers. The bodies of two of the Aboriginal men were strung up at the site (Turbet 2011).

Although the numbers of Aboriginal people in the Narellan/Bringelly area decreased as settlers and farmers moved into the locality, communities remained living at Camden Park and along the Georges River near Liverpool.

3.3 Registered Aboriginal sites in the local area – AHIMS search

A search of the Aboriginal Heritage Information System (AHIMS) database was undertaken on the 14 June 2011 for sites within the vicinity of the study area. Anther search was undertaken in order to capture the large number of sites, two separate searches were undertaken, one of the southern section of the study area and one of the northern section. These searches overlapped so sites all listed sites were captured. (Search 1 E 285788- 293939, N 6238814- 6248867; Search 2 E 285691 - 294050, N 6228827- 6238860). The search area was approximately 20 km long and eight kilometres wide with the study area running through the centre of the two search areas. A total of 282 Aboriginal sites were identified by the search with 18 registered within the study area (Table 1).
An additional AHIMS search was conducted on 6 August 2012. As the original search was over 12 months old, it was considered out of date according to OEH guidelines. The new search was again requested in two overlapping sections in order to capture the large number of sites (Search 1 56H E: 286500 - 293000, N: 6238900 – 6247000; Search 2 56H E: 288500 - 292500, N: 6229500 - 6239000). The only additional sites to be identified within the study area by the site search were those recorded by Artefact Heritage for this study.
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

Table 1: Previously recorded sites and PADs within the vicinity of the study area including those sites listed on AHIMS that have been destroyed which are shaded in orange.

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name</th>
<th>AGD/GDA E=error</th>
<th>Easting</th>
<th>Northing</th>
<th>Site type</th>
<th>Recorder</th>
<th>Site within the study area</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-2-1819</td>
<td>IF1 (Harrington Park)</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>English/Gay</td>
<td>Yes</td>
</tr>
<tr>
<td>52-2-3623</td>
<td>Northern Rd PAD1</td>
<td>GDA</td>
<td></td>
<td></td>
<td>PAD</td>
<td>Biosis 2008</td>
<td>Yes</td>
</tr>
<tr>
<td>52-2-3799</td>
<td>OPW-D4</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Oakes</td>
<td>Yes</td>
</tr>
<tr>
<td>52-2-3331</td>
<td>O-OS-2</td>
<td>GDA/E</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>AMBS</td>
<td>No/5m</td>
</tr>
<tr>
<td>52-2-1808</td>
<td>HP1</td>
<td>AGD</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>English/Gay</td>
<td>Yes</td>
</tr>
<tr>
<td>52-2-1812</td>
<td>HP1 (re-recording of HP1 above)</td>
<td>AGD</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>English/Gay</td>
<td>Yes</td>
</tr>
<tr>
<td>52-2-3330</td>
<td>O-IF-2</td>
<td>GDA/E</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>AMBS</td>
<td>Yes</td>
</tr>
<tr>
<td>52-2-3329</td>
<td>HPO1</td>
<td>GDA/E</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>AMBS</td>
<td>No/ c 5m</td>
</tr>
<tr>
<td>52-2-3803</td>
<td>O-IF-3</td>
<td>AGD</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Kelton</td>
<td>Yes</td>
</tr>
<tr>
<td>52-2-3538</td>
<td>OPM-1</td>
<td>AGD/E</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Oakes/ JMcDCHM</td>
<td>No (Peter Brock Drive)</td>
</tr>
<tr>
<td>52-2-3535</td>
<td>OPD-14</td>
<td>AGD/E</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Oakes/ JMcDCHM</td>
<td>No (Peter Brock Drive)</td>
</tr>
<tr>
<td>45-5-3800</td>
<td>TNR2</td>
<td>AGD/E</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>JMcDCHM</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-4035</td>
<td>PAD 2038-6</td>
<td>GDA</td>
<td></td>
<td></td>
<td>PAD</td>
<td>AHMS</td>
<td>Yes</td>
</tr>
<tr>
<td>Site ID</td>
<td>Site name</td>
<td>AGD/GDA</td>
<td>Easting</td>
<td>Northing</td>
<td>Site type</td>
<td>Recorder</td>
<td>Site within the study area</td>
</tr>
<tr>
<td>----------</td>
<td>-------------------</td>
<td>----------</td>
<td>---------</td>
<td>----------</td>
<td>--------------------------</td>
<td>----------</td>
<td>-----------------------------</td>
</tr>
<tr>
<td>45-5-3542</td>
<td>NR4</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Biosis</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3543</td>
<td>NR5</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find/PAD</td>
<td>Biosis</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3546</td>
<td>NRST1</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Scarred Tree</td>
<td>Biosis</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3545</td>
<td>Northern Rd PAD2</td>
<td>GDA</td>
<td></td>
<td></td>
<td>PAD</td>
<td>Biosis</td>
<td>No/c. 20m</td>
</tr>
<tr>
<td>45-5-3547</td>
<td>NRST2</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Scarred Tree</td>
<td>Biosis</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3544</td>
<td>NR6</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Biosis</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3886</td>
<td>BRP-IF-16</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find and PAD?</td>
<td>Austral/KNC</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3888</td>
<td>BRP-S-01</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>Austral/KNC</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3889</td>
<td>BRP-S-02</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>Austral/KNC</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3890</td>
<td>BRP-S-03</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>Austral/KNC</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3891</td>
<td>BRP-S-04</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact Scatter</td>
<td>Austral/KNC</td>
<td>No/ c.5m</td>
</tr>
<tr>
<td>45-5-3895</td>
<td>BRP-S-08</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact Scatter</td>
<td>Austral/KNC</td>
<td>Yes</td>
</tr>
</tbody>
</table>
3.4 Site types

Material traces of Aboriginal occupation exist throughout the landscape and are known as Aboriginal sites. The primary site types that are found in the Sydney region include:

- **Stone Artefacts** – Flaked and ground stone artefacts are the most common trace of Aboriginal occupation in the Sydney region. Aboriginal people used particular techniques to flake stone and these changed over time. The approximate age of a tool can often be diagnosed by the way that it was made. Stone artefacts are most often found in scatters that may indicate an Aboriginal campsite was once present. Stone artefacts may also be found as isolated finds. Stone tools in the Sydney region are most often made from raw materials known as silcrete, tuff and quartz. These are all easily flaked and form sharp edges, which can be used for cutting or barbing spears. Stone artefacts, either on the surface, or buried, exist within the study area.

- **Rock shelters with deposit** – Rock shelters were used by Aboriginal people for habitation, rest places and as art or ceremonial sites. Deposits can build up on the floor of these shelters over time and bury traces of Aboriginal occupation. If these deposits are not disturbed, rock shelters can provide an intact stratigraphy that can tell us about the way Aboriginal occupation changed through time. It is unlikely that rock shelters would be located within the study area.

- **Shell middens** – Shell middens are remains of campsites in which the primary traces are shell and/or bones of fish. Shell middens are often found close to rivers or streams and are either along banks or within enclosed shelters. The majority of shell middens in the Sydney region were destroyed when they were mined for lime in the early days of the colony. It is unlikely that shell midden exists within the study area, as it is not close enough to a water body that supported suitable shellfish. Although shell middens are unlikely in this part of the Cumberland Plain, shell fragments have been found in association with a hearth near a small watercourse at Kingswood in a similar landscape as the study area (JMcD CHM 2009).

- **Rock engravings/Rock art** – Rock engravings are often found in Hawkesbury geologies on flat sandstone platforms. Shapes of animals, ancestor figures or other symbols were carved into the sandstone. Weathering has affected the visibility of many rock engravings. Other rock art of various forms has also been recorded in the Sydney basin. Stencils, charcoal drawings and paintings are examples of the techniques used by Aboriginal people. Rock art is relatively rare, but is more common on sandstone geologies than on the plains of western Sydney. It is unlikely that engravings exist in the study area due to the absence of sandstone.

- **Axe grinding grooves** – Axe grinding grooves are created when axe blanks (often basalt cobbles) are shaped by rubbing the stone across an abrasive rock such as sandstone, often using water. Sharpening axes and other tools also forms them. Axe grinding grooves are often found on the banks of streams or rock pools. It is unlikely that axe grinding grooves would be found within the study area, as they are most common on sandstone, and on the edge of permanent watercourses.

- **Scarred trees** – Aboriginal people practiced tree marking or scarring for a variety of reasons. Large scars are often the result of a tree being debarked for a canoe blank and smaller scars may have been the result of
making shields or coolamons (storage vessels). Tree marking may have been the result of ritual practices, or associated with burial. Scarred trees that remain today would be over 150 years old and the scar would retain certain characteristics that enable its identification as cultural. Two scarred trees have been recorded within the study area and others have been recorded in the close vicinity.

- Post-contact sites – Sites where evidence of early interaction between Aboriginal people and Europeans are known as contact sites. Artefacts found at contact sites may include flaked glass or ceramic. It is possible that a contact site is located within the study area, as Aboriginal people are documented to have lived in a semi-traditional manner in the area into the 1800s. A significant contact site has been recorded at Denbigh to the west of the study area.

### 3.5 Previous archaeological work within the study area

There have been a number of major archaeological investigations that have included sections of the study area. These have generally been associated with large land releases and the development of infrastructure to service these precincts. The following discussion takes into account the most recent and relevant studies and aims to provide contextual information for the current study. There has been a recent subsurface excavation program conducted within the vicinity of the study area in 2011 but the results from these studies are not yet available (KNC upcoming).

**Harrington Park and Mater Dei rezoning project (Australian Museum Business Services 2006)**

The Harrington Park and Mater Dei study area extends along The Northern Road from Harrington Park (south of the current study area) to its intersection with Cobbitty Road. Several sites identified during this study are therefore within the current study area.

The 2006 study of the Harrington Park and Mater Dei development areas followed on from a Phase 1 preliminary study which identified the need for further investigation (Central West Archaeological and Heritage Services 2004). The Phase 1 study identified 16 Aboriginal sites, including five possible scarred trees. The Phase 2 investigations identified a further 19 sites. A large portion of the study area was assessed as having a medium to high archaeological sensitivity with generally low disturbance levels. It was recommended that large sections of the precinct should be zoned for conservation with 60 per cent of the recorded sites within the conservation areas.

**Archaeological investigation of the Oran Park precinct in the South West Growth Centre (Jo McDonald Cultural Heritage Management 2007).**

The Oran Park precinct includes 1,119 ha of land which surrounds about one quarter of the current study area from the intersection of The Northern Road and Cobbitty Road to 1.5km south of the Maryland property. The survey undertaken by JMcDCHM aimed to locate Aboriginal sites within the precinct and recommend appropriate conservation or mitigation measures. A total of 44 sites and four areas of archaeological potential were located.
during the survey with several sites having very high densities of artefacts. Site OPR-15 comprised of 193 recorded artefacts located on the banks of a minor tributary in the north-eastern section of the precinct.

The majority of the area along The Northern Road was assessed as having a low/moderate archaeological sensitivity with only 15 per cent of the total precinct assessed as having a high archaeological sensitivity.

**The Northern Road upgrade preliminary Aboriginal archaeological assessment (Biosis 2008).**

The Biosis study assessed the area of the proposed upgrade of The Northern Road from the Old Northern Road, Narellan to Bringelly/Greendale Road at Bringelly. The study involved a desktop assessment and a site survey. The field survey focused on creeks, drainage features and prominent rises, and any previously recorded sites within the corridor. Although the ground surface visibility throughout the study area was low, a total of eight Aboriginal sites and two areas of potential archaeological deposit were identified during the survey. Two of these sites were scarred trees, one was an artefact scatter and five were isolated finds. Only four of these eight sites are within the current concept design footprint for The Northern Road upgrade.

**Oran Park and Turner Road Precincts Aboriginal heritage investigation for proposed Infrastructure service routes and site options (Kelleher Nightingale Consulting KNC 2008).**

This study involved the Aboriginal heritage assessment of proposed infrastructure service routes and sites under consideration for the early release areas of Oran Park and Turner Road Precincts. The survey of these routes located seven new Aboriginal sites, and five areas of potential archaeological deposit. None of these newly recorded sites are to be impacted by the upgrade of The Northern Road.

The assessment recommended that there were no constraints on development within the road corridor on either side of The Northern Road due to high levels of disturbance. It was recommended that a number of sites may be impacted by the proposed works outside the road corridor and within the Oran Park and Turner Road precincts. These included the following sites that are within the study area for The Northern Road upgrade assessment (O-IF-2 and O-IF-3). A Section 90 AHIP was recommended for these sites if they were to be impacted by the Oran Park and Turner Road proposal.

**Archaeological excavations at the Oran Park and Turner Road precincts (AECOM 2009).**

The archaeological test excavations at Oran Park involved a program of test pitting and open area excavations. Three hundred and forty test pits were excavated across a variety of landform units, with 160 m² of open area excavated during salvage excavations. A total of 4780 artefacts were recovered from Phase 1 and Phase 2 excavations, with around three quarters of the artefacts made of silcrete. Approximately five per cent of the assemblage comprised of tools or cores including backed artefacts and scrapers.

The results of the excavations indicated a low density spread of archaeological material across the precinct which is argued to reflect a ‘pre-contact landscape of extensive but low intensity Aboriginal activity with evidence of
strategic defensive positioning of campsites within a cultural interaction zone between different language groups’ (AECOM 2009:ES1).

**Bringelly Road upgrade Camden Valley Way to The Northern Road Aboriginal cultural heritage assessment (Kelleher Nightingale Consulting KNC 2010).**

The KNC study followed on from the Austral Archaeology preliminary investigation for the Bringelly Road upgrade route. Forty-four Aboriginal sites were located along the Bringelly Road corridor during the KNC and Austral site surveys. The majority of artefacts recorded were made of silcrete, mudstone or tuff. Artefacts were predominantly flakes or flake fragments, with smaller numbers of cores, flaked pieces and blades.

Five of the recorded sites are within the study area for The Northern Road upgrade project. A Section 90 AHIP with or without artefact collection was recommended for five of these six sites. Salvage excavations were recommended for site BRP-IF-16.
4.0 Predictions

4.1 Aboriginal land use

The exact nature of Aboriginal land use patterns in the vicinity of the study area before colonisation is unknown. Assumptions about land use patterns are made on the basis of archaeological information gained from the local area, from observations made by the Europeans after settlement of the area, and from information known about available natural resources.

As Aboriginal people were mobile hunter-gatherers, it would be likely that they moved across the landscape between resources. It would also be likely that movement was related to socio/cultural factors such as gatherings and ceremonial obligations. Campsites would have provided temporary residences such as bark structures. It is difficult to ascertain whether a campsite existed at a given location, but correlations between stone artefact density and campsites are often assumed. While it would be likely that knapping would have occurred at a campsite, it would also be likely that knapping would have occurred during movement across the landscape, as tools were prepared or repaired during hunting and gathering activities.

Archaeological data gathered in the locality suggests that artefacts would be found across the landscape in low densities. Higher densities would be found in certain locations, often close to permanent water, or on ridgelines (JMcDCHM 2007, AECOM 2009).

4.2 Predictive model

Beth White and Jo McDonald have recently contributed to the debate over site prediction on the Cumberland Plain in their discussion on the nature of Aboriginal site distribution as interpreted through lithic analysis of excavated sites in the Rouse Hill Development Area (RHDA) (White and McDonald 2010). This analysis brings together data from 631 dispersed 1m x 1m test squares from 19 sample areas, which yielded 4,429 stone artefacts in total. The findings of this study generally support earlier models that predicted correlations between proximity to permanent water sources and site location, but also highlighted the relationship between topographical unit and Aboriginal occupation.

The major findings of the study were that artefact densities were most likely to be greatest on terraces and lower slopes within 100m of water. The stream order model was used to differentiate between artefact densities associated with intermittent streams as opposed to permanent water. It was found that artefacts were most likely within 50-100m of higher (4th) order streams, within 50m of second order streams, and that artefact distribution around first order streams was not significantly affected by distance from the watercourse (White and McDonald 2010: 33). Overall landscapes associated with higher order streams (2nd order or greater) were found to have higher artefact densities, higher maximum densities, and more continuous distribution than lower order
intermittent streams. The analysis also concluded that while there were statistically viable correlations that demonstrated a relationship between stream order, land form unit and artefact distribution across the RHDA, the entire area should be recognised as a cultural landscape with varied levels of artefact distribution (White and McDonald 2010: 37). This predictive model can be transferred to other areas of the Cumberland Plain, especially those on shale soil geology, as landscape, soils and artefacts patterning are similar throughout the region.

The results of excavations at the Oran Park precinct have been argued to suggest that correlations between stream confluence, or stream order, and artefact density do not hold for this area. Instead it was argued that ‘the evidence supports a more even spread of archaeological deposit comprising predominantly low density artefact distribution with occasional campsite concentrations in areas with good outlook over the main valley up to locations anywhere to several hundred meters away from the watercourses’ (AECOM 2009: 50).

The predictive model used in the current study comprises a series of statements about the nature and distribution of evidence of Aboriginal land use that is expected in the study area. These statements were based on the information gathered regarding:

- Landscape context and landform units.
- Ethno-historical evidence of Aboriginal land use.
- Distribution of natural resources
- Results of previous archaeological work in the vicinity of the study area.
- Predictive modeling proposed in previous investigations.

Predictive statements were as follows:

- Stone artefacts/artefact scatters would be the most likely Aboriginal site type. Previous studies in the region, as discussed above, have found that stone artefacts are the most common site type.
- Scarred trees may be located. Scarred trees are known to exist within the Camden region and where there is remnant old growth vegetation remaining there is a possibility of scarred trees being retained.
- Artefact densities would be generally low. Previous studies in the region, and close to the study area such as AECOM 2009 have found that artefacts generally occur in a low density across the landscape with some isolated areas of higher density.
- Silcrete, silicified tuff and quartz would be the dominant raw materials. Previous studies have indicated that these raw materials are most common on the Cumberland Plain, including the locality of the study area.
- In situ artefacts would be located in areas of least ground disturbance.
- Artefacts may be located on terraces and slopes within 100 m of water, or on areas with a good outlook over the main valley up to several hundred meters away from water, although it would be likely there would be a fairly even spread of archaeological material across the landscape. This prediction is based on the models developed by White and McDonald, and AECOM, as discussed above.
5.0 Field Methods

5.1 Site definition

An Aboriginal site is generally defined as an Aboriginal object or place. An Aboriginal object is the material evidence of Aboriginal land use, such as stone tools, scarred trees or rock art. Some sites, or Aboriginal places can also be intangible and although they might not be visible, these places have cultural significance to Aboriginal people.

OEH guidelines state in regard to site definition that one or more of the following criteria must be used when recording material traces of Aboriginal land use:

- The spatial extent of the visible objects, or direct evidence of their location.
- Obvious physical boundaries where present, e.g. mound site and middens (if visibility is good), a ceremonial ground.
- Identification by the Aboriginal community on the basis of cultural information.

For the purposes of this study an Aboriginal site was defined by the recording the spatial extent of visible traces or the direct evidence of their location. As there was a continuous scatter of artefacts in some areas of exposure, a site was defined as areas of visible artefact scatter more than 50 m apart. A number of artefact scatters or isolated finds were assessed to be within an extended site area based on a discrete landform unit.

5.2 Survey methodology

The survey was conducted over six days (29 August to 30 August 2011, 26 September to 28 September 2011 and 9 November 2011). The study area was covered on foot, apart from areas that were clearly highly disturbed, or were thickly vegetated.

The survey was undertaken in accordance with RMS PACHCI guidelines. A handheld Global Positioning System (GPS) was used to track the path of the surveyors, and to record the co-ordinates of sites, features and location of landform units along the route.

All ground exposures were examined for stone artefacts, shell, or other traces of Aboriginal occupation. Old growth trees were examined for signs of cultural scarring or marking.

Artefacts were recorded in detail. Dimensions were measured with electronic calipers to the nearest 0.1 of a centimeter. Raw material, type and colour were logged and appear in the survey results below.
A photographic record was kept for all sections of the study area. Photographs were taken to represent the landform unit, vegetation communities, objects of interest and levels of disturbance. Scales were used for photographs where appropriate.

5.3 Site recording

The located Aboriginal sites were recorded in detail, and site cards including this information would be lodged with AHIMS. GDA94 co-ordinates for the sites were taken with a handheld GPS and have been mapped in GIS format.
6.0 Results

6.1 Effective survey coverage

Ground visibility was very low throughout most of the study area due to thick grass cover promoted by a season of high rainfall. Sections of the study area were highly disturbed, especially along the road corridor and where localised disturbance has taken place, including construction of buildings, roads and dams. Overall the effective survey coverage was relatively low, estimated to be 2% of the study area.

**Table 2: Survey coverage**

<table>
<thead>
<tr>
<th>Survey area (estimate)</th>
<th>Landform</th>
<th>Visibility (%)</th>
<th>Exposure (%)</th>
<th>Effective coverage area</th>
<th>Effective coverage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,460,000m²</td>
<td>The landform of the survey area varied from gently undulating hills to creek flats. Several hill tops and ridgelines were also within the survey area.</td>
<td>10%</td>
<td>20%</td>
<td>29,200</td>
<td>2%</td>
</tr>
</tbody>
</table>

6.2 Previously recorded Aboriginal sites

The results of the Aboriginal Heritage Information Management System (AHIMS) search were that 18 previously recorded Aboriginal sites are located within the study area. Sites within the vicinity of the study area were also checked to confirm their accuracy. As part of the background study for this investigation site cards, or reports for each previously recorded site were obtained from OEH in order to cross check that the location recorded on the AHIMS register matched the site description. Sometimes there are errors in datum (AGD – Australian Geodetic Datum to GDA – Geocentric Datum of Australia) or other issues result in a site being listed on the AHIMS register in the incorrect location. This was found to be demonstrably the case with 11 Aboriginal sites within the vicinity of the study area. The datum of these sites was changed and appears as corrected on the current heritage maps (Appendix 1 and detailed in Table 3 below). There may be errors with co-ordinates of other sites at a greater distance from the impact corridor as they were not checked for this study. Site card updates would be prepared for the sites with erroneous co-ordinates and would be submitted to AHIMS.

**Table 3: Corrected AHIMS site co-ordinates for 11 AHIMS entries found to have inaccurate locations.**

<table>
<thead>
<tr>
<th>AHIMS number</th>
<th>Site name</th>
<th>AHIMS listing</th>
<th>Correction</th>
<th>Easting</th>
<th>Northing</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-2-3804</td>
<td>SW_AS1_2010</td>
<td>GDA</td>
<td>AGD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3335</td>
<td>HPK 2</td>
<td>GDA</td>
<td>AGD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3330</td>
<td>O-IF-2</td>
<td>GDA</td>
<td>AGD</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Where possible the location of each of the existing sites was visited during the site survey in order to relocate the object/s and to check on site condition. In many cases thick grass cover obscured areas that may once have been exposed and therefore artefacts were no longer visible. In the case of site AHIMS #52-2-3535 a large black snake was sunning itself at the precise location of the recorded site, preventing investigation.

A number of sites are currently listed on existing AHIPs associated with developments including the Harrington Grove estate and the Oran Park east and Oran Park west precincts. The status of these sites is not currently known as the AHIPs are valid over long periods and the progress of works affecting Aboriginal heritage is not known. It is not at this stage confirmed as to whether these sites have been salvage collected by the Aboriginal community as required by the conditions of the AHIP, or if the sites remain intact and salvage will be conducted at a later date. This information should be obtained from the permit holders before an AHIP is requested by RMS for The Northern Road upgrade project to impact these sites.

The locations of all Aboriginal sites within the study area have been shown on the heritage maps provided in Appendix 1.

6.2.1 52-2-1819 (IF1)

Site IF1 is an isolated find located on the northern edge of Fairwater Drive in a disturbed area next to a landscaped garden and path on a creek flat associated with Narellan Creek. This site is located in a highly disturbed context within the study area.

6.2.2 52-2-3799 (OPW-D4)

Site OPW-D4 is an isolated find with associated archaeological deposit located on a creek flat approximately 100m north of Narellan Creek. The heritage assessment report for the Oran Park West sewer infrastructure (AECOM 2010) recommended that an AHIP should be sought as the site was within the proposed development corridor. This site has subsequently been impacted by these works under AHIP 3363.
6.2.3 52-2-3623 (NRPAD1)

NRPAD1 was recorded by Biosis during their 2008 survey of The Northern Road upgrade route. NRPAD1 consists of an area of potential archaeological deposit (PAD) on a small raised terrace on the edge of the Narellan Creek floodplain. There were no artefacts recorded in association with the PAD.

The section of this PAD within The Northern Road concept design footprint has been entirely impacted by the construction of sewer mains for the Oran Park West precinct (Figure 2). The Aboriginal heritage assessment for these works (AECOM 2010) states that this PAD is 80 m to the west of the proposed sewer works which appears to be an error. The majority of PAD area is now heavily disturbed and the section of the PAD within The Northern Road development footprint and was assessed as having a low archaeological potential and a low archaeological significance. This area should no longer be considered as PAD and a site impact form should be submitted to AHIMS.

Figure 2: NRPAD1 approximate extent outlined in red with the approximate proposed impact footprint of the TNR upgrade shown in blue (north to top of page): background source is Nearmap.

6.2.4 52-2-1808 / 52-2-1812 (HP1)

These two sites are located within approximately 20 m of each other. Sites cards held by AHIMS suggest that these two site numbers may refer to the same site area. Site 52-2-1808 is recorded as a single stone artefact, while site 52-2-1812 is recorded as three artefacts, two mudstone flakes and one grey chert flake fragment.

It appears that these sites have been impacted by excavation works associated with the construction of houses and associated infrastructure at Harrington Park. There was no record of an s90 AHIP for these sites on the AHIMS data base. A site impact form should be submitted to AHIMS detailing the destruction of the sites.
6.2.5 52-2-3331 (O-OS-2)

Site O-OS-2 comprises two stone flakes located on a small exposure adjacent to an unsealed 5 m from the study area boundary. This site was originally assessed as being of low to moderate archaeological significance and it has been listed under AHIP 3380 for collection by the Aboriginal community.

6.2.6 52-2-3330 (O-IF-2)

Site O-IF-2 is located on a creek terrace and lower hillslope along the banks of a drainage line associated with Cobbitty Creek on a small exposure. The site was originally recorded as an isolated find, but additional artefacts were located during subsequent field surveys. The site is now recorded as comprising seven artefacts including a silcrete backed blade. This site is associated with HP01 and is the same site that was re-recorded at TNRU2 during the current survey. An update form will be submitted to AHIMS for this site.

6.2.7 52-2-3329 (HP01)

Site HP01 is located approximately 10 m north of a drainage line that is currently dry on a lower hillslope. It is situated on a small area of exposure that has been subject to minimal disturbance. The site includes two silcrete flakes and one broken silicified tuff flake. The site is located approximately 5 m west of the study area, but forms part of a broader site complex including TNRU02/O-IF-2. This site has been listed under AHIP 3380 for collection by the Aboriginal community.

6.2.8 52-2-3803 (O-IF-3)

Site O-IF-3 is an isolated quartzite flake located 100 m southwest of the intersection of The Northern Road and Cobbitty Road on a lower hillslope, and approximately 30 m from Cobbitty Road. The original assessment of the site (Kelton 2004) assessed the site as being disturbed with a low archaeological potential. The site is located within the study area although may be subject to indirect impacts. This site has been listed on AHIP 3380.

6.2.9 52-2-3538 (OPM-1)

Site OPM-1 consists of a tuff flake located on a flat area on a small exposure to the west of The Northern Road opposite the old Oran Park raceway. This site is included under the s90 AHIP granted for the development of the Oran Park West precinct (AHIP 1116799 – July 2010). The site has not yet been destroyed, although the s90 is valid until 2017 for works associated with the development of Oran Park West. This site is within the study area.

6.2.10 52-2-3535 (OPD-14)

Site OPD-14 consists of an isolated artefact approximately 50 m north of a minor drainage line 100m to the east of The Northern Road. This site is listed on the s90 AHIP granted for the development of the Oran Park West precinct (AHIP 1116799 – July 2010). The site has not yet been destroyed, although the s90 is valid until 2017 for works associated with the development of Oran Park West. This site is not within the study area.
6.2.11 45-5-3800 (TNR2)

Site TNR2 consists of one silcrete flake and one quartz flake piece. It was recorded by Jo McDonald Cultural Heritage Management as part of the assessment of the proposed area of a 33kV feeder line for Endeavour Energy. The site co-ordinates as registered with AHIMS appear to be in error, probably as they were registered with AHIMS as AGD instead of GDA datum co-ordinates. If the datum system listed with AHIMS does not match the datum system the site was recorded in, the mapped site location will be in error by about about 200 m. The site is therefore located in a relatively undisturbed context on a lower hillslope on the western side of The Northern and is within the study area.

6.2.12 45-5-4035 (PAD 2038-6)

PAD 2038-6 is located along the eastern side of The Northern Road within Leppington Pastoral Company land and was recorded by Biosis during a survey for Sydney Water in early 2010. During the current survey PAD 2038-6 was assessed as being of low archaeological significance as it has been subject to ground disturbance associated with the former alignment of The Northern Road. The 1930 aerial photo (Figure 5) shows the former alignment which can still be discerned in contemporary aerial photos (Figure 4).

Figure 4: PAD 2038-6 outlined in blue with former road alignment shown by red line: north to top of page.

At the time of the recent survey further ground disturbance as a result of ploughing, stock trampling and sheet wash was noted. There was reasonable ground exposure at the time of the recent survey (5-10 per cent) and no
artefacts were located further indicating that there is not a high potential for significant archaeological deposits within this area. A site impact form will therefore be prepared for PAD 2038-6 which will recommend that the area is not a PAD and has a low potential for buried archaeological deposits to remain.

**Figure 5: 1930 aerial with approximate location of PAD 2038-6 outlined in blue: north to top of page.**

6.2.13  **45-5-3542 (NR4)**

Site NR4 is a red silcrete flake which was recorded on an exposed area on a driveway within the study area. The site is within 50 m of a minor drainage line on a lower hill slope. The site area has been disturbed by vehicle and stock movements, and it would be possible that the artefact may have been brought it with road gravels used to top the driveway.

6.2.14  **45-5-3543 (NR5)**

Site NR5 is a red silcrete flake located to the west of the current road corridor within the study area. At the time of the survey it was observed that the paddock had probably been ploughed and was currently used as pasture. The site area has been disturbed by agricultural practices and stock movements.

6.2.15  **45-5-3546 (NRST1)**

Site NRST1 is a scarred tree located just outside the current road corridor approximately 200 m north of Lowes creek on the edge of the floodplain. The tree is 15-20 m tall with a circumference of 2.6m. The scar is small and oval shaped measuring 33 cm x 13 cm with 6-8 cm of regrowth. The tree has had some branches lopped during the construction of the transmission line but is still living. The tree is within the study area.
Plate 1: Site NRST1 (Artefact Heritage 27/9/12).

Figure 6: Site NRST1 in relation to concept design (SKM sketch).

Map removed for public document
6.2.16  45-5-3545 (NRPAD2)

NRPAD2 was recorded by Biosis during their 2008 survey and is located on the eastern side of The Northern Road approximately 10 m to the east of the road corridor and NRST1. The PAD consists of a small raised alluvial terrace on the edge of the Lowes Creek floodplain about 300 m to the north of Lowes Creek. The dimensions of the PAD were not specified by Biosis but the mud map attached to the site card indicates that it covers an area of approximately 40 m x 50 m. NRPAD2 is outside the study area.

Figure 7: Location of NRPAD2 (outlined in red).

Map removed for public document

6.2.17  45-5-3547 (NRST2)

Site NRST2 was recorded as a scarred tree by Biosis during the preliminary investigation for The Northern Road upgrade. The tree is located within The Northern Road corridor approximately 200 m south of Carrington Road. After inspection during the current survey there was some question as to whether the tree was culturally scarred. The tree does not appear to be old enough to have been culturally scarred and the scar shape is not consistent with cultural scarring. The Aboriginal representatives attending the survey agreed that the tree was unlikely to be an Aboriginal site. This was confirmed by an arborist who was engaged by RMS.
Site NR6 is a quartzite 'scraper' which was located in a large exposure at the front of a small lot. The site is within the study area. Two other artefacts were located within 20 m of this site during the site survey. This site has been disturbed by leveling and erosion. The soil profile has been truncated with clay observed at the surface. It would be unlikely that significant subsurface deposits remain within this area.

Site BRP-IF-16 consists of an isolated silcrete artefact located along a property access track at No. 993 Bringelly Road within the study area. The artefact is located approximately 10 m south of Bringelly Road in an exposed area less than 1m². The site landform consists of a relatively intact north-facing upper slope of a low hill top. This area encompasses the crest of the low hill-top and the north and west running slopes from the hill-top. The site exhibits some archaeological potential related to its landscape position, association with known archaeological sites.
and access to a range of resources (KNC 2010). New artefacts were recorded at this site during the survey. See section 6.3.14.

6.2.20 45-5-3888 (BRP-S-01)

Site BRP-S-01 consists of one chert and four silcrete artefacts located behind a row of shops that front The Northern Road on a gentle hill slope. The site is within the study area. The area was covered with thick grass at the time of the current site survey with no ground surface visibility. The original recording noted that the site was highly disturbed (KNC 2010).

6.2.21 45-5-3889 (BRP-S-02)

Site BRP-S-02 consists of two chert flakes and two silcrete flakes located at the north side of a dam exposure approximately 20m south of Greendale Road West and within the study area. The dam is located at No. 20 Greendale Road West, approximately 175m west the junction with The Northern Road. The site is located along the east bank of a minor drainage line of Thompson’s Creek. The exposures described by the original recording where largely grown over at the time of this site inspection (KNC 2010).

6.2.22 45-5-3890 (BRP-S-03)

Site BRP-S-03 consists of one tuff flake and one mudstone flaked piece located on the southern side of Greendale Road West in front of the Integral Energy, Bringelly Zone Substation within the study area. The site landform is gentle lower hill slope and marginal floodplain associated with a minor drainage channel approximately 80 m west of the area. The tuff flake was located in the disturbed entrance area to the substation, approximately 30 m west of the substation entrance and approximately two metres from Greendale Road. The area has been highly modified from the building of the substation, road base/fill deposition and ground penetration works such as drainage pipe construction (KNC 2010).

6.2.23 45-5-3891 (BRP-S-04)

Site BRP-S-04 consists of a small artefact scatter located in front of property No. 1226, The Northern Road. The site landform consists of gentle, north-west facing hill slope approximately 130 m east of a minor drainage channel of Thompson’s Creek. Sites BRP-S-01 and BRP-S-02 are located to the south of the area along the same drainage channel. Two chert flakes and one mudstone flake were located over an area of 70 m heading south from the driveway of the property. The exposure area in front of the property fence is likely due to vehicle use. The area is disturbed by contemporary development (KNC 2010). The site is approximately 5m outside the study area.

6.2.24 45-5-3895 (BRP-S-08)

Site BRP-S-08 consists of a scatter of six silcrete and four chert artefacts located on the Bringelly Public School grounds. BRP-S-08 surface artefacts have been collected as part of Austral Archaeology’s 2010 assessment. The artefacts are now held by OEH. The artefacts were recorded behind Classroom J, adjacent to the basketball court.
and front access gate to The Northern Road. The area is covered with imported sand for grass growing. A number of artefacts were located within the imported sand in an area 50 m long x 50 m wide. Artefacts were also found in the garden next to the basketball court or areas of exposure where imported sand had not been spread. The majority of the identified artefacts have been brought into the area within the imported sand. The landform is not archaeologically significant. BRP-S-08 is likely part of a larger site (now disturbed) that encompasses site BRP-S-04 (KNC 2010). The site as originally recorded within the study area.

6.3 Newly recorded Aboriginal sites

Fourteen new Aboriginal sites were located during the site survey; two of these sites were re-recordings of previously registered sites. Five sites were artefact scatters and nine were isolated finds.

6.3.1 TNRU1

Site TNRU1 is an isolated find located on the edge of the Sydney Water sewerage construction works within the study area. The white tuff flake was located behind a tree on the edge of the area of disturbance associated with the works. The site is within a lower hill slope between two dry tributaries of Cobbitty Creek. The sewer construction works extend to five meters to the west of the isolated find but the area immediately around the site and to its east is relatively undisturbed.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuff</td>
<td>White/yellow</td>
<td>Flake</td>
<td>2.2cm</td>
<td>2.0cm</td>
<td>0.6cm</td>
</tr>
</tbody>
</table>

Plate 3: TNRU1 location: facing north-east.

Plate 4: Artefact at TNRU1.

6.3.2 TNRU2/O-IF-2

Site TNRU2 is located on an exposed track 15 m from the edge of the current road corridor on the western side of The Northern Road just south its intersection with Cobbitty Road and within the study area. This site is a re-
recording of site O-IF-2. The artefacts recorded during this survey are located on the bank of a tributary of Cobbitty Creek. From the edge of the creek bank the ground slopes gently upwards towards The Northern Road in the east and to the north and south. The lower slopes adjacent to the creek have a low ground surface visibility due to grass cover, but are likely to contain buried archaeological deposits. This site is the same as previously recorded site O-IF-2 (AHIMS# 52-2-3330) and would be registered as a site card update. The extended site is assessed as encompassing a terrace formation which runs between the road corridor and the drainage line, and to the north towards Cobbitty Road. The area is outlined in Appendix 1.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Broken flake</td>
<td>1.9cm</td>
<td>1.1cm</td>
<td>0.3cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red/purple</td>
<td>Broken flake</td>
<td>1.8cm</td>
<td>1.2cm</td>
<td>0.5cm</td>
</tr>
</tbody>
</table>

Plate 5: TNRU2 location: facing west.  
Plate 6: Artefacts at TNRU2.

6.3.3  

Site TNRU3 is located on a small exposure 30 m west of the road corridor within a paddock currently used for stock grazing and within the study area. The site is within a flat area situated approximately 200 m to the northwest of a minor tributary of South Creek. The site is adjacent to a stand of small trees. The area has been disturbed through clearing, ploughing and stock movements.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Pink</td>
<td>Flake</td>
<td>2.1cm</td>
<td>1.7cm</td>
<td>0.5cm</td>
</tr>
</tbody>
</table>
Plate 7: TNRU3 location: facing south.

Plate 8: Artefact at TNRU3.

6.3.4 TNRU4

Site TNRU4 is a scatter of 13 artefacts found along a dam wall 200 m north of Lowes Creek within the study area. The dam is situated on a gradual slope at the edge of the Lowes Creek floodplain. A number of mature trees remain around the northern edge of the dam and scattered around the paddock. The area surrounding the dam has a very low ground surface visibility due to thick grass cover. The artefacts exposed by the construction of the dam wall are likely to have originated as buried archaeological deposits. Considering this, and the relatively low disturbance of the area surrounding the site, it is likely that further buried deposits remain within the vicinity of the dam, particularly on the lower slope and terrace to the north of TNRU4. The extent of the site is therefore assessed as encompassing a lower hill slope which rises to the north upwards from the flood plain of Lowes Creek. The site is mapped in Appendix 1.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Broken flake</td>
<td>2.3cm</td>
<td>1.9cm</td>
<td>0.4cm</td>
</tr>
<tr>
<td>Tuff</td>
<td>White</td>
<td>Flake</td>
<td>1.1cm</td>
<td>0.8cm</td>
<td>0.1cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Broken backed blade</td>
<td>1.7cm</td>
<td>1.0cm</td>
<td>0.3cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Broken flake</td>
<td>2.3cm</td>
<td>1.2cm</td>
<td>0.4cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Angular fragment</td>
<td>2.1cm</td>
<td>1.3cm</td>
<td>0.6cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Broken flake</td>
<td>3.1cm</td>
<td>2.9cm</td>
<td>1.2cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Flake</td>
<td>2.2cm</td>
<td>1.2cm</td>
<td>0.3cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Angular fragment</td>
<td>2.6cm</td>
<td>1.5cm</td>
<td>1.2cm</td>
</tr>
<tr>
<td>Banded chert</td>
<td>Grey/yellow</td>
<td>Core</td>
<td>4.2cm</td>
<td>2.7cm</td>
<td>1.2cm</td>
</tr>
</tbody>
</table>
6.3.5 TNRU5

Site TNRU5 is an isolated artefact located on the wall of a small dam 60 m to the north of Lowes Creek within the study area. TNRU05 is approximately 160 m to the south of site TNRU4. The site is located on the floodplain of Lowes Creek with localised disturbance around the dam. The area in general has low levels of ground disturbance, but has probably been subject to numerous flooding events.
6.3.6  TNRU6

Site TNRU6 consists of two artefacts located on a 15 m x 15 m exposure within the study area. The site is within a lower hillslope landform unit, which rises gently upwards to the south-west. The area is relatively undisturbed and has probably been cleared and used for grazing. The extended area of this site encompasses the lower hillslope landform unit. This landform extends across to the eastern side of The Northern Road and encompasses sites TNRU7, TNRU 8 and 45-5-344. These sites, along with TNRU6, would have once formed a large site complex which has since been highly disturbed on the eastern side of the road. The extended site area is mapped in Appendix 1.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tuff</td>
<td>White/yellow</td>
<td>Flake fragment</td>
<td>1.2cm</td>
<td>0.9cm</td>
<td>0.3cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Angular fragment</td>
<td>1.3cm</td>
<td>0.8cm</td>
<td>0.6cm</td>
</tr>
</tbody>
</table>

Plate 13: TNRU6 location: facing south-east.  
Plate 14: Artefact at TNRU5.

6.3.7  TNRU7

Site TNRU7 consists of seven artefacts scattered across an area of 100 m x 20 m within the front paddock of a small property lot at 1375 The Northern Road, Bringelly. The site is within the study area. A small tributary of Lowes creek runs 20 m to the north of the property with a gentle slope upwards towards the south.

The site area has recently been graded with topsoil pushed across to form an earthen bank along The Northern Road. The removal of topsoil has exposed subsoil along with artefacts that would have been buried within it. Although this area contained a relatively high number of artefacts the archaeological potential has been compromised by the disturbance of the topsoil.
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>White</td>
<td>Flake fragment</td>
<td>1.8cm</td>
<td>1.2cm</td>
<td>0.6cm</td>
</tr>
<tr>
<td>Tuff</td>
<td>Grey</td>
<td>Flake fragment</td>
<td>2.2cm</td>
<td>1.7cm</td>
<td>1.0cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Flake fragment</td>
<td>1.4cm</td>
<td>0.8cm</td>
<td>0.6cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Pink</td>
<td>Flake</td>
<td>2.3cm</td>
<td>1.2cm</td>
<td>0.5cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Pink</td>
<td>Flake</td>
<td>1.2cm</td>
<td>0.7cm</td>
<td>0.2cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Broken flake</td>
<td>1.4cm</td>
<td>0.5cm</td>
<td>0.3cm</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Pink</td>
<td>Flake</td>
<td>2.1cm</td>
<td>1.9cm</td>
<td>0.5cm</td>
</tr>
</tbody>
</table>

Plate 15: TNRU7 location: facing north.  
Plate 16: Sample of artefacts at TNRU7.

6.3.8 TNRU8

Site TNRU8 is an isolated silcrete flake located at 1074 The Northern Road, Bringelly fronting the road corridor within the study area. The artefact was located on a large exposure 10 m x 15 m. The area has been cleared and appears to have been graded or leveled. Clay was evident at the surface over some exposures.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Pink</td>
<td>Broken flake</td>
<td>1.8cm</td>
<td>1.3cm</td>
<td>0.8cm</td>
</tr>
</tbody>
</table>
6.3.9 **TNRU9**

Site TNRU9 is an isolated artefact located on a disturbed exposure at the site of demolished house at 1340 The Northern Road, Bringelly. The site is within the study area. The landform unit is a low ridgeline with the closest waterway being Thompson’s Creek almost half a kilometre to the south. It is possible that this artefact was brought it with road gravels or construction material associated with the demolished house.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Angular fragment</td>
<td>2.3cm</td>
<td>1.8cm</td>
<td>0.8cm</td>
</tr>
</tbody>
</table>

Plate 17: Site TNRU8 location: facing north.  
Plate 18: Isolated find at TNRU8.  
Plate 19: Site TNRU9 location: facing west.  
Plate 20: Artefact at TNRU9.
6.3.10   **TNRU10**

Site TNRU10 is an isolated quartz fragment located on a dam wall on an upper hillslope rising to a ridgeline to the north. The isolated find is within the study area. The area has used for grazing but does not appear to have been ploughed and therefore remains relatively undisturbed. There is large stand of mature trees to the north of the site. The site is assessed as being an extended area to the north of the isolated find, encompassing the stand of mature trees and the upper hillslope landform unit. The extended site area is mapped in Appendix 1.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>White</td>
<td>Flake fragment</td>
<td>1.3cm</td>
<td>0.7cm</td>
<td>0.3cm</td>
</tr>
</tbody>
</table>

Plate 21: Site TNRU10: facing north.

Plate 22: Isolated find at TNRU10.

6.3.11   **TNRU11**

Site TNRU11 is an isolated find located on a small exposure within a large stand of mature trees. The area is on an upper hillslope rising to a ridgeline to the north and is relatively undisturbed. This site is 50m outside the study area for this proposal.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Pink</td>
<td>Broken flake</td>
<td>2.0cm</td>
<td>1.8cm</td>
<td>0.9cm</td>
</tr>
</tbody>
</table>
6.3.12  

**TNRU12**

Site TNRU12 is an isolated find located on a dam wall at 621 The Northern Road, Cobbitty. The site is within lower hillslope landform unit although as it is located on a dam wall it was uncertain as to where the artefact originated. The area around the dam has been subject to low/moderate disturbance with some evidence of ploughing and intensive cropping. This site is approximately 100 m outside the study area.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Pink</td>
<td>Flake</td>
<td>3.1cm</td>
<td>1.4cm</td>
<td>0.5cm</td>
</tr>
</tbody>
</table>

Plate 25: Site TNRU12 location: facing west.  
Plate 26: Isolated find at TNRU12.
6.3.13  TNRU13

Site TNRU13 comprises two artefacts within 20 m of each other on a large exposure along the front of the property at 11 The Northern Road, Bringelly. The site is within the study area. It appears that the area has been graded and leveled with truncation of the topsoil. Clay is evident at the surface and it is unlikely that significant subsurface archaeological deposits remain within the area. TNRU13 is within 100 m of TNRU8 and site AHIMS# 45-5-3544 recorded on the 2008 survey (Biosis 2008). The closest permanent water source is South Creek about one kilometre to the east.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Core</td>
<td>2.0cm</td>
<td>1.3cm</td>
<td>0.8cm</td>
</tr>
<tr>
<td>Tuff</td>
<td>Red/orange</td>
<td>Broken flake</td>
<td>1.8cm</td>
<td>1.2cm</td>
<td>0.4cm</td>
</tr>
</tbody>
</table>

Plate 27: Site TNRU13 location: facing north-east.

6.3.14  TNRU14/site BRP –IF-16

Site TNRU14 is located on an exposure within a BMX track 10 m from the Bringelly road corridor to the east of its intersection with The Northern Road at 993 Bringelly Road. TNRU14 is 40 m to the east of the site BRP-IF-16 (AHIMS #: 45-5-3886) recorded by Austral and KNC for the Bringelly Road upgrade study and therefore will be recorded as additional information for this previously registered site. The extended site area is within an east-west running ridgeline on a low hilltop. The extended site area within the study area and is mapped in Appendix 1.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Type</th>
<th>Length</th>
<th>Width</th>
<th>Thickness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>Flake</td>
<td>3.2cm</td>
<td>3.2cm</td>
<td>0.6cm</td>
</tr>
</tbody>
</table>
6.4 Summary of results

Four previously recorded sites and PADs within the study area have been found to be destroyed or disturbed and will therefore not been dealt with further within this report (OPW-D4, NRPAD1, PAD 2038-6, HP1). A further five sites are subject to various existing AHIPs (O-OS-2, HP01, O-IF-3, OPD-14, OPM-1). Only O-IF-3 is within the study area and under an already existing AHIP, the other four sites are outside the study area. Consultation between the RMS and the current AHIP holders should be ongoing in order to monitor the status of these sites.

Two sites were re-recorded during the site survey for this study and have been added to the existing site records (TNRU2 was added to the site record for O-IF-2, and TNRU14 was added to the site record for BRP-IF-16).

In summary, twenty-four Aboriginal sites are located within the study area. Seven sites were located just outside the study area (more than 20m outside the proposal impact area). Two new sites were recorded during the site survey but were located more than 50m from the study area.
## Table 4: Summary of Aboriginal sites within the study area: excluding sites that have previously been destroyed.

<table>
<thead>
<tr>
<th>AHIMS number</th>
<th>Site Names</th>
<th>Easting</th>
<th>Northing</th>
<th>AGD/GDA E=error</th>
<th>Site Type</th>
<th>Within the study area</th>
<th>Disturbance levels</th>
<th>Landform Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-2-1819</td>
<td>IFI (Harrington Park)</td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>High</td>
<td>Flat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3331</td>
<td>O-Os-2</td>
<td>GDA/E</td>
<td>Artefact scatter</td>
<td>No/5m</td>
<td>Moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3330</td>
<td>O-JF-2/TNRU 2</td>
<td>GDA/E</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>Low</td>
<td>Lower hillslope/terrace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3329</td>
<td>HPO1</td>
<td>GDA/E</td>
<td>Artefact scatter</td>
<td>No/c. 5m</td>
<td>Low</td>
<td>Hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3803</td>
<td>O-IF-3</td>
<td>AGD</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3538</td>
<td>OPM-1</td>
<td>AGD/E</td>
<td>Isolated find</td>
<td>No (Peter Brock Drive)</td>
<td>Moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3535</td>
<td>OPD-14</td>
<td>AGD/E</td>
<td>Isolated find</td>
<td>No (Peter Brock Drive)</td>
<td>Moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-5-3800</td>
<td>TNR2</td>
<td>AGD/E</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>Low/moderate</td>
<td>Flat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-5-3542</td>
<td>NR4</td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>High</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-5-3543</td>
<td>NR5</td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Low/moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-5-3546</td>
<td>NRSTI</td>
<td>GDA</td>
<td>Scarred Tree</td>
<td>Yes</td>
<td>Low</td>
<td>Flat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>AHIMS number</th>
<th>Site Names</th>
<th>Easting</th>
<th>Northing</th>
<th>AGD/GDA</th>
<th>Site Type</th>
<th>Within the study area</th>
<th>Disturbance levels</th>
<th>Landform Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-5-3545</td>
<td>Northern Rd PAD2</td>
<td></td>
<td></td>
<td>GDA</td>
<td>PAD</td>
<td>No/c. 20m</td>
<td>Low</td>
<td>Creek flat/terrace</td>
</tr>
<tr>
<td>45-5-3547</td>
<td>NRST2</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Scarred Tree</td>
<td>Yes</td>
<td>Low</td>
<td>Flat</td>
</tr>
<tr>
<td>45-5-3544</td>
<td>NR6</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Moderate</td>
<td>Hillslope</td>
</tr>
<tr>
<td>45-5-3886</td>
<td>BRP-JF-16/TNRU14</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>Low</td>
<td>Upper Hillslope</td>
</tr>
<tr>
<td>45-5-3888</td>
<td>BRP-S-01</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>High</td>
<td>Hillslope</td>
</tr>
<tr>
<td>45-5-3889</td>
<td>BRP-S-02</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>High</td>
<td>Lower hillslope</td>
</tr>
<tr>
<td>45-5-3890</td>
<td>BRP-S-03</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>High</td>
<td>Hillslope</td>
</tr>
<tr>
<td>45-5-3891</td>
<td>BRP-S-04</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact Scatter</td>
<td>No/ c.5m</td>
<td>High</td>
<td>Hillslope</td>
</tr>
<tr>
<td>45-5-3895</td>
<td>BRP-S-08</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact Scatter</td>
<td>Yes</td>
<td>High/moderate</td>
<td>Flat</td>
</tr>
<tr>
<td>TNRU1</td>
<td></td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Low</td>
<td>Lower hillslope</td>
</tr>
<tr>
<td>TNRU3</td>
<td></td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Moderate</td>
<td>Flat</td>
</tr>
<tr>
<td>TNRU4</td>
<td></td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact Scatter</td>
<td>Yes</td>
<td>Locally high due to dam construction. Generally low in vicinity of the site.</td>
<td>Lower hillslope</td>
</tr>
</tbody>
</table>
### AHIMS number | Site Names | Easting | Northing | AGD/GDA | Site Type | Within the study area | Disturbance levels | Landform Unit
--- | --- | --- | --- | --- | --- | --- | --- | ---
TNRU5 | GDA | Isolated find | Yes | Locally high due to dam construction. Generally low in vicinity of the site. | Creek flat
TNRU6 | GDA | Artefact scatter | Yes | Low | Lower hillslope
TNRU7 | GDA | Artefact scatter | Yes | High | Lower hillslope
TNRU8 | GDA | Isolated find | Yes | Moderate | Upper hillslope
TNRU9 | GDA | Isolated find | Yes | High | Low ridgeline
TNRU10 | GDA | Isolated find | Yes | Low | Low ridgeline
TNRU11 | GDA | Isolated find | No/ c. 50m | Low | Upper hillslope
TNRU12 | GDA | Isolated find | No/ c. 100m | Locally high due to dam construction. Generally low in vicinity of the site. | Lower hillslope
TNRU13 | GDA | Artefact scatter | Yes | High | Upper hillslope
7.0 Statutory Requirements

This study has been undertaken in the context of several pieces of legislation that relate to Aboriginal heritage and its protection in New South Wales.

**National Parks and Wildlife Act (1974)**

The *National Parks & Wildlife Act 1974*, administered by the OEH, provides statutory protection for all Aboriginal ‘objects’ (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for ‘Aboriginal Places’ (areas of cultural significance to the Aboriginal community) under Section 84.

The protection provided to Aboriginal objects applies irrespective of the level of their significance or issues of land tenure. However, areas are only gazetted as Aboriginal Places if the Minister is satisfied that sufficient evidence exists to demonstrate that the location was and/or is, of special significance to Aboriginal culture.

The Act was recently amended (2010) and as a result the legislative structure for seeking permission to impact on heritage items has changed. An s.90 permit is now the only Aboriginal Heritage Impact Permit (AHIP) available and is granted by the OEH. Various factors are considered by OEH in the AHIP application process, such as site significance, Aboriginal consultation requirements, ESD principles, project justification and consideration of alternatives. The penalties and fines for damaging or defacing an Aboriginal object have also increased.

As part of the administration of Part 6 of the Act OEH has developed regulatory guidelines on Aboriginal consultation, which are outlined in *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (2010). Guidelines have also been developed for the processes of due diligence - *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (2010), and for investigation of Aboriginal objects - *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (2010) in accordance with the 2010 amendment to the Act.

Schedule 14 lists lands of cultural significance to Aboriginal persons. The proposal will not impact on any lands of cultural significance listed under this schedule.

**Heritage Act (1977)**

*The Heritage Act 1977* is administered by the Department of Premier and Cabinet and protects the natural and cultural heritage of NSW. Generally this Act only pertains to Aboriginal Heritage if it is listed on the State Heritage Register, or subject to an interim heritage order.
Aboriginal Land Rights Act (1983)

The Aboriginal Land Rights Act 1983 is administered by the NSW Department of Human Services - Aboriginal Affairs. This Act established Aboriginal Land Councils (at State and Local levels). These bodies have a statutory obligation under the Act to; (a) take action to protect the culture and heritage of Aboriginal persons in the council’s area, subject to any other law, and (b) promote awareness in the community of the culture and heritage of Aboriginal persons in the council’s area.

Native Title Act (1994)

The Native Title Act 1994 was introduced to work in conjunction with the Commonwealth Native Title Act. Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act.
8.0 Significance Assessment

8.1 Assessment criteria

Archaeological significance refers to the archaeological or scientific importance of a landscape or area. This is characterised using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These are outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state’s natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?
- Education potential: does the subject area contain teaching sites or sites that might have teaching potential?

Cultural values and significance would be discussed by the Aboriginal groups during ongoing Aboriginal consultation for the project and would be detailed in the Cultural Heritage Assessment Report prepared at the conclusion of Stage 3 PACHCI.

8.2 Archaeological significance assessment

Only those sites within the study area that have not previously been impacted, and the two new sites recorded during this study which are outside the study area have been included in the assessment of significance. The sites within the area covered by the Peter Brock Drive intersection DA are also included as there were within the original study area.

- Twenty-four Aboriginal sites identified by this study have been assessed as having a low archaeological significance. This assessment was generally made based on the disturbance levels of the site and the number of artefacts present at the site in relation to ground surface visibility. In one case a site (TNRU7) contained relatively high numbers of artefacts but was in a highly disturbed context. The site had a high ground surface visibility and therefore it would be likely that most artefacts present were recorded. In this case the assessment of archaeological significance as low reflected the lack of intact deposit and archaeological context as well as the low potential for further significant archaeological material to remain at the site. The representative and rarity values of these sites were low.
- Seven Aboriginal sites identified along the proposed upgrade corridor for The Northern Road have been assessed as having a moderate archaeological significance. In the case of these sites their representativeness and rarity values were moderate with potential for research value. If sites with a
moderate archaeological significance are to be impacted further archaeological work would be conducted to mitigate against these impacts.

- One Aboriginal site identified along the proposed upgrade corridor for The Northern Road has been assessed as having a high archaeological significance. It is possible that NRST1 is a culturally scarred tree and it is known to be of particular significance to local Aboriginal groups. This was related to the archaeologist during the site survey. Surviving scarred trees are rare in the Sydney metropolitan area and remaining scarred trees should be conserved for their high archaeological and cultural significance.

Table 5: Summary of significance values.

<table>
<thead>
<tr>
<th>Site name</th>
<th>Research Potential</th>
<th>Scientific / Archaeological Value</th>
<th>Representative Value</th>
<th>Rarity Value</th>
<th>Overall Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF1 (Harrington Park)</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>O-OS-2</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>O-IF-2/TNRU2</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>HP01</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>O-IF-3</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>OPD-14</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>OPM-1</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNR2</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NR4</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NR5</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NRST1</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Northern Rd PAD2</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>NRST2</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NR6</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>BRP-IF-16/TNRU14</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>BRP-S-01</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>Site name</th>
<th>Research Potential</th>
<th>Scientific / Archaeological Value</th>
<th>Representative Value</th>
<th>Rarity Value</th>
<th>Overall Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>BRP-S-02</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>BRP-S-03</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>BRP-S-04</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>BRP-S-08</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNRU1</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNRU3</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNRU4</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>TNRU5</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNRU6</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>TNRU7</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNRU8</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNRU9</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNRU10</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>TNRU11</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNRU12</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNRU13</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
9.0 Impact Assessment

9.1 Impact assessment

Fifteen Aboriginal sites would be directly impacted by the proposed development. Ten Aboriginal sites may be subject to indirect impacts as they are within 20 m of the proposal impact area. Six sites would not be directly or indirectly impacted by the proposal as they are outside the study area and more than 20 m from the proposal impact area. It should be a priority for RMS to ensure that the sites that are outside the development footprint, and do not already have AHIPs attached, are conserved. Impacts for each site have been listed in Table 6.
10.0 Management and Mitigation Measures

10.1 Guiding principles

The overall guiding principle for cultural heritage management is that where possible Aboriginal should be conserved. If conservation is not practical, measures should be taken to mitigate against impacts to Aboriginal sites.

The nature of the mitigation measures recommended is primarily based on an assessment of archaeological significance. The recommendations will also be informed by cultural significance as discussed by the Aboriginal stakeholder groups during Stage 3 consultation.

10.2 Mitigation measures

Mitigation measures recommended vary depending on the assessment of archaeological significance of the Aboriginal site which is based on its research potential, rarity, representativeness and educational value. In general the significance of a site would involve the following mitigation measures:

- Low archaeological significance – Conservation where possible. An AHIP would be required to impact the site before works can commence.

- Moderate archaeological significance – Conservation where possible. An AHIP with further archaeological investigation (archaeological excavations, or artefact collection as a condition of the AHIP) would be required to impact the site before works can commence.

- High archaeological significance – Conservation as a priority. An AHIP would be required only if other practical alternatives have been discounted. Conditions of this AHIP would depend on the nature of the site, but may include removal and preservation of scarred trees, or comprehensive salvage excavations.

The archaeological significance of the study area has been adequately assessed by taking into account the archaeological potential associated with landscape and landform units; ground disturbance levels, results of previous excavations and studies in the locality, and assessment of other significance values such as rarity and representativeness. Test excavations under the Code of Practice are therefore not necessarily warranted in this case as test excavations are intended to facilitate a more accurate assessment of archaeological significance. Salvage by excavation or hand collections are therefore seen as an appropriate mitigation measure for areas with moderate archaeological significance.

Table 6 lists the mitigation measures recommended for each site. These measures are summarised in Tables 7-12.

The site areas that are recommended for salvage excavation are illustrated in the heritage maps in Appendix 1.
10.3 Management strategies

A comprehensive discussion of management strategies and processes would be prepared for the Stage 3 CHAR in consultation with Aboriginal stakeholder groups. This discussion would outline procedures for management of unexpected archaeological finds, including human remains, along with processes to manage changes in proposed impacts.
Table 6: Impacts and mitigation/management measures: sites which would be impacted are shaded in orange.

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site names</th>
<th>Site type</th>
<th>Current AHIP</th>
<th>Significance</th>
<th>Impacts</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-2-1819</td>
<td>IF1 (Harrington Park)</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
<tr>
<td>52-2-3331</td>
<td>O-OS-2</td>
<td>Artefact scatter</td>
<td>To be collected Under AHIP 3380</td>
<td>Low</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>52-2-3330</td>
<td>O-IF-2/TNRU2</td>
<td>Artefact scatter</td>
<td>None</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample of the site is required prior to impact.</td>
</tr>
<tr>
<td>52-2-3329</td>
<td>HP01</td>
<td>Artefact scatter</td>
<td>To be collected Under AHIP 3380</td>
<td>Moderate</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>52-2-3803</td>
<td>O-IF-3</td>
<td>Isolated find</td>
<td>AHIP 3380</td>
<td>Low</td>
<td>Adjacent. Possible indirect impacts. Site is approximately 10 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with current AHIP holder to ascertain status of the site.</td>
</tr>
<tr>
<td>52-2-3535</td>
<td>OPD-14</td>
<td>Isolated find</td>
<td>To be collected under AHIP 1116799</td>
<td>Low</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>52-2-3538</td>
<td>OPM-1</td>
<td>Isolated find</td>
<td>To be collected under AHIP 1116799</td>
<td>Low</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>45-5-3800</td>
<td>TNR2</td>
<td>Artefact Scatter</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
<tr>
<td>45-5-3542</td>
<td>NR4</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
</tbody>
</table>
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site names</th>
<th>Site type</th>
<th>Current AHIP</th>
<th>Significance</th>
<th>Impacts</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-5-3543</td>
<td>NR5</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
<tr>
<td>45-5-3546</td>
<td>NRST1</td>
<td>Scarred Tree</td>
<td>None</td>
<td>High</td>
<td>Tree protected to drip line.</td>
<td>Tree to be conserved by road design. Impacts to be avoided. Site should be fenced off during works to provide protection from indirect impacts.</td>
</tr>
<tr>
<td>45-5-3545</td>
<td>Northern Rd PAD2</td>
<td>PAD</td>
<td>None</td>
<td>Moderate</td>
<td>Adjacent. Possible indirect impacts. PAD is approximately 20m from the road design boundary.</td>
<td>PAD should be fenced off during works to provide protection from indirect impacts.</td>
</tr>
<tr>
<td>45-5-3547</td>
<td>NRST2</td>
<td>Not a scarred tree</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Not a scarred tree</td>
</tr>
<tr>
<td>45-5-3544</td>
<td>NR6</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Adjacent. Possible indirect impacts. Site is approximately 15 m from road design boundary</td>
<td>Site should be fenced off during works to provide protection from indirect impacts.</td>
</tr>
<tr>
<td>45-5-3886</td>
<td>BRP-IF-16/TNRU14</td>
<td>Artefact scatter</td>
<td>None/ AHIP and salvage excavation recommended for Bringelly Rd upgrade</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample of the site is required prior to impact.</td>
</tr>
<tr>
<td>45-5-3888</td>
<td>BRP-5-01</td>
<td>Artefact scatter</td>
<td>None/ AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 10 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with project manager for Bringelly Road upgrade to ascertain whether AHIP has been granted.</td>
</tr>
<tr>
<td>Site ID</td>
<td>Site names</td>
<td>Site type</td>
<td>Current AHIP</td>
<td>Significance</td>
<td>Impacts</td>
<td>Mitigation measures</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>-------------------</td>
<td>---------------------------------------------</td>
<td>--------------</td>
<td>--------------------------------------------------------------------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>45-5-3889</td>
<td>BRP-S-02</td>
<td>Artefact scatter</td>
<td>None/AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 5 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with project manager for Bringelly Rd upgrade to ascertain whether AHIP has been granted.</td>
</tr>
<tr>
<td>45-5-3890</td>
<td>BRP-S-03</td>
<td>Artefact scatter</td>
<td>None/AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 5 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with project manager for Bringelly Rd upgrade to ascertain whether AHIP has been granted.</td>
</tr>
<tr>
<td>45-5-3891</td>
<td>BRP-S-04</td>
<td>Artefact Scatter</td>
<td>None/AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 15 m from road design boundary.</td>
<td>Artefacts have been removed from the site and are held with OEH. Indirect impacts should be avoided during works. Consult with project manager for Bringelly Rd upgrade to ascertain whether AHIP has been granted.</td>
</tr>
<tr>
<td>45-5-3895</td>
<td>BRP-S-08</td>
<td>Artefact Scatter</td>
<td>None/AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 5 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with project manager for Bringelly Rd upgrade to ascertain whether AHIP has been granted.</td>
</tr>
<tr>
<td>TNRU1</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
<td></td>
</tr>
<tr>
<td>TNRU3</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
<td></td>
</tr>
</tbody>
</table>
## Site Details

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site names</th>
<th>Site type</th>
<th>Current AHIP</th>
<th>Significance</th>
<th>Impacts</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNRU4</td>
<td>Artefact Scatter</td>
<td>None</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample would be required prior to impact.</td>
<td></td>
</tr>
<tr>
<td>TNRU5</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
<td></td>
</tr>
<tr>
<td>TNRU6</td>
<td>Artefact scatter</td>
<td>None</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample would be required prior to impact.</td>
<td></td>
</tr>
<tr>
<td>TNRU7</td>
<td>Artefact scatter</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Salvage by collection as a condition of the AHIP.</td>
<td></td>
</tr>
<tr>
<td>TNRU8</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Adjacent. Possible indirect impacts. Site is approximately 5 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts.</td>
<td></td>
</tr>
<tr>
<td>TNRU9</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
<td></td>
</tr>
</tbody>
</table>
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site names</th>
<th>Site type</th>
<th>Current AHIP</th>
<th>Significance</th>
<th>Impacts</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>TNRU10</td>
<td>Isolated find</td>
<td>None</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample would be required prior to impact.</td>
<td></td>
</tr>
<tr>
<td>TNRU11</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TNRU12</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>None</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>TNRU13</td>
<td>Artefact scatter</td>
<td>None</td>
<td>Low</td>
<td>Adjacent. Possible indirect impacts. Site is approximately 10 m from road design boundary</td>
<td>Site should be fenced off during works to provide protection from indirect impacts.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 7: Archaeological sites which will not be impacted by the proposal and do not require mitigation measures.

<table>
<thead>
<tr>
<th>No impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaeological sites</td>
</tr>
<tr>
<td>O-OS-2, HP01, OPM-1, OPD-14, TNRU11, TNRU12</td>
</tr>
</tbody>
</table>

### Table 8: Archaeological sites which may be subject to indirect impacts and should be fenced off during works.

<table>
<thead>
<tr>
<th>Possible indirect impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaeological sites</td>
</tr>
<tr>
<td>O-IF-3, NRPAD2, NR6, BRP-S-01, BRP-S-02, BRP-S-03, BRP-S-04, BRP-S-08, TNRU8, TNRU13,</td>
</tr>
</tbody>
</table>

### Table 9: Archaeological sites which would be impacted by concept design and require and AHIP.

<table>
<thead>
<tr>
<th>Impacted archaeological sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaeological sites</td>
</tr>
<tr>
<td>IF1, NR4, NR5, TNR2, TNRU1, TNRU3, TNRU5, TNRU9</td>
</tr>
</tbody>
</table>

### Table 10: Scarred trees.

<table>
<thead>
<tr>
<th>Scarred Trees – to be conserved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaeological sites</td>
</tr>
<tr>
<td>NRST1</td>
</tr>
</tbody>
</table>

### Table 11: Archaeological site requiring surface collection.

<table>
<thead>
<tr>
<th>Surface Collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaeological sites</td>
</tr>
<tr>
<td>TNRU7</td>
</tr>
</tbody>
</table>

### Table 12: Archaeological sites requiring salvage excavations.

<table>
<thead>
<tr>
<th>Salvage excavation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaeological sites</td>
</tr>
<tr>
<td>O-IF-2/TNRU2, BRP-IF-16/TNRU14, TNRU4, TNRU6, TNRU10</td>
</tr>
</tbody>
</table>

### Table 13: Archaeological sites requiring site card update and no further mitigation measures

<table>
<thead>
<tr>
<th>Site card update</th>
</tr>
</thead>
<tbody>
<tr>
<td>Archaeological site</td>
</tr>
<tr>
<td>NRST2</td>
</tr>
</tbody>
</table>
11.0 Recommendations

The following recommendations were based on consideration of:

- Statutory requirements under the *National Parks and Wildlife Act 1974* as amended.
- The results of the background research, site survey and assessment.
- The interests of the Aboriginal stakeholder groups.
- The likely impacts of the proposed development.

It was found that:

- Twenty-four Aboriginal sites are located within the study area (the proposal impact area and a buffer of 20m). A further eight sites were considered in this study as they were either in the original study area, or were recorded during this study outside the study area.
- Fifteen Aboriginal sites would be directly impacted by the proposal. Ten of these sites were assessed as having low archaeological significance, while five have been assessed as having a moderate archaeological significance.

It was therefore recommended that:

- Salvage excavations of a representative area of the five sites with a moderate archaeological significance that are to be impacted by the proposal would provide appropriate mitigation measures against these impacts.
- Hand collection of site TNRU7 should be conducted by the Aboriginal stakeholder groups under a Care and Control agreement negotiated with OEH.
- The Aboriginal sites which are located within 20m of the proposal impact area should be protected during works by being fenced off. Workers should be made aware of the location of the sites in order to avoid unintended impacts occurring.
- Scarred tree NRST1 is known to be culturally significant, and would be conserved by the road design. A sufficient buffer zone should be placed around the tree so that impacts would be avoided during road construction.
- Before works commence on the road upgrade an area based Section 90 AHIP should be sought for impacts on all Aboriginal sites within the design corridor that cannot be conserved, and for any required salvage excavations or surface collections.
- If archaeological salvage excavations are conducted within the former location of the Narellan Army Camp (near site O-IF-2/TNRU2), or the Wesleyan Church (near site BRP-IF-16/TNRU14), which are areas of non-Aboriginal archaeological sensitivity, an excavation permit or exception should be sought from the NSW Heritage Council under section 139 of the *Heritage Act 1977*. 


• A number of Aboriginal sites are currently listed on existing AHIPs. Before an AHIP application is submitted by RMS for the proposal the permit holder and OEH should be consulted as to the current status of the Aboriginal sites.

• Site cards for the newly recorded sites would be submitted to AHIMS and site update cards for those sites found to have errors in their co-ordinates would also be submitted.

• A copy of this final report would be provided to all registered Aboriginal stakeholder groups.

• Comprehensive Aboriginal community consultation would be required under RMS Stage 3 PACHCI and OEH guidelines, as Aboriginal sites would be impacted by the proposal. An AFG has been held as part of Stage 3 consultation and the Aboriginal groups consulted regarding the findings and recommendations of this report.

• After Aboriginal consultation for this project has been completed a Cultural Heritage Assessment Report (CHAR) would be prepared, based on the current report, and outlining the comprehensive Aboriginal consultation process and information regarding cultural significance of the study area provided by the Aboriginal stakeholders.

• If the project design is changed and areas not surveyed are to be impacted, or other Aboriginal sites not identified are to be impacted, further archaeological assessment would be required.
12.0 References

AECOM 2010 *Oran Park West Sewer Infrastructure Aboriginal Heritage Impact Assessment*. Report to South West Growth Centre.


Biosis 2008 *The Northern Road upgrade: Preliminary Aboriginal archaeological assessment*. Report to RTA.


Jo McDonald CHM Pty Ltd. 2005. *Archaeological salvage excavation of site CG1 (NPWS #45-5-2648), at the corner of Charles and George Streets, Parramatta, NSW*. Report for Meriton Apartments Pty Ltd.


Jo McDonald CHM Pty Ltd. 2007. *Archaeological investigation of the Oran Park Precinct in the South West Growth Centre, Camden, NSW*. Report to APP.


Jo McDonald CHM Pty Ltd. 2010. *Archaeological Assessment of the proposed sewer and water mains associated with the Marsden Park Industrial Precinct, Stage 1*. Report to APP.


KNC 2008 *Oran Park and Turner Road Precincts: Aboriginal Heritage Investigation for Proposed Infrastructure Service Routes and Site Options*. Report to Landcom.

KNC 2010 *Bringelly Road upgrade: Camden Valley Way to The Northern Road Aboriginal cultural heritage Cultural Heritage Assessment Report Prepared for the Roads and Traffic Authority.*


Turbet, P. 2010 *The First Frontier: The Occupation of the Sydney Region: 1788 to 1816.* Rosenberg Press.


The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

Cultural Heritage Assessment Report

Report to Roads and Maritime Services (RMS)

August 2012

Artefact Heritage Services
ABN 73 144 973 526

Lvl 1/716 New South Head Rd
Rose Bay 2029
PO BOX 772 Rose Bay
NSW Australia 2029
+61 2 9025 3958
+61 2 9025 3990

office@artefact.net.au
www.artefact.net.au
### 5.6.11 45-5-3546 (NRST1)

5.6.12 45-5-3545 (NRPAD2)

5.6.13 45-5-3547 (NRST2)

5.6.14 45-5-3544 (NR6)

5.6.15 45-5-3886 (BRP-IF-16)

5.6.16 45-5-3888 (BRP-S-01)

5.6.17 45-5-3889 (BRP-S-02)

5.6.18 45-5-3890 (BRP-S-03)

5.6.19 45-5-3891 (BRP-S-04)

5.6.20 45-5-3895 (BRP-S-08)

### 5.7 Newly recorded Aboriginal sites

5.7.1 TNRU1

5.7.2 TNRU2/O-IF-2

5.7.3 TNRU3

5.7.4 TNRU4

5.7.5 TNRU5

5.7.6 TNRU6

5.7.7 TNRU7

5.7.8 TNRU8

5.7.9 TNRU9

5.7.10 TNRU10

5.7.11 TNRU11

5.7.12 TNRU12

5.7.13 TNRU13

5.7.14 TNRU14/site BRP-IF-16

### 5.8 Effective survey coverage

### 6.0 Significance assessment

#### 6.1 What are cultural heritage values?

#### 6.2 What is cultural significance?
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

10.4.3 Salvage excavation (open areas) ........................................................................................................59
10.5 Post excavation analysis ......................................................................................................................60
10.6 Aboriginal community involvement ....................................................................................................60
10.7 Aboriginal objects ................................................................................................................................61
10.8 Reporting ...........................................................................................................................................61
10.9 Timeframe ........................................................................................................................................61
11.0 References ......................................................................................................................................62

APPENDIX A Advertisement for Aboriginal Stakeholders
APPENDIX B Aboriginal Stakeholder Comments
APPENDIX C Aboriginal Stakeholder Consultation Log
APPENDIX D Aboriginal Heritage Maps
APPENDIX E AHIMS search results
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

Figures

Figure 1: The proposal location. .............................................................................................................. 4
Figure 2: AHIMS registered sites in the vicinity of the study area. .......................................................... 16
Figure 3: Site NRST1 in relation to concept design (SKM sketch). .......................................................... 19
Figure 4: Location of NRPAD2 outlined in red. ....................................................................................... 20

Plates

Plate 1: Site NRST1 (Artefact Heritage 27/9/12). ..................................................................................... 19
Plate 2: Site NRST2 (Artefact Heritage 26/9/12). ..................................................................................... 21
Plate 3: TNRU1 location: facing north-east. ........................................................................................... 25
Plate 4: Artefact at TNRU1. ..................................................................................................................... 25
Plate 5: TNRU2 location: facing west. ...................................................................................................... 26
Plate 6: Artefacts at TNRU2. .................................................................................................................... 26
Plate 7: TNRU3 location: facing south. .................................................................................................... 26
Plate 8: Artefact at TNRU3. ..................................................................................................................... 26
Plate 9: TNRU4 location: facing south-west. ......................................................................................... 27
Plate 10: Sample of artefacts at TNRU4. ............................................................................................... 27
Plate 11: TNRU5 location: facing south. ............................................................................................... 27
Plate 12: Artefact at TNRU5. .................................................................................................................. 27
Plate 13: TNRU6 location: facing south-east. ....................................................................................... 28
Plate 14: Artefact at TNRU5. .................................................................................................................. 28
Plate 15: TNRU7 location: facing north. ............................................................................................... 28
Plate 16: Sample of artefacts at TNRU7.................................................................28
Plate 17: Site TNRU8 location: facing north......................................................29
Plate 18: Isolated find at TNRU8.................................................................29
Plate 19: Site TNRU9 location: facing west...........................................................30
Plate 20: Artefact at TNRU9.................................................................30
Plate 21: Site TNRU10: facing north.................................................................30
Plate 22: Isolated find at TNRU10.................................................................30
Plate 23: Site TNRU11 location: facing north...........................................................31
Plate 24: Artefact at TNRU11.................................................................31
Plate 25: Site TNRU12 location: facing west...........................................................31
Plate 26: Isolated find at TNRU12.................................................................31
Plate 27: Site TNRU13 location: facing north-east......................................................32
Plate 28: Artefacts at TNRU13.................................................................32
Plate 29: Site TNRU14 location in foreground: facing south..................................................32
Plate 30: Isolated find at TNRU14........................................................................32
# Tables

Table 1: Registered Aboriginal stakeholders. ................................................................. 7

Table 2: Previously recorded sites and PADs within the vicinity of the study area. ....................... 23

Table 3: Summary of Aboriginal sites. .................................................................................... 33

Table 4: Survey coverage ......................................................................................................... 36

Table 5: Summary of significance values. .................................................................................. 39

Table 6: Impacts on Aboriginal sites ......................................................................................... 44

Table 7: Impacts and mitigation/management measures: sites which would be directly impacted are shaded in orange. ........................................................................................................... 48

Table 8: Recommended mitigation measures ........................................................................... 53
1.0 Introduction and background

1.1 Project description

The NSW Roads and Maritime Services (RMS) propose to upgrade about 15 km of The Northern Road between The Old Northern Road, Narellan and Mersey Road, Bringelly (the proposal). The location of the proposal has been provided in Figure 1, with more detailed figures provided in Appendix D.

The proposal would cater for the predicted traffic growth along The Northern Road arising from increased residential and commercial development in the South West Growth Centre and nearby areas. The Northern Road would form one of the principal arterial transport corridors within the South West Growth Centre.

Key features of the proposal include:

- Four-lane divided road (two lanes each way) with a central wide median, allowing for the future addition of a third lane in each direction.
- An intended signposted vehicle speed limit of 80 km/h.
- Provision for a three metre wide off-road shared pedestrian/cyclist path on both sides of the road.
- A typical lane width of 3.5 metre lanes (3.3 metre lanes for turning lanes) with two metre outside shoulders and 0.5 metre inside shoulders.
- Bicycle and pedestrian crossing provisions at traffic lights.
- Bus priority at traffic lights and with 3.5m indented bus bays on both sides of The Northern Road.
- Upgrade at eight intersections, which would be controlled by traffic lights:
  - Fairwater Drive / Porrende Street (four way intersection).
  - Hillside Drive (four way intersection).
  - Cobbity Road (west) (four way intersection).
  - Belmore Road (four way intersection).
  - Bringelly Road / Greendale Road (four way intersection).
  - Badgerys Creek Road / Dart Road (four way intersection).
  - Derwent Road (four way intersection).
  - Mersey Road (four way intersection).
- Installation of five new intersections, which would be controlled by traffic lights:
  - Oran Park Link Road 2 (four way intersection).
  - Marylands Link Road 1 (four way intersection).
  - Marylands Link Road 2 (four way intersection).
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

- Maryland's Link Road 3 (four way intersection).
- Lowes Creek Link Road (four way intersection).
- Upgrade of ten t-intersections including Cobbity Road (east), Cobbity Road (west), Carrington Road, Robinson Road, Loftus Street, Thames Road, Solway Road, Lea Road, Avon Road and Severn Road.
- Installation of a new t-intersection at Oran Park Link Road 3.
- Designated turning lanes at signalised intersections.
- Temporary u-turn facilities located opposite the traffic lights at the upgraded intersection of Lowes Creek Link Road.
- Permanent u-turn facilities at Belmore Road, Greendale Road and Derwent Road.
- Realignment of local side road to align with intersections.
- Retention of the existing bridge over Narellan Creek for the southbound carriageway and provision of a new four-span bridge over Narellan Creek for the northbound carriageway.
- Retention of the existing bridge over Thompsons Creek for the southbound carriageway and provision of a new two-span bridge over Thompsons Creek for the northbound carriageway.
- Upgrade of the culvert within Lowes Creek.
- Scour protection works at Narellan Creek and Thompson Creek bridges and the Lowes Creek culvert.
- Temporary and permanent sediment basins.
- Batter requirements for cut and fill areas.
- Flood immunity for a 1 in 100 year average recurrence interval (ARI).
- Ancillary facilities including compounds and stockpile sites.

The Oran Park Link Road 1 intersection (Peter Brock Drive), which is located within the 15 km proposal area, would not be upgraded as part of the proposal. This intersection is currently being developed by Brown Consulting (NSW) Pty Ltd under DA 1051/2007.

1.2 Scope of Review of Environmental Factors

RMS has prepared a Review of Environmental Factors (REF) for the proposed Northern Road upgrade. As a part of the REF, Artefact conducted the Stage 2 investigations, which were based on the preliminary Aboriginal heritage assessment undertaken by Biosis in 2008. The Biosis assessment was part of the Preliminary Environmental Investigation (PEI) which informed the development of the concept design.

The concept design that was subsequently developed by RMS included a further four kilometres of The Northern Road to the north of Bringelly Road. This section of the study area was addressed for the first time during the investigations required by Stage 2 of the RMS Procedure for Aboriginal Cultural heritage Consultation and Investigation (PACHCI) investigations. Subsequently an Aboriginal Archaeological Survey Report (ASR) complying with Stage 2 PACHCI was prepared.
Artefact has been engaged to complete the Stage 3 PACHCI, which includes comprehensive Aboriginal consultation and an assessment of cultural significance. It also includes a research design for recommended salvage excavations. This Cultural Heritage Assessment Report (CHAR) fulfills the RMS's Stage 3 PACHCI reporting requirements and outlines the Aboriginal heritage consultation undertaken. The CHAR is based on the ASR and adheres to the requirements of the Office of Environment and Heritage (OEH) Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales 2010.

The study area has been defined as the proposal impact area (marked in red in Figure 1) plus a 20 m buffer.
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

Figure 1: The proposal location.
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

---

---

---
2.0 Objectives of the study

The objectives of this study were to comply with the RMS PACHCI, and OEH regulations, including the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales 2010* (‘the Code of Practice’), the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales 2010* and the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*. This report includes:

- A description of the scope of the project and the extent of the study area.
- A description of Aboriginal community involvement and Aboriginal consultation.
- A significance assessment of the study area including cultural and archaeological values.
- A description of statutory requirements for the protection of Aboriginal heritage.
- An impact assessment for the recorded Aboriginal sites and areas of archaeological potential.
- Provision of recommendations for management and mitigation measures for Aboriginal sites and areas of archaeological potential.
3.0 Aboriginal community involvement

3.1 Survey participation

In accordance with Stage 2 of the RMS PACHCI the Aboriginal community was involved in the survey and assessment conducted by Artefact (2012).

The study area straddles the boundary between two Local Aboriginal Land Councils.

- Tharawal Local Aboriginal Land Council (TLALC).
- Gandangara Local Aboriginal Land Council (GLALC).

Representatives from these two groups attended the site survey, Roy Murray from GLALC; and Donna Whillock and Alfred Fazldeen from TLALC.

3.2 Stakeholder identification and consultation

The results of the Stage 2 assessment identified potential impacts to Aboriginal cultural heritage, therefore RMS initiated an Aboriginal stakeholder identification and consultation program in accordance with the PACHCI.

In accordance with the OEH Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 and the RMS PACHCI, the RMS advertised for Aboriginal stakeholders to be involved in the Stage 3 assessment (Appendix A). A registered stakeholder list was prepared by RMS.

<table>
<thead>
<tr>
<th>Registered stakeholder group</th>
<th>Representative</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cubbitch Barta Native Title Claimants</td>
<td>Glenda Chalker</td>
</tr>
<tr>
<td>Darug Land Observations (DLO)</td>
<td>Gordon Workman</td>
</tr>
<tr>
<td>Darug Custodial Aboriginal Corporation (DCAC)</td>
<td>Leanne Watson</td>
</tr>
<tr>
<td>Darug Tribal Aboriginal Corporation (DTAC)</td>
<td>Sandra Lee</td>
</tr>
<tr>
<td>Darug Aboriginal Cultural Heritage Assessments (DACHA)</td>
<td>Gordon Morton and Celestine Everingham</td>
</tr>
<tr>
<td>TLALC</td>
<td>Greg Bondar</td>
</tr>
<tr>
<td>GLALC</td>
<td>Cindy Cronin</td>
</tr>
<tr>
<td>Darug Aboriginal Land Care Inc</td>
<td>Des Dyer</td>
</tr>
</tbody>
</table>
The formal Stage 3 consultation process so far has included:

- An advertisement published in local and Indigenous media seeking expressions of interest from Indigenous stakeholders (Appendix A).
- Letters to agencies seeking information of knowledge holders (refer consultation log Appendix C).
- Compilation of a registered stakeholder list.
- Continuing consultation with the local Aboriginal community including an Aboriginal Focus Group (AFG) meeting.

A copy of the draft CHAR was provided to the registered stakeholder groups for their comments. An AFG meeting was held on 24 May 2012 and all registered stakeholder groups were invited to attend. An additional site visit for registered stakeholder groups who did not attend the survey was requested at the AFG. The site visit was organised by RMS and conducted on 18 June 2012. Glenda Chalker from Cubbitch Barta attended the additional site visit.

Information gained through Aboriginal stakeholder consultation has been reflected in the CHAR and an Aboriginal heritage management policy has been developed in consultation with the Aboriginal groups.
4.0 Aboriginal cultural values assessment

4.1 Aboriginal cultural values

Information on Aboriginal cultural values was requested from the Aboriginal stakeholder groups during several phases of consultation, including at the AFG and in submissions on the draft CHAR and research methodology. No specific areas of cultural importance were identified by the stakeholder groups, but it was made clear that the country and landscape as a whole was culturally significant to Aboriginal people. All the Aboriginal sites identified during the survey, regardless of their extent or nature, were also seen as significant by the stakeholder groups. The point was made at the AFG that archaeological grading of significance of sites (low-high) did not necessarily correlate with the value or significance that the site has to Aboriginal people. All sites were seen as significant. The landscape as a whole was also seen as important and as such a site visit was required before cultural significance could be commented on by the stakeholder groups.
5.0 Archaeological assessment

The Stage 1 preliminary archaeological assessment of the Northern Road upgrade undertaken by Biosis (2008) included a site survey which identified eight new Aboriginal sites. The Stage 2 PACHCI ASR (Artefact 2012) built on the preliminary assessment by comprehensively surveying the study area and identifying 14 previously unrecorded Aboriginal sites (two of these sites were part of larger previously recorded sites and were recorded as additions to these sites). The following discussion outlines the archaeological context of the study area.

5.1 Environmental information

The study area is within the southern Cumberland Plain which is typically comprised of an undulating landscape of hills or low ridges with occasional more prominent rises. The Nepean River runs to the west of the study area, from two kilometres distant in the south of the study area to up to 10 km distant in the central and northern sections of the study area. Four major creeks transect the study area along its length. From south to north, these include Narellan Creek, Cobbitty Creek, Lowes Creek and Thompsons Creek. A number of associated tributaries and drainage lines also criss-cross the study area.

The study area is primarily underlain by Bringelly shale which forms part of the Wianamatta Group, consisting of shale, carbonaceous claystone, claystone, laminate, fine to medium grained lithic sandstone, rare coal, and tuff (Clark and Jones 1991).

The primary soil type across the study area is the Blacktown soil landscape. The Blacktown soil landscape is typified by shallow duplex soils over a clay base. The biomantle is underlain by heavily textured subsoil with a depth of generally less than a metre, and most commonly less that 30 cm. There is potential for archaeology to survive within this soil landscape. Intact deposits are likely to occur in the A horizon, which is generally up to 30 cm deep, although stratigraphic potential would be limited. The Blacktown podzolic soils indicate good conditions for artefact survivability but imperfect stratigraphic potential. Artefacts will exist where soil conditions are stable, but the active (aggraded/deflated) nature of podzolics means most artefacts will collect above the B horizon.

The area around Lowes Creek is within a South Creek soil landscape. The soil profiles of the South Creek soil landscape generally comprise an A1 horizon of brown sandy loam with an A2 horizon of more compact bleached clay loam with gravels. This is underlain by a yellow to brown clay B horizon with high gravel content. The fluvial Theresa Park soil landscape is found in association with Narellan Creek. The area around Narellan Creek is flood prone with deposition and scouring events affecting the soil profile. Archaeological deposits would be unlikely to occur close to the creek, or within the flood plain area, but would be more likely on terraces and lower slopes on the edge of the active floodplain.

The study area would once have been covered by open Cumberland Plain Woodland, which is typical of the
Wianamatta Group shale geology. Tree species would have included Forest Red Gum (*E. tereticornis*), and Grey Box (*E. moluccana*). Honey Myrtle (*Melaleuca decora*) and Prickly Leaf Paperbark (*Melaleuca nodosa*) would have been present on the floodplain areas (Benson and Howell 1990).

### 5.2 Aboriginal and European land use

Aboriginal people were highly mobile hunter-gatherers utilising different landform units and resource zones. Different resources may have been available seasonally, necessitating movement or trade (Attenbrow 2010: 78). Aboriginal people hunted kangaroo and wallaby and snared possums for food and skins. In marine or estuarine environments Aboriginal people caught fish and collected shellfish. There are many accounts by Europeans of Aboriginal people in canoes on rivers and the ocean, fishing and cooking the fish on small fires within the vessels (e.g. Collins 1798).

Plants were an important source of nutrition, common edible species being *Macraziama*, a cycad palm with poisonous seeds that were detoxified and ground into a paste and *Xanthorrhoea*, or grass tree. The grass tree nectar was a high-energy food, the resin a strong hafting glue and the flower spikes used for spear barbs. From observations by early European colonists, only about twenty species of plant are identified as being used for food or manufacture by Aboriginal people of the Sydney region (Attenbrow 2010:41). It would be likely that this is only a fraction of what was actually used.

There are no known suitable stone sources for artefact manufacture within the study area (JMcDCHM 2007:17). Resources for tool manufacture would have been brought in from areas such as Mulgoa Creek, approximately 10 km north of the study area, or from the Plumpton Ridge and Marsden park silcrete deposits 20 km north-east of the study area. Raw materials such as silcrete and tuff cobbles are also found in the Nepean River gravels and have been recorded at the confluence of South Creek and Badgerys Creek 10 km north-east of the study area.

The study area has been heavily impacted by agricultural use and semi-rural development. Some areas have recently been developed as residential estates, or are in the process of such changes. The Narellan and Bringelly areas were predominately part of a wider agricultural district until very recently and even now agricultural activities play a major role in the local area. During the 1840s, wheat cultivation was a major industry in the district and several flour mills were established to process this wheat (Atkinson 1988:31). However, in the early 1860s, an outbreak of rust destroyed the wheat industry and landholders diversified into other avenues of agricultural production (Atkinson 1988:95). These included sheep, cattle, dairying, crops such as oats, and fruit and vegetable cultivation. During the 1930s depression, many of the large properties in the area were subdivided and smaller farms for orchards or poultry became more common (Willis n. d.). Since the 1950s, the development of the Camden region has been strongly affected by state government planning policies. The 1968 Sydney Region Outline Plan encouraged the growth of Narellan (Willis n. d.) and from the 1970s, urbanisation in the area rapidly increased. A large portion of the study area is currently within the Sydney South West Growth Centre.
5.3 Previous archaeological investigations

There have been a number of major archaeological investigations that have included sections of the study area. These have generally been associated with large land releases and the development of infrastructure to service these precincts. The following discussion takes into account the most recent and relevant studies and aims to provide contextual information for the current study. There has been a recent subsurface excavation program conducted within the vicinity of the study area but the results from these studies are not yet available (KNC upcoming).

**Harrington Park and Mater Dei rezoning project (Australian Museum Business Services 2006)**

The Harrington Park and Mater Dei study area extends along The Northern Road from Harrington Park (south of the current study area) to its intersection with Cobbitty Road. Several sites identified during this study are therefore within the current study area.

The 2006 study of the Harrington Park and Mater Dei development areas followed on from a Phase 1 preliminary study which identified the need for further investigation (Central West Archaeological and Heritage Services 2004). The Phase 1 study identified 16 Aboriginal sites, including five possible scarred trees. The Phase 2 investigations identified a further 19 sites. A large portion of the study area was assessed as having a medium to high archaeological sensitivity with generally low disturbance levels. It was recommended that large sections of the precinct should be zoned for conservation with 60 per cent of the recorded sites within the conservation areas.

**Archaeological investigation of the Oran Park precinct in the South West Growth Centre (Jo McDonald Cultural Heritage Management 2007).**

The Oran Park precinct includes 1119 ha of land which surrounds about one quarter of the current study area from the intersection of The Northern Road and Cobbitty Road to 1.5 km south of the Maryland property. The survey undertaken by JMcDCHM aimed to locate Aboriginal sites within the precinct and recommend appropriate conservation or mitigation measures. A total of 44 sites and four areas of archaeological potential were located during the survey with several sites having very high densities of artefacts. Site OPR-15 comprised of 193 recorded artefacts located on the banks of a minor tributary in the north-eastern section of the precinct.

The majority of the area along The Northern Road was assessed as having a low/moderate archaeological sensitivity with only 15 per cent of the total precinct assessed as having a high archaeological sensitivity.

**The Northern Road upgrade preliminary Aboriginal archaeological assessment (Biosis 2008).**

The Biosis study assessed the area of the proposed upgrade of The Northern Road from the Old Northern Road, Narellan to Bringelly/Greendale Road at Bringelly. The study involved a desktop assessment and a site survey. The field survey focused on creeks, drainage features and prominent rises, and any previously recorded sites within the
corridor. Although the ground surface visibility throughout the study area was low, a total of eight Aboriginal sites and two areas of potential archaeological deposit were identified during the survey. Two of these sites were scarred trees, one was an artefact scatter and five were isolated finds. Only five of these eight sites are within the current study area for The Northern Road upgrade.

**Oran Park and Turner Road Precincts Aboriginal heritage investigation for proposed Infrastructure service routes and site options (Kelleher Nightingale Consulting KNC 2008).**

This study involved the Aboriginal heritage assessment of proposed infrastructure service routes and sites under consideration for the early release areas of Oran Park and Turner Road Precincts. The survey of these routes located seven new Aboriginal sites, and five areas of potential archaeological deposit. None of these newly recorded sites would be impacted by the upgrade of The Northern Road.

The assessment recommended that there were no constraints on development within the road corridor on either side of The Northern Road due to high levels of disturbance. It was recommended that a number of sites may be impacted by the proposed works outside the road corridor and within the Oran Park and Turner Road precincts. These included the following sites that are within the study area for The Northern Road upgrade assessment (OPM1, O-OS-2, HP01, O-IF-2, O-IF-3 and O-OS-1) but would not be impacted by the concept design. A section 90 AHIP was recommended for these sites if they were to be impacted by the Oran Park and Turner Road proposal.

**Archaeological excavations at the Oran Park and Turner Road precincts (ENSR/AECOM 2009).**

The archaeological test excavations at Oran Park involved a program of test pitting and open area excavations. Three hundred and forty test pits were excavated across a variety of landform units, with 160m² of open area excavated during salvage excavations. A total of 4780 artefacts were recovered from Phase 1 and Phase 2 excavations, with around three quarters of the artefacts made of silcrete. Approximately five per cent of the assemblage comprised of tools or cores including backed artefacts and scrapers.

The results of the excavations indicated a low density spread of archaeological material across the precinct which is argued to reflect a ‘pre-contact landscape of extensive but low intensity Aboriginal activity with evidence of strategic defensive positioning of campsites within a cultural interaction zone between different language groups’ (ENSR/AECOM 2009:ES1).

**Bringelly Road upgrade Camden Valley Way to The Northern Road Aboriginal cultural heritage assessment (Kelleher Nightingale Consulting KNC 2010).**

The KNC study followed on from the Austral Archaeology preliminary investigation for the Bringelly Road upgrade route. Forty-four Aboriginal sites were located along the Bringelly Road corridor during the KNC and
Austral site surveys. The majority of artefacts recorded were made of silcrete, mudstone or tuff. Artefacts were predominantly flakes or flake fragments, with smaller numbers of cores, flaked pieces and blades.

Six of the recorded sites are within the study area for The Northern Road upgrade project and one would be impacted by the proposal. A section 90 AHIP with or without artefact collection was recommended for five of these six sites. Salvage excavations were recommended for site BRP-IF-16 which is the site that would be impacted by the proposal.

5.4 Predictive model

The predictive model used in the Stage 2 PACHCI assessment comprised a series of statements about the nature and distribution of evidence of Aboriginal land use that would be expected in the study area. These statements were based on the information gathered regarding:

- Landscape context and landform units.
- Ethno-historical evidence of Aboriginal land use.
- Distribution of natural resources.
- Results of previous archaeological work in the vicinity of the study area.
- Predictive modeling proposed in previous investigations.

Predictive statements were as follows:

- Stone artefacts/artefact scatters would be the most likely Aboriginal site type. Previous studies in the region, as discussed above, have found that stone artefacts are the most common site type.
- Scarred trees may be located. Scarred trees are known to exist within the locality and where there is remnant old growth vegetation remaining there is a possibility of scarred trees being retained.
- Artefact densities would be generally low. Previous studies in the region, and close to the study area such as ENSR/AECOM 2009 have found that artefacts generally occur in a low density across the landscape with some isolated areas of higher density.
- Silcrete, silicified tuff and quartz would be the dominant raw materials. Previous studies have indicated that these raw materials are most common on the Cumberland Plain, including the locality of the study area.
- In situ artefacts would be located in areas of least ground disturbance.
- Artefacts may be located on terraces and slopes within 100 m of water, or on areas with a good outlook over the main valley up to several hundred meters away from water, although it would be likely there would be a fairly even spread of archaeological material across the landscape. This prediction was based on the models developed by White and McDonald (2010), and ENSR/AECOM (2009).
5.5 Aboriginal Heritage Information Management System (AHIMS)

A search of the Aboriginal Heritage Information System (AHIMS) database was undertaken on the 14 June 2011 for sites within the vicinity of the study area. In order to capture the large number of sites, two separate searches were undertaken, one of the southern section of the study area and one of the northern section. These searches overlapped so sites all listed sites were captured. (Search 1 E 56H 285788- 293939, N 6238814- 6248867; Search 2 56H E 285691 - 294050, N 6228827- 6238860). A total of 282 Aboriginal sites were identified by the search with 13 registered within the study area (Table 2). Sites that were found to have been previously destroyed as outlined in the ASR have not been included in this assessment.

An additional AHIMS search was conducted on 6 August 2012. As the original search was over 12 months old, it was considered out of date according to OEH guidelines. The new search was requested in two overlapping sections in order to capture the large number of sites (Search 1 56H E: 286500 - 293000, N: 6238900 – 6247000; Search 2 56H E: 288500 - 292500, N: 6229500 - 6239000). The only additional sites to be identified by the site search were those recorded by Artefact Heritage for this study.

During the additional site visit undertaken on 18 June 2012, Glenda Chalker from Cubbitch Barta Native Title Claimants identified two areas where she recalled artefacts being located on previous surveys with other consultants. No artefacts could be relocated by Glenda or the Artefact archaeologist. No recordings have been found for these locations in previous reports and the AHIMS database did not list sites in these locations. As no artefacts were found during the site visit, and both locations were within the road corridor in disturbed locations, no sites or PADs were recorded in these locations as a result of the site visit.

Information on the location of Aboriginal sites has been removed from this report as it is to enter the public domain.
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

Figure 2: AHIMS registered sites in the vicinity of the study area. Sites recorded during this study are not included.

Map removed as it contains sensitive cultural information
5.6 Previously recorded sites within the study area

The results of the Aboriginal Heritage Information Management System (AHIMS) search were that 13 previously recorded Aboriginal sites are located within the study area. As is the case throughout this report, the study area is described as the proposal impact area plus a buffer of 20 m.

5.6.1 52-2-1819 (IF1)

Site IF1 is an isolated find located on the northern edge of Fairwater Drive in a disturbed area next to a landscaped garden and path on a creek flat associated with Narellan Creek. This site is located in a highly disturbed context within the study area and within the proposal impact area.

5.6.2 52-2-3331 (O-OS-2)

Site O-OS-2 comprises two stone flakes located on a small exposure adjacent to an unsealed track five metres from the study area boundary. This site was originally assessed as being of low to moderate archaeological significance and it has been listed under AHIP 3380 for collection by the Aboriginal community.

5.6.3 52-2-3330 (O-IF-2)

Site O-IF-2 is located on a creek terrace and lower hillslope along the banks of a drainage line associated with Cobbitty Creek on a small exposure. The site was originally recorded as an isolated find, but additional artefacts were located during subsequent field surveys. The site is now recorded as comprising seven artefacts including a silcrete backed blade. This site is associated with HP01 and is the same site that was re-recorded at TNRU2 during the current survey. An update form would be submitted to AHIMS for this site. The site is within the study area and the proposal impact area.

5.6.4 52-2-3329 (HP01)

Site HP01 is located approximately 10 m north of a drainage line that is currently dry on a lower hillslope. It is situated on a small area of exposure that has been subject to minimal disturbance. The site includes two silcrete flakes and one broken silicified tuff flake. The site is located approximately five metres west of the study area, but forms part of a broader site complex including TNRU02/O-IF-2. This site has been listed under AHIP 3380 for collection by the Aboriginal community.

5.6.5 52-2-3803 (O-IF-3)

Site O-IF-3 is an isolated quartzite flake located 100 m southwest of the intersection of The Northern Road and Cobbitty Road on a lower hillslope, and approximately 30 m from Cobbitty Road. The original assessment of the site (Kelton 2004) assessed the site as being disturbed with a low archaeological potential. The site is located within the study area but not within the proposal impact area. This site has been listed on AHIP 3380.
Site OPM-1 consists of a tuff flake located on a flat area on a small exposure to the west of The Northern Road opposite the old Oran Park raceway. This site is included under the AHIP granted for the development of the Oran Park West precinct (AHIP 1116799 – July 2010). The site has not yet been destroyed, although the s90 is valid until 2017 for works associated with the development of Oran Park West. This site is within the study area but not within the proposal impact area.

Site OPD-14 consists of an isolated artefact approximately 50 m north of a minor drainage line 100 m to the east of The Northern Road. This site is listed on the AHIP granted for the development of the Oran Park West precinct (AHIP 1116799 – July 2010). The site has not yet been destroyed, although the s90 is valid until 2017 for works associated with the development of Oran Park West. This site is not within the study area.

Site TNR2 consists of one silcrete flake and one quartz flake piece. It was recorded by Jo McDonald Cultural Heritage Management as part of the assessment of the proposed area of a 33kV feeder line for Endeavour Energy. The site co-ordinates as registered with AHIMS appear to be in error, probably as they were registered with AHIMS as AGD instead of GDA datum co-ordinates. If the datum system listed with AHIMS does not match the datum system the site was recorded in, the mapped site location will be in error by about 200 m. The site is therefore located in a relatively undisturbed context on a lower hillslope on the western side of The Northern Road but it is not within the study area.

Site NR4 is a red silcrete flake which was recorded on an exposed area on a driveway within the study area and within the proposal impact area. The site is within 50 m of a minor drainage line on a lower hill slope. The site area has been disturbed by vehicle and stock movements, and it would be possible that the artefact may have been brought in with road gravels used to top the driveway.

Site NR5 is a red silcrete flake located to the west of the current road corridor within the study area. At the time of the survey it was observed that the paddock had been ploughed and was currently used as pasture. The site area has been disturbed by agricultural practices and stock movements. The site is within the study area and the proposal impact area.

Site NRST1 is a scarred tree located just outside the current road corridor approximately 200 m north of Lowes Creek on the edge of the floodplain. The tree is 15 m-20 m tall with a circumference of 2.6 m. The scar is small.
and oval shaped measuring 33 cm x 13 cm with 6-8 cm of regrowth. The tree has had some branches lopped during the construction of the transmission line but is still living. The tree is within the study area but not within the proposal impact area.

Plate 1: Site NRST1 (Artefact Heritage 27/9/12).

Figure 3: Site NRST1 in relation to concept design (SKM sketch).

Map removed as it contains sensitive cultural information
5.6.12  45-5-3545 (NRPAD2)

NRPAD2 was recorded by Biosis during their 2008 survey and is located on the eastern side of The Northern Road approximately 10 m to the east of the road corridor and NRST1. The PAD consists of a small raised alluvial terrace on the edge of the Lowes Creek floodplain about 300 m to the north of Lowes Creek. The dimensions of the PAD were not specified by Biosis but the mud map attached to the site card indicates that it covers an area of approximately 40 m x 50 m. NRPAD2 is outside the study area.

*Figure 4: Location of NRPAD2 outlined in red.*

Map removed as it contains sensitive cultural information

5.6.13  45-5-3547 (NRST2)

Site NRST2 was recorded as a scarred tree by Biosis during the preliminary investigation for The Northern Road upgrade. The tree is located within The Northern Road corridor approximately 200 m south of Carrington Road. After inspection during the current survey there was some question as to whether the tree was culturally scarred. The tree does not appear to be old enough to have been culturally scarred and the scar shape is not consistent with cultural scarring. The Aboriginal representatives attending the survey agreed that the tree was unlikely to be an Aboriginal site. This was confirmed by an arborist who was engaged by RMS. The arborist’s conclusion was that the tree was too young to have Aboriginal heritage values associated with it and the trunk wounds are far more likely to have been caused by accidental mechanical damage (Hare 2012). The tree is within the study area and the proposal impact area.
5.6.14 45-5-3544 (NR6)

Site NR6 is a quartzite ‘scraper’ which was located in a large exposure at the front of a small lot. The site is within the study area but not within the proposal impact area. Two other artefacts were located within 20 m of this site during the site survey. This site has been disturbed by leveling and erosion. The soil profile has been truncated with clay observed at the surface. It would be unlikely that significant subsurface deposits remain within this area.

5.6.15 45-5-3886 (BRP-IF-16)

Site BRP-IF-16 consists of an isolated silcrete artefact located along a property access track at No. 993 Bringelly Road within the study area and within the proposal impact area. The artefact is located approximately 10 m south of Bringelly Road in an exposed area less than 1 m². The site landform consists of a relatively intact north-facing upper slope of a low hill top. This area encompasses the crest of the low hill-top and the north and west running slopes from the hill-top. The site exhibits some archaeological potential related to its landscape position, association with known archaeological sites and access to a range of resources (KNC 2010). New artefacts were recorded at this site during the Stage 2 survey.

5.6.16 45-5-3888 (BRP-S-01)

Site BRP-S-01 consists of one chert and four silcrete artefacts located behind a row of shops that front The Northern Road on a gentle hill slope. The site is within the study area but not within the proposal impact area. The area was covered with thick grass at the time of the current site survey with no ground surface visibility. The original recording noted that the site was highly disturbed (KNC 2010).
5.6.17  45-S-3889 (BRP-S-02)

Site BRP-S-02 consists of two chert flakes and two silcrete flakes located at the north side of a dam exposure approximately 20 m south of Greendale Road West and within the study area but not within the proposal impact area. The dam is located at No. 20 Greendale Road West, approximately 175 m west the junction with The Northern Road. The site is located along the east bank of a minor drainage line of Thompson’s Creek. The exposures described by the original recording where largely grown over at the time of the Stage 2 site inspection (KNC 2010).

5.6.18  45-S-3890 (BRP-S-03)

Site BRP-S-03 consists of one tuff flake and one mudstone flaked piece located on the southern side of Greendale Road West in front of the Integral Energy, Bringelly Zone Substation within the study area but not within the proposal impact area. The site landform is gentle lower hill slope and marginal floodplain associated with a minor drainage channel approximately 80 m west of the area. The tuff flake was located in the disturbed entrance area to the substation, approximately 30 m west of the substation entrance and approximately two metres from Greendale Road. The area has been highly modified from the building of the substation, road base/fill deposition and ground penetration works such as drainage pipe construction (KNC 2010).

5.6.19  45-S-3891 (BRP-S-04)

Site BRP-S-04 consists of a small artefact scatter located in front of property No. 1226, The Northern Road. The site landform consists of gentle, north-west facing hill slope approximately 130 m east of a minor drainage channel of Thompson’s Creek. Sites BRP-S-01 and BRP-S-02 are located to the south of the area along the same drainage channel. Two chert flakes and one mudstone flake were located over an area of 70 m heading south from the driveway of the property. The exposure area in front of the property fence is likely due to vehicle use. The area is disturbed by contemporary development (KNC 2010). The site is approximately five metres outside the study area.

5.6.20  45-S-3895 (BRP-S-08)

Site BRP-S-08 consists of a scatter of six silcrete and four chert artefacts located on the Bringelly Public School grounds. BRP-S-08 surface artefacts have been collected as part of Austral Archaeology’s 2010 assessment. The artefacts are now held by OEH. The artefacts were recorded behind Classroom J, adjacent to the basketball court and front access gate to The Northern Road. The area is covered with imported sand for grass growing. A number of artefacts were located within the imported sand in an area 50 m long x 50 m wide. Artefacts were also found in the garden next to the basketball court or areas of exposure where imported sand had not been spread. The majority of the identified artefacts have been brought into the area within the imported sand. The landform is not archaeologically significant. BRP-S-08 is likely part of a larger site (now disturbed) that encompasses site BRP-S-04 (KNC 2010). The site is within the study area bit not within the proposal impact area.
Table 2: Previously recorded sites and PADs within the vicinity of the study area.

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name</th>
<th>AGD/GDA E=error</th>
<th>Easting</th>
<th>Northing</th>
<th>Site type</th>
<th>Recorder</th>
<th>Site within the study area?</th>
<th>Within the proposal impact area?</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-2-1819</td>
<td>IF1 (Harrington Park)</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>English/Gay</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>52-2-3331</td>
<td>O-OS-2</td>
<td>GDA/E</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>AMBS</td>
<td>No/5m</td>
<td>No</td>
</tr>
<tr>
<td>52-2-3330</td>
<td>O-IF-2</td>
<td>GDA/E</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>AMBS</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>52-2-3329</td>
<td>HPO1</td>
<td>GDA/E</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>AMBS</td>
<td>No/ c.5m</td>
<td>No</td>
</tr>
<tr>
<td>52-2-3803</td>
<td>O-IF-3</td>
<td>AGD</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Kelton</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>52-2-3538</td>
<td>OPM-1</td>
<td>AGD/E</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Oakes/JMcDCHM</td>
<td>No (Peter Brock Drive)</td>
<td>No</td>
</tr>
<tr>
<td>52-2-3535</td>
<td>OPD-14</td>
<td>AGD/E</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Oakes/JMcDCHM</td>
<td>No (Peter Brock Drive)</td>
<td>No</td>
</tr>
<tr>
<td>45-5-3800</td>
<td>TNR2</td>
<td>AGD/E</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>JMcDCHM</td>
<td>No (Peter Brock Drive)</td>
<td>No</td>
</tr>
<tr>
<td>45-5-3542</td>
<td>NR4</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Biosis</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3543</td>
<td>NR5</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Biosis</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>45-5-3546</td>
<td>NRST1</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Scarred Tree</td>
<td>Biosis</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>45-5-3545</td>
<td>Northern Rd PAD2</td>
<td>GDA</td>
<td></td>
<td></td>
<td>PAD</td>
<td>Biosis</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>
### The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name</th>
<th>AGD/GDA</th>
<th>Easting</th>
<th>Northing</th>
<th>Site type</th>
<th>Recorder</th>
<th>Site within the study area?</th>
<th>Within the proposal impact area?</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-S-3547*</td>
<td>NRST2</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Scarred Tree (not a site)</td>
<td>Biosis</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>45-S-3544</td>
<td>NR6</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Biosis</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>45-S-3886</td>
<td>BRP-IF-16</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Isolated find</td>
<td>Austral/KNC</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>45-S-3888</td>
<td>BRP-S-01</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>Austral/KNC</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>45-S-3889</td>
<td>BRP-S-02</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>Austral/KNC</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>45-S-3890</td>
<td>BRP-S-03</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact scatter</td>
<td>Austral/KNC</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td>45-S-3891</td>
<td>BRP-S-04</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact Scatter</td>
<td>Austral/KNC</td>
<td>No/ c.5m</td>
<td>No</td>
</tr>
<tr>
<td>45-S-3895</td>
<td>BRP-S-08</td>
<td>GDA</td>
<td></td>
<td></td>
<td>Artefact Scatter</td>
<td>Austral/KNC</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>

*45-S-3547 has been assessed by an arborist. The arborists conclusion was that the tree was too young to have Aboriginal heritage values associated with it. The scar was more likely to have been caused by mechanical damage.
5.7 Newly recorded Aboriginal sites

Fourteen new Aboriginal sites were located during the Stage 2 PACHCI site survey; two of these sites were later found to be re-recordings of previously registered sites and two were outside the study area. Five sites were artefact scatters and nine were isolated finds.

5.7.1 TNRU1

Site TNRU1 is an isolated find located on the edge of the Sydney Water sewerage construction works within the study area and within the proposal impact area. The white tuff flake was located behind a tree on the edge of the area of disturbance associated with the works. The site is within a lower hill slope between two dry tributaries of Cobbitty Creek. The sewer construction works extend to five meters to the west of the isolated find but the area immediately around the site and to its east is relatively undisturbed.

Plate 3: TNRU1 location: facing north-east.
Plate 4: Artefact at TNRU1.

5.7.2 TNRU2/O-IF-2

Site TNRU2 is located on an exposed track 15 m from the edge of the current road corridor on the western side of The Northern Road just south its intersection with Cobbitty Road and within the study area and the proposal impact area. This site is a re-recording of site O-IF-2. The artefacts recorded during this survey are located on the bank of a tributary of Cobbitty Creek. From the edge of the creek bank the ground slopes gently upwards towards The Northern Road in the east and to the north and south. The lower slopes adjacent to the creek have a low ground surface visibility due to grass cover, but are likely to contain buried archaeological deposits. This site is the same as previously recorded site O-IF-2 (AHIMS# 52-2-3330) and would be registered as a site card update. The extended site is assessed as encompassing a terrace formation which runs between the road corridor and the drainage line, and to the north towards Cobbitty Road. The area is outlined in Appendix D.
5.7.3 TNRU3

Site TNRU3 is located on a small exposure 30 m west of the road corridor within a paddock currently used for stock grazing and within the study area and the proposal impact area. The site is within a flat area situated approximately 200 m to the northwest of a minor tributary of South Creek. The site is adjacent to a stand of small trees. The area has been disturbed through clearing, ploughing and stock movements.

5.7.4 TNRU4

Site TNRU4 is a scatter of 13 artefacts found along a dam wall 200 m north of Lowes Creek within the study area and within the proposal impact area. The dam is situated on a gradual slope at the edge of the Lowes Creek floodplain. A number of mature trees remain around the northern edge of the dam and scattered around the paddock. The area surrounding the dam has a very low ground surface visibility due to thick grass cover. The artefacts exposed by the construction of the dam wall are likely to have originated as
buried archaeological deposits. Considering this, and the relatively low disturbance of the area surrounding the site, it is likely that further buried deposits remain within the vicinity of the dam, particularly on the lower slope and terrace to the north of TNRU4. The extent of the site is therefore assessed as encompassing a lower hill slope which rises to the north upwards from the flood plain of Lowes Creek. The site is mapped in Appendix D.

5.7.5 TNRU5

Site TNRU5 is an isolated artefact located on the wall of a small dam 60 m to the north of Lowes Creek within the study area and within the proposal impact area. TNRU5 is approximately 160 m to the south of site TNRU4. The site is located on the floodplain of Lowes Creek with localised disturbance around the dam. The area in general has low levels of ground disturbance, but has probably been subject to numerous flooding events.
5.7.6 TNRU6

Site TNRU6 consists of two artefacts located on a 15 m x 15 m exposure within the study area and within the proposal impact area. The site is within a lower hillslope landform unit, which rises gently upwards to the south-west. The area is relatively undisturbed and has probably been cleared and used for grazing. The extended area of this site encompasses the lower hillslope landform unit. This landform extends across to the eastern side of The Northern Road and encompasses sites TNRU7, TNRU 8 and 45-5-344. These sites, along with TNRU6, would have once formed a large site complex which has since been highly disturbed on the eastern side of the road. The extended site area is mapped in Appendix D.

5.7.7 TNRU7

Site TNRU7 consists of seven artefacts scattered across an area of 100 m x 20 m within the front paddock of a small property lot at 1375 The Northern Road, Bringelly. The site is within the study area and within the proposal impact area.
A small tributary of Lowes creek runs 20 m to the north of the property with a gentle slope upwards towards the south. The site area has recently been graded with topsoil pushed across to form an earthen bank along The Northern Road. The removal of topsoil has exposed subsoil along with artefacts that would have been buried within it. Although this area contained a relatively high number of artefacts the archaeological potential has been compromised by the disturbance of the topsoil.

5.7.8 TNRU8

Site TNRU8 is an isolated silcrete flake located at 1074 The Northern Road, Bringelly fronting the road corridor within the study area but outside the proposal impact area. The artefact was located on a large exposure 10 m x 15 m. The area has been cleared and appears to have been graded or leveled. Clay was evident at the surface over some exposures.

5.7.9 TNRU9

Site TNRU9 is an isolated artefact located on a disturbed exposure at the site of demolished house at 1340 The Northern Road, Bringelly. The site is within the study area and within the proposal impact area. The landform unit is a low ridgeline with the closest waterway being Thompson’s Creek almost half a kilometre to the south. It is possible that this artefact was brought it with road gravels or construction material associated with the demolished house.
5.7.10 TNRU10

Site TNRU10 is an isolated quartz fragment located on a dam wall on an upper hillslope rising to a ridgeline to the north. The isolated find is within the study area and the proposal impact area. The area has used for grazing but does not appear to have been ploughed and therefore remains relatively undisturbed. There is a large stand of mature trees to the north of the site. The site is assessed as being an extended area to the north of the isolated find, encompassing the stand of mature trees and the upper hillslope landform unit. The extended site area has been mapped in Appendix D.

5.7.11 TNRU11

Site TNRU11 is an isolated find located on a small exposure within a large stand of mature trees. The area is on an upper hillslope rising to a ridgeline to the north and is relatively undisturbed. This site is 50 m outside the study area.
Plate 23: Site TNRU11 location: facing north.

Plate 24: Artefact at TNRU11.

5.7.12 TNRU12

Site TNRU12 is an isolated find located on a dam wall at 621 The Northern Road, Cobbitty. The site is within lower hillslope landform unit although as it is located on a dam wall it was uncertain as to where the artefact originated. The area around the dam has been subject to low/moderate disturbance with some evidence of ploughing and intensive cropping. This site is approximately 100 m outside the study area.

Plate 25: Site TNRU12 location: facing west.

Plate 26: Isolated find at TNRU12.

5.7.13 TNRU13

Site TNRU13 comprises two artefacts within 20 m of each other on a large exposure along the front of the property at 11 The Northern Road, Bringelly. The site is within the study area. It appears that the area has been graded and leveled with truncation of the topsoil. Clay is evident at the surface and it is unlikely that significant subsurface archaeological deposits remain within the area. TNRU13 is within 100 m of TNRU8 and site AHIMS# 45-5-3544 recorded on the 2008 survey (Biosis 2008). The closest permanent water source is South Creek about one kilometre to the east.
5.7.14 **TNRU14/site BRP-IF-16**

Site TNRU14 is located on an exposure within a BMX track 10 m from the Bringelly road corridor to the east of its intersection with The Northern Road at 993 Bringelly Road. TNRU14 is 40 m to the east of the site BRP-IF-16 (AHIMS # 45-5-3886) recorded by Austral and KNC for the Bringelly Road upgrade study and therefore will be recorded as additional information for this previously registered site. The extended site area is within an east-west running ridgeline on a low hilltop. The extended site area is within the study area and the proposal impact area, and is mapped in Appendix D.
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

Table 3: Summary of Aboriginal sites.

<table>
<thead>
<tr>
<th>AHIMS number</th>
<th>Site Names</th>
<th>Easting</th>
<th>Northing</th>
<th>AGD/GDA E=error</th>
<th>Site Type</th>
<th>Within the study area</th>
<th>Within the proposal impact area?</th>
<th>Disturbance levels</th>
<th>Landform Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-2-1819</td>
<td>IF1 (Harrington Park)</td>
<td>AGD</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>Flat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3331</td>
<td>O-OS-2</td>
<td>GDA/E</td>
<td>Artefact scatter</td>
<td>No/5m</td>
<td>No</td>
<td>Moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3330</td>
<td>O-IF-2/TNRU 2</td>
<td>GDA/E</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>Yes</td>
<td>Low</td>
<td>Lower hillslope/terrace</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3329</td>
<td>HPO1</td>
<td>GDA/E</td>
<td>Artefact scatter</td>
<td>No/c. 5m</td>
<td>No</td>
<td>Low</td>
<td>Hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3803</td>
<td>O-IF-3</td>
<td>AGD</td>
<td>Isolated find</td>
<td>Yes</td>
<td>No</td>
<td>Moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3538</td>
<td>OPM-1</td>
<td>AGD/E</td>
<td>Isolated find</td>
<td>No (Peter Brock Drive)</td>
<td>No</td>
<td>Moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>52-2-3535</td>
<td>OPD-14</td>
<td>AGD/E</td>
<td>Isolated find</td>
<td>No (Peter Brock Drive)</td>
<td>No</td>
<td>Moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-5-3800</td>
<td>TNR2</td>
<td>AGD/E</td>
<td>Artefact scatter</td>
<td>No (Peter Brock Drive)</td>
<td>No</td>
<td>Low/moderate</td>
<td>Flat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-5-3542</td>
<td>NR4</td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-5-3543</td>
<td>NR5</td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Yes</td>
<td>Low/moderate</td>
<td>Lower hillslope</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45-5-3546</td>
<td>NRST1</td>
<td>GDA</td>
<td>Scarred Tree</td>
<td>Yes</td>
<td>No</td>
<td>Low</td>
<td>Flat</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>AHIMS number</th>
<th>Site Names</th>
<th>Easting</th>
<th>Northing</th>
<th>AGD/GDA</th>
<th>Site Type</th>
<th>Within the study area</th>
<th>Within the proposal impact area?</th>
<th>Disturbance levels</th>
<th>Landform Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-5-3545</td>
<td>Northern Rd PAD2</td>
<td></td>
<td></td>
<td>GDA</td>
<td>PAD</td>
<td>No/c. 20m</td>
<td>No</td>
<td>Low</td>
<td>Creek flat/terrace</td>
</tr>
<tr>
<td>45-5-3547</td>
<td>NRST2</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Scarred Tree</td>
<td>Yes</td>
<td>Yes</td>
<td>Low</td>
<td>Flat</td>
</tr>
<tr>
<td>45-5-3544</td>
<td>NR6</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>No</td>
<td>Moderate</td>
<td>Hillslope</td>
</tr>
<tr>
<td>45-5-3886</td>
<td>BRP-IF-16/TNRU14</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>Yes</td>
<td>Low</td>
<td>Upper Hillslope</td>
</tr>
<tr>
<td>45-5-3888</td>
<td>BRP-S-01</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>Hillslope</td>
</tr>
<tr>
<td>45-5-3889</td>
<td>BRP-S-02</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>Lower hillslope</td>
</tr>
<tr>
<td>45-5-3890</td>
<td>BRP-S-03</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>Hillslope</td>
</tr>
<tr>
<td>45-5-3891</td>
<td>BRP-S-04</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact Scatter</td>
<td>No/ c.5m</td>
<td>No</td>
<td>High</td>
<td>Hillslope</td>
</tr>
<tr>
<td>45-5-3895</td>
<td>BRP-S-08</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact Scatter</td>
<td>Yes</td>
<td>No</td>
<td>High/moderate</td>
<td>Flat</td>
</tr>
<tr>
<td>52-2-3920</td>
<td>TNRU1</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Yes</td>
<td>Low</td>
<td>Lower hillslope</td>
</tr>
<tr>
<td>45-5-4139</td>
<td>TNRU3</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Yes</td>
<td>Moderate</td>
<td>Flat</td>
</tr>
</tbody>
</table>
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>AHIMSn</th>
<th>Site Names</th>
<th>Easting</th>
<th>Northing</th>
<th>AGD/GDA</th>
<th>Site Type</th>
<th>Within the study area</th>
<th>Within the proposal impact area?</th>
<th>Disturbance levels</th>
<th>Landform Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-5-4140</td>
<td>TNRU4</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact Scatter</td>
<td>Yes</td>
<td>Yes</td>
<td>Locally high due to dam construction. Generally low in vicinity of the site.</td>
<td>Lower hillslope</td>
</tr>
<tr>
<td>45-5-4141</td>
<td>TNRU5</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Yes</td>
<td>Locally high due to dam construction. Generally low in vicinity of the site.</td>
<td>Creek flat</td>
</tr>
<tr>
<td>45-5-4142</td>
<td>TNRU6</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>Yes</td>
<td>Low</td>
<td>Lower hillslope</td>
</tr>
<tr>
<td>45-5-4143</td>
<td>TNRU7</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>Lower hillslope</td>
</tr>
<tr>
<td>45-5-4144</td>
<td>TNRU8</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>No</td>
<td>Moderate</td>
<td>Upper hillslope</td>
</tr>
<tr>
<td>45-5-4145</td>
<td>TNRU9</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Yes</td>
<td>High</td>
<td>Low ridgeline</td>
</tr>
<tr>
<td>45-5-4146</td>
<td>TNRU10</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>Yes</td>
<td>Yes</td>
<td>Low</td>
<td>Low ridgeline</td>
</tr>
<tr>
<td>45-5-4147</td>
<td>TNRU11</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>No/ c. 50m</td>
<td>No</td>
<td>Low</td>
<td>Upper hillslope</td>
</tr>
<tr>
<td>45-5-4148</td>
<td>TNRU12</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Isolated find</td>
<td>No/ c. 100m</td>
<td>No</td>
<td>Locally high due to dam construction. Generally low in vicinity of the site.</td>
<td>Lower hillslope</td>
</tr>
<tr>
<td>45-5-4149</td>
<td>TNRU13</td>
<td></td>
<td></td>
<td>GDA</td>
<td>Artefact scatter</td>
<td>Yes</td>
<td>No</td>
<td>High</td>
<td>Upper hillslope</td>
</tr>
</tbody>
</table>
5.8 Effective survey coverage

Ground visibility was very low throughout most of the study area due to thick grass cover promoted by a season of high rainfall. Sections of the study area were highly disturbed, especially along the road corridor and where localised disturbance has taken place, including construction of buildings, roads and dams. Overall the effective survey coverage was relatively low, estimated to be 2% of the study area. This level of survey coverage was adequate for the purposes of the study.

Table 4: Survey coverage

<table>
<thead>
<tr>
<th>Survey area (estimate)</th>
<th>Landform</th>
<th>Visibility (%)</th>
<th>Exposure (%)</th>
<th>Effective coverage area</th>
<th>Effective coverage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,460,000m²</td>
<td>The landform of the survey area varied from gently undulating hills to creek flats. Several hill tops and ridgelines were also within the survey area.</td>
<td>10%</td>
<td>20%</td>
<td>29,200</td>
<td>2%</td>
</tr>
</tbody>
</table>
6.0 Significance assessment

6.1 What are cultural heritage values?

This significance assessment has been undertaken in accordance with the OEH Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in New South Wales 2010.

Cultural heritage consists of places, or objects, that are of significance to Aboriginal people. Cultural heritage values are the attributes of these places or objects that allow the assessment of levels of cultural significance.

6.2 What is cultural significance?

Assessing the cultural significance of a place or object means defining why a place or object is culturally important. It is only when these reasons are defined that measures can be taken to appropriately manage possible impacts on this significance. Assessing cultural significance involves two main steps, identifying the range of values present across the study area and assessing why they are important.

6.3 Social/cultural heritage values and significance?

Social/cultural heritage significance should be addressed by the Aboriginal people who have a connection to, or interest in, the area. As part of the consultation process the registered Aboriginal stakeholder groups were asked to provide appropriate information on the cultural significance of the study area. The Aboriginal stakeholder groups indicated that the study area as a landscape was of cultural significance. No particular areas of cultural significance, apart from the Aboriginal sites discussed by this study, were identified by the stakeholder groups.

6.4 Historic values and significance

Historic values refer to the association of the place with aspects of Aboriginal history. Historic values are not necessarily reflected in physical objects, but may be intangible and relate to memories, stories or experiences.

The study area is in the vicinity of areas of high Aboriginal historic significance, such as the colonial estates of Denbigh, Maryland, Oran Park and Orielton. Evidence of early Aboriginal historical associations has been found at Oran Park in the form of flaked glass (JMcDCHM 2007) and Aboriginal people were known to camp within the estates in the 1800s. Although the study area exists within a broader landscape of high historic significance, the study area itself does not hold historic value in isolation. No evidence of post-contact Aboriginal occupation was noted, and no historical records or oral histories were found which described historic values of the study area. The study area has therefore been assessed as having a low historic significance.
6.5 **Scientific/archaeological values and significance**

Archaeological significance refers to the archaeological or scientific importance of a landscape or area. This would be characterised using archaeological criteria such as archaeological research potential, representativeness and rarity of the archaeological resource and potential for educational values. These have been outlined below:

- Research potential: does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state’s natural and cultural history?
- Representativeness: how much variability (outside and/or inside the subject area) exists, what is already conserved, how much connectivity is there?
- Rarity: is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practised? Is it in danger of being lost or of exceptional interest?

Scientific significance was assessed using criteria to evaluate the contents of a site, state of preservation, integrity of deposits, representativeness of the site type, rarity/uniqueness and potential to answer research questions on past human behaviour (NPWS 1997).

The following significance assessment has been made for the sites identified in this report.

- Twenty-four Aboriginal sites identified by this study have been assessed as having a low archaeological significance. This assessment was generally made based on the disturbance levels of the site and the number of artefacts present at the site in relation to ground surface visibility. In one case a site (TNRU7) contained relatively high numbers of artefacts but was in a highly disturbed context. The site had a high ground surface visibility and therefore it would be likely that most artefacts present were recorded. In this case the assessment of archaeological significance as low reflected the lack of intact deposit and archaeological context as well as the low potential for further significant archaeological material to remain at the site. The representative and rarity values of these sites were low.

- Seven Aboriginal sites identified within the study area have been assessed as having a moderate archaeological significance. In the case of these sites their representativeness and rarity values were moderate with potential for research value. If sites with a moderate archaeological significance are to be impacted further archaeological work would be conducted to mitigate against these impacts.

- One Aboriginal site identified within the study area has been assessed as having a high archaeological significance. It is possible that NRST1 is a culturally scarred tree and it is known to be of particular significance to local Aboriginal groups. This was related to the archaeologist during the Stage 2 site survey. Surviving scarred trees are rare in the Sydney metropolitan area and remaining scarred trees should be conserved for their high archaeological and cultural significance.
### Table 5: Summary of significance values.

<table>
<thead>
<tr>
<th>Site name</th>
<th>Research Potential</th>
<th>Scientific / Archaeological Value</th>
<th>Representative Value</th>
<th>Rarity Value</th>
<th>Overall Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td>IF1 (Harrington Park)</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>O-OS-2</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>O-IF-2/TNRU2</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>HP01</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>O-IF-3</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>OPD-14</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>OPM-1</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>TNR2</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NR4</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NR5</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NRST1</td>
<td>High</td>
<td>High</td>
<td>Moderate</td>
<td>High</td>
<td>High</td>
</tr>
<tr>
<td>Northern Rd PAD2</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Low</td>
<td>Moderate</td>
</tr>
<tr>
<td>NRST2</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>NR6</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>BRP-IF-16/TNRU14</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
<td>Moderate</td>
</tr>
<tr>
<td>BRP-S-01</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>BRP-S-02</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>BRP-S-03</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>BRP-S-04</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>BRP-S-08</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
</tbody>
</table>
6.6  Aesthetic values and significance

Aesthetic values refer to the sensory, scenic, architectural and creative aspects of the place. These values may be related to the landscape and are often closely associated with social/cultural values. Much of the undeveloped land surrounding the study area retains some aesthetic significance. Sections of the study area such as in the south around Harrington Park have been highly modified and have not retained aesthetic values. The study area as a whole therefore has a moderate aesthetic significance. Aboriginal stakeholders did not have further input on assessment of aesthetic values.

6.7  Statement of significance

The study area was assessed as having a low historical significance in regard to Aboriginal heritage, in the context of a locality with high historical heritage values. The overall aesthetic significance of the study area was assessed as
being moderate with the central section of the study area retaining natural landscapes having higher aesthetic values than the recently highly modified landscapes in the south and north of the study area.

Twenty four Aboriginal sites with a low archaeological significance were located within the study area, with seven sites with moderate archaeological significance and one scarred tree with a high archaeological significance.

No particular areas of cultural significance were identified by the Aboriginal groups although the cultural importance of the landscape as a whole was discussed at the AFG.
7.0 Statutory requirements

This study has been undertaken in the context of several pieces of legislation that relate to Aboriginal heritage and its protection in New South Wales.

**National Parks and Wildlife Act (1974)**

The *National Parks & Wildlife Act 1974*, administered by the OEH provides statutory protection for all Aboriginal ‘objects’ (consisting of any material evidence of the Aboriginal occupation of NSW) under Section 90 of the Act, and for ‘Aboriginal Places’ (areas of cultural significance to the Aboriginal community) under Section 84.

The protection provided to Aboriginal objects applies irrespective of the level of their significance or issues of land tenure. However, areas are only gazetted as Aboriginal Places if the Minister is satisfied that sufficient evidence exists to demonstrate that the location was and/or is, of special significance to Aboriginal culture.

The Act was recently amended (2010) and as a result the legislative structure for seeking permission to impact on heritage items has changed. An s.90 permit is now the only Aboriginal Heritage Impact Permit (AHIP) available and is granted by the OEH. Various factors are considered by OEH in the AHIP application process, such as site significance, Aboriginal consultation requirements, ESD principles, project justification and consideration of alternatives. The penalties and fines for damaging or defacing an Aboriginal object have also increased.

As part of the administration of Part 6 of the Act OEH has developed regulatory guidelines on Aboriginal consultation, which are outlined in *Aboriginal Cultural Heritage Consultation Requirements for Proponents* (2010). Guidelines have also been developed for the processes of due diligence - *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW* (2010), and for investigation of Aboriginal objects - *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (2010) in accordance with the 2010 amendment to the Act.

**Heritage Act (1977)**

The *Heritage Act 1977* is administered by the Department of Premier and Cabinet and protects the natural and cultural heritage of NSW. Generally this Act only pertains to Aboriginal Heritage if it is listed on the State Heritage Register, or subject to an interim heritage order.

**Aboriginal Land Rights Act (1983)**

The *Aboriginal Land Rights Act 1983* is administered by the NSW Department of Human Services - Aboriginal Affairs. This Act established Aboriginal Land Councils (at State and Local levels). These bodies have a statutory obligation under the Act to; (a) take action to protect the culture and heritage of Aboriginal persons in the council’s area,
subject to any other law, and (b) promote awareness in the community of the culture and heritage of Aboriginal persons in the council's area.

**Native Title Act (1994)**

The Native Title Act 1994 was introduced to work in conjunction with the Commonwealth Native Title Act. Native Title claims, registers and Indigenous Land Use Agreements are administered under the Act.
### 8.0 Impact assessment

#### 8.1 Summary of impacts

Fourteen Aboriginal sites would be directly impacted by the proposal (Table 6). Ten Aboriginal sites may be subject to indirect impacts as they are within the study area and within 20 m of the proposal impact area. Seven sites would not be directly or indirectly impacted by the proposal as they are more than 20 m from the proposal impact area (Table 7). It should be a priority for RMS to ensure that the sites that are outside the proposal impact area, and that do not already have AHIPs attached, are conserved.

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site names</th>
<th>Site type</th>
<th>Significance</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-2-1819</td>
<td>IF1 (Harrington Park)</td>
<td>Isolated find</td>
<td>Low</td>
<td>Site IF1 would be subject to direct impacts from construction of the Fairwater Drive link road.</td>
</tr>
<tr>
<td>52-2-3330</td>
<td>O-IF-2/TNRU2</td>
<td>Artefact scatter</td>
<td>Moderate</td>
<td>Site O-IF-2/TNRU2 would be directly impacted by the widening of The Northern Road. The site will be within an area subject to earthworks.</td>
</tr>
<tr>
<td>45-5-3542</td>
<td>NR4</td>
<td>Isolated find</td>
<td>Low</td>
<td>Site NR4 would be directly impacted by ground works at the edge of the road corridor and a site compound area.</td>
</tr>
<tr>
<td>45-5-3543</td>
<td>NR5</td>
<td>Isolated find</td>
<td>Low</td>
<td>The location of site NR5 would be directly impacted by lane widening and will be within the new road corridor.</td>
</tr>
<tr>
<td>45-5-3547</td>
<td>NRST2</td>
<td>Scarred Tree</td>
<td>Low</td>
<td>Site NRST2 would be directly impacted by the proposed road widening. An arborists report has concluded that this tree is too young to be culturally scarred and the mark is most likely to be a result of mechanical damage.</td>
</tr>
<tr>
<td>45-5-3886</td>
<td>BRP-IF-16/TNRU14</td>
<td>Artefact scatter</td>
<td>Moderate</td>
<td>Site BRP-IF-16/TNRU14 would be directly impacted by the road widening and earthworks at the edge of the road widening.</td>
</tr>
<tr>
<td>52-2-3920</td>
<td>TNRU1</td>
<td>Isolated find</td>
<td>Low</td>
<td>Site TNRU1 would be directly impacted earthworks associated with the widening of The Northern Rd.</td>
</tr>
<tr>
<td>45-5-4139</td>
<td>TNRU3</td>
<td>Isolated find</td>
<td>Low</td>
<td>Site TNRU3 would be directly impacted by a sediment basin.</td>
</tr>
<tr>
<td>45-5-4140</td>
<td>TNRU4</td>
<td>Artefact Scatter</td>
<td>Moderate</td>
<td>Site TNRU4 would be directly impacted by the infilling of the dam in association with the widening of The Northern Road.</td>
</tr>
<tr>
<td>45-5-4141</td>
<td>TNRU5</td>
<td>Isolated find</td>
<td>Low</td>
<td>Site TNRU5 would be directly impacted by earthworks associated with the widening of The Northern Road.</td>
</tr>
<tr>
<td>45-5-4142</td>
<td>TNRU6</td>
<td>Artefact scatter</td>
<td>Moderate</td>
<td>Site TNRU6 would be directly impacted by earthworks associated with the widening of The Northern Road.</td>
</tr>
</tbody>
</table>
The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site name(s)</th>
<th>Site type</th>
<th>Significance</th>
<th>Impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-5-4143</td>
<td>TNRU7</td>
<td>Artefact scatter</td>
<td>Low</td>
<td>Site TNRU7 would be directly impacted by earthworks associated with the widening of The Northern Road.</td>
</tr>
<tr>
<td>45-5-4145</td>
<td>TNRU9</td>
<td>Isolated find</td>
<td>Low</td>
<td>Site TNRU9 would be directly impacted by earthworks associated with the widening of the Badgerys Creek Road link.</td>
</tr>
<tr>
<td>45-5-4146</td>
<td>TNRU10</td>
<td>Isolated find</td>
<td>Moderate</td>
<td>Site TNRU10 will be directly impacted by a link road between The Northern Rd and Derwent Rd.</td>
</tr>
</tbody>
</table>

8.2 Consideration of alternatives and justification of impacts

Significant traffic growth has been predicted along The Northern Road due to increased residential and commercial development in the South West Growth Centre and nearby areas, and the proposal is required to cater for this future growth. The upgraded Northern Road would form one of the principal arterial transport corridors within the South West Growth Centre.

During development of the concept design, impacts on Aboriginal sites have been considered and impacts on sites of high archaeological/cultural significance have been avoided.

As open sites are spread across the landscape in the locality of the study area any proposed route for this linear project would impact upon Aboriginal objects to some extent. As the area around the existing road has already been disturbed to varying degrees the likelihood of highly significant Aboriginal sites remaining within the study area was considered to be lower than if the road was realigned through green field landscape.

An important modification was made to the concept design in order to avoid impacts to a highly significant site (scarred tree NRST1). The site would now be avoided and would be protected by creating an exclusion zone during works.

It was considered that mitigation measures including surface collection and salvage excavation would be sufficient to manage impacts on Aboriginal sites of moderate archaeological significance. No areas of high cultural significance have been identified by the Aboriginal stakeholder groups.

8.3 Ecological sustainable development (ESD) principles

ESD principles are relevant to this CHAR as the OEH Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW specifies that ESD principles must be considered when assessing harm and recommending mitigation measures in relation to Aboriginal objects.

The following relevant ESD principles are outlined in Section 3A of the Environment Protection and Diversity Act 1999:
Decision-making processes should effectively integrate both long-term and short-term economic, environmental, social and equitable considerations (the ‘integration principle’).

- If there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation (the ‘precautionary principle’).
- The principle of inter-generational equity – that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations (the ‘intergenerational principle’).

The proposal would adhere to the following ESD principles.

**The Integration Principle**

The proposal would comply with the Integration Principle in regard to Aboriginal heritage. A number of measures to avoid impacts and mitigate against impacts have been recommended in the context of the economic and social justification for the road upgrade.

**The Precautionary Principle**

The proposal would be unlikely to have significant effects on heritage values across the study area. There is no considerable scientific uncertainty as to the impacts of the project on heritage values. Predictive models have been used to assess the probable nature of the archaeological record within the study area, based on other studies in the locality.

The precautionary principle would nevertheless be adhered in the implementation of the proposed mitigation measures of salvage excavations and surface collection.

**The Principle of Intergenerational Equity**

The proposal was considered to adhere to this principle in regard to Aboriginal heritage as it will not impact on areas of high archaeological or cultural significance. The proposal was also within a landscape that has already been considerably altered by the construction of the road and suburbs in the north and south of the study area. Further archaeological investigation was recommended for areas of moderate archaeological significance in order to mitigate against impacts and provide information about the sites for future research.
9.0 Management and mitigation measures

9.1 Guiding principles

The overall guiding principle for cultural heritage management would be that where possible Aboriginal heritage should be conserved. If conservation would not be practical, measures should be taken to mitigate against impacts to Aboriginal sites.

The nature of the mitigation measures recommended has been primarily based on an assessment of archaeological significance. The recommendations would also be informed by cultural significance as discussed by the Aboriginal stakeholder groups during Stage 3 PACHCI consultation.

9.2 Mitigation measures

Mitigation measures recommended vary depending on the assessment of archaeological significance of the Aboriginal site which was based on its research potential, rarity, representativeness and educational value. In general following mitigation measures would be appropriate for each level of significance:

- Low archaeological significance – Conservation where possible. An AHIP would be required to impact the site before works can commence.
- Moderate archaeological significance – Conservation where possible. An AHIP with further archaeological investigation (archaeological excavations, or artefact collection as a condition of the AHIP) would be required to impact the site before works can commence.
- High archaeological significance – Conservation as a priority. An AHIP would be required only if other practical alternatives have been discounted. Conditions of this AHIP would depend on the nature of the site, but may include removal and preservation of scarred trees, or comprehensive salvage excavations.

The archaeological significance of the study area has been adequately assessed by taking into account the archaeological potential associated with landscape and landform units; ground disturbance levels, results of previous excavations and studies in the locality, and assessment of other significance values such as rarity and representativeness. Test excavations under the Code of Practice would therefore not necessarily be warranted in this case as test excavations are intended to facilitate assessment of archaeological significance. Salvage by excavation or hand collections would therefore be seen as an appropriate mitigation measure for areas with moderate archaeological significance.
### Table 7: Impacts and mitigation/management measures: sites which would be directly impacted are shaded in orange.

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site names</th>
<th>Site type</th>
<th>Current AHIP</th>
<th>Significance</th>
<th>Impacts</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-2-1819</td>
<td>IF1 (Harrington Park)</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
<tr>
<td>52-2-3331</td>
<td>O-OS-2</td>
<td>Artefact scatter</td>
<td>To be collected Under AHIP 3380</td>
<td>Low</td>
<td>None</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
<tr>
<td>52-2-3330</td>
<td>O-IF-2/TNRU2</td>
<td>Artefact scatter</td>
<td>None</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample of the site is required prior to impact.</td>
</tr>
<tr>
<td>52-2-3329</td>
<td>HP01</td>
<td>Artefact scatter</td>
<td>To be collected Under AHIP 3380</td>
<td>Moderate</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>52-2-3803</td>
<td>O-IF-3</td>
<td>Isolated find</td>
<td>AHIP 3380</td>
<td>Low</td>
<td>Adjacent. Possible indirect impacts. Site is approximately 10 m from road design boundary</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with current AHIP holder to ascertain status of the site.</td>
</tr>
<tr>
<td>52-2-3535</td>
<td>OPD-14</td>
<td>Isolated find</td>
<td>To be collected under AHIP 1116799</td>
<td>Low</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>52-2-3538</td>
<td>OPM-1</td>
<td>Isolated find</td>
<td>To be collected under AHIP 1116799</td>
<td>Low</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>45-5-3800</td>
<td>TNR2</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>None</td>
<td></td>
</tr>
<tr>
<td>45-5-3542</td>
<td>NR4</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
</tbody>
</table>
## The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site names</th>
<th>Site type</th>
<th>Current AHIP</th>
<th>Significance</th>
<th>Impacts</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-5-3543</td>
<td>NR5</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
<tr>
<td>45-5-3546</td>
<td>NRST1</td>
<td>Scarred Tree</td>
<td>None</td>
<td>High</td>
<td>Tree protected to drip line.</td>
<td></td>
</tr>
<tr>
<td>45-5-3545</td>
<td>Northern Rd PAD2</td>
<td>PAD</td>
<td>None</td>
<td>Moderate</td>
<td>Adjacent. Possible indirect impacts. PAD is approximately 20m from the road design boundary.</td>
<td>PAD should be fenced off during works to provide protection from indirect impacts.</td>
</tr>
<tr>
<td>45-5-3547</td>
<td>NRST2</td>
<td>Not a scarred tree</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Not a scarred tree. No mitigation necessary.</td>
</tr>
<tr>
<td>45-5-3544</td>
<td>NR6</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Adjacent. Possible indirect impacts. Site is approximately 15 m from road design boundary</td>
<td>Site should be fenced off during works to provide protection from indirect impacts.</td>
</tr>
<tr>
<td>45-5-3886</td>
<td>BRP-IF-16/TNRUI4</td>
<td>Artefact scatter</td>
<td>None/ AHIP and salvage excavation recommended for Bringelly Rd upgrade</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample of the site is required prior to impact.</td>
</tr>
<tr>
<td>45-5-3888</td>
<td>BRP-S-01</td>
<td>Artefact scatter</td>
<td>None/ AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 10 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with project manager for Bringelly Road upgrade to ascertain whether AHIP has been granted.</td>
</tr>
</tbody>
</table>
## The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site names</th>
<th>Site type</th>
<th>Current AHIP</th>
<th>Significance</th>
<th>Impacts</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-5-3889</td>
<td>BRP-02</td>
<td>Artefact scatter</td>
<td>None/ AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 5 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with project manager for Bringelly Road upgrade to ascertain whether AHIP has been granted.</td>
</tr>
<tr>
<td>45-5-3890</td>
<td>BRP-03</td>
<td>Artefact scatter</td>
<td>None/ AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 5 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with project manager for Bringelly Road upgrade to ascertain whether AHIP has been granted.</td>
</tr>
<tr>
<td>45-5-3891</td>
<td>BRP-04</td>
<td>Artefact Scatter</td>
<td>None/ AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 15 m from road design boundary.</td>
<td>Artefacts have been removed from the site and are held with OEH. Indirect impacts should be avoided during works. Consult with project manager for Bringelly Road upgrade to ascertain whether AHIP has been granted.</td>
</tr>
<tr>
<td>45-5-3895</td>
<td>BRP-08</td>
<td>Artefact Scatter</td>
<td>None/ AHIP recommended for Bringelly Rd upgrade</td>
<td>Low</td>
<td>Adjacent. Possible indirect impact. Site is approximately 5 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts. Consult with project manager for Bringelly Road upgrade to ascertain whether AHIP has been granted.</td>
</tr>
<tr>
<td>52-2-3920</td>
<td>TNRU1</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
<tr>
<td>45-5-4139</td>
<td>TNRU3</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
</tbody>
</table>
### The Northern Road upgrade from The Old Northern Rd, Narellan, to Mersey Rd, Bringelly

<table>
<thead>
<tr>
<th>Site ID</th>
<th>Site names</th>
<th>Site type</th>
<th>Current AHIP</th>
<th>Significance</th>
<th>Impacts</th>
<th>Mitigation measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>45-5-4140</td>
<td>TNRU4</td>
<td>Artefact Scatter</td>
<td>None</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample would be required prior to impact.</td>
</tr>
<tr>
<td>45-5-4141</td>
<td>TNRU5</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
<tr>
<td>45-5-4142</td>
<td>TNRU6</td>
<td>Artefact scatter</td>
<td>None</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample would be required prior to impact.</td>
</tr>
<tr>
<td>45-5-4143</td>
<td>TNRU7</td>
<td>Artefact scatter</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Salvage by collection as a condition of the AHIP.</td>
</tr>
<tr>
<td>45-5-4144</td>
<td>TNRU8</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Adjacent. Possible indirect impacts. Site is approximately 5 m from road design boundary.</td>
<td>Site should be fenced off during works to provide protection from indirect impacts.</td>
</tr>
<tr>
<td>45-5-4145</td>
<td>TNRU9</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site.</td>
</tr>
<tr>
<td>Site ID</td>
<td>Site names</td>
<td>Site type</td>
<td>Current AHIP</td>
<td>Significance</td>
<td>Impacts</td>
<td>Mitigation measures</td>
</tr>
<tr>
<td>----------</td>
<td>------------</td>
<td>----------------------</td>
<td>--------------</td>
<td>--------------</td>
<td>------------------</td>
<td>-------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>45-5-4146</td>
<td>TNRU10</td>
<td>Isolated find</td>
<td>None</td>
<td>Moderate</td>
<td>Would be impacted</td>
<td>Aboriginal Heritage Impact Permit (AHIP) required prior to commencement of works affecting the site. Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample would be required prior to impact.</td>
</tr>
<tr>
<td>45-5-4147</td>
<td>TNRU11</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>45-5-4148</td>
<td>TNRU12</td>
<td>Isolated find</td>
<td>None</td>
<td>Low</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>45-5-4149</td>
<td>TNRU13</td>
<td>Artefact scatter</td>
<td>None</td>
<td>Low</td>
<td>Adjacent. Possible indirect impacts. Site is approximately 10 m from road design boundary</td>
<td>Site should be fenced off during works to provide protection from indirect impacts.</td>
</tr>
</tbody>
</table>
9.3 Management outcomes

The heritage management outcomes of the project will be dependent on the conditions of the AHIP approved for the proposal. The conditions for the AHIP as recommended in this report would result in the management outcomes discussed in Table 8. These outcomes were also related to the heritage management policy for the proposal developed in consultation with the Aboriginal stakeholder groups.

Fourteen identified Aboriginal sites would be directly impacted by the proposal. It has been recommended that an area based AHIP be sought which would give consent for impacts on all of these sites. As a condition of the AHIP for the proposal one of the fourteen sites to be impacted would require surface collection (TNRU7), and five sites would require salvage excavation (O-IF-2/TNRU2, BRP-IF-16/TNRU14, TNRU4, TNRU6, TNRU10).

Ten Aboriginal sites (HP01, O-IF-3, OPM-1, NR6, BRP-S-01, BRP-S-02, BRP-S-04, BRP-S-08, TNRU8, TNRU13, NRPAD2, NRST1) have been identified within 20 m of the proposal impact area and would be fenced off to create an exclusion zone before construction works commence. Indirect impacts to the sites would be avoided by implementation of this mitigation measure.

<table>
<thead>
<tr>
<th>Impacts</th>
<th>Recommended mitigation measures</th>
<th>Archaeological sites</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>None</td>
<td>TNRU11, TNRU12, O-OS-2, HP01, OPD-14, OPM-1, TNR2, NRST1</td>
</tr>
<tr>
<td>Possible indirect impacts</td>
<td>Exclusion zone around site during works</td>
<td>O-IF-3, NR6, BRP-S-01, BRP-S-02, BRP-S-03, BRP-S-04, BRP-S-08, TNRU8, TNRU13, NRPAD2,</td>
</tr>
<tr>
<td>Direct Impacts</td>
<td>AHIP application to impact site</td>
<td>IF1, NR4, NR5, TNRU1, TNRU3, TNRU5, TNRU9, NRST2</td>
</tr>
<tr>
<td>Direct Impacts</td>
<td>AHIP application/ surface collection</td>
<td>TNRU7</td>
</tr>
<tr>
<td>Direct Impacts</td>
<td>AHIP application/ salvage excavations</td>
<td>O-IF-2/TNRU2, BRP-IF-16/TNRU14, TNRU4, TNRU6, TNRU10</td>
</tr>
</tbody>
</table>
9.4 Proposed management policy for Aboriginal heritage

The management policy for Aboriginal heritage should be developed as part of the Construction Environment Management Plan (CEMP) which would be prepared prior to ground works commencing. A heritage sites map should also form part of the CEMP.

The management policy for Aboriginal heritage would be guided by the recommendations of the ASR, the CHAR, and the recommended conditions of the AHIP. The general principles of the management policy are discussed below as developed in consultation with the Aboriginal stakeholder groups during the AFG and subsequent Stage 3 consultation process.

9.4.1 Actions required prior to commencement of works

Any impacts to Aboriginal objects or Aboriginal Places would constitute a breach of the National Parks and Wildlife Act 1974 an exception being when an AHIP has been granted for those impacts. It would therefore be essential that an AHIP was obtained prior to any disturbance of Aboriginal sites, and that the conditions of the AHIP be adhered to throughout the life of the project. It has been recommended by the ASR that an ‘area based’ AHIP be obtained from OEH prior to works commencing for The Northern Road upgrade. The conditions of the AHIP would include the surface collection of one site and the salvage excavation of five sites. The protection from indirect impacts of 10 sites would also form a condition of the AHIP. The AHIP would not allow impacts on sites outside the project footprint.

For areas which the AHIP specifies would be be subject to salvage excavation, ground works should not commence until salvage excavations have been completed and a letter of notification has been provided by the archaeologist to RMS. It should be noted that even minor works such as the construction of fences, access tracks and site sheds would not commence until salvage works are completed within these designated areas.

The AHIP would allow impacts to previously unrecorded Aboriginal objects that may be located during construction works. The AHIP would not allow impacts on Aboriginal skeletal remains (refer to Section 9.4.6).

9.4.2 Aboriginal heritage induction

The worker induction should be completed by all RMS employees and subcontractors who will participate in works within the vicinity of an existing Aboriginal site. This would be particularly important for workers involved in the initial stages of development, and in works that would impact sites under the AHIP.

The Aboriginal heritage induction should include:

- The location of known Aboriginal sites/objects.
- Protocols for avoiding impact to known Aboriginal objects which are not covered under the AHIP.
- Protocols for actions if unexpected Aboriginal objects are uncovered.
• Protocols for actions if skeletal remains are uncovered.
• Useful contacts.
• A brief description of the legislation protecting Aboriginal objects and the penalties for impacting on objects.
• An explanation of the importance of Aboriginal objects and country to the Aboriginal community to be developed in consultation with the registered Aboriginal stakeholders.

9.4.3 Protection against indirect impacts

The AHIP would require that 10 sites were protected from indirect impacts by exclusion zones during works. An exclusion zone is a physical barrier to prevent encroachment on the site. Exclusion zones should be highly visible and prevent access to the site. Highly visible orange para-webbing stretched between star pickets would be suitable materials with which to construct this barrier. If works are planned within 20 m of a known site an exclusion zone should be established. If Aboriginal sites are located outside the area covered by the AHIP during works, these sites should also be protected from indirect impacts.

9.4.4 Salvage excavations

Salvage excavations would be conducted in accordance with the prepared methodology for the project (preliminary version – Section 10.0). The AHIP would be granted on the condition that the approved research design is implemented and once the AHIP was granted any changes in salvage methodology would require a variation to the AHIP.

9.4.5 Discovery of human remains

If suspected human skeletal remains are uncovered at any time throughout the life of the project the RMS Unexpected Archaeological Finds Procedure 2011 would be followed.

A separate AHIP including further consultation with Aboriginal stakeholder groups would be required to disturb human remains.

9.4.6 Changes to development design

This CHAR was based upon the most recent concept design made available to Artefact Heritage as of the date of preparation of this report. If changes are made to the design that would impact on Aboriginal sites, or would reduce impacts on Aboriginal sites changes in the management policy and management outcomes may eventuate.

Any changes that may impact on known Aboriginal sites that are not listed on the AHIP, or may impact areas that have not been assessed during the current study, should be assessed by an archaeologist in consultation with the registered Aboriginal stakeholder groups.
9.4.7 Ongoing consultation with Aboriginal stakeholder groups

In principal, Aboriginal consultation should be ongoing throughout the life of the project with processes in place to involve the Aboriginal community. Appropriate circumstances for further Aboriginal consultation include, but would not be limited to, the discovery of Aboriginal skeletal remains, or proposed changes to heritage impacts at a later stage of the project. If there is an increased impact to a known Aboriginal site, or if a new area needs to be assessed to accommodate a change in the development design, the registered Aboriginal groups would be consulted. It should be noted that if there has been a gap of greater than six months in consultation for a project, and an AHIP or an AHIP variation would be required, the consultation process would restart with the compilation of a new registered stakeholder list.
10.0 Preliminary methodology for salvage excavations

10.1 Introduction

It has been recommended by the ASR for the upgrade of The Northern Road that five Aboriginal sites would be salvaged as mitigation against the proposed impacts. The following preliminary research design for a combined test/salvage excavation program was developed in consultation with the Aboriginal stakeholder groups. Comments on this research design were invited at the AFG but no comments were forthcoming.

This research design would be included in the application for an AHIP which would be approved before archaeological excavations commenced.

10.2 Aims

The proposed outcome of the excavations would be to salvage a representative sample from the following five sites recorded during the Stage 2 investigations:

- BRP-IF-16/TNRU14
- O-IF-2/TNRU2
- TNRU4
- TNRU6
- TNRU10

These sites were selected for further investigation based on an assessment for their archaeological significance. All sites were assessed as having a moderate archaeological significance based on disturbance levels, recorded artefacts and landform unit.

The primary aim of the excavation program would be to provide a greater understanding of Aboriginal occupation of the study area through the analysis of the lithic assemblage. Occupation patterning would be investigated through analysis of different tool types, which may reflect different uses for different site areas (such as hunting, camping or ritual), and of the correlation of artefact density with landform unit. The following research questions were designed to facilitate the achievement of the specified aims.

10.3 Research Questions

The research questions were designed to focus the field work and analysis on particular aspects of archaeological investigation, and therefore to maximise the research value gained from the nonrenewable resource of the archaeological record.

**Question 1: Is there evidence of differing cultural activities or behaviors within different landform units?** The salvage exaction would focus on two major landform unit types. The lower hillslope (TNRU2, TNRU14
and TNRU6) and the upper hillslope/low ridgeline (TNRU14, TNRU10). The White and McDonald predictive model argues that the highest artefact density sites would be found within 100 m of permanent water on lower hill slopes or terraces. This prediction was based on data gleaned from a number of large excavations within the Rouse Hill Development Area (RHDA) (White and McDonald 2010). The Southern Cumberland Plain has been subject to fewer large scale archaeological excavations that the western Cumberland Plain. The comparison of the data gained from the RHDA with The Northern Road study area would therefore add the broader comparative analysis of sites within the Sydney region, and provide information on possible regional differences in landscape utilisation.

A related secondary research question would be whether similar landform units at differing distances to permanent water would show different occupation patterns. Sites TNRU2 and TNRU6 are lower hill slopes within 100 m of water. Site TNRU 14 is a lower hill slope located over 800 m away from permanent water.

**Question 2: Is there evidence within the study area for pockets of high artefact density within a low density background scatter as predicted for the Oran Park precinct (ENSR/AECOM 2009)?**

The ENSR/AECOM excavations of archaeological landscapes across the Oran Park precinct concluded that Aboriginal occupation of the area was characterised by a low density background scatter of artefacts across different landform units, with high density pockets of artefacts representing foci of occupational or behavioral activity. The excavation program along The Northern Road upgrade would test this conclusion and build upon the data gathered at Oran Park. The proposed excavation program would also assess the intrasite variation in artefact density and would aim to correlate artefact density patterning with specific activities. For example, do areas of high artefact density show evidence that they were associated with high intensity ‘events’ of occupation such as knapping events, or is the high density a product of deposition over longer periods of time. This research question would be answered primarily by analysis of reduction sequences within the assemblages for each site.

### 10.4 Field Methods

#### 10.4.1 General Approach and Methodology

Given the low levels of ground surface visibility throughout the study area and the widely accepted theory that the lack of surface evidence does not necessitate the absence of subsurface deposits, a combination of testing and open area excavation has been recommended. Excavation would only be conducted within areas which would be impacted by the road upgrade or associated construction.

The aim of the initial testing would be to identify areas of higher artefact density or the location of significant finds such as hearths or knapping events. The five extended site areas would be comprehensively tested with test pits placed on a grid across the entire site. Localised areas of disturbance, such as the dam wall at TNRU04 would be avoided. Between two and five test pits at each site would be selected for expansion into open areas.
All excavated squares (both test and open area) would be recorded in detail including photographs, level readings, plans and context sheets. Stratigraphic sections detailing the stratigraphy and features within the excavated deposit would also be drawn. A detailed geomorphological analysis would be undertaken by a qualified geomorphologist where appropriate.

All squares would be excavated in 10 or 20 cm arbitrary spits. Although Cumberland Plain soils are deflationary and not stratified, excavating in spits provides some vertical control, especially if a conjoin analysis is performed. If a stratigraphic deposit is identified, for example in alluvial soils near the major creeks, excavation may be conducted stratigraphically.

All material retrieved from the test pits would be hand sieved through nested 3 mm and 5 mm mesh. Wet sieving would be preferred, especially in clay soils. All recovered stone artefacts would be cleaned, dried and bagged with a brief analysis conducted in the field. This analysis would include logging artefact type, raw material, and dimensions. These items would then be taken off site to be analysed in detail by relevant specialists in consultation with Aboriginal stakeholder groups. Test pits and open areas would be backfilled by RMS. Carbon dating or OSL dating would be undertaken if suitable samples were identified during excavations.

10.4.2 Test Excavations

A number of transects approximately 20 m apart and 100 m -150 m in length would be placed across the site areas. Test pits would be placed at 20 m intervals along these transects. These measurements may differ slightly at each site depending on the size of the designated site area. It is estimated that 20-25 test pits would be excavated within each site area. Test pits locations would only deviate from the grid pattern to avoid localised disturbance, or to avoid trees and other large vegetation. Each test pit would be given a grid reference based on its east and north co-ordinates in relation to an arbitrary datum at the site. The location of each test pit would also be recorded using a hand held GPS.

Excavation squares measuring 1 m x 1 m would be hand excavated in 10 -20 cm spits. If significant cultural material is encountered the hand excavations would continue in five centimetre spits or following stratigraphic layering. Squares would be excavated until the basal layer or culturally sterile deposit is reached. The initial excavation squares at each location would be excavated well into the sterile unit to confirm the absence of artefacts. The location of each excavated square would be identified on a surveyed plan of the site.

10.4.3 Salvage excavation (open areas)

The area/s of highest artefact concentration would be further investigated by the excavation of an open area around the original test pit. The aim would be to characterise the area of artefact density and to assess its extent.

Test pits to be expanded during open area excavation would be selected by the following criteria:
• Significant features (e.g. hearths or knapping events which contain the potential to yield statistically viable assemblages).

• Identification of tools, such as backed blades or ground edge axes.

• A higher than average density of artefact in a test square with undisturbed deposit. The density required to trigger a test pits expansion would generally be more than 10 artefacts per square metre. This number would depend on the density of the wider site and would be assessed on a site by site basis.

The expansion of the open area would continue until the extent of the high density site had been identified or it is assessed under the principle of diminishing returns that no new scientific information can be gathered from continuing excavations.

10.5 Post excavation analysis

It would be expected that the primary artefact type recovered during the salvage excavations would be lithics. Lithics would be analyzed by a specialist and classified in accordance with common definitions of form, function, raw material and reduction sequence. The lithic analysis would conform to methodologies used for analysis of assemblages recovered from other areas the Cumberland Plain. This would allow a comparative analysis not only between the five sites areas along The Northern Road, but between significant local and regional assemblages such as Oran Park (ENSR/AECOM 2009 ), Harrington Park (KNC upcoming) and Rouse Hill (JMcDCHM 2005).

The lithic analysis would be based on the attribute analysis and methodology as outlined in Holdaway and Stern (2004). This approach is in line with the analysis of other comparable assemblages. A number of characteristics would be recorded for each artefact and a multivariate analysis would be performed. The analysis would also allow comparison of lithic data across different site areas within the study area so that landform unit and other variables can be correlated with artefact type patterning and density.

Minimum Number of Flake (MNF) and conjoin analysis may be undertaken if required. Information from MNF analysis would allow an assessment of activities being performed at the site, such as tool manufacture or retouch. Conjoin analysis can also provide a measurement of pre depositional and taphonomic artefact movement both laterally and vertically.

10.6 Aboriginal community involvement

As part of the ongoing Aboriginal community consultation process, representatives from the registered stakeholder groups should be involved in the salvage excavation program. The level of involvement would be at the discretion of the RMS, but it has been recommended that the number of Aboriginal representatives engaged were equal to the number of archaeological assistants. Aboriginal representatives would participate in all tasks during the salvage excavations and would be given the opportunity to comment on the findings of the excavations, in the field and after the excavation report has been prepared.
10.7 Aboriginal objects

The Australian Museum is the primary repository for collected Aboriginal objects in NSW. Recent changes to the Museum’s deposition policy mean that only significant or unusual assemblages will be accepted for storage and all approved depositions will require payment of a fee to the Museum. If the salvaged assemblage for this proposal is not accepted by the Museum, a Care and Control agreement would be negotiated between Aboriginal stakeholder groups, OEH and the RMS. Under this Care and Control agreement the artefacts would be handed over to the Aboriginal groups to store in a keeping place.

10.8 Reporting

At the conclusion of salvage excavations, the archaeologist would notify RMS by letter that the conditions of the AHIP have been met and that construction works can commence at the site. This may take place before the salvage report has been completed as a number of months may be required to conduct lithics analysis and post excavation data analysis.

A salvage excavation report would be prepared which outlines the results of the excavation program. This report would include the lithics analysis and geomorphological study if required. The report would adhere to OEH standards and guidelines.

10.9 Timeframe

The timeframe for the salvage excavations has yet to be determined. A detailed construction program for the Northern Road upgrade has yet to be finalised by RMS.
11.0 References

AECOM 2010 *Oran Park West Sewer Infrastructure Aboriginal Heritage Impact Assessment*. Report to South West Growth Centre.


Attenbrow, V. 2010 *Sydney’s Aboriginal Past: Investigating the archaeological and historical records*. UNSW Press.


Biosis 2008 *The Northern Road upgrade: Preliminary Aboriginal archaeological assessment*. Report to RTA.


Jo McDonald CHM Pty Ltd. 2007. *Archaeological investigation of the Oran Park Precinct in the South West Growth Centre, Camden, NSW*. Report to APP.

KNC 2008 *Oran Park and Turner Road Precincts: Aboriginal Heritage Investigation for Proposed Infrastructure Service Routes and Site Options*. Report to Landcom.

KNC 2010 *Bringelly Road upgrade: Camden Valley Way to The Northern Road Aboriginal cultural heritage Cultural Heritage Assessment Report* Prepared for the Roads and Traffic Authority.

APPENDIX A: Advertisement for Aboriginal stakeholders
Prices for Indigenous art have since fallen considerably but the work found in New York is expected to attract interest from museums internationally.

Had it been discovered in Australia its significance would have attracted export controls preventing it leaving the country.

cting planning to employ as business still booms

Anthony Martin, owner of ALM Contracting, described his experience working with BHP Billiton Iron Ore and the support he has received as his company takes up the challenge of working as a contract company to the mining industry.

“Working as a Trainer/Assessor within BHP Billiton Iron Ore, I saw a great many opportunities for a business with a flexible work approach and good work ethic to take up some of the non-mining specific contracts such as grounds maintenance and weed-spraying,” Mr Martin said.

“ALM Contracting is committed to taking on a 100 percent local Indigenous workforce and, through on-the-job-training, providing real workplace experience and a chance to prove themselves through hard work.

“Since establishing my business I have received support from Veolia Environmental Services. They provide me with an operations area within their local yard and access to their experience and tools which can only be accumulated over years of working within the mining-industry.”

ments quizzed over printer spend

I spent $80,000 buying more than 0 printer cartridges in less than three months.

The Premier said it would be up to the Auditor-General to determine whether he had been purchasing the same cartridges in bulk.

The bulk buying provided staff with personal benefits.

Inquiries in Victoria and Western Australia earlier this year found public servants there had been paying inflated prices for printer cartridges and receiving gifts.

Opposition finance spokesman Rob Lucas said information provided to the opposition indicated the Aboriginal Affairs and Reconciliation division of the Department of the Premier and Cabinet had purchased more than 200 cartridges between May and July this year.

He said the Victorian-based supplier was known to offer vouchers to individuals who purchased its products.
Aboriginal Heritage
The Northern Road Upgrade, Bringelly

The RTA is proposing to upgrade The Northern Road between The Old Northern Road, Narellan and Mersey Road, Bringelly.

An environmental assessment under the Environmental Planning & Assessment Act 1979 will be undertaken for this project.

An Aboriginal cultural heritage assessment will also be undertaken and may result in the RTA:

- Undertaking investigations in accordance with the Code of practice for archaeological investigations in NSW and/or

The RTA invites Aboriginal people and/or Aboriginal groups who hold cultural knowledge relevant to determining the significance of Aboriginal object(s) and/or place(s) between Narellan and Bringelly for The Northern Road Upgrade project to register with the RTA to be consulted.

Registrations must be received by phone or in writing by Thursday 13 October 2011.

To register your interest, please contact Barry Gunther, RTA Aboriginal Cultural Heritage Team Leader:

PO Box 973 Parramatta CBD NSW 2124.
T (02) 8849 2006.

My dear

So the other day I actually went out on a date. I was so excited. Not only was I doing something new, I got my body out of the house and into the world.

A few weeks ago I went out and met someone at an event. They are really nice, smart and independent — just my cuppa tea.

We got to talking about life and the universe and how much we love Harry Potter. This other one then said a throwaway comment ‘we should hook up for a coffee and a movie sometime’.

I took this as an invitation to make a date. Quick off the mark, when I got home that night I added them as a friend on Facebook and sent them a message saying how nice it was to meet them.
APPENDIX B: Aboriginal Stakeholder Comments
Attention

Benny Gutter

Northern Road Upgrade

DACA have reviewed the proposed management policy for the Aboriginal heritage of this area and we support your aims and objectives. We support the Preliminary Methodology for the salvage excavations and we wish to be involved in all fieldwork. We look forward to working with you on this project.

Yours sincerely,

G. W. Morton

Cultural Heritage – Building respect for the past and Conservation for the future
APPENDIX C: Aboriginal Stakeholder Consultation Log

Removed for public version as contains culturally sensitive information
APPENDIX D: Aboriginal Heritage Maps

Removed for public version as contains culturally sensitive information
Removed for public version as contains culturally sensitive information
Dear Glenda,

**Re: The Northern Road – Roads and Maritime Services upgrade proposal - Cultural Heritage Assessment report**

Since the finalisation of the Aboriginal Cultural Heritage Assessment report (CHAR) prepared for The Northern Road upgrade, we have been notified by RMS that there has been a minor adjustment of the proposal impact area.

The proposal impact area as described in the CHAR did not include a section around the proposed Oran Park link road from approximately chainage 3000 to chainage 4650. This section is marked as ‘Oran Park Development – not included in proposal’ on the Aboriginal heritage maps which were included as an appendix to the CHAR. Since the finalisation of the CHAR it has been necessary to reduce the size of the area within the Oran Park development which is excluded from the proposal impact area. The excluded area now runs from approximately chainage 3350 to chainage 3800. The attached Aboriginal heritage maps show the changed boundary of the proposal impact area.

As a result of this change to the proposal impact area, one additional Aboriginal site would be impacted. This site is TNR2 (AHIMS # 45-5-38000) an artefact scatter, consisting of two artefacts. This site is located on a hillslope adjacent to The Northern Road, just to the south of the Oran Park substation. TNR2 was assessed as having a low archaeological significance. Please note that TNR2 was described and discussed in the CHAR and during the AFG held on 24 May 2012. The site and the area around it was surveyed during the site inspection for the proposal, but the site was listed in the CHAR as located outside the proposal impact area.

The amened assessment report for The Northern Road upgrade will therefore note that TNR2 would be impacted and recommend that it would be included in the area based Aboriginal Heritage Impact Permit prior to works commencing for the upgrade.

Please do not hesitate to contact Barry Gunther from RMS on (02) 8849 2006 or myself on (02) 90253958 if you have any queries about this amendment.

Please forward comments to Dr Sandra Wallace at the contacts below by 24 October 2012.

Kind regards

Dr Sandra Wallace

---

Glenda Chalker  
Cubbitch Barta  
55 Nightingale Road  
Pheasants Nest  
NSW 2574  
26 September 2012

---