Leppington Precinct Indigenous Heritage Study: Stage 2 Aboriginal Heritage Assessment

Prepared by Australian Museum Business Services for NSW Department of Planning & Infrastructure

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1 Introduction

1.1 Preamble

Australian Museum Business Services (AMBS) has been commissioned by NSW Department of Planning and Infrastructure (DP&I), to prepare an Aboriginal (Indigenous) heritage assessment for the Leppington Precinct of the South West Growth Centres (SWGC). This report will inform the Urban Form Analysis, and development of the project footprint.

1.2 Study Area

The Leppington Precinct (the study area) comprises part of the NSW Government’s SWGC land release. DP&I is currently undertaking Precinct Planning for this precinct. The precinct falls within the boundary of the Camden Local Government Areas (LGA), and is bounded by the Leppington North, Leppington East, and Catherine Fields North precincts.

The Leppington Precinct is located approximately 40km west of Sydney CBD, and will comprise an area of approximately 464ha, as well as an additional 194ha on the western boundary. The area will be serviced by a new rail line, the South West Rail Link, and a major town centre is planned in the vicinity of the future Leppington Station in the Leppington North Precinct, close to the northern boundary of the Leppington Precinct.

This Aboriginal Heritage Assessment addresses all lands in the Leppington Precinct, and the additional investigation area on the western boundary (see Figure 1.1).

1.3 Methodology

This Heritage Assessment is broadly consistent with the processes and principles set out in the Australia ICOMOS Burra Charter (The Australia ICOMOS charter for the conservation of places of cultural significance).

This assessment follows the methodologies and protocols for heritage assessment developed by the former NSW Growth Centres Commission (now the Strategies and Land Release Office of the NSW Department of Planning and Infrastructure) and the Department of Environment and Climate Change (now the Office of Environment and Heritage [OEH]; formerly Department of Environment, Climate Change and Water [DECCW]), namely The Consultants Brief for Identifying and Assessing Aboriginal Cultural Heritage in the Sydney Growth Centres (Context 2006) and its two Appendices:

- Appendix A: Protocol for Aboriginal Stakeholder involvement in the assessment of Aboriginal Cultural Heritage in the Sydney Growth Centres; and
- Appendix B: Precinct Assessment Method for Aboriginal Cultural Heritage in the Sydney Growth Centres.

The Precinct Assessment Method outlines the following steps to be undertaken:

- Step 1 – gather and analyse existing information;
- Step 2 – identify and assess Aboriginal cultural heritage and values;
  - 2a – undertake investigations;
  - 2b – assess significance;
- Step 3 – develop land use and management options; and
- Step 4 – input into Precinct Planning.

This report has been prepared to fulfil Steps 1-2 of the Method, and will inform Steps 3-4 at a later stage.
1.3.1 Aboriginal Community Consultation

Aboriginal community consultation is an integral part of the assessment of Aboriginal cultural heritage significance. Consultation was undertaken in accordance with SWGC consultation guidelines and its two Appendices, particularly Appendix A (see above).

The aims of this consultation process were to:

- ensure that places of importance to the stakeholder Aboriginal communities are identified and taken into consideration during project development;
- ensure that values and places and importance to Aboriginal culture and community identity are clearly identified and articulated;
- identify and document those cultural values held by the Aboriginal groups and people which may not have been identified during the archaeological investigation or historical research; and
- provide an understanding of the cultural values of information obtained during archaeological investigation or historical research and other investigations.

An advertisement advising of the commencement of Aboriginal heritage assessments for the Leppington Precinct was placed in the South West Rural Advertiser (SWRA) on 5 September 2012. The stakeholder Aboriginal communities identified in Appendix A were contacted, as was OEH, the Registrar of Aboriginal Owners (RAO), the National Native Title Tribunal (NNTT), NTSCorp, the Sydney Metropolitan Catchment Management Authority, and the local council (Camden). Stakeholders were invited to identify whether they were interested in having primary involvement (that is, active involvement in heritage identification, assessment, and management) or general involvement (that is, only to be kept informed about the process and outcomes).

The stakeholder Aboriginal communities that have so far been identified for this project are:

- Cubbitch Barta Native Title Claimants Aboriginal Corporation (CBNTCAC);
- Darug Aboriginal Cultural Heritage Assessments (DACHA);
- Darug Custodian Aboriginal Corporation (DCAC);
- Darug Land Observations (DLO);
- Darug Tribal Aboriginal Corporation (DTAC);
- Gandangara Local Aboriginal Land Council (GLALC);
- Gunjeewong Cultural Heritage Aboriginal Corporation (GCHAC);
- Tharawal Local Aboriginal Land Council (TLALC);
- Peter Falk Consultancy (PFC); and
- Yarrawalk (a division of Tocomwall Pty Ltd).

The Aboriginal heritage assessment is to be undertaken in consultation with all identified Aboriginal community groups. An initial consultation meeting, to discuss the project and the proposed survey methodology, and to identify any initial cultural values, was undertaken on 5 October 2012, to which all Aboriginal parties were invited. Representatives from CBNTCAC, DACHA, DLO, DTAC, PFC and Tocomwall attended the meeting, with apologies from DCAC, GCHAC and TLALC. No cultural values or additional issues for consideration were raised during the meeting. The draft Stage 1 preliminary report, and a survey methodology, was provided to each stakeholder group for review and comment on 21 November 2012. Responses received have been included in Appendix A.

Those groups which had identified an interest to have primary involvement were then invited to participate in the preliminary field assessment. Aboriginal community groups who were available to participate in the fieldwork are listed in Table 1.1.
Appendix A.

DLO and Tocomwall attended the meeting, with apologies from CBNTCAC, DACHA and DCAC. Aboriginal parties were invited. This meeting was undertaken on 19 June 2013. Representatives from and a meeting was also arranged to discuss further Aboriginal social/cultural values, to which all

This draft Aboriginal heritage assessment report was provided to each group for review and comment, and a meeting was also arranged to discuss further Aboriginal social/cultural values, to which all Aboriginal parties were invited. This meeting was undertaken on 19 June 2013. Representatives from DLO and Tocomwall attended the meeting, with apologies from CBNTCAC, DACHA and DCAC. Concerns raised during the meeting and during the feedback period are outlined and addressed in Appendix A.

### 1.4 Authorship & Acknowledgements

This report has been prepared by AMBS Project Officer Jenna Weston. AMBS Project Manager, Chris Langeluddecke, provided technical advice and reviewed the report. AMBS Senior Project Manager, Jennie Lindbergh, reviewed the report for quality and consistency.
Figure 1.1 Location of the study area.
2 Statutory Context

2.1 Preamble

The conservation and management of heritage items, places, and archaeological sites takes place in accordance with relevant Commonwealth, State or local government legislation. Non-statutory heritage lists and registers, ethical charters, conservation policies, and community attitudes and expectations can also have an impact on the management, use, and development of heritage items. The relevant statutory and non-statutory heritage listings for the study area are summarised below.

2.2 Environment Protection & Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) provides a legal framework for the protection and management of places of national environmental significance. Several heritage lists are addressed by the EPBC Act, including the National Heritage List (NHL) and the Commonwealth Heritage List (CHL). The NHL protects places that have outstanding value to the nation. The CHL protects items and places owned or managed by Commonwealth agencies. The Australian Government Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) is responsible for the implementation of national policy, programs and legislation to protect and conserve Australia’s environment and heritage and to promote Australian arts and culture. Approval from the Minister is required for controlled actions which would have a significant impact on items and places included on the NHL or CHL.

There are no Aboriginal heritage items listed on the NHL or CHL within the study area or in its vicinity.

2.3 National Parks & Wildlife Act 1974 (Amended 2010) and National Parks & Wildlife Amendment Regulation 2010

Under the provisions of the National Parks & Wildlife Act 1974 (NPW Act), the Director-General of the National Parks and Wildlife Service (NPWS; now OEH) is responsible for the care, control and management of all national parks, historic sites, nature reserves, state conservation areas, karst conservation reserves and regional parks. The Director-General is also responsible, under this legislation, for the protection and care of native fauna and flora, and Aboriginal places and objects throughout NSW.

All Aboriginal Objects are protected regardless of their significance or land tenure under the NPW Act. Aboriginal Objects can include pre-contact features such as scarred trees, middens and open campsites, as well as physical evidence of post-contact use of the area such as Aboriginal built fencing and fringe camps. The NPW Act also protects Aboriginal Places, which are defined as 'is or was of special significance with respect to Aboriginal culture’. Aboriginal Places can only be declared by the Minister administering the NPW Act.

Under Section 90 of the Act, it is an offence for a person to destroy, deface, damage or desecrate an Aboriginal Object or Aboriginal Place without the prior issue of an Aboriginal Heritage Impact Permit (AHIP). The Act requires a person to take reasonable precautions and due diligence to avoid impacts on Aboriginal Objects. AHIPs may only be obtained from the Environmental Protection and Regulation Division (EPRD) of OEH.

The National Parks and Wildlife Amendment Regulation 2010 commenced on 1 October 2010. This Regulation excludes activities carried out in accordance with the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW from the definition of harm in the Act. That is, test excavations may be carried out in accordance with this Code of Practice, without requiring an AHIP.
The Regulation also specifies Aboriginal community consultation requirements (*Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010*). In addition, the Regulation adopts a Due Diligence Code of Practice which specifies activities that are low impact, providing a defence to the strict liability offence of harming an Aboriginal object.

Part of the regulatory framework for the implementation of the NPW Act is the Aboriginal Heritage Information Management System (AHIMS), maintained by OEH. AHIMS includes a database of Aboriginal heritage sites, items, places and other objects that have been reported to the OEH. Also available through AHIMS are site cards, which describe Aboriginal sites registered in the database, as well as Aboriginal heritage assessment reports, which contribute to assessments of scientific significance for Aboriginal sites. The AHIMS is not a comprehensive list of all Aboriginal heritage in NSW, rather it reflects information which has been reported to OEH. As such, site co-ordinates in the database vary in accuracy depending on the method used to record their location. Heritage consultants are obliged to report Aboriginal sites identified during field investigations to OEH, regardless of land tenure, or whether such sites are likely to be impacted by a proposed development. The results of a site search for the local area are presented in Section 4.3.2.

### 2.4 Heritage Act 1977

The NSW *Heritage Act 1977* (Heritage Act) provides protection for heritage places, buildings, works, relics, moveable objects, precincts and archaeological sites that are important to the people of NSW. These include items of Aboriginal and non-Aboriginal heritage significance. Where these items have particular importance to the state of NSW, they are listed on the State Heritage Register (SHR).

There are no Aboriginal heritage items listed on the SHR within the study area or in its vicinity.

#### 2.4.1 Roads and Maritime Services (RMS) Section 170 Register

Part 8 Section 170 of the Heritage Act requires government departments and agencies to maintain a Heritage and Conservation Register (Section 170 Register). Part 4 Clause 21 of the Heritage Regulation 2012 describes the assets that must be included on a Section 170 Register:

1. **(a)** items that are listed as heritage items under an environmental planning instrument made under the Environmental Planning and Assessment Act 1979,
2. **(b)** items that are subject to an interim heritage order,
3. **(c)** items that are listed on the State Heritage Register,
4. **(d)** items identified by the government instrumentality concerned as having State heritage significance.

There are no Aboriginal heritage items listed on the RMS Section 170 Register within the study area or its vicinity.

### 2.5 Environmental Planning & Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) is the main act regulating land use planning and development in NSW. Under Section 111 of the Act, DP&I as proponent and determining authority for the project:

> must examine and take into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of that activity.

Clause 228(2)(e) of the *Environmental Planning and Assessment Regulation 2000* states that, for the purposes of Part 5 of the EP&A Act, the factors to be taken into account when consideration is being given to the likely impact of an activity on the environment include:
any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations.

The EP&A Act also controls the making of environmental planning instruments (EPIs). Two types of EPIs can be made: Local Environmental Plans (LEPs) and Development Control Plans (DCPs), covering local government areas; and State Environment Planning Policies (SEPPs), covering areas of State or regional environmental planning significance. LEPs commonly identify, and have provisions for, the protection of local heritage items and heritage conservation areas.

LEPs and DCPs commonly identify and have provisions for the protection of local heritage items and heritage conservation areas. The study area is located in the Camden LGA.

2.5.1 Camden LEP 2010

Part 5.10 ‘Heritage conservation’ of the Camden LEP is consistent with current heritage best practice guidelines, providing for the protection of heritage items, places and archaeological sites.

Schedule 5, Part 1 ‘Heritage items’ does not include any Aboriginal items or places within the study area, or its vicinity.

2.6 Non-Statutory Registers

2.6.1 Register of the National Estate

The Register of the National Estate (RNE) was originally established under Section 22 of the Australian Heritage Commission Act 1975 (AHC Act). Since the establishment of the NHL and CHL, there is now a considerable level of overlap between the RNE and heritage lists at the national, state and territory, and local government levels. From February 2012, all references to the RNE have been removed from the EPBC Act and the AHC Act. The RNE is now being maintained on a non-statutory basis as a publicly available archive.

There are no Aboriginal heritage items listed on the RNE within the study area or its vicinity.

2.6.2 National Trust of Australia (NSW)

The National Trust of Australia is a private, not-for-profit organisation committed to conserving Australia’s heritage. Listing with the National Trust of Australia does not have statutory authority; however, it does have a role in raising public awareness of heritage issues.

There are no Aboriginal heritage items listed on the National Trust Register within the study area or its vicinity.
3 Environmental Context

3.1 Preamble

An understanding of environmental factors within the local landscape provides a context for past human occupation and history of an area. The analysis of environmental factors contributes to the development of the predictive modelling of archaeological sites, but it is also required to contextualise archaeological material and to interpret patterns of past human behaviour. In particular, the nature of the local landscape including topography, geology, soils, hydrology and vegetation are factors which affect patterns of past human occupation. Current land use practices have the potential to affect the visibility of archaeological material; they may obscure, or expose archaeological sites. In addition, previous disturbances may have also exposed archaeological material, such as excavation for dams or other ground disturbance. It is important that such factors are also considered in making assessments of archaeological resources in an area and understanding the distribution of observed sites.

3.2 Geology

The study area is underlain by the Triassic Wianamatta Group Shales which comprise the Liverpool Sub-Group of Minchinbury Sandstone and Bringelly and Ashfield Shales (1:250,000 Geological Series Sheet S1 56-5 Sydney). This geological landscape consists of shale with some sandstone beds, and does not generally result in stone outcroppings suitable as surfaces for art (such as engraving and drawing/painting), sharpening stone axes/tools or artefact manufacture, or as shelters for camping. As such, rock engravings/art sites, axe grinding grooves, shelter and quarry sites are highly unlikely to be present in the study area.

3.3 Topography, Soils & Vegetation

The landscape of the study area is characterised by gently undulating rises with narrow ridges, hillcrests and valleys. A map of the topography/contours and areas subject to 1 in 100 year flood events is provided in Figure 3.1.

The study area is on the Cumberland Plain within the Georges River catchment area. The region is characterised by two soil types; the Blacktown landscape (residual) and the South Creek landscape (fluvial). These soil types are found at various locations throughout the study area (see Figure 3.2).

The Blacktown soil landscape consists of gently undulating rises on Wianamatta Group shales (local relief to 30m, slopes usually less than 5%). The landscape is characterised by broad rounded crests and ridges with gently inclined slopes. The soils comprise brownish black loam, red podzolic soils and brown podzolic soils on crests and upper slopes, and loam and red and brown podzolic soils overlying yellow podzolic soils on the lower side slopes. The subsoil is highly plastic and moderately reactive with low fertility and poor drainage. Vegetation consists of cleared eucalypt woodland and tall open forest (dry schlerophyll forest) (Bannerman & Hazelton 1990:28).

South Creek soils, comprising red clays and sands and yellow podzolics, occur mainly in drainage lines, flats and floodplains. Vegetation commonly consists of Angophora subvelutina, Eucalyptus amplifolia and Casuarina glauca. Eleocharis phacelata, Junctus usitatus and Polygonum spp. are common where channels are silted up. Melaleuca spp. and Leptospermum spp. may occur on more elevated stream banks (Bannerman & Hazelton 1990:68-9). The potential for stratified or in situ archaeological deposits is most likely in the fluvial South Creek soils which underlie Kemps and Bonds Creeks.
Figure 3.1 Topographic details of the study area, including areas prone to 1 in 100 year flood events.
Figure 3.2 Soils within the study area.

3.4 Hydrology & Drainage

The study area is within the upper catchment area of the Hawkesbury River system. Surface runoff and groundwater in the area generally flows to the north west into Kemps and Bonds Creeks, thence flowing to South Wianamatta Creek (approximately 12km away), and eventually flowing into the
Hawkesbury River (15-20km away). Kemps Creek extends through the western side of the study area, and several tributaries of this creek extend throughout the study area, of varying stream order. Although minor tributaries are unlikely to have provided permanent water, they would have been seasonal water sources for Aboriginal people in the past. Bonds Creek, which is to the east of Kemps Creek, flows through the eastern corner of the study area, also with a number of smaller tributaries. There is therefore, a high likelihood that Aboriginal sites may be present throughout the area.

3.5 Land Use & Disturbance

Land use within the study area is dominated by pastoralism, agriculture, horticulture and residential developments. The various land use activities have resulted in the majority of the study area having been extensively cleared of its original vegetation, particularly mature trees. Further disturbance has resulted from the development of infrastructure associated with the construction of roads, electricity and telecommunications transmission lines, and water/sewage pipelines. Road easements within the study area are provided in Table 3.1.

Table 3.1 Road easements within the study area

<table>
<thead>
<tr>
<th>Road easements within the Leppington Precinct</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ingleburn Road</td>
</tr>
<tr>
<td>McCann Road</td>
</tr>
<tr>
<td>Eastwood Road</td>
</tr>
<tr>
<td>Dickson Road</td>
</tr>
<tr>
<td>Rickard Road</td>
</tr>
<tr>
<td>Byron Road</td>
</tr>
<tr>
<td>Camden Valley Way</td>
</tr>
<tr>
<td>Heath Road</td>
</tr>
<tr>
<td>Philip Road</td>
</tr>
<tr>
<td>Cordeaux Street</td>
</tr>
</tbody>
</table>

The construction of residential areas and road networks are likely to have affected the integrity of the archaeological resource, particularly subsurface deposits in the above-mentioned areas, as well as intact in situ archaeological deposits.
4 Aboriginal Archaeological Context

4.1 Preamble

This chapter describes the nature of the known Aboriginal archaeology of the study area, based upon a review of relevant archaeological reports and publications, and a search and review of previously recorded sites in the OEH Aboriginal Heritage Information Management System (AHIMS). This review and discussion allows for the development of a predictive model for potential Aboriginal sites within the study area, and establishes context for a comparative significance assessment. Summary descriptions of site types are provided in Table 4.1 below.

Table 4.1 Summary descriptions of Aboriginal site types referred to in this report

<table>
<thead>
<tr>
<th>Site type</th>
<th>Details</th>
</tr>
</thead>
</table>
| Open Camp Sites/ Stone Artefact Scatters/ Isolated Finds | Open camp sites represent past Aboriginal subsistence and stone knapping activities, and include archaeological remains such as stone artefacts and hearths. This site type usually appears as surface scatters of stone artefacts in areas where vegetation is limited and ground surface visibility increases. Such scatters of artefacts are also often exposed by erosion, agricultural events such as ploughing, and the creation of informal, unsealed vehicle access tracks and walking paths. These types of sites are often located on dry, relatively flat land along or adjacent to rivers and creeks. Camp sites containing surface or subsurface deposit from repeated or continued occupation are more likely to occur on elevated ground near the most permanent, reliable water sources. Flat, open areas associated with creeks and their resource-rich surrounds would have offered ideal camping areas to the Aboriginal inhabitants of the local area.

Isolated finds may represent a single item discard event, or be the result of limited stone knapping activity. The presence of such isolated artefacts may indicate the presence of a more extensive, in situ buried archaeological deposit, or a larger deposit obscured by low ground visibility. Isolated artefacts are likely to be located on landforms associated with past Aboriginal activities, such as ridgelines that would have provided ease of movement through the area, and level areas with access to water, particularly creeks and rivers.                                                                                                          |
| Scarred Trees                                  | Tree bark was utilised by Aboriginal people for various purposes, including the construction of shelters (huts), canoes, paddles, shields, baskets and bowls, fishing lines, cloaks, torches and bedding, as well as being beaten into fibre for string bags or ornaments. The removal of bark exposes the heart wood of the tree, resulting in a scar. Over time the outer bark of the tree grows across the scar (overgrowth), producing a bulging protrusion around the edges of the scar. Trees may also have been scarred in order to gain access to food resources (e.g. cutting toe-holds so as to climb the tree and catch possums or birds), or to mark locations such as tribal territories. The locations of scarred trees often reflect historical clearance of vegetation rather than the actual pattern of scarred trees. Unless the tree is over 150 years old, scarring is not likely to be of Aboriginal cultural origin; therefore, these sites most often occur in areas with mature, remnant native vegetation. |
| Axe Grinding Grooves                           | Grinding grooves are the physical evidence of tool making or food processing activities undertaken by Aboriginal people. The manual rubbing of stones against each other creates grooves in the rock, which are usually found on flat areas of soft rock such as sandstone, in areas of creek beds and other water sources. They are often associated with rock pools in creek beds and on platforms to enable the wet-grinding technique. |
| Quarries                                       | Aboriginal quarry sites are sources of raw materials, primarily for the manufacture of stone tools, but also for ochre procurement. They are only found where raw materials (stone or ochre) occur within the landscape, and where these have been exploited in the past. Such sites are often associated with stone artefact scatters and stone knapping areas. Loose or surface exposures of stone or cobbles may be coarsely flaked for removal of portable cores. Raw materials can be sourced to these sites and provide evidence for Aboriginal movement and/or exchange. |
| Rock Engravings                                | Rock engravings are a type of Aboriginal art, and are often located on high vantage points along ridge lines at the headwaters of creeks, but can be located on any suitable fine grained stone surface. |
| Shelter Sites with Art (Engraving, Painting or Drawing) or Occupation Deposit | These are art or occupation sites located in areas where suitable rock outcrops and surfaces occur, where weathering has resulted in suitable overhangs or recesses in boulder outcrops or cliff-lines. |
Middens

Shell middens result from Aboriginal exploitation and consumption of shellfish, in marine, estuarine or freshwater contexts. Middens may also include faunal remains such as fish or mammal bone, stone artefacts, hearths, charcoal and occasionally, burials. They are usually located on elevated dry ground close to the aquatic environment from which the shellfish has been exploited and where fresh water resources are available. Deeper, more compacted, midden sites are often found in areas containing the greatest diversity of resources, such as rivers estuaries and coastal lagoons.

Bora/Ceremonial

Aboriginal ceremonial sites are locations that have spiritual or ceremonial values to Aboriginal people. Aboriginal ceremonial sites may comprise natural landforms and, in some cases, will also have archaeological material. Bora grounds are a ceremonial site type, usually consisting of a cleared area around one or more raised earth circles, and often comprised two circles of different sizes, connected by a pathway, and accompanied by ground drawings or mouldings of people, animals or deities, and geometrically carved designs on the surrounding trees. Unfortunately, the raised earth features are easily destroyed by agricultural and pastoral activities, vegetation growth and exposure to weather.

Stone Arrangements

Stone arrangements usually consist of geometric arrangements of portable stone on prominent rock outcrops, such as vantage points along escarpments where other key landmarks are visible. Some stone arrangements also include circles and pathways. They are thought to be ceremonial in nature, and may have also sometimes been used for corroborees (dances), fights or judicial meetings. Stone arrangements are often isolated from known camp site areas.

Natural Mythological (Ritual) Sites

These types of sites are usually identified by the local Aboriginal community as locations of cultural significance, and they may not necessarily contain material evidence of Aboriginal associations with the place.

Carved Trees

Carved trees generally marked areas for ceremonial purposes, or the locations of graves.

Burial Sites

Aboriginal burial of the dead often took place relatively close to camp site locations. This is due to the fact that most people tended to die in or close to camp (unless killed in warfare or hunting accidents), and it is difficult to move a body long distances. Soft, sandy soils on, or close to, rivers and creeks allowed for easier movement of earth for burial; and burials may also occur within rockshelters or middens. Aboriginal burial sites may be marked by stone cairns, carved trees or a natural landmark. Burial sites may also be identified through historic records, or oral histories.

Contact/ Historical Sites

These types of sites are most likely to occur in locations of Aboriginal and settler interaction, such as on the edge of pastoral properties or towns. Artefacts located at such sites may involve the use of introduced materials such as glass or ceramics by Aboriginal people, or be sites of Aboriginal occupation in the historical period.

4.2 Regional Archaeological Context

At the time of European settlement, the Aboriginal people of the Sydney region lived in local clans. Groups local to the study area are likely to have belonged to the Darug (Dharug), Gundundurra and the Dharawal (Thurrawal) language groups (Attenbrow 2010: 221,222).

Aboriginal occupation of the Sydney region is likely to have spanned at least 20,000 years, although dates of more than 40,000 years have been claimed for artefacts found in gravels of the Cranebrook Terrace on the Nepean River (Nanson et al. 1987; Stockton 1993; Stockton & Holland 1974). Late Pleistocene occupation sites have been identified on the fringes of the Sydney basin and from rock shelter sites in adjoining areas. Dates obtained from these sites were 14,700 years Before Present (BP) at Shaws Creek in the Blue Mountain foothills (Kohen et al. 1984), c.11,000 BP at Loggers Shelter in Mangrove Creek (Attenbrow 1981, 2004), and c.20,000 BP at Burrill Lake on the South Coast (Lampert 1971). The majority of sites in the Sydney region, however, date to within the last 3,000 to 5,000 years, with many researchers proposing that occupation intensity increased from this period (Kohen 1986; McDonald 1994; McDonald & Rich 1993). This increase in sites may reflect an intensity of occupation which was influenced by rising sea levels, which stabilised approximately 6,500 years ago. Older occupation sites along the now submerged coastline would have been flooded, with
subsequent occupation concentrating on and utilising resources along the current coastlines and in the changing ecological systems of the hinterland (Attenbrow 2003).

The spread of urban development across the Cumberland Plain, particularly over the last few decades, has meant that archaeological investigations have intensified with the need for environmental impact assessments. Most archaeological investigations conducted within this framework have been restricted by small study areas (as defined by individual developments) and limited project briefs. As a result, the Cumberland Plain has become the most intensively investigated archaeological landscape in Australia. The studies carried out over these decades of development in the west provide a broad picture of the archaeological context of the region.

A number of predictive models relating to Aboriginal occupation patterns and site locations have been formulated through archaeological investigations in the Cumberland Plain (Dallas 1989a; Haglund 1980; Kohen 1986; Smith 1989). More recent works have contributed to refining these models (AMBS 2000a, 2002; Jo McDonald Cultural Heritage Management [JMCHM] 1997, 1999, 2001a; McDonald 1999). However, it should be noted that archaeological investigations still reveal site information in contradiction to the current, general predictive model for the area, and it is expected that further archaeological work will continue to refine the model.

The most common site types found on the Cumberland Plain are open artefact scatters/open camp sites, followed by scarred trees and isolated finds. Shelter sites and grinding grooves are also found, although mainly around the periphery of the Plain in sandstone geology. Key trends are summarized below:

- site frequency and density are directly related to the location of sites within the landscape;
- complex sites are usually located close to permanent water sources, with major confluences being a key requirement for occupation sites, and would have been used intensively by larger groups, or used repeatedly by smaller groups over a longer period of time;
- sites with large numbers of artefacts can occur on ridge tops and hill crests;
- sites situated in alluvial soils retain the potential for stratified deposits;
- Potential Archaeological Deposits (PADs) are most likely to be located along valley floors and low slopes in well-drained areas; and surface artefact distribution does not accurately reflect the composition or density of subsurface archaeological deposits. Some areas with few or no surface manifestations have often been shown to contain subsurface archaeological deposits.
- artefact scatters are most commonly linked to the close proximity of permanent water sources in areas such as creek and river banks and alluvial flats. The majority of these sites are located within 100m of permanent fresh water;
- artefact assemblages generally comprise a small proportion of formal tool types with the majority of assemblages dominated by unretouched flakes and debitage;
- high concentrations of artefacts are more likely to be located within resource rich areas;
- silcrete is the dominant raw material used for tool manufacture, followed by chert (also known as tuff). Silcrete sources are located in the north western Cumberland Plain at places such as St Marys, Plumpton Ridge, Marsden Park, Schofields, Riverstone, Deans Park, Llandilo and Ropes Creek (the closest source to the study area, approximately 11km north). Other raw materials include indurated mudstone from Nepean River gravels, quartz, porphyry and hornfels which may be derived from Rickabys Creek gravels, and basalt;
- stands of remnant old growth vegetation retain the potential for scarred trees to be present; however, large scale land clearance of the plain in general means that such stands of vegetation are rare; and
- evidence of post-contact camp sites may be located in close proximity to early European houses and farms, or official buildings.
4.2.1 The Current Regional Model

Regional trends indicate that Aboriginal sites are most frequently located in close proximity to permanent water courses; on creek banks and alluvial flats, or on high ground, and within range of food resources and the raw materials for tool making. However, some exceptions have been demonstrated in excavations at Mungerie Park and Parklea Leisure Centre, where large artefact scatters were identified up to 200-250m from major watercourses (AMBS 2000a). McDonald suggested that this site distribution pattern may be due to surface visibility and site formation processes, rather than a true depiction of the cultural distribution of artefacts across the landscape (1994, cited in Mills & Kelton 2002). In 2009, ENSR Australia Pty Ltd (ENSR) undertook excavations at the Oran Park and Turner Road Land Release Precincts, approximately 2-5km south west of the project study area (see Figure 4.1), and concluded that:

The archaeological landscape revealed by this investigation suggests that archaeological models derived from other regions or other areas should not be applied uncritically. There was no evidence for greater complexity (defined as intricacy) associated with confluences. There was no evidence of greater densities of archaeological material associated with higher order watercourses. Instead it appears that archaeological deposit in the south west [Cumberland Plain] is of relatively low density with occasional clusters in association with all areas of reliable water regardless of stream order. Future assessments in south west Sydney would benefit from paying greater attention to the investigation of areas within 300m of all reliable watercourses (i.e. more than the conventional 50m vicinity of watercourses) (ENSR 2009:66).

ENSR also found that large sites tend to be located in elevated areas with a good outlook over surrounding major creek valleys, at a distance of over 150m from creeks. It was suggested that this may reflect strategic defensive positioning of camp sites within a cultural interaction zone between three different language groups; the Darug, Gundungurra and Tharawal speaking peoples (ENSR 2009). It should be noted that the ENSR excavations were concerned with testing archaeological patterning throughout a large landscape; however, this type of landscape model has not been extensively tested in other archaeological studies, and further work is needed to determine whether this pattern is seen in other areas. It is also possible that the ‘strategic defensive positioning’ of sites will not be seen in areas that were not major cultural interaction zones between Aboriginal groups.

Previous studies have also highlighted the problems inherent in characterising archaeological sites on the Cumberland Plain solely by the presence of visible surface stone artefacts, and the importance of test excavation in establishing the nature and density of archaeological material in the Cumberland Plain. Studies have demonstrated that the average ratio of subsurface artefacts to those found at surface could be 25:1, with more recent work indicating this could be as much as 2,000:1 in some locations (JMCHM 2001a). Further, the detection of sites is often influenced by factors such as previous land-use and disturbance, and location within the landscape (JMCHM 2003). A high proportion of sites located in the region are found in disturbed contexts (e.g. Smith 1989).
4.2.2 Archaeological Excavations in the Vicinity of Leppington Precinct

Although Sections 4.3.3 and 4.3.4 provide a review of archaeological investigations within the Leppington Precinct study area and its near vicinity, there are several archaeological excavations which
have been undertaken within the wider vicinity of the study area, which have relevance to predictive modelling in the area (see Figure 4.2).

Figure 4.2 Location of previous archaeological studies on the eastern side of the study area.
Navin Officer 1993

Navin Officer undertook test excavations on the banks and flats of Maxwells Creek, near the intersection of the M5/M7 and Camden Valley Way (approximately 6km north east of the current study area), in accordance with recommendations made by Haglund & Associates in 1992. Although no artefacts were recovered in the 57 pits excavated by spade, it is estimated that only 0.016% of the three testing areas was excavated. Further, the excavated soil was not completely sieved in order to recover artefacts, with Navin Officer noting that ‘soil was hand-crumbled into a 5mm mesh but, in most localities, was too damp to sieve’ (1993:9). Navin Officer found that the areas had been affected by considerable disturbance and regular flooding in the past, and considered that the potential for significant, in situ sites was low; instead, they postulated that a background scatter of artefacts was likely to be present in this location, which was unlikely to be discovered by test pit sampling (1993:13). Therefore, although the tested areas were in close proximity to the reliable water of Maxwells Creek, no large sites were found; however, this result may have been affected by the limited excavation area and, limitations in the excavation methodology.

Rich & McDonald 1995

Rich and McDonald undertook excavations near a fairly reliable tributary of Cabramatta Creek in West Hoxton, at site WH3 (approximately 3.5km north east of the current study area). Despite the fact that mechanical grader scrapes were used for the excavation, a total of 3,686 artefacts were recovered. This was interpreted as resulting from two silcrete knapping floors.

Navin Officer 1998

Following their survey of The Crossroads in 1997, Navin Officer undertook test excavations on the banks and flats of Maxwells Creek (approximately 6km north east of the current study area), approximately 200m south of the 1993 Navin Officer excavations (see above). While no artefacts had been recovered from the 1993 excavations, Navin Officer considered this area to be relatively undisturbed, and identified it as having archaeological potential, although ground visibility was too low to identify any surface artefacts. Therefore, mechanical excavation of the area by backhoe was undertaken. Although only 0.12% of the area of archaeological potential was excavated (of which only a sample was sieved), 92 artefacts were recovered (an average of almost two artefacts per square metre of the excavated area). Navin Officer interpreted the site as representing background scatter. Although the tested area was in close proximity to the reliable water of Maxwells Creek, no large sites were found; however, this result may have been affected by the limited excavation area and, limitations in the excavation methodology.

AMBS 2000b

AMBS undertook salvage excavations in an area of PAD near site MC-1, on the bank of Maxwells Creek in a relatively undisturbed area of Cumberland Plain Woodland (approximately 7km north east of the current study area). Three areas of the PAD were excavated, by hand and mechanically, resulting in the recovery of 151 artefacts from 78m² (an average of almost two artefacts per square metre that was excavated). The site was interpreted as evidence of low-density/background artefact scatter throughout the area. It was noted that undisturbed Aboriginal sites are thought to be rare on Maxwells Creek, due to extensive development along the creek line (AMBS 2000b:15).

Dallas 2000

Dallas undertook test excavation of an area of PAD that had been identified as potentially representing Aboriginal occupation focused around a bend of Bunbury Curran Creek, near Macquarie Fields House (approximately 6km east of the current study area; Figure 4.2). The test excavations consisted of 17 1m² backhoe trenches in an area proposed to be impacted by a perimeter road and house blocks,
and four backhoe trenches in landfill within the PAD. The excavations revealed a low density background scatter of stone artefacts, of types common in the region, and hence considered to be of low archaeological significance (Dallas 2000).

**Mills & Kelton 2002**

Mills and Kelton undertook test excavation of 16 PADs along the alignment of the Western Sydney Orbital (now known as the M7) in 2002 (no map was available from the report; however, the M7 is approximately 6km north east of the current study area). These excavations located 556 artefacts within 1876 test pits. Mills and Kelton considered that the 82 artefacts recovered from 456 pits at PAD1 demonstrate that there was more intense occupation at Maxwells Creek than in other areas.

**Central West Archaeological and Heritage Services 2003**

Central West Archaeological and Heritage Services (CWAHS) undertook test excavations of a PAD (WSO PAD 6) that had been identified during the M7 assessments, on the western flood-prone creek bank of Maxwells Creek (no map was available from the report; however, the site is in the vicinity of MC-1, approximately 7km north east of the current study area; see Figure 4.2). Only four stone artefacts were recovered from the 21 50 x 50 cm pits that were excavated, and it was concluded that flooding of the site had impacted any archaeological deposit that may have been located there.

#### 4.2.3 Summary

Excavations in this region of the Cumberland Plain have predominantly concentrated on the major creeks (particularly Eastern, Hinchinbrook, Cabramatta and Maxwells), and have found extensive deposits representing repeated use of the area for occupation or resource use within c.100m of these permanent water sources and their reliable tributaries (e.g. Mills & Kelton 2002; Rich & McDonald 1995). Low densities of artefacts representing one-off resource use or infrequent occupation have also been located near reliable water sources, although prior disturbance of these sites is often a factor in the low density of artefacts found (e.g. AMBS 1996; Mills & Kelton 2002; Navin Officer 1993, 2007a). Sites or PADs in the vicinity of less reliable, ephemeral creeks are generally considered likely to have low-to-moderate density archaeological deposits (more than background scatter, which may be defined as an average of 0.01 artefacts/m²). Low-lying, flood prone areas are also unlikely to have been used extensively for camping (CWAHS 2003); higher areas overlooking creeks are more likely to have been suitable locations for repeated use by Aboriginal people camping in the area (ENSR 2009). However, it may be seen from Section 4.2.2 that archaeological investigations of areas considered to have archaeological potential may have results which are contrary to expectations, based on the current predictive model. Further, there has been limited archaeological investigation undertaken in the study area and its immediate vicinity (AMBS 2010a; Environmental Resources Management [ERM] 2005, 2007; Navin Officer 2007; Rich & McDonald 1995). It is clear that further excavation of the area is required in order to refine predictive modelling.

#### 4.3 Local Archaeological Context

##### 4.3.1 Ethnographic Context

The Aboriginal history of the Campbelltown/Liverpool area was compiled as a Bicentennial project by Liston (1988). This study documents interactions between Europeans and the Tharawal people from the early 18th century. Traditionally, this area was thought to be close to the intersection of a number of language group (tribal) boundaries. Language groups include the Dharug who inhabited much of the Cumberland Plain between the Blue Mountains and the coast, the Tharawal who ranged from the coast westwards towards Camden, and the Gandangara who inhabited areas westward and southwest of the Tharawal and into the Blue Mountains. The Tharawal people and other Aboriginal groups continue to be active in the Campbelltown area (Liston 1988).
4.3.2 Site Types

A search of the AHIMS database was undertaken on 14 August 2012 (AHIMS client service number #77232), and 90 registered Aboriginal sites were identified within a search area of 4.5km x 5.5km centred on the study area. The search results are summarised in Table 4.2 and presented in Figure 4.3.

Table 4.2 AHIMS data for the local area (AHIMS search conducted on 14/08/2012; Service ID 77232)

<table>
<thead>
<tr>
<th>Site type</th>
<th>Count</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Isolated find</td>
<td>53</td>
<td>58.9%</td>
</tr>
<tr>
<td>Artefact scatter</td>
<td>25</td>
<td>27.8%</td>
</tr>
<tr>
<td>Potential Archaeological Deposit (PAD)</td>
<td>7</td>
<td>7.8%</td>
</tr>
<tr>
<td>Scarred tree</td>
<td>3</td>
<td>3.3%</td>
</tr>
<tr>
<td>Artefact scatter and PAD</td>
<td>2</td>
<td>2.2%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>90</strong></td>
<td><strong>100%</strong></td>
</tr>
</tbody>
</table>

Previous archaeological investigations have recorded Aboriginal heritage items within and near the study area. There are three previously recorded sites located within the study area, and an additional three sites in its vicinity (within 100 metres). A summary of recorded sites that are relevant to the current study area is provided in Table 4.3 (organised according to distance from the study area, and roughly north to south and east to west) and Figure 4.4.

Table 4.3 Registered Aboriginal sites within 100m of the study area

<table>
<thead>
<tr>
<th>Site</th>
<th>AHIMS No.</th>
<th>Site Type</th>
<th>Location</th>
<th>Recorder/report</th>
</tr>
</thead>
<tbody>
<tr>
<td>PAD 2055-6</td>
<td>45-S-4050</td>
<td>PAD</td>
<td>Within study area. Alluvial flat and lower slope on Heath Road (c.200m from Dickson Road), south east of Kemps Creek, with relatively low disturbance (particularly north east of Heath Road).</td>
<td>Archaeological and Heritage Management Solutions (AHIMS) (in prep.) – SWGC water pipelines</td>
</tr>
<tr>
<td>PAD 2056-6</td>
<td>45-S-4051</td>
<td>PAD</td>
<td>Within study area. Area of relatively low disturbance on alluvial flat on Heath Road (c.200m from Rickard Road) directly south and west of confluence of two low order streams. Area of highest sensitivity is on north side of Heath Road (north of road boundary).</td>
<td>AHMS (in prep.) – SWGC water pipelines</td>
</tr>
<tr>
<td>Isolated Object 2057-5</td>
<td>45-S-4052</td>
<td>Isolated find – possible bi-face/discarded blank PAD</td>
<td>Within study area. At base of letterbox at 7 Heath Road.</td>
<td>AHMS (in prep.) – SWGC water pipelines</td>
</tr>
<tr>
<td>PAD 2059-6</td>
<td>45-S-4053</td>
<td>PAD</td>
<td>Adjacent to study area, next to eastern edge. Eastern extent of a long stretch of Camden Valley Way with generally low disturbance, and containing a number of smaller spur areas which have the potential to hold in situ deposits.</td>
<td>AHMS (in prep.) – SWGC water pipelines</td>
</tr>
<tr>
<td>LP-4</td>
<td>45-S-3947</td>
<td>Artefact scatter – 2 artefacts (red/yellow silcrete broken flakes)</td>
<td>30m north of study area. At base of Grey Box tree, in grassy strip at southern edge of Lockies Hotel carpark, 55m west of Camden Valley Way, 10m north east of Ingleburn Road.</td>
<td>Kelleher Nightingale (KN) (2010a) – Camden Valley Way upgrade</td>
</tr>
<tr>
<td>SWRL Site 9</td>
<td>45-S-3532</td>
<td>Artefact scatter – 3 artefacts (red silcrete broken/whole flakes)</td>
<td>60m north of study area. At base of electricity transmission line poles, 5m west of Kemps Creek, 200m north east of McCann Road, within Lot 102 DP736147.</td>
<td>AMBS (2010b) – survey for SWRL</td>
</tr>
</tbody>
</table>
Figure 4.3 Location of AHIMS sites in the vicinity of the study area (AHIMS search conducted on 14/08/2012; Service ID 77232). Items referred to in Table 4.3 are highlighted in blue. [NB. Figure removed for public exhibition.]

Figure 4.4 Identification of AHIMS sites in closest proximity to the study area (AHIMS search conducted on 14/08/2012; Service ID 77232). Items referred to in Table 4.3 are highlighted in blue. [NB. Figure removed for public exhibition.]

4.3.3 Previous Archaeological Investigations within the Leppington Precinct

There have been a number of archaeological investigations in the general vicinity of the study area (see Figure 4.1-Figure 4.2); however it appears that the majority of the land within the study area has not been previously subject to Aboriginal heritage survey or assessment. The information in the following sections is based on reports that have been registered with the OEH AHIMS, and which are most relevant and informative to archaeological background of the current project.

South West Growth Centres

Archaeological and Heritage Management Solutions (AHMS) (in prep.) recently undertook investigations of the North West Growth Centres (NWGC) and the South West Growth Centres (SWGC) for the Sydney Water Corporation (SWC). The report has not yet been completed; however, given the relevance to the Leppington Precinct within the SWGC, some completed sections of the report were previously obtained by DP&I.

In comparing the two Growth Centres, AHMS states that their archaeological investigations in the NWGC area suggest that stone raw material for tool manufacture was transported to the SWGC area, due to the lack of naturally occurring material in its vicinity, and the disproportionate core-to-flake ratio, lack of cortex and small size of stone tools seen in artefact assemblages (AHMS in prep:83, 85). Further, in the SWGC, sites were generally located near watercourses, and stream order does not appear to have a predictable influence on site size, density or complexity; sites with greater frequency, size and complexity are found 120m-180m from creeklines on gentle slopes and hillcrests, and within 500m of watercourses on ridgelines and their associated mid to lower slopes (AHMS in prep:84).

The survey undertaken by AHMS for the SWGC included parts of the current study area; mainly creeks and roads where SWC proposes to install infrastructure (Figure 4.1). A total of 65 sites were identified in the area, comprising four artefact scatters, 17 artefact scatters with associated PAD, 25 PADs, one scarred tree, 19 isolated finds and two cultural sites. All sites were affected to various degrees by disturbance. Four of these sites are within the current study area (see Table 4.3 for details).

Camden Valley Way

Kelleher Nightingale (KN) (2010a) undertook a survey of Camden Valley Way between Cobbitty Road and Cowpasture Road, which includes part of the current study area (Figure 4.1-Figure 4.2). The road corridor, adjacent property boundaries and creeklines which were to be affected by the road upgrade were inspected. Fourteen sites were identified, comprising ten artefact scatters, two isolated finds and two scarred trees. Within the vicinity of the current study area, isolated finds LP-1 and LP-3 and artefact scatter LP-4 were assessed as having low archaeological potential and significance, while artefact scatter LP-2 was assessed as having high archaeological potential and significance. A Section 90 was recommended for LP-1 and LP-4; LP-2 and LP-3 were able to be avoided by the development.
4.3.4 Previous Archaeological Investigations in close proximity to the Leppington Precinct

**East Leppington**

East Leppington is located adjacent to the current study area, on the eastern side of Camden Valley Way (Figure 4.2). The area was surveyed by Navin Officer in 2008, and 60 sites were identified. Godden Mackay Logan (GML) undertook test excavations throughout the area to inform management strategies for the proposed East Leppington residential development (Figure 4.5). The excavations recovered 519 stone artefacts (predominantly of silcrete, silificed tuff and quartz) from 533 test units comprising a total of 133.25m², sampling each landform within the area. The highest numbers of artefacts were located on flats/terraces and lower slopes adjacent to Bonds Creek and Bonds Creek South; artefact density and raw material variation tended to increase with stream order. On hilltops or ridge crests, artefacts were present in slightly higher numbers than background scatter, whereas this was not generally the case on mid-slopes. There was evidence of microlithic (backed artefacts comprised 5% of the artefact assemblage) and bipolar (bipolar flaking was evident on 2.5% of artefacts) technologies, and heat-shattered artefacts tended to be more common in association with higher order streams, possibly indicating more intensive use of hearths in these areas. The proportion of artefacts manufactured on silcrete, and of microlithic and bipolar artefacts, also seemed to increase with stream order. It was suggested that these creek-side areas were occupied deliberately and repeatedly over thousands of years, by Aboriginal clan groups.

Figure 4.5 Location of test units and areas of archaeological potential identified by GML (2012:Figure 3.37). [NB. Figure removed for public exhibition.]

**Glenfield-Leppington South West Rail Link**

The South West Rail Link (SWRL; now known as the Glenfield to Leppington Rail Line [GLRL]) is an 11km rail alignment extending from south west of the existing Glenfield Rail Station to a proposed train stabling facility at Rossmore, approximately 100m north of the current study area (Figure 4.2). Surveys for the GLRL project have been undertaken by Heritage Concepts (2006) and AMBS (2010b). Twenty new sites were located during these surveys, and AMBS identified areas of archaeological sensitivity and recommended excavations in the following areas (see also Figure 4.6):

- land between Cabramatta and Maxwells Creeks, including Ingleburn, which was considered to have moderate-high archaeological sensitivity, for the potential to reveal a continuity of activity in the landscape around Cabramatta and Maxwells Creeks;
- land adjacent to Kemps Creek, which was considered likely to have high archaeological sensitivity; and
- an elevated area in the landscape at the rear of a property at 511 Bringelly Road, in the immediate vicinity of a tributary of Kemps Creek, which was considered to have moderate archaeological sensitivity.

AMBS undertook test and salvage excavations in these areas from 2010-2013. The largest numbers of excavated artefacts were recovered from lower slopes and flats within 50-100m (and to a much lesser extent, up to 200-300m) of significant water resource zones in the region, just outside the flood inundation zones of the creeks. In particular, a majority of artefacts were recovered from Kemps Creek on the north western margins of the current study area (2898, or 98%, of the stone artefacts located during the test/salvage excavations undertaken in September/October 2011 and April 2013; Figure 4.7). The assessed potential for significant Aboriginal archaeological deposits to be present within the identified areas of high archaeological sensitivity in the GLRL corridor, particularly in association with creeks and swamp areas (AMBS 2010a), was thus confirmed by the test/salvage excavations undertaken in September/October 2011 and April 2013.

Figure 4.6 Location of Aboriginal sites and areas of archaeological sensitivity (AAS) within the GLRL corridor (Source: AMBS 2011b:Figure 2.6). [NB. Figure removed for public exhibition.]
Although few artefacts were recovered along elevated landforms within the GLRL study area, this may be a result of an increase in previous impacts and associated erosion affecting site integrity, and may not reflect past Aboriginal land use. Any sites identified on high points/ridges, such as any within the current study area, would therefore have significance in identifying Aboriginal use of these areas, should there be a lesser level of disturbance.

**Figure 4.7 Results of Aboriginal heritage excavations within the GLRL corridor.** [NB. Figure removed for public exhibition.]

**McCann Road**

A survey for a proposed residential subdivision was undertaken by White (2001), between Bringelly and McCann Roads, approximately 400m north west of the current study area (Figure 4.1). White’s study area was located on a ridge top between South and Kemps Creeks, and six isolated finds and one PAD were identified during the survey (Figure 4.8). The PAD was located on hillslopes adjacent to a creek, and test excavation was recommended prior to any impact in that area.

**Figure 4.8 Study area and sites identified by White (2001:Figure 1).** [NB. Figure removed for public exhibition.]

**Bringelly Road**

Austral Archaeology (AA) recently undertook the Stage 1 assessment for the upgrade of Bringelly Road (approximately 500m north of the current study area), between Camden Valley Way (Leppington) and the North Road (Bringelly) (AA in prep.). Although the site cards are available in the OEH AHIMS (15 of which were identified during an AHIMS search for the study area and its vicinity), the report (including map) is not yet available in the AHIMS.

KN (2011) undertook the next stage of the Draft RTA Procedure For Aboriginal Cultural Heritage Consultation & Investigation (PACHCI; RTA 2011). Their archaeological survey (Figure 4.1-Figure 4.2) verified the locations of previously recorded Aboriginal sites. In addition, Aboriginal stakeholders were consulted, and a methodology was developed for further archaeological investigation of five sites.

**Gas Pipeline**

English (1994) undertook a survey of the proposed Moomba to Sydney ethane pipeline, between Wilton and Botany. A sample of the pipeline area was surveyed, with sampled areas chosen on the basis of landform and previous landuse/disturbance. One of the surveyed sections extended from Denham Court Road to Camden Valley Way, which is approximately 1km to the east of the current study area (Figure 4.2).

**Leppington Caravan Park**

Navin Officer (2006) undertook a survey as part of the proposed redevelopment of Leppington Caravan Park, Camden Valley Way, Leppington (approximately 1km north east of the current study area; Figure 4.2). Navin Officer’s study area comprised the approximately 8.1ha caravan park, and an additional 2.2ha of undeveloped land.

The caravan park area was found to comprise heavily disturbed and modified ground, sealed roads, kerb and guttering and associated electricity, sewerage and drainage infrastructure. The survey therefore focussed on the 2.2ha of undeveloped land; however, despite excellent visibility, only one artefact was identified. Based on the lack of associated material in the study area and vicinity, the site was assessed as being of low archaeological significance, and indicative of low archaeological potential for the study area.
Denham Court

AHMS (2010) undertook a field survey approximately 1.5km east of the current study area (Figure 4.2), commencing at Raby Reservoir, continuing along Denham Court Road, and then moving into Campbelltown Road. The intersection of Campbelltown and Denham Court Roads, and the section along Campbelltown Road to the intersection of MacDonald Road, were also surveyed.

AHMS noted that no sites, artefacts or objects of significance were identified. This is in line with the predictive model (2010:47).

Edmondson Park

Dallas surveyed the Department of Defence lands at Ingleburn, within the area now known as Edmondson Park (approximately 2km east of the current study area; Figure 4.2) and located 10 stone artefact sites (see Figure 4.9). The level of disturbance in these areas, the poor condition of the sites and the low likelihood of subsurface material to be present, were such that Dallas assessed the sites as having low significance.

Figure 4.9 Location of sites recorded by Dallas (1999:Figure 3). [NB. Figure removed for public exhibition.]

AMBS undertook surveys of the Edmondson Park area as part of the Edmondson Park Composite Site (EPCS) Master Plan in 2003 (Figure 4.2). It was noted that 13 artefact scatters and five isolated finds had previously been recorded across the EPCS, comprising a total of 276 artefacts, and that most sites were located in areas of low or moderate disturbance along tributaries of Maxwells Creek, either on the alluvial flats immediately adjacent to the creekline or on the associated elevated, gently sloping undulating rises above the creeks (AMBS 2003:10). The survey identified 15 new stone artefact sites (EPCS1 – EPCS15), comprising a total of 32 artefacts (see Figure 4.10).

Figure 4.10 Location of sites in Edmondson Park Composite Site (AMBS 2003:Figure 6). [NB. Figure removed for public exhibition.]

AMBS identified several areas of sensitivity where in situ archaeological deposits were considered likely to remain. Most areas of sensitivity are associated with known surface archaeological manifestations or landforms conducive to Aboriginal occupation. Areas were divided into four categories in accordance with their estimated archaeological potential:

- areas of high sensitivity are those where the original landscape has not been significantly disturbed and include locations conducive to Aboriginal occupation. These locations have either surface archaeological evidence and/or have the potential to yield substantial subsurface archaeological deposits based on landform and degree of disturbance;
- areas of moderate sensitivity are those where the original landscape has been partially disturbed by past land uses, although subsurface archaeological deposits are likely to remain intact to some degree. These locations have been identified by surface archaeological evidence or their potential to yield subsurface archaeological deposits based on landform and degree of disturbance;
- areas of low sensitivity are those where the original landscape has been more substantially disturbed by past land uses and subsurface archaeological deposits are likely to remain intact to a lesser degree. Locations were identified by surface evidence or their potential to yield subsurface archaeological deposits based on landform; and

the remainder of the site has been categorised as disturbed landscape because of the substantial degree of previous land disturbance that has taken place. While the presence of archaeological material within these zones cannot be ruled out, it is considered unlikely that intact archaeological deposits would still be present (AMBS 2003:27-30) (see Figure 4.11).
Navin Officer undertook test excavations on a rise overlooking Cabramatta Creek, approximately 3km east of the current study area (Figure 4.2). A total of 68 test pits, in areas of least disturbance, were mechanically excavated throughout the area, including site EPCS5 (see Figure 4.12). Only 0.008% of the area of archaeological potential was excavated (of which only a sample was sieved, ‘equivalent to the in situ deposit that would be recovered from an excavation area of 100 x 48 cm’; Navin Officer 2007a:5). A low density of artefacts was recovered, 33 in total from the 68 pits (an average of 1.3 artefacts per square metre that was excavated), with the majority on a low slope near the banks of a second order tributary of Cabramatta Creek. All finds were within the site designated as EPCS5 except for one isolated artefact (LLB1). Navin Officer recommended that this area did not require further archaeological assessment (Navin Officer 2007a).

Based on the results of this subsurface archaeological testing, Navin Officer revised the areas of archaeological potential identified by AMBS within Edmondson Park. Navin Officer’s justification for the reassessment of the entire Edmondson Park precinct was that ‘the subsurface investigation [at LLB1] found that soils within the test area were very shallow, with minimal subsurface deposits. Consequently the overall archaeological potential of the area was downgraded. There are now four areas of moderate archaeological potential and three areas of low archaeological potential in the area’ (Navin Officer 2007b:5). However, it should be noted that this is based on the excavation of a very small percentage (0.008%) of the area considered by AMBS in 2003, to have high sensitivity, particularly as only a sample of excavated soil was sieved. Given the contradictions between excavations in the vicinity of the area (see Section 4.2.2), it is inadequate to attempt to reassess all sites throughout the Edmondson Park precinct, sight unseen, based on the results of one small-scale excavation.

In 2009, AA undertook an archaeological risk assessment of 20 route options, as part of a wastewater planning study of the Edmondson Park area. The assessment was desktop-based, with a limited site inspection undertaken off Rynan Avenue (approximately 3km north east of the current study area; see Figure 4.2). No new sites were identified during the inspection; however, it was noted that ground surface visibility was limited. Further, AA considered that most areas close to creeks, particularly those that are relatively undisturbed, were likely to contain Aboriginal archaeological deposits.

KN prepared an Aboriginal Cultural Heritage Assessment Report (CHAR) for Edmondson Park South, a proposed urban community development by Landcom within the Edmondson Park Release Area. No field surveys were undertaken for the CHAR, which relied on the findings of the preliminary Aboriginal heritage assessment in the EPCS Master Plan to identify areas of archaeological sensitivity, areas of high cultural significance, and degree of landscape disturbance (KN 2010b:1,7,11-15; see Figure 4.14).

AMBS (2011) recently undertook a survey of the proposed trunk water, wastewater and recycled water infrastructure for the Edmondson Park Release Area (Figure 4.2). The locations of five previously recorded Aboriginal sites were verified during the survey, and five new Aboriginal sites were identified and recorded (one isolated find and four artefact scatters). Based on the results of the survey and the level of disturbance and landform types in the vicinity of the study area, thirty-four areas within the
proposed impact area were identified as having varying degrees of archaeological sensitivity (Figure 4.15).

Figure 4.15 Identified sites and areas of archaeological sensitivity identified for water infrastructure at Edmondson Park (AMBS 2011:Figure 7.29). [NB. Figure removed for public exhibition.]

Cowpasture Road

AHMS (2004) undertook an Aboriginal archaeological assessment for the proposed upgrade of Cowpasture Road between Main Street and Camden Valley Way (approximately 3km north east of the current study area; Figure 4.2). The study area comprised land adjacent to the road corridor, and was found to have been significantly disturbed by the construction of Cowpasture Road. No sites were located, and the corridor was considered to have low archaeological potential. AHMS considered that no further archaeological work was necessary prior to the upgrade.

Hoxton Park

In 2005, AA undertook a field survey for Sydney Water for the Hoxton Park Recycled Water Scheme (approximately 3km to the east of the current study area; Figure 4.2, Figure 4.15); however, changes were required for the Scheme and AA prepared a revised report in 2006 (AA 2006). The survey of the initial and revised routes identified areas of PAD in the vicinity of tributaries of Cabramatta and Maxwells Creeks. PADs J and L were considered to have the most potential for significant archaeological deposit, followed by PADs H, I and K. PAD M was not surveyed, but was estimated to have high potential based on available information (AA 2006:55-56). It was recommended that the PADs be avoided by the proposed development, or subject to test excavation if avoidance was not possible.

Figure 4.16 Location of PAD and PAS areas identified by AA for the Hoxton Park Recycled Water Scheme. [NB. Figure removed for public exhibition.]

In August 2008, AA undertook field surveys for an updated report for the Hoxton Park Recycled Water Scheme (Austral 2008a). Eight survey units were delineated for fieldwork across the Hoxton Park/Glenfield region. No new Aboriginal sites were recorded by the survey teams. Due to the high level of disturbance, the AA report concluded that the Hoxton Park/Glenfield site represented low archaeological potential.

In October 2008, AA mechanically excavated 12 1m x 1.2m test pits at PAD L, which was renamed HP PAD2 (AA 2008b). A very low density of artefacts (33, manufactured predominantly on silcrete, tuff and quartz) was located on both sides of an unnamed first-order tributary of Cabramatta Creek, and it was concluded that insufficient artefacts were retrieved to “warrant further works or in-depth artefact analysis” (AA 2008b:ii-iii,5). The site was registered as an artefact scatter and renamed HP AD1 (AA 2008b:58), and a Section 90 AHIP was issued.

Liverpool Release Areas

Smith (1989) surveyed approximately 2700ha in the Liverpool Release Areas, which includes land approximately 3km north east of the current study area (Figure 4.2). Smith targeted a representative sample of landscape units, topographic features and land use areas (1989:22). Smith assessed the areas of highest archaeological potential to be within 50-100m of permanent creek lines and swamps, including the headwaters of permanent creeks, and relatively undisturbed areas along Maxwells Creek; with the banks of all temporary creeks considered to have moderate archaeological potential, and hill tops and slopes also having some archaeological potential (Smith 1989:70-71).

One of the sites identified by Smith, WH1, was adjacent to a creek and recommended for test excavation. McDonald (1992a) undertook an additional survey of the area and determined that
WH1 has skeletal topsoil and therefore should not be excavated. However, three additional stone artefact scatters were located during the survey and two were test excavated, resulting in the identification of 113 flaked, retouched, heat-shattered, bipolar, backed & ground-edged silcrete, mudstone, quartz, basalt & fine-grained siliceous artefacts. Further excavation was recommended, and undertaken by Rich & McDonald (1995; see Section 4.2.2 above for the results of the salvage excavation).

**Horningsea Park**

A survey for a proposed school site at Horningssea Park, approximately 3.5km north east of the current study area was undertaken by Hardy (2003; Figure 4.2). Although no sites were identified during the survey, ground surface visibility was low. Given the location of the area c.500m from Cabramatta Creek and 100-200m from one of its tributaries, Hardy recommended that test excavation should be undertaken prior to development.

**Bringelly-Rossmore Transmission Line**

McDonald (1992b) surveyed an area proposed for a transmission line, between Bringelly and Rossmore (approximately 4.5km north west of the current study area; Figure 4.2). The survey identified one isolated find, and one artefact scatter comprising flakes, flaked pieces and backed blades of silcrete, indurated mudstone and quartzite. The dominance of indurated mudstone and backed blades was a significant find at this site.

**Harrington Park**

CWAHS (2004) surveyed the Harrington Park 2 and Mater Dei rezoning and development area (approximately 4km south of the study area; Figure 4.1), as part of a preliminary Phase 1 assessment of the area. CWAHS identified a need for further detailed investigations, and a Phase 2 Aboriginal heritage assessment was undertaken by AMBS (2006). The Phase 1 investigations identified 16 Aboriginal sites, including five possible scarred trees (Figure 4.17). The Phase 2 investigations identified a further 19 sites, including a scarred tree within site HP-OS-1, previously unrecorded by the Phase 1 survey. Six areas of Potential Archaeological Deposit (PAD) were also recorded. The locations of five scarred trees recorded in the Phase 1 survey were verified in the Phase 2 assessment and the scars assessed as being of either natural origin, or originating from historical tree lopping procedures. The locations of all but three of the sites identified during the Phase 1 investigation were verified in the Phase 2 assessment.

A large portion of the study area was assessed as having medium to high archaeological sensitivity, with most of the landscape exhibiting only low to medium disturbance (Figure 4.18). One site (HPK4) was assessed as having high archaeological and cultural importance due to its unique landscape positioning located at the crest of Crear Hill (elevation 150m), a dominant feature within the study area and the surrounding region. Additionally, a number of sites and PADs were located around this point. As a whole, the study area was considered to represent an archaeological landscape continuum where past Aboriginal occupation was distributed over a relatively intact selection of geographic features.

Large sections of the area were zoned for conservation, with 19 (63%) sites and 5 (83%) PADs located within these areas. One (17%) PAD and 11 (37%) sites were to be impacted by the development, and the PAD and five sites were recommended for salvage excavation. The remaining six sites were assessed as having at best low significance due to disturbance and position in the landscape, and thus salvage was not considered to be necessary.
Figure 4.17 Harrington Park 2 and Mater Dei rezoning and development area, showing sites and PADs identified by CWAHS (2004) and AMBS (2006: Figure 4). [NB. Figure removed for public exhibition.]

Figure 4.18 Areas of archaeological sensitivity and proposed development/conservation areas of the Harrington Park 2 and Mater Dei study area (AMBS 2006:Figure 6).

**Middleton Grange**

JMCHM (2001) investigated an area approximately 5.5km north east of the current study area as part of the South Hoxton Park Aerodrome Master Plan (Figure 4.2). This preliminary archaeological assessment confirmed the location of one previously recorded site (PCP5) and identified two open camp sites and nine PADs in relatively undisturbed areas along the northern, central and southern creek and their tributaries (see Figure 4.19). Test excavation was recommended for any of the sites or PADs proposed to be impacted, in order to accurately assess their significance.

Further survey of this area was undertaken by Environmental Resources Management (ERM) in 2004. This survey identified one flaked silcrete artefact at the northern edge of JMCHM’s (2001b) PAD1. It was predicted that within the Middleton Grange landscape, the highest densities of Aboriginal stone artefacts would occur along the fourth order Hinchinbrook Creek (approximately 2.5km east of the current study area), where camping would have been the most intensive (see Figure 4.20). Camping would also have been frequent along the third order tributary of Hinchinbrook Creek (approximately 500m east of the current study area), with evidence of knapping floors predicted. Middle-low density deposits representing occasional food-gathering were predicted along the northern, central and southern second order creek tributaries, with background scatter present throughout the remaining area (ERM 2004).

Test excavations in the vicinity of the third order tributary, and the hill and slopes to the south (north of the central creek tributary) were subsequently undertaken by ERM (2005). This area had been recorded as PAD9 by JMCHM (2001b) and was renamed SH4 by ERM (2005). Although conducted within a relatively intact landscape, these excavations revealed lower densities of artefacts than had been predicted. No knapping floors were identified along the third order tributary, and artefact density was only slightly higher along this creek than on the slopes and crest of the hill. The artefacts were considered to represent low density archaeological deposit within 50m of the creek, and
background scatter further than 50m from the creek. Based on these results, it was anticipated that archaeological deposit along the central and southern creek tributaries would be of low density, and would not make any important contribution to archaeological knowledge of Aboriginal occupation of the local area (Figure 4.20).

Figure 4.19 Location of sites and PADs identified by JMCHM (2001b). [NB. Figure removed for public exhibition.]

Figure 4.20 Predicted archaeological patterning in Middleton Grange (Source: ERM 2007:Figure 3.5).

Further assessment of the area was undertaken for a Water Cycle Management Plan (ERM 2006). At this time it was recommended that monitoring and salvage of artefacts be undertaken for any impacts
on SHMP1, SHMP2, SH4 and PAD1 (which was recommended to be reclassified as the boundary of site SH1).

Most recently, construction of a bridge across the central creek tributary involved impact to the area of inferred archaeological deposit associated with site SHMP1. As such, a Section 90 permit was obtained, and archaeological monitoring of topsoil stripping in this area was undertaken (ERM 2007). JMCHM (2001b) identified this area as likely to be associated with complex or extensive archaeological material, and it was predicted that if this was the case, artefacts would be found during monitoring. Based on subsequent investigations in the area, ERM (2007) anticipated a low density of archaeological material in this area, which may not be revealed by monitoring. It was anticipated that the results of the monitoring would be “useful in clarifying models of Aboriginal site location, specifically the association of Aboriginal sites with low order creek confluences, particularly where higher order creeks are present in the wider area” (ERM 2007:20). No archaeological deposits were identified during the monitoring, which supported the model predicting low density artefact distribution in this area.

AMBS (2008) also recently undertook a survey for the Middleton Grange Landscape Transition Zone (LTZ; see Figure 4.2). Three stone artefact scatters were located during the survey (see Figure 4.21). Although sites LTZ2 and LTZ3 are within close proximity of each other (c.80m apart), they are located on separate landforms and are considered to have differing subsurface expressions, and therefore were recorded as separate sites. Site LTZ3 was considered to have the highest archaeological sensitivity, given its visible surface expression, its relatively undisturbed state and its location on a raised area of land adjacent to (within 15m of) a second order creek tributary.

Figure 4.21 Study area and sites identified by AMBS (2008:Figure 6.2). [NB. Figure removed for public exhibition.]

### 4.3.5 Aboriginal Heritage Site Prediction Modelling

On the basis of the registered archaeological sites in the region, and review of previous archaeological studies, the following conclusions can be drawn regarding the potential presence and location of Aboriginal heritage sites within the landscape of the study area:

- stone artefact sites are the most common site type occurring across the landscape, and are the most likely site type to be present in the study area. This site type usually appears as low density open artefact scatters or isolated finds, although high density scatters may also be present. Stone artefact sites are found in all environmental contexts, but are most readily identified in areas where vegetation is limited and ground surface is visible. Larger sites with higher densities of artefacts tend to be found close to permanent water sources, such as Kemps and Bonds Creeks; and

- sites situated on relatively undisturbed alluvial soils have the potential to be associated with stratified subsurface archaeological deposits. Excavations within the region indicate that high densities of artefacts can be present up to 250m from water sources, and that subsurface material may be much greater than indicated by surface numbers of artefacts.

On the basis of the archaeological sites registered in the region and review of previous archaeological studies, the following types of site are unlikely to be present in the study area:

- stone quarry sites, axe grinding grooves, stone engravings/art and shelter sites are highly unlikely to be found in the study area because of the lack of suitable stone outcrops;

- scarred or carved trees are unlikely to be present in the study area as the majority of the study area has been extensively cleared of vegetation for past agricultural practices, transport corridors and residential developments resulting in a lack of mature trees; and
• burials and ceremonial sites (including stone arrangements) are highly unlikely to be present in the area given the disturbance caused by early pastoralism, agriculture, roads and more recent development.

4.4 Conclusion

This background assessment has identified preliminary areas of archaeological sensitivity, including registered Aboriginal sites. These are shown in Figure 4.22. As identified in Section 4.2.3, archaeological excavations in the region have found extensive archaeological deposits within c.100m of permanent water sources and their reliable tributaries. Thus, Figure 4.39 identifies high sensitivity within 100m of such water sources within the Precinct. Further, the most recent excavations in closest proximity to the Precinct, at East Leppington and SWRL (summarised in Section 4.3.4) identified that the largest numbers of excavated artefacts were recovered within 100m (and to a lesser extent, up to 300m) of significant water resources. As such, moderate archaeological sensitivity has been identified within 100-200m of major water sources, and within 100m of ephemeral tributaries, as these areas may have had repeated Aboriginal occupation, but not as extensively as the areas within 100m of reliable water. As Table 4.1 identifies, ridgelines would also have provided ease of movement through the area, and thus may also contain occasional Aboriginal occupation evidence; as such, moderate sensitivity is identified within 20m of ridgelines.

Figure 4.22 Preliminary archaeological sensitivity of the study area. [NB. Figure removed for public exhibition.]
5 Field Survey

5.1 Survey Methodology

Targeted field survey of the study area was undertaken on 30-31 January and 1 February 2013, by AMBS archaeologists Jenna Weston and Ngaire Richards, accompanied by Aboriginal community representatives (see Table 1.1). The field work methodology, overall project and available maps were discussed with, and reviewed by, the Aboriginal community representatives prior to, and during field work.

The Leppington Precinct development is currently at the Precinct Planning stage, and given the area’s large size and the lack of specific heritage impacts requiring assessment, the survey aimed to identify as many Aboriginal sites and areas of potential Aboriginal heritage sensitivity as possible. In order to achieve this, the survey methodology concentrated on areas of highest archaeological sensitivity: major creeks, ridges and high points. Within these locations, the focus was on areas of least disturbance and highest percentage of ground surface exposure, to allow the greatest opportunity of identifying sites. However, at the request of DP&I, the survey was restricted to properties which had provided prior written consent to be included in the survey. Further, high levels of rainfall throughout the Sydney region over the last several years has resulted in many of the properties within the study area being densely vegetated, particularly along creek lines. Due to this lack of visibility, some properties were traversed only along the road verge. A map identifying the properties that were surveyed is provided in Figure 5.1 (with those that were actually entered for survey shown in Figure 5.2; the tracklog is provided in Figure 5.3).

Photographs of the study area were taken using a Canon 300D digital camera, a Fuji Finepix HS20 EXR digital camera and a Canon PowerShot S95 digital camera. Track logs and Geocentric Datum of Australia (GDA94) site co-ordinates were recorded using Garmin Oregon 300 handheld GPS units. Where Aboriginal artefacts were encountered, notes were made regarding their type, size, and material; and descriptions of the site were recorded including the environmental setting and details of any disturbance to archaeological material in the site’s vicinity. Where older mature native trees were observed within the study area, they were examined for the presence of Aboriginal cultural scarring.

5.2 Survey Results

Survey coverage data was gathered during the archaeological field survey to allow quantification of ground exposure and visibility, as adverse observation conditions can affect the detection of Aboriginal sites and material. This data does not reflect the extent of the area that was physically surveyed, but represents an estimate of the area of ground surface examined, and presents an estimate of the effectiveness of the survey, given environmental conditions and ground visibility. Survey coverage and disturbance data is presented in accordance with the OEH guidelines, in Appendix B, Table 5.1, Table 5.2 and Table 5.3. The spacing between survey personnel varied depending on the topography; however, where conditions permitted a distance of approximately 5m between was maintained. The area covered during the survey was considered adequate for the purposes of this preliminary heritage assessment, which is to feed into the precinct planning.
Figure 5.1 Properties subject to survey within the study area. Due to lack of visibility, some properties were traversed only along the road verge (see Appendix B for details of pedestrian survey).
Figure 5.2 Properties entered for survey within the study area.
Figure 5.3 Survey tracklog.
Table 5.1 Landform summary for sampled areas.

<table>
<thead>
<tr>
<th>Landform</th>
<th>Landform sample area (m²)</th>
<th>Sample area effectively surveyed (m²)</th>
<th>% of landform sample area effectively surveyed</th>
<th>Number of sites</th>
<th>Number of features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>1054250</td>
<td>38293.77</td>
<td>3.63%</td>
<td>12 (10 and part of 1 new)</td>
<td>7 isolated finds (LP21F, LP71F, LP81F, LP91F, LP121F, LP131F, 45-5-4052); 5 artefact scatters (LP11AS, LP4AS, LP5AS, LP10AS, part of LP11AS)</td>
</tr>
<tr>
<td>Creek flat</td>
<td>173025</td>
<td>2386.1</td>
<td>1.38%</td>
<td>4 (2 new)</td>
<td>2 PADs (45-5-4050, 45-5-4051); 1 artefact scatter (LP3AS); 1 isolated find (LP61F)</td>
</tr>
<tr>
<td>Crest</td>
<td>4400</td>
<td>1188</td>
<td>27%</td>
<td>1 (part of 1 new)</td>
<td>1 artefact scatter (part of LP11AS)</td>
</tr>
<tr>
<td>Ridge</td>
<td>3500</td>
<td>49</td>
<td>1.4%</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 5.2 Landform summary for total study area.

<table>
<thead>
<tr>
<th>Landform</th>
<th>Estimated total landform area (m²)</th>
<th>Estimated total landform area (m²)</th>
<th>Estimated landform sample area (m²)</th>
<th>Estimated landform area effectively surveyed (m²)</th>
<th>% of total landform area effectively surveyed (%)</th>
<th>Number of sites</th>
<th>Number of features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>50670970</td>
<td></td>
<td>1054250</td>
<td>38293.77</td>
<td>2.1%</td>
<td>12</td>
<td>7 isolated finds (LP21F, LP71F, LP81F, LP91F, LP121F, LP131F, 45-5-4052); 5 artefact scatters (LP11AS, LP4AS, LP5AS, LP10AS, part of LP11AS)</td>
</tr>
<tr>
<td>Creek flat</td>
<td>801430</td>
<td></td>
<td>173025</td>
<td>2386.1</td>
<td>21.6%</td>
<td>4</td>
<td>2 PADs (45-5-4050, 45-5-4051); 1 artefact scatter (LP3AS); 1 isolated find (LP61F)</td>
</tr>
<tr>
<td>Ridge</td>
<td>71560</td>
<td></td>
<td>3500</td>
<td>49</td>
<td>4.9%</td>
<td>1</td>
<td>1 artefact scatter (part of LP11AS)</td>
</tr>
<tr>
<td>Crest</td>
<td>7200</td>
<td></td>
<td>4400</td>
<td>1188</td>
<td>61.1%</td>
<td>0</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Table 5.3 Disturbance summary for total study area.

<table>
<thead>
<tr>
<th>Landform</th>
<th>Estimated area with minimal disturbance (m²)</th>
<th>Estimated area with moderate disturbance (m²)</th>
<th>Estimated area with gross disturbance (m²)</th>
<th>Estimated area with gross disturbance (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slope</td>
<td>50670970</td>
<td>2533327</td>
<td>1128486</td>
<td>2.2%</td>
</tr>
<tr>
<td>Creek flat</td>
<td>801430</td>
<td>304388</td>
<td>142790</td>
<td>17.8%</td>
</tr>
<tr>
<td>Ridge</td>
<td>71560</td>
<td>33210</td>
<td>14040</td>
<td>19.6%</td>
</tr>
<tr>
<td>Crest</td>
<td>7200</td>
<td>1100</td>
<td>0</td>
<td>0%</td>
</tr>
</tbody>
</table>

5.2.1 Aboriginal Heritage Sites

Approximately 19% of the study area was surveyed for this assessment (1,235,175m² of approximately 6,551,160m²). As discussed in Section 5.1 above, the properties chosen for this sample were those that, of the properties for which access permission had been granted, were considered to have the highest potential to contain Aboriginal heritage sites. It was considered that surveying the entire study area would not provide any more meaningful archaeological results, given the lack of visibility (effective coverage being estimated at 0.34% of the properties chosen for survey).

The location of three previously recorded Aboriginal sites (AHIMS Sites #45-5-4050, #45-5-4051 and #45-5-4052) were verified during the archaeological survey of the study area, and 13 new Aboriginal heritage sites were identified and recorded. Other previously recorded sites in the vicinity of the study area are not addressed in this section, as they are located outside of the Leppington Precinct (see Table 4.3).

The new sites comprised eight isolated stone artefacts, and five stone artefact scatters. A summary of sites identified during the survey is presented in Table 5.4 (in the order in which they were identified during the field survey), and their location relative to the study area is presented in Figure 5.4. Specific details on each site are provided below.
Table 5.4 Summary of Aboriginal heritage sites identified during survey.

<table>
<thead>
<tr>
<th>Site</th>
<th>Type</th>
<th>Property</th>
<th>Landform</th>
<th>Easting</th>
<th>Northing</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP1AS</td>
<td>Artefact scatter</td>
<td>131 Eastwood Road</td>
<td>Gentle slope</td>
<td>Removed</td>
<td>Removed</td>
<td>1 mudstone &amp; 11 silcrete flaked and heat-shattered artefacts exposed in market garden</td>
</tr>
<tr>
<td></td>
<td>Isolated</td>
<td>Object 2057-5</td>
<td>25 Byron Road</td>
<td>Removed</td>
<td>Removed</td>
<td>1 possible bi-face/ discarded blank previously recorded by AHMS (in prep.) exposed along fenceline PAD previously recorded by AHMS (in prep.) at creek crossing road</td>
</tr>
<tr>
<td>PAD 2056-6</td>
<td>Isolated</td>
<td>In front of 80 Heath Road</td>
<td>Creek flat</td>
<td>Removed</td>
<td>Removed</td>
<td>1 silcrete heat-shattered artefact exposed on dam</td>
</tr>
<tr>
<td>PAD 2055-6</td>
<td>Isolated</td>
<td>In front of 220 Heath Road</td>
<td>Creek flat</td>
<td>Removed</td>
<td>Removed</td>
<td>7 silcrete flaked artefacts exposed on dam PAD previously recorded by AHMS (in prep.) at creek crossing road</td>
</tr>
<tr>
<td>LP4AS</td>
<td>Artefact scatter</td>
<td>42 Philip Road</td>
<td>Gentle slope</td>
<td>Removed</td>
<td>Removed</td>
<td>1 mudstone &amp; 1 silcrete flaked artefact, exposed in market garden</td>
</tr>
<tr>
<td>LP5AS</td>
<td>Artefact scatter</td>
<td>290 George Road</td>
<td>Gentle slope</td>
<td>Removed</td>
<td>Removed</td>
<td>1 mudstone &amp; 4 silcrete flaked artefacts</td>
</tr>
<tr>
<td>LP6IF</td>
<td>Isolated</td>
<td>294 George Road</td>
<td>Creek flat</td>
<td>Removed</td>
<td>Removed</td>
<td>1 silcrete flake (broken)</td>
</tr>
<tr>
<td>LP7IF</td>
<td>Isolated</td>
<td>294 George Road</td>
<td>Gentle slope</td>
<td>Removed</td>
<td>Removed</td>
<td>1 silcrete flake</td>
</tr>
<tr>
<td>LP8IF</td>
<td>Isolated</td>
<td>268 George Road</td>
<td>Slope</td>
<td>Removed</td>
<td>Removed</td>
<td>1 silcrete flake</td>
</tr>
<tr>
<td>LP9IF</td>
<td>Isolated</td>
<td>59 Joseph Road</td>
<td>Slope</td>
<td>Removed</td>
<td>Removed</td>
<td>1 quartz flake</td>
</tr>
<tr>
<td>LP10AS</td>
<td>Artefact scatter</td>
<td>253 Ingleburn Road</td>
<td>Gentle slope</td>
<td>Removed</td>
<td>Removed</td>
<td>3 silcrete flaked and heat-shattered artefacts</td>
</tr>
<tr>
<td>LP11AS</td>
<td>Artefact scatter</td>
<td>15 George Road</td>
<td>Slope &amp; crest</td>
<td>Removed</td>
<td>Removed</td>
<td>4 quartz, 2 silcrete, 1 mudstone &amp; 1 quartzite flaked artefacts</td>
</tr>
<tr>
<td>LP12IF</td>
<td>Isolated</td>
<td>60 Park Road</td>
<td>Gentle slope</td>
<td>Removed</td>
<td>Removed</td>
<td>1 silcrete medial flake</td>
</tr>
<tr>
<td>LP13IF</td>
<td>Isolated</td>
<td>1289 Camden Valley Way</td>
<td>Gentle slope</td>
<td>Removed</td>
<td>Removed</td>
<td>1 mudstone proximal flake</td>
</tr>
</tbody>
</table>

Figure 5.4 Location of Aboriginal sites recorded during the survey. [NB. Figure removed for public exhibition.]

**LP1AS – Stone artefact scatter**

**Landform:** Gentle slope above Kemps Creek  
**Site Size:** Approximately 40m x 75m  
**Exposure:** Market garden at rear of property  
**Property:** 131 Eastwood Road (Lot 1 DP 564579)  
**Site description:** This site, comprising one mudstone and 11 silcrete flaked and heat-shattered artefacts, is located c.100-180m west of Kemps Creek, within a market garden at the rear of the property at 131 Eastwood Road, Leppington (see Table 5.5, Figure 5.5-Figure 5.6). Although market gardening has disturbed the integrity of the soil at the rear of the property, it has also exposed artefacts...
in the topsoil. As the site is located on slightly elevated land (a gentle slope) above Kemps Creek, it is likely that the area was used extensively by past Aboriginal people.

Table 5.5 LP1AS artefact details.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mudstone</td>
<td>Cream</td>
<td>20</td>
<td>15</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>20</td>
<td>15</td>
<td>5</td>
<td>Flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>Flaked piece</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Grey/red</td>
<td>40</td>
<td>30</td>
<td>15</td>
<td>Medial flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>Medial flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Pink/grey</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>20</td>
<td>5</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>20</td>
<td>15</td>
<td>5</td>
<td>Heat shatter</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>30</td>
<td>25</td>
<td>10</td>
<td>Heat shatter</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>Heat shatter</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Pink</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>Flake</td>
</tr>
</tbody>
</table>

Figure 5.5 Western end of LP1AS; view to north west (left). Eastern end of LP1AS; view to south east, towards Kemps Creek (right).

Figure 5.6 Mudstone and silcrete artefacts, LP1AS.
Isolated Object 2057-5 (AHIMS #45-5-4052) – Isolated find

**Landform:** Gentle slope  
**Site Size:** N/A  
**Exposure:** Fenceline at front of property  
**Property:** 7 Heath Road (Lot 1 DP 858011)  

**Site description:** This site is located c.85m west of Camden Valley Way, on the southern side of Heath Road. AHMS (in prep.) recorded the site as comprising an Aboriginal object, possibly a bi-face (most likely a discarded blank in the early stages of reduction; although the raw material was not identified in the site card), in the southeast corner of a boundary fence at the base of a letterbox; and asserted that the location would have traditionally represented an ideal place for habitation with access to resources, although disturbance levels (including underground services and landscaping) precluded identifying the area as a PAD (AHIMS#45-5-4052 site card). The location of the object was confirmed during the current field survey (Figure 5.7).

![Image of isolated object](image-url)

Figure 5.7 Isolated object 2057-5 (AHIMS#45-5-4052), in front of property at 7 Heath Road; view to south west.

**PAD 2056-6 (AHIMS #45-5-4051) – PAD**

**Landform:** Creek flat  
**Site Size:** N/A  
**Exposure:** N/A  
**Property:** 80 Heath Road (Lot 46 DP 8176)  

**Site description:** This PAD is located in front of 80 Heath Road, Leppington, adjacent to Bonds Creek. AHMS (in prep.) recorded the PAD as comprising an area of relatively low disturbance on an alluvial flat directly south and west of the confluence of two low order streams, and noted that the PAD extends to both sides of Heath Road, but the area of highest sensitivity was considered to be on the north side, and specifically north of the property boundary (the road verge on the north side of Heath Road is highly disturbed with existing sub-surface utilities present) (AHIMS#45-5-4051 site card). The location of the PAD was confirmed during the current field survey.
**LP2IF – Isolated find**

**Landform:** Gentle slope  
**Site Size:** N/A  
**Exposure:** Dam near front of property  
**Property:** 25 Byron Road (Lot 44C DP 8979)  

**Site description:** This site, comprising an isolated silcrete heat-shattered artefact, is located c.290m west of Bonds Creek, adjacent to a dam on what appears to be a man-made drainage line flowing into Bonds Creek, behind the dwellings at the front of the property at 25 Byron Road, Leppington (see Table 5.6, Figure 5.8-Figure 5.9). The rear of the property has been disturbed by tree clearing, the construction of a dam and drainage line, market gardens and stock grazing. The dam and drainage line had exposed the clay of the area, indicating a lack of potential artefact-bearing topsoil. Further, as the drainage line appears to be artificial, and Bonds Creek is almost 300m away, it is unlikely that the area was used extensively by past Aboriginal people. Rather, it is considered that more intensive use was made of Bonds and Kemps Creeks to the west.

Table 5.6 LP2IF artefact details.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>Heat shatter</td>
</tr>
</tbody>
</table>

Figure 5.8 Location of LP2IF; view to south west.

Figure 5.9 LP2IF silcrete heat-shattered artefact, ventral (left) and dorsal (right) surfaces.
**LP3AS – Stone artefact scatter**

**Landform:** Creek flat  
**Site Size:** Approximately 10m x 3.5m  
**Exposure:** Dam at rear of property  
**Property:** 220 Heath Road (Lot 2 DP 544887)  

**Site description:** This site, comprising seven silcrete flaked artefacts, is located c.150m east of Kemps Creek, adjacent to a dam at the rear of the property at 220 Heath Road, Leppington (see Table 5.7, Figure 5.10-Figure 5.11). The rear of the property has been disturbed by tree clearing, the construction of a dam and other structures, and stock grazing. Although construction of the dam has disturbed the integrity of the soil at the rear of the property, it has also exposed artefacts in the topsoil. As the site is located on slightly elevated land (a gentle slope) above Kemps Creek, it is likely that the area was used extensively by past Aboriginal people.

**Table 5.7 LP3AS artefact details.**

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Pink</td>
<td>25</td>
<td>15</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red/grey</td>
<td>10</td>
<td>10</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Grey</td>
<td>30</td>
<td>20</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Grey/pink</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>Flaked piece</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>20</td>
<td>10</td>
<td>5</td>
<td>Distal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red/cream</td>
<td>25</td>
<td>15</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>15</td>
<td>15</td>
<td>5</td>
<td>Flake</td>
</tr>
</tbody>
</table>

Figure 5.10 Location of LP3AS adjacent to dam; view to north.

Figure 5.11 Silcrete artefacts, LP3AS.
**PAD 2055-6 (AHIMS #45-5-4050) – PAD**

**Landform:** Creek flat  
**Site Size:** N/A  
**Exposure:** N/A  
**Property:** 220 Heath Road (Lot 2 DP 544887)  
**Site description:** This PAD is located in front of 220 Heath Road, Leppington, adjacent to Kemps Creek. AHMS (in prep.) recorded the PAD as comprising an alluvial flat and lower slope south east of Kemps Creek, exhibiting relatively low signs of disturbance; and noted that the area of lowest disturbance is north east of Heath Road (AHIMS#45-5-4050 site card). The location of the PAD was confirmed during the current field survey (Figure 5.12).

![Figure 5.12 Location of PAD 2055-6, view to north west.](image)
**LP4AS – Stone artefact scatter**

**Landform:** Gentle slope  
**Site Size:** Approximately 6m x 1m  
**Exposure:** Market garden at rear of property  
**Property:** 42 Philip Road (Lot 34 DP 28107)

**Site description:** This site, comprising one mudstone and one silcrete flaked artefact, is located c.250m west of Kemps Creek (and c.120m south of an ephemeral drainage line flowing into Kemps Creek, which has been dammed in numerous places), within a market garden at the rear of the property at 42 Philip Road, Leppington (see Table 5.8, Figure 5.13-Figure 5.14). Although market gardening has disturbed the integrity of the soil at the rear of the property, it has also exposed artefacts in the topsoil. As the site is located on slightly elevated land (a gentle slope) above Kemps Creek, it is likely that the area was used somewhat extensively by past Aboriginal people, although areas somewhat closer to Kemps Creek would have been used even more frequently.

**Table 5.8 LP4AS artefact details.**

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mudstone</td>
<td>Cream</td>
<td>30</td>
<td>20</td>
<td>10</td>
<td>Flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>Distal flake</td>
</tr>
</tbody>
</table>

Figure 5.13 Location of LP4AS on edge of market garden; view to north east.

Figure 5.14 Mudstone and silcrete artefacts, LP4AS.
**LP5AS – Stone artefact scatter**

**Landform:** Gentle slope above Kemps Creek  
**Site Size:** Approximately 30m x 10m  
**Exposure:** Erosion within fence/gate and horse training area towards rear of property  
**Property:** 290 George Road (Lot 43 DP 28107)  

**Site description:** This site, comprising one mudstone and four silcrete flaked artefacts, is located c.150m west of Kemps Creek, adjacent to a fence/gate and horse training area towards the rear of the property at 290 George Road, Leppington (see Table 5.9, Figure 5.15-Figure 5.16). The rear of the property has been disturbed by tree clearing, stock grazing, and the construction of a dam, contours to prevent erosion, a transmission line pole and other structures. As the site is located on slightly elevated land (a gentle slope) above Kemps Creek, it is likely that the area was used extensively by past Aboriginal people, and the level of disturbance across the property is relatively minor, for the most part; however, the topsoil exposed in eroded areas appears to be relatively shallow.

**Table 5.9 LP5AS artefact details.**

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Mudstone</td>
<td>Cream</td>
<td>15</td>
<td>5</td>
<td>10</td>
<td>Flaked piece</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>15</td>
<td>5</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>10</td>
<td>5</td>
<td>5</td>
<td>Distal flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Pink/grey</td>
<td>20</td>
<td>15</td>
<td>10</td>
<td>Flake</td>
</tr>
</tbody>
</table>

Figure 5.15 Eastern end of LP5AS; view to east (left). Western end of LP5AS; view to east (right).

Figure 5.16 Mudstone and silcrete artefacts, LP5AS.
**LP6IF – Isolated find**

**Landform:** Creek flat  
**Site Size:** N/A  
**Exposure:** Dam near front of property  
**Property:** 294 George Road (Lot 42 DP 28107)  

**Site description:** This site, comprising an isolated silcrete flake (recently broken into two pieces), is located c.15m south of an ephemeral tributary of Kemps Creek, and c.100m east of Kemps Creek, on a dam near the front of the property at 294 George Road, Leppington (see Table 5.10, Figure 5.17-Figure 5.18). Although the construction of the dam has disturbed the integrity of the soil in this area, it has also exposed an artefact in the excavated material used to construct the dam wall. As the site is located close to Kemps Creek, it is likely that the area was used extensively by past Aboriginal people.

**Table 5.10 LP6IF artefact details.**

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>25</td>
<td>15</td>
<td>15</td>
<td>Flake (recently broken into 2 pieces)</td>
</tr>
</tbody>
</table>

Figure 5.17 Location of LP6IF on edge of dam; view to north east.

Figure 5.18 LP6IF silcrete artefact, broken into two pieces (left), with broken surface shown (right).
**LP7IF – Isolated find**

**Landform:** Gentle slope  
**Site Size:** N/A  
**Exposure:** Former garden at rear of property  
**Property:** 294 George Road (Lot 42 DP 28107)  

**Site description:** This site, comprising an isolated silcrete flake, is located c.75m south of an ephemeral tributary of Kemps Creek, and c.240m east of Kemps Creek, in a former garden at the rear of the property at 294 George Road, Leppington (see Table 5.11, Figure 5.19-Figure 5.20). As the site is located on slightly elevated land (a gentle slope) above Kemps Creek, it is likely that the area was used somewhat extensively by past Aboriginal people, although areas somewhat closer to Kemps Creek would have been used even more frequently. The level of disturbance across the property is relatively minor, for the most part; however, the area in which the artefact was located exhibits evidence of plough marks/former market gardening, and the topsoil exposed in eroded areas appears to be relatively shallow.

Table 5.11 LP7IF artefact details.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>25</td>
<td>25</td>
<td>5</td>
<td>Flake</td>
</tr>
</tbody>
</table>

Figure 5.19 Location of LP7IF on ploughed ground; view to west.

Figure 5.20 LP7IF silcrete artefact, ventral (left) and dorsal (right) surfaces.
**LP8IF – Isolated find**

**Landform:** Slope above Kemps Creek  
**Site Size:** N/A  
**Exposure:** Unsurfaced vehicle track near front of property  
**Property:** 268 George Road (Lot 46 DP 28107)  
**Site description:** This site, comprising an isolated silcrete flake, is located c.60m south of an ephemeral tributary of Kemps Creek, and c.50m west of Kemps Creek, on a vehicle track near the front of the property at 268 George Road, Leppington (see Table 5.12, Figure 5.21-Figure 5.22). The property has been disturbed by tree clearing, stock grazing and pens, and the construction of creek crossings and other structures. As the site is located on elevated land above Kemps Creek, it is likely that the area was used extensively by past Aboriginal people, and the level of disturbance across the property is relatively minor, for the most part; however, the topsoil exposed in eroded areas appears to be relatively shallow.

**Table 5.12 LP8IF artefact details.**

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red/pink</td>
<td>20</td>
<td>15</td>
<td>5</td>
<td>Flake</td>
</tr>
</tbody>
</table>

Figure 5.21 Location of LP8IF on track; view to south east.

Figure 5.22 LP8IF silcrete artefact, ventral (left) and dorsal (right) surfaces.
**LP9IF – Isolated find**

**Landform:** Slope

**Site Size:** N/A

**Exposure:** Eroded area between driveway and shed structure

**Property:** 59 Joseph Road (Lot 11 DP 28107)

**Site description:** This site, comprising an isolated quartz flake, is located c.65m east of the start of an ephemeral tributary of Rileys Creek, and c.700m west of Kemps Creek, on an exposed area between the driveway and a shed structure on the property at 59 Joseph Road, Leppington (see Table 5.13, Figure 5.23-Figure 5.24). The rear of the property has been disturbed by tree clearing, the construction of a dam and other structures, and stock grazing. The dam and erosion had exposed the clay of the area, indicating a lack of potential artefact-bearing topsoil. Further, as the tributary is small and ephemeral, and Kemps Creek is almost 700m away, it is unlikely that the area was used extensively by past Aboriginal people. Rather, it is considered that more intensive use was made of Kemps Creek to the east, and Rileys Creek to the west.

**Table 5.13 LP9IF artefact details.**

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quartz</td>
<td>White</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>Flake</td>
</tr>
</tbody>
</table>

Figure 5.23 Location of LP9IF between driveway and shed structure; view to south west.

Figure 5.24 LP9IF quartz artefact, ventral (left) and dorsal (right) surfaces.
LP10AS – Stone artefact scatter

Landform: Gentle slope above Kemps Creek  
Site Size: Approximately 60m x 15m  
Exposure: Market gardens at rear of property  
Property: 253 Ingleburn Road (Lot 18 DP 8979)  
Site description: This site, comprising three silcrete flaked and heat-shattered artefacts, is located c.100-160m north of Kemps Creek, in market gardens at the rear of the property at 253 Ingleburn Road, Leppington (see Table 5.14, Figure 5.25-Figure 5.26). Although market gardening has disturbed the integrity of the soil at the rear of the property, it has also exposed artefacts in the topsoil. As the site is located on slightly elevated land (a gentle slope) above Kemps Creek, it is likely that the area was used extensively by past Aboriginal people.

Table 5.14 LP10AS artefact details.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red/pink</td>
<td>25</td>
<td>20</td>
<td>5</td>
<td>Retouched flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Red/cream</td>
<td>50</td>
<td>40</td>
<td>15</td>
<td>Heat shatter</td>
</tr>
<tr>
<td>Silcrete</td>
<td>Orange/cream</td>
<td>50</td>
<td>35</td>
<td>20</td>
<td>Retouched flake</td>
</tr>
</tbody>
</table>

Figure 5.25 Northern end of LP10AS; view to south west (left). Southern end of LP10AS; view to south west (right).

Figure 5.26 LP10AS silcrete artefacts.
**LP11AS – Stone artefact scatter**

**Landform:** Upper slope and crest  
**Site Size:** Approximately 80m x 60m  
**Exposure:** Market garden at side and rear of property  
**Property:** 15 George Road (Lot 15 DP 28057)  

**Site description:** This site, comprising four quartz, two silcrete, one mudstone and one quartzite flaked artefacts, is located c.160-200m east of the start of a first-order tributary of Kemps Creek, and c.1km south east of the major part of Kemps Creek, in market gardens at the side and rear of the property at 15 George Road, Leppington (see Table 5.15, Figure 5.27-Figure 5.28). The property has been disturbed by tree clearing, the construction of a dam, dwellings and other structures, market gardens and stock grazing. Although market gardening has disturbed the integrity of the soil at the side and rear of the property, it has also exposed artefacts in the topsoil. Although the site is on a crest and upper slope, which may have afforded good views of the surrounding area, the distance from permanent water makes it unlikely that the area was used as extensively by past Aboriginal people as land closer to Kemps Creek would have been.

**Table 5.15 LP11AS artefact details.**

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red/grey</td>
<td>30</td>
<td>20</td>
<td>5</td>
<td>Flake</td>
</tr>
<tr>
<td>Quartz</td>
<td>White</td>
<td>15</td>
<td>15</td>
<td>10</td>
<td>Flake</td>
</tr>
<tr>
<td>Mudstone</td>
<td>Cream</td>
<td>20</td>
<td>15</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
<tr>
<td>Quartz</td>
<td>White</td>
<td>25</td>
<td>20</td>
<td>10</td>
<td>Flake</td>
</tr>
<tr>
<td>Silcrete</td>
<td>White/cream</td>
<td>35</td>
<td>25</td>
<td>20</td>
<td>Multidirectional core</td>
</tr>
<tr>
<td>Quartz</td>
<td>White</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>Medial flake</td>
</tr>
<tr>
<td>Quartzite</td>
<td>Pink/cream</td>
<td>15</td>
<td>10</td>
<td>10</td>
<td>Flaked piece</td>
</tr>
<tr>
<td>Quartz</td>
<td>White</td>
<td>15</td>
<td>15</td>
<td>10</td>
<td>Flaked piece</td>
</tr>
</tbody>
</table>

Figure 5.27 Western end of LP11AS; view to east (left). Southern end of LP11AS; view to north (right).

Figure 5.28 LP11AS silcrete flake (left) and multidirectional core (right).
**LP12IF – Isolated find**

**Landform:** Gentle slope  
**Site Size:** N/A  
**Exposure:** Eroded area around trees and corner fenceline, behind main structures at front of property  
**Property:** 60 Park Road (Lot 32 DP 28459)  

**Site description:** This site, comprising an isolated silcrete medial flake, is located c.140m north west of an ephemeral tributary of Bonds Creek, and c.300m west of Bonds Creek, on an eroded area around some trees and a corner fenceline, behind the main structures at the front of property at 60 Park Road, Leppington (see Table 5.16, Figure 5.29-Figure 5.30). The rear of the property has been disturbed by tree clearing, market gardens and construction of various structures. The distance from permanent water makes it unlikely that the area was used as extensively by past Aboriginal people as land closer to Bonds Creek would have been.

Table 5.16 LP12IF artefact details.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Silcrete</td>
<td>Red</td>
<td>15</td>
<td>15</td>
<td>5</td>
<td>Medial flake</td>
</tr>
</tbody>
</table>

Figure 5.29 Location of LP12IF behind main structures on property; view to west.

Figure 5.30 LP12IF silcrete artefact, ventral (left) and dorsal (right) surfaces.
**LP13IF – Isolated find**

**Landform:** Gentle slope  
**Site Size:** N/A  
**Exposure:** Vehicle track within market garden at rear of property  
**Property:** 1289 Camden Valley Way (Lot 2 DP 28459)  
**Site description:** This site, comprising an isolated mudstone proximal flake, is located c.100m east of an ephemeral tributary of Bonds Creek, and c.220m east of Bonds Creek, on a vehicle track between market gardens at the rear of the property at 1289 Camden Valley Way, Leppington (see Table 5.17, Figure 5.31-Figure 5.32). Although market gardening has disturbed the integrity of the soil at the side and rear of the property, it has also exposed an artefact in the topsoil. Nevertheless, the distance from permanent water makes it unlikely that the area was used as extensively by past Aboriginal people as land closer to Bonds Creek would have been.

<table>
<thead>
<tr>
<th>Material</th>
<th>Colour</th>
<th>Max. length (mm)</th>
<th>Max. width (mm)</th>
<th>Max. thickness (mm)</th>
<th>Artefact type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mudstone</td>
<td>Cream/orange</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>Proximal flake</td>
</tr>
</tbody>
</table>

Figure 5.31 Location of LP13IF on track between market gardens; view to south west.

Figure 5.32 LP13IF mudstone artefact, ventral (left) and dorsal (right) surfaces.
5.2.2 Areas of Potential Aboriginal Archaeological Sensitivity

Given the lack of ground surface visibility and accessibility of many properties in the study area, and the resulting difficulty in identifying Aboriginal heritage sites during the archaeological survey, an archaeological sensitivity map has been developed to facilitate a clearer understanding of the constraints and opportunities associated with the Leppington Precinct.

The results of the field survey and previous archaeological investigations have informed an estimate of potential Aboriginal archaeological sensitivity for landforms within the study area, which is presented in Figure 5.33. This estimate considers both the predictive model for Aboriginal heritage and the recorded Aboriginal sites. The areas of archaeological sensitivity are the same as that shown in Figure 4.22, because the survey results were found to be in accordance with the predictive modelling. For the purposes of this assessment, which is intended to provide a guide for the precinct planning, archaeological sensitivity is defined as areas in which sites are known to occur, or which have the potential to contain undetected buried Aboriginal archaeological deposits (see Section 4.4 for an explanation of how these areas were identified). Definitions of levels of archaeological sensitivity are presented in Table 5.18. Note that areas that have not been identified as having moderate or high sensitivity may contain Aboriginal sites, but these sites are more likely to represent background scatter of locally sourced raw material, rather than extensive or in situ sites.

Table 5.18 Definition of levels of archaeological sensitivity.

<table>
<thead>
<tr>
<th>Level</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moderate Sensitivity</td>
<td>Artefacts in detectable densities known to occur in the area, or in similar environmental/landscape contexts within the region. For the current study area, moderate archaeological sensitivity has been identified within 100-200m of major water sources, within 100m of ephemeral tributaries, and within 20m of ridgelines (see Section 4.4).</td>
</tr>
<tr>
<td>High Sensitivity</td>
<td>Artefacts known to occur in high densities in the area, or are consistently identified in similar environmental/landscape contexts, and are highly likely to be detected and disturbed during ground disturbance works and archaeological excavations. For the current study area, high archaeological sensitivity has been identified within 100m of major water sources (see Section 4.4).</td>
</tr>
</tbody>
</table>

An estimate of previous disturbance has also been made, based on the existing landuse mapping (Figure 5.34). Areas identified as having gross disturbance include road corridors, proposed water pipelines, market gardens, poultry farms/intensive horticulture, halls and reservoirs. Areas identified as having moderate disturbance include ovals and properties with small dams. Areas identified as having minimal disturbance include properties classified as residential or vacant.

Figure 5.33 Identified Aboriginal sites and areas of archaeological sensitivity. [NB. Figure removed for public exhibition.]

Figure 5.34 Estimate of level of disturbance impacting upon archaeological sensitivity within the study area. NB. Minimal disturbance is considered not to impact upon the sensitivity; moderate disturbance has some impact; and gross disturbance has a major impact, effectively cancelling (or ‘whiting-out’) sensitivity. [NB. Figure removed for public exhibition.]
6 Assessing Heritage Significance

6.1 Preamble

A primary step in the process of Aboriginal cultural heritage management is the assessment of significance. Heritage significance relating to Aboriginal sites, objects and places in NSW is assessed in accordance with the criteria defined in the OEH guidelines, and cultural significance is identified by Aboriginal communities. In accordance with best practice, archaeological values should be identified and their significance assessed using criteria reflecting assessment processes set out in the Burra Charter.

The criteria for assessing Aboriginal heritage significance are derived from the Burra Charter criteria of aesthetic, historic, scientific, social or spiritual value, for assessing cultural significance for past, present and future generations (Article 1.2).

Not all sites are equally significant and not all are worthy of equal consideration and management. The significance of a site is not fixed for all time; what is considered as significant at the time of assessment may change as similar items are located, more research is undertaken and community values change. This does not lessen the value of the heritage approach, but enriches both the process and the long-term outcomes for future generations as the nature of what is conserved and why also changes over time (Pearson and Sullivan 1995:7).

The SWGC guidelines detailed in the Precinct Assessment Method for Aboriginal Cultural Heritage in the Sydney Growth Centres (Context 2006:17-19), require that assessments of significance are undertaken in accordance with the SHR criteria as defined in Assessing Heritage Significance (NSW Heritage Office 2001). The 2010 OEH Code of Practice for Aboriginal Investigation of Aboriginal Objects in New South Wales, states that archaeological values should be identified and their significance assessed using criteria reflecting best practice assessment processes as set out in the Burra Charter. The SHR criteria reflect the Burra Charter assessment criteria, and are consistent with the OEH 2010 guidelines. The Precinct Assessment Method for Aboriginal Cultural Heritage in the Sydney Growth Centres suggests the following significance rankings and justifications:

<table>
<thead>
<tr>
<th>Ranking</th>
<th>Example Justifications</th>
</tr>
</thead>
</table>
| Exceptional | - Rare example of its type in the nation, state or outstanding example of its type in the region; and/or  
- Irreplaceably expresses Aboriginal cultural heritage, history or stories of the region (or State or nation); and/or  
- Of primary and essential importance to the identity and culture of the Aboriginal communities of the region; and/or  
- Intact with no disturbance; and/or  
- Loss or unsympathetic or further disturbance or change will irreversibly diminish the Aboriginal cultural heritage significance of the Precinct and/or community cultural identity of the Aboriginal communities associated with the Precinct. |
| High | - Rare example of its type in the region; and/or  
- Expresses (possibly in combination with other places or features) the Aboriginal cultural heritage, history or stories of the region; and/or  
- Important to the identity and culture of the Aboriginal communities of the region; and/or  
- Existing disturbance and evidence of change does not detract from Aboriginal cultural heritage significance; and/or  
- Loss or unsympathetic or further disturbance or change is likely to diminish the Aboriginal cultural heritage significance of the Precinct and/or community cultural identity of the Aboriginal communities associated with the Precinct. |
### Moderate

- Rare example of its type in the Precinct, but not the region (or Growth Centre); and/or
- Expresses in combination with other places or features the Aboriginal cultural heritage, history or stories of the region; and/or
- Contributes to the identity and culture of the Aboriginal communities of the region; and/or
- Existing disturbance and evidence of change does not detract from Aboriginal cultural heritage significance of the place; and/or
- Loss or unsympathetic or further disturbance or change may diminish the Aboriginal cultural heritage significance of the Precinct and/or community cultural identity of the Aboriginal communities associated with the Precinct.

### Some

- Common example of its type in the Precinct; and/or
- Does not express clear community or cultural values of the precinct or only in a minor way; and/or
- Substantially modified or impacted; and/or
- Loss or change is unlikely to diminish Aboriginal cultural heritage significance of the Precinct and/or applicable Aboriginal community cultural identity.

### 6.2 Assessment against Criteria

The following assessment of heritage values against the Heritage Branch criteria is informed by the results of the background and environmental review (acknowledging that many sites in the region are being destroyed due to increasing development), the predictive model for Aboriginal sites in the region, and the results of the Aboriginal heritage field assessment and assessment of archaeological potential. The assessment of significance against the criteria has been undertaken upon the basis that a site would meet the threshold for the criteria if it is considered to be, at a local, regional, state or national level, rare or an excellent representative example of its type in relation to the relevant criteria. In relation to criterion c), high significance would be attributed to sites which are so rare or unique that their loss would affect our ability to understand an aspect of past Aboriginal use/occupation of an area; or where it has now become rare by the destruction of the archaeological record through development despite once being quite common. Moderate significance would be attributed to sites which provide information on an established research question. Some/low significance would be attributed to sites which cannot contribute new information about past Aboriginal use/occupation of an area, possibly due to site disturbance or the nature of the site’s contents.

The following is an assessment of the Aboriginal archaeological heritage significance.

#### Criterion a) an item is important in the course, or pattern, of NSW’s cultural or natural history (or the cultural or natural history of the local area)

Aboriginal stone artefact sites identified during the survey are representative of similar Aboriginal sites across the Cumberland Plain and of NSW, and as such, do not meet the threshold for inclusion for this criterion.

#### Criterion b) an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW’s cultural or natural history (or the cultural or natural history of the local area)

Aboriginal stone artefact sites identified during the survey are representative of activity by the local Darug/Tharawal/Gandangara people. Although such deposits retain cultural significance, a sense of place, and heritage value for the local Aboriginal people, and are representative of the daily lives of their ancestors, individually they are not rare at a local or regional level; and as such, do not meet the threshold for inclusion for this criterion.

#### Criterion c) an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area)

Aboriginal stone artefact sites identified during the survey are representative of similar Aboriginal sites across the Cumberland Plain and the rest of NSW, and as such, do not meet the threshold for inclusion for this criterion.
Criterion d) an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons.

Aboriginal communities consulted with throughout this project have indicated that, while all Aboriginal heritage sites recorded contain intrinsic cultural significance, there are no further specific cultural significances attached to the sites which were identified during the current survey. As such, the Aboriginal stone artefact sites identified during the survey do not meet the threshold for this Criterion.

Criterion e) an item has potential to yield information that will contribute to an understanding of NSW’s cultural or natural history (or the cultural or natural history of the local area).

The Aboriginal cultural deposits located in the Leppington precinct have archaeological research potential. Key research questions to be addressed have the potential to add insight into the cultural history of the Darug/Tharawal/Gandangara people, including those relating to patterns in prehistoric Aboriginal occupation of the region, and evidence of stone procurement and tool manufacturing processes. The levels of potential for in situ archaeological deposits to be present at Aboriginal stone artefact sites identified during the survey are summarised below.

**LP1AS**

Creek lines in the region are likely to contain evidence of past Aboriginal activity. The number of surface artefacts identified at site LP1AS is comparatively high, the creek is a major water source, and excavations undertaken at Kemps Creek c.500m to the north west identified a very high number of artefacts within 100m (and to a lesser extent, up to 300m) of Kemps Creek (see Section 4.3.4 above). However, the site is located in a market garden with a high level of disturbance, and is therefore unlikely to contain in situ archaeological deposit; although vegetated areas adjacent to the creek, south east of the market garden beds, are more likely to contain in situ archaeological deposit. As such, the surface extent of the site is considered to have low research potential; however, the rear of the property at 131 Eastwood Road, adjacent to Kemps Creek (where there was no surface visibility) is considered to have moderate-high research potential.

**Isolated Object 2057-5 (AHIMS #45-5-4052)**

Isolated Object 2057-5 (AHIMS #45-5-4052) is one artefact, possibly a bi-face, adjacent to a boundary fence, c.500m from Bonds Creek. High disturbance levels have resulted from underground services and landscaping. As such, the site is considered to have low potential for in situ subsurface deposit, and therefore has some/low research potential.

**PAD 2056-6 (AHIMS #45-5-4051)**

Creek lines in the region are likely to contain evidence of past Aboriginal activity. Although there was no surface visibility in this area, the PAD was previously identified as an area of relatively low disturbance on an alluvial flat directly south and west of the confluence of two low order streams, and adjacent to Bonds Creek. As such, it is considered to have moderate-high research potential.

**LP2IF**

LP2IF is an isolated artefact adjacent to a dam on what appears to be a man-made drainage line flowing into Bonds Creek, almost 300m from Bonds Creek. The dam and drainage line had exposed the clay of the area, indicating a lack of potential artefact-bearing topsoil. As such, the site is considered to have low potential for in situ subsurface deposit, and therefore has some/low research potential.
LP3AS

Creek lines in the region are likely to contain evidence of past Aboriginal activity. The number of surface artefacts identified at site LP3AS is comparatively moderate, the creek, at a distance of c.150m, is a major water source, and excavations undertaken nearby at Kemps Creek identified a very high number of artefacts within 100m (and to a lesser extent, up to 300m) of Kemps Creek (see Section 4.3.4 above). Although construction of the dam has disturbed the integrity of the soil at the rear of the property, it has also exposed artefacts in the topsoil, and its extent is relatively limited. As such, the surface extent of the site is considered to have some/low research potential; however, the north western corner of the property at 220 Heath Road, adjacent to Kemps Creek (where there was no surface visibility) is considered to have moderate-high research potential.

PAD 2055-6 (AHIMS #45-5-4050)

Creek lines in the region are likely to contain evidence of past Aboriginal activity. Although there was no surface visibility in this area, the PAD was previously identified as an alluvial flat and lower slope south east of Kemps Creek, exhibiting relatively low signs of disturbance. As such, it is considered to have moderate-high research potential.

LP4AS

Creek lines in the region are likely to contain evidence of past Aboriginal activity. The small number of surface artefacts identified at site LP4AS, the distance from Kemps Creek, and the disturbance to the property caused by market gardening, makes it unlikely that the site will contain in situ archaeological deposit. As such, the site is considered to have some/low research potential.

LP5AS

Creek lines in the region are likely to contain evidence of past Aboriginal activity. Although LP5AS is located on slightly elevated land within c.150m of Kemps Creek, and the level of disturbance across the property is relatively minor, for the most part; the topsoil exposed in eroded areas appears to be relatively shallow. As such, the site may contain relatively in situ archaeological deposit, but it is unlikely to be extensive. Therefore, the site is considered to have some/low-moderate research potential.

LP6IF

Creek lines in the region are likely to contain evidence of past Aboriginal activity. LP6IF is located within 100m of Kemps Creek, and excavations undertaken nearby at Kemps Creek identified a very high number of artefacts within 100m, reducing up to 300m, of Kemps Creek (see Section 4.3.4 above). Although construction of the dam and other structures has disturbed the integrity of the soil at the front of the property, it has also exposed an artefact in the excavated material forming the dam wall. As such, the surface extent of the site is considered to have some/low research potential; however, the front of the property at 294 George Road, adjacent to Kemps Creek, is considered to have moderate research potential.

LP7IF

Creek lines in the region are likely to contain evidence of past Aboriginal activity. Although LP7IF is located on slightly elevated land c.240m from Kemps Creek, and the level of disturbance across the property is relatively minor, for the most part; the topsoil exposed in eroded areas appears to be relatively shallow, and the site itself has been disturbed by former ploughing/market gardening. As such, the site is unlikely to contain extensive or in situ archaeological deposit. Therefore, the site is considered to have some/low research potential.
LP8IF

Creek lines in the region are likely to contain evidence of past Aboriginal activity. LP8IF is located on elevated land within 50m of Kemps Creek, and excavations undertaken nearby at Kemps Creek identified a very high number of artefacts within 100m (and to a lesser extent, up to 300m) of Kemps Creek (see Section 4.3.4 above). Although the level of disturbance across the property is relatively minor, for the most part; the topsoil exposed in eroded areas appears to be relatively shallow. As such, the site may contain relatively in situ archaeological deposit, but it is unlikely to be extensive. Therefore, the site is considered to have some/low-moderate research potential.

LP9IF

LP9IF is an isolated artefact in an exposed area between a driveway and a shed structure, c.65m east of the start of an ephemeral tributary, and c.700m from Kemps Creek. Further, erosion had exposed the clay of the property, indicating a lack of potential artefact-bearing topsoil. As such, the site is considered to have low potential for in situ subsurface deposit, and therefore has some/low research potential.

LP10AS

Creek lines in the region are likely to contain evidence of past Aboriginal activity. LP10AS is located c.100-160m from Kemps Creek, and excavations undertaken at Kemps Creek c.800m to the north identified a very high number of artefacts within 100m (and to a lesser extent, up to 300m) of Kemps Creek (see Section 4.3.4 above). However, the site is located in an area of market gardening, which has resulted in a high level of disturbance across the property, and it is therefore unlikely to contain in situ archaeological deposit. As such, the site is considered to have some/low research potential.

LP11AS

LP11AS comprises a comparatively moderate number of artefacts, with a comparatively high level of variation in type and raw material. The site is also located on a crest and upper slope, which may have afforded good views of the surrounding area. However, the distance from permanent water (c.1km from the major part of Kemps Creek), and the high level of disturbance resulting from market gardening, indicates that the site is unlikely to contain in situ archaeological deposit. As such, the site is considered to have some/low research potential.

LP12IF

LP12IF is an isolated artefact in an exposed area near a corner fenceline, c.140m from an ephemeral tributary, and c.300m from Bonds Creek. The lack of additional artefacts and the distance from permanent water indicates that the site is unlikely to contain extensive in situ archaeological deposit. As such, the site is considered to have some/low research potential.

LP13IF

LP13IF is an isolated artefact on a vehicle track between market gardens, c.100m from an ephemeral tributary, and c.220m from Bonds Creek. The distance from permanent water and the high level of disturbance resulting from market gardening, indicates that the site is unlikely to contain in situ archaeological deposit. As such, the site is considered to have some/low research potential.


Criterion f) an item possesses uncommon, rare or endangered aspects of NSW’s cultural or natural history (or the cultural or natural history of the local area).

The Aboriginal stone artefact sites identified during the survey may be regarded as being relatively common in the local region. Such sites are the most common site type both locally and regionally, and are therefore not considered to have archaeological rarity.

Criterion g) an item is important in demonstrating the principal characteristics of a class of NSW’s Cultural or natural places or environments (or in the local area).

Aboriginal stone artefact sites identified during the survey are representative of similar Aboriginal sites across the Cumberland Plain and the rest of NSW. Stone artefact sites are the most common type of site previously recorded in the local region. Such site types represent a continuity of use of water resources across the study area. It is considered likely that a background scatter of such artefacts is present throughout similar landforms in the region. Sites LP2IF, LP7IF, LP9IF, LP12IF, LP13IF and Isolated Object 2057-5 are likely to represent such incidental, background Aboriginal activity in the region; while sites LP1AS, LP3AS, LP4AS, LP5AS, LP6IF, LP8IF, LP10AS, LP11AS, PAD 2055-6 and PAD 2056-6 are likely to represent archaeological deposits of some complexity, though still representative of Aboriginal use of the area. All identified sites are considered to be representative of the local archaeology, although sites LP2IF, LP4AS, LP6IF, LP7IF, LP9IF, LP10AS, LP11AS, LP13IF and Isolated Object 2057-5 have low site integrity. As such, Aboriginal stone artefact sites identified during the survey do not meet the threshold for this Criterion.

6.2.1 Summary Statement of Significance

Aboriginal stone artefact sites identified during the survey are representative of similar Aboriginal sites across the Cumberland Plain and the rest of NSW.

PAD 2055-6, PAD 2056-6, and less disturbed areas adjacent to sites LP1AS, LP3AS and LP6IF have potential to contain in situ subsurface archaeological deposits, and are therefore considered to be of moderate or moderate-high local significance due to their research potential. Other artefact sites identified during the survey have potential to contain disturbed subsurface archaeological deposits, and are therefore of low to moderate local significance due to their research potential. Aboriginal communities consulted throughout this project have indicated that, while all Aboriginal heritage sites recorded contain intrinsic moderate cultural significance, there are no further specific cultural significances attached to the identified sites.

The current evidence indicates that Aboriginal stone artefact sites LP1AS, LP2IF, LP3AS, LP4AS, LP6IF, LP7IF, LP9IF, LP10AS, LP12IF, LP13IF and Isolated Object 2057-5 have low significance. Sites LP5AS, LP8IF and LP11AS are regarded as being of some/low-moderate significance due to their location near major creeklines and relative lack of disturbance (or in the case of LP11AS, evidence of a comparatively high level of variation in type and raw material of artefacts). An area adjacent to LP6IF, at the front of 294 George Road, is considered to have moderate significance for its location adjacent to a major creekline and relative lack of disturbance (although topsoil is likely to be relatively shallow). PAD 2055-6, PAD 2056-6, and less disturbed areas adjacent to sites LP1AS and LP3AS are considered to have moderate-high significance for their potential to contain extensive, in situ archaeological deposits. A summary of the assessed levels of archaeological significance for identified sites is presented in Table 6.1 below.
Table 6.1 Assessed levels of significance for sites within the study area.

<table>
<thead>
<tr>
<th>Assessed Site</th>
<th>Archaeological Research Potential</th>
<th>Representativeness</th>
<th>Rarity</th>
<th>Overall Significance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Low</td>
<td>Moderate</td>
<td>High</td>
<td></td>
</tr>
<tr>
<td>- LP1AS</td>
<td>✓</td>
<td>✓</td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>- Rear of 131 Eastwood Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LP2IF</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>- LP3AS</td>
<td>✓</td>
<td>✓</td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>- North west corner of 220 Heath Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LP4AS</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>LP5AS</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>LP6IF</td>
<td>✓</td>
<td>✓</td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>Front of 294 George Road</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LP7IF</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>LP8IF</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>LP9IF</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>LP10AS</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>LP11AS</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
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<tr>
<td>LP12IF</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
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<tr>
<td>LP13IF</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>Isolated Object 2057-5</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>PAD 2055-6</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
<tr>
<td>PAD 2056-6</td>
<td>✓</td>
<td></td>
<td>Local</td>
<td>No</td>
</tr>
</tbody>
</table>
7 Conclusion

7.1 Preamble

As part of the NSW government’s land release program, the DP&I is carrying out precinct planning to inform the rezoning of the Leppington Precinct in the South West Growth Centres. The aim of the Aboriginal heritage assessment is to inform the Urban Form Analysis and land use planning regarding constraints and opportunities associated with Aboriginal heritage.

A number of large infrastructure developments are currently proposed for the study area; the Camden Valley Way upgrade, and water infrastructure for the South West Growth Centres. The surrounding area is also in the process of development with the Bringelly Road upgrade, the South West Rail Link, and water infrastructure for the South West Growth Centres and Edmondson Park precinct. However the timing for delivery of some of this infrastructure has yet to be determined. The Camden Valley Way upgrade is currently in progress, although it is uncertain whether any archaeological excavations have been undertaken as part of this project. Should additional archaeological investigations, including excavation, be undertaken in the local area, their results may assist in refining constraints and recommendations during future detailed assessments for the Leppington Precinct, and should be considered during any major future planning for the Project.

The following recommendations are based on the results of the background research, Aboriginal community consultation, archaeological field survey, and significance assessment as described in this report. Given the area’s large size and the lack of ground surface visibility during the survey, these recommendations are based on a landscape-based model of past Aboriginal use of the study area, and identify preliminary Aboriginal heritage constraints.

Conservation or avoidance of identified Aboriginal sites and areas of moderate and high archaeological sensitivity is the preferred heritage option. As precinct planning is essentially rezoning the land within the precincts and establishing new development controls, there is an opportunity to avoid impact to some areas or sites identified as having archaeological sensitivity when further detailed site planning is conducted at the Development Application stage. Where this is not possible due to design or engineering constraints, other mitigation measures may be appropriate; such as archaeological test excavations under OEH’s Code of Practice for Aboriginal Investigation of Aboriginal Objects in New South Wales (Code of Practice) in areas of moderate and high archaeological sensitivity, and an application for an AHIP to allow direct impacts to identified Aboriginal heritage sites. However, it is anticipated that individual development proposals within the Precincts will be required to comply with the Development Application process, which will include preparation of detailed Aboriginal heritage impact assessments. Site specific recommendations to mitigate and offset proposed impacts to Aboriginal heritage would be included in these heritage assessments.

7.1.1 Cumulative Impacts

The Leppington Precinct is part of the South West Growth Centres (Figure 7.1). The first release precincts of the SWGC, Edmondson Park, Oran Park and Turner Road, are currently being developed, as is the South West Rail Link. Thirteen other precincts are planned to be released for Precinct Planning progressively. In total, the SWGC is approximately 17,000 hectares and has capacity for around 110,000 new dwellings for 300,000 people (although it must be noted that these dwelling numbers are approximate and will be confirmed during Precinct Planning). Although it is understood that development of the SWGC is to take into consideration Aboriginal heritage (among other environmental issues) in its broad scale planning, the eventual urban development of these Precincts, along with the remainder of the SWGC and associated developments, will have a
cumulative negative impact on Aboriginal heritage of South West Sydney and the South West Cumberland Plain (Figure 7.1).

Figure 7.1 Indicative map of the SWGC precincts.

AMBS’ predictive modelling, outlined in Section 4.3.5, identifies stone artefact sites as the most common Aboriginal heritage site type occurring in the local landscape. A review of the environmental and historic context of the local area suggests that the majority of such sites are likely to have been previously impacted and disturbed by past land clearing, development, construction and agricultural practices. As such, it has been determined that there is a low likelihood that in situ stone artefacts are
present in the local region. This means that areas of archaeological sensitivity in areas that have been subject to minimal previous disturbance are of increasing value, and worthy of conservation.

Current and future developments in the local area are likely to impact primarily upon previously disturbed stone artefact sites, as well as PADs with varying degrees of previous disturbance, where it is not possible to avoid such impacts within their development planning and methodology. Recommendations discussed below take into account the scientific significance of similar site types identified within and adjacent to the Precinct and make appropriate recommendations based upon the cumulative impacts of associated developments and regional rarity and representativeness.

7.2 Areas of Potential Archaeological Sensitivity

As discussed in Section 5.2.2 and presented in Figure 5.33 and Figure 5.34, an estimate of potential Aboriginal archaeological sensitivity for landforms within the study area has been developed. These estimates of sensitivity relate to the potential for sites to be present or absent, and are not closely related to site integrity, archaeological research potential, or the archaeological or cultural significance of the sites, which would need to be the subject of future assessments; however, Figure 5.34 provides a preliminary consideration of the effects of disturbance. For example, some of the previously recorded sites, which are present within areas of high or moderate sensitivity, have been previously assessed as having low significance due to disturbance of the site or a lack of remaining topsoil. Nevertheless, it must be noted that this is merely an estimate of previous disturbance, based on the existing landuse data; it is not a detailed estimate of disturbance, as would be gained by extensive pedestrian survey.

7.2.1 Areas of Moderate & High Archaeological Sensitivity

Areas of moderate and high archaeological sensitivity have the potential to contain sub-surface Aboriginal archaeological deposits; but may have no archaeological exposure or visibility. The majority of the sites in the study area are located in these areas; the remainder of the sites, which are not located in these areas of sensitivity, are either sites with few artefacts, most likely representing background scatter, or sites with extensive levels of disturbance.

Avoidance of impacts to areas of moderate and high archaeological sensitivity is recommended, through their incorporation into conservation corridors, particularly riparian areas. This may be feasible for areas of high archaeological sensitivity, which are generally aligned along major creeklines; however, it is noted that Sydney Water are currently undertaking assessments for installation of pipelines along parts of these creeklines (Figure 5.34 includes indicative locations of the pipeline infrastructure, and the potential resulting impact upon the areas of sensitivity). This gives greater importance to conserving as much as possible of the remainder of the sensitive areas. Where this is not possible due to design or engineering constraints, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken. Archaeological test excavations under the Code of Practice may be required to determine the integrity or extent of any artefactual assemblages that are present and the nature of Aboriginal activities in these areas.

Recommendation 1

Areas of moderate and high archaeological sensitivity should be incorporated into conservation zones where possible, particularly areas outside of Sydney Water’s proposed pipelines. Where this is not possible, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and archaeological test excavations under the Code of Practice may be required, to determine the artefactual assemblages that are present and the nature of Aboriginal activities in these areas.

An Indicative Layout Plan (ILP), drafted 17 June 2013, indicates that many of the areas identified as being sensitive are within riparian corridors/open space (Passive Open Space, Environmental Living
and/or Infrastructure with an Environmental Protection Overlay). Conservation areas for the protection of Aboriginal cultural heritage must be considered as part of the future development of the Precinct, which should include areas of high and moderate sensitivity, preferably within the less disturbed parts of the areas (see Figure 7.2, Figure 5.33 and Figure 5.34). It should be noted that there may be impacts in the designated riparian corridors/open space, arising from works such as the installation of Council stormwater and detention infrastructure along creeks, and possibly some development of open space facilities such as footpaths, benches, play equipment, landscaping etc. These will adversely impact on the conservation of sensitive areas.

Where any such impacts will occur within areas of sensitivity, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken. Archaeological test excavations under the Code of Practice may be required to determine the integrity or extent of any artefactual assemblages that are present and the nature of Aboriginal activities in these areas. Conservation of these areas for their Aboriginal cultural heritage values, without such impacts, should be considered as part of the future development of the Precinct.

**Recommendation 2**

Areas for conservation of Aboriginal cultural heritage should be considered as part of the future development of the Precinct. Conservation areas should be within areas of high and moderate sensitivity, preferably within the less disturbed parts of these areas. Impacts to these conservation areas (e.g. drainage infrastructure, footpaths and other open space facilities/landscaping) should be avoided.

**Recommendation 3**

Where impacts will occur in areas of moderate and high archaeological sensitivity within riparian corridors/open space, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken. Archaeological test excavations under the Code of Practice may be required, to determine the integrity or extent of any artefactual assemblages that are present and the nature of Aboriginal activities in these areas.

### 7.2.2 Areas without an Ascribed Archaeological Sensitivity

As discussed in Section 5.2.2, areas that have not been identified as having moderate or high sensitivity may contain Aboriginal sites; however, these sites are more likely to represent background scatter, rather than extensive or in situ sites. As all Aboriginal heritage is protected under the National Parks & Wildlife Act 1974 (Amended 2010) and National Parks & Wildlife Amendment Regulation 2010, Aboriginal heritage assessment of specific proposed development in accordance with OEH guidelines should be undertaken in these areas, to identify any surface sites which may not have been visible during the current survey, and to identify appropriate mitigation strategies for the proposed development.

**Recommendation 4**

*For any specific proposed development to areas without an ascribed archaeological sensitivity, assessment of Aboriginal heritage should be undertaken in accordance with the National Parks & Wildlife Act 1974 (Amended 2010) and National Parks & Wildlife Amendment Regulation 2010, as per the OEH guidelines.*

### 7.3 Sites with Some/Low or Some/Low-Moderate Significance

As summarised in Table 6.1, there are 10 identified Aboriginal sites within the study area which are considered to have some/low archaeological significance, and three sites considered to have low-moderate archaeological significance. These are sites LP1AS, LP2IF, LP3AS, LP4AS, LP5AS, LP6IF, LP7IF, LP8IF, LP10AS, LP11AS, LP12IF, LP13IF and Isolated Object 2057-5.
Figure 7.2 Estimate of level of disturbance impacting upon archaeological sensitivity within the study area, including potential impact of proposed Sydney Water infrastructure. NB. Minimal disturbance is considered not to impact upon the sensitivity; moderate disturbance has some impact; and gross disturbance (including the potential Sydney Water infrastructure) has a major impact, effectively cancelling (or ‘whiting-out’) sensitivity. [NB. Figure removed for public exhibition.]

### 7.3.1 Sites LP1AS, LP2IF, LP3AS, LP4AS, LP5AS, LP6IF, LP7IF, LP8IF, LP10AS, LP11AS, LP12IF & LP13IF

There are 13 sites with some/low or some/low-moderate significance within the study area, 12 of which were recorded during the current survey and were therefore not to be impacted by previous developments. These are sites LP1AS, LP2IF, LP3AS, LP4AS, LP5AS, LP6IF, LP7IF, LP8IF, LP10AS, LP11AS, LP12IF and LP13IF. Impact to these sites should be avoided as a first option in the Precinct Planning. However, where this is not possible due to design or engineering constraints, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, in accordance with the Code of Practice, and an AHIP for the sites may be required prior to impact.

**Recommendation 5**

*Impact should be avoided to sites LP1AS, LP2IF, LP3AS, LP4AS, LP5AS, LP6IF, LP7IF, LP8IF, LP10AS, LP11AS, LP12IF and LP13IF. Where this is not possible, detailed Aboriginal heritage impact assessment, in accordance with the Code of Practice, should be undertaken for any specific proposed development in the vicinity of these sites, and an AHIP may be required.*

The ILP currently identifies the following land uses for the areas in which these sites are located: low/medium density residential (LP1AS; LP2IF; LP4AS; LP10AS); active open space (LP3AS); low density residential/local road (LP5AS; LP11AS); environmental protection overlay on infrastructure (LP6IF); environmental living (LP8IF); and local road (LP7IF; LP12IF; LP13IF). Thus, it may be possible to conserve three of these 12 sites; however, it should be noted that there may be impacts in these areas arising from works such as the installation of Council stormwater and detention infrastructure, and possibly some open space development including footpaths, benches, play equipment, landscaping and rural land uses. Where any such impact will occur within these areas, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and AHIPs may be required.

**Recommendation 6**

*Where impacts are likely to occur to sites LP1AS, LP2IF, LP3AS, LP4AS, LP5AS, LP6IF, LP7IF, LP8IF, LP10AS, LP11AS, LP12IF and LP13IF, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and AHIPs may be required.*

### 7.3.2 Isolated Object 2057-5

There are 13 sites with some/low or some/low-moderate significance within the study area, one of which may be impacted by other developments; site Isolated Object 2057-5. As such, this site may be destroyed, prior to the Precinct development commencing, by the construction of SWGC water infrastructure. This should be determined during detailed Aboriginal heritage impact assessment of specific proposed developments.

In the event that the site will not have been destroyed by the construction of SWGC water infrastructure, impact to the site should be avoided as a first option in the Precinct Planning. However, where this is not possible due to design or engineering constraints, detailed Aboriginal
heritage impact assessment of specific proposed development should be undertaken, in accordance with the Code of Practice, and an AHIP for the site may be required prior to impact.

**Recommendation 7**

Should site Isolated Object 2057-5 not have been destroyed by the construction of SWGC water infrastructure prior to Precinct development commencing, impacts to the site should be avoided. Where this is not possible, detailed Aboriginal heritage impact assessment, in accordance with the Code of Practice, should be undertaken for any specific proposed development in the vicinity of the site, and an AHIP may be required.

The ILP currently identifies low density residential land use for the area in which this site is located. Thus, the site is unlikely to be conserved. Where any such impact will occur within this area, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and an AHIP may be required.

**Recommendation 8**

Where impacts are likely to occur to site Isolated Object 2057-5, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and an AHIP may be required.

### 7.4 Sites with Moderate or High Significance

As summarised in Table 6.1, there is one area adjacent to a site which is considered to have moderate archaeological significance, and two PADs and two areas adjacent to sites which are considered to have moderate-high archaeological significance, within the study area. These are sites PAD 2055-6, PAD 2056-6, the rear of 131 Eastwood Road adjacent to LP1AS, the north west corner of 220 Heath Road adjacent to LP3AS and the front of 294 George Road adjacent to LP6IF.

#### 7.4.1 Rear of 131 Eastwood Road, North West Corner of 220 Heath Road & Front of 294 George Road

There are five areas with moderate or moderate-high significance within the study area, three of which were recorded during the current survey and were therefore not to be impacted by previous developments. These are the rear of 131 Eastwood Road adjacent to LP1AS, the north west corner of 220 Heath Road adjacent to LP3AS and the front of 294 George Road adjacent to LP6IF. Impact to these areas should be avoided as a first option in the Precinct Planning. However, where this is not possible due to design or engineering constraints, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and archaeological test excavations under the Code of Practice may be required to determine the integrity or extent of any artefactual assemblages that are present and the nature of Aboriginal activities in these areas.

**Recommendation 9**

Impact should be avoided to the rear of 131 Eastwood Road adjacent to LP1AS, the north west corner of 220 Heath Road adjacent to LP3AS and the front of 294 George Road adjacent to LP6IF. Where this is not possible, detailed Aboriginal heritage impact assessment, in accordance with the Code of Practice, should be undertaken for any specific proposed development in the vicinity of these sites, and archaeological test excavations under the Code of Practice may be required, to determine the integrity or extent of any artefactual assemblages that are present and the nature of Aboriginal activities in these areas.

The ILP currently identifies the following land uses for these areas: low/medium density residential, local roads, and environmental protection overlay on passive open space, infrastructure and environmental living (rear of 131 Eastwood Road adjacent to LP1AS); active open space, and
infrastructure with an environmental protection overlay (the north west corner of 220 Heath Road adjacent to LP3AS); and environmental protection overlay on passive open space, infrastructure and environmental living (the front of 294 George Road adjacent to LP6IF). Thus, it may be possible to conserve all or part of these three areas; however, it should be noted that there may be impacts in these areas arising from works such as the installation of Council stormwater and detention infrastructure along creeks, and possibly some open space development including footpaths, benches, play equipment, landscaping and rural land uses. Where any such impact will occur within these areas, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and AHIPs may be required.

**Recommendation 10**

*Where impacts are likely to occur to sites the rear of 131 Eastwood Road adjacent to LP1AS, the north west corner of 220 Heath Road adjacent to LP3AS and the front of 294 George Road adjacent to LP6IF, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and AHIPs may be required.*

### 7.4.2 PAD 2055-6 & PAD 2056-6

There are five areas with moderate or moderate-high significance within the study area, two of which may be impacted by other developments. These are PAD 2055-6 and PAD 2056-6. As such, these sites may be destroyed, prior to the Precinct development commencing, by the construction of SWGC water infrastructure. This should be determined during detailed Aboriginal heritage impact assessment of specific proposed developments, and recommendations developed accordingly.

In the event that one or more of these sites will not have been destroyed by the construction of SWGC water infrastructure, impact to these sites should be avoided as a first option in the Precinct Planning. However, where this is not possible due to design or engineering constraints, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and archaeological test excavations under the Code of Practice may be required to determine the integrity or extent of any artefactual assemblages that are present and the nature of Aboriginal activities in these areas.

**Recommendation 11**

*Should PAD 2055-6 and PAD 2056-6 not have been destroyed or excavated by other developments prior to the Precinct development commencing, impacts to these sites should be avoided. Where this is not possible, detailed Aboriginal heritage impact assessment, in accordance with the Code of Practice, should be undertaken for any specific proposed development in the vicinity of these sites, and archaeological test excavations under the Code of Practice may be required, to determine the integrity or extent of any artefactual assemblages that are present and the nature of Aboriginal activities in these areas.*

The ILP currently identifies an environmental protection overlay on passive open space, infrastructure and active open space for the areas in which these sites are located. Thus, it may be possible to conserve these two sites; however, it should be noted that there may still be impacts in these areas, arising from the installation of Council stormwater and detention infrastructure along creeks, rural land uses, and possibly other open space development including footpaths, benches, play equipment and landscaping. Where any such impact will occur within these areas, and to the other sites and parts of sites in this category, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and AHIPs may be required.
Recommendation 12

Where impacts are likely to occur to sites PAD 2055-6 and PAD 2056-6, detailed Aboriginal heritage impact assessment of specific proposed development should be undertaken, and AHIPs may be required.

7.5 Site LP9IF

Site LP9IF was identified during the current survey, but is located outside of the current study area. As such, no recommendations need to be made, because there should be no impact to this site as a result of the Precinct Planning.

Recommendation 13

There should be no impact to site LP9IF as a result of the Precinct Planning.

7.6 Aboriginal Community Feedback

One of the Aboriginal community stakeholders has requested that all contractors and sub-contractors working on the development should be given Aboriginal Cultural Heritage Training by a Qualified Aboriginal Trainer, and that Aboriginal people from the area should be employed during the future development. It has also been requested that when any soil is removed or disturbed for the installation of roads, power poles and underground services, Aboriginal stakeholders should be present to recover any Aboriginal artefacts that are exposed and record their locations. Another request is that any Aboriginal heritage material found within the Precinct should be donated to a museum and protected. These requests should be addressed at future development stages for the Precinct, as the current assessment is a planning study only and cannot address specific proposed developments, including installation of roads, power poles or underground services. At this stage, it cannot be predicted whether monitoring, collection or deposition of artefacts would be appropriate. Concerns were also raised about potential impacts within the areas of moderate and high sensitivity, including areas containing sites, along the creeklines. The revised ILP has now been amended to remove residential development from the riparian corridors. The majority of these corridors are now to be zoned passive open space, infrastructure, environmental living and rural transition with an environmental protection overlay. Recommendations are provided above for the appropriate management of areas of sensitivity within riparian corridors.

7.7 Summary of Constraints

A summary of constraints, comprising the 15 sites that have been identified within the study area, including their assessed significance and mitigation recommendations, is provided in Table 7.1 below. The additional site identified during the current survey which is outside the study area is also included in this table, as it has not previously been assessed in any other report. Constraints for the areas of archaeological sensitivity within the study area, identified in this report, are summarised in Table 7.2. This information is presented visually in Figure 5.33 and Figure 7.3.

The ILP currently identifies the conservation of six, and part of one, of the 15 sites and three areas of archaeological sensitivity within the study area, and portions of the areas of high and moderate sensitivity. A map of sites and areas of archaeological sensitivity, overlain on the draft ILP is provided in Figure 7.4.
Table 7.1 Summary of constraints – sites within the study area (and sites identified during the current survey).

<table>
<thead>
<tr>
<th>Site</th>
<th>AHIMS No.</th>
<th>Site Type</th>
<th>Assessed Archaeological Sensitivity of Surrounding Area</th>
<th>Significance and Recommendations</th>
<th>Proposed Impact in Draft ILP</th>
</tr>
</thead>
<tbody>
<tr>
<td>LP1AS - Rear of 131 Eastwood Road</td>
<td>N/A</td>
<td>Artefact scatter &amp; area of archaeological sensitivity</td>
<td>- Moderate - High</td>
<td>Significance assessed in current report as some/low (site) and moderate-high (area of archaeological sensitivity). Avoid impact; otherwise an AHIP (for site) or further investigation (of the area of archaeological sensitivity) in accordance with OEH’s Code of Practice, may be required prior to impact.</td>
<td>- Low/medium density residential - Low/medium density residential, local road; environmental protection overlay on passive open space, infrastructure, environmental living</td>
</tr>
<tr>
<td>LP2IF</td>
<td>N/A</td>
<td>Isolated find</td>
<td>Moderate</td>
<td>Significance assessed in current report as some/low. Avoid impact; otherwise an AHIP may be required prior to impact.</td>
<td>- Low/medium density residential</td>
</tr>
<tr>
<td>LP3AS - North west corner of 220 Heath Road</td>
<td>N/A</td>
<td>Artefact scatter &amp; area of archaeological sensitivity</td>
<td>- Moderate - High</td>
<td>Significance assessed in current report as some/low (site) and moderate-high (area of archaeological sensitivity). Avoid impact; otherwise an AHIP (for site) or further investigation (of the area of archaeological sensitivity) in accordance with OEH’s Code of Practice, may be required prior to impact.</td>
<td>- Active open space - Active open space, environmental protection overlay on infrastructure</td>
</tr>
<tr>
<td>LP4AS</td>
<td>N/A</td>
<td>Artefact scatter</td>
<td>None ascribed</td>
<td>Significance assessed in current report as some/low. Avoid impact; otherwise an AHIP may be required prior to impact.</td>
<td>- Low/medium density residential</td>
</tr>
<tr>
<td>LP5AS</td>
<td>N/A</td>
<td>Artefact scatter</td>
<td>Moderate</td>
<td>Significance assessed in current report as some/low-moderate. Avoid impact; otherwise an AHIP may be required prior to impact.</td>
<td>- Low density residential, local road</td>
</tr>
<tr>
<td>LP6IF - Front of 294 George Road</td>
<td>N/A</td>
<td>Artefact scatter &amp; area of archaeological sensitivity</td>
<td>- High - High</td>
<td>Significance assessed in current report as some/low (site) and moderate (area of archaeological sensitivity). Avoid impact; otherwise an AHIP (for site) or further investigation (of the area of archaeological sensitivity) in accordance with OEH’s Code of Practice, may be required prior to impact.</td>
<td>- Environmental protection overlay on infrastructure - Environmental protection overlay on passive open space, infrastructure, environmental living</td>
</tr>
<tr>
<td>LP7IF</td>
<td>N/A</td>
<td>Isolated find</td>
<td>Moderate</td>
<td>Significance assessed in current report as some/low. Avoid impact; otherwise an AHIP may be required prior to impact.</td>
<td>- Local road</td>
</tr>
<tr>
<td>LP8IF</td>
<td>N/A</td>
<td>Isolated find</td>
<td>High</td>
<td>Significance assessed in current report as some/low-moderate. Avoid impact; otherwise an AHIP may be required prior to impact.</td>
<td>- Environmental living</td>
</tr>
<tr>
<td>LP9IF</td>
<td>N/A</td>
<td>Isolated find</td>
<td>N/A</td>
<td>Significance assessed in current report as some/low. Site is outside of the current study area and therefore should not be impacted.</td>
<td>N/A – outside current study area</td>
</tr>
<tr>
<td>LP10AS</td>
<td>N/A</td>
<td>Artefact scatter</td>
<td>Moderate</td>
<td>Significance assessed in current report as some/low. Avoid impact; otherwise an AHIP may be required prior to impact.</td>
<td>- Low/medium density residential</td>
</tr>
<tr>
<td>Area</td>
<td>Recommendations</td>
<td>Proposed impact in Draft ILP</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>---------------------</td>
<td>----------------------------------------------------------------------------------</td>
<td>------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Areas of high</td>
<td>Incorporate these areas into conservation corridors and avoid impact; otherwise</td>
<td>Various</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>archaeological</td>
<td>further investigation of these areas may be required in accordance with OEH’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sensitivity</td>
<td>Code of Practice, prior to impact.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Areas of moderate</td>
<td>Incorporate these areas into conservation corridors and avoid impact; otherwise</td>
<td>Various</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>archaeological</td>
<td>further investigation of these areas may be required in accordance with OEH’s</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>sensitivity</td>
<td>Code of Practice, prior to impact.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figure 7.3 Estimate of level of disturbance impacting upon archaeological sensitivity within the study area, including potential impact of proposed Sydney Water infrastructure. NB. Minimal disturbance is considered not to impact upon the sensitivity; moderate disturbance has some impact; and gross disturbance (including the potential Sydney Water infrastructure) has a major impact, effectively cancelling (or ‘whiting-out’) sensitivity. [NB. Figure removed for public exhibition.]

Figure 7.4 Aboriginal sites and areas of archaeological sensitivity, overlain on the draft ILP. [NB. Figure removed for public exhibition.]
References

Archaeological and Heritage Management Solutions (AHMS) (2004) *Cowpasture Road Upgrade, Southern Section (Main Street to Camden Valley Way), Liverpool, NSW: Aboriginal Archaeological Assessment.* Consultancy report to NSW RTA.

AHMS (2010) *Aboriginal and Historic Impact Assessment: Edmondson Park, NSW.* Consultancy report to SWC.

AHMS (in prep.) *Water Related Services for North West and South West Growth Centres: Aboriginal Heritage Impact Assessment.* Consultancy report to SWC.


AMBS (2000a) *Mungerie Park Town Centre Archaeological Salvage Excavations Near Kellyville, Cumberland Plain, NSW.* Consultancy report to the Department of Urban Affairs and Planning.

AMBS (2000b) *Maxwells Creek Archaeological Salvage and Monitoring, Prestons, NSW.* Consultancy report to the P R & C M Drafting Services on behalf of Maraya Holdings Pty Ltd.


AMBS (2010a) *South West Rail Link – Preliminary Aboriginal Heritage Test Excavations.* Consultancy report prepared for TCA.

AMBS (2010b) *South West Rail Link – Glenfield to Leppington Rail Line: Aboriginal Heritage Assessment.* Consultancy report prepared for Parsons Brinckerhoff Pty Ltd for TIDC.

AMBS (2011) *Proposed Edmondson Park Servicing Scheme Aboriginal Heritage Impact Assessment.* Consultancy report to Parsons Brinckerhoff, on behalf of Sydney Water.


AA (2010) *MR647 Bringelly Road Upgrade: Aboriginal Archaeological Survey, Camden Valley Way, Leppington to the Northern Road, Bringelly*. Consultancy report to RTA.


ENSR (2009) Phase 2 Archaeological Excavations – Oran Park and Turner Road Precincts, South West Sydney, NSW. Consultancy report to Landcom/Greenfield Development Corporation, Dart West Developments Pty Ltd and Paynter Dixon Golf Pty Ltd.


Haglund L (1980) Report on an Archaeological Survey in the City of Blacktown. Consultancy report to NSW NPWS.


JMCHM (1999) Test Excavation of PAD 5 (RH/SP9) and PAD 31 (RH/CC2) for Rouse Hill (Stage 2) Infrastructure Project at Rouse Hill and Kellyville, NSW. Consultancy report to Rouse Hill Infrastructure Consortium (RHIC).

JMCHM (2001a) Salvage Excavation of Six Sites along Caddies, Second Ponds, Smalls, and Cattai Creeks in the Rouse Hill Development Area, NSW. Consultancy report to RHIC.

JMCHM (2001b) South Hoxton Park Aerodrome Master Plan: Preliminary Archaeological Assessment of Indigenous Heritage Sites. Consultancy report to SMEC, Annand & Alcock and LCC.


Kelleher Nightingale (KN) (2010a) Camden Valley Way Upgrade – Cobbitty Road to Couparastrue Road. Consultancy report to the RTA.

KN (2011) *Bringelly Road Upgrade, Camden Valley Way to the Northern Road: Aboriginal Cultural Heritage Assessment Report.* Consultancy report to RTA.


Lampert RJ (1971) *Burrill Lake and CURRARONG: Coastal Sites in Southern New South Wales.* Department of Prehistory, Research School of Pacific Studies, Australian National University, Canberra.


McDonald J (1992a) *Archaeological Investigation Project 12603 Cowpasture Road, Hoxton Park, NSW.* Consultancy report to Department of Housing, Liverpool.

McDonald J (1992b) *Archaeological Survey of the Proposed 33kV Transmission Line between Bringelly and Rossmore, NSW.* Consultancy report to EDAW Australia on behalf of Prospect Electricity.


McDonald J (1999) *Survey for Archaeological Sites: Proposed Rouse Hill stage 2 Infrastructure Works at Rouse Hill, Parklea and Kellyville, NSW.* Consultancy report to GHD for RHIC.


Navin Officer (1993) *Further Archaeological Investigation of the M5 Casula Link Corridor at Prestons, NSW.* Consultancy report to NSW RTA.


Appendix A

Aboriginal Community Consultation
### Aboriginal community consultation log

<table>
<thead>
<tr>
<th>Date</th>
<th>Sender</th>
<th>Organisation</th>
<th>Recipient</th>
<th>Organisation</th>
<th>Method</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>Fairfax Media</td>
<td>Email</td>
<td>Emailed text for an ad to be placed in the South West Rural Advertiser’s next publication. Ad to appear on Wednesday 5 September 2012; response date 19 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Glenda Chalker</td>
<td>CBNTCAC</td>
<td>Fax</td>
<td>Notification of project and request for notification if they would like to be consulted, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Gordon Morton</td>
<td>DACHA</td>
<td>Fax</td>
<td>Notification of project and request for notification if they would like to be consulted, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Leanne Watson</td>
<td>DCAC</td>
<td>Email</td>
<td>Notification of project and request for notification if they would like to be consulted, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Des Dyer</td>
<td>DTAC</td>
<td>Email</td>
<td>Notification of project and request for notification if they would like to be consulted, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Robyn Straub</td>
<td>TLALC</td>
<td>Email</td>
<td>Notification of project, request for notification if they would like to be consulted, and request for contact details of Aboriginal groups, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>GLALC</td>
<td>Email</td>
<td>Notification of project, request for notification if they would like to be consulted as it was outside their boundary, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Lou Ewins</td>
<td>OEH</td>
<td>Fax</td>
<td>Notification of project and request for contact details of Aboriginal groups, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>ORALRA</td>
<td>Email</td>
<td>Notification of project and request for contact details of Aboriginal groups, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>NNTT</td>
<td>Email</td>
<td>Notification of project and request for contact details of Aboriginal groups, by 12 September.</td>
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<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>NTScorp</td>
<td>Fax</td>
<td>Notification of project and request for contact details of Aboriginal groups, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>SMCMA</td>
<td>Email</td>
<td>Notification of project and request for contact details of Aboriginal groups, by 12 September.</td>
</tr>
<tr>
<td>29/8/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>Camden City Council</td>
<td>Email</td>
<td>Notification of project and request for contact details of Aboriginal groups, by 12 September.</td>
</tr>
<tr>
<td>30/8/12</td>
<td>LeanneWatson</td>
<td>DCAC</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Email</td>
<td>Registration of interest - primary involvement.</td>
</tr>
<tr>
<td>31/8/12</td>
<td>Tabatha Dantoine</td>
<td>ORALRA</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Post</td>
<td>No registered Aboriginal owners identified; suggested contacting TLALC.</td>
</tr>
<tr>
<td>3/9/12</td>
<td>Jessica Di Blasio</td>
<td>NNNT</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Email</td>
<td>Identified Gundungurra Tribal Council Aboriginal Corporation (GTCAC) claim. However, the GTCAC claim does not extend as far as the study area.</td>
</tr>
<tr>
<td>4/9/12</td>
<td>Celestine Everingham</td>
<td>DACHA</td>
<td>Ngaire Richards</td>
<td>AMBS</td>
<td>Phone</td>
<td>Registration of interest - primary involvement.</td>
</tr>
<tr>
<td>4/9/12</td>
<td>Celestine Everingham</td>
<td>DACHA</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Fax</td>
<td>Registration of interest - primary involvement.</td>
</tr>
<tr>
<td>5/9/12</td>
<td>Lisa Howard</td>
<td>Camden City Council</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Email</td>
<td>Identified the following groups as potentially having an interest in the study area: TLALC, CBNTCAC, DTAC, DCAC, DACHA, Tharawal Aboriginal Corporation and NIAC.</td>
</tr>
<tr>
<td>5/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>NIAC</td>
<td>Post</td>
<td>Notification of project and request for notification if they would like to be consulted, by 19 September.</td>
</tr>
<tr>
<td>5/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>Tharawal Aboriginal Corporation DLO</td>
<td>Post</td>
<td>Notification of project and request for notification if they would like to be consulted, by 19 September.</td>
</tr>
<tr>
<td>7/9/12</td>
<td>Jenna</td>
<td>AMBS</td>
<td>Gordon</td>
<td>DLO</td>
<td>Post</td>
<td>Notification of project and request for notification if they would like to be consulted, by 19 September.</td>
</tr>
<tr>
<td>Date</td>
<td>Name</td>
<td>Organisation</td>
<td>Contact Person</td>
<td>Contact Details</td>
<td>Reference</td>
<td></td>
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<tr>
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<tr>
<td>7/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Scott Franks</td>
<td>Post</td>
<td>Notification if they would like to be consulted, by 21 September.</td>
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<tr>
<td>7/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Des Dyer</td>
<td>DALCI</td>
<td>Notification if they would like to be consulted, by 21 September.</td>
<td></td>
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<tr>
<td>7/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Cherie Carroll Turrise</td>
<td>GCHAC</td>
<td>Notification if they would like to be consulted, by 21 September.</td>
<td></td>
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<tr>
<td>7/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Peter Falk</td>
<td>PFC</td>
<td>Notification if they would like to be consulted, by 21 September.</td>
<td></td>
</tr>
<tr>
<td>12/9/12</td>
<td>Luke Masters</td>
<td>GLALC</td>
<td>Jenna Weston</td>
<td>AMBS Email</td>
<td>Registration of interest (NB the study area is not within GLALC’s boundaries).</td>
<td></td>
</tr>
<tr>
<td>13/9/12</td>
<td>Scott Franks</td>
<td>Tocomwall</td>
<td>Jenna Weston</td>
<td>AMBS Email</td>
<td>Registration of interest - primary involvement.</td>
<td></td>
</tr>
<tr>
<td>18/9/12</td>
<td>Glenda Chalker</td>
<td>CBNTCAC</td>
<td>Jenna Weston</td>
<td>AMBS Fax</td>
<td>Registration of interest - primary involvement.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Peter Falk</td>
<td>PFC</td>
<td>Jenna Weston</td>
<td>AMBS Email</td>
<td>Registration of interest.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Leanne Watson</td>
<td>DCAC Email</td>
<td>Notice of stakeholder workshop/meeting on 5 October.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Sandra Lee</td>
<td>DTAC Email</td>
<td>Notice of stakeholder workshop/meeting on 5 October. Also asked them to register ASAP if they wished to be consulted.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>TLALC Email</td>
<td>Notice of stakeholder workshop/meeting on 5 October. Also asked them to register ASAP if they wished to be consulted.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Luke Masters</td>
<td>GLALC Email</td>
<td>Notice of stakeholder workshop/meeting on 5 October.</td>
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</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Peter Falk</td>
<td>PFC Email</td>
<td>Notice of stakeholder workshop/meeting on 5 October.</td>
<td></td>
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<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Scott Franks</td>
<td>Tocomwall Email</td>
<td>Notice of stakeholder workshop/meeting on 5 October.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Gordon Morton</td>
<td>DACHA Fax</td>
<td>Notice of stakeholder workshop/meeting on 5 October.</td>
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</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Glenda Chalker</td>
<td>CBNTCAC Fax</td>
<td>Notice of stakeholder workshop/meeting on 5 October.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Des Dyer</td>
<td>DALCI Post</td>
<td>Notice of stakeholder workshop/meeting on 5 October. Also asked them to register ASAP if they wished to be consulted.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Cherie Carroll Turrise</td>
<td>GCHAC</td>
<td>Notice of stakeholder workshop/meeting on 5 October. Also asked them to register ASAP if they wished to be consulted.</td>
<td></td>
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<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>NIAC Post</td>
<td>Notice of stakeholder workshop/meeting on 5 October. Also asked them to register ASAP if they wished to be consulted.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>Tharawal Aboriginal Corporation</td>
<td>Notice of stakeholder workshop/meeting on 5 October. Also asked them to register ASAP if they wished to be consulted.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Gordon Workman</td>
<td>DLO Post</td>
<td>Notice of stakeholder workshop/meeting on 5 October. Also asked them to register ASAP if they wished to be consulted.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Peter Falk</td>
<td>PFC</td>
<td>Jenna Weston</td>
<td>AMBS Email</td>
<td>Advised that he and his wife would attend the meeting.</td>
<td></td>
</tr>
<tr>
<td>21/9/12</td>
<td>Scott Franks</td>
<td>Tocomwall</td>
<td>Jenna Weston</td>
<td>AMBS Phone</td>
<td>Had some confusion about a different letter that he was aware had been sent to some groups, which contained additional information and a map of the study area; he’d received a notice of the meeting which didn’t have this information. I explained that an initial letter had gone out with this information and map, and that the meeting notice was separate to that,</td>
<td></td>
</tr>
</tbody>
</table>
because everyone who was sent the notice had already been sent the initial letter with map and request to register interest to be consulted, if they wished. Scott said either he or someone else from his organisation would attend the meeting.

<table>
<thead>
<tr>
<th>Date</th>
<th>Name</th>
<th>Site</th>
<th>Contact Person</th>
<th>Department</th>
<th>Method</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>21/9/12</td>
<td>Gordon Workman</td>
<td>DLO</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Email</td>
<td>Registered interest and said someone would attend the meeting.</td>
</tr>
<tr>
<td>21/9/12</td>
<td>Gai Marheine</td>
<td>DTAC</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Email</td>
<td>Registered interest and said John Reilly would attend the meeting.</td>
</tr>
<tr>
<td>21/9/12</td>
<td>Elwyn Brown</td>
<td>TLALC</td>
<td>Chris Langeduddecke</td>
<td>AMBS</td>
<td>Phone</td>
<td>Called to discuss our letter. Left message.</td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Elwyn Brown</td>
<td>TLALC</td>
<td>Phone</td>
<td>Registered their interest for primary involvement, and said they hoped to have someone attend the meeting.</td>
</tr>
<tr>
<td>21/9/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Gordon Workman</td>
<td>DLO</td>
<td>Email</td>
<td>Confirmed that we’d received their registration of interest and intention to attend the meeting. Said that a letter inviting them to the meeting and to register their interest had been sent on Friday, but asked to disregard as I had now received his responses.</td>
</tr>
<tr>
<td>2/10/12</td>
<td>Cherie Carroll Turrise</td>
<td>GCHAC</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Post</td>
<td>Letter received on 6/10/12, registering interest in the project and saying that she would try to attend the meeting. Said that she avoided computers and preferred to write responses.</td>
</tr>
<tr>
<td>5/10/12</td>
<td>Leanne Watson</td>
<td>DCAC</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Phone</td>
<td>Said she wouldn’t be able to come to the meeting because her daughter was unwell.</td>
</tr>
<tr>
<td>5/10/12</td>
<td>Chris Langeduddecke, Jenna Weston</td>
<td>AMBS</td>
<td>Glenda Chalker, Gordon Morton, Gordon Workman &amp; Paul Goddard, John Reilly, Peter &amp; Jean Falk, Danny Franks &amp; Chloe Green</td>
<td>CBNTCAC, DACHA, DLO, DTAC, PFC, Tocorwall</td>
<td>Meeting</td>
<td>Discussed the project and methodology for survey and reporting, including consultation. Glenda asked why GLALC was registered and we explained that they registered to be consulted, but we understood that the area was wholly within TLALC’s boundaries. We acknowledged that most of the area had not been surveyed. We suggested focussing the survey on areas adjacent to Kemps Creek and other creeks, and then sampling landforms, including areas of disturbance, to get a good sample. Suggested that visibility may be an issue. No-one raised any objections or concerns about this approach. We discussed sites recorded by AMHS, and excavations in East Leppington by GML. No-one raised any cultural concerns or values, but we said we would send a preliminary draft report for their comment, and they could contact us by phone at any time.</td>
</tr>
<tr>
<td>6/11/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Nicole Davis</td>
<td>OEH</td>
<td>Email</td>
<td>List of registered parties, and ad proof.</td>
</tr>
<tr>
<td>6/11/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>N/A</td>
<td>TLALC</td>
<td>Email</td>
<td>List of registered parties, and ad proof.</td>
</tr>
<tr>
<td>21/11/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Email</td>
<td>Said she would put the information on file.</td>
</tr>
<tr>
<td>21/11/12</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Glenda Chalker</td>
<td>CBNTCAC</td>
<td>Post</td>
<td>Sent draft preliminary report and survey methodology, requesting feedback by 19 December.</td>
</tr>
<tr>
<td>21/11/12</td>
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<td>AMBS</td>
<td>Gordon Morton</td>
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<td>AMBS</td>
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<td>Post</td>
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<tr>
<td>Date</td>
<td>Person</td>
<td>Location</td>
<td>Contact</td>
<td>Type</td>
<td>Notes</td>
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<td>N/A</td>
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<td>Tocomwall</td>
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<td>27/11/12</td>
<td>Peter Falk</td>
<td>PFC</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Email</td>
<td>Agreement with preliminary report and methodology, and identifying that the area was likely to contain subsurface artefacts. Said that they would not support any mechanical excavation and provided other recommendations for potential future development works. [NB this project is only a planning study, not proposing any development at this stage.]</td>
</tr>
<tr>
<td>27/11/12</td>
<td>Gordon Morton</td>
<td>DACHA</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Fax</td>
<td>Agreement with methodology.</td>
</tr>
<tr>
<td>30/11/12</td>
<td>Cherie Carroll Turrise</td>
<td>GCHAC</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Post</td>
<td>Said that any artefacts found should be put into a museum and protected.</td>
</tr>
<tr>
<td>13/12/12</td>
<td>Glenda Chalker</td>
<td>CBNTCAC</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Post</td>
<td>Commented on draft preliminary report. Said that much of the surrounding area has very little Aboriginal heritage left. Identified concern about previous excavations that only sampled the excavated material, as the results leave much of this material unexplored. Identified that the area was within TLALC’s boundary, so GLALC should not be involved in fieldwork. Agreed with survey methodology of targeting areas, making sure to check ground exposures; and acknowledged that there would be a lot of organisation of access.</td>
</tr>
<tr>
<td>24/5/13</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Elwyn Brown</td>
<td>TLALC</td>
<td>Email</td>
<td>Sent draft report for comment, requesting feedback by 21 June 2013. Also advised that a stakeholder meeting was proposed for the week 17-21 June, with a date to be confirmed soon.</td>
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<td>DTAC</td>
<td>Email</td>
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<tr>
<td>Date</td>
<td>Name</td>
<td>Organisation</td>
<td>Contact</td>
<td>Method</td>
<td>Message</td>
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<td>24/5/13</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Luke Masters</td>
<td>GLALC</td>
<td>Email Sent draft report for comment, requesting feedback by 21 June 2013. Also advised that a stakeholder meeting was proposed for the week 17-21 June, with a date to be confirmed soon.</td>
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<td>Gordon Morton</td>
<td>DACHA</td>
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<td>AMBS</td>
<td>Cherie Carroll Turisse</td>
<td>GCHAC</td>
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<tr>
<td>25/5/13</td>
<td>Gordon Workman</td>
<td>DLO</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Email Said they would provide feedback after the meeting.</td>
<td></td>
</tr>
<tr>
<td>27/5/13</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Elwyn Brown</td>
<td>TLALC</td>
<td>Email Notice of stakeholder meeting on 19 June.</td>
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<td>27/5/13</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Glenda Chalker</td>
<td>CBNTCAC</td>
<td>Fax Notice of stakeholder meeting on 19 June.</td>
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<td>27/5/13</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Gordon Morton</td>
<td>DACHA</td>
<td>Fax Notice of stakeholder meeting on 19 June.</td>
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<td>Jenna Weston</td>
<td>AMBS</td>
<td>Cherie Carroll Turisse</td>
<td>GCHAC</td>
<td>Post Notice of stakeholder meeting on 19 June.</td>
<td></td>
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<tr>
<td>12/6/13</td>
<td>Celestine Everingham</td>
<td>DACHA</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Fax Agreed with the report and recommendations. Said they are concerned that conservation corridors be established to avoid impacts to areas of moderate and high archaeological sensitivity.</td>
<td></td>
</tr>
<tr>
<td>16/6/13</td>
<td>Glenda Chalker</td>
<td>CBNTCAC</td>
<td>Jenna Weston</td>
<td>AMBS</td>
<td>Post Letter received on 21/6/13, identifying that she would be unable to attend the meeting. Commented that it appeared that there were no heritage conservation areas on the ILP map, and that public recreation was likely to include parks, which would impact on sites. Recommended that test excavation be undertaken if impact was to occur. NB although this project is only a planning study, not proposing any development at this stage, the recommendations in the report are that test excavations may be required if impact is to occur in areas of</td>
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<tr>
<td>Date</td>
<td>Attendees</td>
<td>Notes</td>
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<tr>
<td>19/6/13</td>
<td>Chris Langeludecke and Jenna Weston, AMBS</td>
<td>Discussed the draft report and the process going forward regarding the ILP and the public exhibition. Concerns were raised that there would be a lot of development impact, based on the ILP. It was explained that the report was intended to allow appropriate rezoning that would consider Aboriginal heritage early in the planning process, but was in no way intended to allow development, or AHIP applications. It was also clarified that the rezoning had been changed to pull back the residential zoning from creeklines. Concerns were raised that the report would allow development in areas that weren’t marked with particular sensitivity; particularly if individuals did their own due diligence assessments. Clarified that the areas with no ascribed sensitivity would still need proper heritage assessment if any impacts were planned in the future, as recommended in the report. Concerns were raised about the potential for a lack of consistency in recommendations and outcomes in the future, if the same archaeological consultants did not continue on the project. Identified that it could not be guaranteed that the same consultants would do the assessments if/when they are required, but that we could note the concerns raised, that the same recommendations be carried through in the future. It was noted by the Aboriginal community representatives that the significance of sites could change as more and more sites were being destroyed. This was acknowledged, and it was identified that cumulative impacts were discussed in the report, and that this was increasingly required to be addressed in all assessment reports. Agreed to email through the revised ILP prior to exhibition. Also agreed that we would remove maps showing site locations (and GPS co-ordinates) in the copy of the report that goes on public exhibition.</td>
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<tr>
<td>21/6/13</td>
<td>Glenda Chalker, CBNATC, Chris Langeludecke, AMBS</td>
<td>Glenda called to confirm that we had received her message that she would not be able to attend the consultation meeting the previous Wednesday. The results and discussion held in the meeting were briefly explained to her, and she identified that she had similar concerns with the report as those that were raised in the meeting. She stated...</td>
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</table>
that she was concerned that there were no heritage areas identified, and that residential areas appeared to encroach upon creeklines. I explained that the report was merely a planning device, a study, and that there was no actual development planned at this time. Any future development will require its own AHIA, and large developments are likely to create their own masterplan, which would identify any heritage conservation areas. I explained that the report was intended to allow appropriate rezoning that would consider Aboriginal heritage early in the planning process, but was in no way intended to allow development, or AHIP applications. I further clarified that the rezoning had been changed to pull back the residential zoning from creeklines.
Notice of Commencement of an Aboriginal Heritage Assessment for the Leppington Precinct within the South West Growth Centre

The NSW Department of Planning & Infrastructure (DP&I) has commenced Precinct Planning for 464ha comprising the Leppington Precinct, located within the South West Growth Centre. Planning for this Precinct will also investigate and determine appropriate planning controls for an additional 194ha on the western boundary of the Leppington Precinct.

This notice is to inform Aboriginal stakeholders that an Aboriginal heritage assessment of this Precinct, including the additional western investigation area, will be commencing in the near future and to request that Aboriginal stakeholders register their interest in participating in the planning process.

Consultation will be undertaken in accordance with the Protocol for Aboriginal Stakeholder Involvement in the Assessment of Aboriginal Heritage in the Sydney Growth Centres. Groups and individuals already listed in the Protocol will be consulted throughout the process. Other Aboriginal groups or individuals not currently listed in the Protocol are now invited to register their interest in participating in the process.

The purpose of this notice is to highlight that the Aboriginal cultural heritage assessment and consultation with Aboriginal stakeholders will:

• inform the precinct planning process and assessment of any necessary approvals made pursuant to the National Parks and Wildlife Act 1974 to impact on Aboriginal objects within the precinct;
• acknowledge that the Aboriginal groups and individuals specified in the Protocol will be consulted with; and
• invite any other interested Aboriginal parties to register their interest in writing to the DP&I, providing their name, address, contact phone number(s) and (where applicable) e-mail address.

Any group or individual wishing to participate in the Aboriginal heritage assessment process for the Leppington Precinct should register their interest by writing to Adrian Hoehenzollern at Department of Planning & Infrastructure, GPO Box 39, SYDNEY NSW 2001 by 19 September 2012 providing the information outlined above. Interested parties are also requested to specify their preferred level of involvement in the consultation process, from the two levels proposed:

Primary involvement: active involvement in heritage identification, assessment, and management; or

General involvement: only to be kept informed about the process and outcomes.

Copies of maps identifying the Leppington Precinct, and additional area to be investigated, can be obtained from www.growthcentres.nsw.gov.au or by contacting the Growth Centres Community Information Line on 1300 730 550.

Registration of interest does not guarantee employment.
Feedback from PFC

Peter Falk Consultancy
PO Box 1018 Mittagong NSW 2575
0401938060

Australian Museum Business Services
6 College Street,
Sydney NSW 2010
Attn: Jenna Weston

Dear Jenna,

Subject: Leppington Precinct Indigenous Heritage Study: Stage 1 Aboriginal Heritage Preliminary Assessment

Your report shows that there is great potential for this site to have Aboriginal Cultural Heritage areas within it. The surveys from surrounding sites indicate that the D’harawal people lived within 300 metres of constant or seasonal water sources.

The Leppington Precinct has sites which are yet to be found and as there are artefact scatters on the surface, this shows that the incidence of subsurface artefacts is greater.

Further to your investigations of areas within the 5 Km of Leppington Precinct it was noted that some sites were excavated with mechanical means, this did not show a true reading of the excavated materials and also has the potential to damage artefacts as demonstrated by Navin Officer (2011-2012) on the excavations for the Goulburn-Malwarre Pipeline.

Peter Falk Consultancy does not wish to see ANY mechanical digging for Aboriginal Artefact on ANY site.

The proposed survey and excavation of this site is agreed to by Peter Falk Consultancy and is contingent on no mechanical excavations carried out.

Further to this it must be noted that upon the developer starting work on this site, he must be made aware that:

1. All contractors and sub-contractors are given Aboriginal Cultural Heritage Training by a Qualified Aboriginal Trainer.
2. When any soil is removed or disturbed for the installation of roads, power poles and underground services, that the Aboriginal Stakeholders be present to recover any Aboriginal Artefacts and record their locations.
3. The contractor must be able to employ Aboriginal People from the area for this site.

If you have any further questions for the writer, please do not hesitate to contact.

Yours faithfully,

Peter Falk
Feedback from DACHA

Darug Aboriginal Cultural Heritage Assessments

Gordon Morton & Associates
Mob: 0421 968 931
Fax: 45 677 421

Celestine Everingham
90 Hermitage Rd., Kurrajong Hills, 2758
Ph/Fax: 49 777 421
Mob: 0432 528 896

Attention

Teena Weston
AMBS

Re: Leppington Precinct - South West Grant

We have reviewed your proposed methodology for the project and we support your aims and objectives. We look forward to working with you again.

Yours sincerely,

E. Everingham

Cultural Heritage – Building respect for the past and Conservation for the future
Feedback from GCHAC

PURPOSE OF THIS FORM

This form is intended to make it easier for registered Aboriginal parties to provide comments and feedback on the Draft Leppington Precinct Indigenous Heritage Study: Stage 1 Aboriginal Heritage Preliminary Assessment report, and the proposed methodology for the Indigenous heritage assessment. It is not obligatory to provide feedback in this way; however, if you would like to use this form, please fill out, sign and return to AMBS as a scanned document emailed to jenna.weston@austrmus.gov.au, by fax to (02) 9320 6428, or post the original to:
Attn: Jenna Weston
Australian Museum Business Services
6 College Street, Sydney NSW 2010

ABORIGINAL FEEDBACK

I, Cherie Carrolly Turrisi (your name)
Director (Aboriginal group name)

agree with the Draft Leppington Precinct Indigenous Heritage Study: Stage 1 Aboriginal Heritage Preliminary Assessment report (dated November 2012), and/or the proposed methodology for the Indigenous heritage assessment (dated 21 November 2012)

and/or would like to make the following comments about the Draft Leppington Precinct Indigenous Heritage Study: Stage 1 Aboriginal Heritage Preliminary Assessment report (dated November 2012), and the proposed methodology for the Indigenous heritage assessment (dated 21 November 2012), or provide the following information regarding the cultural heritage values of the study area (cross out if not applicable):

As an elder and being as a child on a mission, and on a few field trips I know it is vital that all artefacts of our ancestors are protected and saved for future generations, and allowed for families to see what their ancestors has seen and taken is not a lost left behind. I would like to see anything found put in a museum and protected

Signature: Cherie Carrolly Turrisi
Date: 30/11/2012

Position within Aboriginal group: Director

[Seal]
Feedback from CBNTCAC

Cubbitch Barta Native Title Claimants
Aboriginal Corporation
55 Nightingale Road,
PHEASANTS NEST, N.S.W. 2574.
14th December, 2012

AMBS,
6 College Street,
SYDNEY, N.S.W. 2010.

Dear Jenna,

LEPPINGTON PRECINCT

Thank you for the opportunity to comment on the DRAFT Aboriginal Heritage Preliminary Assessment. I would like to take the opportunity of making the following comments.

1. There has been a lot of research into other assessments around the area, all involving test or salvage excavations. There is very little of the Aboriginal Heritage left, besides very small pockets in all of those areas of assessment.

2. The one disconcerting thing that I have read, is the sampling only of excavated material, by one particular consultant, which must not be a true indicator of the possibilities, that have been left unexplored in several instances.

3. The area of the Leppington Precinct is wholly within the Tharawal LALC Boundary, and therefore Gandangarra LALC has no need to be involved in any of the field work.

4. Most of the area of Leppington is made up of small lots, and will require a lot of movement between properties, and a lot of organisation of access.

5. The methodology to target areas, is probably the best and only way to carry out any survey. All ground exposures should also be checked.

Yours faithfully,

Glenda Chalker
Hon. Chairperson
Phone/Fax 0246841129 0427218425
Feedback from DACHA

Darug Aboriginal Cultural Heritage Assessments

Gordon Morton Associates

Celestine Everingham
90 Herestage Rd, Kurrajong Hills, 2758
Ph/Fax: 45677 421
Mob: 0424 052 896

Attention

Jenna Weston

We leppington precinct

DACHA have reviewed your indigenous heritage assessment and we support your recommendations. We are very concerned that the conservation considers the establishment of moderate and avoid impacts on areas of moderate and avoid archaeological sensitivity. We look forward to continue working with you on this project.

Yours sincerely,

C. Everingham

Cultural Heritage – Building respect for the past and Conservation for the future
Feedback from CBNTCAC

Leppington Precinct Indigenous Heritage Study: Stage 2 Aboriginal Heritage Assessment

Australian Museum Business Services,
6 College Street,
SYDNEY, N.S.W. 2010.

Dear Jenna,

LEPPINGTON PRECINCT

Thank you for the opportunity of commenting on the above proposed project. I have read the report, which is very detailed about the heritage assessments that have taken place in and around this precinct over the years.

The recommendations that are made are also very detailed and there are eleven, with a lot of ifs and buts attached. The maps are very small and hard to read and understand any details. According to the map of Figure 7.4 it appears that there is to be no Heritage on the map at all and all of the sites are within areas that will be impacted by everything, including public areas, which I would presume are playing fields and the likes (public recreation). Even the creek lines are not safe from any development, and will contain infrastructure as well as public recreation and low and medium density housing.

It always saddens me that there is no place for REAL CONSERVATION OUTCOMES within every Precinct. It should be mandatory, just like they have to save X amount of trees, not even the riparian corridors appear to be safe within this Precinct.

I say test the lot of it, if they intend to destroy the lot. Unfortunately I will not be at the meeting on the 19th to voice my opinions, but I think that you get my drift.

Yours faithfully,

Glenda Chalker
Hon. Chairperson
Phone/Fax 0246841129 0427218425
Summary of Feedback to-date, and responses

Concerns raised by Aboriginal stakeholders to-date have been in response to the draft preliminary (pre-survey) report, which essentially comprised Sections 1-4 of the current (post-survey) report; and now in response to this draft (post-survey) report. The concerns that have been raised are:

- **Feedback:** There is potential for the Precinct to have Aboriginal cultural heritage areas; the surveys from surrounding area indicate that D’harawal people lived within 300m of water; and the Leppington Precinct has sites which are yet to be found, and the presence of artefact scatters on the surface indicates that there will be subsurface artefacts.
  - **Response:** This is acknowledged throughout Section 4 of the report, and has been taken into account in the assessment of archaeological potential and significance, and the recommendations.

- **Feedback:** Some of the surrounding archaeological investigations of were excavated with mechanical means; this does not provide a true representation of archaeological deposits and may damage artefacts, so there should not be any mechanical excavation within the Precinct.
  - **Response:** AMBS has not recommended that any mechanical excavations be undertaken, and would not recommend this as an excavation strategy in the future.

- **Feedback:** All contractors and sub-contractors working on the development should be given Aboriginal Cultural Heritage Training by a Qualified Aboriginal Trainer, and Aboriginal People from the area should be employed in the development. When any soil is removed or disturbed for the installation of roads, power poles and underground services, Aboriginal stakeholders should be present to recover any Aboriginal artefacts and record their locations.
  - **Response:** See Section 7.6.

- **Feedback:** Any Aboriginal heritage material found within the Precinct should be put in a museum and protected.
  - **Response:** See Section 7.6. All Aboriginal heritage material is protected under the legislation, as identified in Sections 2.3 and 7.2.2 of the report.

- **Feedback:** There is very little Aboriginal heritage left in the areas that have been previously assessed for development proposals.
  - **Response:** It is acknowledged that many sites in the region are being destroyed due to increasing development (see Section 7.1.1), and this has been taken into account in the assessment of significance (see Section 6.2).

- **Feedback:** The sampling of excavated material by a particular consultant is not a true indicator of what Aboriginal heritage is present in these areas.
  - **Response:** Section 4.2.2 includes summaries of excavations in which not all excavated material was sieved, and identifies that the results obtained by these means may have been affected by these limitations in the excavation methodology.

- **Feedback:** Leppington Precinct is entirely within TLALC’s boundaries, so GLALC should not be involved in the fieldwork.
  - **Response:** Table 1.1 indicates that GLALC was not involved in the fieldwork.

- **Feedback:** The Precinct is made up of small lots and would require much organisation of access, so the methodology to target areas was considered acceptable. All ground exposures should also be checked.
  - **Response:** As indicated in Section 5.1, the survey was undertaken in accordance with the methodology, and all ground exposures were surveyed on the properties for which access was granted. The survey was undertaken in conjunction with Aboriginal representatives, and none of the representatives indicated that they were dissatisfied with the coverage of the survey.

- **Feedback:** Conservation corridors should be established so as to avoid impacts (including residential development) to areas of moderate and high archaeological sensitivity and known sites, particularly along creeklines.
Response: Many of the sites and areas of high archaeological sensitivity are within conservation/riparian corridors, as are some of the areas of moderate archaeological sensitivity. As such, many impacts should be avoided to the areas of highest archaeological sensitivity. Further, the revised ILP has now been amended to include remove residential development from the riparian corridors. The majority of these corridors are now to be zoned passive open space, infrastructure, environmental living and rural transition with an environmental protection overlay, which should improve conservation outcomes. Although public recreation areas may still have impacts, it is recommended that mitigation of such impacts would be required.

- **Feedback:** Test excavation should be undertaken if impact is to occur.
  
  **Response:** Although this project is only a planning study, not proposing any development at this stage, the recommendations in the report are that test excavations may be required if impact is to occur in areas of moderate and high sensitivity. Further, the report recommends conservation in the riparian corridors, identifying that test excavations may be required if impact, including for public recreation, is to occur in these areas.

- **Feedback:** It appeared that there would be a lot of development impact, based on the ILP.
  
  **Response:** This report is intended to allow appropriate rezoning that would consider Aboriginal heritage early in the planning process, but is in no way intended to allow development, or AHIP applications. Further, the revised ILP has now been amended to include remove residential development from the riparian corridors. The majority of these corridors are now to be zoned passive open space, infrastructure, environmental living and rural transition with an environmental protection overlay, which should improve conservation outcomes.

- **Feedback:** Concerns were raised that the report would allow development in areas that were not ascribed moderate or high sensitivity.
  
  **Response:** As identified in Recommendation 4 of this report, the areas with no ascribed sensitivity would still need proper heritage assessment if any impacts were planned in the future.

- **Feedback:** There is potential for a lack of consistency in recommendations and outcomes in the future, if the same archaeological consultants do not continue to be utilised on the project.
  
  **Response:** It cannot be guaranteed that the same consultants would do the assessments if/when they are required for any proposed impact; however, these concerns have been noted.

- **Feedback:** The significance of sites may change as more and more sites are being destroyed in the area.
  
  **Response:** This is acknowledged. Cumulative impacts have been discussed in Section 7.1.1 of the report, and the significance assessment has been undertaken in light of the existing, remaining sites in the region. Further, cumulative impacts are increasingly required to be addressed in all assessment reports.
Appendix B

Effective Coverage Table
<table>
<thead>
<tr>
<th>Property</th>
<th>Landform</th>
<th>Description</th>
<th>Approx. area of property (m²)</th>
<th>Approx. area surveyed (m²)</th>
<th>Visibility</th>
<th>Exposure</th>
<th>Effective coverage area (m²)</th>
<th>Estimate of effective coverage (for whole property)</th>
<th>Site(s)</th>
<th>Photograph</th>
</tr>
</thead>
<tbody>
<tr>
<td>131 Eastwood Road (Lot 1 DP 564579)</td>
<td>Gentle slope Creek flat</td>
<td>Kemps Creek flows through rear of property. Market garden above creek flat, behind dwelling at front of property. No visibility on creek flat.</td>
<td>17100 6900</td>
<td>11250 0</td>
<td>40% 0%</td>
<td>95% 0%</td>
<td>4275 0</td>
<td>25% 0%</td>
<td>LP1AS identified during current survey.</td>
<td><img src="image1.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>125 Eastwood Road (Lot 2 DP 564579)</td>
<td>Gentle slope Creek flat</td>
<td>Kemps Creek flows through rear of property. Sheep grazing pasture above creek flat, behind dwelling near front of property. No visibility.</td>
<td>8525 11275</td>
<td>0 0</td>
<td>0% 0%</td>
<td>0% 0%</td>
<td>0 0</td>
<td>0% 0%</td>
<td>No sites identified (NSI) during current survey.</td>
<td><img src="image2.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>121 Eastwood Road (Lot 8 DP 363901)</td>
<td>Gentle slope Creek flat</td>
<td>Kemps Creek flows through rear of property. Sheep grazing pasture above creek flat, behind dwellings at front of property. No visibility.</td>
<td>7600 6800</td>
<td>0 0</td>
<td>0% 0%</td>
<td>0% 0%</td>
<td>0 0</td>
<td>0% 0%</td>
<td>NSI</td>
<td><img src="image3.jpg" alt="Photograph" /></td>
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<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
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<tr>
<td>115 Eastwood Road (Lot ADP 357433)</td>
<td>Gentle slope Creek flat</td>
<td>Kemps Creek flows through rear of property. Sheep grazing pasture and dam above creek flat, behind dwellings at front of property. No visibility.</td>
<td>5600</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>93 Eastwood Road (Lot 192 DP 611628)</td>
<td>Gentle slope Creek flat</td>
<td>Kemps Creek flows through front of property. Dwelling, sheds and dam at centre and rear of property.</td>
<td>9900</td>
<td>9900</td>
<td>1%</td>
<td>2%</td>
<td>70%</td>
<td>69.3</td>
<td>0.7%</td>
<td>NSI</td>
</tr>
<tr>
<td>253 Ingleburn Road (Lot 18 DP 8979)</td>
<td>Gentle slope</td>
<td>Grassed and vegetated, with dwelling and shed at front of property; dam and market gardens at back.</td>
<td>20000</td>
<td>20000</td>
<td>20%</td>
<td>95%</td>
<td>3800</td>
<td>19%</td>
<td>LP10AS identified during current survey.</td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage for whole property</td>
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<tr>
<td>39 Dickson Road (Lot 32 DP 595465)</td>
<td>Slope</td>
<td>Grassed and vegetated. Dwellings at front of property; dam at back.</td>
<td>20000</td>
<td>20000</td>
<td>1%</td>
<td>50%</td>
<td>100</td>
<td>0.5%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>43 Dickson Road (Lot 31 DP 595465)</td>
<td>Slope</td>
<td>Grassed and vegetated. Dwellings and structures at front of property; orchard/market garden and dams at back. No visibility.</td>
<td>20000</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>220 Heath Road (Lot 2 DP 544887)</td>
<td>Creek flat</td>
<td>Kemps Creek flows through front edge of property. Grassed and vegetated, with dam at back and dwelling/structures at side.</td>
<td>20100</td>
<td>20100</td>
<td>2%</td>
<td>90%</td>
<td>361.8</td>
<td>1.8%</td>
<td>LP3AS identified during current survey. 1 previously identified site at front of property (PAD 2055-6; AHIMS #45-5-4050).</td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage (for whole property)</td>
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<tr>
<td>149 Ingleburn Road (Lot 12 DP 629130)</td>
<td>Slope</td>
<td>Heavily grassed and vegetated. Dwelling and structures in centre of property. No visibility.</td>
<td>23000</td>
<td>1000</td>
<td>0%</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>NSI</td>
<td><img src="image1.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>107 Ingleburn Road (Lot 2 DP 1012407)</td>
<td>Gentle slope</td>
<td>Grassed and vegetated, but some visibility from horse grazing. Dwelling at side of property.</td>
<td>21000</td>
<td>21000</td>
<td>30%</td>
<td>40%</td>
<td>2520</td>
<td>12%</td>
<td>NSI</td>
<td><img src="image2.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>31 Rickard Road (Lot 1 DP 214064)</td>
<td>Slope</td>
<td>Heavily grassed and vegetated. Manicured lawns, dwelling and sheds at front of property. No visibility.</td>
<td>26000</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>NSI</td>
<td><img src="image3.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
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<tr>
<td>80 Heath Road (Lot 46 DP 8176)</td>
<td>Gentle slope Creek flat</td>
<td>Grassed and vegetated property surrounding central structures and dwelling at front. Bonds Creek flows through front corner of property, in front of which PAD 2056-6 was previously identified.</td>
<td>34000 6000</td>
<td>700 300</td>
<td>10% 5%</td>
<td>20% 10%</td>
<td>14 1.5</td>
<td>0.04% 0.025%</td>
<td>1 previously identified site (PAD 2056-6; AHIMS #45-5-4051).</td>
<td><img src="image1.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>66 Heath Road (Lot 47 DP 1156592)</td>
<td>Gentle slope</td>
<td>Pat Konista Reserve. Built-up level oval, tennis court and facility building, surrounded by vegetated areas.</td>
<td>40000</td>
<td>40000</td>
<td>5%</td>
<td>20%</td>
<td>400</td>
<td>1%</td>
<td>NSI</td>
<td><img src="image2.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>25 Byron Road (Lot 44C DP 8979)</td>
<td>Gentle slope</td>
<td>Pasture, market gardens and dam behind dwellings at front of property.</td>
<td>25000</td>
<td>25000</td>
<td>5%</td>
<td>80%</td>
<td>1000</td>
<td>4%</td>
<td>LP2IF identified during current survey.</td>
<td><img src="image3.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
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<tr>
<td>63 Ingleburn Road (Lot 2 DP 525996)</td>
<td>Gentle slopes</td>
<td>Treed area at rear of property, behind dwellings at front and middle.</td>
<td>22200</td>
<td>22200</td>
<td>0.1%</td>
<td>20%</td>
<td>4.44</td>
<td>0.02%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>69 Ingleburn Road (Lot 2 DP 525996)</td>
<td>Gentle slopes</td>
<td>Heavily grassed and vegetated at rear of property, even around dam. Dwellings at front of property.</td>
<td>22800</td>
<td>0</td>
<td>0%</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>11 Ingleburn Road (Lot 54 DP 8979)</td>
<td>Gentle slopes</td>
<td>Heavily grassed and vegetated, with one creek tributary. Houses and vehicles. No visibility.</td>
<td>18400</td>
<td>900</td>
<td>0%</td>
<td>0%</td>
<td>0</td>
<td>0%</td>
<td>NSI</td>
<td></td>
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<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
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<tr>
<td>7 Heath Road (Lot 1 DP 858011)</td>
<td>Gentle slopes</td>
<td>Previously recorded site at front of property, near mailbox. Confirmed location of site, but no access to property.</td>
<td>32000</td>
<td>375</td>
<td>5%</td>
<td>90%</td>
<td>16.88</td>
<td>0.05%</td>
<td>1 previously identified site (2057-7 Isolated Artefact; AHIMS #45-5-4052).</td>
<td><img src="image1" alt="Photograph" /></td>
</tr>
<tr>
<td>49 Heath Road (Lot 21 DP 776219)</td>
<td>Gentle slope</td>
<td>Market garden/orchard next to dwelling with manicured lawn. Bonds Creek flows near back edge of property.</td>
<td>20000</td>
<td>20000</td>
<td>40%</td>
<td>70%</td>
<td>5600</td>
<td>28%</td>
<td>NSI</td>
<td><img src="image2" alt="Photograph" /></td>
</tr>
<tr>
<td>69 Heath Road (Lot 1 DP 556930)</td>
<td>Gentle slope Creek flat</td>
<td>Bonds Creek flows through centre of property. Vegetable garden and dam at back, dwelling at front.</td>
<td>7500 12500</td>
<td>7500 12500</td>
<td>1% 10%</td>
<td>10% 60%</td>
<td>7.5 750</td>
<td>0.1% 6%</td>
<td>NSI</td>
<td><img src="image3" alt="Photograph" /></td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
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<tr>
<td>89 Heath Road (Lot 632 DP 791829)</td>
<td>Gentle slope Creek flat</td>
<td>Bonds Creek flows through front edge of property. Heavily grassed and vegetated, with dwellings and manicured lawns at front. No visibility, except along road verge.</td>
<td>19600</td>
<td>400</td>
<td>2%</td>
<td>0%</td>
<td>132</td>
<td>0.02%</td>
<td>1 previously identified site (PAD 2056-6; AHIMS #45-5-4051).</td>
<td></td>
</tr>
<tr>
<td>113 Heath Road (Lot 101 DP 1031121)</td>
<td>Slope Creek flat</td>
<td>Small drainage line flows through back edge of property. Heavily grassed and vegetated, with sheep grazing, crops and sheds at back, and dwelling at front of property. No visibility, except along road verge and at front of market garden.</td>
<td>20400</td>
<td>550</td>
<td>30%</td>
<td>0%</td>
<td>0.65%</td>
<td>0.0%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>125 Heath Road (Lot 100 DP 1031121)</td>
<td>Slope</td>
<td>Heavily grassed and vegetated, with shed at back, and dwelling and dam at front of property. No visibility, except along road verge and along dam.</td>
<td>20000</td>
<td>500</td>
<td>20%</td>
<td>40%</td>
<td>40</td>
<td>0.2%</td>
<td>NSI</td>
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<td>Property</td>
<td>Landform</td>
<td>Description</td>
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<tr>
<td>34 Cordeaux Street (Lot 14 DP 262084)</td>
<td>Slopes Creek flat</td>
<td>Heavily grassed and vegetated. Dwelling at front, dam at back along drainage line. No visibility, except along road verge.</td>
<td>18000 2000</td>
<td>450 0</td>
<td>10% 0%</td>
<td>30% 0%</td>
<td>13.5 0</td>
<td>0.075% 0%</td>
<td>NSI</td>
<td><img src="https://example.com/photograph1.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>220 Eastwood Road (Lot 4 DP 262084)</td>
<td>Slopes Creek flat</td>
<td>Heavily grassed and vegetated. Dwellings at front. No visibility, except for a small amount on the road verge.</td>
<td>18200 1600</td>
<td>500 0</td>
<td>1% 0%</td>
<td>40% 0%</td>
<td>2 0</td>
<td>0.01% 0%</td>
<td>NSI</td>
<td><img src="https://example.com/photograph2.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>46 Philip Road (Lot 34 DP 28107)</td>
<td>Slope Creek flat</td>
<td>Dwelling and shed at front; dam and market garden at back. Drainage line runs along rear of property.</td>
<td>18400 1600</td>
<td>8500 0</td>
<td>50% 0%</td>
<td>70% 0%</td>
<td>2975 0</td>
<td>16.2% 0%</td>
<td>LP4AS identified during current survey.</td>
<td><img src="https://example.com/photograph3.jpg" alt="Photograph" /></td>
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<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage for whole property</td>
<td>Site(s)</td>
<td>Photograph</td>
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</tr>
<tr>
<td>36 Philip Road (Lot 35 DP 28107)</td>
<td>Slope Creek flat</td>
<td>Heavily grassed and vegetated. Dwellings at front; dam and market gardens at back. Drainage line runs along rear of property. No visibility, except along road verge.</td>
<td>18400</td>
<td>400</td>
<td>40%</td>
<td>0%</td>
<td>1600</td>
<td>128</td>
<td>0.7%</td>
<td>0%</td>
</tr>
<tr>
<td>26 Philip Road (Lot 36 DP 28107)</td>
<td>Slope</td>
<td>Heavily grassed and vegetated. Dwellings and other structures at front; dam and grazing animals at back. No visibility, except along road verge.</td>
<td>20000</td>
<td>400</td>
<td>10%</td>
<td>8</td>
<td>10%</td>
<td>8</td>
<td>0.04%</td>
<td>NSI</td>
</tr>
<tr>
<td>18 Philip Road (Lot 37 DP 28107)</td>
<td>Slope Creek flat</td>
<td>Heavily grassed and vegetated. Dwelling at front; dam at back. Kemps Creek flows through back corner of property. No visibility, except along road verge.</td>
<td>15200</td>
<td>400</td>
<td>5%</td>
<td>2</td>
<td>4800</td>
<td>10%</td>
<td>2</td>
<td>0.01%</td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage (for whole property)</td>
<td>Site(s)</td>
<td>Photograph</td>
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</tr>
<tr>
<td>5 Philip Road (Lot 31 DP 28107)</td>
<td>Slope</td>
<td>Heavily grassed and vegetated. Dwelling at front; dam and crops at back. No visibility, except along road verge.</td>
<td>19500</td>
<td>70</td>
<td>5%</td>
<td>90%</td>
<td>3.15</td>
<td>0.02%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>294 George Road (Lot 42 DP 28107)</td>
<td>Slope Creek flat</td>
<td>Heavily grassed and vegetated, with exposure around dam and former market gardens at back. Dwelling and dam at front. Kemps Creek flows through front of property.</td>
<td>27300 1200</td>
<td>27300 1200</td>
<td>5% 1%</td>
<td>60% 20%</td>
<td>819 2.4</td>
<td>3% 0.2%</td>
<td>LP6AS and LP7IF identified during current survey.</td>
<td></td>
</tr>
<tr>
<td>290 George Road (Lot 43 DP 28107)</td>
<td>Slope Creek flat</td>
<td>Heavily grassed and vegetated, with exposures around fences, horse training areas and dam. Dwellings and sheds at front. Kemps Creek flows through front of property.</td>
<td>18750 7500</td>
<td>18750 7500</td>
<td>5% 2%</td>
<td>70% 40%</td>
<td>656.3 60</td>
<td>3.5% 0.8%</td>
<td>LP6AS identified during current survey.</td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage (for whole property)</td>
<td>Site(s)</td>
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</tr>
<tr>
<td>268 George Road (Lot 46 DP 28107)</td>
<td>Slope Creek flat</td>
<td>Heavily grassed and vegetated, with exposures around fences and tracks. Dwellings and sheds at front. Kemps Creek flows through centre of property.</td>
<td>11200</td>
<td>9600</td>
<td>5%</td>
<td>1%</td>
<td>75%</td>
<td>60%</td>
<td>360</td>
<td>3.2% 0.3%</td>
</tr>
<tr>
<td>260 George Road (Lot 47 DP 28107)</td>
<td>Creek flat</td>
<td>Heavily grassed and vegetated. Dwellings and tennis court at front, built up above creek. Kemps Creek flows through centre of property, with dam adjacent. No visibility.</td>
<td>20250</td>
<td>375</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
<td>0%</td>
</tr>
<tr>
<td>236 George Road (Lot 50 DP 28380)</td>
<td>Slope Creek flat</td>
<td>Heavily grassed and vegetated. Dwellings and structures at front, with thick trees and understorey behind. Kemps Creek flows through back corner of property. No visibility, except along road verge.</td>
<td>19200</td>
<td>300</td>
<td>20%</td>
<td>0%</td>
<td>60%</td>
<td>0%</td>
<td>36</td>
<td>0% 0.19%</td>
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<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage (for whole property)</td>
<td>Site(s)</td>
<td>Photograph</td>
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<tr>
<td>228 George Road (Lot 51 DP 28380)</td>
<td>Slope</td>
<td>Grassed and vegetated, with dwellings and structures along side, and dam at back, of property.</td>
<td>23600</td>
<td>23600</td>
<td>10%</td>
<td>80%</td>
<td>1888</td>
<td>8%</td>
<td>NSI</td>
<td><img src="image1.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>59 Joseph Road (Lot 11 DP 28107)</td>
<td>Slope Ridge</td>
<td>Structures at side of property; dam at back. Horses grazing.</td>
<td>9700 3500</td>
<td>9700 3500</td>
<td>5%  2%</td>
<td>70%  70%</td>
<td>339.5 49</td>
<td>3.5% 1.4%</td>
<td>LP9IF</td>
<td><img src="image2.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>78 Joseph Road (Lot 9 DP 28107)</td>
<td>Slope</td>
<td>Grassed and vegetated. Dwelling in centre of property; dam at end. Horse grazing.</td>
<td>19200</td>
<td>19200</td>
<td>5%</td>
<td>80%</td>
<td>768</td>
<td>4%</td>
<td>NSI</td>
<td><img src="image3.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage (for whole property)</td>
<td>Site(s)</td>
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</tr>
<tr>
<td>102 Woolgen Park Road (Lot 31 DP 205952)</td>
<td>Slope Creek flat</td>
<td>Heavily grassed and vegetated. Dwelling, sheds, dam and landscaping at front of property; second dam at back. Kemps Creek flows through back corner of property.</td>
<td>23000</td>
<td>23000</td>
<td>0.5% 1%</td>
<td>60% 30%</td>
<td>69</td>
<td>0.3% 0.12%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>81 Woolgen Park Road (Lot 37 DP 205952)</td>
<td>Slope Creek flat</td>
<td>Heavily grassed and vegetated. Dwelling, shed, dam and drainage line through centre of property. No visibility, except along road verge.</td>
<td>17350</td>
<td>500</td>
<td>20% 5%</td>
<td>50% 30%</td>
<td>50</td>
<td>0.29% 0.05%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>61 Woolgen Park Road (Lot 39 DP 205952)</td>
<td>Slope Creek flat</td>
<td>Heavily grassed and vegetated. Dwelling at front of property; dam at back. Drainage line through centre of property. No visibility, except along road verge.</td>
<td>19500</td>
<td>200</td>
<td>5% 0%</td>
<td>10% 0%</td>
<td>1</td>
<td>0.005% 0%</td>
<td>NSI</td>
<td></td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage (for whole property)</td>
<td>Site(s)</td>
<td>Photograph</td>
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<tr>
<td>39 Woolgen Park Road (Lot 41 DP 205952)</td>
<td>Slope</td>
<td>Heavily grassed and vegetated. Dwellings and dam at front of property.</td>
<td>24000</td>
<td>7000</td>
<td>2%</td>
<td>30%</td>
<td>42</td>
<td>0.18%</td>
<td>NSI</td>
<td><img src="image1.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>38 George Road (Lot 12 DP 200915)</td>
<td>Gentle slope Creek flat</td>
<td>Dwelling and sheds at front of property; dam and market garden at back. Drainage line through centre of property.</td>
<td>26000</td>
<td>1600</td>
<td>5%</td>
<td>80%</td>
<td>1040</td>
<td>4%</td>
<td>0.4%</td>
<td>NSI</td>
</tr>
<tr>
<td>15 George Road (Lot 15 DP 28057)</td>
<td>Slope Crest Creek flat</td>
<td>Heavily grassed and vegetated, except around market gardens at front end of property; drainage line at back end of property. Dwellings at front of property.</td>
<td>15800</td>
<td>4400</td>
<td>30%</td>
<td>80%</td>
<td>960</td>
<td>6.1%</td>
<td>27%</td>
<td>LP11AS and LP12AS identified during current survey.</td>
</tr>
</tbody>
</table>

**Photograph:** Images of the properties with descriptions.
<table>
<thead>
<tr>
<th>Property</th>
<th>Landform</th>
<th>Description</th>
<th>Approx. area of property (m²)</th>
<th>Approx. area surveyed (m²)</th>
<th>Visibility</th>
<th>Exposure</th>
<th>Effective coverage area (m²)</th>
<th>Estimate of effective coverage (for whole property)</th>
<th>Site(s)</th>
<th>Photograph</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>52 Hulls Road (Lot 8 DP 858010)</strong></td>
<td><strong>Slope Creek flat</strong></td>
<td>Grassed and vegetated. Dwellings, sheds and dam at front of property; second dam at back. Drainage line through centre of property.</td>
<td>17900 1300</td>
<td>17900 1300</td>
<td>0.5% 1%</td>
<td>60% 40%</td>
<td>53.7 5.2</td>
<td>0.3% 0.4%</td>
<td>NSI</td>
<td><img src="image1.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>33 Park Road (Lot 10 DP 28459)</strong></td>
<td><strong>Slope Creek flat</strong></td>
<td>Heavily grassed and vegetated. Dwellings, sheds and dam at front of property. Drainage line along side of property. Dirt bike track at rear of property.</td>
<td>15800 4000</td>
<td>15800 2200</td>
<td>1% 0%</td>
<td>70% 0%</td>
<td>110.6 0</td>
<td>0.7% 0%</td>
<td>NSI</td>
<td><img src="image2.png" alt="Image" /></td>
</tr>
<tr>
<td><strong>44 Park Road (Lot 34 DP 28459)</strong></td>
<td><strong>Gentle slope Creek flat</strong></td>
<td>Heavily grassed and vegetated. Dwellings and sheds at front of property. Bonds Creek flows through back corner of property, and drainage line runs through centre of property. No visibility, except along road verge and front fence.</td>
<td>37600 5500</td>
<td>1150 200</td>
<td>10% 0%</td>
<td>80% 0%</td>
<td>92 0</td>
<td>0.24% 0%</td>
<td>NSI</td>
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<td>Property</td>
<td>Landform</td>
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<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage (for whole property)</td>
<td>Site(s)</td>
<td>Photograph</td>
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<tr>
<td>53 Park Road (Lot 12 DP 28459)</td>
<td>Gentle slope Creek flat</td>
<td>Heavily grassed and vegetated. Abandoned dwelling and shed at front of property; shed and dam in centre of property. Drainage line runs from dam into next property. Horse grazing.</td>
<td>20150 1600</td>
<td>20150 1600</td>
<td>5% 30%</td>
<td>70% 60%</td>
<td>705.3 288</td>
<td>3.5% 18%</td>
<td>NSI</td>
<td><img src="image1.jpg" alt="Photo 1" /></td>
</tr>
<tr>
<td>60 Park Road (Lot 32 DP 28459)</td>
<td>Gentle slope</td>
<td>Heavily grassed and vegetated, particularly at rear of property. Dwellings and sheds at front of property; market garden and sheds in centre of property.</td>
<td>27375</td>
<td>27375</td>
<td>10% 40%</td>
<td>1095</td>
<td>4%</td>
<td>LP131 identified during current survey.</td>
<td></td>
<td><img src="image2.jpg" alt="Photo 2" /></td>
</tr>
<tr>
<td>69 Ridge Square (Lot 22 DP 28459)</td>
<td>Gentle slope Creek flat</td>
<td>Heavily grassed and vegetated. Dwellings and other structures at front of property, with dam just behind. Horse grazing.</td>
<td>17200 2400</td>
<td>17200 2400</td>
<td>1% 5%</td>
<td>70% 10%</td>
<td>120.4 12</td>
<td>0.7% 0.5%</td>
<td>NSI</td>
<td><img src="image3.jpg" alt="Photo 3" /></td>
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<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage (for whole property)</td>
<td>Site(s)</td>
<td>Photograph</td>
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<tr>
<td>93 Ridge Square (Lot 27 DP 28459)</td>
<td>Gentle slope</td>
<td>Heavily grassed and vegetated. Dwellings at front of property; dam at back. No visibility, except along road verge.</td>
<td>20000</td>
<td>200</td>
<td>5%</td>
<td>10%</td>
<td>1</td>
<td>0.005%</td>
<td>NSI</td>
<td><img src="https://example.com/photograph1.jpg" alt="Photograph" /></td>
</tr>
<tr>
<td>103 Ridge Square (Lot 28 DP 28459)</td>
<td>Gentle slope</td>
<td>Heavily grassed and vegetated. Dwellings and sheds at front of property; former market gardens at back.</td>
<td>20000</td>
<td>20000</td>
<td>1%</td>
<td>90%</td>
<td>180</td>
<td>0.9%</td>
<td>NSI</td>
<td><img src="https://example.com/photograph2.jpg" alt="Photograph" /></td>
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<tr>
<td>125 Ridge Square (Lot 30 DP 28459)</td>
<td>Gentle slope Creek flat</td>
<td>Heavily grassed and vegetated. Dwellings at front of property. Drainage line runs from next to front edge of property. No visibility, except along road verge.</td>
<td>18000</td>
<td>400</td>
<td>5%</td>
<td>10%</td>
<td>40%</td>
<td>30%</td>
<td>8</td>
<td>3</td>
</tr>
<tr>
<td>Property</td>
<td>Landform</td>
<td>Description</td>
<td>Approx. area of property (m²)</td>
<td>Approx. area surveyed (m²)</td>
<td>Visibility</td>
<td>Exposure</td>
<td>Effective coverage area (m²)</td>
<td>Estimate of effective coverage (for whole property)</td>
<td>Site(s)</td>
<td>Photograph</td>
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</tr>
<tr>
<td>1289 Camden Valley Way (Lot 2 DP 28459)</td>
<td>Slope Creek flats</td>
<td>Heavily grassed and vegetated. Dwellings at front; market gardens through remainder of property. Drainage lines run through centre, and back corner, of property.</td>
<td>17300 3700</td>
<td>17300 3700</td>
<td>50% 20%</td>
<td>90% 90%</td>
<td>7785 666</td>
<td>45% 18%</td>
<td>LP14IF identified during current survey.</td>
<td><img src="image-url" alt="Photograph" /></td>
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<tr>
<td>Total</td>
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<td>1235175</td>
<td>597445</td>
<td>4196.87</td>
<td>0.34%</td>
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