Airds Bradbury Renewal Project- 50392:

Assessment of Aboriginal Heritage

Considerations

March 2011

Report to URBIS on behalf of Landcom

Report Register

The following report register documents the development and issue of the report entitled Airds Bradbury Renewal Project- 50392: Assessment of Aboriginal Heritage Considerations, undertaken by Jo McDonald Cultural Heritage Management Pty Ltd

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1. INTRODUCTION AND BACKGROUND

1.1 Background to this Investigation

The Airds Bradbury Renewal Project is a joint project by Landcom and Housing NSW that seeks to undertake major significant physical and social development works to address the social disadvantage in this public housing area. This is to be undertaken via the preparation of a Masterplan that will guide the long term physical renewal of the area.

The Airds Bradbury Renewal Project (Figure 1) has recently been declared a Major Project, under Part 3A of the *Environmental Planning and Assessment Act 1979* (NSW). The Concept Plan for which approval will be sought has been based on background studies and a series of community and stakeholder consultations that has taken place over the past 18 months.

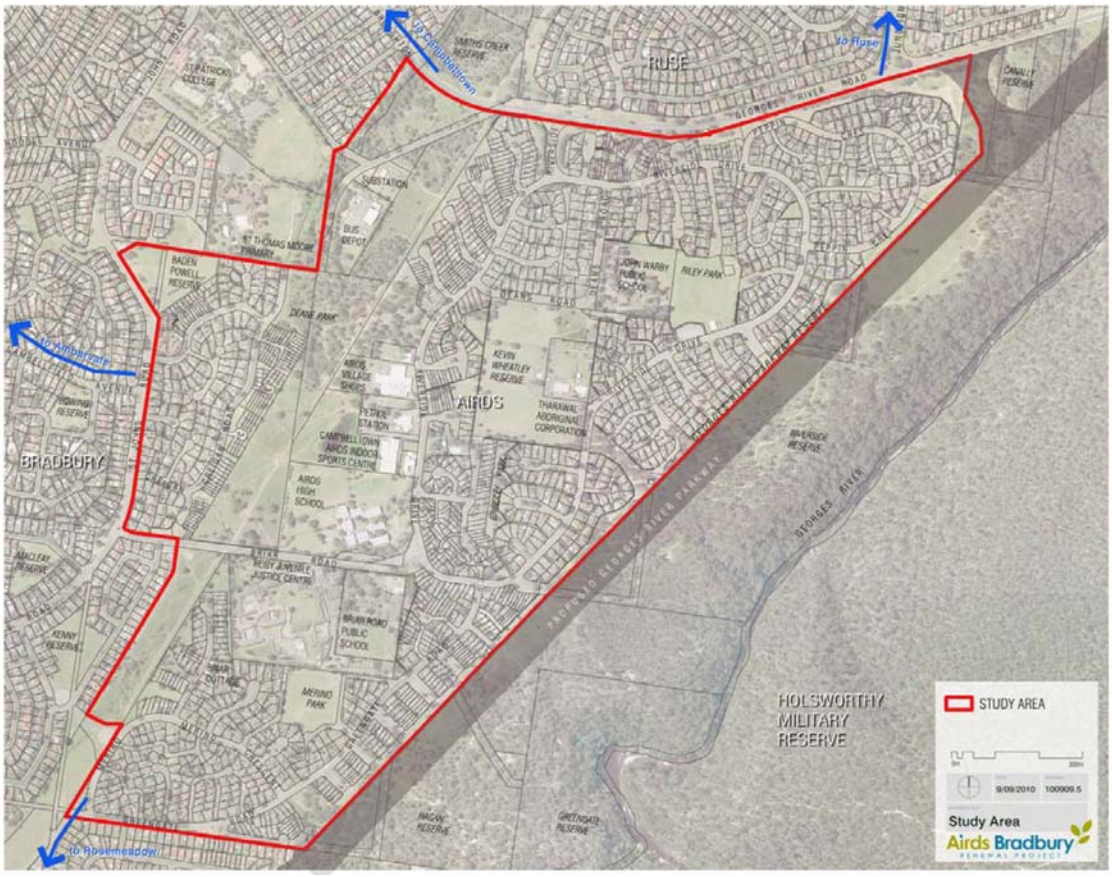

Figure 1: The Study Area. The Airds Bradbury Renewal Project.

The Director-General's Requirements (DGRs) for the Airds Bradbury Urban Renewal Project (MP 10_0186) were issued on 10 December 2010. With respect to Aboriginal heritage the key tasks to be achieved by this study are to:

- respond to the Director General's Requirements in relation to Aboriginal heritage, by addressing Aboriginal heritage in accordance with the Draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation 2005;
- identify items of potential Aboriginal heritage within the Project Application Area (PAA);
- provide an assessment of identified items of potential Aboriginal heritage to form the basis of an Aboriginal Heritage Impact Report;
- identify any stakeholder consultation that may be required subsequent to lodging the Environmental Assessment report, in order to facilitate Part 3A approval; and
- prepare a management plan for the protection of Aboriginal objects, post project approval.

This report is one of a series of reports being produced to support the Environmental Assessment application to the NSW Department of Planning (DoP). This report is written in relation to the Concept Plan and addresses the Director General's Requirements in relation to Aboriginal heritage. The Project Brief defines four stages of work to be completed on Aboriginal heritage. Stage 1, Project Inception, is not detailed below. This report addresses the Stage 2 and 3 requirements and provides the outline for the issues being presented for public review.

Stage 2—Background Review

- Desktop review of available data from relevant agencies (e.g. Department of Climate Change and Water (DECCW) Aboriginal Heritage Information Management System (AHIMS) Register), key local stakeholders (i.e. Tharawal Local Aboriginal Land Council (TLALC) and Cubbitch Barta), and Campbelltown Council.
- Review of archaeological history of the study area by undertaking site investigations in accordance with DECCW guidelines.

- Review of the consultation process and its outcomes relating to Aboriginal heritage findings, to date, and confirm those findings.

Stage 3—Aboriginal Heritage Assessment

- Identify items or areas of Aboriginal cultural heritage value and explore the constraints and opportunities.
- Identify and describe appropriate mitigation measures that would reduce the intensity and extent of impacts to items of cultural heritage, especially those of conservation value.
- Undertake a preliminary heritage assessment of the identified items or areas of Aboriginal heritage value.
- Prepare a report to accompany the Environmental Assessment report to the NSW Department of Planning.

Stage 4—Post Environmental Assessment Works

- Provide input into the preparation of the Preferred Project Report;
- Provide input subsequent to the Preferred Project Report up to the determination stage.

1.2 Scope and Objectives of this Report

This report addresses Stage 2 and 3 of the Brief. The report also outlines the recommended approach to strategically managing the Airds Bradbury Renewal Project on the basis of landscapes which have been identified as having Aboriginal heritage sensitivity.

The approach taken during the preparation of the detailed site assessment was based on the following current best practice guidelines:

- NSW Department of Planning (DoP) DGRs (reference MP 10-0186, 10 December 2010);
- NPWS Aboriginal Cultural Heritage, Standards and Guidelines Kit (draft 1997);
- NSW Department of Planning's (DoP) Part 3A EP&A Act Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation;
- DECC Operational Policy: Protecting Aboriginal Cultural Heritage (2009);

- DECCW Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (13 September 2010); and
- *The Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance 1999* (Burra Charter).

1.3 Authorship

This report has been prepared by Dr Jo McDonald, Jo McDonald Cultural Heritage Management (JMcD CHM) and Dr Tim Owen, Godden Mackay Logan (GML).

1.4 Report Structure

This report is structured in the following way:

Chapter 2 Environmental background relating to the study area.

Chapter 3 Aboriginal community consultation undertaken for this heritage assessment.

Chapter 4 Archaeological context of the study area, including known and potential heritage sites within and near the study area.

Chapter 5 Survey methodology, results of the field survey and significance assessment of heritage sites located within the study area.

Chapter 6 The proposed Masterplan and impact assessment.

Chapter 7 NSW legislative framework and statutory requirements.

Chapter 8 Heritage management and impact mitigation recommendations.

2. ENVIRONMENT AND CONTEXT

Airds and Bradbury are located approximately 2.5km southeast of the Campbelltown CBD, the regional centre of the Macarthur Region, which is about 50km from the City of Sydney. The study area includes 231ha on the southern Cumberland Plain, immediately west of the Georges River. Its northern boundary is Georges River Road; its southern extent is marked by Merino Crescent/Akuna Avenue. Its eastern boundary is the Georges River Parkway Reserve, and its western boundary is St Johns Road. The study area is essentially made up of three main parts:

- the Smiths Creek Bypass Corridor land (the now-abandoned road corridor which separates Airds and Bradbury, which is no longer required for transport-related purposes);
- the existing Airds and Bradbury public housing estates; and
- Airds Town Centre.

The Airds Bradbury study area comprises 1,550 dwellings within 28 identified precincts, the Reiby Detention Centre, Airds High School, indoor sports centre, Airds Village Shopping Centre, a service station, a community centre, recreational facilities, Smiths Creek Corridor, and open spaces (21 parks and reserves totalling 37.19ha).

2.1 Vegetation

The Cumberland Plain originally contained a complex of woodland and forest adapted to mostly clayey soils (Benson & Howell 1990, NPWS 2000). The vegetation community that would have originally grown within the study area includes trees such as grey box (*E. Moluccana*), forest red gum (*E. Tereticornis*), and ironbarks (mainly red ironbark or mugga—*E. Sideroxylon*). Blackthorn (*Bursaria spinosa*) and paperbark (*Melaleuca spp*.) are also representative of the open woodland in the area.

2.2 Geology and Soil

The study area is underlain by beds of middle-Triassic Bringelly Shale of the Wianamatta Formation (Clark and Jones 1991), very close to the Hawkesbury sandstone transition. Bringelly Shale includes claystone and siltstone and the soils produced from the weathering of these rocks are fine-grained with high proportions of

fine sands and silts. These soils tend to be acidic, which limits the likely preservation of organic materials (i.e. bone and shellfish) in prehistoric archaeological contexts. The consequences of the underlying Wianamatta Formation geology for archaeological site formation are:

- Low relief landforms with well-developed and relatively high-density drainage networks. Water sources occur frequently, with both ephemeral and permanent streams and ponds forming significant elements in the prehistoric landscape.
- Generally poor soils have precluded intensive agricultural uses of the area. This has assisted in the preservation of natural woodland, promoted pastoral land-use and minimised the effects of land disturbance from clearance and agriculture. There is thus a higher potential for undisturbed preservation of archaeological sites.

2.3 Topography

The erosional landform pattern of the study area can be described as rolling low hills, characterised by low relief (about 80m) with some moderate inclines (after Speight 1984). At the south of the study area, Bradbury Trig (just outside the southern boundary) has a spot height of 165m AHD; at the northern extent of the study area, where Smiths Creek crosses Georges River Road, the elevation is 120m. The eastern boundary of the study area is similarly at an elevation of 160m. The topography has been significantly altered by the original construction of these suburbs, and most areas of open space have been levelled for playing fields and creeks have been channelised. To the east of the study area, the land slopes sharply to the Georges River, which cuts through Hawkesbury sandstone geology.

2.4 Hydrology and Stream Order

The study area is immediately west of the Georges River, but most of the internal drainage here is oriented to the north. Smiths Creek runs south–north through the centre of the Renewal Project, this being a tributary in the Bow Bowing catchment. The deeply dissected Georges River channel is less than 500m east of the study area, and there are some minor tributary creeklines which drain the very eastern parts of the area.

Stream order is the basis for a Cumberland Plain predictive model for Aboriginal site location (McDonald and Mitchell 1994; White and McDonald 2010). The model assumes that people will preferentially select places where the water supply is more permanent and predictable for their usual camping locations. The smallest tributary streams are first order streams and the classification continues stepwise downstream. Two first order streams join at a first order node to form a second order stream; two second order streams join at a second order node to form a third order stream and so on.

The logic behind the stream order model is that in any particular climate and landscape a threshold catchment area is probably necessary to allow permanent stream flow or the establishment of waterholes with extended longevity (i.e. months to years). On the Cumberland Plain, where the average annual rainfall is between 700–900mm, the critical point for human habitation appears to be at the junction of two second or third order streams (second and third order nodes). While the Georges River is a sixth order stream as it passes the study area, and permanent water would thus have been available 500m to the east of the study area, Smiths Creek would appear to be a long linear second order stream for the entire study area (high levels of landscape modification make it difficult to interpret what the original topography and stream order would have been).

2.5 Land Use and Disturbance

The Airds Bradbury area was originally constructed in the 1970s for housing commission accommodation. At this time the study area was significantly modified with the construction of housing, roads and other infrastructure. Land use impact assessment using current aerial photography (access is still being sought to historic air photos to gauge the nature of the original impacts) demonstrate that there is a total of c.60 hectares across the study area which is open space: these are a combination of playing fields, the Smiths Creek Bypass lands and other small pockets where there are no buildings constructed. Air photo analysis indicates that these areas have undergone varying amounts of previous disturbance and this will have a bearing on the likely survival of any possible Aboriginal sites (Figure 2).

Previous impacts across the study area are divided into one of the following categories:

Extreme disturbance—The built environment, which has had extensive previous impact on the land surfaces. Buildings, houses, reservoirs, suburbs, roads, market gardens, poultry farms, BMX tracks, rubbish tips, formed tracks, dams, drains and other excavations.

Higher disturbance—Severe disturbance to the soil. These included levelled and returfed playing fields, swales for drainage reserves and smaller public spaces which have been cleared of original vegetation and presumably levelled at the time of the suburb's initial construction.

Moderate disturbance—Cleared of trees at some time, cultivation or extensive soil disturbance likely, caused by machinery or extended periods of trampling. This area has revegetated but requires ground-truthing to determine whether intact soil horizons remain.

Low disturbance—Partly cleared and grazed at some time (particularly on shale geology), but apparently never subject to extreme soil disturbance. Heavily vegetated areas may be weed infested in places.

The implications of these levels of disturbance relate to the potential preservation of Aboriginal archaeological deposits, such as stone artefact sites, hearths and other possible features.

Zones with low levels of disturbance are likely to retain intact soil horizons, which could hold spatially intact archaeological deposits. Such zones can be assessed to determine their condition, which can be related to the level of erosion or other similar formation processes. On a fundamental level, areas with high soil integrity, also possessing good condition, can be assigned with a low level of impact or disturbance.

Such landforms then need to be assessed in terms of their likelihood of bearing archaeological deposits (such as the stream-order model cited above). Only then can a level of archaeological sensitivity and/or potential be assigned to an area (Section 4.6).

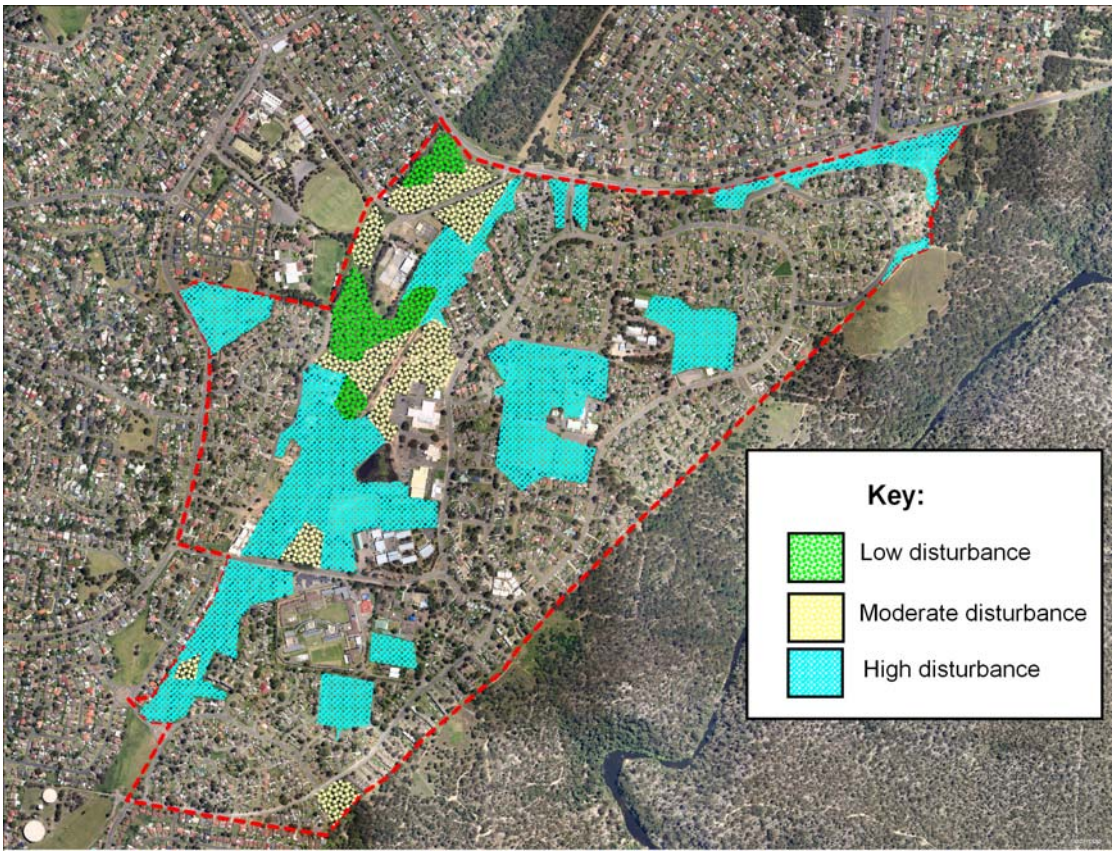

Figure 2: Airds Bradbury: Landuse impact assessment. NB the uncoloured majority of the study area is assessed as having extreme levels of previous disturbance.

Table 1: Areas of land use impact within the Airds Bradbury study area.

Land use impact category	Area (ha)	*%f*
Extreme	167.9	*72.7*
Higher	46.3	*20.0*
Moderate	11	*4.8*
Low	5.8	*2.5*
Total Study area	231	*100*

The analysis undertaken for land use impacts suggests that the majority of the study area has been significantly impacted by historical and more recent land use practices. The areas with low (and moderate) land use impact are located primarily along the northeastern margin of the Smiths Creek Bypass lands, extending to the existing shopping complex car park area, bus depot and residential zone.

3. ABORIGINAL COMMUNITY CONSULTATION

The study area falls within the boundaries of the Tharawal Local Aboriginal Land Council (TLALC) and Cubbitch Barta Native Title Claimants Aboriginal Corporation (Cubbitch Barta). It is also within the area of interest of a number of other groups: Korewal Elouera Jerrungurah Tribal Elders Council, Ilawarra Aboriginal Corporation, Wadi Wadi Coomaditchie Aboriginal Corporation, Wodi Wodi Elders Corporation, Woronora Plateau Gundungara, Wulunguu Elders Council, Coomaditchie United Aboriginal Corporation, Darug Tribal Aboriginal Corporation and the D'harawal Knowledge Holders, who have all registered their interest in the Campbelltown LGA with the DECCW. Most of these registrations are in response to the Community Consultation Guidelines developed by the Growth Centre Commission. DECCW guidelines do not stipulate that consultation with all listed groups is mandatory (outside the South-Western Growth Centre), although their registrations of interest should be noted.

For the assessment of the Aboriginal heritage values in the Airds Bradbury study area, contact with the Tharawal LALC and Cubbitch Barta has been made. Representatives of these two groups (Donna Whillock [TLALC] and Glenda Chalker [Cubbitch Barta]) participated in a field survey on Wednesday 16 March 2011. Representatives of both of these groups participated in the earlier AMBS study, and both are actively engaged in heritage assessment work in this part of the Sydney region.

The views and opinions of these two stakeholder groups have been incorporated into the heritage assessment and management sections of this report. Correspondence from both groups will be attached as Appendix 2 in the final report.

4. ARCHAEOLOGICAL CONTEXT

4.1 Ethno-History

According to early mapping of tribal boundaries by Tindale (1974), the Campbelltown region was occupied by the Dharawal language group, their land extending south of Botany Bay to the Shoalhaven River and inland to Camden. The Dharug language group occupied country to the north of Camden and covered the southwest part of the County of Cumberland. The Gundangara language group occupied country to the south and southwest.

More recent linguistic mapping and research has suggested a wide variation on the geographical boundaries of these languages and dialects, though it is likely that there were enough common words between them that the groups could communicate without too much difficulty.

The geographical boundaries of language groups and territories are only indicative. The issue is subject to significant debate and the interpretation of extremely limited historical documentation. Moreover, such boundaries may not have been well-defined or obviously delineated across the landscape. Despite the lack of certainty in regard to tribal boundaries, what is apparent from the ethnographic record is that the region was within the frequented territory of a number of separate and often conflicting Aboriginal groups. It does appear likely that the area was close to the boundary between the Darug, Dharawal and Gundangara dialects.

4.2 Archaeology in the Sydney Region

The first human colonisation of the Australian continent is generally accepted as happening c.43–45,000 years ago (O'Connell & Allen 2004). Evidence from archaeological excavations has demonstrated that the Sydney region has been populated from as early as 30,000 years ago (JMcD CHM 2005b). Although the Cumberland Plain has been inhabited for c.30,000 years, evidence shows that the region was most intensively occupied in the last 3,000 years (Attenbrow 2002).

Many of the earliest excavations in this region were of rock shelters in the sandstone country surrounding the Cumberland Plain (e.g. Attenbrow 2002, 2004; McDonald 2008; Nanson *et al*. 1987). Much of our information about the original inhabitants of the locality came from these. Development pressures in Western Sydney over the last decades have led to the increased excavation of open sites on the Cumberland Plain. This ongoing work, combined with other archaeological investigations over the past 20 years has provided substantial evidence for Aboriginal occupation, settlement patterns and resource use in this region. Archaeologically, the Cumberland Plain is now one of the most extensively investigated regions in Australia.

The duration and extent of vegetation stripping, farming, industry and urban development on the Cumberland Plain has resulted in the removal a large percentage of evidence resulting from the 30,000 years of Aboriginal occupation. When considering the Cumberland Plain's landscape as an object (i.e. a series of sites), the majority of inland areas (including the subject area) only contain residual evidence related to stone artefact based sites, with some scarred trees in areas with remnant vegetation; whilst locations nearer the coast also exhibit evidence of Aboriginal places with rock art, middens and burials.

A long history of the study of stone sites has resulted in a framework for understanding changes in lithic technologies in the Sydney region from the late Pleistocene through to the Holocene. McCarthy first proposed the Eastern Regional Sequence (ERS) in the 1940s and further developed it through to the 1960s (McCarthy 1946). Subsequent archaeological work in this region has further refined this sequence (Attenbrow 2002, 2004; Hiscock and Attenbrow 2005; McDonald 2008).

Looking at the sequence of technological changes provides a context from which we can assess and comprehend changes in occupation patterns and resource exploitation in this region. The ERS is a regional variant of the Core Tool and Scraper Tradition changing to the Small Tool Tradition and consists of 4 phases: Pre-Bondaian; Early Bondaian; Middle Bondaian; and Late Bondaian (see Table 2).

The change from Pre-Bondaian to Bondaian is characterised by a major shift in raw material use and a later predominance of smaller implements. Phases within the

Bondaian are characterised by the introduction and subsequent decline of the backed artefact, the increasing dominance of bipolar flaking and a change in proportions of raw material.

Table 2: The Eastern Regional Sequence (dates from JMcD CHM 2005b).

Period	Age (BP=before present)	Description
Pre-Bondaian	30,000-9,000 BP	Preference for silicified tuff unless at an extreme distance from sources. This is augmented with quartz or other local materials, also grainy stone raw materials. Cores and tools vary widely in size, some quite large. No backed artefacts, elouera or ground stone. The predominant technique is unifacial flaking. Bipolar flakes are rare. The 30,000 BP date possibly indicates the earliest time frame for this phase
Early Bondaian	9,000-4,000 BP	The use of silicified tuff declines, more use is made of local stone materials. Backed artefacts appear sporadically. Bipolar flaking is widely in use but only rarely at individual sites. Bifacial flaking probably continues as the predominant technique
Middle Bondaian	4,000-1,000 BP	The use of different raw material types varies between and within sites over time. Main phase of backed artefact. Introduction of asymmetric alternating flaking. Substantially smaller cores and tools. Increase in bipolar flaking. Ground stone artefacts appear, though infrequently and present at fewer than half the dated sites. Elouera are rare
Late Bondaian	1,000 BP to European Contact	The use of different raw material types continues to vary. Backed artefacts become rare or absent from most sites. Bipolar cores make up 2% or more at most sites. Ground stone found at most sites but usually <2% of assemblages. Elouera remain rare.

The following is a summary of the findings of previous archaeological work on the Cumberland Plain. In general:

- The complexity of the Cumberland Plain's archaeological record and time span of Aboriginal occupation is far greater than was previously identified on the basis of surface recording and more limited test excavation.
- Archaeological landscapes on permanent water, as reflected by Aboriginal people's preference for artefact discard, are more complex than sites on ephemeral or temporary water lines (McDonald 2008, White & McDonald 2010).

Specifically:

- Most areas within a landscape that contain residual soil horizons, even those with sparse or no surface manifestations, contain subsurface archaeological deposits.
- Where lithic concentrations are found in aggrading or stable landscapes, they are largely intact and have the potential for internal structural integrity. Sites in alluvium possess potential for stratification.

- Most sites will be of mid- to late-Holocene age. Suitable geomorphic conditions (e.g. deep sand bodies) for the preservation of Pleistocene–aged assemblages do occur but are not common on the Cumberland Plain.
- Frequently, the density and diversity of implements and *debitage* is conditioned by permanence of water (stream order) and landscape unit.
- Distance to known silcrete sources seems to have little influence on artefact discard generally, although many silcrete sources are perhaps still to be identified. Proximity to known sources does influence the proportion of flaked to blocky silcrete material on sites.
- Where silcrete outcrops occur naturally there will be evidence for quarrying and likely some stone reduction activity in the vicinity.
- Contrary to earlier models for the region (e.g. Kohen 1986, Smith 1989) many areas contain extremely high artefact densities, with variability appearing to depend on the range of lithic activities present. Densities in excess of 400/600 artefacts per square metre are not uncommon along major streams on the Cumberland Plain.
- Around the periphery of the plain, sandstone features such as overhangs and/or platforms may have been used for habitation, processing basalt ground-edged axes and/or the production of art.

4.3 Previous Work in the Study Area

An AHMS Basic Search was undertaken on 28 February 2011 using the Office of the Environment and Heritage website (http://www.environment.nsw.gov.au/) (Appendix 1). This revealed that there were 16 registered sites in and within a one kilometre radius of the study area (Table 1, Figure 3).

Figure 3: Registered site locations within the study area and surrounds (based on AHIMS grid reference data).

Table 3: AHIMS Registered sites: Site types.

Site Type	No.	*%f*
Open artefact scatter	3	*18.75*
Modified tree	2	*12.5*
Open PAD	11	*68.75*
	16	*100*

A previous Masterplan study involved an archaeological survey of Aboriginal heritage—mainly within the Smiths Creek Bypass Corridor (AMBS 2001). This involved a desktop study of archaeological records and a site survey. As a result of this study two archaeological Aboriginal sites were recorded within the study area.

These two sites have been registered under the DECCW's AHIMS. They are:

Airds 01: 52-2-2150 Scarred Tree

This site was recorded as follows (AMBS 2001: 15):

> *This archaeological feature is a large oval-shaped scar near the base of a mature Forest Red Gum (Plates 5.10–5.12). The dimensions of the scar are listed in Table 5.3. There are no axe marks discernable around the perimeter of the scar.*
>
> *The site is located in an area of Cumberland Plains forest regrowth between Smiths Creek and the southwest corner of the bus depot fence (Figure 5.1). The scarred tree is the only mature eucalypt in this part of the forest, surrounded by a number of juvenile red gum and Grey Box. Some disturbance to the land surface is evidenced by the presence of a number of large sandstone blocks that have been moved by heavy machinery. There is no evidence of any impact to the tree with the scar.*

Airds 02: 52-2-2151 Open Artefact Scatter and PAD

This site was recorded as follows (AMBS 2001: 17):

> *This site is visible on the surface of a dirt walking track in an area of forest regrowth immediately west of the local shops (Figure 5.1, Plates 5.13 & 5.14). The site comprises 10 silcrete flakes and flake debitage and one retouched flake (flake tool) scattered over a distance of 10 metres (Table 5.4). The artefacts appear to be eroding from a shallow deposit (c.10cm) of remnant A-Unit soils. The artefacts now lie upon a compact silty sand amongst a gravel lag deposit of ironstone nodules and sandstone pieces.*
>
> *The silcrete flakes and flaked pieces are all red in colour and are similar in appearance. It is likely that they represent the eroded component of a knapping event, the remains of which survive within the adjacent uneroded A-Unit soils each side of the track. The single retouched flake or tool, is of a slightly different textured silcrete which suggests that it may derive from a separate reduction event. If so, there may be other scatters of stone flakes within the immediate surrounds.*
>
> *This site is located on relatively level terrain within 50 metres of Smiths Creek. The remains of Aboriginal camp sites are often discovered nearby reliable water sources such as creeks, which would have formed a local foci of human activity. The presence*

of the nearby scarred tree, on one of the few remaining mature eucalypts, is further evidence that this area may have represented a local foci of occupation.

It should be noted that the location of these two sites, as recorded on the AHIMS cards, appears to contradict the locations provided in AMBS: Figure 5.1.

Both sites were assessed as being associated with a large area of Potential Archaeological Deposit (AMBS 2001: Figure 5.1). This PAD was not registered under AHIMS.

4.4 Previous Work Near the Study Area

A number of archaeological studies have been conducted within the region of the Airds Bradbury Renewal Project; a summary of relevant reports is presented below. Given the disparity between the erosional landscape patterns, the reports detailed below specifically refer to archaeological studies on the Cumberland Plain, rather than those associated with landforms on the Hawkesbury sandstone landscape.

Haglund (1985) investigated the (then) proposed Mt Annan Botanic Garden and Native Arboretum (6km west of the current study area). One surface open camp site was located consisting of a sparse scatter of artefacts, as well as six isolated finds. There was no evidence of artefact manufacture and the material was interpreted as debris left behind from hunting and gathering trips through the area. It was noted that the locations more favourable for camp sites, and thus more likely to contain higher density sites, had been significantly disturbed by previous land use.

In 1989, Sites N2 and N5 were excavated approximately 11km west of the study area within the Narellan Creek Valley (Haglund 1989). Site N2 was located at the junction of Narellan Creek and a large tributary, approximately 1.3km south of Camden Road. A total of 259 artefacts were recovered from site N2, including a ground edge hatchet and a hammerstone. Silcrete dominated the assemblage (66%), followed by indurated mudstone (24%) and quartz (10%). A variety of tool types were recovered, including backed artefacts. Site N5 was located approximately 1km further south, east of a large dam. A total of 41 artefacts were recovered from site N5, a total too small for detailed statistical analysis, although with similar ratios of raw material and tool types to that of N2.

The density and type of material recovered from N2 suggests repeated occupation over a considerable period of time. The presence of a backed artefact assemblage was interpreted as indicating occupation of the site was concentrated within the last three millennia. Site N5 was interpreted as representing short term camps by occasional small groups or individuals.

Menangle Park and its surrounds (approximately 7km west of the study area) have been the focus of more extensive archaeological work over recent decades. Twenty-two surface open sites have now been recorded within the Menangle Park release area, as have a number of PAD area/sensitive landscapes (Barker 1999; Byrne 1994; Corkill and Edgar 1991; Dibden 2002a, 2002b, 2003a, 2003b; HLA 2004; JMcD CHM 1996, 2004a; Kohen and Knight 2000; McDonald and Brayshaw 1983; McDonald 1990). The sand bodies along the Nepean, while seldom containing surface artefacts, have been identified as having the potential for buried camp sites and possibly human burials.

Sites Menangle Park (MP) 1–3 were excavated in 1991 (Corkill and Edgar 1991). Menangle Park 1 was located on a ridge spur approximately 1km north of the Nepean River. Three artefacts were recovered from a surface collection. Given the disturbed nature of the site, excavation focused on a flat section of the spur approximately 300m west of MP1. Seven artefacts were recovered from this area. A transect linking this area with MP1 recovered no additional artefacts and so the area of artefact recovery was designated a separate site (MP3). Menangle Park 2 was located within a shallow valley approximately 2km north of the Nepean River. A total of 18 artefacts were recovered from MP2 by means of surface collection, 95 shovel probes and six 0.25m^2 trenches.

In 2007 Mary Dallas Consulting Archaeologists excavated four areas within the Spring Farm Urban Release Area (8km northeast of the current study area). Spring Farm Areas 1, 2 and 3 were located on spurs and hill slopes within a Blacktown soil landscape. Spring Farm 4 was located within a sand body of the Theresa Park soil landscape. A total of 66 stone pieces—at least 22 of which were identified as being artefacts—were recovered within an excavated area of 81.4m^2. The areas were found to have been subject to historical disturbance and erosion caused by clearing and

ploughing. Area 4 was found to be highly disturbed by its previous use as a chicken farm. The artefact density within the four areas was found to be very low.

In 2008 and 2009, the site of the Spring Farm town centre, 9km west of the current study area, was surveyed (Kayandel 2009c). Three Aboriginal sites were recorded: two open scatters and one single flake. The single flake (SF2) and one scatter of four artefacts (SF1) were found on 'relict floodplain' while the open scatter of seven artefacts (SF3) was located on the banks of Spring Creek. Two areas of PAD were associated with SF2 and SF3.

In 2009 Biosis Research excavated site GWS1 for the ongoing Camden Gas project (10km west of the current study area). GWS1 was within an identified area of Potential Archaeological Deposit on a hill slope near Springs Creek. The initial survey in 2008 recorded a number of surface artefacts and a shell fragment at the site. Thirty-seven 0.5 x 0.5m^2 pits were excavated. A total of 29 artefacts were recovered from 11 test pits: the remaining 26 test pits contained no archaeological material. The report concluded that the site was a low density artefact scatter which provided limited information about site use by Aboriginal people.

In 2009, JMcD CHM undertook a test excavation in relation to a proposed sand extraction area northwest of the Menangle Park Township between the Nepean River and the Main Southern Railway line (7km southwest of the current study area). Cultural lithics were recovered from 13 of the 24, 1.2m x 0.8m test pits, and from three additional pits which were excavated in the vicinity of some of the higher density pits. A total of 183 lithic items likely to have had an Aboriginal origin were recovered during the test excavation. Of these, 168 met technical criteria as artefacts. A site focus was identified on sandy deposits on the southern side of and within 200m of Howes Creek. This area was assessed as having good archaeological potential and part of it was recommended for conservation.

In 2010, JMcD CHM undertook a test excavation of SFPAD5, 9km northwest of the current study area. The geomorphology of SFPAD5 was locally complex. It included a Pleistocene sand sheet underlying a clay based swamp on either side of a small creek, associated with a swamp (which had been drained). These landforms were overlain by a biomantle of soil, abutting the Bringelly Shale landscape. Survey of the

area identified no surface cultural material. The series of 12 dispersed test pits (each 1m^2) resulted in the recovery of 102 lithics from all but one of the pits. The highest concentration of cultural lithics (n=43) resulted in the additional excavation of 43m^2 around this pit. A further 926 cultural lithics were recovered from this extension area. The assemblage was assessed as having a moderate level of scientific significance, with the ability to inform knowledge about the use and occupation of land on transitional geologies in the Spring Farm area.

4.5 Synopsis of Prior Work

As already discussed, a range of archaeological surveys and excavations have been completed within a 10km zone surrounding the study area. This research reveals a general pattern of stone artefact based surface sites, most with minimal evidence for late Holocene Aboriginal occupation of this area. Excavations, where they have been completed at current best practise, demonstrate more complex cultural assemblages.

Observation relating to the pre-European environmental landscape setting of this region indicates that it is dominated by two features: the Nepean River (in the west) and its associated rolling low hills, and the more proximal Georges River (in the east) and its associated steep slopes. The current study area is located on the eastern margin of the rolling low hills landscape, and the local archaeological record reflects this landform, with a series of low density stone artefact sites. However, the study area abuts the disparate landscape of the Georges River, with its deep gorges and landforms that present sandstone suitable for rock engraving and art sites.

The juxtaposition between these two landscapes would have created an environment where each landscape was possibly used by the local Aboriginal people for very different purposes. The relatively flat, easily accessible and traversable landscape of the Nepean River could have lent itself to everyday economic activities, such as hunting larger species (wallaby etc.), which may have resulted in the legacy of stone artefact sites scattered across the wider landscape. The steeper gorged sandstone landscape to the east provides evidence of more complex cultural aspects of Aboriginal society, with numerous art sites and occupation evidence recorded in rockshelter sites (author's [TO] personal observations within the Holsworthy Military Range and McDonald 2008).

A zone of archaeological interest exists at the margin between these two different landscapes, within the current study area. Sites within the study area could be connected to use of the steeper gorged sandstone landscape, and may exhibit different artefact assemblage characteristics to those associated more closely with the Nepean River.

4.6 Archaeological Sensitivity

In order to appropriately manage Aboriginal heritage values, it is necessary to assess the area's archaeological sensitivity and/or potential. This assessment includes the identification of lands with the greatest potential to contain intact archaeological deposits (i.e. only minimally disturbed by previous land use impact) and those which are locally and regionally threatened by urban development. These two factors affect the assessment of high conservation potential.

It is important to note that the level of archaeological sensitivity and/or potential relates to the likelihood of discovering an Aboriginal object or site in good condition within a particular location. Only once all the actual and potential sites have been considered, can archaeological and cultural significance values start to be assessed for an area with potential. Scientific value needs to consider factors such as rarity, representativeness, the cultural/archaeological landscape, connectedness complexity and the level of archaeological potential. Therefore, whilst scientific value and sensitivity/potential are linked, it must be noted that 'value' and 'potential' are not the same and can differ substantially for any single site or area.

An assessment of the study area's land use impact was undertaken (Section 2.5). When coupled with local and regional knowledge relating to Aboriginal archaeological patterning it is possible to infer locations that are most likely to retain evidence resulting from Aboriginal activities.

A map showing archaeological potential has been created for the study area based on the assessed previous land use impacts (Figure 2). The archaeological potential of the study area was ground-truthed during the survey (Figure 4). Four zones of archaeological potential (sensitivity) are commonly identified for this purpose, and all four are found within the current study area.

- Zone 1—High archaeological potential
- Zone 2—Moderate archaeological potential
- Zone 3 - Low archaeological potential
- Zone 4—No archaeological potential

These zones are used to assist in the assessment of the sites and landscapes within the study area. The designation of these zones is based on the site survey, the findings of previous investigations within the study area, and assessed existing ground disturbance.

A very small area (5.78 ha; 2.6%) of the study area is assessed as having high archaeological sensitivity and a slightly larger area (11ha; 4.8%) as having moderate potential (Table 4). Those parts of the study area designated as Zone 3 and 4 are assessed as having low and no archaeological potential.

Table 4: Assessed sensitivity zones within the Airds Bradbury study area.

Assessed sensitivity	**Area (ha)**	***%f***
No sensitivity	167.9	*72.7*
Low sensitivity	54.7	*23.6*
Moderate sensitivity	3.4	*1.5*
High sensitivity	5.0	*2.2*
Total Study area	231	*100*

Much of the study area (24%) has low archaeological potential. The majority of the study area (73%) has no archaeological potential. A little less than 4% of the study area is considered to have moderate or high archaeological sensitivity.

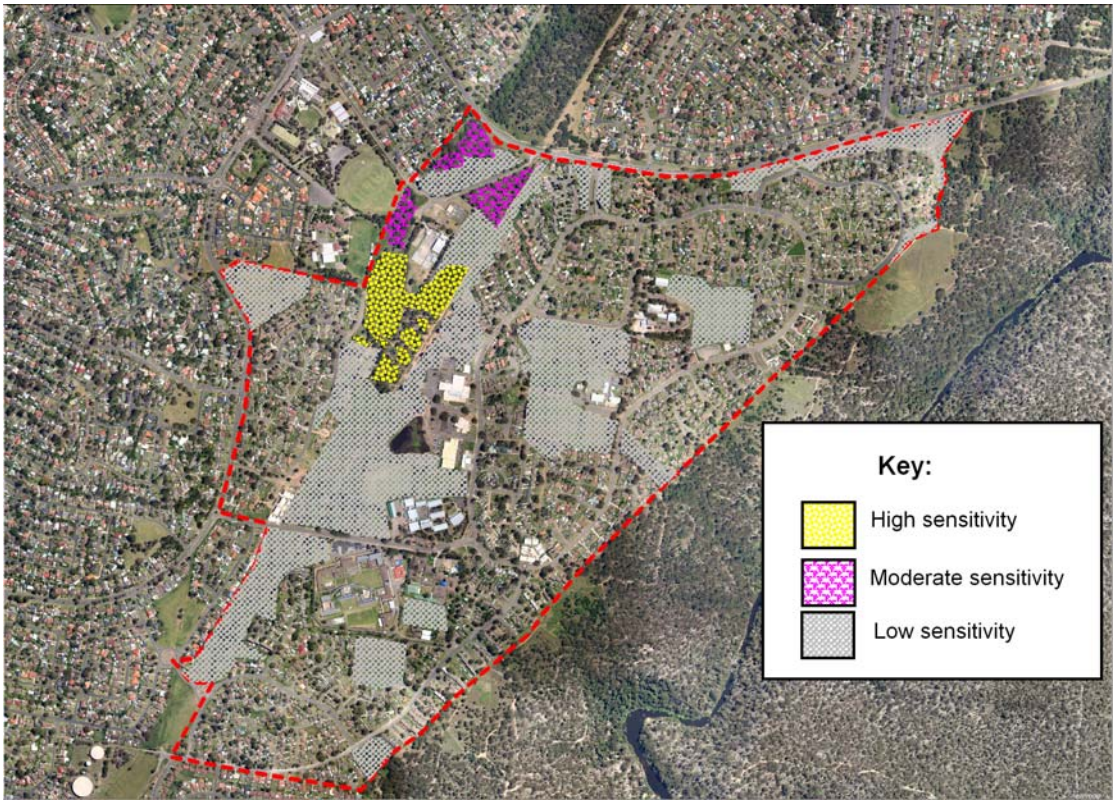

Figure 4: Airds Bradbury: Ground-truthed sensitivity zones. NB the uncoloured majority of the study area is assessed as having no archaeological sensitivity.

5. FIELD SURVEY

5.1 Survey Methodology

The study area was surveyed by the study team and Aboriginal representatives (see *Chapter 3*) on 16 March 2011. The linear pedestrian survey aimed to assess those portions of the study area with moderate and high sensitivity (Figure 4). In addition, all zones with an assessed moderate level of disturbance (Figure 2) were also inspected. A few other zones that, although disturbed, had some potential (albeit low) for containing Aboriginal objects, were also inspected.

An inspection of soil exposures and zones with low vegetation that contained any tracks and paths was made. All mature trees were inspected for the presence of Aboriginal cultural scars.

When heritage sites were identified they were recorded by the survey team for content and GPS location, and digitally photographed. Notes were made of soil conditions, evidence of disturbance and possible extent of sites.

5.2 Survey Results

Survey Units

A total of six separate survey units were inspected (Figure 5). Four of these survey units were within the Smiths Creek Bypass corridor, and they are distinguished mostly by their land use impact history and previous levels of disturbance. A summary of their characteristics is provided in Table 5.

Table 5: Survey units assessed within the study area

Survey Units	Description
A	Located in the northwest of the study area, this survey unit comprises sloping creek flats adjacent to Smiths Creek. The landform is covered by remnant vegetation, albeit with some zones that have been stripped and now contain regrowth. Soils across this survey unit were observed along tracks and eroded margins adjacent to the creek: there was only average visibility and exposure. Generally the soils were eroding downslope. A number of disturbances were observed. These included alterations to the creek corridor, historic sandstone quarrying, and recent urban infrastructure development. The central portion of this landform was assessed as highly disturbed and thus possesses a low archaeological sensitivity. However, not all parts of this survey unit have

Survey Units	Description
	been impacted to the same degree, and their proximity to Smiths Creek suggests that they have a moderate potential for Aboriginal stone artefact sites to be present within the less disturbed buried contexts.
B	Located in the centre to northwest of the study area, this survey unit can be described as sloping creek flats adjacent to Smiths Creek. These creek flats rise away from the creek to form localised high points (e.g. where the shops and bus depot are now located). The creek flat landform was covered by remnant Cumberland Plain woodland that is in good condition. This woodland retained an understorey with extensive leaf litter, which prevented an inspection of all soil profiles across the majority of its extent. However, a series of tracks cross the landform have been highly eroded to the underlying clays and bedrock, providing excellent exposure and 100% visibility within their margins. An inspection of soil profiles indicated that an eroding A1, A2 duplex soil profile was present, with a depth of ~200mm, before the basal B clay commenced. This profile confirms the good potential of this survey unit to contain intact archaeological deposit. Two Aboriginal sites were identified within this survey unit (see below). It was assessed that there is a high potential for further Aboriginal objects to be present within a buried context, with at least one focus (i.e. where surface Aboriginal objects were recorded.
C	Located on the centre-mid western boundary of the study area, this gently sloping landform is covered by some small stands of mature vegetation but shows high levels of apparent previous ground disturbance. The area is crossed by a series of small tracks and paths that provided good visibility and exposure. The remainder of the area has a dense grass cover that prevented an inspection of soil profiles; parts of this had been subject to a recent grass fire, which improved the ground surface visibility. Soils profiles, where visible, were generally thin (~100mm) and eroding down slope. The area has been disturbed through the installation of the transmission line and a subsurface service corridor. No Aboriginal objects/sites were identified within this survey unit. It was assessed that there is a low potential for such sites to be present in good condition within a buried context.
D	Located in the southwest of the study area, this survey unit contained a creek slope either side of Smiths Creek. The survey unit has been significantly modified through channelisation for urban development, with bunding creating a small (recent) wetland area. Also visible was a service corridor for stormwater and sewerage. The creek slope landform had been stripped of all original vegetation and consisted of new regrowth. Soil profiles on the margins of the creek were visible through an eroded track, which provided evidence for shallow (~100mm) top soils (A horizon). No Aboriginal objects/sites were identified within this survey unit. It was assessed that there is a low potential for such sites in good condition to be present within a buried context due to the high disturbance levels.

Survey Units	Description
E	Located on the middle eastern boundary of the study area, abutting the steeply sloping landforms adjacent to the Georges River. This survey unit slopes to the east and contains mature trees, with a severely stripped and mown understorey. Exposure and visibility across this landform were both good, with shallow (<100mm) eroded soils revealing the underlying clay and bedrock. No Aboriginal objects/sites were identified within this survey unit. It was assessed that there is a low potential for such sites to be present in good condition within a buried context.
F	Located in the southeast of the study area, in an area of regrowth bushland, adjacent to an ephemeral creek, this survey unit was a shallow sloping hillslope around a tributary headwater creek. The survey unit has been modified by the installation of a culvert in the creek and by sewer mains installation. The heavily mown grass cover below semi-mature trees, provided good visibility and exposure of the eroding, thin (50–100mm) soil. Bedrock was observed in several places across the creek slope; some of this may have been imported to the location, or have resulted from disturbance within the area. No Aboriginal objects/sites were identified within this disturbed survey unit. It was assessed that there is a low potential for such sites to be present in good condition within a buried context.

Figure 5: Survey unit inspected within the study area

Social/Cultural

The following statement is presented without prejudice and describes the opinions expressed by the attending representatives on the day of the field survey. The Aboriginal community's stated views and opinions on the draft Concept Plan and results of our survey will be provided in Appendix B of the final report.

During the field survey possible social and cultural heritage values were discussed with Tharawal LALC and Cubbitch Barta Aboriginal representatives. It is understood that prior community consultation, undertaken by Landcom project staff, also involved consultation with alternative local Aboriginal community members.

The results of the consultation during the field survey did not identify any areas of traditional cultural significance associated with the study area (such as ceremonial or Aboriginal places). However the archaeological sites, located within survey unit B (as a whole), were identified by the Aboriginal community as having conservation potential and values. The Aboriginal stakeholders expressed an opinion that the Aboriginal sites identified were regionally rare and that few areas of Aboriginal heritage conservation existed regionally. The artefacts observed were identified as important objects, as they signified use of this landscape by their ancestors. The Aboriginal stakeholders present stated that Aboriginal archaeological conservation areas should be incorporated into a development so that future generations can appreciate their heritage sites.

The Aboriginal stakeholders expressed the opinion that they would like to see survey unit B designated as a conservation zone. At the time of field survey, the Aboriginal stakeholders indicated that they would not be happy with some of the potential impacts posed by the draft Masterplan's design options (e.g. the more easterly and northerly playing fields) in survey unit B.

In addition, a number of mature trees, located within survey unit B, have also been identified by the Aboriginal community (to representatives of Landcom during community consultation) as having Aboriginal cultural values; however, an inspection of these trees did not provide any archaeological evidence for Aboriginal cultural practices or an anthropogenic origin (Plate 1). The identification of these trees, by the

Aboriginal community, within this survey unit provides further Aboriginal social connection to this particular location within the Airds Bradbury study area.

Plate 1: Survey unit B: Mature tree, which bears no evidence for cultural modification.

Archaeological

Two previously recorded Aboriginal sites (AMBS 2001) were re-located during the field survey. The sites as recorded in 2011 were fundamentally in the same condition as 2001; however, advances in spatial location technology (since 2001) have allowed for more precise positioning of each site. Revised site location details have been lodged with the DECCW AHIMS register. Table 6 summarises these sites.

Table 6: Details of the two recorded Aboriginal sites

Site Name	AHIMS #	Site Type	Location
AIRDs 01	52-2-2150	Scarred Tree	^{2}99449E ^{62}26643N
AIRDs 02	52-2-2151	Stone artefact concentration	^{2}99473E ^{62}26456N

Airds 01: 52-2-2150 Scarred Tree

Airds 01 was a scar resultant of Aboriginal cultural modification to the tree, located on the eastern face of a mature forest red gum tree. The scar is oval in shape, tapering towards a point at the bottom. Whilst the proximity of the scar's base close to ground level suggests that it could have resulted from tree limb rip, the uniformity of the scar's vertical edges, coupled with the uniform depth and even regrowth, suggest that this is a scar of Aboriginal cultural origin. Since original recording in 2001, the scar appears to have shrunk slightly. Its recorded dimensions are a length of 1m, width of 250mm and bark thickness of 75mm.

The scarred tree was located on a gentle creek slope landform, approximately 70m from Smiths Creek. The landform surrounding the tree does not appear to have been impacted by historical disturbances, other than a low level of soil erosion from walking tracks. The scarred tree is associated, in terms of landform and by the continuous intact potential archaeological deposit, with site Airds 02.

Plate 2: Airds 01: Context of scarred tree and detail of scar.

Airds 02: 52-2-2151 Open site—stone artefact concentration

Site Airds 02 is a localised concentration of stone artefacts, all comprising red silcrete. The site is located on a creek slope landform, sloping gently downhill to the west. The site is located approximately 50m east of Smiths Creek, possibly just above the 100 year flood line. The location of the observed artefacts was an undifferentiated landform (i.e. it was not on a raised flat within the creek slope landform) and as such the selection of this location for stone knapping purposes would appear to be unintentional within the wider landscape.

Located within survey unit B, the artefacts from Airds 02 were observed eroding from the intact margins of remnant A horizon soil; some artefacts were embedded in the B clay horizon of a 2m wide walking trail/bike path. On either side of the track this landform does not appear to have been previously impacted by any landuse activities that would have significantly disturbed ground soil conditions; however, it is not possible to determine whether this area has been subject to vegetation removal during the nineteenth/early-twentieth centuries. More apparent areas of vegetation regrowth—and higher levels of ground disturbance—were present closer to the shopping centre, to the east of Airds 02.

Airds 02 comprises ten silcrete Aboriginal objects, all exhibiting some degree of cultural modification (Table 7) . It is assumed that the majority of artefacts were the same as those recorded in 2001. The site was observed to extend over a linear length of 50m, far longer than the 10m observed in 2001, and possibly the result of further erosion to the local soil horizons. It could be assumed that the concentration of artefacts from Airds 02 may be present within soil horizons on either side of the eroded track.

Table 7: Airds 2: Details of artefacts recorded in 2011.

No.	Raw material	Artefact type	Size (mm)	Comment/description
1	Red silcrete	Flake	20*33*10	Located on B clay
2	Red silcrete	Flake with negative scar	38*25*12	Possible retouch and use wear
3	Red glossy silcrete	Flake	20*10*7	Cone split no distal end
4	Red glossy silcrete	Flake	35*30*17	Flawed material with cortex
5	Red glossy silcrete	Flake	-	In situ, not moved
6	Red glossy silcrete	Flake	-	In situ, not moved
7	Red glossy silcrete	Flake	-	In situ, not moved

No.	Raw material	Artefact type	Size (mm)	Comment/description
8	Red glossy silcrete	Flake	-	In situ, not moved
9	Red/beige silcrete	Flake	22*15*6	Heat treated, broken distal end
10	Red silcrete	Flake	28*22*6	Collapsed platform

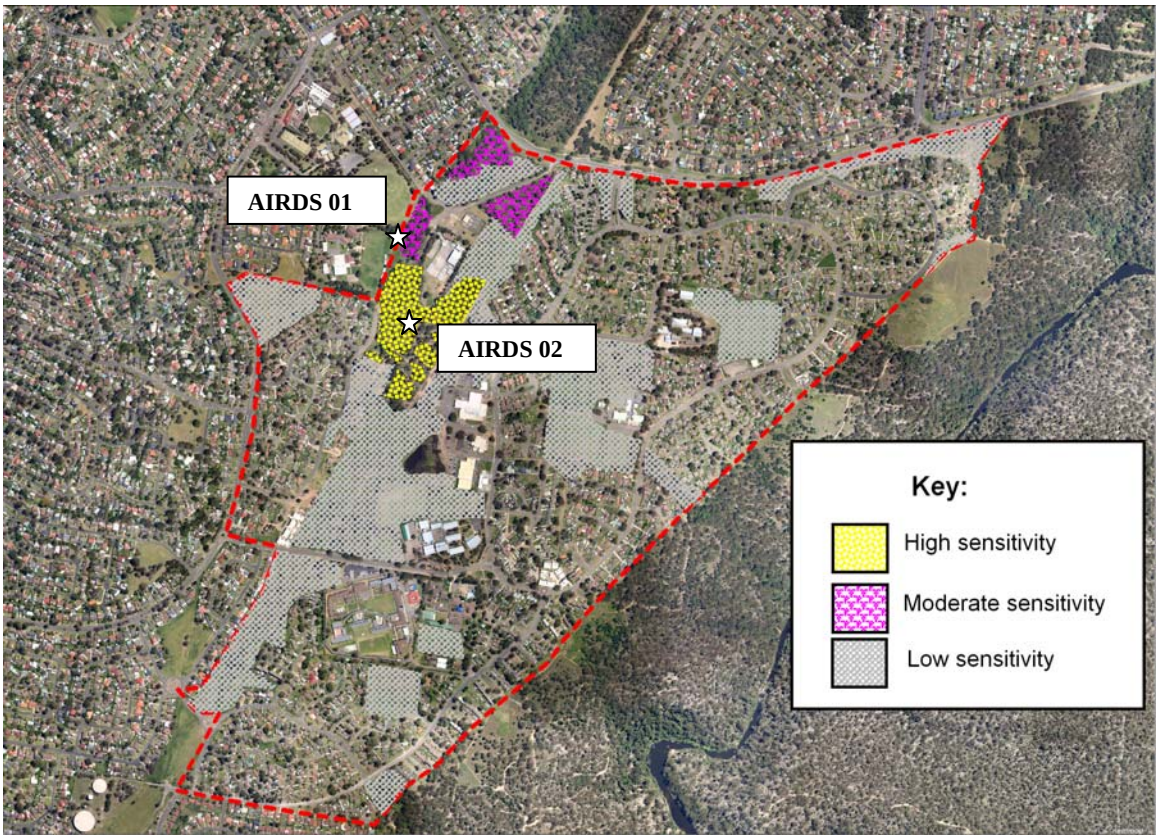

Figure 6: Recorded Aboriginal sites and areas with archaeological sensitivity.

Plate 3: Airds 02, context of the site with Airds shops in the background.

Plate 4: Airds 02, examples of some of the artefacts recorded.

5.3 Discussion of the Survey Results

The study area possesses a mostly erosional landscape pattern of rolling low hills, with a series of low promontories, which present localised views. Environmentally, the study area is dominated by Smiths Creek in the west, and the Georges River immediately outside the study area to the east. Between these two catchments Aboriginal people may have undertaken a complete range of social and economic activities. However, evidence for such practices has only been recorded through the presence of two Aboriginal sites (a scarred tree and a small stone artefact site).

Smiths Creek can be described as one of a number of regionally similar creeks, all of which (eventually) drain into the Georges River. As such its local prominence was unlikely to be significant and it does not appear to provide a local or regional focus for specific Aboriginal activities which might have created an archaeological signature.

As already noted, the study area is positioned immediately to the west of the deeply incised Hawkesbury sandstone country. The pattern of recorded Aboriginal sites indicates that the Hawkesbury sandstone region contains a different archaeological resource (one which is focussed in rockshelter sites—although open sites have also been recorded), and as such may have been considered and used in a very different manner to the adjacent rolling hills by a Holocene period Aboriginal population. The proximity of the study area to the recorded linguistic boundary (between the Tharawal and inland Darug) means that the study area may have been used as a transition or staging area in which, on occasions, people waited prior to entering or leaving the Hawkesbury area.

It is likely that the study area would originally have contained a great deal more evidence for pre-European Aboriginal occupation and use. However, the extent of urban development and landscaping has destroyed the majority of such evidence. Thus the zones allocated here with high and moderate sensitivity (Figure 6) represent the only places that do, and are likely to, contain such intact archaeological evidence.

5.4 Significance Assessment

Cultural Significance

This usually refers to the importance of a site or feature to the local Aboriginal community. Certain sites, items and landscapes may have traditional significance or contemporary importance to the community. This importance may involve both traditional links with specific areas, as well as an overall concern by Indigenous people for continued protection of their sites in general. Cultural significance must be assessed by the relevant Aboriginal community—in this case Tharawal LALC and Cubbitch Barta (as well as the other registered stakeholders for the South West Growth Centres).

Reports describing the field inspection of the study area and the assessed cultural significance from the various Aboriginal groups will be included in Appendix B (see above).

Scientific Significance

One of the aims of cultural heritage management is to preserve a representative sample of the archaeological resource for the benefit of future scientific researchers, the Aboriginal community and the general public. Assessment of scientific significance involves placing a site or heritage item within a broader regional framework, as well as assessing the site's individual merits in light of current archaeological discourse. This usually includes an assessment of a site's potential to answer current archaeological research questions. Assessment is also based on the condition (integrity), content, and representativeness of a site, for example is it representative of a certain site type? Is it a rare or exceptional example? Can it contribute information that no other site can?

On the basis of the field inspection of the study area and the intactness/integrity of archaeological deposits in surrounding areas, three portions of the study area may contain significant intact archaeological deposit. These parts of the study area therefore may have ***high scientific significance***.

The majority of the study area, however, is already highly disturbed, and therefore has low to no archaeological significance.

Public Significance

This usually refers to a site's ability to educate the general public about Aboriginal culture, but can have a broader definition. Increasing public awareness and understanding about a site's Indigenous and scientific values may spare other sites from inadvertent or intentional destruction. Educating the public to appreciate the past may increase the chances of archaeological resources surviving into the future.

Public significance may also include the different community values placed on a site or heritage place. These may include its importance to local residents or the wider community: e.g. aesthetic values, recreational values, links with local European history and local identity.

Development in the Airds Bradbury area has significantly modified the nature of the environs. This, combined with the low visibility of the archaeological evidence here, mean that most of the study area has been assessed as having ***low public significance***. The scarred tree is a more visible site type and therefore has a moderate level of public significance.

6. PROPOSED MASTERPLAN

The sensitivity mapping was overlain with the Concept Plan, Figure 7. This reveals that there are two locations of potential conflict between high sensitivity areas and likely development impacts:

- An area at the south of the remnant bushland, where there are proposed playing fields (survey unit B). This is also the location of site Airds 02.
- In an area in the northeast of the bushland where there are proposed houses (survey unit A).

These two locations will require further negotiations between the Aboriginal community and Landcom; and an application of the strategic management approach to landscapes of archaeological sensitivity.

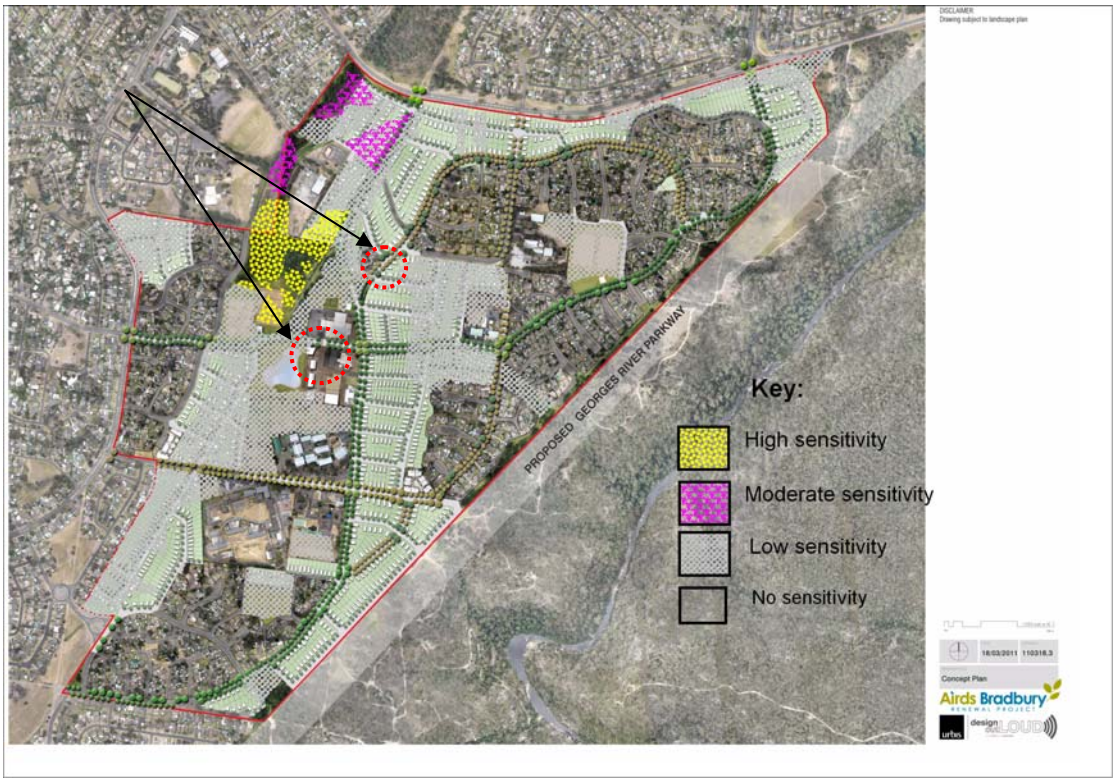

Figure 7: Concept Plan for Airds Bradbury overlain with sensitivity mapping: the two areas requiring further discussion are arrowed.

7. ECOLOGICALLY SUSTAINABLE DEVELOPMENT (ESD)

7.1 Preamble to ESD

An objective of the *National Parks and Wildlife Act 1974* (NSW) (NPW Act) is the "*conservation of objects places and features … of cultural value within the landscape, including … places, objects and features of significance to Aboriginal people …*" (s.2A(1(b)(i)).

The publication—*Operational Policy: Protecting Aboriginal Cultural Heritage* (DECCW 2009)—provides guidance to proponents in term of ESD. The following discussion provides an overview of ESD and its application to the current project.

Avoiding or Reducing Impact to Aboriginal Sites

> *DECC needs to balance the sometimes competing tensions between development activities and environment protection when we make decisions. Although the NPW Act gives a high level of protection to known Aboriginal objects [and since the NPW Amendment Regulation 2010 all unknown Aboriginal sites], recent court decisions have reinforced that Part 6 gives the Director General (DG) express powers to consent to the damage, destruction or defacement of Aboriginal objects by development activities. The powers in Part 6 are not inconsistent with the objects of the Act or a requirement to give effect to ESD.* (DECC 2009: Section 3.8)

The DECCW has three policies that provide guidance with respect to avoiding or reducing impact to Aboriginal sites:

> *Policy 20*
>
> *Impacts to significant Aboriginal objects and places should always be avoided wherever possible. We [the DECC] will promote the development (or amendment) of proposals to avoid impacts and therefore avoid the need for s.90 AHIPs.*
>
> *Policy 21*
>
> *Where impacts to Aboriginal objects and places cannot be avoided, we will require the proponent or AHIP applicant to develop (or amend) proposals so as to reduce the extent and severity of impacts to significant Aboriginal objects and places through the*

use of reasonable and feasible measures. Any measures proposed should be negotiated between the proponent or AHIP applicant and the Aboriginal community.

Policy 22

Once all avoidance, minimisation and mitigation options have been adequately explored, we may also consider the appropriateness of any proposed actions having potential Aboriginal cultural heritage benefit. Any actions proposed should be negotiated between the proponent or AHIP applicant and the Aboriginal community.

Principles of Ecologically Sustainable Development

Ecologically Sustainable Development has been defined in s.6 of the *Protection of the Environment Administration Act 1991* (NSW). This requires the integration of *economic* and *environmental* considerations (including cultural heritage) in the decision-making process. In regard to Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle (DECC 2009: 26).

Intergenerational Equity

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity and productivity of the environment for the benefit of future generations.

In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous AHIPs), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.

Information about the integrity, rarity or representativeness of the Aboriginal objects and places proposed to be impacted, and how they illustrate the occupation and use of land by Aboriginal people across the region, will be relevant to the consideration of intergenerational equity and the understanding of the cumulative impacts of a proposal.

Where there is uncertainty, the precautionary principle should also be followed. (DECC 2009:26)

The Precautionary Principle

The precautionary principle states that if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing cost-effective measures to prevent environmental degradation.

In applying the precautionary principle, decisions should be guided by:

- *a careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment*
- *an assessment of the risk-weighted consequences of various options.*

The precautionary principle is relevant to DECC's consideration of potential impacts to Aboriginal cultural heritage where:

- *the proposal involves a risk of serious or irreversible damage to Aboriginal objects or places or to the value of those objects or places, and*
- *there is uncertainty about the Aboriginal cultural heritage values or scientific or archaeological values, including in relation to the integrity, rarity or representativeness of the Aboriginal objects or places proposed to be impacted.*

Where this is the case, a precautionary approach should be taken and all cost-effective measures implemented to prevent or reduce damage to the objects/place. (DECC 2009:26)

With respect to the above DECCW policies (Policy 20–22) and ESD the following sections detail specifications for conservation, potential impact, and possible reductions to impact on the identified Aboriginal sites and values in the current study area.

7.2 Proposed Conservation (Avoidance of imacts) of Heritage Sites

The draft Concept Plan (Figure 7) places the majority of land that is assigned moderate and high archaeological sensitivity within parkland. Aboriginal site Airds 01 is located within this parkland and thus can be conserved within a conservation

area. Aboriginal site Airds 02 is located within an area proposed to accommodate playing fields, thus conservation options for this site, based on the current Concept Plan, appear more limited.

The allocation of conservation areas within the parkland will result in the preservation (and therefore avoidance of impacts) of known Aboriginal heritage sites and the largest areas of lands which have been assessed as having the best potential for intact subsurface Aboriginal archaeological deposits.

7.3 Proposed Impacts to Heritage Sites

The proposed Concept Plan indicates that portions of Zones 1 and 2 (with high and moderate sensitivity) would be impacted by playing fields and residential development. The larger majority of Zone 1, however, can be preserved within the proposed parkland.

Impact from the placement of the proposed playing fields would occur to the recorded location of Aboriginal site Airds 02, the stone artefact concentration, and its connected area of high archaeological sensitivity PAD. The draft Concept Plan locates these facilities here because of space considerations and social reasons associated with limiting the extent of woodlands adjacent to the public shopping areas (Wayne Coleman, Landcom, pers. comm.).

7.4 Proposed Reduction of Impacts to Heritage Sites

Of primary consideration are the proposed impacts to the recorded Aboriginal site Airds 02 and the area identified as having high archaeological potential. Discussions with Landcom have indicated that the playing fields could be moved from their current proposed location. The following options are available to reduce the potential impacts to Aboriginal heritage arising from the Concept Plan:

- Changes to the current design placement of playing fields at the location of Aboriginal site Airds 02 and associated zone of archaeological sensitivity.

- Protection of the Airds 2 site/PAD below a capping of introduced soil and turf This measure would need to be carefully managed so as to avoid impacts to

the existing upper surfaces of known Aboriginal site—and the site would be effectively sealed into the future and not available for visitation.

- Archaeological salvage of the surface site and sensitive area as mitigation against the loss of this site because of development impacts. This would provide a representative sample of the sorts of archaeological evidence which will be preserved within the parkland.

7.5 Potential Effects arising from Proposed Impacts

Portions of Zones 1 and 2 with moderate and high archaeological sensitivity will be affected by various aspects of the proposed Concept Plan (Figure 7).

Should it not be possible to avoid impacts on Aboriginal site Airds 02 and the Zone with high archaeological sensitivity, the effect of these impacts would be to remove the only known surface stone artefact site from the Airds suburb.

7.6 Summary of Sites, Conservation, Impacts and Effects

Table 7.1 provides an overview of the impacts to each of the survey unit (with heritage value) and associated Aboriginal sites identified during this project and whether these impacts will require archaeological mitigation prior to impact.

Table 2 Airds Bradbury sites and sensitivity zones: Aboriginal sites impacted by the Concept Plan.

Survey unit or Site	Scientific significance	Cultural significance	Conserved or impacted	Archaeological mitigation required
Zone 1	High	TBA	Partially impacted	Yes
Zone 2	Moderate	TBA	Partially impacted	Possibly
Airds 01	High	TBA	Conserved	No
Airds 02	High	TBA	Impacted	Yes

7.7 Cumulative Impact to Aboriginal Heritage

At the local level (within 5km of the study area) there has been little prior archaeological work undertaken: a consequence of development occurring here prior to Aboriginal heritage regulations in the 1970s. The absence of formal survey has resulted in a lack of registered Aboriginal AHIMS sites. The original urban

development at Airds has resulted in the removal of the majority of evidence relating to Aboriginal occupation of this area, outside of open areas. As such, the existing open spaces in the study area, in particular the northern parts of the Smiths Creek Bypass corridor, appear to contain the only likely residual evidence for Aboriginal habitation.

At the regional level a considerable amount of Aboriginal heritage work has recently been undertaken on the Cumberland Plain. The most useful work has been archaeological excavations, triggered by recent urban development projects. Whilst this work has furthered Aboriginal archaeological knowledge, the cumulative impact to Aboriginal heritage in the region is considerable—with a consequent dwindling of the archaeological resource. To the east of the study area, Defence's Holsworthy Range has resulted in the holistic conservation and protection of hundreds of Aboriginal sites. However, these sites are different in nature and context to that contained within the study area. Further, this military range is not accessible to the public.

When considering the level of regional impact to Aboriginal sites, the relative absence of evidence of Aboriginal occupation in Airds, the small area of high archaeological sensitivity remaining (4.98 ha)—coupled with the precautionary principle and the potential for intergenerational equity—a case can be made for the conservation of Zone 1 and the two recorded archaeological features during the redevelopment of Airds Bradbury.

8. MANAGEMENT STRATEGY FOR ABORIGINAL HERITAGE

The following management and mitigation statements are based on consideration of:

- legal requirements under the terms of the NPW Act, as amended—which states that it is illegal to harm or desecrate an Aboriginal object without first obtaining an AHIP from the Director-General, DECCW (now OEH), NSW;
- abiding by the new DECCW Code of Practice, which was adopted by the *National Parks and Wildlife Regulation 2009* (NPW Regulation) made under the NPW Act, and which came into force on 1 October 2010;
- recognition of the provisions made under Part 3a of the EP&A Act; and in accordance with the Director General's Requirements in relation to this Major Project;
- this assessment of the Aboriginal cultural heritage values in the Airds Bradbury Renewal Project area;
- the interests of Tharawal Local Aboriginal Land Council, Cubbitch Barta and other Aboriginal community members in the Airds Bradbury area;
- the size of the study area, the size of the remaining areas with archaeological sensitivity and likely impacts posed by the Concept Plan; and
- the concept planning stage of this development.

8.1 Management Principles

The following general management principles apply for sites and landscapes with Aboriginal heritage values within the study area. These principles are predicated on the assessment of archaeological sensitivity based on previous levels of land-use disturbance.

- Sites and/or landscapes with high archaeological sensitivity or Aboriginal significance (particularly in threatened landscape) should be identified as worthy of conservation, and development impacts on these should be avoided.
- Sites and/or landscapes with moderate archaeological sensitivity or Aboriginal significance (particularly in threatened landscape) should be avoided if possible by development proposals. If impacts are unavoidable then these features should be subject to further investigation to ensure that information is retrieved prior to their destruction. Selection of salvage areas should be made on the basis of a 'whole of development' approach and be landscape based.

- Sites and/or landscapes of low or no archaeological sensitivity or Aboriginal significance do not require planning consideration or further archaeological investigation in relation to the proposed development.
- The majority of the study area has high levels of previous subsurface disturbance and has been assessed as being either Zone 3 or Zone 4 (Figure 4 and Table 4). These zonings do not require further archaeological consideration.

8.2 Strategy—Site Avoidance/Conservation

An Indigenous heritage conservation strategy should be applied to the Airds Bradbury Renewal Project area based on the results of this investigation. This strategy should identify a meaningful conservation outcome, which incorporates a representative set of landscapes with high archaeological potential (Zone 1—Figure 4) and lands identified as having cultural significance. There is likely to be a significant overlap with ecological considerations and a Conservation Zone, based on lands with these combined values, should be defined.

Land that falls outside the resultant Conservation Zone should be considered to be 'developable' land. The developable lands should be managed on the basis of the sensitivity mapping and the defined management principles.

8.3 Strategy—Future Heritage Management

Once a conservation zone has been identified, an Aboriginal Heritage Management Plan (AHMP) will be required to ensure the ongoing survival of high Aboriginal cultural and archaeological values. The Department of Planning and Infrastructure and Landcom would be responsible for the selection of the conservation zone and the orchestration of its ongoing management. The selection process and ongoing management should involve the Aboriginal community and regulators, to ensure a meaningful outcome.

8.4 Strategy—Community Consultation

All future Aboriginal heritage and archaeological work associated with the study area should involve the registered Aboriginal stakeholders. At the current time one copy (each) of this report should be sent to:

Ms Robyn Straub
Chairperson,
Tharawal Local Aboriginal Land Council
PO Box 20
Buxton 2571.

Ms Glenda Chalker
Cubbitch Barta Aboriginal Corporation
55 Nightingale Road
PHEASANTS NEST NSW 2574

8.5 Strategy—Archaeological Excavation

One identified archaeological surface feature occurs within the Airds Bradbury study area (Airds 02). This site is connected to a landscape which has a high level of archaeological sensitivity (Zone 1—Figure 4 and 6). This zone should ideally be conserved. If conservation cannot be achieved then archaeological subsurface investigation (testing and salvage) should be undertaken.

There will also be a range of impacts within developable land on landscapes which have moderate archaeological sensitivity (Zone 2—Figure 4 and 6). A sample of these should be selected for subsurface investigation (testing and possibly salvage) as mitigation against their destruction, if they cannot be conserved.

Areas and/or landscapes within Zone 3 have low archaeological potential and those within Zone 4 have no archaeological potential. These should be considered as developable and without archaeological constraint. There is no requirement for further investigation in these areas.

All Aboriginal heritage sites should be managed on the basis of their individual and collective assessed significance and/or potential, in accordance with a POM (see above). When the planning process is sufficiently advanced that defined impacts can be determined, the appropriate management outcomes for landscapes and identified sites within the Renewal Project should be defined.

Once the conservation area has been agreed upon, development impacts finalised and locations chosen for salvage, an AHIP will not be required from DECCW (under Part 3a) but signoff from the DG of the Aboriginal Management Plan should be sought.

8.6 Summary of Recommendations

The outcomes of the Aboriginal heritage considerations for the Airds Bradbury Renewal Project are that the project area contains:

- two registered Aboriginal heritage sites (Figure 6);
- one landscape with high archaeological sensitivity (Figure 5 and 6); and
- one landscape with moderate archaeological sensitivity (Figure 5 and 6).

The landscape with high archaeological sensitivity and the site Airds 02 can be considered locally rare, as a consequence of extensive urban development.

With respect to Aboriginal heritage and its ongoing management this report recommends:

- development of an Aboriginal Heritage Management Plan ;
- if possible, conservation of the landscape with high archaeological sensitivity and the sites Airds 01 and 02;
- that if such conservation of this area in its entirety is not possible, then archaeological subsurface testing of this landscape to recover a scientifically assessable assemblage of archaeological material will be necessary;
- archaeological subsurface testing of representative landscapes with moderate archaeological sensitivity; and
- ongoing consultation and involvement of the registered local Aboriginal stakeholders.

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