



Plate 4 A view of Rose Hill in 1791 showing the Crescent, with the farm buildings on the left on the opposite side of the river (Source: Kass et al. 1996, originally Dixson Galleries, SLNSW).



Figure 11 Excerpt from Johnstone's 1836 map, which shows no detail of anything within the Study Area (Source: SR Map 4799).



Figure 12 Sketch map of 1857 showing the racecourse north of the river opposite Government House (Source: Surveyor-General, Sketchbook 7 f 169, SRNSW).



Figure 13 Enlargement of map of 1858 showing racecourse north of the river opposite Government House (Source: SR Map 4807)



Figure 14 Georeferenced excerpt of Surveyor Edward Ebsworth's 1887 survey map showing the sports facilities in Parramatta Park north of the river (Source: Ms.80.3000 (originally Ms.80.Sy), LPI). Approximate location of Study Area marked in red.



Figure 15 Georeferenced 1930 aerial photograph of Study Area and environs (Source: NSW Department of Lands)



Figure 16 Georeferenced 1951 aerial photograph of Study Area and environs (Source: NSW Department of Lands)

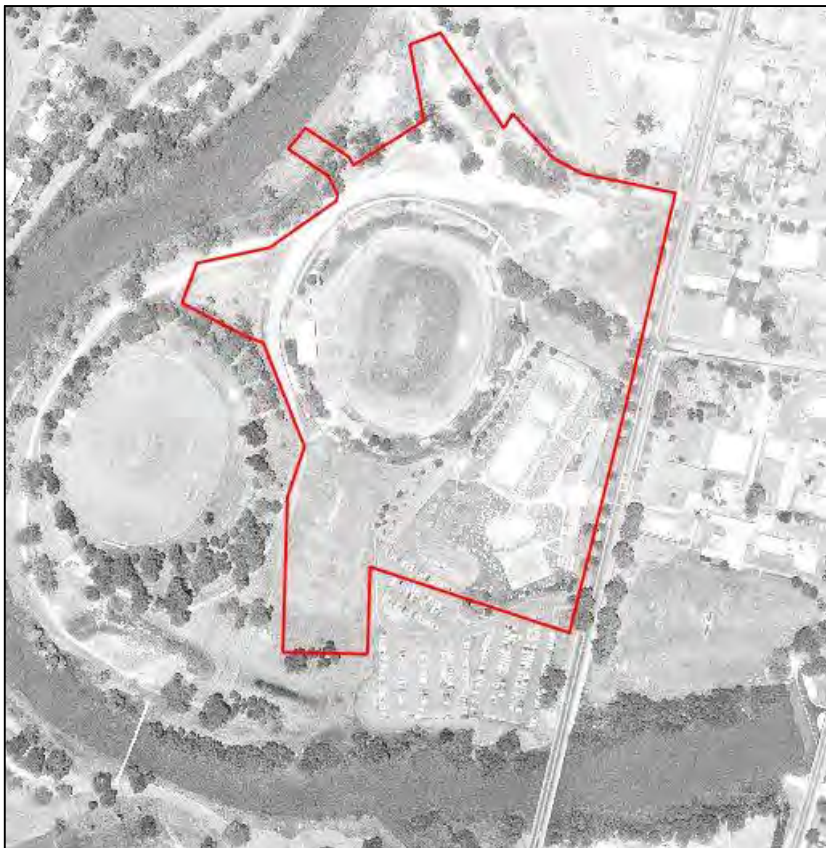


Figure 17 Georeferenced 1976 aerial photograph of Study Area and environs (Source: NSW Department of Lands)

4.7 Land Disturbance

Existing data indicate that the integrity of land within the Study Area has been affected by a range of historical land use activities, with key activities including:

- Native vegetation removal;
- Early colonial cultivation activities;
- The establishment and use of a racecourse across the Study Area and adjoining Old Kings Oval;
- The construction (and subsequent destruction/demolition) of Cumberland Oval and its ancillary facilities;
- The construction of the Parramatta Swimming Centre; and
- The construction of Parramatta Stadium and its ancillary facilities.

To varying degrees, all of the above-cited land use activities are relevant to the survival, integrity and identification of Aboriginal archaeological evidence within the Study Area. As a general observation, it can be confidently assumed that ground surface impacts associated with historical land use activities within the Study Area will have destroyed or severely disturbed a proportion of the Aboriginal archaeological record of the site, with the most severe impacts occurring as a result of heavy earthworks associated with the construction of the current stadium complex and adjoining swimming centre. Artefact-bearing portions of the PSS in the area of the current playing field, for example, which was lowered up to 4 m as part of the Cumberland Oval redevelopment, are likely to have been totally removed. Similarly, any artefact-bearing deposits that once existed in the areas now occupied by the Parramatta Swimming Centre's various swimming pools are likely to have been removed or severely truncated as a result of the installation of these pools. Nonetheless, as suggested by the findings of several previous Aboriginal archaeological investigations of the PSS within the Parramatta CBD (e.g., Austral Archaeology 2007; Comber 2010a, 2010b; Jo McDonald CHM 2005b, 2005c, 2006b), ground surface impacts outside of areas subject to major subsurface disturbance(s) are unlikely to have removed completely any artefact-bearing deposits that once existed in these areas. In common with some other archaeologically-investigated sections of the PSS within the Parramatta CBD (e.g., Jo McDonald CHM 2005b, 2005c), extant, near-surface (~1.5 m below original ground surface) PSS sediments within the Study Area are considered to retain high potential for Aboriginal archaeological materials, albeit of variable integrity and composition.

4.8 Key Observations

Key observations to be drawn from a review of the landscape context of the Study Area are as follows:

- While the natural topography of the Study Area has been significantly altered by the construction of the current stadium complex and adjoining swimming centre, historical and contemporary reference materials indicate that the majority of the Study Area formerly comprised part of an extensive left bank river terrace whose constituent sediments have been identified as a standalone stratigraphic unit known variously as the "Parramatta Sand Sheet" (PSS), "Parramatta Sand", "Parramatta Sand Body" and "Parramatta Terrace Sand" (Jo McDonald CHM 2005c; Mitchell 2008).
- First identified as a soil landscape unit in 2002, the PSS is present along both sides of the Parramatta River, with the bulk of the sand body forming a levee on the river's right bank and extending from Church Street in the west to Arthur Street in the east and south from the river to around Macquarie Street in the west and Oak Street in the east (Mitchell 2008, 2010a). Previous geomorphological assessments of the PSS indicate a well-developed but locally variable soil profile, with intra-unit variability tied to local drainage conditions and variation in the internal composition of the river's terraces (Mitchell 2008: 12-15).
- Available radiometric dates support a Late Pleistocene antiquity for the deposition of the upper portion of the PSS (Mitchell 2010a: 3; Jo McDonald CHM 2005c), with thermoluminescence (TL) dates from a sealed, archaeologically-sampled section of the PSS at 140 Macquarie Street indicating deposition between c.50 and 58,000 years ago (Mitchell 2010a: 3; see also Mitchell 2010b).
- Previous geotechnical investigations within and immediately surrounding the Study Area confirm the presence, at depth underneath historical fill materials of variable composition and thickness (range: surface to 6m b.g.l), of interbedded alluvial sands and clays (Douglas and Partners 1984, 2002; EIS, 2014a, 2014b; JBS&G, 2015a, 2015b, 2015c, 2016; see also Douglas and Partners 2016). These sediments, which extend to a maximum depth of around 13 m b.g.l (Douglas and Partners 1984) and overlie weathered shale and/or

sandstone bedrock are similar in texture, colour and consistence to those described by Mitchell (2008) for the PSS and considered to form part of this unit.

- In the northwestern portion of the Study Area, under the western car park, JBS&G (2015a) report the presence of at least 0.7 m of “natural” yellow, homogeneous, poorly graded coarse sand, which may - contra Mitchell (2008: 10) - comprise part of a sandy levee on the margin of the terrace plain.
- Existing soil landscape mapping (i.e., Bannerman and Hazelton 2011; Chapman and Murphy 1989), which depicts the majority of land within the Study Area as comprising part of the Birrong (bg) and Blacktown (bt) Soil Landscapes, is inaccurate and in need of revision.
- Consistent with previous assessments of the occupational potential of the terraces bordering the Parramatta River (e.g., Jo McDonald CHM 2005c: 19-20; Mitchell 2008: 16), consideration of the pre- and early-post European settlement landscape of the Study Area suggests that this area would have represented a prime location for Aboriginal occupation over a long period of time. Several contributing factors can be identified:
 - Ready access to a permanent source of freshwater (Parramatta River);
 - Ready access to a range of freshwater and estuarine plant and animal resources, both along and away from the river;
 - Ready access to timber/bark for shelter construction;
 - Soft, well-drained sandy soils for camping; and
 - Local availability of rocks suitable for flaked stone tool manufacture and/or use as grindstones.
- Existing data indicate that the integrity of land within the Study Area has been affected by a range of historical land use activities, with the most severe impacts to natural soil profiles occurring as a result of heavy earthworks associated with the construction of the current stadium complex and adjoining swimming centre;
- Artefact-bearing portions of the PSS in the area of the current playing field, which was lowered up to 4 m as part of the Cumberland Oval redevelopment (Douglas Partners 2016: 1), are likely to have been totally removed. Similarly, any artefact-bearing deposits that once existed in the areas now occupied by the Parramatta Swimming Centre's various in-ground swimming pools are likely to have been removed or severely truncated as a result of the installation of these pools.
- Near-surface (~1.5 m below original ground surface) PSS sediments outside of areas subject to major subsurface disturbance(s) are considered to retain high potential for Aboriginal archaeological materials, albeit of variable integrity and composition. Those portions of the Study Area assessed as having potential to retain such deposits have been demarcated as areas high Aboriginal archaeological sensitivity on **Figure 23**.

5.0 Archaeological Context

5.1 Introduction

This section describes the archaeological context of the Study Area on a regional and local scale. Archaeological data of relevance to the current assessment are reviewed as a basis for developing, in conjunction with the landscape data and ethnohistoric information reviewed in **Sections 4.0 and 5.6** respectively, a series of predictions regarding the Aboriginal archaeological record of the Study Area.

5.2 The Sydney Region

Available archaeological data indicate that Aboriginal people have occupied the Sydney region⁸ for at least 36,000 years (Jo McDonald CHM 2005b; Williams *et al.* 2014). Late Pleistocene/early Holocene occupation of the region is evidenced by radiometric dates from both coastal and hinterland sites (see Attenbrow, 2010:18, Table 3.1). Excavated material culture assemblages from these periods have been interpreted as evidence of relatively small populations of Aboriginal people employing settlement patterns of high residential and low logistical mobility (Attenbrow 2010:152-154; McDonald 2008: 39). Late Pleistocene/early Holocene chipped stone assemblages attest to a preference for silicified tuff sourced from secondary geological sources such as the Hawkesbury-Nepean River gravels (McDonald 2008; Williams *et al.* 2014). However, they also indicate the exploitation of other raw material types such as silcrete, quartzite, petrified wood and quartz. Direct freehand percussion appears to have been the dominant reduction technique employed by Late Pleistocene/early Holocene Aboriginals knappers, with bipolar flaking comparatively poorly represented in available assemblages. Retouched 'tools' include unifacially-flaked pebble implements, dentated saws, burins and a variety of scrapers, with unmodified utilised flakes also well represented (Kohen *et al.* 1984; Williams *et al.* 2014). Stone tools such as these will have been complemented by a range of organic implements such as wooden digging sticks, spears and boomerangs. However, these do not survive archaeologically (Attenbrow 2010:154).

Compared with the late Pleistocene/early Holocene, archaeological evidence for mid-to-late Holocene Aboriginal occupation of the Sydney Region abounds (for recent syntheses see Attenbrow 2010; McDonald 2008). In keeping with broader Australian developments (e.g., Allen and O'Connell 1995; Beaton 1985; Brumm and Moore 2005; Attenbrow *et al.* 2009; Lourandos 1983, 1997; Lourandos and Ross 1994), the social and economic systems of Aboriginal groups living in the region during this period appear to have become increasingly complex. Available archaeological data, for example, suggest a significant increase in site establishment and population densities over time, as well as a concomitant growth in the size and complexity of social aggregation (but see Attenbrow (2012) and Hiscock (2008) for cautionary notes on the interpretive significance of radiometric date graphs). Growing economic specialisation is indicated by the emergence and/or proliferation of complex fishing and stoneworking technologies, with the latter linked variously to increased foraging risk associated with greater climatic variability as well as other variables such as redefinition of social space, reduction of resources and increased logistical pre-equipping (Attenbrow *et al.* 2009; McDonald 2008: 40). Complex, long-distance exchange networks are also attested archaeologically (e.g., Attenbrow *et al.* 2012; Grave *et al.* 2012) as are important developments in artistic activities (McDonald 2008). Higher levels of stylistic heterogeneity in pigment and engraved art across the region, for example, have been linked to increasing territoriality (McDonald 2008: 42).

With some modification, McCarthy's (1967) *Eastern Regional Sequence* (ERS) of stone artefact assemblages remains the dominant chronological framework for Aboriginal occupation of the region. Based on appreciable changes in the composition of chipped stone artefact assemblages over time, the ERS hypothesises a three phase sequence of 'Capertian' (earliest), 'Bondaian' and 'Eloueran' (most recent) assemblages and was developed on the basis of McCarthy's (1948, 1964) pioneering analyses of stratified flaked stone assemblages from Lapstone Creek rockshelter, on the lower slopes of the Blue Mountains eastern escarpment, and Capertee 3 rockshelter in the Capertee Valley north of Lithgow. At present, the most widely cited characterisation of the ERS in the Sydney region is that of a four-phase sequence beginning with the *Pre-Bondaian* (McCarthy's *Capertian*) and moving successively through the Early, Middle and Late phases of the *Bondaian*, the last of which equates to McCarthy's (1967) *Eloueran* phase. The tripartite division of the Bondaian is based principally on the presence/absence and relative abundance of backed artefacts (Attenbrow 2010: 101). However, other factors, such as changes in the abundance of bipolar artefacts and different stone materials, as well as the presence/absence of edge-ground hatchet-heads are also relevant.

⁸ Following Attenbrow (2012a), the land bounded by the coast on the east, by the Hawkesbury-Nepean River on the north and west, and by a line running east-west through Picton and Stanwell Park in the south.

Table 5 McCarthy's (1967) Eastern Regional Sequence (ESR) of stone artefact assemblages

Current phasing	McCarthy's (1967) Phasing	Approximate date range	Backed artefact frequency	Bipolar artefacts	Edge-ground hatchet heads
Pre-Bondaian	Capertian	40,000-8,000 BP	Absent	Rare	Absent
Early Bondaian	Bondaian	8,000-4,000 BP	Very low	Rare	Absent
Middle Bondaian		4,000-1,000 BP	Very high	Increasingly common	Present
Late Bondaian	Eloueran	1,000 BP to European contact	Low	Very common	Present

5.3 The Port Jackson Archaeological Project

The Port Jackson Archaeological Project (PJAP) was initiated by Val Attenbrow (Senior Fellow, Australian Museum) as a vehicle for investigating pre-colonial Aboriginal land and resource use patterns in the Port Jackson catchment (Attenbrow 1990, 1991, 1992a, 1992b, 1994). Still ongoing, the Project has generated a substantial body of data concerning pre-contact Aboriginal occupation of the catchment and remains one of the comprehensive sources of data on Aboriginal archaeological site distribution within it. Alongside desktop analyses of AHIMS and privately-held site data, the PJAP has involved the relocation and re-recording of numerous previously identified (but poorly described) sites as well as targeted survey in parts of the catchment with few, if any, sites. Archaeological excavations have also been undertaken at several sites (e.g., Attenbrow *et al.* 2008; Attenbrow 1992a), with analysis of recovered cultural materials completed for some sites but not others. Of particular interest here are the results of Attenbrow's (1990, 1991) analysis of the distribution of then known shell middens and open archaeological deposits within the catchment (n = 369, with 335 middens and 34 open deposits respectively), with eight sub-catchments recognised on the basis of major rivers and creeks and further subdivided into freshwater, estuarine and ocean zones (**Figure 18**).

Key patterns to emerge from Attenbrow's analysis were as follows:

- Shell middens occur only in sub-catchments with estuarine and/or ocean zones. Shell is present in freshwater zone sites but in quantities insufficient for their classification as middens (**Table 7**);
- Archaeological deposits tend to occur in freshwater zones (**Table 7**);
- The majority of sites are located in areas underlain by Hawkesbury sandstone, with comparatively few sites located in areas underlain by Wianamatta Shale;
- Most sites occur within council reserves or on undeveloped Crown Land;
- Middens and deposits occur in higher densities in sub-catchments that include estuary mouths;
- Most middens and deposits occur in rockshelters as opposed to 'open' contexts; and
- Most middens and deposits occur on landform elements within 10 m of high water level (i.e., in foreshore zones); and
- Ridgetops and ridge-side sites are comparatively poorly represented.

The distributional patterning revealed by Attenbrow's (1991) analysis can be interpreted in a number of ways. Taken at face value, site distribution patterns suggest an occupational emphasis on coastal/estuarine environments and the Hawkesbury Sandstone, with hinterland/freshwater environments and areas underlain by Wianamatta shales less intensively utilised. Greater numbers of people living in these areas can also be inferred. However, as Attenbrow (2010: 51) has cautioned, equating larger numbers of sites with increased activity and/or populations without taking into consideration the size and contents of these sites, as well as the effects of natural and anthropogenic processes is, at best, problematic. Variations in the numbers and densities of Aboriginal sites between aquatic zones and geological formations must be interpreted with due reference to such variables. Key issues for the Port Jackson catchment include marked differences in levels of archaeological site visibility and preservation potential between areas, variable urban and industrial development pressures and archaeological sampling bias (Attenbrow 2010: 52). Whilst recognising the distributional biases introduced by such variables, reference to the results of large scale surveys in comparatively undisturbed estuarine areas to the north of the Hawkesbury River (e.g., Vinnicombe 1980) suggest that the general trends in site distribution revealed by the PJAP may, at least in part, reflect the original distribution of these sites (i.e., more sites and deposits along shores

compared with slopes and very few sites on ridgetops). As Attenbrow (2010: 53) has suggested, it seems reasonable to conclude that “many activities, including those relating to tool-making which probably happened at base campsites, took place close to the estuarine and freshwater waterways as well as the marine shorelines” .

Table 6 Port Jackson catchment: number of shell middens and archaeological deposits in each sub-catchment (after Attenbrow 2010: 51, Table 5.1)

Sub-catchment	Area (km ²)	Aquatic zone(s)	No. of middens	No. of arch. deposits	Density (no./sq km)
1. Middle Harbour	92.5	F; Est; O	171	7	1.9
2. Lane Cove River	96.5	F; Est	86	9	0.98
3. Vineyard Creek	41	F; Est	36	2	0.92
4. Darling Mills Creek	32.5	F	0	10	0.3
5. Upper Parramatta River*	71	F	0	3	0.04
6. Duck River	81	F; Est	0	3	0.04
7. Concord to Sydney Harbour Bridge	50	F; Est	20	0	0.4
8. Sydney Harbour Bridge to South Head	20.5	F; Est; O	22	0	1.1
Total	485	-	335	34	-

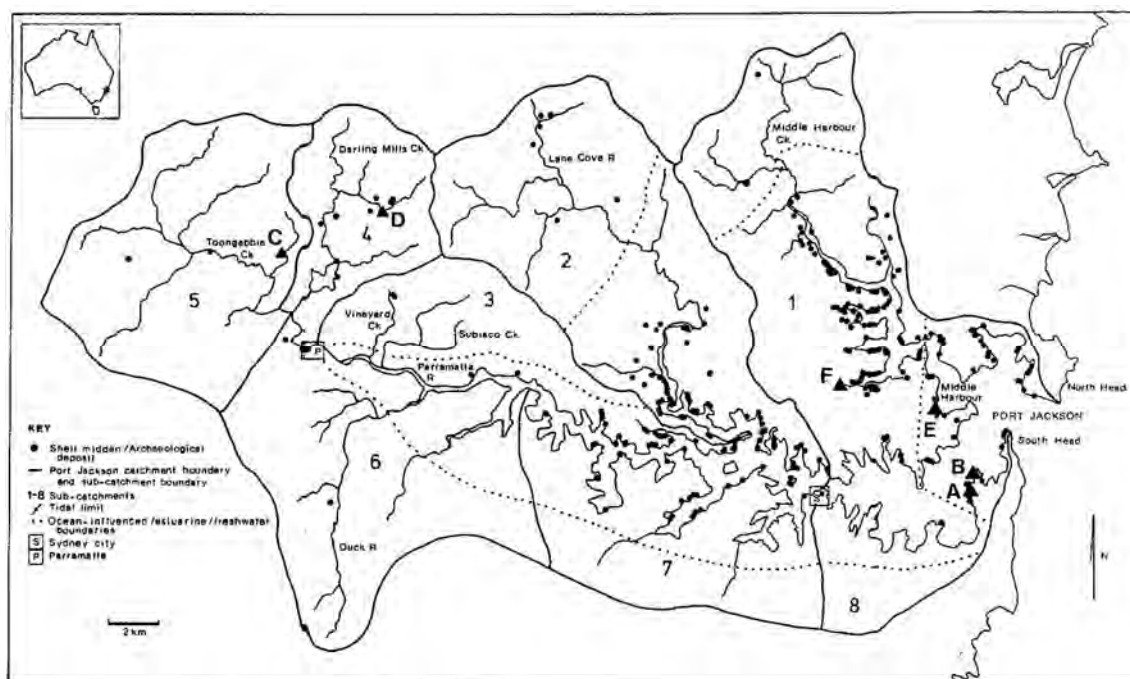


Figure 18 Map of the Port Jackson catchment showing Attenbrow's (1991) sub-catchments and zones, previously recorded shell middens and archaeological deposits (as at 1994) and the location of excavated rockshelter sites (A = Mt Trefle; B = Hydrofoil; C = John Curtain Reserve; D = Darling Mills Creek; E = Balmoral Beach; and F = Cammeray) (after Attenbrow 1994: 3, Fig. 1)

5.4 The Cumberland Plain

Concentrated archaeological investigation of the Aboriginal archaeological record of Sydney's Cumberland Plain can be traced to the early-to-mid 1980s, a period marked by a rapid growth in residential and other forms of development across the Plain. Intensive development activities since this time have secured the Cumberland Plain's place as one of the most intensively investigated archaeological regions in Australia, with hundreds, if not thousands, of Aboriginal archaeological investigations involving survey and/or excavation having now been undertaken, the majority as part of larger Environmental Impact Assessments associated with residential

development and affiliated infrastructure projects. Unsurprisingly, these investigations have varied significantly in scale and scope, ranging from targeted small-scale surveys to complex, multi-phase survey and excavation projects over large areas. Nonetheless, together, they have revealed a rich and diverse record of past Aboriginal occupation, with thousands of Aboriginal archaeological sites registered on OEH's Aboriginal Heritage Information Management System (AHIMS) database. To date, useful syntheses of this record have been compiled by Attenbrow (2010), Jo McDonald CHM (1997b), McDonald (2008) and Przywolnik (2007). Key investigation themes are detailed in brief in the sections below.

5.4.1 Open Artefact Sites: Distribution, Contents and Definition

Surface and subsurface distributions of stone artefacts, variously referred to as open artefact sites, open sites and open camp sites are the most common and widely distributed form of Aboriginal archaeological site on the Cumberland Plain (see Attenbrow 2010: Plate 12; Przywolnik 2007: 46., Table 4.2). Other site types, such as scarred trees, quarries, grinding grooves and rock shelters with deposit and/or art or PAD, have also been identified but are comparatively rare. Accordingly, open artefact sites remain the most intensively investigated component of the Aboriginal archaeological record of the Cumberland Plain, with site distribution and the technology of associated flaked stone artefact assemblages, in particular, comprising key research topics (e.g., AMBS 2000; Craib *et al.* 1999; Jo McDonald CHM 2001, 2003, 2005a, 2006a, 2006b, 2006c, 2007, 2009a, 2009b; Kohen 1986; White & McDonald 2010).

Existing archaeological survey data for the Cumberland Plain indicate a strong trend for the presence of open artefact sites along watercourses, specifically, on creek banks and 'flats' (i.e., flood/drainage plains), terraces and bordering lower slopes. Although this distribution pattern can be attributed in part to geomorphic dynamics and archaeological sampling bias, with extensive fluvial erosion activity along watercourses resulting in higher levels of surface visibility and, by extension, concentrated survey effort, an occupational emphasis on watercourses is supported by the results of numerous subsurface investigations (e.g., AECOM 2013b, 2015; AMBS 2000; Craib *et al.* 1999; GML 2012; Jo McDonald CHM 2001, 2003, 2005a, 2006a, 2006b, 2007, 2009a, 2009b). Collectively, these investigations have demonstrated that assemblage size and complexity tend to vary significantly in relation to stream order and landform, with larger, more complex⁹ assemblages concentrated on elevated, low gradient landform elements adjacent to higher order watercourses. Outside of these contexts, surface and subsurface artefact distributions have typically been found to be sparse and discontinuous and are often referred to as 'background scatter', being "artefactual material which is insufficient in number or in association with other material to suggest focussed activity in a particular location" (Douglas and McDonald 1993).

Flaked stone artefacts dominate archaeological finds assemblages from recorded open artefact sites on the Cumberland Plain, with heat shattered rock also well represented. Items such as complete and broken grindstones, hammerstones and edge-ground hatchet heads have also been recorded though comparatively infrequently. With the notable exception of 'knapping floors', a relatively common component of the Aboriginal archaeological record of the Cumberland Plain, associated archaeological features (e.g., hearths and heat treatment pits) have likewise proven elusive (but see AHMS 2013; McDonald and Rich 1994; Jo McDonald CHM 2009a for examples). Investigated knapping floors across the Plain have varied considerably in size and complexity, with the largest and most complex examples identified through excavation as opposed to surface survey (e.g., Jo McDonald CHM 2001, 2005a, 2006b, 2007). Backed artefacts (i.e., Bondi points, geometric microliths and elouera) are a common feature of knapping floors and most of these features were likely specifically associated with their production. As in other NSW contexts, most notably the Hunter Valley (e.g., Hiscock 1993; Moore 2000), available evidence supports the suggestion that backed artefact manufacture on the Cumberland Plain was a highly structured or systematic activity.

Although relevant to a variety of site types, geomorphic processes such as soil erosion and colluvial/fluvial aggradation are of particular relevance to the identification and definition of open artefact sites. As in other archaeological contexts (e.g., Dean-Jones & Mitchell 1993; Fanning & Holdaway 2004; Fanning *et al.* 2009; Holdaway *et al.* 2000), it is now widely accepted by archaeologists working on the Cumberland Plain that the visibility of open artefact sites across the Plain can, for the most part, be attributed to contemporary and historical geomorphic processes which have variously exposed and obscured them. As demonstrated by numerous large scale salvage projects across the Cumberland Plain, surface artefacts invariably represent only a fraction of the total number of artefacts present within recorded surface open artefact sites, with a typical surface to subsurface artefact ratio of 1:25 proposed (Jo McDonald CHM 2005b: 35). Artefact exposure, unsurprisingly, is highest on

⁹ Those containing a wider variety of raw materials and technological types and/or higher mean artefact densities and features such as knapping floors.

erosional surfaces and lowest on depositional ones. At the same time, in many areas, surface artefacts have been shown through dispersed testing to form part of more-or-less continuous subsurface distributions of artefacts, albeit with highly variable artefact densities linked to environmental variables such as distance to water, stream order and landform (e.g., White & McDonald 2010). Critically, the presence or absence of surface artefacts on the Cumberland Plain is not a reliable indicator of Aboriginal archaeological sensitivity.

5.4.2 Flaked Stone Artefact Technology

Virtually indestructible, flaked stone artefacts are a ubiquitous element of the Aboriginal archaeological record of the Cumberland Plain and have assumed a prominent position in archaeological reconstructions of past Aboriginal land use across the region. To date, hundreds, if not thousands, of surface-collected and excavated flaked stone assemblages from across the Cumberland Plain have been analysed, with individual assemblage sizes, research questions, aims, analytical methodologies and terminological schemes varying significantly between researchers and projects. Studies to date have ranged from basic descriptive accounts of assemblage composition in typological terms to detailed reconstructions of past stone reduction and quarrying behaviours through rigorous technological analyses. Particularly informative analyses in the context of the Cumberland Plain include those conducted by Jo McDonald CHM (2001, 2003, 2005a, 2006a, 2006b, 2006c, 2007, 2009a, 2009b) as part of archaeological salvage projects associated with development activities within the Rouse Hill Development Area (RHDA), the former Australian Defence Industries (ADI) site at St Marys and the Colebee Release Area (CRA). Technological analyses of stone artefact assemblages recovered from fluvial sand bodies adjacent to the Parramatta (Jo McDonald CHM, 2005b, 2005c, 2006b) and Hawkesbury Rivers (AHMS 2013; Williams *et al.* 2012) have likewise proven highly informative, particularly with respect to the documentation of diachronic changes in raw material use and stone artefact technologies.

Available technological and typological data for surface collected and excavated flaked stone artefact assemblages from the Cumberland Plain suggest that the majority of these assemblages belong to what is known as the 'Australian small-tool tradition', a term coined by Gould (1969) to describe what was then thought to be the first appearance, in the mid-Holocene¹⁰, of a new suite of flaked stone tool forms in the Aboriginal archaeological record of Australia, including backed artefacts, adzes and points (both unifacially and bifacially flaked). Complex, hierarchically-organised reduction sequences associated with the production of these tools contrast markedly with the simple sequences of earlier periods (Moore 2011). Tools of the Australian small-tool tradition, it has been suggested, formed part of a portable, standardised and multifunctional tool kit aimed specifically at risk reduction (Hiscock 1994, 2002, 2006). Stone artefact assemblages from late Pleistocene and early Holocene contexts, in contrast, are described by archaeologists as belonging to the 'Australian core tool and scraper tradition', a term first used by Bowler *et al.* (1970) to describe the Pleistocene assemblages recovered from Lake Mungo in western New South Wales. Bowler *et al.* (1970) saw the main components of these assemblages - core tools, steep-edged scrapers and flat scrapers - as characteristic of early Australian Aboriginal assemblages and as being of a distinctly different character to those associated with the preceding small-tool tradition. In southeastern Australia, including the Cumberland Plain, the Australian 'small-tool' and 'core tool and scraper' traditions are most commonly described in terms of McCarthy's (1967) ERS, with 'Capertian' assemblages assigned to the latter tradition and 'Bondaian' assemblages, the former.

Flaked stone artefact assemblages from excavated and surface collected open artefact sites on the Cumberland Plain attest to the exploitation of a diverse range of lithic raw materials (Corkill 1999, 2005). However, two rock types - silcrete and silicified tuff (also known as indurated mudstone) - dominate the region's existing stone artefact record. Other, less commonly exploited raw materials represented in excavated and surface collected assemblages include quartz, quartzite, petrified wood, chert and various fine-grained volcanics. Alongside silcrete and silicified tuff, these materials occur variously in a number of geological formations and units across the Cumberland Plain (for a detailed review see Corkill 1999). Oft-cited sources, for example, include the Tertiary St Marys (Ts) and Rickabys Creek Gravel (Tr) formations, as well as the various unconsolidated Pleistocene units that line as terraces the present day and abandoned channels of the Nepean-Hawkesbury River (e.g., Agnes Bank Sand (Qpa) and Cranebrook Formation (Qpc)).

In common with the Sydney region as a whole (Attenbrow 2010:120-121), various excavated assemblages from the body and peripheries of the Cumberland Plain (e.g., Jo McDonald CHM 2001a, 2005a; Williams *et al.* 2012; Williams *et al.* 2014) attest to a shift, over time, in the relative significance of particular raw materials for flaked stone artefact manufacture, principally silcrete and silicified tuff but also quartz. An 'early' (i.e., Pre-Bondaian)

¹⁰ More recent research into the chronology of backed artefacts and points in Australia (e.g., Hiscock & Attenbrow 1998, 2004; Hiscock 1993b) has demonstrated a long history of production and use for these implement types, with both types now known to have been produced, albeit in small numbers, in the early Holocene and likely in the late Pleistocene as well.

emphasis on the procurement and reduction of silicified tuff, for example, appears to have given way to a 'later' (i.e., Bondaian) emphasis on silcrete. Quartz use, meanwhile, appears to have peaked in the late Holocene. For the Cumberland Plain, these changes have been linked, in particular, to broader changes in settlement organisation, with a decline in levels of residential mobility over time prompting more intensive use of locally available stone (Jo McDonald CHM 2005a).

In the northwestern portion of the Cumberland Plain, the Tertiary St Marys Formation has been singled out as a particularly important source of silcrete for stone artefact manufacture. Mapped at various localities across the Mulgoa Creek, South Creek and Eastern Creek catchments, the best known and most intensively investigated outcrops of this formation occur on Plumpton Ridge, a low but prominent ridgeline separating the floodplains of Eastern and Bells Creek between the suburbs of Plumpton and Riverstone. The subject of numerous archaeological investigations since the early-1980s (e.g., AMBS 2002b; Baker 1996; McDonald 1986), recent large-scale archaeological salvage works across what is now Stonecutters Ridge Golf Club have unequivocally identified Plumpton Ridge as a major Aboriginal quarry site (Jo McDonald CHM 2006c). At the same time, they have highlighted a number of important trends in relation to the procurement and reduction of silcrete obtained from this source. Trends in the relative frequencies of raw material types, artefact types and the size of silcrete artefacts in local excavated assemblages, for example, have been attributed to a process of 'distance-decay'. As one of only three systematically investigated Aboriginal quarry sites on the Cumberland Plain, the other two being the ADI-EPI and ADI-FF22 sites within the former ADI site at St Marys (Jo McDonald CHM 2006a, 2008a), Plumpton Ridge is widely regarded as a feature of high scientific and cultural significance.

Backed artefacts dominate the retouched components of the majority of dated and undated Bondaian assemblages from the Plain and, as such, the technology of their manufacture has received considerable analytical and interpretive attention. Studies by Jo McDonald CHM (2001, 2003, 2005a, 2006a, 2006b, 2007, 2009a, 2009b), in particular, have demonstrated that backed artefact manufacture on the Cumberland Plain was a highly structured or systematic activity involving a complex system of raw material procurement, transportation, preparation and reduction. Differences in the technological character of recovered cores across the region attest to a significant degree of variability in the methods used by Aboriginal knappers to produce flakes for backed artefact manufacture. However, certain techniques (e.g., asymmetric alternating flaking and Hiscock's (1993) 'tranchet technique') are particularly well represented. Evidence for the deliberate heat treatment of silcrete blanks, both as part of systematic backed artefact manufacture activities and other reduction activities, is abundant and widespread, with excavated and surface collected assemblages attesting to the use of heat at various points in the reduction process. As in other contexts (e.g., Hiscock 1993), the thermal alteration of Cumberland Plain silcrete appears to have significantly improved the flaking quality of the stone, increasing the lustre and smoothness of fracture surfaces.

5.4.3 Chronology of Occupation

In common with the Sydney region as a whole, evidence for late Pleistocene/early Holocene (i.e., Pre-Bondaian/Early Bondaian) Aboriginal occupation of the Cumberland Plain is relatively sparse, with potential and confirmed evidence from these periods obtained from only twelve sites / landscapes: Rouse Hill sites RH/CC2 (Jo McDonald CHM 2001), RH/SC5 (Jo McDonald CHM 2002b), RH/CD12 (Jo McDonald CHM 2002a) and RHCD7 (Jo McDonald CHM 2007); Richmond site RMI (Jo McDonald CHM 1997a); SA23 in the Colebee Release Area (Jo McDonald CHM 2006b); PT12 near Pitt Town (Williams *et al.* 2012; Williams *et al.* 2014); Jamisons Creek, Emu Plains (Kohen *et al.* 1984); Power Street Bridge 2, Doonside (McDonald 1993), Regentville RS1, Regentville (Koettig & Hughes 1995; McDonald *et al.* 1996), the Parramatta CBD (AHMS 2013; Austral Archaeology, 2007; Jo McDonald CHM, 2005b, 2005c, 2006b) and the Windsor Museum site (Austral Archaeology 2011; Williams *et al.* 2012; Williams *et al.* 2014). Claims of a c.40 ka year old date for five 'flaked pebbles' recovered from a gravel pit associated with the Cranebrook Terrace near Penrith (Nanson *et al.* 1987) have been widely questioned, with legitimate concerns raised over the artefactual status of these pebbles, their provenance and association with available dates. For most sites, late Pleistocene/early Holocene occupation has been inferred on the basis of the technological and typological characteristics of recovered flaked stone artefact assemblages as opposed to radiometric dates.

At present, the oldest securely dated archaeological site on the Cumberland Plain is the PT12 site at Pitt Town, with compliance-based archaeological excavations across a source-bordering dune at this site, which overlooks the Hawkesbury River, producing a suite of OSL dates suggestive of Aboriginal occupation from at least 36,000 years ago (and potentially earlier) (Williams *et al.* 2012; Williams *et al.* 2014). Closer to the coast, Late Pleistocene/early Holocene occupation of a sandy fluvial terrace adjacent to the Parramatta River (i.e., the Parramatta Sand Sheet) has been proposed by Jo McDonald CHM (2005b, 2005c, 2006b) and seems likely on the basis of available radiometric dates and assemblage characteristics.

In stark contrast to the late Pleistocene/early Holocene, evidence for mid-to-late Holocene (i.e., Middle to Late Bondaian) Aboriginal occupation of the Cumberland Plain abounds, with numerous excavated sites producing assemblages that can be confidently assigned to these periods on the basis of radiometric dates and/or their typological/technological profiles. Available radiometric dates indicate a steady increase in the number of sites occupied over the course of the Holocene, with a peak in the 2nd millennium BP (see, for example, Przywolnik 2007: 53, Fig. 4.6). Taken at face value, these data suggest a progressive increase in the Aboriginal population of the Cumberland Plain over the course of the Holocene. However, as argued by Hiscock (2008), albeit on a national scale, it seems likely that the directional population growth suggested by such data is, to a certain extent at least, a product of differential site preservation, with younger sites better preserved than older ones. Other factors, such as the burial of older sites through sediment deposition and bias in the location of archaeological surveys and excavations, may also be relevant.

Critical to any discussion concerning the antiquity of Aboriginal occupation across the Cumberland Plain are the well-documented difficulties surrounding the dating of open artefact sites with active 'biomantles' (*sensu* Paton et al. 1995; see Dean-Jones & Mitchell, 1993; Balek 2002; Hofman 1986; Johnson et al. 2005; Johnson 1989; Paton et al. 1995; Peacock & Fant 2002; Stein 1983). On the Cumberland Plain, the term biomantle is typically used as a collective descriptor for the 'A' soil horizons of the Plain's dominant texture contrast or duplex soil profiles¹¹, which tend to be relatively thin (<30 cm), and exhibit extensive evidence of bioturbation in the form of roots, open/infilled burrows, live insects and/or earthworms and stone lines¹². However, it is noted that the uppermost portions of underlying 'B' soil horizons can also exhibit such evidence and form part of the biomantle (e.g., AECOM 2015). As highlighted by Dean-Jones & Mitchell (1993) and others (e.g., Balek 2002; Johnson 1989), excavated finds assemblages from archaeological sites with active biomantles are subject to a range of interpretive constraints, with intact depositional stratigraphy unlikely to be preserved and inset archaeological features (e.g., hearths and heat treatment pits) representing the only reliable means of dating (with any specificity) intercepted archaeological events (Mitchell 2009: 4). Any stone artefacts discarded at the surface in landscapes with active biomantles are likely, over time, to have been incorporated into the soil profile through bioturbation, with depth of artefact burial ultimately corresponding to the base of major biological activity (i.e., the base of the biomantle). Where biomantles remain relatively undisturbed, patterns of artefact discard may be preserved. However, in heavily disturbed contexts, the preservation of such patterning is unlikely (Mitchell 2009: 4).

For archaeologists working on the Cumberland Plain, the analytical and interpretive constraints posed by intensive bioturbation have, in combination with a real paucity of dateable features, led to a reliance on the dating of excavated archaeological finds assemblages through relative means, specifically, through consideration of the typological and technological composition of associated flaked stone artefact assemblages and reference to a modified version of McCarthy's (1967) ESR, the broad temporal parameters of which are now well established (Table 5). While offering a useful chronological framework within which to assess diachronic changes in the stone artefact technologies and raw material use, the largely undated and palimpsest character of the Plain's lithic record represents a significant analytical and interpretive obstacle for period-specific reconstructions of Aboriginal mobility regimes (cf. Cowan 1999). Well dated assemblages from sites retaining stratified deposit(s) are rare, with the most comprehensively dated sequences to date coming from deep fluvial sand bodies adjacent to the Hawkesbury and Parramatta Rivers (i.e., AHMS 2013; Jo McDonald CHM 2005c; Williams et al. 2012, 2014). While the preservation and dating potential offered by such bodies has been amply demonstrated, the same cannot be said of alluvial valley fill sequences outside of these major river valley contexts, with comparatively little research directed towards investigating the age, genesis or evolution of alluvial valley fill sequences within the Cumberland Plain's numerous creek valleys, nor their potential for preserving at depth (i.e., within buried paleosols) Aboriginal archaeological materials of varying ages, including those of Late Pleistocene/Early Holocene antiquity (but see AHMS 2015; Barham 2005, 2007; Jo McDonald CHM 2005a for notable exceptions). Nonetheless, the limited work that has been conducted in this regard suggests considerable research potential, particularly with respect with the development of chronological frameworks for contextualising and interpreting flaked stone artefact assemblages recovered from such sequences.

5.4.4 Site Distribution and Occupation Models

A number of Aboriginal site distribution and occupations models have been proposed for the Cumberland Plain over the past four decades, with early models (e.g., Kohen 1986; Smith 1989) based almost exclusively on

¹¹ Such profiles are characterised by loamy topsoils¹¹ and silty clay to clay subsoils, with boundaries between these two units typically clear to abrupt. Clayey subsoils have formed by *in situ* weathering of the parent material, while topsoils are derived from a combination of *in situ* weathering and the deposition of colluvially and/or fluvially transported materials.

¹² Stone lines, where present, typically occur at the interface between the A and B horizons.

surface evidence and more recent models (e.g., AMBS 2000; Jo McDonald CHM 1997b) taking into account both surface and excavated evidence. As indicated in **Table 7**, Aboriginal site distribution on the Cumberland Plain has been linked to a variety of environmental factors, with proximity to water, stream order, landform and geology (including proximity to known stone sources) variously highlighted as key determinants.

Table 7 Aboriginal site distribution and occupation models for the Cumberland Plain

Researcher(s)	Year	Summary of model
Dallas and Witter	1983	- Sites closer to silcrete and other raw material sources will tend to contain more cores and waste chips and less utilized material than sites which are located further away. They will also contain more block fractured pieces, a higher frequency of cortex, and the artefacts will generally be larger than those at sites not associated with raw material sources; - In areas of raw material abundance, artefacts will be discarded earlier in the reduction sequence and will generally be larger and occur in a variety of forms; - Raw material abundance, quality and size will influence assemblage variability; and - Sites located away from raw material sources will exhibit a wider variety of activities and a higher number of utilized pieces than those closer to them.
Kohen	1986	- Proximity to water and geological context key determinants for site location; - Sites can be categorized as one of three types according to their function: - camping sites, which have a wide range of activities represented in the archaeological record; - woodworking sites, where there is a high proportion of implements to debitage present; and - hunting sites, which contain a relatively small number of unworked flakes and are sometimes associated with backed blades. - Greatest proportion of sites located on Wianamatta Shale substrates. - Number of artefacts found at a site and site size more closely correlated to the nature and degree of disturbance at a site than any behavioural factors. The more disturbed the site, the greater the visibility and hence the greater quantity of artefacts recorded. - Sites with high artefact densities tend to be found within 100m of permanent water sources.
Smith	1989	- Sites are most likely to occur in association with water sources. Permanency of the water source, however, is not a determining factor for site location, with a significant quantity of sites found along temporary creek lines. - Sites on the Londonderry Clay/Rickabys Creek Formation are likely to be found in association with gravel exposures. - Sites dominated by silcrete are less likely to be found west of Marsden Park and South Creek than east of those areas. Isolated finds in these areas are also less likely to be made from silcrete. - Sites east of South Creek are likely to be principally stone tool and silcrete manufacturing and processing sites. - Sites in the northern Cumberland Plain are expected to have a lower frequency of implements than those in the south. - Woodland areas will typically contain sites at lower densities than open forest areas. - Surface sites appear to be more common than subsurface sites, and undisturbed stratified sites are rare due to the degree of disturbance. - Sites with over 50 artefacts are rare, although very large sites (500+ artefacts) do occur. There is no apparent patterning to the occurrence of these large sites. The pattern of distribution of site size appears to be determined predominantly by visibility. - Sites cannot be divided neatly into 'single use' categories, as most sites were the location of numerous activities.
Jo McDonald CHM	1997b	- Open sites with subsurface archaeological deposits are the most commonly occurring sites. - Sites cannot be adequately characterized on the basis of surface evidence alone. - Where open sites are found in stable and aggrading landscapes, many will be intact and have the potential for internal structural integrity, with sites in alluvium and other depositional environments containing the best potential for intact archaeological remains

Researcher(s)	Year	Summary of model
		and stratification. - Many sites contain extremely high artefact densities, with variability depending on the range of activity areas and site types present. - Artefacts are not evenly distributed across the landscape. Site patterning can be related to gross environmental factors, with sites on permanent water being more complex than those situated on ephemeral or temporary water lines. However, there is not always a direct correlation between site location and the environment - Major confluences, particularly along major creeks, are prime site locations. - Proximity to water and underlying geological units are key factors in site distribution. However, distribution can be further measured according to stream order, with sites located in close proximity to established, permanent, and resource rich drainage channels (e.g., 3rd and 4th order creeks) are more likely to have higher artefact densities and a greater diversity of tools than sites associated with lower order water courses. - Temporary water sources and minor gullies tend to have single-use or occasionally repeated visits and hence lower density sites. - Locations between creeks, such as ridge-tops and spurs, may possibly contain archaeological evidence, which may vary according to proximity to water sources. - Sites in close proximity to an identified stone source will contain a range of size and cortex characteristics in their assemblages. As distance increases from the source, artefact size and percentage of cortex in the assemblage will decrease.
AMBS	2000	- Spatial patterning in chipped stone artefact distributions adjacent to major creek lines can - in certain instances - be accommodated under a three-tiered model of 'Activity Overprint Zones' incorporating 'complex', 'dispersed' and 'sparse' zones. - Complex zones will exhibit overlapping knapping floors and high density concentrations of artefacts indicative of repeated, long-term occupation events. - Dispersed zones may include knapping floors. However, these are typically spatially discrete due to less frequent occupation. - Sparse zones will exhibit consistently low frequencies/densities of artefacts. Artefact discard in these zones is likely to have resulted from discard in the context of use or loss rather than manufacture. - Flaked stone artefact production and maintenance will leave a more obtrusive archaeological signature than resource extraction (e.g., food collection and processing). These activities will also occur closer to the residential core while resource extraction will typically occur away from it.

White and McDonald's (2010) analysis of lithic artefact distribution in the Rouse Hill Development Area (RHDA) provides a suitably robust dataset for assessing the validity of some of the key predictions of the models outlined above. Based on the results of over a decade of intensive test excavation in the RHDA, this study remains the most comprehensive of its type currently available for the Cumberland Plain. As indicated, Aboriginal site distribution on the Cumberland Plain has been linked to a variety of environmental factors, with distance to water, stream order, landform and geology (including proximity to known stone sources) variously highlighted as important influences. White and McDonald's (2010) analysis both supports and negates various aspects of the postulated relationships between these factors and Aboriginal site patterning on the Cumberland Plain. Key findings can be summarised as follows:

- Artefact distributions do not, as implied by the models of Kohen (1986) and Smith (1989), form bounded 'sites' but rather 'landscapes'.
- Artefact distribution does, as variably expressed by AMBS (2000), Kohen (1986), Jo McDonald CHM (1997b) and Smith (1989), appear to vary with proximity to water, albeit to different extents based on stream order.
- Artefact density does, as suggested by Jo McDonald CHM (1997b), appear to vary significantly with stream order.
- Artefact density does, as suggested by Jo McDonald CHM (1997b), appear to vary significantly with landform.

- Aboriginal archaeological sites on the Cumberland Plain cannot, as proposed by Jo McDonald CHM (1997b), be adequately characterized on the basis of surface evidence alone. Most areas, regardless of surface indications, contain subsurface archaeological deposit(s).
- The orientation of open land surfaces appears to have influenced the selection of artefact discard locations in the lower portions of valleys, with generally higher densities on lower slopes facing north and north-east.
- Distance from known silcrete sources does not, on present evidence at least, appear to have influenced intensity of artefact discard (cf. Dallas & Witter 1983).
- Trends in artefact density and distribution indicate long-term, large scale patterns. Short term models of settlement organization are insufficient to account for these artefact distributions; and
- Social and/or symbolic factors may have influenced site selection along with the distributions of economic and other resources.

5.5 Local Archaeological Context

5.5.1 AHIMS Database

The AHIMS database, administered by the NSW Office of Environment and Heritage (OEH), contains records of all Aboriginal objects reported to the Secretary of the Department of Premier and Cabinet in accordance with Section 89A of the *National Parks and Wildlife Act 1974*. It also contains information about Aboriginal places, which have been declared by the Minister to have special significance with respect to Aboriginal culture. Previously recorded Aboriginal objects and declared Aboriginal places are known as 'Aboriginal sites'.

A search of the AHIMS database on 26 May 2016 for a 5 x 5 km area centred on the Study Area (AHIMS search area) returned 84 site entries. As is typical for the Cumberland Plain, open artefact sites with and without other forms of archaeological evidence (i.e., PAD and scarred trees) are the most common site type represented within the AHIMS search area, accounting for 61.9% (n = 52) of known sites. Remaining sites consist principally of areas of Potential Archaeological Deposit (PAD) (n = 25, 29.8%). However, three grinding groove sites, three rockshelters, one scarred tree and one shell midden are also represented.

Centroid coordinates for registered Aboriginal sites within the AHIMS search area place none within or immediately adjacent to the Study Area (**Figure 19**). However, it is noted that Attenbrow's (1994a) map of Aboriginal archaeological sites within Parramatta Park (**Figure 20**), produced as part of an early management study, places scarred tree 45-5-0277 within the Study Area. While listed on AHIMS as a 'valid' site, it is noted that neither Attenbrow (1994a) or Comber (2014) were able to relocate this tree, which appears to have been destroyed sometime between 1981 and 1994, likely as part of the construction of the current stadium.

Table 8 AHIMS Search Results

Site type	Site Feature(s)	Number	%
Open artefact site	Artefact(s) (AFT); Potential Archaeological Deposit (PAD); Scarred Tree (TRE)	51	60.7
Potential Archaeological Deposit (PAD)	PAD; Aboriginal Resource and Gathering (ARG)	25	29.7
Grinding groove(s)	Grinding groove(s) (GDG)	3	3.6
Rockshelter	Art (ART)	3	3.6
Scarred tree	TRE	1	1.2
Shell midden	(SHL); AFT	1	1.2
Total	-	84	100



Figure 20 Georeferenced excerpt of Attenbrow's (1994) location map for then known Aboriginal sites in Parramatta Park. Note presence of scarred tree 45-5-0277 in the northwestern portion of the Study Area, marked as location "1" (modified from Attenbrow, 1994: 5, Fig. 2).

5.5.2 Previous Aboriginal Heritage Investigations - Parramatta CBD and Environs

Existing AHIMS data indicate that a large number of Aboriginal archaeological investigations incorporating survey and/or test/salvage excavation programs have been undertaken within the greater Parramatta CBD area over the last few decades. In common with the Cumberland Plain as a whole (**Section 5.4.1**), existing archaeological data for this area identify the open artefact site as the most common site type, with the majority of previously recorded open artefact sites identified as a result of subsurface archaeological investigations in heavily-developed urban contexts and yielding finds assemblages dominated by, or consisting exclusively, of flaked stone artefacts. Despite 200+ years of European settlement, previous Aboriginal heritage investigations within the Parramatta CBD attest to the widespread survival of Aboriginal archaeological objects and sites in subsurface contexts, albeit with variable integrity depending on the nature and extent of localised historical disturbance activities.

By virtue of its widespread distribution across the Parramatta CBD, and associated development pressures, the PSS and its associated Aboriginal archaeological record has been a topic of particular research interest for archaeologists working in the Parramatta LGA. Previous archaeological investigations of the PSS within the Parramatta CBD have identified this fluvial sand body as a geomorphic feature of high scientific and cultural significance, with subsurface investigations in some contexts (e.g., Jo McDonald CHM 2005b, 2005c, 2006b) intercepting stratified deposits with Late Pleistocene / Early Holocene components. Consistent with broader regional patterning, flaked stone assemblages from these contexts have revealed diachronic changes in raw material use and associated stone artefact technologies, changes linked to the shifting settlement and subsistence patterns of Aboriginal people occupying the Parramatta area from the Late Pleistocene onward. More broadly, the results of previous investigations of the PSS attest to considerable intra-unit variability in the nature of the sand body's archaeological resource, with observed variability explicable in terms of varying levels of historical disturbance, as well as Aboriginal peoples' differential use of the terraces bordering the Parramatta River.

To date, physical investigation of the Aboriginal archaeological record of the current Study Area has been limited to survey, with parts of the site selectively inspected as part of a number of Aboriginal heritage assessments (Attenbrow 1994a; Comber 2014; Cook 1981) and resulting in the identification of a single site - scarred tree 45-5-0277. The results of the most informative of these assessments, as well as several undertaken in the greater Parramatta CBD area (including Parramatta Park), are summarised in **Table 9**.

Table 9 Previous Aboriginal archaeological investigations

Consultant	Year	Project	Investigation type	Location relative to the Study Area	Summary of investigation & results	Reference
V.Attenbrow	1994	Management of Aboriginal sites within Parramatta Park	Survey	Partially within	Preliminary site survey undertaken as part of initial stage (Stage 1) of project relating to the management and interpretation of Aboriginal sites in Parramatta Park. Attempt made to relocate three previously recorded sites within the park: two artefacts scatters (45-5-0762 and 45-5-0864), one of which was associated with two probable scarred trees, and scarred tree 45-5-277, formerly located within the northwestern portion of the current Study Area. With the exception of the two probable scarred trees associated with artefact scatter 45-5-0762, none of these sites could be relocated. Artefact scatter 45-5-0762, located near the Crescent at the top of the low ridge between the Parramatta River and Domain Creek, reported to consist "of a sparse scatter of flaked stone artefacts exposed in areas devoid of grass, about 120 m to the north of the Boer War Memorial" (Attenbrow 1994a: 7). Silcrete noted as the dominant raw material, with two broken Bondi points also originally present. Artefact scatter 45-5-0864, located to the south of 45-5-0762, originally recorded by Guider, reported to contain 13 stone artefacts of silcrete, chert and quartz, as well as fragments of cockle and oyster shell. Locations of several other unregistered sites within park, including one artefact scatter, three isolated artefacts and some scarred trees, also noted.	Attenbrow 1994a
Jo McDonald CHM	2002	Salvage of site CGI, cnr. Charles and George Streets	Salvage	c.900 m southeast	Archaeological salvage program for site CG1, located at the corner of Charles and George Streets in the Parramatta CBD. Site located across right bank levee of the PSS and adjoining backplain. Four "strategies of lithic collection" employed during salvage program: 1) surface collection of artefacts on zero surface level; 2) excavation of 117 1 m² test pits across development site, with test pit locations selected by way of a stratified random sampling design; 3) four 'large-area' salvage excavations centred on test pits with high artefact yields; and 4) mechanical excavation and sieving of eight sample areas covering 250 square metres. Observed soil profile characterised as a gradational red earth, with original A₁ horizon (0 to 25/30 cm) found to be missing or totally disturbed. Total of 6,763 artefacts recovered from site, with more than 680 manuports also retrieved. More than half of the assemblage (62%) recovered from 0-20 cm depth, with maximum reported depth of 60-100 cm. Observed artefact densities characterised as "low-to-moderate", with an average overall density of 24 artefacts / m². Five hand-excavated squares yielded >100 artefacts, with the maximum number being 393. Excavators concluded that the majority of site's most recent occupation evidence had been lost as a result of recent and historical land disturbance. Silcrete and silicified co-dominant raw materials in recovered stone artefact assemblage, with analysis of vertical distribution of artefacts showing silcrete dominant in upper 20 cm of deposit and silicified	Jo McDonald CHM 2005b

Consultant	Year	Project	Investigation type	Location relative to the Study Area	Summary of investigation & results	Reference
					tuff dominant below this depth. Lower, silicified tuff dominant assemblage assessed as being of early Holocene (at least 6-10 ka) antiquity. Rare finds included stone hatchet heads, hammerstones, anvils, grindstone fragments and cobble chopping tools. Perforated shark tooth (interpreted as a hair ornament) also recovered from fill of historic well. Several 'living floors', including artefacts and hearth arrangements, identified in Salvage Area B.	
L.Haglund	2004	Redevelopment of Parramatta Children's Court Site	Test excavation	c.250 m southeast	Test excavation program across the Parramatta Children's Court Site. Total area of 45.75 m ² excavated in the form of isolated 1m ² pits and trench 'complexes' of variable size. Stone artefacts recovered from all trench complexes and all but one 1m ² pit, with excavations advanced to a maximum depth of 60 cm below zero surface level (range: 30-60 cm). Haglund (2004: 9) reports that the majority of artefacts occurred within "a broad, central, north-south belt" and that there "were sufficient items [in this belt] to suggest that areas of focused activity relating to artefact manufacture and use were once present". Reference to Haglund's (2004:11-12, Table A) summary results table suggests that artefacts were recovered up to 50 cm below zero surface level (Haglund 2004: 11-12, Table A), with Haglund (2004:9) concluding that recovered artefacts had likely "moved downward from a now lost surface that has been churned over, removed, built on and generally disturbed from early colonial times onward" Haglund (2004: 13) does not provide a detailed breakdown of the recovered lithic assemblage but notes that is consisted principally "of tiny debitage from artefact manufacture and fragments of broken or discarded flakes". Formal tools, Haglund (2004: 13) reports, "were few and mostly broken". Raw materials listed in summary results table include silcrete, quartz, basalt and chert. Results interpreted as a reflection of either low intensity Aboriginal use or the loss of much of the artefact-bearing deposit through natural events and/or historical land disturbance activities (Haglund 2004: 13).	Haglund 2004
Jo McDonald CHM	2004	Civic Place Development	Test excavation	c.700 m southeast	Test excavation program undertaken across Civic Place development site in conjunction with historical (European) archaeological investigation. Fourteen 1m ² test pits hand-excavated within six larger, mechanically-excavated trenches. Evidence of historical fill materials / features overlying and/or protruding into artefact-bearing Aboriginal deposits identified in all tested areas. Fills present to a maximum depth of c.80 cm (Trench 5). Only one trench contained a profile with identifiable A ₁ and A ₂ horizons (Trench 1). Probable alluvial deposits noted in two trenches (Trenches 5 and 6). Stone artefacts identified in all six mechanical trenches, with majority (n = 10, 71%) of hand excavated pits yielding artefacts. Very low average overall density of 2.6 artefacts / m ² . Total of 37 stone artefacts recovered. Silcrete dominant raw material overall, accounting for 37.8% of the assemblage (n = 14). Other materials included silicified tuff (n = 9, 24.3%), chert (n = 8, 21.6%), quartz (n = 4, 10.8%), quartzite (n = 1, 2.7%) and FGS (n = 1, 2.7%). Assemblage dominated by flake debitage items, with formed objects limited to single	Jo McDonald CHM 2004b

Consultant	Year	Project	Investigation type	Location relative to the Study Area	Summary of investigation & results	Reference
					chert core and three minimally-retouched flakes.	
Jo McDonald CHM	2004	Civic Place Development - Aboriginal site 'SSP1'	Test excavation	c.900 m southeast	Two phase test excavation program undertaken across a c.80 x 40 m developments site bounded by Darcy Street (to the south), Smith Street (to the east), Civic Place Lane (to the north) and Union Street (to the south) (Aboriginal site 'SSP1'). Phase 1 testing involved 29 random 1 m² test pits, with a further 50 1 m² pits excavated in Phase 2 as a single open area excavation (Area A). Site located on low broad spur approximately 300 m from Clay Cliff Creek and 500 m from the Parramatta River. Excavators estimated that 40-50% of the artefact-bearing A horizon deposit across the site, which generally extended to a depth of between 15-20 cm, remained undisturbed, with the southern half of the site (fronting Darcy Street) assessed as the most intact. Areas outside of Area A were assessed as exhibiting poor integrity. Total of 198 lithic items recovered during the test excavation program, with test pit data indicating a sparse and discontinuous scatter across the site (mean density = 2 artefacts / m², max. density = 25 artefacts / m²). Increased artefact density in Area A (mean density = 3 artefacts / m², max. density = 26 artefacts / m²) attributed to the interception of a quartz knapping floor. Quartz dominant raw material overall, accounting for 59.6% of the assemblage by count. Remaining raw materials included silcrete (n = 54, 27.3%), silicified tuff (n = 25, 12.6%) and silicified wood (n = 1, 0.5%). Formed objects limited to seven cores, five of which were quartz bipolar cores. Results considered consistent with "transient, non-residential" occupation (Jo McDonald CHM 2004:30). Late Bondaian antiquity inferred on the basis of the strong representation of quartz and quartz bipolars in the site's flaked stone artefact assemblage.	Jo McDonald CHM 2004a
Jo McDonald CHM	2005	Redevelopment of 109-113 George Street	Salvage	c.1km southeast	Archaeological salvage program for site RTA-G1, located at 109-113 George Street <i>within</i> the PSS, and considered a continuation of site CG1. Total of 125 1m² pits (including three previously excavated test pits) hand excavated in the form of three open area salvage excavations (Areas A - C) and a small exploratory trench (50 E trench). Salvage activities focused on the most intact portion of the development site, being the northeastern section of 113 George Street. RTA-G1 located on backplain terrace surface south of the right bank levee. Top of deposit variably truncated by historical and contemporary ground disturbance activities, with zero surface level between 21 and 51 cm below probable original ground surface. Typical profile described as "a yellow earth profile with a well-mixed biomanle to 22 cm, and some traces of bioturbation to 50 cm". Total of 4775 stone artefacts recovered from site, as well as a large quantity of manuport stone (>50 kg). Artefacts recovered from every square excavated, with an average overall density of 38/ m² (range: 4-146). Recovered assemblage divided into two broad horizons: an 'upper'	Jo McDonald CHM 2005c

Consultant	Year	Project	Investigation type	Location relative to the Study Area	Summary of investigation & results	Reference
					silcrete-dominant horizon (<20 cm) with Bondaian characteristics, and 'lower' silicified tuff-dominant horizon (>20 cm) with Pre-Bondaian characteristics. Upper horizon included edge-ground hatchet heads, backed artefacts and a few bipolar artefacts. Glossy, heat-treated silcrete concentrated in the top 10-20 cm of deposit. Serrate tools restricted to lower assemblage. Radiometric dates for the site (n = 5) indicate that RTA-G1 was likely first occupied in the Late Pleistocene, around 30,000 BP, with multiple separate occupations thereafter. Oldest date - 30,735±407 BP - obtained on charcoal recovered from 80-100 cm below zero surface level. Age determinations bracketing c.6,000-8,000 BP considered an upper limit for the lower, silicified tuff horizon. Upper, silcrete-dominant assemblage not targeted for dating.	
L.Haglund	2006	Parramatta Heritage River Walk	Test excavation	c.200 m southeast	Test excavation program for Parramatta Heritage River Walk. Seven 'trenches' (typically 1 m ²) excavated across two investigations areas (Areas A and B), with test pit locations selected "opportunistically". Investigation Area A located on the eastern and southern margins of the former Kings School Oval. Total of five trenches excavated in this area. Investigation Area B restricted to the riverbank near the O'Connell Street Bridge. Two trenches excavated in this area. Trenches in Area A advanced to a maximum of 1.1 m (range 10 cm to 1.1 m). All revealed thick layers of introduced fill underneath a levelled playing surface of grassed sandy loam, with trenches on southern margin of oval containing historical (European) artefacts. Natural red-brown alluvial sands encountered below fill in one trench (A3) and assessed as forming part of "an old alluvial terrace" (i.e., the PSS, Haglund and Tuck 2006: 24). Five probable and three possible stone artefacts recovered from four trenches. Formed objects limited to single silcrete core. Silcrete dominant raw material overall. No Aboriginal or European artefacts recovered from trenches in Area B. Soil profiles in both Area B trenches heavily disturbed.	Haglund & Tuck 2006
L.Haglund	2007	Redevelopment of Parramatta Old Hospital Site	Test excavation	c.250 m southeast	Test excavation program across Old Hospital Site, adjacent to Children's Court Site. Investigation area characterised by a low ridge (crest) and associated slope and divided into four areas for the purposes of testing and post-excavation analyses (NC, SC, NW, SW). Areas NC and SC comprised the northern and southern parts of the low ridge respectively while Area NW and SW comprised the northern and southern parts of the ridge slope respectively. Excavation component of program involved both hand and mechanical excavation. Hand excavated units included 1m ² pits and trenches measuring 1 m x 0.5 m and 2 m x 0.5 m. Where intercepted, "relatively intact soil profiles" showed mixed fill units overlying variably disturbed (natural) A and B soil horizons, with the former incorporating - in places - distinct A ₁ and A ₂ horizons. In general, natural soil profiles across the site had been heavily affected by historical land use activities, with truncation/loss of artefact-bearing sediments noted in several areas. Haglund (2007: 37, Table A) reports a total of 870 stone artefacts for the site as a whole, with 487 (55.9%) of these recovered	Haglund 2007

Consultant	Year	Project	Investigation type	Location relative to the Study Area	Summary of investigation & results	Reference
					through excavation. Additional 383 artefacts surface collected. Silcrete dominant raw material overall, with silicified tuff second most common material. Other materials included quartz, quartzite, igneous and FGS. Results interpreted as reflection of non-intensive Aboriginal use.	
Austral Archaeology	2007	Multi-storey commercial development, 95-101 George Street	Salvage	c.900 m southeast	Archaeological salvage program for c. 85 x 60 m area of PAD across 95-101 George Street in the Parramatta CBD. Testing component (Phase 3) involved excavation of 25 1 m ² pits along six transects. Subsequent salvage excavation (Phase 4) involved excavation of an additional 45 1 m ² pits, the majority of which comprised part of a single open area excavation. Landform of site characterised as “sandy terrace in the northwest and western margins of the property overlooking a low-lying waterlogged basin comprising the remainder of the site” (Austral Archaeology 2007: iii). Sampled archaeological deposit observed to be “mostly intact” though it was noted that any topsoil that had once existed across the site has likely been removed. Total of 601 stone artefacts recovered during salvage program, with flake debitage items overwhelmingly dominant (93.5%). Silicified tuff dominant raw material overall (48.9%, n = 294), followed by FGS (23.1%, n = 139), silcrete (16.3%, n = 98), chert (4.2%, n = 25), quartz (3.3%, n = 20), quartzite (3.2%, n = 19), volcanic (0.8%, n = 5) and silicified wood (0.2%, n = 1). Formed objects limited to 12 cores, 12 retouched flakes (inc. single backed artefact) and single edge-ground hatchet head. Excavators report increased frequency of artefacts in top 40 cm of deposit but no “linear vertical patterns or trends” in raw material use (Austral Archaeology 2007: iii). Artefacts recovered from top 40 cm of deposit considered to be of late Holocene / Bondaian antiquity. Deposit(s) below this assessed as being “at least 5,000 years old” (Austral Archaeology 2007: iii). Average overall density of 8.7 artefacts / m ² characterised as ‘very low’ and interpreted, in part, as a product of topsoil loss associated with historical ground disturbance.	Austral Archaeology 2007
J.Comber	2010	Replacement of 132kV Switching Station, cnr Union Street and Argus Lane	Test/Salvage Excavation	c.1.1 km southeast	Total of 32 trenches, each measuring 1 m x 2 m in size, hand excavated across subject land parcel (140 Macquarie Street). Trenches advanced to a maximum depth of 1.2 m below zero start surface, which was c.2 m below current road level due to historical filling. Total of 55 stone artefacts recovered from 17 (53.1%) trenches. Site located at the margin between the floodplain of Clay Cliff Creek and reworked sands on the levee backplain. Mitchell (2010b: 15) reports a natural ground surface with an overall slope to the southeast and notes that observed “topographic features suggest that the site was a swampy flat or perhaps close to a lagoon at the time of European settlement”. PSS on this site represented by lowest stratigraphic unit (i.e., Unit 3), which was found to be sealed beneath a layer of acidic alluvial clay (Unit 2). Sand samples from Unit 3, which was atypically non-bioturbated, returned TL dates of 49.5±2.8 ka (Sample 1 - 30 cm), 57.6±5.1 ka (Sample 2 - 80 cm) and 58.4±6.1 ka (Sample 3 - 30 cm, different square) (Mitchell 2010a: 3), indicating that the upper portion of the PSS was deposited in the Late	Comber, 2010b

Consultant	Year	Project	Investigation type	Location relative to the Study Area	Summary of investigation & results	Reference
					Pleistocene, between 50 and 58 ka.	
J.Comber	2010	Redevelopment of Cumberland Newspaper Site. 142-154 Macquarie Street	Test Excavation	c.1.1 km southeast	Two trenches, each measuring 3 m x 1 m in size, hand excavated in the northern portion of the site on former right bank levee. Trench 1 advanced to a maximum depth of 150 cm below ground level, with sediments to 80 cm characterised as 'highly disturbed'. Excavation in northern section of Trench 1 terminated at 80 cm due to interception of sewer main. Active telecommunications cable intercepted in the southern section of same trench at 85 cm, necessitating use of a 50 x 50 cm pit to termination of excavation at 150 cm. Trench 2 advanced to 165 cm below ground level and reportedly "even more disturbed than Trench 1" (Comber 2010a: 11). Surface horizons of PSS in both trenches noted by Mitchell (2010 in Comber 2010a) to have been "extremely disturbed or destroyed". Total of 21 artefacts recovered during excavation, with all but two coming from Trench 1. Artefacts in Trench 1 recovered between 50 cm and 75 cm below ground surface. Both artefacts in Trench 2 recovered from Spit 33 (160-165 cm). Comber (2010a: 26) reports five unmodified flakes, four retouched flakes and 12 flaked pieces. All but two artefacts manufactured out of silcrete.	Comber, 2010a
AHMS	2013	Redevelopment of 189-191 Macquarie Street	Test excavation	c.1 km, southeast	Seven test pits, ranging in size from 1 to 3 m ² , excavated across development site, resulting in the recovery of 27 stone artefacts (average density = 2.3 artefacts / m ²). Northeastern portion of development site considered to extend into southern edge of PSS, with the majority of land to the south of this area interpreted as "low-lying swampy ground". Raised ground in the southernmost portion of the development site - adjacent to Hassall Street - interpreted as part of a levee along Clay Cliff Creek. No artefacts recovered from test pit on southern edge of the PSS or from test pits advanced into the low-lying swampy terrain separating the terrace from the levee along Clay Cliff Creek. Artefacts on Clay Cliff creek levee present in low densities (4-7 artefacts / m ²) and interpreted as a product of low intensity occupation activity. Soil samples from Tests Pit 3 and 6 and Area 7A, associated with the PSS (Test Pit 3) and Clay Cliff Creek levee (Test Pit 6 and Area 7A) respectively, submitted for OSL analysis. Sample from Test Pit 3 returned an age estimate of 13-11 ka, that from Area 7A an age estimate of 12-10 ka, and that from Test Pit 6, an age estimate of 15-13 ka. Dated sample from Test Pit 6, located on the Clay Cliff Creek levee, the only sample associated with artefacts. Absence of archaeological materials in sampled PSS sediments interpreted as a product of the fact that occupation of the right bank terrace was likely focussed on the highest part of the terrace, closer to the Parramatta River.	AHMS 2013
J.Comber	2014	Parramatta North Urban Renewal Area (PNUR Area) -	Survey	Study Area falls wholly within Sports & Leisure	Portions of Cumberland and Sports & Leisure Precincts of the PNUR Area selectively inspected as part of larger Aboriginal archaeological and cultural heritage impact assessment. No new or previously recorded sites identified during field inspection. Previously recorded scarred tree 45-5-	Comber 2014

Consultant	Year	Project	Investigation type	Location relative to the Study Area	Summary of investigation & results	Reference
		Cumberland and Sports & Leisure Precincts		Precinct of PNUR Area.	0277 assumed destroyed. Majority of land within Sports & Leisure Precinct assessed as having moderate to high archaeological potential due to likely presence of PSS and protection through filling (Comber 2014: 48). Parramatta Park identified as being “exceptionally important to the local and broader Aboriginal community” (Comber 2014: 45). Comber (2014: 51) concludes that the park “is a significant cultural landscape containing evidence of Aboriginal occupation in the form of scarred trees, artefact scatters and resource zones. The whole landscape including connections between individual sites is imbued with significant cultural meaning. The park is a rare and valuable cultural and natural landscape representing the history of the Darug Nation. The Cumberland plain vegetation within the Park is an integral part of that history, as is the open “park like” setting that was created by “firestick farming”. Darug cultural values include the strong relationship they have with the environment and its natural resources”.	
GML	2015	Parramatta Leagues Club - Redevelopment Project	Survey	Directly adjacent	AECOM understands that GML was engaged by Parramatta Leagues Club through APP Corporation to prepare an ACHAR and Archaeological Technical Report (ATR) for a proposed redevelopment project at the Parramatta Leagues Club, to the immediate north of the current Study Area. Detailed information on GML's assessment, completed in 2015 and detailed in the project's as yet unreleased ACHAR and ATR, is currently unavailable. Nonetheless, it is understood that PAD 45-5-4630, the centroid location of which is shown on Figure 19 , was identified as part of GML's assessment and relates specifically to the PSS. Moreover, AECOM understands that this PAD is currently the subject of a subsurface investigation by GML, with excavation impacts authorised under an AHIP issued to Parramatta Leagues Club in May 2016 (E.Mein, Archaeologist, GML pers. comm. June 2016).	GML () cited in

5.6 Archaeological Predictions

Taking into account the landscape context of the Study Area (**Section 4.0**), as well as the archaeological and ethnohistoric information reviewed in **Sections 5.0** and **6.0**, the following predictions are made regarding the Aboriginal archaeological record of the Study Area:

1. Where preserved beneath historical fill materials, “near-surface” PSS sediments within the Study Area (i.e., those ~1.5 m below original ground surface) are likely to contain Aboriginal occupation deposits, albeit of highly variable integrity depending on the nature and extent of localised historical disturbance activities;
2. Heavy earthworks associated with the construction of the current stadium complex and the Parramatta Swimming Centre are likely, in places, have totally removed the artefact-bearing horizons of the PSS;
3. Owing to comparably favourable landform characteristics, the complexity of the Study Area's Aboriginal archaeological record - as indicated by subsurface artefact densities, assemblage richness values and numbers/types of archaeological features - is likely to match that previously identified on the right bank of the Parramatta River;
4. Aboriginal archaeological materials are likely to be concentrated on the crest portion of any left bank levee present within the Study Area. Artefact densities and assemblage richness values on the levee crest are likely to be significantly higher than those on the backplain;
5. Where relatively intact, near-surface PSS sediments within the Study Area are likely to retain evidence of vertical stratification, with two broad horizons identifiable on the basis of flaked stone artefact assemblage characteristics - an ‘upper’ Bondaian horizon and ‘lower’ Pre-Bondaian horizon;
6. Where relatively intact, near-surface PSS sediments within the Study Area are likely to contain archaeologically- discernible “living floors” characterised by knapping floors and hearth arrangements;
7. Aboriginal objects are likely to extend to a *minimum* of 1 m below the original ground surface of the left bank terrace, but will be concentrated in the upper 40 cm of the deposit;
8. Any ‘Bondaian’ assemblages present within the Study Area are likely be dominated by artefacts manufactured out of silcrete. Conversely, any ‘Pre-Bondaian’ assemblages present will be dominated by artefacts manufactured out of silicified tuff;
9. Artefacts manufactured out of glossy, heat-treated silcrete are likely to be restricted to Bondaian contexts;
10. Flaked stone artefact assemblages from the Study Area are likely to be dominated by flake debitage items, with formed objects (i.e., cores and retouched ‘tools’) and non-flake debitage items comparatively poorly represented;
11. Artefacts of demonstrated chronological significance are likely to include backed artefacts (Bondi points, geometric microliths and Elouera), edge-ground hatchet heads and serrated flakes; and
12. Given its proximity to Old Government House and late 18th / 19th century Parramatta township, the Study Area is likely to contain archaeological evidence of post-contact campsites (e.g, ceramics, worked glass).

6.0 Ethnohistoric Context

6.1 Introduction

Information regarding the ways in which Aboriginal people likely used pre-contact landscapes is available to archaeologists through two primary sources: archaeological (i.e., survey and excavation) data and historical records. **Section 5.0** has summarised the Aboriginal archaeological context of the Study Area on both a regional and local scale. This section builds on this foundation by summarising relevant ethnohistoric information for the Study Area. As in other parts of New South Wales and Australia more broadly, non-Aboriginal people occupying the Sydney Region began to document Aboriginal culture from first contact, with explorers, missionaries, settlers and the like recording their observations of Aboriginal people and/or their material culture in letters, journals and official reports. Many of these accounts are overtly Eurocentric in tone and the content and veracity of some is, at best, questionable. Nonetheless, taken together, they form an important source of information on Aboriginal lifeways at the time of British colonisation and can, in conjunction with available archaeological data, be used to generate working predictive models of prehistoric Aboriginal land use.

Key sources, both primary and secondary, for the post-contact languages and lifeways of the Aboriginal people occupying the Sydney region at the time of British colonisation include: Attenbrow (2010); Barrallier (1802 [1975]); Bradley (1792 [1961]); Brook & Kohen (1991); Collins (1798 [1975], 1802 [1971]); Dawes (1790a, 1790b); Flynn (1994, 1995a, 1995b); Hunter (1793 [1968]); Kohen (1985, 1986, 1988, 1993); Kohen and Lampert (1987); Kohen et al. (1999); Matthews (1903); McDonald (2008); Phillip (1789 [1970], 1791[1963]); Tench (1793 [1979]); Troy (1994); White (1790 [1962]) and Worgan (1788). While a detailed review of these sources is beyond the scope of this report, salient information is summarised in the sections below.

6.2 The Darug Language and People

Available sources indicate that Study Area falls wholly within the traditional country of the Darug people, who spoke the Darug (also spelt Dhaʼ-rook, Dharrook, Dhaʼrook, Dharruk and Dharug) language. Darug is believed to have been spoken from the Hawkesbury River in the north, to Appin in the south, and from the coast west across the Cumberland Plain into the Blue Mountains. Early sources (e.g., Collins 1798 [1975]; 1802 [1971]; Tench 1793 [1961]; Dawes 1790a, 1790b; Phillip in Hunter 1793 [1961]) and more recent linguistic research (e.g., Troy 1994) indicates that two distinct dialects of Darug were spoken at the time of European contact, a coastal dialect, spoken on the Sydney peninsula and the country to the north of Port Jackson, and a hinterland dialect, spoken on the Cumberland Plain from Appin in the south to the Hawkesbury River in the north (Attenbrow 2010: 34). This linguistic division is thought to correspond to a broader economic division between 'coastal' and 'hinterland' Darug-speaking peoples, with the accounts of several early observers (e.g., Bradley 1792 [1961]; Collins 1798 [1975], 1802 [1971]; Phillip 1788 in Attenbrow 2010: 63; Tench 1793 [1979]) suggestive of a 'coastal', marine-oriented subsistence economy¹³ and contrasting 'inland' economy focused on the exploitation of land mammals, plant foods and freshwater faunal resources. Notably, early sources (e.g., Barrallier 1802 [1975]; Collins 1798 [1975]; Tench 1793 [1961]) suggest that there was little contact between coastal and hinterland groups.

Some idea of population size for the coastal Darug at contact is provided by Attenbrow (2010), who suggests that the area around Port Jackson likely supported a minimum population density of 0.75 persons/ 1 sq. km (i.e., 1 person/1.3 sq. km). Attenbrow's estimate is based Governor Phillip's own estimate of the Aboriginal population of this area, made in 1788. Phillip, reporting to Lord Sydney on 15 May 1788, estimated a total population of not "less than one thousand five hundred" (Phillip 1788 in Attenbrow 2010: 17). Attenbrow (2010:17), citing Hunter (1793 [1968]: 62), notes that "population densities for the hinterland (west of Parramatta) were initially assessed by the colonists as being less than those along the coast" but implicitly urges interpretive caution given the deleterious effects of 1789 smallpox epidemic, which "had killed many people living to the west of Rose Hill before Phillip's 1791 expedition crossed the Cumberland Plain to the Hawkesbury-Nepean River". More recently, Kohen (1995) has estimated a minimum overall density of around 0.5 persons per sq. km for the hinterland zone.

In common with other regions of New South Wales (e.g., Attenbrow 2010) and Australia more broadly (Peterson, 1976), available historical records suggest that the primary units of social organisation amongst the Darug were the clan and band. Kohen (1993:15) equates the term 'clan' with 'band', defining both as "groups of people who

¹³ Note that available archaeological evidence suggests that the historically documented seafood bias in the diets of coastal Darug speaking peoples has been overemphasised, with excavated bone assemblages from coastal rockshelter sites (e.g., Balmoral Beach, Angophora Reserve) attesting to the importance of terrestrial and avian fauna in coastal diets.

lived together and hunted together". However, Attenbrow (2010) draws a distinction between the two, with clans comprising local descent groups and bands, land-using groups who, though not necessarily all of the same clan¹⁴, camped together and cooperated daily in hunting, fishing and gathering activities. Individual bands will have habitually occupied and exploited the resources of particular tracts of land within the overall territory of their clan. However, the territorial boundaries of each band will have been permeable or elastic in the sense of complex kinship ties facilitating inter-band territorial movements and the reciprocal use and/or exchange of resources. Early accounts (e.g., Collins 1798 [1795:453]; Tench 1793 [1799:292]) indicate that clan names were derived from the country on which the members of the clan lived.

The size of the individual bands occupying the Cumberland Plain at contact was no doubt activity and season dependent. However, an upper limit of around 50 individuals, consisting of several nuclear families, has been suggested (Kohen 1988: 239). Individual band sizes notwithstanding, much larger groups of Aboriginal people, numbering in the hundreds, are known to have come together for events such as corroborees, ritual combats and feasts (Attenbrow 2010; Kohen et al. 1999). Unlike many Australian Aboriginal groups, social organisation amongst the Darug did not comprise a class system based on moieties or sections but rather was based on clan membership attained through patrilineal descent (Attenbrow 2010: 57; Kohen 1993: 35). Totemic affiliations were inherited from a person's father and, along with clan membership, were the basis upon which marriages were arranged and initiations carried out.

Available historical records indicate that a wide range of marine and freshwater fauna were exploited by Darug-speaking peoples for food and other resources (for a detailed discussion see Attenbrow 2010: 62-84). Along the coast, an emphasis on the exploitation of marine resources, principally fish and shellfish, is attested in the writings of several early observers (e.g., Bradley 1792 [1969: 133]; Collins 1798 [1795:456, 461, 495]; Phillip 1788 in Attenbrow 2010: 63; Tench 1793: 125, 195 [1799]: 233, 287). Further inland, historical records suggest an emphasis on the hunting of land mammals (e.g., Barrallier 1802 [1795:2 n4]; Collins 1798 [1795:456]; Tench 1793: 121 [1799:230]), with kangaroos, wallabies, possums, gliders, fruit bats (i.e., flying foxes), dingos, koalas and wombats variously reported as having been either hunted and/or eaten (Attenbrow 2010: 71). Possums, in particular, appear to have been major food source in the hinterland, with a number of early observers remarking on the tree climbing skills of the 'woods people' and detailing procurement techniques (e.g., Hunter 1793 [1968]; Tench 1793 [1799]; Collins 1798 [1795]; Barrallier 1802 [1795]). Freshwater fish, shellfish and eels, as well as platypus, are also known to have been exploited by hinterland groups (e.g., Barrallier 1802 [1795: 2]; Collins 1798 [1795: 461-63], 1802 [1791: 321-22]; Phillip in Hunter 1793 [1968: 523]; Tench 1793 [1799: 230]), as are birds.

Compared with their faunal counterparts, the plant food resources of coastal and hinterland Darug-speaking peoples are poorly represented in the writings of early colonial observers. Nonetheless, available descriptions do suggest that plants formed a regular part of the diets of groups in both areas (see Attenbrow 2010: 77-8). Along from the coast, a "vegetable catalogue" consisting of "a few berries, the yam and fern root, the flowers of the different Banksia, and at times some honey" is reported by Collins (1798 [1795:462-63]). Along the Hawkesbury-Nepean River, yams appear to have been particularly important food item (see, for example, Hunter 1793 [1968: 153]) and it has been suggested that the establishment of European farms along the banks of the river, which resulted in the widespread destruction of traditional yam beds, was an important contributing factor to the significant Aboriginal-Settler hostilities that occurred in this area (Kohen 1985).

A wide range of hunting and gathering 'gear' was employed by Darug speaking peoples, with distinctive repertoires for men and women (McDonald 2008: 24). Men's gear included several different forms of spears (variously barbed), spear throwers, clubs, 'swords', boomerangs, shields and hafted stone hatchets known as *mogo*. Women's toolkits, in contrast, included fishing hooks, lines and sinkers, digging sticks and various containers (shell and wood). Net bags made from plaited wood fibre appear to have been used both men and women (see Attenbrow 2010: 91). Bark canoes were also widely used (Attenbrow 2010: 87).

Two principal forms of shelter appear to have been utilised by Darug speaking peoples at the time of European contact: rockshelters and small huts built from sheets of bark, branches and bushes. In keeping with the linguistic division of the Darug language into coastal and hinterland dialects, differences in the nature of huts built along the coast and in the hinterland are attested in early colonial writings, with the former reportedly larger and "formed of pieces of bark from several trees put together in the form of an oven with an entrance, and large enough to hold six or eight people" (Collins 1798 [1795: 460]). Unlike those living along the coast, Darug-speaking peoples occupying the Cumberland Plain appear to have relied heavily on bark huts (Hunter 1793 [1968]: 60-61). Regarding settlement duration, as Attenbrow (2010:54) has observed, "there is little direct historical evidence for

¹⁴ Some individuals may have been related through marriage.

the length of time people stayed at any one campsite (be it a rockshelter or bark hut), how often they moved, or what motivated them to move to another campsite". Kohen and Lampert (1987), for their part, have argued that "some bands probably lived at one campsite for months of each year and regularly returned to it". However, this argument is not universally accepted (e.g., Attenbrow 2010: 55; McDonald 2008).

Evidence for ceremonial or ritual behaviour amongst Darug-speaking peoples can be found in the writings of a number early observers, with documented 'ceremonial' activities including corroborees, male initiation ceremonies, ritual combats and various burial, body adornment and personal decoration practices (Attenbrow 2010: 126-42). While available colonial records provide only scant information on the belief systems of Darug-speaking peoples, reference to the 19th century writings of people such as L.E Threlkeld, A.W Howitt, R.H Matthews, W. Ridley and W.J Enright, suggest that spiritual authority amongst Darug clans was likely vested in a number of ancestral beings, with Baiame or Daramulan - the supreme creative being - a central figure (Attenbrow 2010: 127).

In common with other parts of NSW and Australia more generally, the post-contact history of the Darug-speaking peoples of the Sydney region is primarily one of dispossession and loss, with groups alienated from their traditional hunting, gathering and camping grounds, populations decimated by a combination of introduced diseases¹⁵ and frontier violence (Attenbrow 2010: 14-15, 21-22) and surviving groups subject to various colonial initiatives aimed at assimilating them into an ostensibly superior European way of life. Nonetheless, active resistance and friendly relations are also attested in available records.

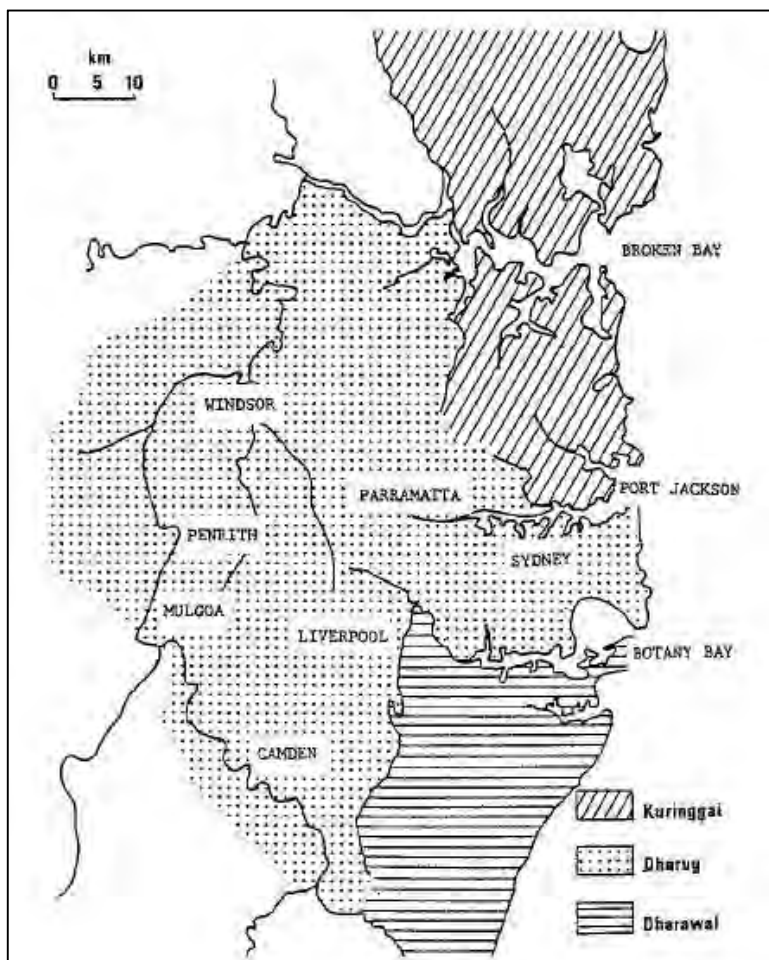


Figure 21 Aboriginal language group boundaries in the Sydney Region (from Kohen 1993: 241, Fig. 1)

¹⁵ As highlighted by Attenbrow (2010: 21-22), a major initial cause of depopulation amongst the Darug was the April 1789 smallpox epidemic, which "hit the local [Aboriginal] population horrific effect" and is estimated to have killed "well over half" of Sydney's Aboriginal population (Attenbrow 2010: 21).

6.3 Parramatta and the 'Burramattagal'

Available historical reference materials, including Governor Phillip's own account (i.e., Phillip in Hunter 1793 [1968: 351]), indicate that the word Parramatta derives from the name of the territory of the *Burramattagal*¹⁶, a Darug clan whose territory "was probably centred on Parramatta or little further to the east" (Kohen et al. 1999: 8). Kohen et al. (1999: 7), for their part, explain that "[t]he two root words are *burra*", which is a general term for food, but in this context means "eel", and *matta*", which means "a place with water" or a "creek" (Parramatta, Cabramatta, Wianamatta)". However, it is noted that the meaning of the word *matta* is contested, with Jackelin Troy (Troy in Flynn 1995b: 10) proposing that it may be a verb meaning "[place] to have"¹⁷. These semantic differences notwithstanding, information contained in the notebooks of Dawes (1790a, 1790b) and Tench's accounts (1789, 1793 [1979]) confirm that the *Burramattagal* spoke the coastal dialect of Darug. As speakers of the coastal dialect, it has been suggested that the "economic links ...[of the Burramattagal]...were with the coastal clans [to their east], not with "woods tribes" who lived inland, although intermarriage almost certainly took place with the clans to the east and to the west, providing opportunities for accessing resources which were not available within their own clan boundaries" (Kohen et al. 1999: 7). Flynn (1995b: 9) tentatively identifies the western boundary of the Burramattagal's country as occurring "in the vicinity of Parramatta Park" while the eastern boundary was "probably either Duck River, Homebush Bay or some point between the two". While significant ambiguities exist concerning the country with which different Darug clans were associated, neighbouring clans appear to have included the *Wangal* to the east, the *Tugagal* to the west (in the vicinity of Prospect / Toongabbie), *Bediagal* (Bidjigal) to the northwest and the *Wallumattagal* to the north (on the opposite side of the Parramatta River) (Attenbrow 2010: 27; Kohen et al. 1999: 8; Mary Dallas Consulting Archaeologists 2003: 32).

While the *Burramattagal* and other Darug clans were no doubt observing them, most of the early colonial expeditions away from the coast - including Governor Phillip's Expedition to Belle Vue (Prospect Hill) in April 1788 - did not encounter any Aboriginal people. However, traces of their presence, namely, huts, camp fires, burning trees and partially-eaten food - were encountered "at every step" (Tench 1791 [1979: 154]; see also Phillip 1789 [1970: 55]). That Aboriginal people were clearly occupying the "inland" came as a surprise to the exploring colonists, as the prevailing opinion at the time was that this area was uninhabited or, at best, had a very low Aboriginal population density (Kohen 1985). Once made, initial contacts between Aboriginal people and the exploring colonists appear to have been friendly in nature, "with exchange of gifts and a general atmosphere of co-operation" (Kohen 1985).

Establishment of the settlement at Rose Hill (Parramatta) in November 1788 did not, at least initially, result in the loss of the goodwill that characterised the region's earliest Aboriginal-European contacts, with Collins 1798 [1975:137], for example, reporting the existence at Parramatta of a barter system in which local Aboriginal people (including Bolloderree (Ballederry)) and resident military officers exchanged fish for small amounts of bread and salt beef. Relations, however, appear to have soured quickly, with the aforementioned barter system at Parramatta ending abruptly in mid-1791 as a result of the unprovoked destruction of Bolloderree's canoe, an act that led to the retaliatory spearing (by Bolloderree) of a settler at 'The Flats' (near Kissing Point) and his subsequent banishment from Parramatta by Governor Phillip. Together with the growth of Parramatta township itself, the early (1791) establishment of "out-settlements" at Prospect and Toongabbie, and subsequent establishment (from 1794) of farms along the Hawkesbury River, restricted Aboriginal peoples' access to their traditional lands and food resources and precipitated what Kohen (1993) has referred to as the "First Australian War". Along the Hawkesbury River, the widespread destruction¹⁸ of traditional yam beds, which provided a dietary staple for inland Darug clans, has been identified as a significant contributing factor to the particularly violent conflict that characterised Aboriginal-settler relations in this part of the Sydney region from the mid-1790s to early-1800s (i.e., to around 1816) (Kohen 1993: 63). Here, as in other parts of the Sydney region, loss of access of traditional hunting and gathering grounds was one of a number of sources of Aboriginal settler-conflict, with unprovoked murders, the kidnapping and rape of Aboriginal women and unfair work conditions on farms also contributing to poor relations and/or directly resulting in armed conflict (Kohen 1993: 62-67).

¹⁶ Note that the term 'Burramattagal' (with the masculine suffix 'gal') refers specifically to the male members of the clan occupying the Parramatta area. As Kohen et al. (1999: 8) note "[t]here would have been between 40 and 60 men, women and children who belonged to the *burramatta* clan - the men were *burramattagal* and the women were *burramattagaleon*". For ease of reference, the term *burramattagal* is used here as a non-gender-specific term for all members of the *burramatta* clan.

¹⁷ Flynn (1995b: 10), citing Troy, suggests a "rough translation" of "place where they have eels" or "place for having eels"

¹⁸ I.e., as a result of vegetation clearance and the planting of crops

While numerous acts of Aboriginal resistance to the spread of European settlement across the Sydney region can be identified in available historical records, the guerrilla war waged by Pemulwuy, a *Bidjigal* man from the George's River area, is undoubtedly the best known. Between 1791 and his death in 1802, Pemulwuy, who first came to the attention of Europeans in December 1790 when he speared Governor Phillip's gamekeeper McIntire, is believed to have organised numerous raids on settler farms around present day Parramatta, Toongabbie, Prospect and Ryde, and to have speared many travellers around Botany Bay and the Georges River (Flynn 1995b: 135). In March 1797, Pemulwuy was involved in an armed confrontation on the streets of Parramatta, which resulted in him being severely wounded and taken to Parramatta hospital, where he was chained by his ankle. Despite his wounds and ankle chain, Pemulwuy managed to escape from hospital and was soon after observed at the mouth of the Georges River "...having perfectly recovered from his wounds" (Collins 1798 [1975:70]). Widely known and respected in his community due to his various acts of resistance and evasion, many Aboriginal people believed Pemulwuy to be invincible. Nonetheless, on 2 June 1802, while still at large, Pemulwuy was shot dead and decapitated, his head subsequently preserved in spirits and sent to England. After his death, Governor King acknowledged Pemulwuy as "an active, daring leader of his people" and "brave and independent character" (King to Hobart, 30 October 1802; King to Banks 5 June 1802). Pemulwuy's resistance activities in the greater Parramatta area were continued by his son *Tedbury*, who was arrested in 1805 and 1809 for robberies and was shot (non-fatally) by Edward Luttrell at Parramatta in February 1810 (Flynn 1995b: 63).

Aboriginal-European relations across the Cumberland Plain are reported to have "entered a new phase" from 1816 onward, with the massacre of 14 Aboriginal men, women and children at Appin in April of that year, undertaken as part of a government sanctioned 'punitive expedition', all but putting an end to regional hostilities (Kohen 1993: 68). With populations decimated by introduced diseases and the frontier violence, and many clans alienated from their traditional country, Aboriginal people increasingly turned to Europeans to meet their basic needs (Kohen 1993: 68). While traditional practises continued in many areas, many survivors began to congregate on the estates of Europeans sympathetic to their plight, with the "Mulgoa Tribe", for example, congregating on the estate of William Cox in the Mulgoa Valley, and the "South Creek Tribe" typically residing on Charles Marsden's estate close to junction of South and Eastern Creeks. Governmental initiatives to 'civilise' the Cumberland Plain's remaining Aboriginal population can also be traced to this period, with Governor Macquarie, the fifth and last autocratic Governor of New South Wales (1810-1821), pursuing a policy of assimilation aimed at encouraging Aboriginal people "to become regular Settlers" and conciliating "them as much as possible to our Government and Manners" (Macquarie 1816 in Brook & Kohen 1991: 44; Macquarie 1811 in Kohen et al. 1999: 78). Macquarie's key initiatives to this end were the Parramatta Native Institution, established in December 1814, and the annual Native "Conference" or "Feast", with the latter serving the "dual purpose of "conciliating the Aboriginal people of the settled areas and encouraging them to give up their children for placement in the Institution" (Flynn 1995b: 90). Held annually¹⁹ until 1833, when judged ineffective by then Governor, Sir Richard Bourke, the Native Feasts were also "designed to facilitate the imposition of administrative structures on the surviving clans" (Flynn 1995b: 96), namely, the division of attendees into their respective "tribes" and the election, amongst each "tribe", of a "chief" that could be held responsible for the behaviour of the members of his group and act a "conduit for any grievances they had" (Flynn 1995b: 96). Post-1833, it was Governor Bourke²⁰ who initiated the distribution of blankets through local magistrates, with the resulting "Returns of Natives", taken between 1834 and 1843, providing "a kind of Aboriginal census for these years" (Flynn 1995b: 107) and confirming the presence of several hundred Aboriginal people within the Sydney region into the 1840s.

Established in the context of a series of frontier skirmishes in mid-1814, the Parramatta Native Institution, which was in operation from 1814 to 1822, functioned as a school for teaching Aboriginal children reading, writing, arithmetic and Christian religion, as well as manual labour and agriculture (boys only) and needlework, knitting and spinning (girls only) (Brook & Kohen 1991). Fluctuating pupil numbers over the life of the institution have been attributed to a range of factors, with many Aboriginal children, for example, running away from the school to re-join their families (Brook & Kohen 1991: 70; Kohen et al. 1999: 83). In 1823, the Native Institution was moved by Governor Brisbane to a parcel of land adjoining what was then known as the 'Black Town', a community of Aboriginal people living on and around Governor Macquarie's 30 acre land grant to Darug men Colebee and Nurragingy, adjacent to Richmond Road in the present day suburb of Colebee. The Blacktown Native Institution, which functioned in a similar manner to its predecessor, was in operation from 1823 to 1829 under the direction of the Church Missionary Society (CMS).

¹⁹ Note that no feast was held in 1815 due to drought

²⁰ Bourke was in office from 1831-37

7.0 Visual Inspection

7.1 Introduction

This section presents the results of a visual inspection of the Study Area and its immediate environs, undertaken on 30 June 2016 by a combined field team of one AECOM archaeologist (Dr Andrew McLaren) and eight RAP field representatives. Undertaken in place of a formal archaeological survey owing to gross historical modifications to the natural topography of the Study Area, the inspection provided an opportunity to “ground-truth” levels of past ground disturbance across the Study Area, to confirm the broader landform context of the existing stadium and adjoining Swimming Centre and to identify surface evidence of past Aboriginal occupation (should any remain). The inspection, which involved a pedestrian inspection of all readily-accessible portions of the Study Area, as well as fluvial landform elements to its south and east, also provided an opportunity to relocate previously recorded scarred tree 45-5-0277, which remains listed as a valid site on the AHIMS database. RAP field representatives involved in the visual inspection are listed in **Table 10**.

Table 10 RAP field representatives

Organisation	Field representative
Deerubbin Local Aboriginal Land Council	Steve Randall
Darug Custodian Aboriginal Corporation	Justine Coplin
Darug Aboriginal Cultural Heritage Assessments	Tim Wells
Darug Land Observations	Jamie Workman
Darug Aboriginal Land Care Inc	Raymond Adams
Kamilaroi-Yankuntjatjara Working Group	Chris Jones
Tocomwall Pty Ltd	Jen Norfolk
Duncan Suey & Associates	Darren Duncan

7.2 Results

7.2.1 General Observations

Consistent with available historical aerial photographs and geotechnical data, as well as Fanning's geomorphological assessment (**Appendix H**), the visual inspection undertaken for the current assessment confirmed that the natural topography of the Study Area has been extensively modified as a result of historical land use activities, with the most drastic modifications having occurred as result of the construction of the current stadium and its associated ancillary facilities.

During the inspection, it was noted that the large sections the Study Area are “artificial” in the sense that they were created historically as a result of heavy earthworks (i.e., through cutting and/or filling and levelling), with the training field to the immediate south of the stadium, the current playing field and the large L-shaped mound to the north of stadium highlighted in-field as the most extreme examples. Field observations suggested that construction of the carparks to the northeast and west of the stadium also involved filling and/or levelling earthworks, with the latter, for example, sitting approximately 0.5 m above the adjoining stadium access path ground level. In the southeastern portion of the Study Area, visual inspection confirmed the presence of five in-ground swimming pools, with surrounding paved areas and associated infrastructure extending to the Study Area's eastern boundary (O'Connell Street). Water slides associated with the smallest, southernmost pool, were observed to have been built into a raised (artificial) mound covered in immature shrubs and trees.

Visual inspection of minimally disturbed alluvial landform elements to the south and east of the Study Area confirm that the majority of land within it formerly comprised part extensive left bank terrace of the Parramatta River, with a sequence of at least two terraces observed in the vicinity of Old Kings Oval. To the southeast of the Study Area, it was noted that Parramatta River's left bank terrace sequence remains relatively undisturbed, with the construction of Old Kings Oval the most significant impact.

7.2.2 Aboriginal Archaeological Sites

AHIMS registered scarred tree 45-5-0277 was not relocated during the current visual inspection, with no potential or probable Aboriginal scarred trees observed in the vicinity of its AHIMS registered centroid coordinates. In view of Attenbrow's (1994a) and Comber's (2014) similarly unsuccessful attempts to relocate this site, it is concluded that scarred tree 45-5-0277 was likely destroyed during construction of the current stadium.

One new Aboriginal archaeological site was identified during the visual inspection. Located wholly outside of the current Study Area, the site consists of two flaked stone artefacts, located approximately nine metres apart, on an unsealed vehicle track that traverses a natural terrace riser to the immediate east of Old Kings Oval and has been designated as '**Old Kings Oval Artefact Scatter 1**' (**Plate 5**). The two artefacts - both of which were manufactured out of silcrete - consist of a complete flake (**Plate 6**) and flake shatter fragment. Both artefacts have been exposed by the establishment / use of the track in question, with the constituent soils of the terrace riser sandy and variably compacted at the surface. Ground Surface Visibility (GSV) on the track is generally very good (60-90%) but poor (0-30%) off of it.



Plate 5 View across newly identified Aboriginal archaeological site Old Kings Oval Artefact Scatter 1, located on an unsealed vehicle track to the immediate east of Old Kings Oval, outside of the current Study Area (Source: AECOM 2016).



Plate 6 Complete silcrete flake in Old Kings Oval Artefact Scatter 1. GPS stylus in 9.5 cm long (Source: AECOM 2016).



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