HENRY LAWSON DRIVE – HUME HIGHWAY TO M5 UPGRADE

Aboriginal Cultural Heritage Assessment

Prepared for Roads and Maritime Services

Canterbury Bankstown Local Government Area

September 2020

Ref. 1829

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Executive Summary

Roads and Maritime Services (Roads and Maritime) is planning a staged upgrade of Henry Lawson Drive between the Hume Highway and the M5, including a section of Milperra Road between Henry Lawson Drive and Ashford Road. Henry Lawson Drive is currently mostly a single lane carriageway and the upgrade would provide dual carriageway, with the provision to upgrade to three lanes in each direction in the future.

The upgrade will be designed and implemented in stages (Stages 1A, 1B, 2 and 3) over several years. The staged upgrade is proposed to alleviate traffic congestion and delays currently experienced along single lane sections of Henry Lawson Drive, provide road safety improvements and implement pedestrian safety improvements at Gordon Parker Reserve Bridge.

A Preliminary Environmental Investigation was prepared by GHD in December 2014. Concept design development and environmental assessments a Review of Environmental Factors (REF) are currently being undertaken for the first stage of the project, Stage 1.

Roads and Maritime engaged Kelleher Nightingale Consulting Pty Ltd (KNC) to prepare an Aboriginal cultural heritage assessment report (CHAR) for Aboriginal heritage within the proposal area, including a program of archaeological test excavations. The CHAR has been prepared in accordance with Stage 3 of the Roads and Maritime *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (Roads and Maritime 2011) and NSW Department of Planning, Industry and Environment (DPIE, formerly Office of Environment and Heritage (OEH)) *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011).

Preparation of the CHAR has included Aboriginal community consultation in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (OEH 2010a) and an Aboriginal archaeological test excavation program undertaken in accordance with the *Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales* (OEH 2010b) and Roads and Maritime's PACHCI.

Archaeological test excavation was undertaken across ten of the 12 sites/Potential Archaeological Deposits (PADs) identified within the study area during the Stage 2 PACHCI assessment: HLD Site 1 (AS+PAD), HLD Site 3 (AS+PAD), HLD Site 4 (AS+PAD), HLD PAD 1, HLD PAD 2, HLD PAD 3, HLD PAD 4, HLD PAD 5, HLD PAD 6, and HLD Resource Zone 1 + PAD. Following the test excavation, sites names and extents were updated to reflect the findings, resulting in the confirmation of eight Aboriginal archaeological sites containing Aboriginal objects within the study area. Impact assessment found that all eight would be subject to total and direct harm as a result of the proposal.

Archaeological significance of the identified Aboriginal sites was defined by the information exhibited by each site. The majority of identified sites were found to display low archaeological significance (due to high levels of soil disturbance and paucity of artefacts) and do not warrant mitigation. Two sites were found to display moderate significance and warrant mitigation prior to impact. These sites have the potential to offer information on Aboriginal landscape use along the Prospect Creek catchment and wider Georges River catchment.

An AHIP will be sought for the land and associated objects within the proposed Stage 3 area following planning approval (REF and/or EIS). The AHIP would also be sought for the specified Aboriginal sites and objects contained within the Stage 3 area:

HLD Site 1 (AS)	AHIMS 45-5-5119	Total impact	Low significance
HLD Site 2 (IF)	AHIMS 45-5-5116	Total impact	Low significance
HLD Site 3 (AS)	AHIMS 45-5-5116	Total impact	Low significance
HLD Site 4 (AS)	AHIMS 45-5-5115	Total impact	Low significance
HLD Site 6 (AS)	AHIMS 45-5-5120	Total impact	Moderate significance
HLD Site 7 (AS)	AHIMS 45-5-5121	Total impact	Moderate significance
HLD Site 8 (IF)	AHIMS 45-5-5118	Total impact	Low significance

A second site based AHIP would be sought for HLD Site 5 (IF) following planning approval (REF and/or EIS) for Stage 1A of the proposed upgrade:

HLD Site 5 (IF)	AHIMS 45-5-5125	Total impact	Low significance

The CHAR has been prepared in accordance with Stage 3 of the Roads and Maritime PACHCI and NSW Office of Environment and Heritage *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW.*

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1 Introduction

1.1 Proponent and consultants

Roads and Maritime Services (Roads and Maritime) is planning a staged upgrade of Henry Lawson Drive between the Hume Highway and the M5, including a section of Milperra Road between Henry Lawson Drive and Ashford Road (Figure 1). Henry Lawson Drive is currently mostly a single lane carriageway and the upgrade would provide dual carriageway, with the provision to upgrade to three lanes in each direction in the future.

The upgrade will be designed and delivered in stages over several years. The staged upgrade is proposed to alleviate traffic congestion and delays currently experienced along single lane sections of Henry Lawson Drive, provide road safety improvements and implement pedestrian safety improvements at Gordon Parker Reserve Bridge. A Preliminary Environmental Investigation (PEI) was prepared by GHD for the proposed upgrade in December 2014. Concept design development and environmental assessments are currently being undertaken for the first stage of the project, Stage 1.

Roads and Maritime engaged Kelleher Nightingale Consulting Pty Ltd (KNC) to prepare an Aboriginal cultural heritage assessment report (CHAR) for Aboriginal heritage within the proposal area, including program of archaeological test excavations. The CHAR has been prepared in accordance with Stage 3 of the Roads and Maritime *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (Roads and Maritime 2011) and NSW Department of Planning, Industry and Environment (DPIE, formerly Office of Environment and Heritage (OEH)) *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011a).

1.2 Location and scope of activity

Roads and Maritime is planning a staged upgrade a 7.5 kilometre section of Henry Lawson Drive between the M5 Motorway at Milperra and the Hume Highway at Lansdowne and to upgrade a one kilometre section of Milperra Road between the intersection of Henry Lawson Drive and the intersection of Ashford Road (hereafter referred to as the study area). The study area is located within the Canterbury Bankstown Local Government Area (LGA), approximately 10 kilometres south of Parramatta and 20 kilometres south west of the Sydney CBD.

1.3 Statutory controls and development context

The proposal is for road infrastructure carried out by Roads and Maritime assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979 (EP & Act)*. Small sections of the proposal impacting on Coastal Wetlands mapped under the State Environmental Planning Policy (Coastal Management) 2018, will be assessed under Division 4.1 of the EP & Act as designated development in accordance with the Secretary's Environmental Assessment Requirements for an Environmental Impact Statement. Aboriginal objects would be harmed by the proposal and an application for an Aboriginal Heritage Impact Permit (AHIP) would be made under section 90A of the *National Parks and Wildlife Act 1974*.

This Aboriginal CHAR has been prepared to support future AHIP applications for the staged development and delivery of the upgrade. It has been prepared in accordance with the Office of Environment and Heritage *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011a). The CHAR complies with the Roads and Maritime PACHCI (Roads and Maritime 2011).

1.4 National Parks and Wildlife Act 1974

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

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

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

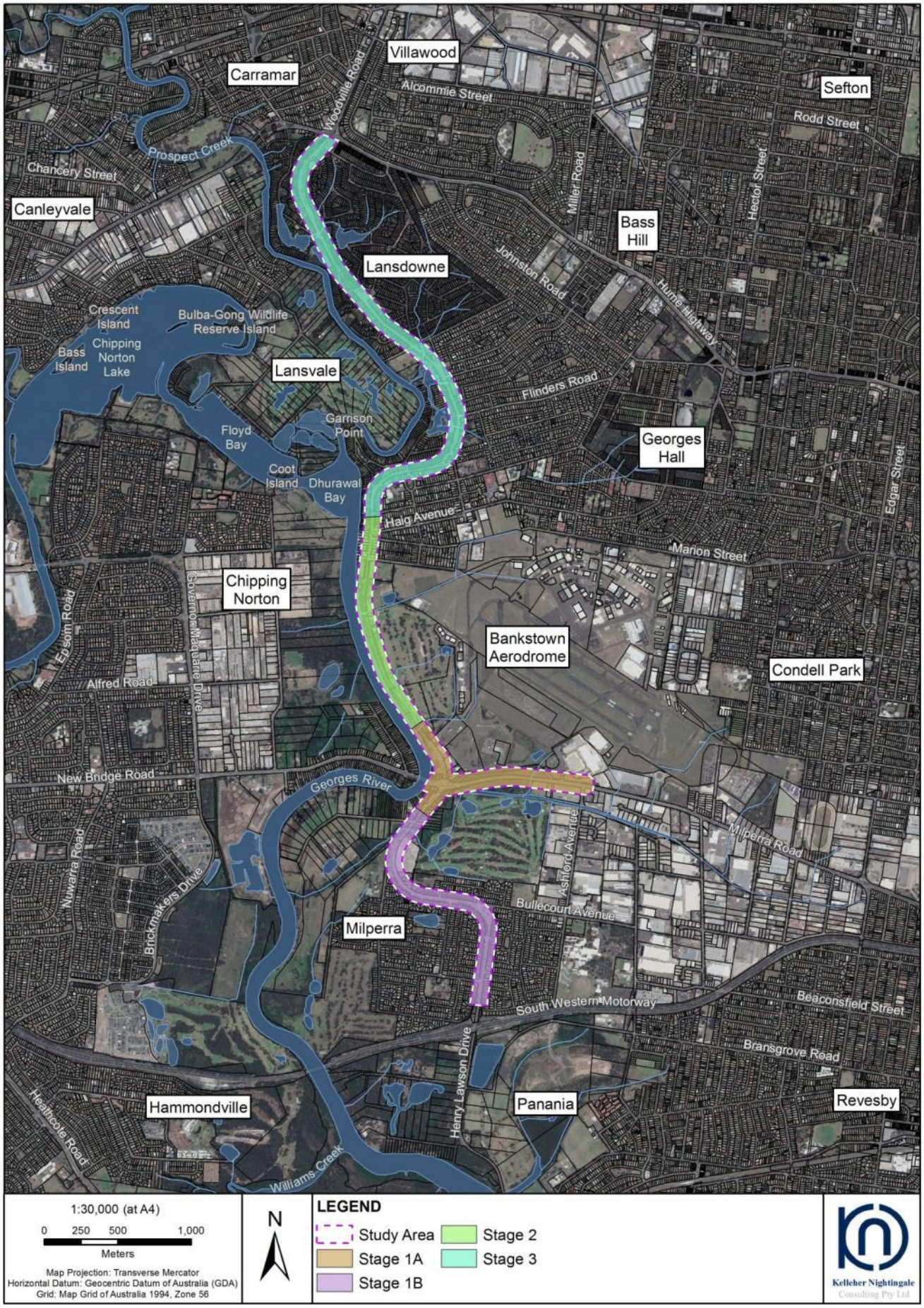

Figure 1. Location of the study area with proposed stages

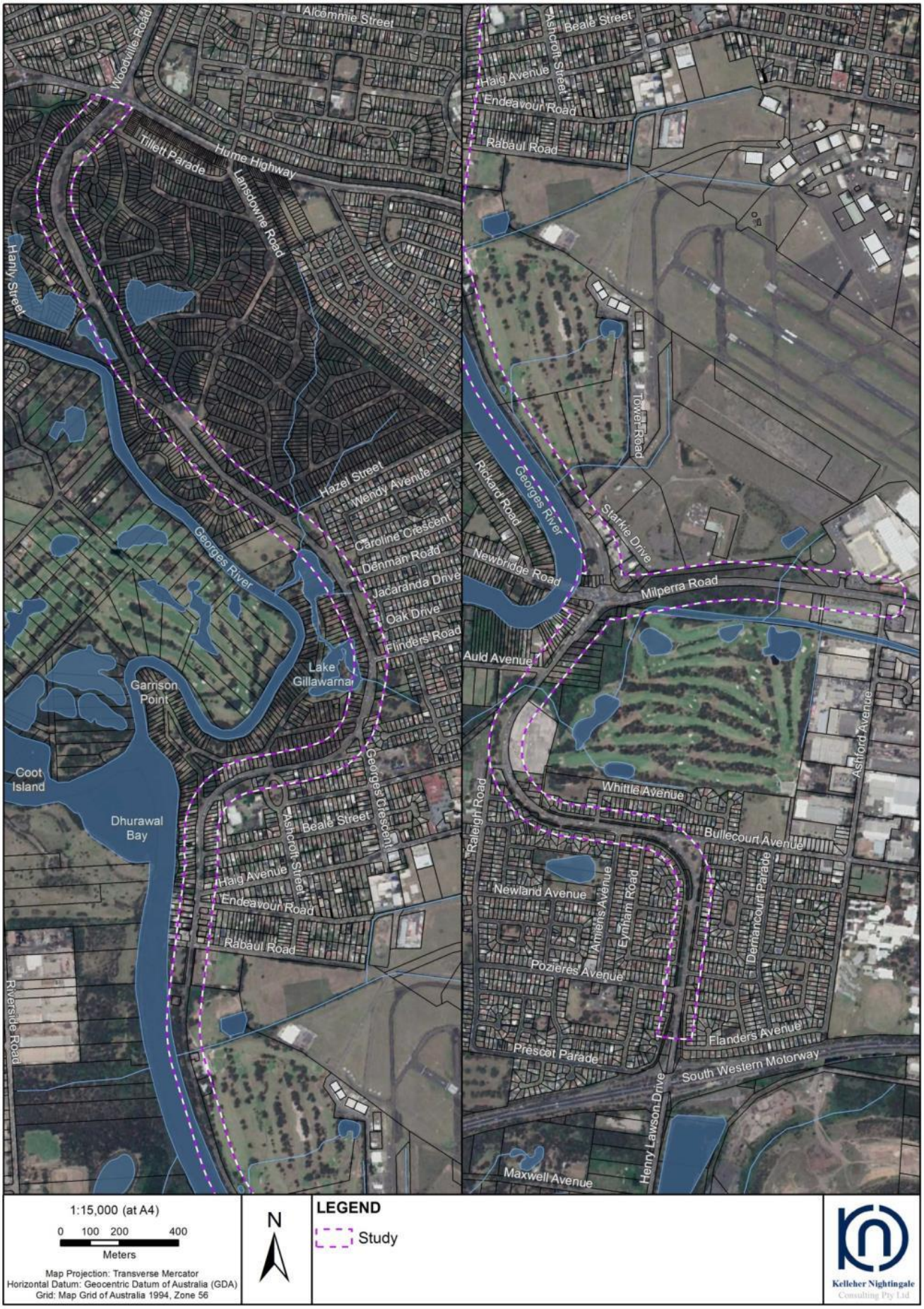

Figure 2. Study area details

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

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

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

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

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

Under section 90 (1) of the Act "the Director-General may issue an Aboriginal heritage impact permit". The regulation of Aboriginal heritage impact permits is provided in Part 6 Division 2 of the Act, including regulations relating to consultation (section 90N).

An AHIP is required for an activity which will harm an Aboriginal object.

1.5 Objectives of the CHAR

The proposed infrastructure works will impact on some Aboriginal objects (sites). Approval obtained under the *National Parks and Wildlife Act 1974* is required for these Aboriginal objects prior to any impact or harm. The proponent would apply for an AHIP under section 90A of the Act.

Clause 80D of the *National Parks and Wildlife Regulation 2009* requires that an application for an AHIP is accompanied by a CHAR. The CHAR is to provide information on:

- the significance of the Aboriginal places that are the subject of the application
- the actual or likely harm to those Aboriginal objects or Aboriginal places from the proposed activity that is the subject of the application
- any practical measures that may be taken to protect and conserve those Aboriginal objects or Aboriginal places
- any practical measures that may be taken to avoid or mitigate any actual or likely harm to those Aboriginal objects or Aboriginal places.

The OEH *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011) provides further guidance on the preparation of a CHAR. This report has been prepared in accordance with the requirements of the Regulation and the OEH guide.

This CHAR has been prepared to accompany an application for an AHIP made by Roads and Maritime for Aboriginal objects within the proposal Stage 3 area, including those associated with Aboriginal sites HLD Site 1 (AS), HLD Site 2 (IF), HLD Site 3 (AS), HLD Site 4 (AS), HLD Site 6 (AS), HLD Site 7 (AS) and HLD Site 8 (IF). The CHAR has also been prepared to accompany an application for a second AHIP that would include HLD Site 5 (IF) which is located within the proposed Stage 1A area.

2 Landscape Context

2.1 Landform and hydrology

The study area is located within the Cumberland Plain, a gently undulating and generally low-lying physiographic region of the Sydney Basin. The Sydney Basin is a large geological feature that stretches from Batemans Bay to Newcastle and west to Lithgow. The formation of the basin began between 300 to 250 million years ago when river deltas gradually replaced the ocean that had extended as far west as Lithgow (Pickett and Alder 1997). The oldest, Permian layers of the Sydney Basin consist of marine, alluvial and deltaic deposits that include shales and mudstone overlain by coal measures. The near surface geology of the Cumberland Plain consists of sedimentary rocks of the Wianamatta Group and Hawkesbury Sandstone that were deposited during the Triassic.

The study area encompasses a low lying hill in the south, floodplains are adjacent to the eastern bank of the Georges River and Prospect Creek, and the western slopes and spur lines of a north west running ridge in the north (Figure 3). The ridgeline forms the watershed between the Prospect Creek catchment area in the west and Salt Pan Creek, located approximately five kilometres east of the study area. Prospect Creek and Salt Pan Creek are major tributaries of the Georges River which meanders north and east along the boundary between the undulating Cumberland Plain to the north and the steep slopes of the Woronora Plateau to the south. The Georges River is an intermediate tide dominated drowned valley estuary that contains fresh water from its headwaters to the area around Liverpool Weir, approximately five kilometres west of the study area. The river contains salt water from the Liverpool Weir to Botany Bay, approximately 15 kilometres east of the study area.

The low lying portions of the study area would have been in the vicinity of a range of resources utilised by Aboriginal people; however, these areas are located within a flood prone zone (RMS 2014: 60). The Georges River has had 19 flooding events between 1873 and 1980 alone, and one in 20 year floods occurred in 1986 and 1988 (AHMS 2012: 20). Flood prone areas are dynamic landscapes where sediment can be removed, reworked or redeposited. These processes can negatively impact the preservation of subsurface archaeological deposits and elevated landforms bordering or within the floodplain are generally found to have greater archaeological potential than the flats.

2.2 Geology and soil landscapes

The underlying geology of the study area comprises Wianamatta Group geology within the slope and crest landforms of the hill and spurs while the low lying areas contain deposits of Quaternary Alluvium. The Wianamatta Group geology within the study area comprises Ashfield Shale on the lower slopes and low lying hill, a thin band of Minchinbury Sandstone, and Bringelly Shale in the higher slopes and crests. Ashfield Shale geology forms the lowest formation of the Wianamatta Group and was formed from subaqueous sedimentary deposits. Ashfield Shale consists of dark-grey to black sideritic claystone and siltstone, grading upward into a fine sandstone-siltstone laminate (Clark and Jones 1991). The Minchinbury Sandstone interface is comprised mostly of quartz and quartzose rock, and represents the original strandline boundary between the alluvial plain sediments of the Bringelly Shale and the shallow-water subaqueous Ashfield Shale (Clark and Jones 1991: 24). Bringelly Shale formed during the late Triassic Period and consists of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff.

The Sydney coastline and major rivers were subject to episodic sea level fluctuations during the late Quaternary Period (within the last 120,000 years) with sea levels reaching a maximum of five metres above present sea level during the last Pleistocene highstand (120,000 years ago) and a minimum of 110-130 metres below present level during the Last Glacial Maximum (26,000-14,500 years ago). Sea levels then rose until 5,000 years ago when they reached the present day level. The Quaternary Alluvium geology within the study area represent the sediments deposited during this time and is classified into three depositional systems (alluvial, estuarine and coastal barrier), each of which is distinguished by a particular range of sediment types, processes and geomorphic features (Troedson and Hashimoto 2008: 7).

The study area contains Cenozoic undifferentiated alluvium (TQa), Holocene floodplain (Qhap), Holocene levee (Qhal) and Quaternary valley fill (Qav) deposits. Cenozoic undifferentiated alluvium (TQa) deposits form low relief plains that consist of silt, clay, gravel, fluvial sand which was deposited between the Tertiary and Quaternary periods. Holocene floodplain (Qhap) deposits form plains that bound active stream channels and consist of silt, fluvial sand and clay. Holocene levee (Qhal) deposits form asymmetric paired or single ridges flanking fluvial channels and consist of fluvial sand, silt, clay. Quaternary valley fill (Qav) deposits form valley head plains and consist of silt, clay, fluvial sand and gravel (Figure 4).

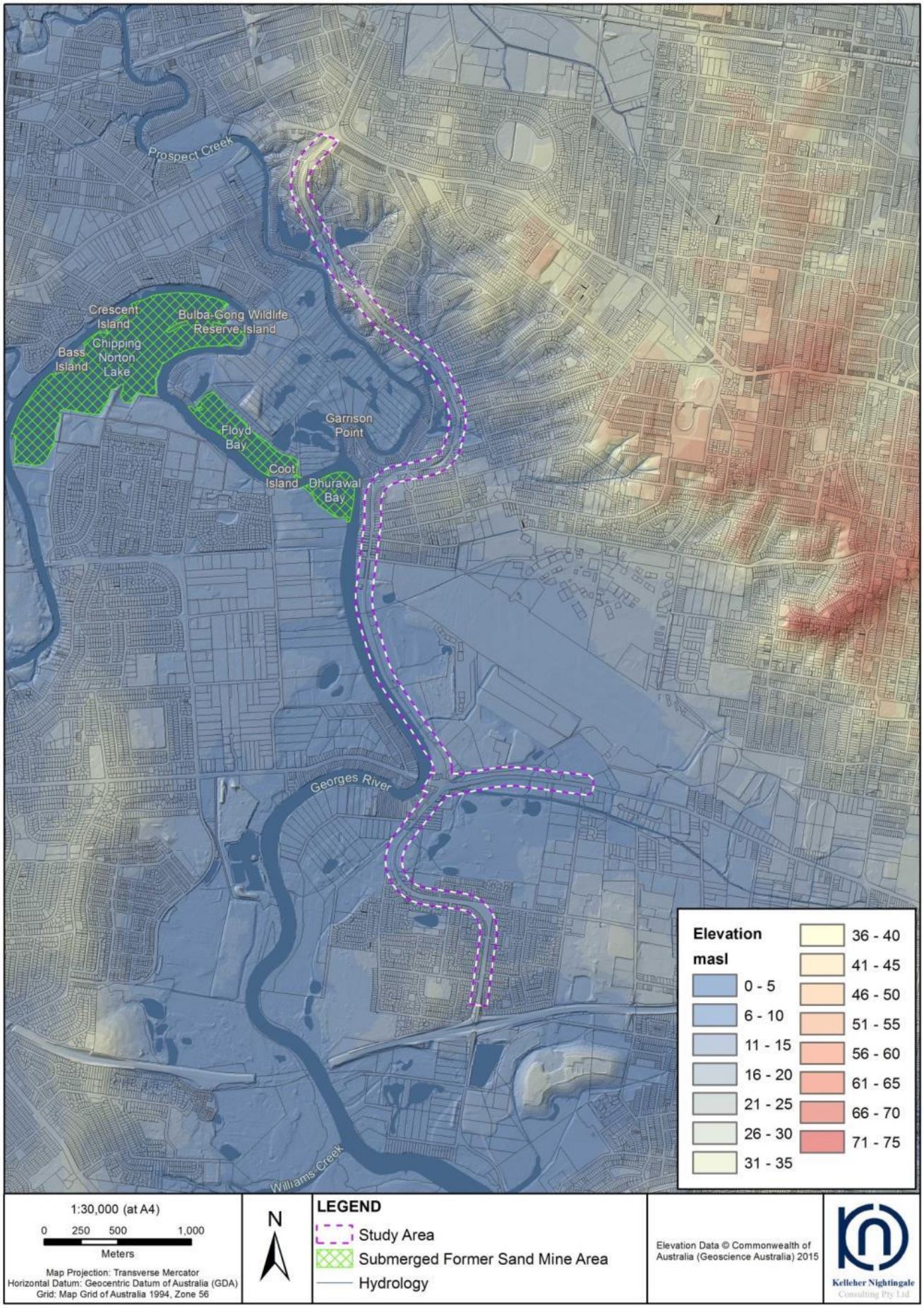

Figure 3. Topography of the study area

In alluvial depositional systems, sediments accumulate by aggradation (building up vertically) or lateral accretion (building out horizontally). Holocene overbank depositional units are spatially arranged relative to the positions of currently and formerly active channels: levees (Qhal) form ridges along channel margins, and floodplains (Qhap) occupy the transitional areas, with backswamps in the channel distal areas. In upstream alluvial plains, such as those within the study area, Holocene overbank units may be flanked and/or underlain by older alluvial deposits (Pleistocene/Quaternary). Pleistocene alluvial deposits may form emergent terraces above the general level of the inset Holocene alluvial plain, or may occur beneath Holocene deposits in the shallow subsurface. Remnants of older alluvium, such as TQa (Cenozoic undifferentiated alluvium) may be found within higher elevations adjacent to Late Pleistocene to Holocene alluvial deposits, or in isolation overlying bedrock (Troedson and Hashimoto 2008: 35).

The study area contains three soil landscapes related to varying interactions between the underlying geology, topography, weathering processes and land use practices. Soils primarily consist of the Richmond soil landscape, which is present on the low lying flat landforms around the river. The residual Blacktown soil landscape occupies the higher slopes and crests atop the Wiannamatta shales. An area mapped as Disturbed Terrain is associated with the Bankstown Airport and areas of reclamation/former sand mining around the river foreshores which have been substantially disturbed by modern land use practices.

The alluvial Richmond soil landscape is associated with Quaternary terraces of the Georges River catchment and consists of reddish brown loamy sand overlying brown sandy clay loam to fine sandy clay loam and alternating layers of reddish to yellowish brown light or medium light clay and heavier, reddish brown to yellowish brown medium to heavy clay, with occasional lenses of reddish brown sandy clay. Iron-indurated gravels may occur in concentrated bands or dispersed throughout these layers. Richmond soils are susceptible to flooding and becoming waterlogged. Stone artefacts and subsurface archaeological deposits may be present in this soil landscape but context and stratigraphic integrity will be variably affected by flooding.

The residual Blacktown soil landscape is developed in situ on the gentle crests and slopes from underlying Ashfield Shale geology and consists of shallow to moderately deep hard-setting red, brown and yellow podzolic soils. It is subject to minor erosion where surface vegetation is not maintained. The soil landscape is often close to water sources and associated resources without being within areas prone to flooding. Previous archaeological investigations within the region have shown that areas within close proximity to permanent water sources are more likely to contain high-density Aboriginal sites. These areas would have provided a relatively stable environment throughout the year for the use of a range of resources.

2.3 Vegetation and land use history

The distribution of native vegetation within the study area has been affected by historic and contemporary land use practices in the region. Prior to 1788, a mixture of native vegetation communities would have extended across the entirety of the Cumberland Plain with distribution determined by a combination of factors including soil, terrain, climate and management by Aboriginal people. Vegetation within the study area consists of areas of exotic grasses with scattered clusters of remnant native vegetation or areas of remnant native vegetation within regional parks and along the riparian corridors of larger waterways. The current study area and its immediate surroundings display remnant communities from eight vegetation classes: Cumberland Shale Plains Woodland/Grassy Woodland; Castlereagh Swamp Woodland/Dry Sclerophyll Forest; Coastal Lagoon Fringing Scrub/Freshwater Wetlands; Cumberland Riverflat Forest, Cumberland Swamp Oak Riparian Forest, Estuarine Swamp Oak Forest/Forested Wetlands; Estuarine Reedland/Freshwater Wetlands; and Estuarine Mangrove Forest/Saline Wetlands. The wide variety of native vegetation and sources of permanent water would have made the region an attractive locale for past Aboriginal people. The variety of habitats would also have encouraged a diverse population of fauna.

The expansion of British settlement into the region began in 1797 with several land grants along the Georges River and Prospect Creek which Governor Hunter called 'Bank's Town' after Sir Joseph Banks. Grants made to George Bass and Matthew Flinders covered the portion of the study area immediately north of the junction of the Georges River and Prospect Creek. Agricultural use of the area was generally limited due to flooding and difficulties in transportation to Parramatta or Sydney; however, a timber industry developed that rapidly cleared the native trees in the region during the 18th Century (GML 2018b: 18, 20).

In the 20th Century, the region contained orchards, poultry and dairy farms, brick makers and sawmills. Henry Lawson Drive was constructed as part of a relief project during the Great Depression in the 1930s and in the 1950s several sand mining pits were cut into the Quaternary Alluvium along the Georges River that were subsequently converted into several bays and an artificial lake called the Chipping Norton Lake (Figure 3). Current land use in the area is predominantly residential and recreational with the Bankstown Airport located to the east of the study area and several golf courses along the river. Landscaping and construction activities associated with land use practices have caused varying levels of disturbance within the study area. In areas of intensive agriculture, road or utility construction or residential, commercial or industrial development, disturbance is generally higher. Channelisation, drainage works and artificial lake construction along the creek lines has also altered the flooding characteristics of the area and contributed to disturbance along the waterways.

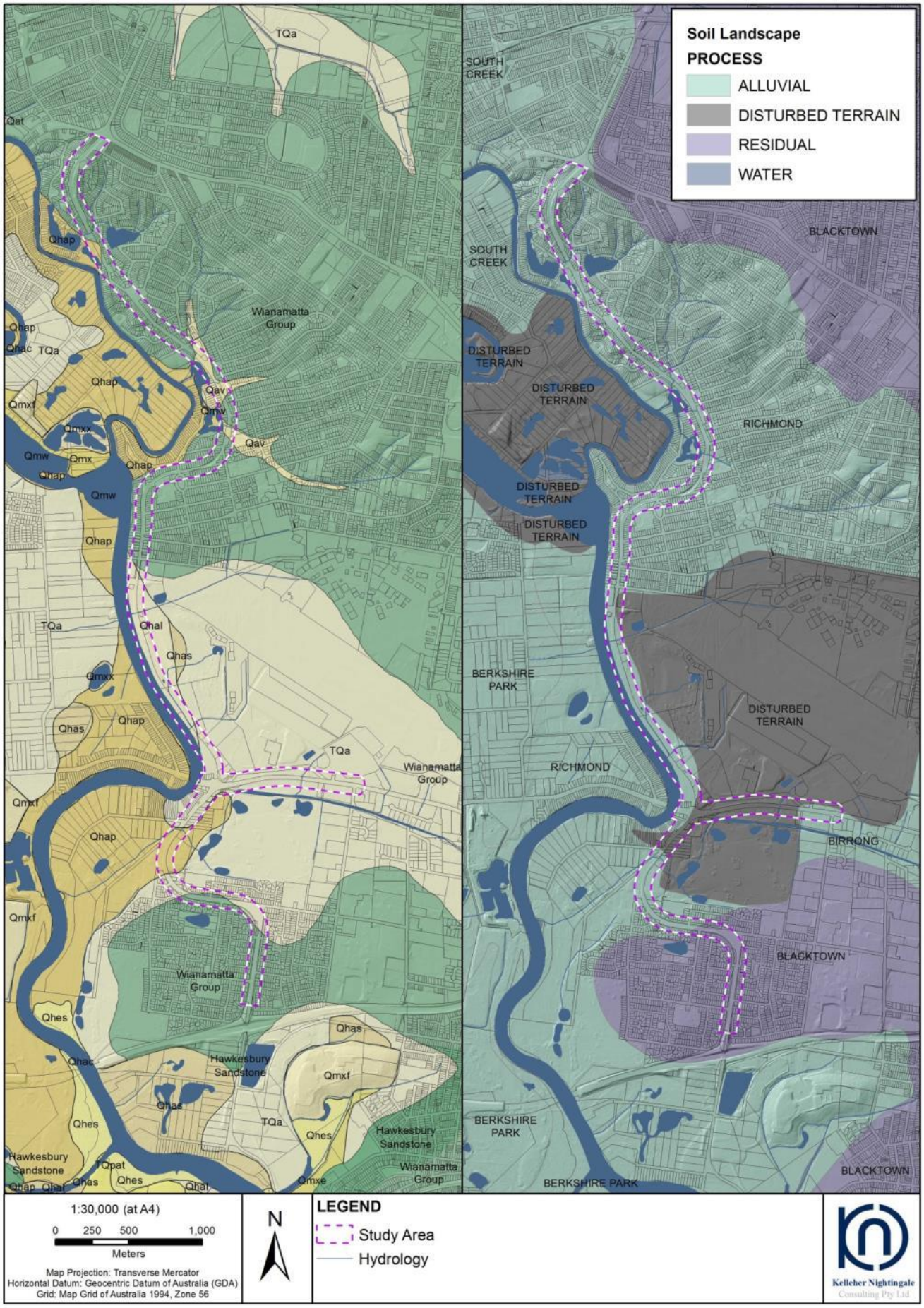

Figure 4. Geology and soil landscapes of the study area

3 Ethnohistoric Context

Over seven days between late April and early May 1770, the crew of a British Royal Navy research vessel called the HM Bark Endeavour explored a bay on the eastern coast of a continent largely unknown to the Europeans at the time. Lieutenant James Cook who commanded the Endeavour had been instructed by the British Admiralty to determine if the continent (which would become known as Australia) existed and, if so, to assess the natural resources and strategic potential of the continent for the United Kingdom. He was also instructed:

> *You are also with the Consent of the Natives to take Possession of Convenient Situations in the Country in the Name of the King of Great Britain: Or: if you find the Country uninhabited take Possession for his Majesty by setting up Proper Marks and Inscriptions, as first discoverers and possessors*

Cook and other members of the Endeavour crew recorded several observations of Aboriginal people as the Endeavour sailed north along the eastern coastline. On 29 April 1770, a group including Lieutenant Cook and a botanist Joseph Banks went ashore on the south side of a bay where Aboriginal people and huts had been seen. The landing was opposed by two Aboriginal men who were armed with wooden spears and shields. The meeting between the two groups devolved into violence with the British shooting at the men and wounding one while the Aboriginal men threw spears and stones at the British. After being fired upon three times, the Aboriginal men withdrew and the British, being unable to establish peaceful contact, took items from the camp including spears and left items that they thought would be accepted as gifts, such as beads. Cook noted that "we could know but very little of their customs as we never were able to form any connections with them, they had not so much as touch'd the things we had left in their huts[sic] on purpose for them to take away" (Cook 1893: 6 May 1770).

Despite finding the continent inhabited and failing to gain the consent of Aboriginal people, Cook proceeded to claim the eastern half of the continent, which he called New South Wales, for the United Kingdom on 22 August 1770. The actions of Cook were part of a series of territorial acquisitions that were ruled or administered by the United Kingdom and would become known as the British Empire (Ferguson 2003). By 1909, the British Empire would encompass almost a quarter of the world's population and landmass (Ferguson 2003: 240). The British Empire was driven by commercial gain and utilised military, civil and religious coercion to control the often larger local populations of its foreign territories (Ferguson 2003). In Australia, the claim of sovereignty and subsequent colonisation of Australia was founded and implemented on the erroneous belief in the superiority of the British civilisation which continues to have ramifications to the present day (Doukakis 2006).

The history of Aboriginal people living on the Cumberland Plain in the late 18th and early 19th centuries is heavily reliant on a small number of contemporary accounts generally written by European military officers or wealthy individuals. These accounts were written as either reports for the British government or personal accounts intended for publication and distribution to a European audience. The accounts of Aboriginal people and illiterate British subjects which have survived were oral histories written down many years later. As such, an account of the Endeavour voyage, based on information from the journals of Cook, Banks and others, was published in 1773 while an account from the Aboriginal people who had been present survived as an oral tradition that was partially recorded during the 1830's and 1840's.

Aboriginal people living throughout Australia at the time of European invasion belonged to a multitude of groups that spoke approximately 250 distinct languages and several hundred dialects (Walsh 1993: 1). The information within the early British accounts regarding the Aboriginal people living on the Cumberland Plain was reliant upon communication that was based on hand gestures and tone of voice (Troy 1993: 12). Watkin Tench, who published his account of the voyage of the First Fleet and the colony to December 1791, noted that his information on Aboriginal people was "made up of detached observations, taken at different times, and not from a regular series of knowledge of the customs and manners of a people with whom opportunities of communication are so scarce as to have been seldom obtained" (Tench 2012: 51). As such, historical accounts from this period provide vague and at times contradictory information (Attenbrow 2002: 22-28). Some of the material within these accounts contains views that are not considered appropriate today and do not reflect the views of the authors of this report.

On 25 April 1787, Arthur Phillip was commissioned Captain General and Governor in Chief of the Territory of New South Wales by King George III of the United Kingdom. The British First Fleet, under the command of Arthur Phillip, arrived on the eastern coast of the Australian continent in 1788 and established a penal colony in a small bay which would subsequently be known as Sydney Cove. The British First Fleet contained over 1,000 people including marines, officials and convicts. Phillip was instructed to pursue peaceful relations with the Aboriginal people while also taking precautions to protect the British colony against attack from them, documenting information on the numbers of Aboriginal people living in the region and advising the British government on the "manner Our Intercourse with these people may be turned to the advantage of this country" (Governor Phillip's Instructions 25 April 1787).

In the first years of the colony, British exploration and expansion of the Cumberland Plain was primarily driven by the need to produce food to support the colony as the food brought with the fleet was limited and Sydney Cover was found

to be unsuitable for farming. British efforts were focused along the major waterways in the Sydney Region which could be traversed relatively easily. During the first three years, Broken Bay, Botany Bay and the Hawkesbury and lower reaches of Georges Rivers were surveyed. In November 1788, the British occupied and established a government farm approximately 20 kilometres west of Sydney Cove where the local Aboriginal people called the area Parramatta and which the British initially called Rose Hill. In the years prior to 1831, successive governors appointed by the British government made land grants of the claimed territory to free settlers, emancipists (former convicts) and non-commissioned officers within the Sydney region (La Criox 1992: 9). In 1791, small lots on the fertile eastern and western slopes of Prospect Hill were granted by Governor Philip to time-expired convicts.

In 1796, Matthew Flinders and George Bass explored the Georges River, including the current study area, in a small boat and by 1797 land grants were made in the area which Governor Hunter called 'Bank's Town' after Sir Joseph Banks. A road used by the British that was referred to as the 'Georges River Old Road' on early parish maps is believed to have been an earlier track used by Aboriginal people (GML 2018: 19). The road ran east from the bank of the Georges River south of the junction with Prospect Creek in general alignment with Milperra Road before aligning with Punchbowl Road across Salt Pan Creek and over the Cooks River to Sydney.

Early British accounts described the Cumberland Plain as a mosaic of Aboriginal family groups that were associated with particular areas of land (Collins 1798: 545). The British noted that there were differences between the Aboriginal people living inland, who they referred to as the 'woods tribes' and the Aboriginal people living along the coast. David Collins noted that they had a different dialect, songs, dances, subsistence and some implements (Collins 1798: 557-589; Tench 1793). The British use of the term 'tribes' when referencing specific Aboriginal groups continued into the late 19th Century and was used with other derogatory language to invoke a perception of the European social superiority over the Aboriginal people of Australia that is incorrect and inappropriate today.

Collins noted that the inland groups had spears inlaid with stones instead of oyster shell and used a type of mesh unlike the nets of the people living along the coast (Collins 1798: 589). Tench observed that the two Aboriginal men from the coast were unfamiliar with the area west of Rose Hill (Parramatta) (Tench 1793:117-118) and that when the men conversed with an Aboriginal man further inland "they conversed on a par and understood each other perfectly, yet they spoke different dialects of the same language; many of the most common and necessary words used in life bearing no similitude, and others being slightly different" (Tench 1793:122).

Tench (1793:230) wrote that the inland groups 'depend but little on fish, as the river yields only millets and that their principal support is derived from small animals which they kill and some roots (a species of wild yam chiefly) which they dig out of the earth'. Berries, Banksia flowers and wild honey were also recorded as foods of the local inhabitants (Collins 1798 [Kohen 1985:9]). A particularly important plant food was the Burrawong (*Macrozamia communis*), which provided a nutritious nut that was pounded and soaked in running water to leach out toxins before the flour-like extract was made into small cakes and baked over a fire (Kohen 1993:8).

Along the rivers and larger creeks, bandicoots and wallabies were caught in traps and snares, while birds were snared using decoys (Collins 1798: 555; Tench 1793). The open woodland of the Cumberland Plain would have played host to possums and gliders and these likely formed a major component of the diet. These were hunted in a number of ways, including smoking out the animal by lighting a fire in the base of a hollow tree, burning large tracts of land and gathering the stranded animals, as well as cutting toe-holds in trees and climbing up to reach them (Kohen 1993:10; Tench 1793:82).

Several of the groups were identified by early British accounts in the vicinity of the study area including the Bediagal (Bè-dia-gal or Bidgigal) associated with the area bound by Botany Bay, the Cooks River, the Georges River and Salt Pan Creek, the Gahbrogal (Cah-bro-gal) who ate estuarine teredo worms they called cah-bro and associated with the present day suburb of Cabramatta, and the Gweagal (Gwea-gal-leon) associated with the southern shore of Botany Bay (Attenbrow 2002: 24-26; Goodall and Cadzow 2009:31). Confusion over the names and territories attributed to Aboriginal groups by the British in this period is likely to have been the result of issues with the sources used and translation in addition to the probability that the organisation of territory and groups was more complex than the British were aware of (Yamanouchi 2007: 109).

During the last decade of the 18th Century, raiding by Aboriginal groups and retaliatory killings by Aboriginal people and the British occurred in areas on the peripheries of the colony, including around Prospect Hill, Toongabbie and outside Parramatta (Collins 1798: 178, 275-276, 292, 304). From 1794, the British settlement on the Hawkesbury River near the present day suburb of Green Hills at Windsor was also a focal point for raiding and attacks (Collins 1798: 304, 326-327).

Pemulwuy, a member of the Bediagal, led a series of raids on farms in the Cumberland Plain for food or as 'payback' for atrocities (Kohen 2005). In response, the British used military force. Collins recorded that "to check at once, if possible, these dangerous depredators, Captain Paterson directed a party of the corps to be sent from Parramatta, with instructions to destroy as many as they could meet with of the wood tribe (Bè-dia-gal); and, in the hope of striking terror, to erect gibbets in different places, whereon the bodies of all they might kill were to be hung" and that "several of these people were killed in consequence of this order; but none of their bodies being[sic] found" (Collins 1798: 416). In March

1797, Pemulwuy led a large group of at least a hundred Aboriginal warriors in a raid on the Government Farm at Toongabbie. After the raid, Pemulwuy's group was followed to the outskirts of Parramatta by armed soldiers and settlers. During the ensuing 'Battle of Parramatta', Pemulwuy was shot at least seven times and taken to a government hospital. Although he was wearing leg irons and still had buckshot in his body and head, Pemulwuy escaped the hospital and by April appeared to have recovered when he was seen with a group of Aboriginal people on the Georges River near Botany Bay (Collins 1798: 44).

On 1 May 1801, Governor King issued a government and general order that the Aboriginal people living near Parramatta, the Georges River and Prospect Hill should be driven back from the British habitations by firing at them and in November of that year he outlawed Pemulwuy and offered a reward for his capture (Kohen 2005). Pemulwuy was killed in June 1802 and Governor King ordered that his head should be preserved in spirits and sent to Sir Joseph Banks for study in England (Philip Gidley King, Government and General Order, 1 May 1801, HRNSW Vol.V: 362; Kohen 2005). King wrote to the Botanist Joseph Banks that although Pemulwuy had been "a terrible pest to the colony, he was a brave and independent character" (Kohen 2005).

British occupation expanded across the south western Cumberland Plain during the first decades of the 19th century with several large areas granted to former soldiers and free settlers while several towns including Liverpool, Campbelltown, Camden and Narellan were established (Liston 1988: 50; Paul Davies 2011). The violence between the British and Aboriginal people continued through 1804 and 1805 with several raids made by Aboriginal people across the region that included an attack on James Dunlap at Prospect in May 1805 (Natives 1804: 2; Natives 1805b: 3) and two stockmen who were killed on John MacArthur's Farm at Camden by Aboriginal people 'from the interior of the mountains" (Sydney 1805a: 3).

In April 1805, a series of meetings between Reverend Samuel Marsden and Aboriginal people under the protection of John Kennedy were held at Prospect Hill in an effort to reconcile the groups (Postscript 1805: 4). Marsden insisted that reconciliation was not possible until the names of the 'principal murders' were provided. The attendees from the Cowpastures provided him with the names of six individuals and a military expedition accompanied by an Aboriginal guide and John Warby was sent out (Postscript 1805: 4; Liston 1988:50). In May 1805, the Aboriginal people well known to the British around Prospect and Parramatta in addition to some strangers from the Cowpastures were allowed to camp between Prospect and the Georges River (Government and General Order, 5 May 1805, HRNSW, Vol. V: 616).

Tedbury (also spelt Tjedboro), son of Pemulwuy, was seen by the British as one of the main perpetrators of the violence during this time and was arrested at Pennant Hill's in May 1805 (Sydney 1805a: 3). He was released in August of the same year after Aboriginal people who assisted the British in capturing an Aboriginal man known as Mosquito gave assurances on Tedbury's future good conduct (Sydney 1805b: 2). During 1809, Tedbury was believed to part of a group of Aboriginal people who threw spears at British landholders on the Georges River and was reported waylaying a man named Tunks near Parramatta with Bundle and another assailant (Sydney 1809a: 2; Sydney 1809b: 2; Liston 1988: 58). Tedbury was shot by Edward Luttrell Jnr at Parramatta in 1810 and is believed to have died the same year. From 1810, the violence between the British and Aboriginal people on the Cumberland Plain appears to have diminished.

British policies regarding Aboriginal people on the Cumberland Plain changed during the early 19th century, largely due to Lachlan Macquarie, who had become governor in 1809. Previously British policies largely ignored Aboriginal people living in the region and Aboriginal Law had continued to be practiced, as illustrated by a punishment ordeal endured by Kogi (also been spelt Gogy, Goguey, Gogie or Koggie) that occurred near Prospect in March 1805. The ordeal was punishment for killing an Aboriginal person and involved Bennelong and Nanberry who threw barbed spears at Kogi from four metres away while he used a shield to defend himself, resulting in Kogi being speared in the hip and back (Natives 1805a: 3; Konishi 2016: 15). Macquarie enacted several policies in an attempt to encourage Aboriginal people living on the Cumberland Plain to adopt Christianity, British social practices and European farming techniques. He established the Parramatta Institution in 1814 as a residential school for Aboriginal children and an annual feast and distribution at Parramatta to encourage Aboriginal people to enrol their children (Irish 2017: 29). The institution would be moved by Governor Brisbane to the Blacktown in 1823 and operated until 1829.

The expansion of European settlement and a period of drought during 1814-1816 saw another period of intensive conflict involving a series of raids and retaliatory killings between Aboriginal groups and the British at Bringelly, Appin and along the Nepean/Hawkesbury River (Liston 1988: 50-51). In April 1816, Macquarie ordered soldiers from the 46th Regiment (South Devonshire) regiment under the command of Captain Schaw, Captain James Wallis and Lieutenant Charles Dawe to form three military reprisal raids to track down, capture or kill all Aboriginal people they came across with no distinction between 'friendly' and 'hostile' (Sydney 1816: 2; Brook and Kohen 1991: 22-36). The reprisal raids were provided British guides including John Warby and Aboriginal guides including Bundle, Budbury, Colebee (son of Yarramundi from the Richmond area), Nurragingy (Creek Jemmy) and Tindale.
Captain Schaw was sent to the Hawkesbury River, Lieutenant Dawe was sent to the Cowpastures and Captain Wallis was sent to Airds and Appin. The raids were frustrated by their inability to make contact with Aboriginal people, leading to the suggestion that the Aboriginal guides were 'cunningly and successfully shielding their "wild" compatriots' (Brook and Kohen 1991: 34); however, Schaw's group killed two Aboriginal 'warriors' and captured a boy at the Macarthur Estate after being tipped off by a local stock keeper while the actions of Captain Wallis' group would lead to the Appin

Massacre (Brook and Kohen 1991: 22-36). Kogi and his group took refuge with friendly British settlers including Charles Throsby at Glenfield, in the suburb of Casula, to avoid the conflict in 1816 (Liston 1988: 58).

Wallis, after being deserted by his Aboriginal guides Bundle and Budbury and his British guide John Warby, had followed several reported sightings across the south western Cumberland Plain without encountering Aboriginal people (Liston 1988: 54). Reported sightings of Aboriginal people on Broughton's farm at Appin lead the group further south and on the morning of 17 April 1816 they killed at least 14 Aboriginal men, women and children by shooting and driving the group over the gorge of the Cataract River. The bodies of two men, Durelle and Conibigal (Cannabayagal) were "hung from trees on Broughton's farm as a warning to others" (Liston 1988: 54). Macquarie in an article on the raids stated that "although the result has not been altogether so successful as might have been wished, yet there is little doubt but it will ultimately tend to restrain similar outrages, and a recurrence of those barbarities" (Sydney 1816: 2); however, conflict continued throughout 1816 and on 20 July, Macquarie issued a proclamation that banned Aboriginal people from carrying weapons, banned traditional customs relating to punishment and limited the number of Aboriginal people allowed to gather within the colony (Campbell 1816: 1).

The conflict eventually ended through the outlawing of individuals and an eventual amnesty in November 1816 (Liston 1988: 54-55). In May 1816, Macquarie presented Nurragingy with a brass breastplate inscribed 'Chief of the South Creek/Wianamatta Tribe' as an Order of Merit and granted him and Colebee a parcel of land on South Creek/Wianamatta/Wianamatta as a reward for their assistance (Brook and Kohen 1991: 37). Macquarie established the practice of giving metal breastplates (also referred to as kingplates, gorets or badges) to individuals that the British identified as 'chief' of the district they resided in and who would be accountable to the British governor for the conduct of Aboriginal people in that district (Irish 2017: 30-31). The practice undermined Aboriginal society by rewarding individuals which the British felt were useful and who may not have been recognised by their communities as leaders.

During the first half of the 19th century, the Aboriginal people of Cumberland Plain lived in a range of circumstances that were increasingly entangled with the British economically while also remaining socially separate. The settlements and land grants restricted access to areas that were traditionally used by Aboriginal people and drove the groups who had traditionally lived in these areas to move away or to seek employment as labours or stockmen in settlements and on the large land grants in the region. Aboriginal people continued to act as guides for the British as they explored areas outside the Cumberland Plain with Budbury guiding Governor Macquarie to the Nattai River in 1815 and Bundle guiding Meehan, Throsby and Hume on their attempt to find an overland route to Jervis Bay in 1818 (Yamanouchi 2007: 24). Kogi, Budbury and Bundle were also recorded as trackers for the British during this period and Bundle was appointed a constable of Upper Minto in 1822 (Liston 1988: 57-59; McLaren 2018: 505).

Others occupied areas on the fringes of the settlement where the British believed the land was unsuitable for agriculture. At the junction of Harris Creek and Williams Creek in what is now the suburb of Voyager Point, Kogi and his descendants fished and grew crops until at least the 1840's (Goodall and Cadzow 2009: 57-58). Despite the increasing entanglement of Aboriginal people and British economy in the 19th Century, Aboriginal Law continued to be practiced, with Kogi and his group attending a gathering in Sydney in 1824 to perform payback while corroborees were reported at Camden Park, Denbigh and Denham Court until the at least the 1850s (Liston 1988: 57; Hassall 1902: 3). The historical accounts also show that Aboriginal people continued to live within their Country while also traveling to other areas for official occasions, such as the annual feasts at Parramatta.

The humanitarian movement in Britain in the 1830's drove a change in government policy towards the Indigenous inhabitants of the British Empire that recognised the harmful process of colonisation and dispossession (Perche 2015: 51). During the 1830's and 1840's several committees were formed to examine the condition of Aboriginal people living in Australia and in 1845 a report on New South Wales was published that included testimony from Maroot (also called Boatswain Maroot) an Aboriginal man from the north shore of Botany Bay. Maroot, who was born about 1793, described the neighbouring Aboriginal groups as the Liverpool tribe, which he called the Cobrakalls after a kind of a worm eaten in the wood, and the Five Islands tribe who spoke a different language.

In February 1883, the NSW Legislative Assembly established the NSW Board for the Protection of Aborigines (NSWBPA) to financially support existing stations, administer missions, and to provide blankets and rations (Doukakis 2006: 9). The protection advocated by the NSWBPA was not the preservation of Aboriginal culture and beliefs, but instead a continuation of the belief that Aboriginal people needed to change their lifestyle and beliefs in order to assimilate (SCLCA 2006: 14). The NSWBPA was tasked with "the elevation of the race, by affording rudimentary instruction, and by aiding in the cost of maintenance or clothing where necessary, as well as by grants of land, gifts of boats, or implements of industrial work" (NSWLA 1883: 920). The NSWBPA determined whether an individual was Aboriginal, primarily on the basis of skin colour which resulted in the separation and alienation of members of the Aboriginal community (HREOC 1997: 24).

During the second half of the 19th Century, population growth and new industries began to expand into areas previous on the peripheries of the settlement. In 1847, Kogi's grandson Johnathan Goggy wrote a petition to stop his neighbour from taking the land at Voyager Point that his family had been living on since the early 19th Century (Goodall and Cadzow 2009: 57-58). The migration of Aboriginal people from outside the Cumberland Plain for economic or social reasons was

also documented in the the second half of the 19th Century and became a dominant issue for George Thornton (Goodall and Cadzow 2009: 110-113). The formation of the NSWBPA saw the adoption of an isolationist policy that shut down most informal Aboriginal settlements across the Sydney region and moved the inhabitants into reserves at La Perouse, Sackville and elsewhere in the state. The Aboriginal people living within the reserves were effectively segregated from the rest of the population and many were moved away from their traditional lands.

The publication of Darwin's *On the Origin of Species* in 1859 and an increasing interest in the study of human behaviour and societies during the mid 19th Century in Europe resulted in the publication of several studies on Aboriginal culture and languages by anthropologists including M. Everritt, R. H. Matthews, A.W. Howitt and W Baldwin Spencer (Thomas 2007: 89). As a result of these studies, Darug (also referred to as Daruk, Dharuk, Dharook, and Dharug), Gandangarra (also referred to as Gun'dungar'ra and Gun-dung-ur'ra) and Dharawal (also referred to as Thurrawal or Thur'rawal) began to be used in reference to the languages of the traditional inhabitants of the south western Cumberland Plain (Attenbrow 2002:33).

Mathews stated that 'The Dharuk speaking people adjoined the Thurrawal on the north, extending along the coast to the Hawkesbury River, and inland to what are now Windsor, Penrith, Campbelltown, and intervening towns' (Matthews 1901:155 [Attenbrow 2002: 32]). Dharawal was thought to have been spoken across an area stretching from the east coast (i.e. Botany Bay) to as far west as Camden and as far south as the Shoalhaven River while Gandangarra is thought to have been spoken by Aboriginal people that inhabited areas westward and south west of the Dharawal (i.e. west of the Nepean River and into the Blue Mountains) (Attenbrow 2002: 32; Liston 1988:49). The information within the publications was gathered from Aboriginal people who were often unacknowledged including Emma Timbery, a Dharawal woman who was living at La Perouse and Jimmy Lowndes who provided Matthews with information on the Darug, Dharawal and Gandangarra (Goodall and Cadzow 2009: 86; Thomas 2007: 3).

On 1 January 1901, the Commonwealth of Australia was established and the Constitution of Australia came into effect. The constitution mentioned Aboriginal people in Section 51(xxvi) where they were excluded from part of the people which the Commonwealth government could make *laws for the peace, order and good government* and Section 127 which excluded Aboriginal people from *reckoning the numbers of the people of the Commonwealth, or of a State or other part of the Commonwealth*. The reason for the wording of these sections was not recorded; however, the ramifications of Section 51(xxvi) was to keep the administration and control of Aboriginal people in the hands of the state governments while Section 127 excluded Aboriginal people from having a role in Federal politics (Gardiner-Garden 2007: 4).

Between 1909 and 1969, the NSW Government introduced legislation that is commonly referred to as the 'Protection Acts' which gave the NSWBPA increasing control over the lives of Aboriginal people and were used to implement "policies of protection, separation, absorption and assimilation of Indigenous populations, depending on the prevailing philosophy of governments at the time" (SCLCA 2006: 7). The *Aborigines Protection Act 1909* gave the NSWBPA statutory powers in relation to reserves which it defined as "area of land heretofore or hereafter reserved from sale or lease by the Governor, or given by or acquired from any private person, for the use of aborigines". The statutory powers included the appointment of managers, power to remove people from reserves, ownership of structures, livestock and other items within the reserves, and the ability to apprentice Aboriginal children living in the reserve. The *Aborigines Protection Amending Act 1915* gave the board full control of Aboriginal children, including with the ability to apprentice Aboriginal children under circumstances the board thought were desirable, and to removing them to a home or institution if they refused.

The Protection Acts were used by the NSWBPA to implement policies separating Aboriginal children from their parents in order to encourage "the conversion of the children to Christianity and distancing them from their Indigenous lifestyle" (SCLCA 2006: 8). The children were placed into state run homes including Cootamundra Girls Home and Kinchela Aboriginal Boys Training Home and would become known as the stolen generation. The *Bringing them Home Report*, published in 1997 documented the harsh and often abusive treatment of the children in state run homes that lead to multitude of disadvantages (HREOC 1997: 11-13).

In the early 20th Century, several camps were present along the Georges River including at Salt Plan Creek where an Aboriginal community developed around a property purchased by Ellen Anderson and her husband Hugh Anderson. Ellen was the daughter of Bi-yar-rung, a Gweagal woman known as Biddy Giles and had been taken to the Maloga Mission near Moama on the Murray River in 1881 where she met and married Hugh. By 1926, 30 people lived at Salt Plan Creek where they were they were largely safe from the NSWBPA (Goodall and Cadzow 2009: 135-136). The Aboriginal community at Salt Pan Creek became part of growing activist movement in the 1920s and 1930s which included Ellen and Hugh's son Joe Anderson.

Plate 1. Ellen Anderson with her husband Hugh at their home on Salt Pan Creek, now Charm Place Peakhurst c1925 Image from State Library of New South Wales: http://archival.sl.nsw.gov.au/Details/archive/110318614

In 1937, the Australian Aborigines' League was established to campaign against discriminatory legislation. The Aborigines Progressive Association was cofounded in the same year. On 26 January 1938, the 150th anniversary of the beginning of British occupation in Australia, the Aborigines Progressive Association supported by the Australian Aborigines' League, held the Day of Mourning & Protest in Sydney. The Day of Mourning & Protest was organised to generate public awareness of the civil rights issues and included many Aboriginal civil rights activists. An appeal to the citizens of the Australian Commonwealth was published as part of the Day of Mourning & Protest in which it was argued that state policies towards Aboriginal people were hypocritical and did not protect them but instead made Aboriginal people "deprived of ordinary civil legal rights and citizenship, and we[sic] are made a pariah caste within this so-called democratic community" (Patten and Ferguson 1938: 3). It argued against charity and instead demanded "FULL CITIZEN STATUS and EQUALITY WITHIN THE COMMUNITY" (Patten and Ferguson 1938: 12)

By the mid-1960's, Aboriginal opposition to assimilation was strengthening and an Indigenous civil rights movement was growing under the banner of self-determination. On 27 May 1967, a referendum was held in which Australians voted to change the Australian Constitution to give the Commonwealth Parliament power to make laws with respect to Aboriginal people wherever they lived in Australia and to make it possible to include Aboriginal people in national censuses. The Protection Acts were predominantly repealed by the *Aborigines Act 1969* and the Aboriginal community were, for the first time since 1788, granted the same rights as other Australian citizens.

In 1972, the Whitlam government officially changed the approach to Aboriginal affairs from a policy of assimilation to one of self-determination. The Aboriginal and Torres Strait Islander Commission (ATSIC) was established, composed of Indigenous peoples whose role was to maximise participation of the community in the development and implementation of policies that affected them. Self-determination brought significant challenges to many Aboriginal communities, who were often left under-resourced and unequipped to meet the challenges imposed upon them by top-down approach of the new system. ATSIC was abolished following election of the Howard government in 1996.

The long struggle for recognition, self-determination and acknowledgement forms part of the Aboriginal cultural heritage story and lived experience of contemporary Aboriginal people. New South Wales has the largest Aboriginal population in Australia and the Aboriginal people of New South Wales "continue to fight to protect cultural heritage and maintain cultural practices" (Hunt and Ellsmore 2016: 78). Members of the contemporary Aboriginal community continue to experience connection with the area through cultural and family associations.

4 Archaeological Context

4.1 Database Search (AHIMS)

The Aboriginal Heritage Information Management System (AHIMS) is a database operated by the (NSW) Office of Environment and Heritage (OEH) and regulated under section 90(Q) of the (NSW) *National Parks and Wildlife Act 1974* (NPW Act). AHIMS contains information and records related to registered Aboriginal archaeological sites (Aboriginal objects, as defined under the NPW Act) and declared Aboriginal places (as defined under the NPW Act) in NSW. A search of AHIMS was conducted on 26 September 2019 to identify registered (known) Aboriginal sites or declared Aboriginal places within or adjacent to the study area (Client Service ID 452619). The search results are attached as Appendix A. The AHIMS Web Service database search was conducted within the following coordinates (GDA, Zone 56):

Eastings: 312345 - 314681
Northings: 6241455 - 6248628
Buffer: 200 metres

The AHIMS search results showed:

33	**Aboriginal sites are recorded in or near the above location***
0	**Aboriginal places have been declared in or near the above location**

The distribution of registered Aboriginal sites within these coordinates is shown in Figure 5, with site features ('site types') listed in Table 1 below.

Table 1. Frequency of site types from AHIMS database search*

Site Context	Site Feature	Frequency	(%)
Open	Artefact	5	*15.2*
	Artefact; Potential Archaeological Deposit (PAD)	3	*9.1*
	Modified Tree (Carved or Scarred)*	17*	*51.5**
	PAD	7	*21.2*
	PAD; Aboriginal Resource and Gathering	1	*3*
Total		33	*100*

*Sixteen AHIMS registration listed as 'Modified Tree (Carved or Scarred)' are not Aboriginal archaeological sites. These recordings are listed on the AHIMS database as 'Not a Site' and comprise trees with bark removal scars that were subsequently determined to not be of Aboriginal origin, located around the Riverlands Golf Course adjacent to the M5 South Western Motorway (Figure 5). The true number of registered, valid Aboriginal archaeological sites within the AHIMS search area is therefore 17, the majority of which comprise open context artefact sites (open artefact scatters, open campsites and isolated finds)(n=5, 29.4%) and areas of PAD (n=7, 41.2%). Three areas of PAD also had associated surface artefacts (17.6%) and one further PAD was associated with an area of Aboriginal Resource and Gathering (5.9%). The remaining, valid registration for a modified tree represents 5.9% of valid sites in the search area.

Twelve previously registered AHIMS sites are located within the study area. The sites consist of two open artefact sites (HLD Site 2 (IF) and HLD Site 5 (IF)), three open artefact sites with associated areas of PAD (HLD Site 1 (AS + PAD), HLD Site 3 (AS +PAD) and HLD Site 4 (AS + PAD)), six PADs (HLD PAD 1-HLD PAD 6) and one Aboriginal Resource and Gathering with associated PAD (HLD Resource Zone 1 with PAD). Subsequent testing of the PADs confirmed they contained Aboriginal objects (see Section 5).

4.2 Other heritage registers and databases

Other sources of information including heritage registers and lists were also searched for known Aboriginal heritage in the vicinity of the study area. These included:

- Bankstown Local Environmental Plan 2015
- Roads and Maritime s. 170 Heritage and Conservation Register
- State Heritage Register and State Heritage Inventory
- Commonwealth Heritage List
- National Heritage List
- Australian Heritage Places Inventory
- Register of the National Estate (non-statutory list).

No other Aboriginal archaeological sites or Aboriginal heritage items listed on these heritage lists were situated within the study area or in the vicinity.

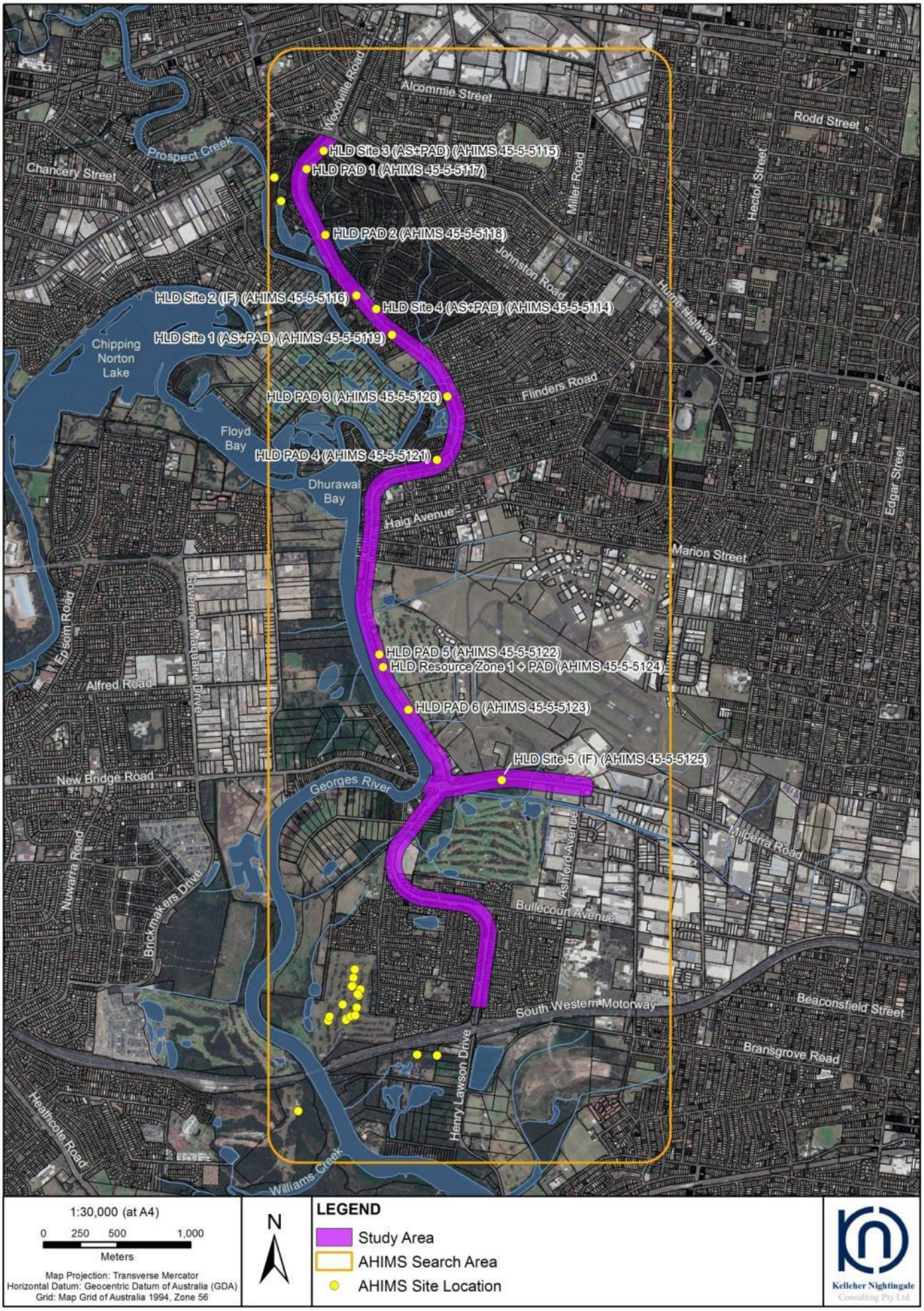

Figure 5. AHIMS search results

4.3 Previous archaeological assessments in the vicinity of the study area

Previous archaeological investigations undertaken in the vicinity of the study area and along the Georges River foreshores have generally taken the form of archaeological field surveys and test excavations for proposed commercial, industrial and residential development projects. A summary of the relevant investigations is presented in this section.

Georges River Estuary
Kayandel Archaeological Services (Kayandel) undertook a cultural heritage study for the Georges River Estuary to inform the development of an Estuary Management Plan (Kayandel 2010). The assessment included both Aboriginal and non-Aboriginal (historical) heritage and comprised a high level desktop review of existing information and assessment from the Liverpool Weir to Botany Bay. Background research on Aboriginal landscape use of similar estuarine environments identified that sites "could potentially have included shell and fish refuse dumped into estuaries when shellfish were consumed in canoes, spear tips or barbs and fish hooks that were lost during fishing, fish traps, marked trees used for lookouts, as well as shell processing and domestic sites on land adjacent to estuaries" (Kayandel 2010:15).

A total of 112 Aboriginal archaeological sites were found to have been recorded on the AHIMS database within immediate proximity to the Georges River. The sites consisted of shell middens within rockshelters and open contexts (n=79), rockshelters with pigment art (n=28), stone artefacts within rockshelters and open contexts (n=21), engraving art (n=3), trees with bark removal scars (n=3), areas of potential archaeological deposit (PAD) (n=3), grinding grooves (n=1) and a burial site (n=1). The distribution of site types from west to east along the study area was then analysed, with some patterning evident. The majority of open artefact scatters were located west of Mill Creek. All of the (closed context) shelter middens were recorded between Deadmans Creek and Rocky Point/Taren Point.

Open context midden sites had a wider distribution than closed context middens, but the majority were recorded east of Green Point/Como Bay. The three engraving sites were recorded between Lime Kiln Bay and Rocky Point, on the northern side of the river. Some of the variation in site distribution relates to underlying geology, with sandstone outcrops suitable for the formation of rockshelters not occurring along the entirety of the study area, however it was considered that the infrequency of middens within the western part of the estuary was notable, possibly related to variation in the ecology of shellfish and/or to cultural factors in the way the estuary was utilised (Kayandel 2010:19).

Henry Lawson Drive Rockshelter
An archaeological investigation of Henry Lawson Drive Rockshelter, located approximately five kilometres south east of the current study, was undertaken in the early 1970's. The site consisted of a west facing rockshelter with an overhang 16 metres long and two metres wide with an internal midden deposit retained by substantial rock fall at the entrance. An external midden deposit was present beyond the rock fall and at least seven hand stencils of red ochre were present on the back wall of the shelter, one metre above the ground surface. The rockshelter was located within sandstone geology at the point where Little Salt Pan Creek joins the Georges River. The artefact assemblage from archaeological excavation of the midden deposits inside and outside the shelter conducted during the 1970s was reanalysed by Hiscock in 2003.

An area of four square metres was excavated near the rear wall of the shelter where substantial rockfall had preserved archaeological deposit and an additional 50 centimetre square was excavated outside the shelter. Within the shelter, the deposit contained five stratigraphic units with midden material principally recovered from Level III in the middle of the stratigraphic sequence. This depth yielded a radiocarbon age estimate of 870 ± 95 years BP (SUA-59). The midden shell material was predominantly oyster (*Saccostrea glomerata*) with low quantities of other molluscs including hairy mussel (*Trichomya hirsuta*) and Hercules Club Whelk (*Pyrazus ebeninus*) and animal bones. The deposit outside the shelter did not contain midden material and a charcoal sample taken 55 centimetres below the ground surface and in association with a stone artefact yielded a radiocarbon age estimate of 5240 ± 100 years BP (SUA-60). The excavation did not recover artefacts within the 35 centimetres of deposit above the charcoal sample (Hiscock 2003: 66)

In total, the excavation recovered an artefact assemblage comprising over 2,000 flakes, 16 non-bipolar cores, 29 bipolar cores, 77 backed artefacts, 40 scrapers and two burins. The cores and formalised tools were predominantly made from silcrete with smaller quantities of chert, volcanic material, mudstone, quartz and quartzite. The analysis of cores and backed artefacts found that cores from the site had been reduced using a bipolar technique to extremely small sizes and that the artefacts were, in general, reduced more than artefacts from other sites in eastern New South Wales. The analysis inferred that hand held direct percussion flaking was initially undertaken on cores and that bipolar techniques were then used once the cores were reduced to a certain size. The results of the analysis were interpreted as indicating that "high costs of raw material replacement and/or comparatively sedentary residential systems at this locality would be obvious mechanisms capable of causing high levels of reduction" (Hiscock: 2008: 72). This suggests a relatively less mobile population than was previously assumed, at least for this specific area during this particular time period. Abundant resources available from the Georges River and surrounding area would have made a more sedentary economic regime possible, while such decreased mobility would reduce access to silcrete.

The hand stencils at Henry Lawson Drive Rockshelter were analysed by McDonald as part of her research on Sydney Basin rock art (McDonald 2008). McDonald noted that the hand stencils were faded and comparatively low down on the

back wall of the shelter, indicating that "the stencils predate the midden period and relate to the lower units" (McDonald 2008: 223). As such, McDonald suggested that the stencils dated to c. 5,800 years ago (McDonald 2008: 223). McDonald's research found that hand stencils were the predominant identifiable pigment motif in rockshelters within the Sydney Basin; however, it was also noted that only 60% of all pigment motifs could be classified due to poor preservation and ad hoc production (McDonald 2008: 340-341). Differences in the colour of ochre used, presence or absence of motifs and proportion of motifs were identified in the rock art of Sydney Basin and the Georges River was identified as the boundary between two stylistic groups (McDonald 2008: 341).

Moorebank Intermodal Terminal and SIMTA Site

The proposed Intermodal Terminal at Moorebank, approximately five kilometres west of the current study area, was subject to a series of archaeological investigations, including survey and test excavation between 2010 and 2014 (Navin Officer 2014). The area is situated on a terrace of Quaternary alluvium adjacent to the eastern bank of the Georges River, opposite the junction of Glenfield Creek. Archaeological field surveys of the area, conducted between 2010 and 2014 identified three surface artefact scatters (MA1,4 and 5), two isolated surface artefacts (MA 2 and 3), three trees with bark removal scars of possible Aboriginal origin and four areas of potential archaeological deposit (PAD). The surface artefact scatters contained low artefact densities of less than five artefacts. The artefacts were predominantly unmodified flakes and flake fragments. The majority of artefacts were made from silcrete while low quantities of artefacts made from indurated mudstone/tuff (IMT), fine grained siliceous material (FGS), rhyolite and quartzite were also recovered. Several tools were also recovered including two multi-platform cores and one flake of IMT with retouch. The majority of sites were identified on the terrace landform within 250 metres of the Georges River.

A series of archaeological test excavations were undertaken for the proposed Intermodal Terminal in 2010, 2013 and 2014. A total of 264 artefacts were recovered from 26 of the 59 test pits excavated. The artefacts were predominantly recovered from two areas: MAPAD1 (n=130) and MA5 (n=110) with one test pit at MA5 (Pit 7) containing 62 artefacts. The artefact assemblage consisted of unmodified flakes and flake fragments (n=163), retouched flakes (n=13), utilised flakes (n=7), cores (n=12) and backed artefacts (n=6). The artefacts were predominantly made from silcrete (n=135) while artefacts made from quartz (n=46), quartzite (n=40), basalt (n=10) and smaller quantities of siltstone, FGS, IMT, dolerite and chert were also recovered (Navin Officer 2014: 62). The majority of artefacts were recovered from the upper 50 centimetres of the deposit with most of these located between 10 and 30 centimetres below the ground surface. The subsurface deposit consisted of relatively deep sandy soils with modern disturbance noted across the tested area within the upper 30 centimetres of the deposit. The investigations found that the distribution of stone artefacts were primarily focused along the edge of the terrace with a generally continuous low to moderate artefact density across the area and discrete areas of higher artefact density (Navin Officer 2014: 82).

In 2010, an archaeological assessment of the proposed SIMTA Site, located opposite the proposed Moorebank Intermodal Terminal on the eastern side of Moorebank Avenue, was undertaken (AHMS 2015). The assessment identified seven isolated artefacts and three areas of potential archaeological deposit (PAD). The artefacts consisted of three cores, one complete flake and three flake fragments/pieces that were made from silcrete (n=4), IMT (n=2) and chert (n=1). The artefacts were identified within exposed contexts including tracks and within introduced gravels. The areas of PAD were identified on a terrace landform overlooking the Georges River (PAD 1) and adjacent to Anzac Creek (PADs 2 and 3). The assessment found that most of the area had been heavily disturbed and had low potential for the preservation of archaeological materials (AHMS 2015: 22).

An archaeological test excavation was undertaken in 2015 at PAD 2 and PAD 3. The test pits were located on the banks of the Georges River on the western side of Moorebank Avenue (PAD 2) and either side of Anzac Creek on the eastern side of Moorebank Avenue (PAD 3). The pits contained relatively deep deposits with an average depth of 70 centimetres that consisted of course silt overlying indurated coffee rock and/or heavy clay (AHMS 2015: 36). A total of 28 Aboriginal artefacts were recovered from five of the eight test pits excavated at PAD 2; however, no artefacts were recovered from the seven test pits excavated at PAD 3.

The artefact assemblage from PAD 2 predominantly consisted of unmodified flakes and flake pieces/fragments (n=20) while two backed artefacts, three cores, one core fragment, one retouched scraper and one artefact with useware also found. The majority of artefacts were made from silcrete (n=10) or IMT (n=10). Smaller quantities of artefacts made from quartz (n=5) and chert (n=3) were also found. The material types were distributed unevenly through the deposit with the IMT artefacts occurring between Spits 5 and 9 while the silcrete artefacts were recovered between Spits 2 and 6. Three OSL samples were taken from the test pit with the highest artefact density at PAD 2. The OSL dates were interpreted as indicating that the sand body in which the SIMTA Site was located formed in the last 60,000 years. An OSL sample from slightly above the upper artefact assemblage returned an age of 3,400 years ago while a sample from slightly below the lower assemblage returned an age 18,000 year ago (AHMS 2015: 45).

Riverland Golf Course

A series of investigations have been undertaken within the Riverland Golf Course, located approximately 100 metres west of the current study area, for subdivision and development planning. The Riverland Golf Course is situated on Quaternary terraces and levees on the eastern side of the Georges River. Preliminary assessments were undertaken by Heritage Concepts (2007) and AHMS (2008). These studies noted that while the flood plains of the Georges River were likely used by Aboriginal people in the past, large-scale flood events have likely reduced the potential for any Aboriginal objects to survive in flood prone areas. Additionally, Aboriginal landscape use within the floodplain was considered likely to be transitory, related to resource-gathering rather than sustained camping or artefact manufacture, and would therefore probably leave only a low density of artefacts. It was considered that higher archaeological potential was present on elevated areas above the flood zone where modern disturbance levels were low.

AHMS undertook a further Aboriginal heritage study ahead of proposed rezoning in 2012 (AHMS 2012). The assessment comprised of a review of landscape context, an archaeological survey and preliminary mapping of known and potential Aboriginal cultural and/or archaeological sites, assessment of their significance and further recommendations. The study area was located within the flood prone area below the 1:100 flood level. Historic land use was limited to vegetation clearance, with modern disturbance from landscaping and development of infrastructure for the golf course. Environmental factors considered relevant to the survival of archaeological material were erosion and removal of soils caused by flooding events.

Based on background information review, AHMS made the following statements about the Aboriginal site patterns around the Georges River (AHMS 2012: 48-9):

- Archaeological evidence and historical records indicate that Aboriginal people utilised the resources in the Georges River area which included oysters, fish, shellfish, crustaceans, eels, platypuses, macropods, reptiles, possums, honey, birds and bird eggs, figs, yams, fern roots, cabbage tree palm hearts, and certain lilies. On the river itself, Aboriginal people fished with hooks, lines & barbed spears.
- The background information also identifies that Aboriginal archaeological site distribution in the vicinity of the subject site is likely to consist of artefact scatters and potential archaeological deposits. These site types are likely to be found on alluvial flats and elevated areas within the vicinity of water courses. Aboriginal archaeological sites are also likely to be found on a bend in the creek and/or in the confluence of two watercourses.
- These sites will generally reduce in size as associated watercourses decrease in catchment (stream order) size;
- Archaeological sites within areas of flood prone land are less likely to survive than those sites situated on elevated ground. Flooding events of the Georges River are likely to remove soil
- Modified trees (scarred or carved) may exist in areas of remnant vegetation; and
- Isolated artefacts may be found anywhere throughout the landscape.

No Aboriginal sites were identified during the field survey. AHMS (2012) mapped areas of high and moderate Aboriginal sensitivity and areas of visible disturbance. As per the predictive model, elevated areas above the flood zone were considered to have moderate to high Aboriginal sensitivity; noting that older soil units within the vicinity of a major river may contain archaeological sites/objects that would have high scientific and/or cultural significance. On the contrary, floodplains were considered to have low to moderate archaeological sensitivity due to flooding causing both removal and redisposition of soil units that might contain Aboriginal objects (AHMS 2012: 60). It was recommended that additional archaeological investigations should be undertaken in areas of moderate to high Aboriginal archaeological sensitivity to inform subsequent development planning for the site, including test excavations where required.

An Aboriginal archaeological assessment, including an archaeological survey, was undertaken for a proposed subdivision of a portion of the Riverlands Golf Course (Comber 2019). The area was situated on an alluvial terrace adjacent to the eastern bank of the Georges River and was immediately west of the current study area. A review of background information confirmed that the previously registered trees within the area were not of Aboriginal origin and had been confirmed by the Office of Environment and Heritage as not Aboriginal objects protected under the NPW Act. Review of previous studies in the area indicated variable levels of landscape disturbance from modern land use and flooding. No Aboriginal artefacts were identified during the survey; however, the area was assessed as having the potential for subsurface archaeological deposits.

Voyager Point

An archaeological survey was conducted prior to the residential development of Voyager Point, approximately two kilometres south of the current study area on the southern side of the Georges River (McDonald 1996). The survey encompassed an area of 43 hectares that was bound by the East Hills Railway corridor to the south, Williams Creek to the west, Georges River to the east and Sirius Road to the north. The terrain within the survey area was gently sloping, with mangrove communities bordering Williams Creek and the Georges River. The survey identified one shell midden site, two culturally modified trees and four isolated artefacts. The majority of the sites were situated on the eastern margin of Williams Creek, whilst two isolated artefacts were identified on a low rise approximately 300 metres east of the creek. The midden site contained two areas of oyster shell. The culturally modified trees had single bark removal scars, one of which had a possible axe scar. The isolated artefacts consisted of one flaked piece with pebble cortex and usewear, one quartz bipolar flaked piece, one silcrete flake fragment and one silcrete flaked piece.

An archaeological survey was conducted within Pleasure Point reserve, approximately two kilometres south east of the current study area on the southern side of the Georges River (Therin 1998) for proposed sewer infrastructure. The survey identified a shell midden and an area of potential archaeological deposit. The remainder of the area was considered to be heavily disturbed by landscaping along the foreshore and the construction of houses and supporting infrastructure. Subsequent geomorphological assessment refined the area of potential and intact soils to "the lower weathered sandstone footslopes adjacent to the river and its former estuarine mudflats (Hughes 1999 in ERM 1999). A test excavation was subsequently undertaken by ERM within the identified area (ERM 1999). A total of three 1m x 2m test pits were placed along the proposed sewer infrastructure impact area. All three displayed disturbed upper deposits of fill above mottled sandy soils. Two flaked artefacts were recovered from one test pit, from within the fill deposit. No in situ material was identified. The newly identified site was assessed as displaying low significance.

AHMS (2009) undertook a preliminary assessment of the proposed rezoning of the western extent of the New Brighton Golf course, located on the western bank of the Georges River, approximately one kilometre west of the current study area. The assessment identified areas of Aboriginal heritage sensitivity within 200 metres of the Georges River, in elevated areas that had not been previously disturbed by historical activities. Recommendations were made for geotechnical investigations in order to establish if natural soil deposits were present within the area. Later test excavations were undertaken across the floodplain. Test excavations revealed a highly disturbed landscape and uncovered one Aboriginal object.

4.4 Henry Lawson Drive Upgrade (Hume Highway to M5) Preliminary Environmental Investigation: Aboriginal archaeological survey report

An Aboriginal archaeological survey report (PACHCI Stage 2) was prepared as part of the Preliminary Environmental Investigation for the Henry Lawson Drive Upgrade (Hume Highway to M5) (GML 2018). The assessment comprised an archaeological survey in addition to a desktop review of previous archaeological investigations and environmental context. The investigation area was substantially the same as the current study area.

The desktop review of previous investigations showed that archaeological sites in the region generally occurred as surface artefact scatters, scarred trees, isolated artefacts and areas of PAD. The closest known sites to the Stage 2 PACHCI study area were located within parklands to the west of the northern part of the study area around Prospect Creek. The sites comprised open artefacts scatters of silcrete, mudstone, quartz and chert on a ridgeline to the east of Prospect Creek. Sites were identified in areas of disturbance along graded walking tracks.

Desktop review of the current study area noted that the proposal area was located within a landscape with varying levels of natural and human disturbance including the construction of roads in addition to earthworks, and natural process such as fluvial activity. Archaeological survey was undertaken with representatives from the Deerubbin and Gandangara Local Aboriginal Land Councils. Survey was undertaken across 27 survey units encompassing four landform elements: flat, open depression, simple slope and crest/hilltop. Ground surface visibility varied between good within eroded areas of hilltops and simple slopes, to low within flats and open depressions that were covered in dense vegetation. Ground surface visibility was increased in areas where natural processes such as erosion and fluvial activity, or land use practices such as recent ground excavation had removed vegetation or restricted its growth.

The survey identified a total of 12 Aboriginal sites within the PACHCI Stage 2 assessment area (Figure 12):

- three Aboriginal artefact scatter sites with PAD - Henry Lawson Drive (HLD) Site 1 (AS + PAD), HLD Site 3 (AS + PAD) and HLD Site 4 (AS + PAD)
- two isolated finds – HLD Site 2 (IF) and HLD Site 5 (IF)
- seven areas of PAD – HLD PAD 1, HLD PAD 2, HLD PAD 3, HLD PAD 4, HLD PAD 5, HLD PAD 6 and
- one PAD with associated resource area - HLD Resource Zone 1 + PAD.

The assessment recommended a program of archaeological test excavation at the artefact scatter sites and PADs to determine the nature, extent and significance of Aboriginal cultural material and inform the Henry Lawson Drive upgrade project design.

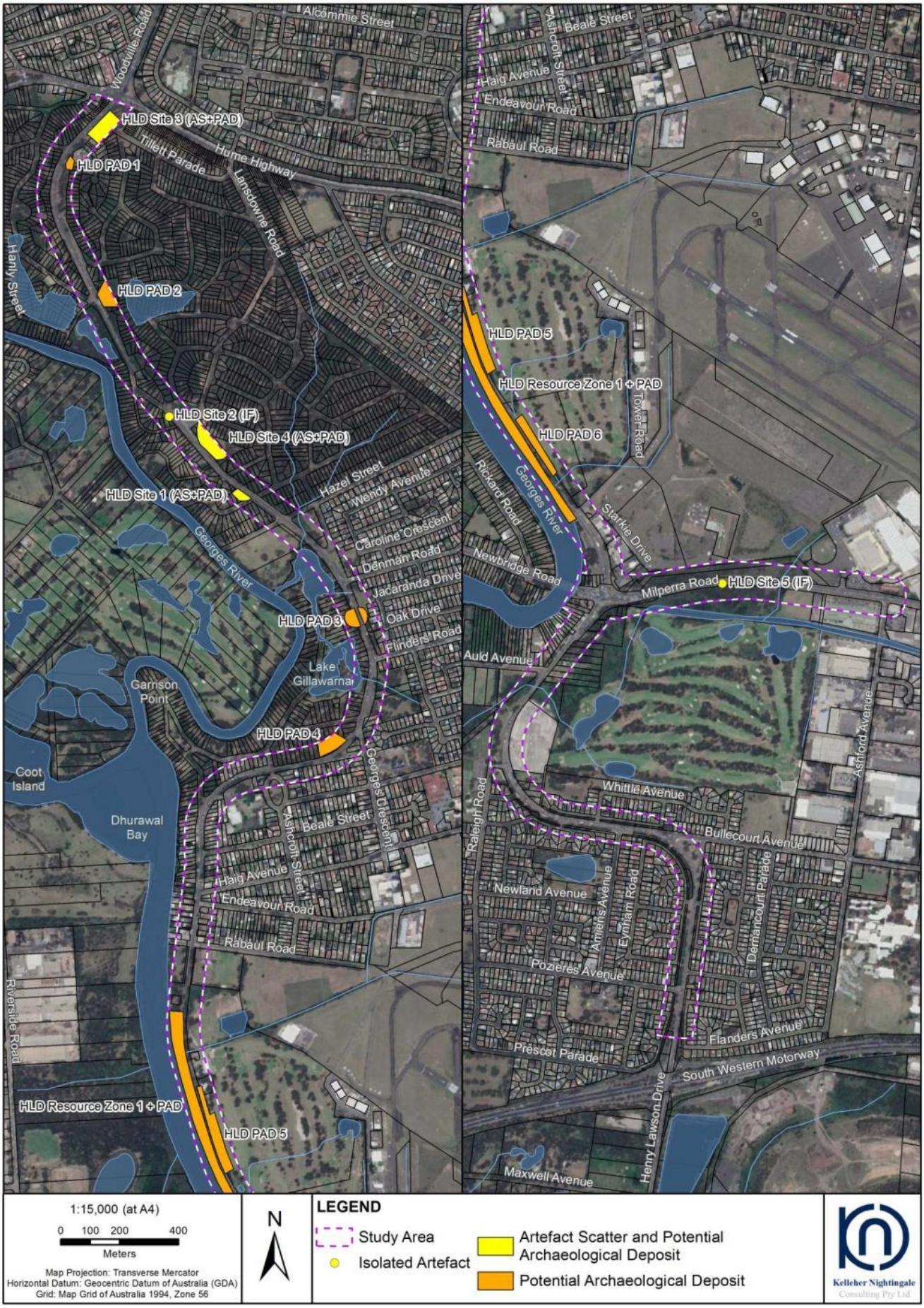

Figure 6. PACHCI Stage 2 assessment results

5 Archaeological Test Excavation

The PACHCI Stage 2 assessment for the project (Section 4.4) identified three surface artefact scatters with associated areas of PAD (HLD Site 1 (AS+PAD), HLD Site 3 (AS+PAD) and HLD Site 4 (AS+PAD)), two isolated surface artefacts (HLD Site 2 (IF) and HLD Site 5 (IF)) and seven areas of Potential Archaeological Deposit (PAD) where surface artefacts were not identified (HLD PADs 1-6 and HLD Resource Zone 1 with PAD). The assessment recommended a program of archaeological test excavation be undertaken in areas that were assessed as having potential for Aboriginal archaeological objects to "further inform an understanding of the archaeological potential of the study area and provide measures to manage or mitigate impact arising from the proposal" (GML 2018: 69). The purpose of the test excavation program was to collect information about the nature and extent of subsurface Aboriginal objects through excavation of a sample of the identified areas of identified Aboriginal archaeological sites.

A program of archaeological test excavations was carried out by KNC and field representatives of registered Aboriginal parties as recommended by the PACHCI Stage 2 assessment and in accordance with the OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* and Roads and Maritime PACHCI.

Aims, methodology and results of the test excavation program are presented in the following section of the report.

5.1 Aims

The primary aim of the test program was to determine if intact archaeological deposits were extant at the identified site and PAD areas and to assess the nature and extent of these deposits. Test excavation focused on defining the boundary of any subsurface archaeological deposit in relation to artefact distribution and disturbance from land use practices or natural processes.

This information was sought to assist in interpreting the archaeological landscape that remains in the proposal area and aid management of the archaeological resource. The sampling area was restricted to ensure an adequate sample without having significant impact on the archaeological value of the identified sites.

5.2 Methodology

Field methodology was developed and carried out in accordance with the Roads and Maritime PACHCI and OEH *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*. The test excavation program was specifically designed to target questions of artefact survivability through assessing the intactness of the deposit.

The test excavation program was undertaken at HLD Site 1 (AS + PAD) (AHIMS 45-5-5119), HLD Site 3 (AS +PAD) (AHIMS 45-5-5115), HLD Site 4 (AS + PAD) (AHIMS 45-5-5114), HLD PAD 1 (AHIMS 45-5-5117), HLD PAD 2 (AHIMS 45-5-5118), HLD PAD 3 (AHIMS 45-5-5120), HLD PAD 4 (AHIMS 45-5-5121), HLD PAD 5 (AHIMS 45-5-5122), HLD PAD 6 (AHIMS 45-5-5123) and HLD Resource Zone 1 with PAD (AHIMS 45-5-5124).

At each test excavation area, a site datum was recorded and test excavation units were placed along regularly spaced adjacent transects. In accordance with the *Code of Practice*, each test excavation unit measured 50 x 50 centimetres and squares were evenly distributed to sample the extent of each area within the boundaries of the study area. The coordinate of the north-west corner for each excavation unit was recorded using a handheld GPS receiver in GDA94 Zone 56. The test units were then given the name 'TS' for Test Square, followed by an arbitrary unique identifying number (e.g. TS 1, TS 2, TS 3).

Following OEH guidelines, the first excavation unit was excavated in 5 centimetre spits onto a culturally sterile deposit. Based on the results of the first excavation square, subsequent squares were excavated in 10 centimetre spits until culturally sterile soils were reached. The information from each test excavation square, including a detailed deposit description and unit depths, was recorded by the excavators onto standardised excavation unit recording sheets. At the end of the excavation program, all squares were photographed and soil section profiles were drawn.

All excavation was undertaken using hand tools. All excavated material was placed in buckets and dry sieved on site using a combination of nested 5 millimetre and 2.5 millimetre wire mesh screens. Artefacts retrieved from the excavation were retained for further investigation. All test squares were backfilled with the original soil at the completion of the excavation. The excavation took place between 8 and 15 July 2019.

5.3 HLD Site 1 (AS +PAD)

The HLD Site 1 (AS +PAD) test excavation area was located in a grassed area between the Flinders Slopes car park and the western boundary of the Henry Lawson Drive corridor (Figure 7). The test excavation area was situated within a narrow strip of a gently sloping landform approximately 175 metres east of Prospect Creek. The potential for subsurface archaeological deposit at the site was determined by "proximity to permanent water sources, and interplay of economic resource zones, landforms and vegetation communities" (GML 2018: 38).

The test excavation area was bounded by Henry Lawson Drive to the north, sealed carparks and access roads to the east, south and west. The carpark and Henry Lawson Drive were on modified embankments that created a shallow depression across the test excavation area (Plate 2). The test excavation area was covered in short cut grass with scattered young regrowth eucalypts. Visible surface disturbance was low and limited to past tree clearance.

Plate 2. Excavation at HLD Site 1 (AS + PAD) showing TS 3 facing north.

A total of four, 50 x 50 centimetre test squares (TS 1 – 4) were excavated along one north-west to south-east oriented transect (Figure 7). The test squares were positioned at 15 metre intervals along the transect; however, TS 2 was offset a further two metres north to avoid a tree and TS 3 was offset seven metres to avoid visible disturbance.

Figure 7. Archaeological test square locations and artefact density at HLD Site 1 (AS + PAD) (AHIMS 45-5-5119).

5.3.1 Soils and disturbance

Sediment profiles the across the test excavation area were found to be disturbed, with TS 4 stripped of natural soils and the other test squares containing fill layers overlying natural silty loam and basal clay. Modern inclusions included glass and introduced gravels. Small fragmented pieces of charcoal were dispersed throughout the test excavation squares with no obvious burning event.

I. 0-4cm: Dark grey brown silty loam, humic. Frequent root systems throughout. Clear boundary to:
II. 4-10cm: Fill. Bands of pale brown silty loam with clay nodules and medium brown sandy loam with frequent grey angular gravel. Infrequent fine root systems. Clear boundary to:
III. 10-16cm: Pale brown silty loam. Some discolouration and charcoal flecking associated with burnt root in middle of section. Clear boundary to:
IV. 16cm-base: Medium brown clay. Infrequent fine root systems.

Figure 8. HLD Site 1 (AS + PAD) - TS 1 west section and soil profile description

I. 0-2cm: Dark grey brown silty loam. Frequent fine root systems throughout. Clear boundary to:
II. 2-8cm: Fill. Bands of pale brown silty loam with clay nodules and medium brown sandy loam. Inclusions of concrete, glass and gravel. Infrequent fine and small root systems. Diffuse boundary to:
III. 8-23cm: Medium brown silty loam, moist. Infrequent fine and small root systems. Diffuse boundary to:
IV. 23cm-base: Yellowish brown clay, moist. Infrequent fine and small root systems.

Figure 9. HLD Site 1 (AS + PAD) - TS 2 east section and soil profile description

I. 0-2cm: Medium brown silty loam, humic. Frequent fine root systems throughout. Clear boundary to:
II. 2-8cm: Pale brown silty loam, compact. Infrequent fine root systems.
III. 8cm-base: Brown clay, compact. Infrequent fine root systems

Figure 10. HLD Site 1 (AS + PAD) - TS 4 south section and soil profile description

5.3.2 Discussion

No Aboriginal objects (artefacts) were recovered from the test excavation program at HLD Site 1 (AS + PAD) (AHIMS 45-5-5119). The test excavation program found that area had been variably disturbed with the test squares in the southern portion very shallow while the northern test squares contained a fill deposit above natural silty clay loam. The three surface artefacts identified at the site during the PACHCI Stage 2 survey demonstrate that the deposit at the site had been disturbed. As a result, HLD Site 1 (AS +PAD) was reclassified/renamed HLD Site 1 (AS) and the site area has been modified to reflect the results.

5.4 HLD Site 3 (AS + PAD)

The HLD Site 3 (AS + PAD) test excavation area was located on the crest of a low lying hill which formed the western extent of a ridgeline that extended from Picnic Point. The ridgeline in the vicinity of the test excavation area forms the watershed between Prospect Creek, approximately 500 metres to the west, and the catchment area of a former unnamed west flowing tributary creek, approximately 1.3 kilometres to the north east.

The test excavation area was located approximately 20 metres east of the existing Henry Lawson Drive, 70 metres south of the intersection of the Hume Highway and Henry Lawson Drive, and extended across Tillett Parade, a partially sealed road connecting Henry Lawson Drive to the west and Lansdowne Road to the east. Vegetation within the test excavation area consisted of dense native and exotic grasses with scattered large regrowth trees. Visible surface disturbance was present within the test area and included several partially sealed, formal and informal tracks, underground and above ground utilities and past tree clearance. In addition, the south eastern portion of the test area had been utilised as vehicle turning circle and consisted of an eroded ground surface covered in introduced road base gravel.

Plate 3. HLD Site 3, facing north east from TS 17 towards the Hume Highway.

Plate 4. HLD Site 3, facing north from TS 15 towards TS 13.

A total of nine, 50 x 50 centimetre test squares (TS 12 – 20) were excavated along two transects that were aligned adjacent to Henry Lawson Drive (Figure 11). The test squares were positioned at 15 metre intervals; however, several had to be offset to avoid visible disturbance that included underground utilities, informal tracks and trees. TS 13 was abandoned due to the presence of contaminants in the upper 5 centimetres of the deposit.

Figure 11. Archaeological test square locations and artefact density at HLD Site 3 (AS + PAD) (AHIMS 45-5-5115).

5.4.1 Soils and disturbance

Sediment profiles varied across the test excavation area in depth and disturbance. The test squares excavated in the northern portion of the test area (TS 12, 14 and 16-19) contained shallow to moderately deep deposits of silty loam overlying basal clay. The test squares in the southern portion of the test area (TS 13, 15 and 20) contained shallow deposits of introduced fill overlying natural basal clay. The introduced fill included modern glass and blue metal gravels.

Bioturbation was evident within the test excavation squares with fine root systems present throughout the area. Small fragmented pieces of charcoal were dispersed throughout the test excavation squares with no focus.

I. 0-4cm: Dark grey brown silty loam, humic. Frequent fine root system. Diffused boundary to:
II. 4-12cm: Medium grey brown silty loam, compact. Infrequent fine root systems and small clay nodules. Diffuse boundary to:
III. 12-18cm: Medium brown silty clay. Infrequent small white and red clay nodules. Infrequent fine root systems. Infrequent charcoal flecking <6mm and burnt clay nodules. Diffuse boundary to:
IV. 18cm-base: Pale brown clay. Infrequent fine root systems. Infrequent charcoal flecking <6mm.

Figure 12. HLD Site 3 (AS + PAD) - TS 12 east section and soil profile description

I. 0-9cm: Medium grey brown silty loam, humic. Frequent fine root systems. Inclusions of glass, bones and ceramics. Clear boundary to:
II. 9-28cm: Pale brown silty loam, moderately compacted. Infrequent fine root systems. Occasional small flecks of charcoal and ironstone gravel. Diffuse boundary to:
III. 28cm-base: Pale brown clay, compact. Infrequent fine root systems.

Figure 13. HLD Site 3 (AS + PAD) - TS 16 east section and soil profile description

I. 0-3cm: Blue metal gravel. Fill material. Clear boundary to:
II. 3-13cm: Medium brown silty loam, highly compact. Infrequent small charcoal flecking, ironstone gravels and burnt clay nodules. Diffuse boundary to:
III. Base: Pale brown clay, highly compact.

Figure 14. HLD Site 3 (AS + PAD) - TS 20 north section and soil profile description

5.4.2 Artefact Distribution and Characteristics

One artefact was recovered during test excavation of HLD Site 3 (AS +PAD) from TS 12 (Plate54). The artefact was identified at a depth of approximately 16 centimetres below the ground surface (Spit 4). The artefact was a yellow silcrete distal flake which was between 5-9 millimetres in size and did not retain cortex. No traces of secondary modification were identified.

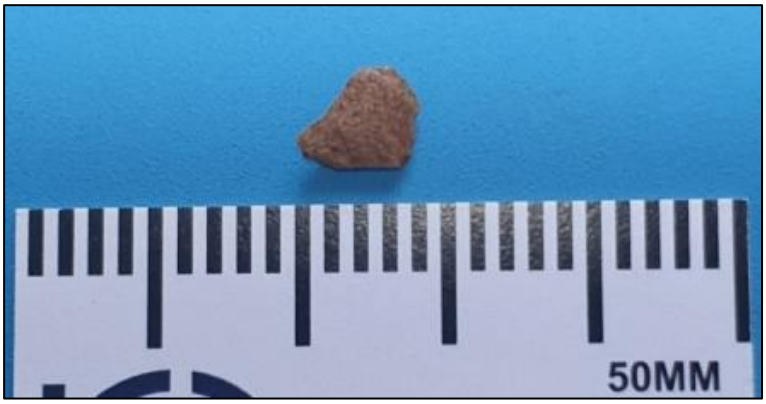

Plate 5. Silcrete distal flake (ID 2) from Spit 4 (15-20cm) of TS 12

5.4.3 Discussion

The test excavation program at HLD Site 3 (AS + PAD) (AHIMS 45-5-5115) confirmed the presence of a very low density subsurface archaeological deposit. The area was found to have been subject to variable levels of subsurface disturbance with test squares excavated in the southern portion containing fill material and truncated or absent natural soils while natural soils with lesser disturbance were found within the test squares in the northern portion of the area. The test area also contained localised areas of significant disturbance from previous land use practices including tree clearance and the construction of sealed and unsealed tracks, parking areas and underground utilities.

The presence of a mudstone flake fragment, identified on the ground surface during the archaeological survey for the PACHCI Stage 2 assessment, demonstrates that disturbance has affected the archaeological deposit at the site; however, the most extensive subsurface disturbance was limited to test squares excavated in the southern portion of the site. Silcrete and mudstone are not present within the local geology; however, these materials are commonly found in Aboriginal archaeological sites in the region.

The results of the test excavation program and PACHCI Stage 2 assessment at the site are consistent with previous archaeological investigations in the region which show that locations which are not in the vicinity of a water source generally contain archaeological deposits with low stone artefact density. The low artefact density and limited range of artefact types present at the site in addition to subsurface disturbance indicate that the site has low potential to offer additional archaeological information. As a result of the test excavation program, the site name has been changed to HLD Site 3 (AS).

5.5 HLD Site 4 (AS + PAD)

The HLD Site 4 (AS + PAD) test excavation area was located on a crest and upper northern slope of a hill which formed the southern end of a spur line that descended from a low north west running ridgeline. The ridgeline in the vicinity of the test excavation area forms the watershed between Prospect Creek, approximately 220 metres to the south, and the catchment area of a former unnamed west flowing tributary creek, approximately 1.3 kilometres to the north. The test excavation area was located approximately 20 metres north of Henry Lawson Drive alongside the Lansdowne Criterion Track.

Plate 6. HLD Site 4, facing north with TS 11 in foreground and Lansdowne Criterion Track at left.

A total of seven, 50 x 50 centimetre test squares (TS 5 – 11) were excavated at 15 metre intervals along one transect which ran parallel to the Lansdowne Criterion Track. The area had been cleared of native vegetation and was covered in short grasses. An area of soil erosion was present in the northern portion of the site and utilities were also present along the Lansdowne Criterion Track.

Figure 15. Archaeological test square locations and artefact density at HLD Site 4 (AS + PAD) (AHIMS 45-5-5114).

5.5.1 Soils and disturbance

The sediment profile was generally homogenous across the test excavation and was characterised by brown silty loams overlying pale brown clay. The depth of subsurface deposit ranged from very shallow in the central portion of the area (TS 7) to moderate. Nodules of iron manganese were found in the test squares excavated within the southern portion of the test excavation area. An area of charcoal and burnt clay nodules associated with a burnt tree root was present in TS 6.

I. 0-2cm: Greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 2-12cm: Greyish brown silty loam. Infrequent fine root systems. Small clay nodules and charcoal along interface with underlying unit from a burnt root. Diffuse boundary to:
III. 12-20cm: Medium brown silty loam, compact. Infrequent fine root systems. Small clay nodules and charcoal along interface with overlying unit from a burnt root. Diffuse boundary to:
IV. 20cm-base: Pale brown clays, compact. Infrequent fine root systems, charcoal flecking and Fe/Mn nodules.

Figure 16. HLD Site 4 (AS + PAD) - TS 6 west section and soil profile description

I. 0-4cm: Dark greyish brown, silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 4-10cm: Medium brown silty loam, moist. Infrequent fine root systems and small clay nodules. Diffused boundary to:
III. 10cm-base: Pale reddish brown clay, moist and compact. Infrequent fine root systems.

Figure 17. HLD Site 4 (AS + PAD) - TS 7 south section and soil profile description

I. 0-2cm: Greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 2-13cm: Medium brown silty loam, moist. Infrequent fine root systems and charcoal flecking. Diffused boundary to:
III. 13cm-base: Pale reddish brown clay, moist and compact. Infrequent fine root systems.

Figure 18. HLD Site 4 (AS + PAD) - TS 11 east section and soil profile description

5.5.2 Artefact Distribution and Characteristics

One artefact was recovered during the test excavation program at HLD Site 4 (AS +PAD). The artefact was found in TS 11 which was located on gentle slope landform at a depth of approximately 15 centimetres (spit 2) below the ground surface. The artefact was a red silcrete flake which was between 25-29 milimetres in size and did not retain cortex. No traces of secondary modification were identified.

Plate 7. Silcrete flake (ID 1) from Spit 2 (10-20cm) of TS 11

5.5.3 Discussion

The test excavation program at HLD Site 4 (AS + PAD) (AHIMS 45-5-5114) confirmed the presence of a very low density subsurface archaeological deposit. The area was found to have been subject to variable levels of subsurface disturbance with the test squares generally containing remnant soils of shallow to moderate depth while the central portion of the area contained a very shallow deposit. The presence of iron manganese nodules in test squares excavated on the slope landform indicate that this landform may have been subject to periodic waterlogging.

The archaeological survey undertaken as part of the PACHCI Stage 2 assessment identified two chert and one mudstone artefacts at the site within an area of surface erosion. The presence of three surface artefacts and the one artefact found during the test excavation program approximately 15 centimetres below the ground surface within a soil profile without visible disturbance demonstrate that while the archaeological deposit at the site has been subject to disturbance, remnant deposit remains. As such the low density of stone artefacts recovered from the site is likely reflective of the land use practices of past Aboriginal people in addition to subsequent disturbance. Silcrete, chert and mudstone are not present within the local geology; however, these materials are commonly found in Aboriginal archaeological sites in the region.

The low stone artefact density at the site is slightly unusual due to the proximity of Prospect Creek and the Georges River; however, the results are consistent with previous archaeological investigations in the region which show that stone artefact density and the frequency of stone artefact sites are generally highest on low slightly elevated landforms in close proximity to permanent water sources while other areas often contain fewer stone artefact sites that contain low artefact densities. The site is located approximately 30 metres above Prospect Creek and as such, the activities which resulted in the deposition of stone artefacts may have been focused on lower lying crest landforms to the south of the site. The low artefact density and limited range of artefact types present at the site in addition to subsurface disturbance indicate that the site has low potential to offer additional archaeological information. As a result of the test excavation program, the site name has been changed to HLD Site 4 (AS).

5.6 HLD PAD 1

The HLD PAD 1 test excavation area was located on the southern end of a crest landform which formed a low lying hill at the western extent of a ridgeline which extended from Picnic Point. The ridgeline in the vicinity of the test excavation area formed the watershed between Prospect Creek, approximately 280 metres to the west, and the catchment area of a former unnamed west flowing tributary creek, approximately 1.5 kilometres to the north east.

The test excavation area was located approximately 20 metres east of the existing Henry Lawson Drive and 270 metres south of the intersection of the Hume Highway and Henry Lawson Drive. The area was bounded by visible disturbance associated with past infrastructure and housing development which included a steep cutting approximately 15 metres east of Henry Lawson Drive. Visible disturbance within the test excavation area consisted of past tree clearance, an unsealed track and utilities.

Plate 8. HLD PAD 1 (AHIMS 45-5-5117) facing north with TS 22 in the foreground

A total of two, 50 x 50 centimetre test squares (TS 21-22) were excavated within the identified PAD area. The test squares were situated 15 metres apart on a transect running north to south.

Figure 19. Archaeological test square locations at HLD PAD 1 (AHIMS 45-5-5117).

5.6.1 Soils and disturbance

Sediment profiles were homogenous across the test excavation area and were characterised by very shallow soils, consisting of silty loam overlying basal clays. TS 21 was located within an area previously used as an informal dirt track, with bollards located approximately 10 metres to the north. Bioturbation was evident within the test excavation squares with fine root systems present throughout the area and some charcoal flecks.

I. 0-4cm: Dark greyish brown silty loam. Frequent fine root systems. Clear boundary to:
II. 4-8cm: Medium brown silty loam. Infrequent fine root systems. Diffused boundary to:
III. 8cm-base: Reddish brown clay, highly compacted. Infrequent fine root systems

Figure 20. HLD PAD 1 - TS 21 north section and soil profile description

I. 0-3cm: Dark greyish brown silty loam. Frequent fine root systems. Clear boundary to:
II. 3cm-base: Reddish brown clay, highly compacted. Infrequent fine root systems

Figure 21. HLD PAD 1 - TS 22 west section and soil profile description

5.6.2 Discussion

No Aboriginal objects (artefacts) were recovered from the test excavation program at HLD PAD 1. The test excavation program found very shallow soils overlying basal clays retaining no potential for subsurface archaeological deposits. The area is not an Aboriginal archaeological site or an area of potential archaeological deposit.

5.7 HLD PAD 2

The HLD PAD 2 test excavation area was situated on the lower south eastern slope of a hill which formed the western extent of a low lying ridgeline which extended from Picnic Point. The ridgeline in the vicinity of the test excavation area formed the watershed between Prospect Creek, approximately 270 metres to the south, and the catchment area of a former unnamed west flowing tributary creek, approximately 1.8 kilometres to the north east.

The area was located approximately 40 metres north of the intersection of Henry Lawson Drive and Hynes Street and 70 metres west of an artificial lake that had been constructed within the former drainage channel of an unnamed west flowing tributary of Prospect Creek. The HLD PAD 2 test excavation area was immediately adjacent to a south west flowing drainage line. Vegetation within the test excavation area consisted of dense grasses and regrowth trees. Visible surface disturbance was low and limited to past tree clearance while earthworks and fill associated with the construction of the retaining wall of an artificial lake was present along the eastern extent of the area.

Plate 9. HLD PAD 2 facing south with TS 23 in the foreground and looking towards TS 24 in the background.

A total of four, 50 x 50 centimetre test squares (TS 23-26) were excavated at HLD PAD 2 within the flat area towards the artificial lake. The test squares were positioned at 15 metre intervals along one north-west to south-east oriented transect with an additional test square (TS 25) excavated 10 metres to the west. TS 26 was offset one metre to the south to avoid a tree.

Figure 22. Archaeological test square locations at HLD PAD 2 (AHIMS 45-5-5118).

5.7.1 Soils and disturbance

The deposit were generally homogenous across the northern portion of the test excavation area while the southernmost test square (TS 26) contained fill material that appeared to be associated with the construction of the embankment around an artificial lake, located less than 50 metres to the east. The sediment profile in the remaining three test squares was characterised by a shallow to medium depth deposit of silty loam with inclusions of clay and ironstone nodules increasing with depth and overlying basal clay. Bioturbation was evident within the test squares with fine root systems present throughout the deposit. Small pieces of charcoal were noted in within the test squares; however, the charcoal appeared to be without focus and may have been the result of past tree clearance.

I. 0-2cm: Greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 2-10cm: Greyish brown silty loam. Infrequent fine root systems and charcoal flecking. Gravels frequent at interface with underlying unit. Diffuse boundary to:
III. 10-20cm: Light greyish brown silty loam. Occasional small Fe/Mn nodules. Infrequent fine root systems. Diffused boundary to:
IV. 20cm-base: Orange brown clay, highly compact. Infrequent fine and small root systems.

Figure 23. HLD PAD 2 - TS 23 south section and soil profile description

I. 0-3cm: Greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 3-12cm: Greyish brown silty loam. Infrequent fine root systems and charcoal flecking. Angular gravels (<5cm) frequent at interface with underlying unit. Diffuse boundary to:
III. 12-18cm: Light greyish brown silty loam. Occasional small Fe/Mn nodules. Infrequent fine root system and charcoal fleckings. Diffused boundary to:
IV. 18cm-base: Pale brown clay, highly compact. Infrequent fine and small root systems

Figure 24. HLD PAD 2 - TS 25 east section and soil profile description

I. 0-2cm: Greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 2cm-base: Pale brown clay, highly compact. Infrequent fine and small root systems. Frequent clay nodules and gravels associated with a tree root.

Figure 25. HLD PAD 2 - TS 26 north section and soil profile description

5.7.2 Artefact Distribution and Characteristics

One artefact was recovered during the test excavation program at HLD PAD 2. The artefact was recovered from TS 25 at a depth of between 10 and 20 centimetres below the ground surface. The artefact was a flake of milky quartz that retained between 31-69% cortex and had a maximum length between 20-24 millimetres. No traces of secondary modification were identified on the artefact.

Plate 10. Quartz flake (ID 3) from Spit 2 (10-20cm) of TS 25

5.7.3 Discussion

The HLD PAD 2 (AHIMS 45-5-5118) test excavation confirmed the presence of a very low density subsurface archaeological deposit. The area was found to have been subject to variable levels of subsurface disturbance with the southern portion containing fill material including gravel, sand and clay overlying basal clay. The subsurface disturbance in this area is likely to be associated with the construction of embankments around an artificial lake which was located approximately 50 metres to the east.

The test squares excavated in the northern portion contained shallow to medium depth remnant soils with low levels of visible disturbance; however, only a single stone artefact was recovered. Quartz is a material that is commonly found in Aboriginal archaeological sites in the region.

Previous archaeological investigations in the region show that slightly elevated locations in the vicinity of higher order creeks and rivers were focal areas for the creation and discarding of stone artefacts. While HLD PAD 2 is situated adjacent to the former channel of a creek, a larger and more permanent creek (Prospect Creek) was located 270 metres to the west. The very low artefact density and limited range of artefact types present indicate that the site has a low potential to offer additional archaeological information. As a result of the test excavation program and confirmation of an isolated object at the site, the site name has been changed to HLD Site 8 (IF).

5.8 HLD PAD 3

The HLD PAD 3 test excavation area was situated on a raised terrace that overlooked the floodplain of Prospect Creek and two unnamed tributaries. The terrace formed the western extent of a spur that descended from a north west running ridgeline that extended from Picnic Point in the south to Prospect Hill in the north. The ridgeline formed the watershed between the catchment for Prospect Creek, approximately 180 metres to the west of HLD PAD 3, and Salt Pan Creek, approximately 6 kilometres to the east of HLD PAD 3.

The area was located on the eastern and western side of the Henry Lawson Drive corridor, approximately 120 metres south of the intersection of Henry Lawson Drive and Denman Road. The HLD PAD 3 test excavation area was bound on the north, south and west by the artificial Lake Gillawarna and the drainage lines of several unnamed tributaries of Prospect Creek. The test area had been predominantly cleared of native vegetation and contained exotic grass cover and small clusters of regrowth trees. Several large surface exposures were also present that had been covered by detritus. Visible surface disturbance included a sealed walkway while the areas adjacent to Henry Lawson Drive had been disturbed by underground services and the road embankment.

Plate 11. HLD PAD 3 facing north with TS 28 in foreground and TS 27 in the background.

Plate 12. HLD PAD 3 facing north with TS 31 in foreground and TS 30 in the background.

A total of five, 50 x 50 centimetre test squares (TS 27-31) were excavated at HLD PAD 3. The test squares were positioned at 15 metre intervals along two transects that were north-west to south-east oriented and parallel to Henry Lawson Drive. Two test squares (TS 27-28) were excavated on the eastern side of Henry Lawson Drive and three test squares (TS 29-31) were excavated on the western side.

Figure 26. Archaeological test square locations and artefact density at HLD PAD 3 (AHIMS 45-5-5120).

5.8.1 Soils and disturbance

Sediment profiles differed between the eastern and western transects. The test squares excavated along the transect east of Henry Lawson Drive exhibited significant disturbance and contained a fill deposit overlying natural clay. Introduced fill material included clay, plastic and glass. The test squares excavated along the transect west of Henry Lawson Drive contained a fill deposit overlying remnant natural silty clay loams above basal clays. The natural deposit within the test squares on the western transect was preserved to an average depth of 20 centimetres. Small charcoal flecks were dispersed throughout the test excavation squares with no obvious burning events.

I. 0-2cm: Greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 2-10cm: Pale greyish brown silty loam, compact. Infrequent fine root systems and charcoal flecking. Diffused boundary to:
III. 10cm-base: Medium brown clay, highly compact. Occasional small Fe/Mn nodules. Infrequent fine root systems. Infrequent orange clay nodules.

Figure 27. HLD PAD 3 - TS 27 south section and soil profile description

I. 0-2cm: Dark greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 2-10cm: Fill. Pale brown silty loam, compact. Infrequent fine root systems and charcoal flecking. Inclusions of metal and glass fragments. Diffused boundary to:
III. 10-18cm: Medium brown silty loam, compact. Infrequent fine and small root systems and charcoal flecking. Diffused boundary to:
IV. 18-25cm: Pale greyish brown silty loam, compact. Infrequent fine root systems and occasional charcoal flecking. Clear boundary to:
V. 25cm-base: Medium brown clay, highly compact. Infrequent fine root systems.

Figure 28. HLD PAD 3 - TS 30 west section and soil profile description

I. 0-5cm: Dark greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 5-10cm: Fill. Greyish brown silty loam, compact. Infrequent fine root systems and charcoal flecking. Inclusions of metal and glass fragments. Nodules of white and orange clay. Clear boundary to:
III. 10-25cm: Pale greyish brown silty loam, compact. Infrequent fine root systems and occasional charcoal flecking. Clear boundary to:
IV. 25cm-base: Medium brown clay, highly compact. Infrequent fine root systems.

Figure 29. HLD PAD 3 - TS 31 east section and soil profile description

5.8.2 Artefact Distribution

A total of 12 stone artefacts were recovered during the test excavation at HLD PAD 3 giving a mean artefact density across the test excavation area of 2.4 artefacts per test square. Extrapolated to square metres, the test area displayed a mean artefact density of 9 artefacts per square metre. The artefacts were recovered from the three squares excavated in the western portion of the test area while the two squares excavated in the eastern portion of the area did not retain any intact deposit or Aboriginal objects. The mean artefact density excluding the two disturbed squares was 4 artefacts per test square and 12 artefacts per square metre. Artefact densities for the test squares are shown in Table 2 and Figure 18.

Table 2. Test excavation artefact densities at HLD PAD 3

Test Square	Total Artefacts
27	0
28	0
29	3
30	5
31	4

Artefact distribution was characterised by a low density deposit in the western portion of the HLD PAD 3 test excavation area. The artefacts were predominantly (n=9) recovered from a depth between 20 and 30 centimetres below the ground surface and within remnant natural silty clayey loams with some inclusion of ironstone gravel and clay nodules. The remaining three artefacts were recovered between 10 and 20 centimetres below the ground surface within the truncated natural silty clayey loam soils mottled with some imported fill material.

5.8.3 Lithics

The artefacts recovered from the test squares at HLD PAD 3 were predominantly made from silcrete (n=8, 66.7%) while three artefacts (25%) were made from indurated mudstone/tuff (IMT) and one artefact was made from chert (8.3%). Artefacts were predominantly small in size with the majority of artefacts measuring between 5-14 millimetres in maximum length (Table 3). The largest artefact was a chert angular fragment that was between 30 and 34 millimetres in length.

Plate 13. HLD PAD 3 artefacts raw material types (IDs 6, 7, 9, 11).

Table 3. Artefact raw materials and size at HLD PAD 3

Raw Material	5-9mm	10-14mm	15-19mm	20-24mm	25-29mm	30-34mm	Total Artefacts
Chert	0	0	0	0	0	1	***1***
Silcrete	1	4	0	2	1	0	***8***
IMT	1	1	1	0	0	0	***3***
Total	***2***	***5***	***1***	***2***	***1***	***1***	***12***

Silcrete varied from coarse to fine grained and ranged in colour from red to yellow. IMT was fine grained and was yellow and grey in colour. Cortex was absent on the majority of recovered artefacts; however, one yellow silcrete proximal fragment had a cortical platform (Plate 12, ID 6). Two artefacts from HLD PAD 3 had been affected by heat with pot lidding on an IMT angular fragment (ID 10, Plate 30) and crenate fractures on a chert angular fragment.

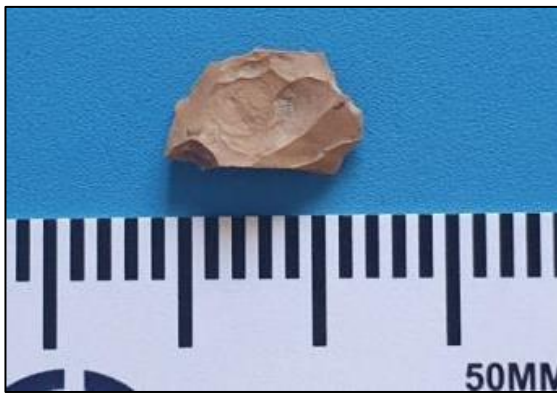

Plate 14. IMT heat shattered debitage (ID 10) from TS 30.

Plate 15. Coarse grained silcrete flakes from TS 31 (IDs 13-15).

The artefact assemblage recovered from HLD PAD 3 consisted of unmodified flaking debitage. Unmodified complete flakes constituted the majority of the assemblage while flake fragments and undiagnostic angular fragments were also present.

Table 4. Reduction types at HLD PAD 3

Raw Material	Flake	Proximal Fragment	Distal Fragment	Angular Fragment	Split Flake
Chert	0	0	0	1	0
IMT	0	1	1	1	0
Silcrete	5	1	1	0	1
Total	***5***	***2***	***2***	***2***	***1***

5.8.4 Discussion

The test excavation program at HLD PAD 3 (AHIMS 45-5-5120) confirmed the presence of a subsurface archaeological deposit. The area had been variably disturbed by past land use activities. The test squares excavated on the eastern side of Henry Lawson Drive were heavily disturbed and contained shallow deposits of introduced fill material overlying natural clay. The presence of fill within the test squares and surface artefacts on the road embankment in the western portion of the test area demonstrated that it had been disturbed by past land use activities; however, a relatively intact subsurface archaeological deposit was present below the fill.

A total of 12 artefacts were recovered from the three test squares excavated in the western portion of HLD PAD 3. The artefact assemblage comprised unmodified flakes, flake fragments and undiagnostic angular fragments. The absence of conjoining artefacts suggests that some movement had occurred within the deposit. Heat damage was present on two angular fragments. The presence of charcoal flecking in the deposit indicates that the heat damage may have been associated with past tree clearance activities. No cultural features were recorded in association with charcoal.

The artefact assemblage was predominantly made from silcrete with indurated mudstone/tuff and chert artefacts also found. The stone artefact raw materials do not occur within the underlying geology at HLD PAD 3; however, suitable raw materials are present within the St Marys Formation and Rickabys Creek Gravel geologies of the north western Cumberland Plain and within the river cobbles of the Nepean River. The stone artefacts recovered during the test excavation demonstrate that the activities undertaken by past Aboriginal people involved discarding unmodified flakes and flaking debitage which had been removed from prepared cores of non-locally sourced raw material.

The test excavation program demonstrated that subsurface archaeological deposit remained within the western portion of HLD PAD 3. As a result, HLD PAD 3 was reclassified/renamed HLD Site 6 (AS) and the site area was modified to reflect the results.

5.9 HLD PAD 4

The HLD PAD 4 test excavation area was situated on the crest of a spur that descended north from a low hill that overlooked the floodplain on the eastern side of the junction of Prospect Creek and the Georges River. HLD PAD 4 was approximately 200 metres east of the Prospect Creek and 100 metres south of several unnamed tributary creeks in which the artificial Lake Gillawarna had been constructed.

The area was located on the northern side of Henry Lawson Drive and approximately 100 metres south west of the intersection of Henry Lawson Drive and Georges Crescent. Vegetation within the HLD PAD 4 test excavation area consisted of patchy grass cover and scattered young regrowth trees. Visible disturbance was present along the southern boundary of the area where Henry Lawson Drive had been constructed on an embankment and along the western boundary where a concrete footpath was located.

Plate 16. Excavation HLD PAD 4, facing east with TS 36 in foreground.

Plate 17. Excavation HLD PAD 4, facing north with TS 37 in foreground and TS 36 in the background.

A total of six, 50 x 50 centimetre test squares (TS 32-37) were excavated at HLD PAD 4. The test squares were positioned at 15 metre intervals along one south west oriented transect and one north west oriented transect.

Figure 30. Archaeological test square locations and artefact density at HLD PAD 4 (AHIMS 45-5-5121).

5.9.1 Soils and disturbance

Sediment profiles were homogenous and consisted of moderately deep deposits of silty loam overlying basal clay. Modern inclusions were found within TS 37 to a depth of three centimetres below the ground surface. The deposit below the modern inclusions in TS 37 and the deposits in the other test squares excavated at HLD PAD 4 contained natural soils. Small fragmented pieces of charcoal were dispersed throughout the test squares with no obvious burning events. A gravelly layer with ironstone nodules was found in TS 32 and TS 36.

I. 0-3cm: Greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 3-16cm: Dark greyish brown silty loam, compact. Infrequent fine root systems and charcoal flecking. Gravels (<5cm) frequent at interface with underlying unit. Diffuse boundary to:
III. 16cm-base: Pale brown clay, highly compact. Infrequent fine and small root systems. Gravels (<5cm) frequent at interface with above unit.

Figure 31. HLD PAD 4 - TS 32 south section and soil profile description

I. 0-3cm: Pale greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 2-10cm: Pale brown silty loam. Infrequent fine root systems and occasional charcoal flecking. Diffused boundary to:
III. 10-18cm: Light grey silty loam. Occasional small Fe/Mn nodules and charcoal flecking. Infrequent fine root systems. Diffused boundary to:
IV. 18cm-base: Orange brown clay, highly compact. Infrequent fine and small root systems.

Figure 32. HLD PAD 4 - TS 35 north section and soil profile description

I. 0-2cm: Greyish brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 3-12cm: Dark brown silty loam, compact. Infrequent fine root systems and charcoal flecking. Gravels (<5cm) frequent at interface with underlying unit. Diffuse boundary to:
III. 12cm-base: Pale brown clay, highly compact. Infrequent fine and small root systems

Figure 33. HLD PAD 4 - TS 36 west section and soil profile description

5.9.2 Artefact Distribution

A total of eight artefacts were recovered from two of the six test squares excavated at HLD PAD 4 giving a mean artefact density across the test excavation area of 1.3 artefacts per test square. Extrapolated to square metres, the test area displayed a mean artefact density of 5.3 artefacts per square metre. Artefact densities for the test squares are shown in Table 5.

Table 5. Test excavation artefact densities at site HLD PAD 4

Test Square	Total Artefacts	Test square	Total Artefacts	Test square	Total Artefacts
32	0	34	0	36	7
33	0	35	1	37	0

Artefact distribution within the HLD PAD 4 test excavation area was characterised by a low density deposit concentrated around TS 36 and an isolated artefact at TS 35. While seven artefacts were recovered from TS 36, two (IDs 22 and 23) were heat angular fragments from the same artefact. The artefacts were predominantly (n= 6) recovered from a depth of between 10 and 20 centimetres below the ground surface while one artefact was recovered from the top 10 centimetres and one artefact from between 20 and 25 centimetres below the ground surface. The six artefacts recovered from TS 36 were located above a gravelly layer of ironstone nodules.

5.9.3 Lithics

Of the eight artefacts recovered from HLD PAD 4 during the test excavation program, six were made from silcrete and two were made from indurated mudstone/tuff (IMT). The silcrete varied from coarse to finer grained and was red, pink and pinkish grey in colour. The IMT artefacts were pale brown and yellow. The artefacts were predominantly small in size with the majority measuring between 5-14 millimetres in maximum length. The largest artefact was a silcrete angular fragment that had extensive pot lidding scars (ID 22). A conjoining pot lid was also recovered (ID 23). Pot lidding scars were also present of an IMT angular fragment (ID 16).

Table 6. Artefact densities and size at site HLD PAD 4.

Raw Material	5-9mm	15-19mm	20-24mm	25-29mm	30-34mm	Total Artefacts
Silcrete	1	2	1	1	1	***6***
IMT	0	1	1	0	0	***2***
Total	***1***	***3***	***2***	***1***	***1***	***8***

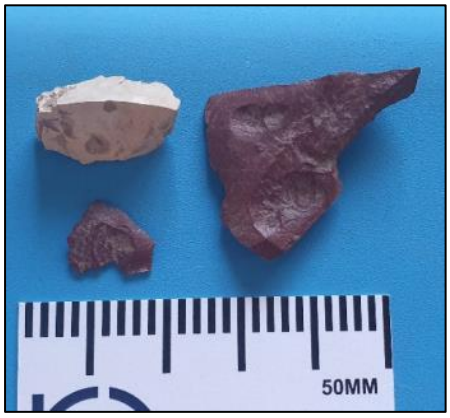

Plate 18. Heat affected artefacts from HLD PAD 4 (ID16, 22 and 23).

Plate 19. Cortical surface of a silcrete core recovered from HLD PAD 4 TS 36 (ID 17).

The artefact assemblage was predominantly flaking debitage that consisted of one flake, two flake fragments and three angular fragments. One medial flake fragment was found in TS 36 with steep retouch along the distal edge. One multidirectional silcrete core was recovered from TS 36 within the upper 10 centimetres of the deposit. The core had four negative flake scars and retained between 31-69% cortex. Cortex was not present on the other artefacts recovered from HLD PAD 4.

Table 7. Reduction types at HLD PAD 4

Raw Material	Flake	Proximal Fragment	Distal Fragment	Angular Fragment	Medial Fragment	Core
Silcrete	1	1	0	2	1	1
IMT	0	0	1	1	0	0
Total	***1***	***1***	***1***	***3***	***1***	***1***

The complete flake was recovered from TS 36 between 10 and 20 centimetres below the ground surface. The flake had been removed from a blade core and had at least five blade scars on its dorsal side.

Plate 20. Dorsal side of a silcrete flake (ID 20) showing negative blade scars.

Plate 21. Ventral side silcrete flake (ID 20).

5.9.4 Discussion

The test excavation program at HLD PAD 4 (AHIMS 45-5-5121) confirmed the presence of a subsurface archaeological deposit. A total of 8 artefacts were recovered from two of the six test squares excavated at HLD PAD 4. The sediment profiles were homogenous across the test area and disturbance was limited to a depth of three centimetres below the ground surface in TS 37.

Artefact distribution within the HLD PAD 4 test excavation area was characterised by a low density deposit concentrated around TS 36 and an isolated artefact at TS 35. The artefact assemblage was predominantly flaking debitage that consisted of one flake, two flake fragments and three angular fragments. One retouched medial flake fragment and one multidirectional core were also recovered. Heat damage was present on three angular fragments, two of which conjoined. The presence of charcoal flecking in the deposit indicates that the heat damage may have been associated with past tree clearance activities. No cultural features were recorded in association with charcoal. The concentration of artefacts within one test square and conjoining artefacts indicates that limited movement had occurred within the deposit.

Raw material consisted of coarse to fine grained silcrete and fine grained IMT. The stone artefact raw materials do not occur within the underlying geology at HLD PAD 4; however, suitable raw materials are present within the St Marys Formation and Rickabys Creek Gravel geologies of the north western Cumberland Plain and within the river cobbles of the Nepean River. The test excavation indicates that flakes were being made and retouched at HLD PAD 4 from non-locally sourced raw material.

The test excavation program demonstrated that subsurface archaeological deposit was present at HLD PAD 4. As a result, HLD PAD 4 was reclassified/renamed HLD Site 7 (AS) and the site area was modified to reflect the results.

5.10 HLD PAD 5

The HLD PAD 5 test excavation area was situated on the low lying Georges River floodplain, approximately 60 metres east of the river. The area was bound by Henry Lawson Drive in the west and the Georges River Golf Club in the east and was located approximately 500 metres south of the intersection of Rabaul Road and Henry Lawson Drive.

Vegetation within the HLD PAD 5 test excavation area consisted of dense grass cover and regrowth trees. Mounds were observed within the test excavation area (Plate 41). Infrastructure services pits were located adjacent to the fence line and two drainage ditches were observed traversing the area.

Plate 22. HLD PAD 5 facing south with TS 38 in foreground showing earth mound.

Plate 23. HLD PAD 5 facing south with TS 40 in foreground. Georges River Golf Club fence to the left.

A total of five, 50 x 50 centimetre test squares (TS 38-42) were excavated at HLD PAD 5. The test squares were positioned at 15 metre intervals along one north south oriented transect with a gap of 40 metres left between TS 39 and TS 40 to avoid visible surface disturbance. The southernmost test square, TS 41, was located to the north of a large ditch.

Figure 34. Archaeological test square locations at HLD PAD 5 (AHIMS 45-5-5122).

5.10.1 Soils and disturbance

Sediment profiles were characterised by fill of shallow to moderate depth overlying a shallow deposit of silty loam above basal clay. The fill deposit was deepest in the northern portion of the test excavation area (TS 38 and 39) where large mounds of fill material were present. The fill material consisted of bands of light and mid brown silty loam with inclusions of blue metal, glass fragments, metal and plastic.

I. 0-5cm: Light brown silty loam, humic. Frequent fine root systems. Diffused boundary to:
II. 5-30cm: Fill. Bands of mid brown or light brown silty loam, compact. Infrequent fine root systems. Inclusions of blue metal, glass fragments, metal and plastic. Clear boundary to:
III. 30-40cm: Mid brown silty loam compact. Infrequent fine root systems. Clear boundary to:
IV. 40cm-base: Medium reddish brown silty clay, compact. Infrequent fine and small root systems.

Figure 35. HLD PAD 5 – TS 38 east section and soil profile description

I. 0-8cm: Dark grey brown silty loam, humic. Frequent fine root systems. Clear boundary to:
II. 8-20cm: Fill. Light brown silty loam, moderately compact. Infrequent fine root systems. Inclusions of blue metal and glass fragments. Clear boundary to:
III. 20cm-base: Dark reddish brown silty clay, moderately compact. Large tree root and infrequent fine root systems. Inclusions of glass fragments and blue metal.

Figure 36. HLD PAD 5 – TS 40 east section and soil profile description

I. 0-5cm: Dark brown silt loam, humic. Frequent fine root systems. Clear boundary to:
II. 5-15cm: Fill. Mid and light brown silty loam, moderately compact. Inclusions of blue metal and glass fragments. Infrequent fine root system. Clear boundary to:
III. 15-25cm: Brown silt loam, moderate compact. Infrequent fine root system. Diffused boundary to:
IV. 25cm-base: Dark reddish brown silty clay, moderately compact. Infrequent fine root system

Figure 37. HLD PAD 5 – TS 41 east section and soil profile description

5.10.2 Discussion

No Aboriginal objects (artefacts) were recovered from the test excavation program at HLD PAD 5. The test excavation program found that the natural soil profile had been disturbed and covered with fill material. The area is not a PAD or Aboriginal archaeological site.

5.11 HLD PAD 6

The HLD PAD 6 test excavation area was situated on the low lying Georges River floodplain, approximately 60 metres east of the river. The area was bound by Henry Lawson Drive in the west and the Georges River Golf Club in the east and was located approximately 170 metres north of the intersection of Tower Road and Henry Lawson Drive.

Vegetation within the HLD PAD 6 test excavation area consisted of dense grass cover and scattered regrowth trees which were present along the fence line of Georges River Golf Club. The area contained uneven terrain due to the road embankment of the Henry Lawson Drive and a drainage ditch that ran adjacent to the Georges River Golf Club fence line.

Plate 24. HLD PAD 6 facing south with TS 43 in foreground on road embankment with drainage ditch left.

Plate 25. HLD PAD 6 facing south with TS 45 in the foreground and Henry Lawson Drive to the right.

A total of five, 50 x 50 centimetre test squares (TS 43-47) were excavated at HLD PAD 6. The test squares were generally positioned at 40 metre intervals along one north south oriented transect; however, two test squares were offset. TS 44 was offset eight metres south and three metres west in order to avoid an underground telecommunications cable (NBN) and the road embankment while TS 47 was offset three metres to the west in order to avoid dense vegetation cover.

Figure 38. Archaeological test square locations at HLD PAD 6 (AHIMS 45-5-5123).

5.11.1 Soils and disturbance

Sediment profiles were characterised by a range of fill materials overlying basal clay. In the northern portion of the test area (TS 43 and 44), the squares were abandoned at a depth of approximate 15 centimetres due to the presence of a dense layer of clay fill. In the southern portion of the test area, the sediment consisted of moderately deep gravelly fill overlying silty loam and/or basal clay. The fill deposits included concrete, plastic and glass inclusions.

I. 0-2cm: Dark brown silty loam, humic. Frequent fine root systems. Diffused boundary to:
II. 2-10cm: Dark brown silty loam. Infrequent fine root systems. Inclusions of plastic. Diffused boundary to:
III. 10cm-base: Fill. Yellow brown clay with some red clay nodules.

Figure 39. HLD PAD 6 – TS 43 south section and soil profile description

I. 0-6cm: Dark brown silty loam, humic. Frequent fine root systems. Diffused boundary to:
II. 6cm: Fill. Bands of Mid and dark brown silty loam, friable. Infrequent fine root systems. Frequent inclusions of gravel concrete, plastic, glass and occasional broken golf balls. Clear boundary to:
III. Base: Dark brown silty clay.

Figure 40. HLD PAD 6 – TS 45 north section and soil profile description

I. 0-5cm: Dark brown silty loam, humic. Frequent fine root systems. Diffused boundary to:
II. 5-12cm: Fill. Dark brown silty loam, loose. Infrequent fine root systems. Infrequent fine root systems. Frequent inclusions of gravel concrete, plastic and glass. Clear boundary to:
III. 12-25cm: Light brown silty loam, moderately compact. Infrequent fine root systems. Diffused boundary to:
IV. 25cm-base: Dark brown silty clay. Infrequent small and fine root systems.

Figure 41. HLD PAD 6 – TS 46 north section and soil profile description

5.11.2 Discussion

No Aboriginal objects (artefacts) were recovered from the test excavation program at HLD PAD 6. The test excavation program found that the natural soil profile had been disturbed and covered with fill material. The area is not a PAD or Aboriginal archaeological site.

5.12 HLD Resource Zone 1 + PAD

The HLD Resource Zone 1 + PAD test excavation area encompassed approximately 1.5 kilometres of a low lying flat adjacent to the eastern bank of the Georges River between the junction with Prospect Creek in the north and a sharp river bend in the south. The area was located within Kentucky Reserve and was bound by Rabaul Road to the north, Henry Lawson Drive to the east, Tower Road to the south and the Georges River to the west. The HLD Resource Zone 1 + PAD test excavation area was on the opposite side of Henry Lawson Drive from sites HLD PAD 5 and HLD PAD 6. The area was identified as a potential resource zone during the PACHCI Stage 2 assessment due to the terrestrial and aquatic resources which would have been available in the vicinity of the area.

Vegetation within HLD Resource Zone 1 + PAD consisted of dense low grasses with scattered regrowth and mature trees adjacent the road corridor of Henry Lawson Drive and the Georges River. The area had been subject to landscaping activities including a concrete foot path that ran north south along the entire reserve, two drainage channels, park facilities, a car park area and a concrete structure. Isolated pockets of remnant mangroves were present in at least two locations within the area; however, the Georges River bank was generally characterised by an artificial embankment of concrete and mixed fill material.

Plate 26. HLD Resource Zone 1 + PAD facing north with TS 51 in background.

Plate 27. Cut showing fill material within deposit at HLD Resource Zone 1 + PAD 30 metres north of TS 49 on Georges River bank.

Plate 28. HLD PAD 5 facing south with TS 38 in foreground with earth mound at the left.

Plate 29. HLD Resource Zone 1 + PAD facing north with TS 56 in foreground and TS 57 in the background.

A total of 11, 50 x 50 centimetre test squares (TS 48-58) were excavated at HLD Resource Zone 1 + PAD. The test squares were positioned along one south to north oriented transect in areas where visible ground disturbance was not present. Six test squares (TS 48-53) were excavated in the southern portion of the area. TS 54 was excavated approximately 400 metres north of TS 53 and 170 metres south of TS 55 to avoid areas of stripped soil and waterlogging. TS 55 was located 115 metres south of TS 56 to avoid a large concrete structure and three test squares (TS 56-58) were placed at 15 metre intervals at the northern extent of the transect within a cleared area with BBQ and picnic facilities.

Figure 42. Archaeological test square locations at HLD Resource Zone 1 + PAD (AHIMS 45-5-5124).

5.12.1 Soils and disturbance

The test squares excavated in the southern portion of the HLD Resource Zone 1 + PAD (TS 48-51) contained a series of fill deposits overlying clay. The fill material consisted of sand or clay with fragments of ceramic, brick, blue metal, plastic, concrete and shale. TS 52 contained fill material overlying a concrete base. The test square was next to a concrete footpath and the concrete within the square may have been an older footpath. In the northern portion of the area, the test squares contained fill deposits overlying natural sandy loam and sandy clay.

I. 0-3cm: Mid grey brown, sandy loam, humic. Frequent fine root systems. Diffused boundary to:
II. 3-20cm: Fill. Dark brown sandy loam, compact. Inclusions of brick fragments, blue metal, plastic and aluminium. Infrequent fine root systems. Clear boundary to:
III. 20cm- base: Fill. Orange brown clay with imported gravel and inclusions. Highly compact. Infrequent fine root systems.

Figure 43. HLD Resource Zone 1 + PAD – TS 51 north section and soil profile description

I. 0-10cm: Mid grey brown, sandy loam. Frequent fine root systems. Clear boundary to:
II. 10-20cm: Fill. Pale yellow brown fine sandy loam. Inclusions of glass and brick fragments. Infrequent fine root systems. Clear boundary to:
III. 20-22cm: Fill. Pale blue grey shale lens. Clear boundary to:
IV. 22cm-base: Mid brown sandy loam, moderately loose. Infrequent fine root systems. Gravel inclusions increasing with depth. Inclusion of a golf ball recovered from 35cm depth.

Figure 44. HLD Resource Zone 1 + PAD – TS 53 west section and soil profile description

I. 0-8cm: Mid grey brown sandy loam, humic. Clear boundary to:
II. 8-19cm: Fill. Pale brown sandy loam. Inclusions of clay and sandstone rubble increasing with depth. Infrequent fine root systems. Clear boundary to:
III. 19cm-base: Dark brown clayey sand, lightly compact. Infrequent gravel inclusion. Infrequent fine root systems.

Figure 45. HLD Resource Zone 1 + PAD – TS 57 south section and soil profile description

An auger hole with a diameter of 10 centimetres was excavated within the north western corner of TS 57 at the 50 centimetre base depth in order to determine how deep the sandy loam deposit was at this location (Plates 29-30). Fine sandy loam was identified to a depth of 65 centimetres where the deposit transitioned to moderately compact sandy clays which continued to the end level of 98 centimetres.

Plate 30. Excavation of an auger hole at TS 57, facing west, concrete path and the Georges River in the background.

Plate 31. Sediment samples from between 50 to 98 cm below the ground surface from TS 57.

5.12.2 Discussion

No Aboriginal objects were recovered from the test excavation program at HLD Resource Zone 1 + PAD. The test excavation program found that the majority of the soil profile had been extensively disturbed by previous land use practices. In the northern portion of the area, remnant natural soils were found beneath imported fill; however, the natural deposit did not contain Aboriginal objects and was consistent with alluvial soils.

The deposit indicates that the area was subject to flooding in the past and the area was likely subject to repeated accumulation and redisposition of soils. The presence of mangroves in non-modified areas indicates that the area would have been low lying and subject to swampy conditions in the past. The area is not a PAD or Aboriginal archaeological site.

6 Consultation Process

6.1 Aboriginal stakeholder consultation

Roads and Maritime is committed to effective consultation with Aboriginal communities regarding Roads and Maritime activities and their potential for impact on Aboriginal cultural heritage. The Roads and Maritime PACHCI was developed to provide a consistent means of effective consultation with Aboriginal communities regarding activities which may impact on Aboriginal cultural heritage and a consistent assessment process for Roads and Maritime activities across NSW.

The aim of consultation is to integrate cultural and archaeological knowledge and ensure registered Aboriginal parties have information to make decisions on Aboriginal cultural heritage. For the preparation of this CHAR, consultation with Aboriginal people has been undertaken in accordance with the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (OEH 2010) and the requirements of Clause 80C of *the National Parks and Wildlife Regulation 2009*.

Roads and Maritime advertised in local media (Appendix B) and contacted potential Aboriginal stakeholders identified from government agency notification responses. Roads and Maritime invited Aboriginal people who hold knowledge relevant to determining the cultural heritage significance of Aboriginal objects and Aboriginal places in the area in which the proposed activity is to occur to register an interest in a process of community consultation. Investigations for the Henry Lawson Drive Upgrade have included consultation with the 18 Aboriginal community groups and individuals as listed in Table 8 below.

Table 8. Registered Aboriginal parties

Registered Aboriginal party	Representative and/or Contact Person
Gandangara Local Aboriginal Land Council	CEO
A1 Indigenous Services	Carolyn Hickey
Barking Owl Aboriginal Corporation	Jody Kulakowski
Barraby Cultural Services	Lee Field
Butucarbin Aboriginal Corporation	Jennifer Beale
Cubbitch Barta Native Title Claimants Aboriginal Corporation	Glenda Chalker
Darug Aboriginal Cultural Heritage Assessments	Celestine Everingham
Darug Land Observations	Anna O'Hara
Didge Ngunawal Clan	Paul Boyd & Lilly Carroll
Kawul Cultural Services	Vicki Slater
Merrigarn	Shaun Carroll
Murra Bidgee Mullangari	Ryan Johnson
Wingikara	Hayley Bell
Woronora Plateau Gundangara Elders Council	Kayla Williamson
Wurrumay Consultants	Kerry Slater
Yulay Cultural Services	Arika Jalomaki
Yurrandaali Cultural Services	Bo Field
Registered Aboriginal Stakeholder (details withheld)*	Registered Aboriginal Stakeholder (details withheld)*

*One additional Aboriginal stakeholder has registered for the proposal but has chosen to withhold their details in accordance with item 4.1.5 of the *Aboriginal Cultural Heritage Consultation for Proponents 2010* (OEH 2010a).

The formal consultation process has included:

- advertising for registered Aboriginal parties (Appendix B);
- government agency notification letters;
- notification of closing date for registration;
- provision of proposed assessment methodology (allowing 28 day review);
- ongoing compilation of registrants list, through continuing to register individuals and groups for consultation on the project;
- provision of draft CHAR for review (allowing 28 day review);
- an online Aboriginal Focus Group (AFG) meeting was held on 24 September 2020 to discuss investigation results, draft CHAR and detailed mitigation strategies;
- ongoing consultation with the local Aboriginal community.

6.2 Provision of test excavation methodology and CHAR methodology

All registered stakeholders were provided with a copy of the proposed text excavation methodology and CHAR methodology as part of an information package. Stakeholders were requested to review the information and provide and comments or cultural information that may affect, inform or refine the methodology.

Formal responses to the proposed assessment methodology were received from A1 Indigenous Services (A1), Barraby Cultural Services (BCS), Barking Owl Aboriginal Corporation (BOAC), Didge Ngunawal Clan (DNC), Kawul Cultural Services (KCS), Merrigarn, Yulay Cultural Services (YLCS) and Yurrandaali Cultural Services (YRCS).

A1 (email received 19/05/2019) stated that they supported the proposed assessment methodology.

BCS (email dated 16/05/2019) stated that they supported the proposed assessment methodology.

BOAC (letter dated 21/05/2019) stated they were satisfied with the proposed assessment methodology and project information.

DNC (email dated 17/05/2019) stated they agreed with the proposed assessment methodology.

KCS (email dated 17/06/2019) stated they agreed with the proposed assessment methodology.

Merrigarn (email dated 28/05/2019) stated they agreed with the proposed assessment methodology.

YLCS (email dated 16/05/2019) stated that they supported the proposed assessment methodology.

YRCS (email dated 16/05/2019) stated that they supported the proposed assessment methodology.

6.3 Review of draft CHAR

The draft CHAR was provided to stakeholders for a 28 day review. Stakeholders were invited to provide any information on the cultural heritage values and significance of the study area that they wanted included in the report. Stakeholders were also invited to review and comment on the draft CHAR.

A formal response was received from Cubbitch Barta Native Title Claimants Aboriginal Corporation (CBNTCAC) who agreed with the recommendation for salvage mitigation (letter dated 30/03/2020).

Stakeholders were invited to attend an online Aboriginal focus group meeting to discuss the findings of the test excavation program, the draft CHAR and the proposed mitigation. The AFG meeting was held on 24 September 2020 and was attended by representatives from Roads and Maritime, KNC and registered Aboriginal stakeholder groups and individuals.

Several questions were asked in relation to the potential occurrence of unexpected Aboriginal archaeological finds or ancestral remains during the proposed upgrade by representatives from CBNTCAC and Butucarbin Aboriginal Corporation (BAC). A representative from Roads and Maritime advised that existing procedures will be followed during the proposed works in the event of unexpected Aboriginal archaeological finds or ancestral remains and that the registered Aboriginal stakeholders will be notified if Aboriginal ancestral remains are identified.

BAC queried the ability of workers on the project to identify unexpected Aboriginal archaeological finds or ancestral remains during the proposed upgrade. A construction environmental management plan would be developed for the proposed upgrade to create additional awareness of the potential for unexpected Aboriginal archaeological finds or ancestral remains.

A further response was received from CBNTCAC following the AFG (letter dated 24/09/2020). CBNTCAC agreed with the proposed archaeological salvage of HLD Site 6 (AS) (formerly HLD PAD 3) and HLD Site 7 (AS) (formerly HLD PAD 4). CBNTCAC noted concerns that Aboriginal ancestral remains may exist below the deposits excavated during the test excavation program and that the proposed works will impact on deposits far deeper than the test excavation. Existing Roads and Maritime procedures will be followed during the proposed works in the event of any unexpected Aboriginal archaeological finds or ancestral remains.

CBNTCAC recommended that mature trees within the proposed impact area should be fully assessed. The mature trees within the study area were inspected during an archaeological survey undertaken as part of the PACHCI Stage 2 assessment (GML 2018). No Aboriginal culturally modified trees were identified within the study area by the PACHCI Stage 2 assessment.

7 Summary and Analysis of Background Information

Analysis of the background information presented in Sections 2-6 allows an assessment of the cultural heritage values within the study area to be made. Combining data from historical/ethnographic sources, Aboriginal community consultation, landscape evaluation and archaeological context provides an insight into how the landscape around the proposal area was used and what sort of events took place in the past. This section draws together a variety of information to bring further understanding to the cultural landscape of the proposal area.

The study area and surrounding region are known to have been important to and extensively used by past Aboriginal people. Early colonial interest in the area led to interactions between the British and the local Aboriginal people relatively soon after the arrival of the British in Australia. Aboriginal people's use of the region is well documented with historical figures including Pemulwuy, his son Tedbury and Kogi were associated with the Georges River. The Aboriginal community who lived along Salt Pan Creek played an important role in the activism of the 20th Century and members of the contemporary Aboriginal community continue to experience connection with the area through cultural and family associations.

Archaeological evidence indicates that the area has been utilised by past Aboriginal occupation for at least the last 5,000 years. Archaeological sites in the vicinity of the study area comprise open artefact scatters, culturally modified trees, areas of potential archaeological deposit and isolated artefacts; however, within the wider region, a large number of midden sites and rockshelters with art or occupation deposits have also been identified. The spatial distribution of archaeological sites in the region is highly influenced by proximity to the aquatic and adjacent terrestrial resources along the Georges River and its tributaries.

The study area is located in an area of relatively low relief unlike the steep sandstone banks of the Georges River to the east and west. The area is also in close proximity to fresh water resources in the upper reaches of the Georges River and Prospect Creek in addition to estuarine resources. The preservation of Aboriginal archaeological sites has been found to be highly influenced by geology, soil landscapes, fluvial activity and ground surface disturbance.

Suitable raw materials for making stone artefacts are not found within the geology of the study area and are present within the St Marys Formation and Rickabys Creek Gravel geologies of the north western Cumberland Plain, within the cobbles deposited by the Nepean River and along the south coast. The artefact assemblage from Henry Lawson Drive Rockshelter demonstrates that raw materials at the site were reduced more than at archaeological sites on the Cumberland Plain and indicate that raw lithic materials may not have been readily available during the last 1,000 years. The use of shell instead of stone by Aboriginal people living in coastal areas of Sydney was documented by the British and access to these materials may have been restricted.

The study area and adjacent lands have been subject to archaeological investigations as part of the current proposal. An archaeological survey was undertaken as part of the PACHCI Stage 2 assessment and identified three Aboriginal artefact sites with associated areas of PAD, two isolated artefacts and seven areas of PAD. The assessment also identified one of the areas of PAD, HLD Resource Zone 1 + PAD, as a potential resource gathering area. The test excavation program undertaken for the current project confirmed the presence of archaeological deposit at three of the seven areas identified as having potential archaeological deposits. No Aboriginal objects or further archaeological potential was found at HLD PAD 1, HLD PAD 5, HLD PAD 6 and HLD Resource Zone 1 + PAD. These areas were found to be either deflated (HLD PAD 1) or low lying and variably disturbed by past land use activities, and do not constitute Aboriginal archaeological sites.

Archaeologically, artefact scatters with stratigraphic integrity provide the most archaeological research potential and the majority of Aboriginal archaeological sites identified within the study area contained low artefact density and were variably disturbed. Two sites, HLD Site 6 (AS) and HLD Site 7 (AS), contained moderate artefact density and generally intact archaeological deposits.

7.1 Summary of identified Aboriginal sites within the proposal area

Review of background information, Aboriginal community consultation and archaeological assessment, including a test excavation program, has resulted in the identification of eight Aboriginal archaeological sites containing Aboriginal objects within the study area. The locations of the sites are shown on Figure 23 and the sites are listed in Table 9 below. Site summaries are provided below.

Table 9. Identified Aboriginal archaeological sites and previously registered AHIMS items within the study area

Site Name	Former Name	AHIMS ID	Site Feature
HLD Site 1 (AS)	HLD Site 1 (AS +PAD)	45-5-5119	Artefact
HLD Site 2 (IF)	HLD Site 2 (IF)	45-5-5116	Isolated Find
HLD Site 3 (AS)	HLD Site 3 (AS + PAD)	45-5-5115	Artefact
HLD Site 4 (AS)	HLD Site 4 (AS + PAD)	45-5-5114	Artefact
HLD Site 5 (IF)	HLD Site 5 (IF)	45-5-5125	Isolated Find
HLD Site 6 (AS)	HLD PAD 3	45-5-5120	Artefact
HLD Site 7 (AS)	HLD PAD 4	45-5-5121	Artefact
HLD Site 8 (IF)	HLD PAD 2	45-5-5118	Isolated Find
	HLD PAD 1	45-5-5117	Not a Site
	HLD PAD 5	45-5-5122	Not a Site
	HLD PAD 6	45-5-5123	Not a Site
	HLD Resource Zone 1 + PAD	45-5-5124	Not a Site

Site name: HLD Site 1 (AS) (formerly HLD Site 1 (AS +PAD))
AHIMS site ID: 45-5-5119

Site HLD Site 1 (AS) is an open context artefact site situated on a narrow strip of a gently sloping landform east of Prospect Creek. The site was located on the western side of Henry Lawson Drive, between the Flinders Slopes car park and the road. The PACHCI Stage 2 survey identified a surface artefact scatter at the site that consisted of of three artefacts in a cleared area at the base of a simple slope that leads to a high point in the landscape with expansive views to the south-west. The artefacts were flakes and flaked pieces made from silcrete and mudstone.

An archaeological test excavation was undertaken at the site by KNC in July 2019. The program excavated four test squares within the proposed impact area. No Aboriginal cultural material was recovered from test excavations. The test excavation program found that the soil profile had been partially or entirely removed with introduced fill material present within all the test excavation units. The soil profile indicated that the soils within the site had been stripped through past land use practices and were not conductive to the preservation of Aboriginal archaeological deposits.

The presence of scattered low-density surface artefacts indicate that the site had been disturbed by recent land use activities, such as vegetation clearing, road and car park construction which has partially or totally displaced natural soils and exposed artefacts. Surface artefacts represent dispersed cultural material from the area. The very low density, limited range of artefact types and shallow deposit at the site indicated a low potential to retrieve additional archaeological information.

Site name: HLD Site 2 (IF)
AHIMS site ID: 45-5-5116

Site HLD Site 2 was an isolated artefact recorded during the PACHCI Stage 2 archaeological survey by GML in 2018. It was located on a graded track approximately 3m west of Henry Lawson Drive verge, 170m east of the Prospect Creek and 80m north of the Lansdowne Criterion Track. The area was extensively disturbed by the construction of the existing road and it was considered that there is no further archaeological potential as there is no likelihood for any intact natural soils to be present.

Site name: HLD Site 3 (AS) (formerly HLD Site 3 (AS + PAD))
AHIMS site ID: 45-5-5115

Site HLD Site 3 AS was an artefact scatter located on a crest landform with a north-facing aspect, approximately 500m east of Prospect Creek. The site is west of Henry Lawson Drive and less than 100m from the intersection with the Hume Highway. PACHCI Stage 2 survey identified a single mudstone flaked artefact, and it was considered the area had further archaeological potential (GML 2018: 38).

An archaeological test excavation was undertaken at the site by KNC in July 2019. The program excavated nine test squares within the proposed impact area. One artefact was recovered, a yellow silcrete flake fragment with no traces of secondary modification. The entire site contained areas of significant disturbance stemming from previous land use practices.

Artefact distribution within HLD Site 3 (AS) was characterised by isolated and scattered artefacts across the site. Silcrete and mudstone artefacts commonly occur across the Cumberland Plain. The test excavation program considered that both the site occupation pattern and modern land use practices have caused this dispersed and fragmentary distribution of Aboriginal objects. The low artefact density, limited range of artefact types, deflated soil profile and subsurface disturbance at the site indicated a low potential to retrieve additional archaeological information.

Site name: HLD Site 4 (AS) (formerly HLD Site 4 (AS + PAD))
AHIMS site ID: 45-5-5114

Site HLD Site 4 AS was an artefact scatter located on a crest and gentle slopes of a low hill approximately 380m west of Prospect Creek, on the eastern side of Henry Lawson Drive and to the east of Lansdowne Criterion Track. PACHCI Stage 2 survey identified two chert and one mudstone artefact within an eroded area. It was considered that there was a potential for intact soils to be present that might have contained Aboriginal cultural material.

An archaeological test excavation was undertaken at the site by KNC in July 2019. The program excavated seven test squares within the proposed impact area. One artefact was recovered, a red silcrete flake with no traces of secondary modification. Test excavation revealed the presence of remnant soils within the majority of the site extent, with one area within the middle section exhibiting heavily truncated topsoil layers. It is likely that previous land use practices and natural agents have removed portions of the artefact bearing soil horizons through this area. Flooding events or seasonal waterlogging also partially remove and disturb soils causing erosion and redeposition of deposits elsewhere.

Artefact distribution within HLD Site 4 (AS) was characterised by low density and scattered artefacts across the site. The assemblage consisted of four flaked pieces made from a variety of raw materials, including silcrete, chert and mudstone, that are commonly occurring across the Cumberland Plain. The test excavation program demonstrated that while subsurface deposits existed at the site, they have been disturbed by natural processes and/or modern land use practices which have caused a dispersed and fragmentary distribution of Aboriginal objects. The low artefact density, limited range of artefact types, deflated soil profile and subsurface disturbance at the site indicated a low potential to retrieve additional archaeological information.

Site name: HLD Site 5 (IF)
AHIMS site ID: 45-5-5125

Site HLD Site 5 IF was an isolated artefact recorded during the PACHCI Stage 2 archaeological survey by GML in 2018. One silcrete artefact was located within an open depression within the southern verge of Milperra Road, approximately 400m east of the intersection with Henry Lawson Drive. It was considered that there was no further archaeological potential as there is no likelihood for any intact natural soils to be present.

Site name: HLD Site 6 (AS) (formerly HLD PAD 3)
AHIMS site ID: 45-5-5120

Site HLD Site 6 (AS) was originally recorded as a potential archaeological deposit (HLD PAD 3) during the PACHCI Stage 2 archaeological survey by GML in 2018. The PAD was located to the north of Lake Gillawarna, 180m east of Prospect Creek and across both sides of Henry Lawson Drive. It is on a raised terrace above the floodplain associated with Prospect Creek approximately 150m to the west.

An archaeological test excavation was undertaken at the site by KNC in July 2019. The program excavated five test squares within the proposed impact area. A total of 12 artefacts were recovered from three of the five test squares. Given the confirmed presence of artefacts, the site was renamed to HLD Site 6 (AS). The artefact assemblage was characterised by unmodified flaking debitage including complete flakes and flake fragments, made of chert, silcrete and IMT. The test excavation squares located on the eastern side of Henry Lawson Drive contained shallow deposits with introduced fill material and total removal of natural A horizons. Those on the western side of Henry Lawson Drive revealed truncated A horizons with some fill material, but had relatively intact soils below this. Sub-surface artefacts were recovered from the western side of Henry Lawson Drive, where there was also a road embankment with artefacts identified on the surface. The site extends along a narrow strip of remnant alluvial deposit on the western side of Henry Lawson Drive.

Given the confirmed presence of artefactual deposit within relatively intact soils, the site offers the potential to yield information that will contribute to our understanding of how the resources of Prospect Creek and the wider Georges River catchment were utilised by past Aboriginal people, especially in relation to the identified environmental factors influencing site formation and preservation in the region.

Site name: HLD Site 7 (AS) (formerly HLD PAD 4)
AHIMS site ID: 45-5-5121

Site HLD Site 7 (AS) was originally identified as a potential archaeological deposit (HLD PAD 4) during the PACHCI Stage 2 archaeological survey by GML in 2018. The site was located on the northern side of Henry Lawson Drive, 100m south-west of the intersection with Georges Crescent, 200m east of Prospect Creek and 100m south of Lake Gillawarna. The site is situated on a low rise above the floodplain. The landscape slopes towards the creek and the lake to west and north respectively.

An archaeological test excavation was undertaken at the site by KNC in July 2019. The program excavated six test squares within the proposed impact area. A total of 8 artefacts were recovered from two of the six test squares giving a mean artefact density across the test excavation area of 1.3 artefacts/test square. The artefact assemblage was characterised by unmodified flaking debitage including one flake, flake fragments and angular fragments, made of silcrete and IMT. One IMT and two silcrete angular fragments had traces of heat damage with potlids. One flake was of a particular interest; it was made of fine grained pink silcrete and was previously used as a unidirectional core, as it contains at least five blade scars on its dorsal side. It indicates that an exhausted blade core made of a good quality raw material was re-used as a flake.

Given the confirmed presence of artefactual deposit within relatively intact soils, the site offers the potential to yield information that will contribute to our understanding of how the resources of Prospect Creek and the wider Georges River catchment were utilised by past Aboriginal people, especially in relation to the identified environmental factors influencing site formation and preservation in the region.

Site name: HLD Site 8 (IF) (formerly HLD PAD 2)
AHIMS site ID: 45-5-5118

Site HLD Site 8 (IF) was originally recorded as a potential archaeological deposit (HLD PAD 2) during the PACHCI Stage 2 archaeological survey by GML in 2018. The PAD was located on the eastern side of Henry Lawson Drive at the base of a slope with a northerly aspect between two artificial lakes located on both sides of Henry Lawson Drive. The PAD was situated to the immediate south of a small drainage line that runs to Prospect Creek approximately 200m to the west.

An archaeological test excavation was undertaken at the site by KNC in July 2019. The program excavated four test squares within the proposed impact area. One artefact was recovered, a milky quartz flake with no traces of secondary modification. Test excavations revealed a varying degree of remnant soils within the site extent, with total removal of natural soils in the southern portion to partial removal of topsoil, but mainly intact soil deposits in the middle section of the site extent. Due to the presence of an artefact, the site was renamed as HLD Site 8 (IF).

It is considered that both Aboriginal site occupation patterns and previous anthropogenic factors have influenced the presence and survivability of archaeological deposit at the site. The presence of an isolated artefact on the flat landform adjacent to a first order ephemeral drainage line conforms to the site occupation model for the Cumberland Plain, namely that more intensive and repeated site use took place adjacent to higher order watercourses. Previous land use practices including vegetation clearing, installation of informal tracks and construction of the artificial lake have caused partial or total removal and displacement of natural soils that may have contained other cultural material. The deflated soil profile and subsurface disturbance at the site indicated a low potential to retrieve additional archaeological information.

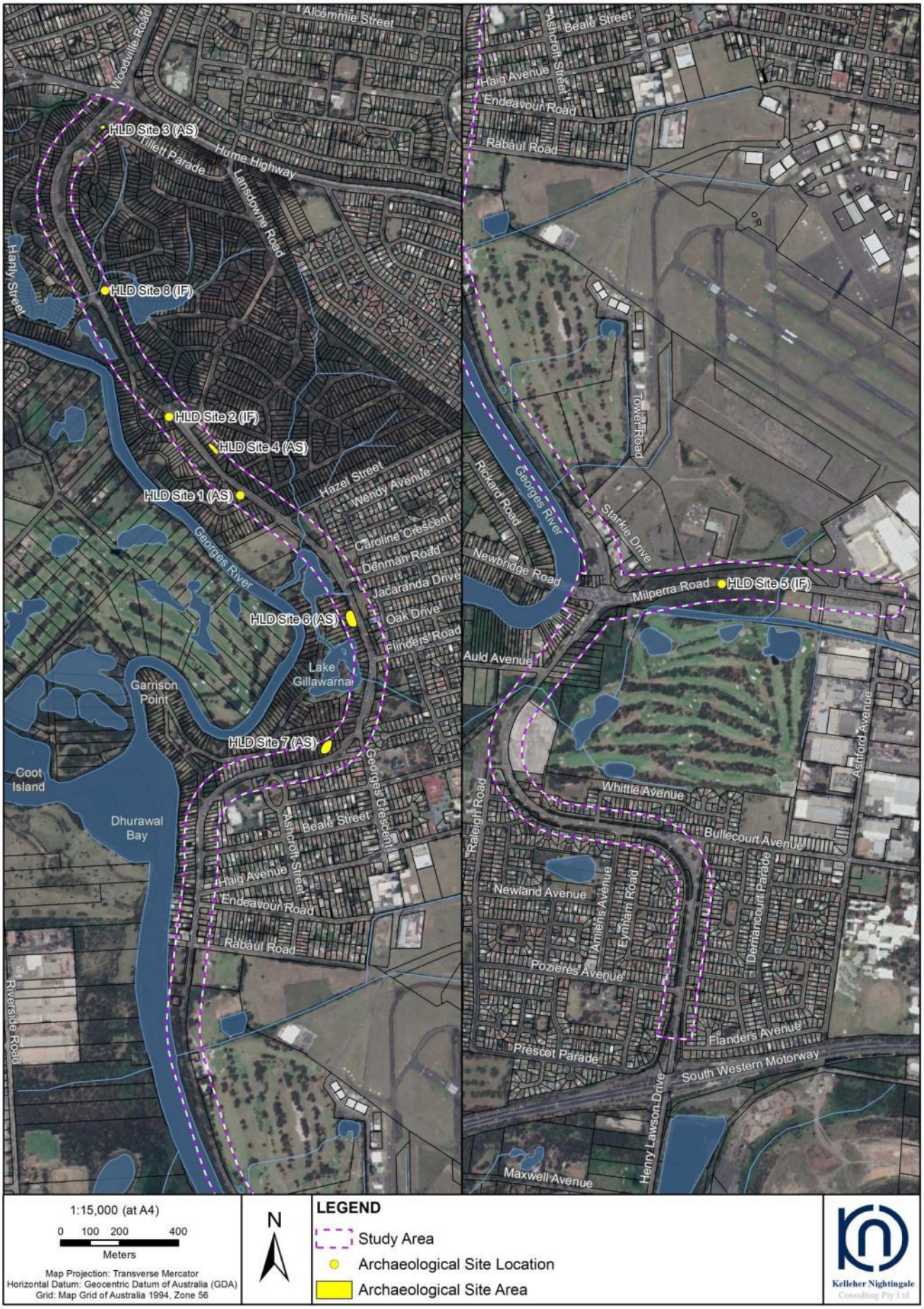

Figure 46. Identified Aboriginal archaeological sites within the study area

8 Cultural Heritage Values and Statement of Significance

8.1 Significance Assessment Criteria

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

The assessment of significance is a key step in the process of impact assessment for a proposed activity as the significance or value of an object, site or place will be reflected in resultant recommendations for conservation, management or mitigation.

The *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (OEH 2010a) requires significance assessment according to criteria established in the Australia ICOMOS Burra Charter, 1999 (Australia ICOMOS 1999). The Burra Charter and its accompanying guidelines are considered best practice standard for cultural heritage management, specifically conservation, in Australia. Guidelines to the Burra Charter set out four criteria for the assessment of cultural significance:

- Aesthetic value - relates to the sense of the beauty of a place, object, site or item
- Historic value - relates to the association of a place, object, site or item with historical events, people, activities or periods
- Scientific value - scientific (or research) value relates to the importance of the data available for a place, object, site or item, based on its rarity, quality or representativeness, as well as on the degree to which the place (object, site or item) may contribute further substantial information
- Social value - relates to the qualities for which a place, object, site or item has become a focus of spiritual, political, national or other cultural sentiment to a group of people. In accordance with the OEH *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*, the social or cultural value of a place (object, site or item) may be related to spiritual, traditional, historical or contemporary associations. According to OEH, "social or cultural value can only be identified though consultation with Aboriginal people" (OEH 2011:8).

There are eight locations of recorded Aboriginal cultural heritage values within the study area. The significance assessment for the identified archaeological sites has focussed on the social/cultural, historic, scientific and aesthetic significance of Aboriginal heritage values as identified in *The Burra Charter*.

Social Values

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

It has been identified during the consultation process that the local area has cultural heritage value (social value) to the local Aboriginal community.

Regarding Aboriginal sites identified within the study area, no specific cultural or social values expressed by these sites have been identified to date.

Historic Values

Historical research did not identify any information regarding specific historical significance of identified Aboriginal archaeological sites within the current study area. No specific historical significance for the sites within the study area have been provided by the registered Aboriginal stakeholders to date.

Scientific Values

Scientific values have been assessed for the identified Aboriginal archaeological sites in the proposal area. These values have been developed based on significance criteria of research potential (including integrity/condition, complexity and archaeological potential), representativeness and rarity. Identified archaeological sites in the study area displayed both moderate and low scientific significance.

Sites of low significance are those that do not offer archaeological research potential and are unlikely to provide any further scientifically valuable information. Sites with moderate significance are those that offer the potential to yield information that will contribute to our understanding of how the resources of the Prospect Creek and the wider Georges River catchment were utilised by past Aboriginal people by providing information regarding site type interrelationships and occupation patterns, especially in relation to the identified environmental factors influencing site formation and preservation in the region.

Aesthetic Values

Aesthetic values are often closely related to the social values of a site or broader cultural landscape. Aspects may include scenic sights, smells and sounds, architectural fabric and creative aspects of a place.

No specific associated aesthetic values have been listed for the study area by the registered Aboriginal stakeholders to date. Archaeologically, the study area does not contain these values.

8.2 Statements of Significance

The proposal area contains eight identified Aboriginal archaeological sites as defined under the *National Parks and Wildlife Act 1974*. The eight identified Aboriginal archaeological sites within the study area are:

HLD Site 1 (AS)	45-5-5119
HLD Site 2 (IF)	45-5-5116
HLD Site 3 (AS)	45-5-5115
HLD Site 4 (AS)	45-5-5114
HLD Site 5 (IF)	45-5-5125
HLD Site 6 (AS)	45-5-5120
HLD Site 7 (AS)	45-5-5121
HLD Site 8 (IF)	45-5-5118

Based on the values assessment, the following levels of significance were ascribed to the eight sites within the study area:

Table 10. Assessed significance of Aboriginal archaeological sites within the study area

Significance	Site	Justification
Moderate	HLD Site 6 (AS) HLD Site 7 (AS)	• These sites offer good research potential as they represent intact archaeological deposits within the study area • Further investigation would add to our understanding of Aboriginal activities in the region and could provide information on the accessibility of artefact raw materials.
Low	HLD Site 1 (AS) HLD Site 2 (IF) HLD Site 3 (AS) HLD Site 4 (AS) HLD Site 5 (IF) HLD Site 8 (IF)	• These sites contain low artefact density and many are highly disturbed with very little potential for further archaeology • Every Aboriginal site is important to the local Aboriginal community, however, there are more intact or better examples of this site type within the study area and wider local area • The loss of the impacted portion of these sites is unlikely to diminish the overall Aboriginal cultural heritage values of the project area and wider local area

9 The Proposed Activity and Impact Assessment

Roads and Maritime proposes to upgrade a 7.5 kilometre section of Henry Lawson Drive between the M5 Motorway at Milperra and the Hume Highway at Lansdowne and to upgrade a one kilometre section of Milperra Road between the intersection of Henry Lawson Drive and the intersection of Ashford Road. The upgrade is proposed in stages and would provide dual carriageway, with the provision to upgrade to three lanes in each direction in the future.

The study area encompasses both the construction and operational footprints allowing for space to construct the road upgrade and temporary ancillary facilities.

The entirety of the study area would be impacted by construction and associated works. In total eight Aboriginal archaeological sites would be impacted by the proposal. Proposed impacts to sites identified within the study area are detailed in Table 11 and shown in Figure 47.

Table 11. Proposed impact to Aboriginal archaeological sites within the study area

Site Name	AHIMS ID	Description	Significance	Type / Degree of Harm	Consequence of Harm
HLD Site 1 (AS)	45-5-5119	Very low density surface artefact scatter without subsurface deposit with variable disturbance	Low	Direct / Total	Total loss of value
HLD Site 2 (IF)	45-5-5116	Isolated artefact within a disturbed context	Low	Direct / Total	Total loss of value
HLD Site 3 (AS)	45-5-5116	Very low density surface and subsurface artefact scatter with variable disturbance	Low	Direct / Total	Total loss of value
HLD Site 4 (AS)	45-5-5115	Very low density surface and subsurface artefact scatter with variable disturbance	Low	Direct / Total	Total loss of value
HLD Site 5 (IF)	45-5-5125	Isolated artefact within a disturbed context	Low	Direct / Total	Total loss of value
HLD Site 6 (AS)	45-5-5120	Moderate density subsurface deposit on a low crest overlooking Prospect Creek	Moderate	Direct / Total	Total loss of value
HLD Site 7 (AS)	45-5-5121	Moderate density subsurface deposit on a low crest overlooking Prospect Creek	Moderate	Direct / Total	Total loss of value
HLD Site 8 (IF)	45-5-5118	Isolated artefact with shallow deposit and variable disturbance	Low	Direct / Total	Total loss of value

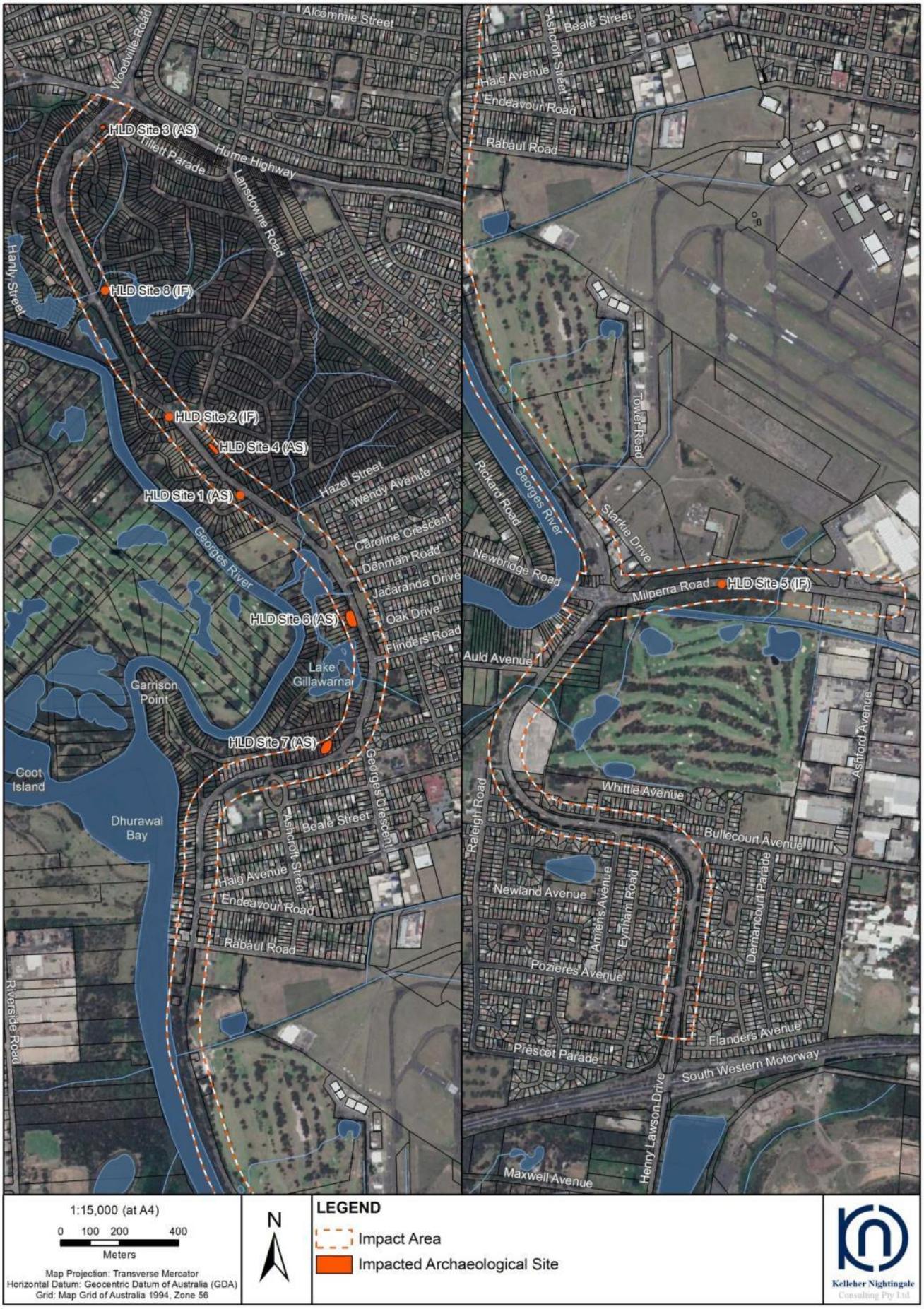

Figure 47. Study area (impact area) and Aboriginal heritage

10 Mitigating Harm

10.1 Ecologically Sustainable Development Principles

The assessment applied the principles of Ecologically Sustainable Development (ESD) to the current proposal. The principles of Ecologically Sustainable Development are defined in Section 6 of the NSW *Protection of the Environment Administration Act 1991*. The ESD principles relevant to Aboriginal cultural heritage within the study area are: the Precautionary Principle and the Principle of Inter-Generational Equity. The application of these principles in relation to the current proposal is discussed below.

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

The identified Aboriginal archaeological sites have been considered by Roads and Maritime in relation to the proposed upgrade and associated activities. A larger area was surveyed as part of the PACHCI Stage 2 assessment in order to provide options for Aboriginal archaeological site avoidance where possible. While conservation is the best approach when considering Aboriginal heritage, the avoidance of Aboriginal archaeological sites within the study area was not possible due to the topography of the area and location of the existing roads which limited the area in which it could occur.

The Aboriginal sites located within the study area have been impacted by past land use activities and would be further impacted by current land use practices. Scientific confidence has been achieved through archaeological investigations which have included test excavation and survey (Sections 4 and 5). Regarding Aboriginal cultural heritage value confidence, no specific cultural or social values expressed by these sites have been identified to date (Section 6). As detailed in Sections 7 and 8, the assessment has determined that the study area contains Aboriginal archaeological sites with a mix of low and moderate significance.

The Principle of Inter-Generational Equity
The Principle of Inter-Generational Equity states "that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations".

The archaeological sites located within the proposal area were evaluated in relation to intergenerational equality and in particular, the cumulative impact of the proposal on the Aboriginal heritage of the region. As discussed in Section 4, redevelopment and the construction of infrastructure in the region have identified and subsequently impacted Aboriginal archaeological sites; however, the majority of identified sites in the region have been identified in various parks and reserves south of the Georges River.

10.2 Mitigation Measures

Suitable recommendations for the identified impacts to the sites have been developed based on ESD, environmental context and condition, background research and consultation with stakeholders. The study area contains a mix of low and moderate significance sites.

Aboriginal archaeological sites HLD Site 1 (AS), HLD Site 2 (IF), HLD Site 3 (AS), HLD Site 4 (AS), HLD Site 5 (IF) and HLD Site 8 (IF) are considered to display low significance based on their scientific value and potential to inform on Aboriginal landscape use along Prospect Creek and Georges River.

Sites of at least moderate significance require mitigation through salvage excavation. Sites HLD Site 6 (AS) and HLD Site 7 (AS) are considered to display moderate significance based on their scientific value and potential to inform on Aboriginal landscape use within the Georges River catchment area. Their archaeological value is linked to the information that they contain. Recovery of this information through archaeological salvage excavation would mitigate the impact of the proposal and offer an opportunity to better understand the distribution of artefact raw materials in these locations. The loss of intrinsic Aboriginal cultural value of impacted sites cannot be offset or mitigated; however the salvaged information will assist in a better understanding of the local archaeological context, particularly as much of the immediate area is impacted by historic and contemporary land use. Salvage would also add open context site excavation data for the region, particularly where this has been focused on closed context sites.

An AHIP is required for impacts to land and identified sites/objects prior to the commencement of pre-construction or construction activities associated with the proposal that would affect the sites. Measures for mitigating harm to the sites are outlined in Table 12 below.

Table 12. Mitigation measures for impacted Aboriginal sites

Site Name	AHIMS number	Mitigating Harm
HLD Site 1 (AS)	45-5-5119	Archaeological mitigation not required AHIP required prior to commencement of works affecting the site.
HLD Site 2 (IF)	45-5-5116	Archaeological mitigation not required AHIP required prior to commencement of works affecting the site.
HLD Site 3 (AS)	45-5-5116	Archaeological mitigation not required AHIP required prior to commencement of works affecting the site.
HLD Site 4 (AS)	45-5-5115	Archaeological mitigation not required AHIP required prior to commencement of works affecting the site.
HLD Site 5 (IF)	45-5-5125	Archaeological mitigation not required AHIP required prior to commencement of works affecting the site.
HLD Site 6 (AS)	45-5-5120	Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample of the site is required prior to impact. AHIP required prior to commencement of works affecting the site.
HLD Site 7 (AS)	45-5-5121	Given the moderate significance of the site and degree of proposed impact, salvage excavation of a representative sample of the site is required prior to impact. AHIP required prior to commencement of works affecting the site.
HLD Site 8 (IF)	45-5-5118	Archaeological mitigation not required AHIP required prior to commencement of works affecting the site.

11 Summary and Recommendations

A total of eight Aboriginal sites are situated within the study area. Seven Aboriginal sites are located within the proposed Stage 3 area of the upgrade and one isolated artefact (HLD Site 5 (IF)) is located within the proposed Stage 1A area. An AHIP would be sought for Aboriginal objects within the boundaries of the study area, incorporating archaeological sites listed in Table 13.

AHIP

An application for an AHIP should be made under section 90A of the *National Parks and Wildlife Act 1974* for the eight Aboriginal archaeological sites. No known current AHIPs or planned future AHIPs exist within the area which is the subject of this application. An AHIP would be sought for the land and associated objects within the Stage 3 area following planning approval (REF and/or EIS) (Figure 48). The AHIP would also be sought for the specified Aboriginal sites and objects contained within the Stage 3 area (Table 13).

A second site based AHIP would be sought for HLD Site 5 (IF) following planning approval (REF and/or EIS) for Stage 1A of the proposed upgrade.

Table 13. Known archaeological sites requiring AHIP and degree of harm

Site Name	AHIMS Number	Degree of Harm	Consequence of Harm	Significance of harm	Mitigation
HLD Site 1 (AS)	45-5-5119	Total	Total loss of value	Low	Disturbed no salvage warranted
HLD Site 2 (IF)	45-5-5116	Total	Total loss of value	Low	Disturbed no salvage warranted
HLD Site 3 (AS)	45-5-5116	Total	Total loss of value	Low	Disturbed no salvage warranted
HLD Site 4 (AS)	45-5-5115	Total	Total loss of value	Low	Disturbed no salvage warranted
HLD Site 5 (IF)	45-5-5125	Total	Total loss of value	Low	Disturbed no salvage warranted
HLD Site 6 (AS)	45-5-5120	Total	Total loss of value	Moderate	Salvage excavation
HLD Site 7 (AS)	45-5-5121	Total	Total loss of value	Moderate	Salvage excavation
HLD Site 8 (IF)	45-5-5118	Total	Total loss of value	Low	Disturbed no salvage warranted

Collected Aboriginal objects

The short term management of collected Aboriginal objects would be as follows:

- Any Aboriginal objects that are removed from the land by actions authorised by an AHIP, must be moved as soon as practicable to the temporary storage location (see below) pending any agreement reached about the long term management of the Aboriginal objects.
- The temporary storage location would be: Kelleher Nightingale Consulting Pty Ltd, Level 10, 25 Bligh Street, Sydney NSW 2000.
- Any Aboriginal objects stored at the temporary storage location must not be further harmed, except in accordance with the conditions of the AHIP.

The long term management of collected Aboriginal objects is as follows:

- Recovered objects will be lodged with the Australian Museum in the first instance in accordance with the *Australian Museum Archaeological Collection Deposition Policy* (January 2012, available online at: http://australianmuseum.net.au/document/Protocols-for-the-deposition-of-archaeological-materials).
- If required, a variation will be sought for recovered objects to be held by the Aboriginal community or reburied. If reburial is to take place, registered Aboriginal parties would be notified and given the opportunity to attend.
- Requirement 26 "Stone artefact deposition and storage" in the Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW (24 September 2010, available online at: http://www.environment.nsw.gov.au/resources/cultureheritage/10783FinalArchCoP.pdf) must be complied with.

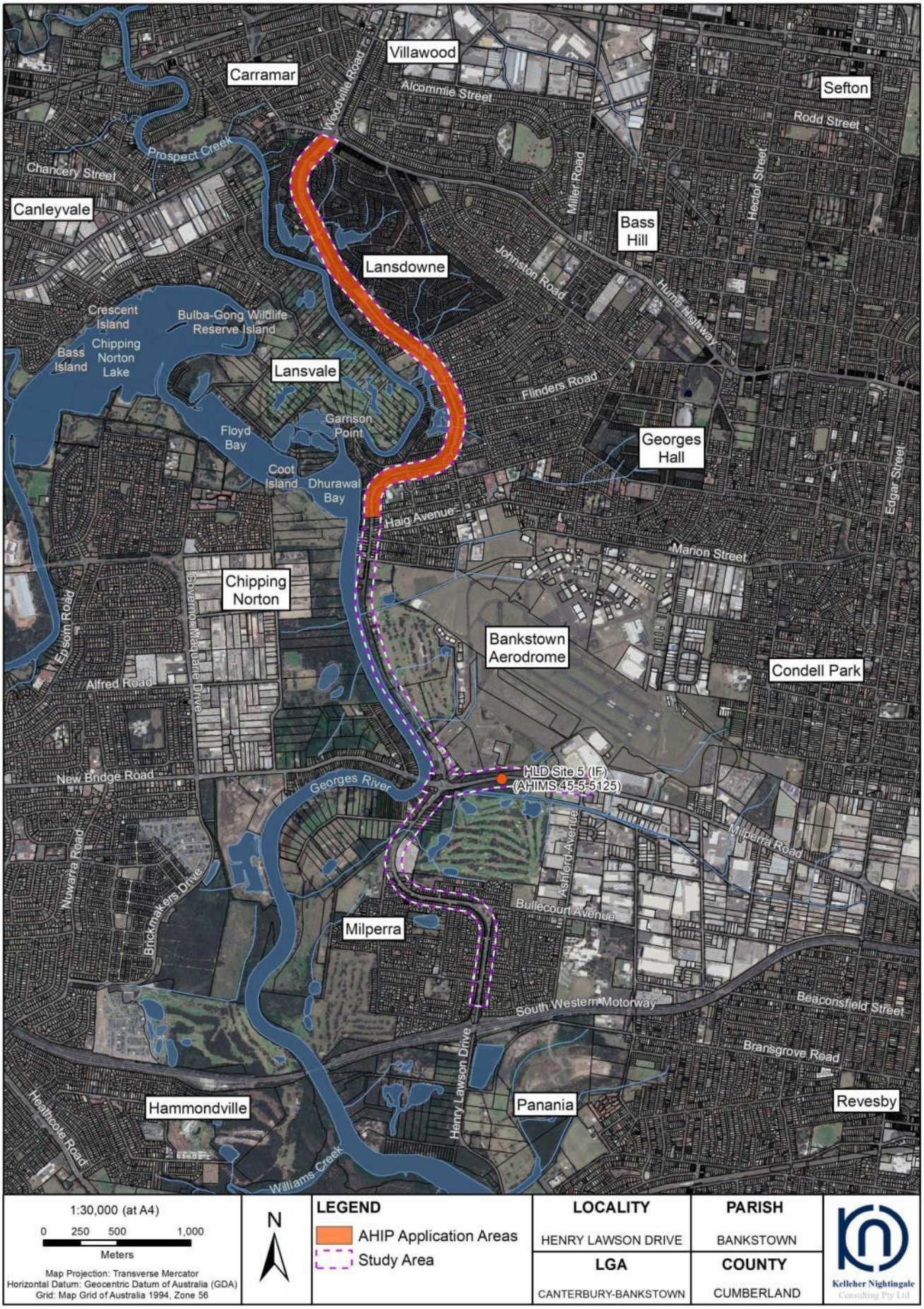

Figure 48. AHIP application areas

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Glossary of Terms

Aboriginal Object (as defined in the NPW Act)	Any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.
Aboriginal Place (as defined in the NPW Act)	A place declared under s.84 of the NPW Act that, in the opinion of the Minister, is or was of special significance to Aboriginal culture.
Anvil	An object used as a stable base for producing stone artefacts. This will have percussion pitting from the impact of reducing an anvil rested core.
Artefact	Any object that has been physically modified by humans or that is unmodified but is out of its natural context and considered to have been brought to the location by humans (a manuport).
Attribute	A physical characteristic of an artefact
Backed Artefact	A tool made from a flake or flake fragment, with steep blunting retouch along one or opposite margin after the flake was removed from the core. Includes geometric microliths of various shapes and asymmetric Bondi points.
Backed Broken	Fragments of backed or partly backed flakes. Breakage often occurred during manufacture.
Backing Debitage	Small retouching flakes produced from the backing process using an anvil rested technique along its thick margin. May have bidirectional scars or a small distal cone from rebounding off an anvil.
Bipolar Core	A core reduced using the bipolar technique, being placed on an anvil and struck with a hammer stone.
Bipolar Flake	A flake with proximal and distal crushing produced by bipolar flaking technique. These may have a flattened ventral surface/bulb of percussion. Some flakes may only have crushing/step fractures at proximal end, having been removed before reaching the base of the core.
Bondi Point	An asymmetrical backed artefact which is widest at the proximal end and pointed at the distal end. The length of a Bondi point is generally over twice the artefact width.
Bulb of Percussion	An attribute on the ventral surface of a flake during the detachment of the flake from a core by the movement of force from a blow applied to a single point. The bulb of percussion is characteristically a bulge which occurs just below the point of force application.
Bulbar (Éraillure) Scar	A scar on the ventral surface of a flake which sometimes occurs during the removal of the flake from a core by the force of percussion.
Chert	A fine rock of sedimentary origin, made up mostly of microcrystalline quartz, but sometimes with a chalcedony or opal component. Chalcedony is a microporous mass of silica. Includes banded varieties.
Cobble	An edge rounded stone more than 6.4 centimeters in size. e.g. core blank, hatchet blank, or hammer stone.
Colour	Recorded with particular reference to silcrete to determine if artefacts were heat altered material versus unheated stone.
Conchoidal	Exhibiting the characteristics of direct percussion such as a bulb of percussion or ripple marks
Cone-Split Broken Flake	A flake broken longitudinally through its point of force application (pfa) /cone. Retains some of the striking platform and point of impact. These are recorded as left or right half of the flake when viewing its ventral surface CSBF/Left, or CSBF/Right.
Conjoin	Two or more stone artefacts which are part of a knapping event that can be refitted to each other.
Core	Any stone used as a nucleus or blank for removing flakes large enough for use as implements. These must have negative flakes scars, although large retouched flakes used as cores may still retain a remnant ventral surface. Subsequent use as a core must intercept the old ventral surface. A core may be made on a cobble, pebble, flake, broken flake, flake fragment, heat shatter or naturally fragmented rock.

Core Flaking Pattern	The pattern of negative flake scars on cores, used to determine stone reduction strategies. Sometimes a core may have evidence of more than one flaking pattern. These include: • Unifacial – scars show that useable flakes have been removed one edge at a time in one direction. Sometimes reduction continued in this way after the core was rotated. Flakes should have a flat unmodified platform. • Bifacial – scars show that larger potentially useable flakes were struck off both opposing faces of an edge. Core edges often appear 'wavy' when viewed in plan. • Asymmetric alternating – tiny preparation flakes are first removed off the core platform, then larger useable flakes struck off the opposing face. The preparation scars can be seen on flakes with faceted platforms, and are sometimes still present on abandoned cores or core fragments. • Bipolar – small negative step scars or crushing at opposing ends of a core, from it being rested on an anvil and struck with a hammer stone. There may also be a tiny distal cone on flakes, from the force rebounding off the anvil.
Core Fragment	Broken off a core, and still retaining technological attributes such as negative flake scars or core platform.
Core Tool	A core that also has evidence of tool use on its margins or ridges such as striations, edge rounding or polish.
Cortex	The natural outer weathering rind or surface of rock. This may be remnant on the dorsal surfaces of an artifact, and is recorded as a percentage of the dorsal surface area.
Crazing	The surface of a heat affected rock which resembles cracked ceramic.
Crenate Fracture (CF)	Debitage with crenate fracture. This could be from heat shatter but may be from chemical weathering, particularly in chert or tuff artefacts
Culturally Modified Tree (as defined in the NPW Regulation)	A tree that, before or concurrent with (or both) the occupation of the area in which the tree is located by persons of non-Aboriginal extraction, has been scarred, carved or modified by an Aboriginal person by: • The deliberate removal, by traditional methods, of bark or wood from the tree, or • The deliberate modification, by traditional methods, of the wood of the tree.
Debitage	Material from the stone knapping process with no signs of subsequent modification.
Distal End	The termination of a flake opposite the bulb of percussion or point of applied force.
Distal Flake Fragment	A fragment of a flake that has been broken but distal termination (also termed distal fragment or distal flake). It does not have a distal termination.
Dorsal	The outside or back of a flake when removed from a core. The dorsal surface may have negative flake scars from previous flake removals and/or cortex
Fine Grained Siliceous (FGS)	Fine grained siliceous rocks which could not be positively identified without detailed mineralogical investigation.
Flake	A stone artefact that has been removed from a core. A flake has a proximal striking platform, point of force application (pfa), bulb of percussion and distal termination. Also may have a bulbar (éraillure) scar, ripple marks and fracture lines
Flaked Piece	An artefact that has evidence of flaking but no characteristics of a flake, broken flake, flake fragment, retouched flake or core can be discerned. Also referred to as an angular fragment.
Geometric Microlith	A type of backed artefact which is symmetrical in shape. They are often made from flakes with backing along truncated proximal and or distal ends.
Grinding Grooves	Oval shaped indentations on rock surfaces, such as sandstone outcrops which occurred as the result of the shaping and sharpening of ground stone artefacts.
Grindstone	A portable stone with linear striations and/or polish which shows that it has ground. Often made from fine grained sandstone or quartzite. May retain evidence of multipurpose use such as grinding of seeds, ochre.
Ground Stone Artefact	A stone artefact with an edge or surface that had been modified by grinding on another piece of stone. See Grindstone and Hatchet

Hammer stone	A stone used to strike a core for removal of flakes. Often spherical pebbles or cobbles with evidence of percussion pitting or spall scars on ends or margins.
Hatchet	A ground edged hatchet head or fragment. Should have evidence of intentional grinding e.g. linear striations/polish from shaping or resharpening the cutting edge. Hatchets were multipurpose tools and may also have evidence of hammer percussion or anvil use.
Heat Shatter (HS) Debitage	Debitage caused by heat shatter. May have evidence of pot lidding from excessive heat stress and/or irregular heat fractured surfaces.
Hornfels	A medium to fine grained metamorphic rock. Includes a variety known as spotted pelitic hornfels with tiny dark clasts or grains.
Igneous	A range of rocks of mixed mineral composition formed after cooling of molten subterranean materials. Occur as intrusions into older rocks such as dykes, diatremes, or spread onto the land surface from volcanic activity. Includes varieties such as basalt, dolerite.
Knapping Floor	An area where a core was flaked/knapped to produce flakes and tools.
Length	A measurement of the distance between the platform and the termination of a flake.
Lustre	A subjective record of lustre of stone artefact, also relating to heat treatment.
Manuport	An unmodified piece of stone out of natural context and considered to have been brought to the site by humans.
Medial Flake Fragment (Med Frag)	A fragment of the mid-section of a flake with no platform or termination.
Medium Grained	A medium grained Siliceous rock of unknown type.
Midden	Also called shell midden. An area with the remains of edible shellfish which were discarded as the result of human procurement/consumption. May included fish and animal bones, stone artefacts and/or charcoal.
Mortar	A large base stone for grinding/pounding.
Modification/Activity Type	Refers to the activity associated with the lithic item e.g. debitage or waste from stone flaking, used as a hammer, anvil, core, bipolar core, retouched artefact, backed artefact.
Pebble	An edge rounded stone less than 6.4 centimetres in size. May have been used as core or small hammer stone.
Petrified Wood	Also called silicified or fossilized wood. Formed when trees were fossilized and their structure replaced by silica. Wood structure and growth rings are still visible as 'bands' within this material.
Platform Type	Records the type of platform on whole flakes or proximal flake fragments for information on flaking patterns and reduction strategies. These include: • Cortical – platform covered in cortex. Unifacial flaking. • Plain – platform is smooth flat surface. Unifacial flaking or unifacial with core rotation. • Ridged – platform has ridge from previous flake removal across core. Unifacial rotated or symmetric alternating (bifacial) flaking. • Scarred – platform has one or more flake scars. Symmetric alternating (bifacial) flaking or asymmetric alternating flaking. May indicate platform preparation. • Faceted – platform has multiple tiny flake scars struck from the dorsal. Indicates careful platform preparation. Asymmetric alternating flaking. • Focal – small platform less than twice the area of ring crack. • Crushed - platform has been crushed from force of flake removal but the rest of the flake is otherwise intact. The platform may have multiple step fractures. Bipolar or unifacial. • Indeterminate – platform is flawed, irregular, or partly collapsed with the remainder of the flake intact.
Potential Archaeological Deposit (PAD)	An area where no surface archaeological remains are present that has been assessed as having the potential to contain subsurface archaeological deposits on the basis of indicators which may include landform, distance to water and visible surface disturbance.

Proximal End	The striking end of a flake opposite the distal end or termination.
Proximal Flake Fragment (Prox Frag)	A fragment of a flake that has been broken but retains its proximal striking platform (also termed proximal fragment or proximal flake). It does not have a distal termination.
Quality	A record of the flaking quality of the stone. This is a subjective measurement based on how well the material flakes and the presence of flaws. Poor quality material may have large grains or internal flaws which may inhibit controlled reduction of the material. Certain fine grained material lacking in flaws or inclusions may have been preferred for its good flaking properties and selected for particular tasks or implement types e.g. precision cutting/slicing.
Quartz	A hexagonal crystalline form of silicon dioxide (SiO2). May occur as clear, white or coloured from mineral impurities. Can occur as single crystals, veins or geodes. Often has internal fractures or flaws.
Quartzite	Sandstone that had been metamorphosed by volcanic activity or recemented with silica in solution.
Raw Material	The type of stone out of which the artefacts have been made. See Chert, Silcrete and Quartz
Reduction Type	Refers to the technological aspects of reducing stone. For definitions on fracture mechanics and flake characteristics refer to work by Cotterell and Kamminga (1987) and Holdaway and Stern (2004). For non-debitage items it is used to describe the form of that item before it was modified or fractured e.g. a large flake may have been reflaked and used as a core to produce further useable flakes.
Retouched Artefact	A stone artefact with negative flake scars along its margins from intentional retouch after it was removed from the core. More recent scars show that the flakes removed were too small to have been used as tools. It could not always be determined whether these were intended for use as tools or were for core preparation.
Shape	Recorded for whole flakes and includes the following: • Wider than long (W>L) • Longer than wide (L>W) • Length equals width (L=W) • Elongate - length more than twice the width.
Silcrete	An indurated rock comprised of quartz grains cemented in a siliceous matrix.
Silicified Tuff	Also variously termed indurated mudstone, tuff or ryolitic tuff. A fine grained rock of volcanic ash or other fine sediments metamorphosed and consolidated with silica. Sometimes distinguished from chert by having a lack of lustre (Corkill 1999:45), although heat treatment may result in lustrous flaked surfaces (Flenniken & White 1983:43).
Site	An area where Aboriginal objects have been identified.
Size	The maximum or longest dimension of each item was recorded, and entered as individual size classes of 5 milimetres (0-4mm, 5-9mm, 10-14mm, 15-19mm etc.).
Termination	Records the type of termination on whole flakes or distal flake fragments. Termination variation depends on the amount of force used, nature of the raw material and core morphology. These include: • Feather – A distal end which has a gradual thinning towards the termination • Hinge – A rounded termination • Plunging – A distal end containing the bottom surface of the core it was removed from • Step – A squared off termination
Thickness	A measurement of the distance between the dorsal and ventral faces of a flake at point where length and width measurements meet.
Tool	A stone artefact which has been modified into a formal type or used (expedient tool).
Usewear	An artefact with evidence of use such as striations, rounding or tiny edge fracture scars
Ventral Surface	The face of a flake which can be joined back to the core the flake was removed from. The ventral surface of a flake may exhibit the bulb of percussion, the ringcrack, ripple marks or fissures

Weight	Weight for each artefact was recorded using an electronic balance to the nearest 0.1g.
Width	A measurement at right angles to the length measurement of a flake, at the midpoint of the length

Appendix A AHIMS extensive search results

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 1829
Client Service ID : 452619

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-2909	Mirambeena Regional Park 2	AGD	56	312125	6247600	Open site	Valid	Artefact : 18		102196
	Contact	Recorders	Michael Guider					Permits		
45-5-2910	Mirambeena Regional Park 3	GDA	56	312185	6247952	Open site	Valid	Artefact : 3		102196
	Contact	Recorders	Mary Dallas Consulting Archaeologists (MDCA),Michael Guider,Ms.Tamika Goward					Permits		
45-5-4303	New Brighton Isolated Find	GDA	56	312347	6241606	Open site	Valid	Artefact : 1		
	Contact	Recorders	Ms.Fenella Atkinson					Permits	3623,3628	
45-5-5124	HLD Resource Zone 1 + PAD	GDA	56	312924	6244624	Open site	Valid	Aboriginal Resource and Gathering : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5125	HLD Site 5 (IF)	GDA	56	313732	6243856	Open site	Valid	Artefact : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5114	HLD Site 4 (AS+PAD)	GDA	56	312878	6247057	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5115	HLD Site 3 (AS+PAD)	GDA	56	312520	6248132	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5116	HLD Site 2 (IF)	GDA	56	312743	6247149	Open site	Valid	Artefact : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5117	HLD PAD 1	GDA	56	312404	6248008	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5118	HLD PAD 2	GDA	56	312531	6247561	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5119	HLD Site 1 (AS+PAD)	GDA	56	312985	6246882	Open site	Valid	Artefact : -, Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5120	HLD PAD 3	GDA	56	313363	6246462	Open site	Valid	Potential Archaeological Deposit (PAD) : -		

Report generated by AHIMS Web Service on 26/09/2019 for Matthew Kelleher for the following area at Datum :GDA, Zone : 56, Eastings : 312345 - 314681, Northings : 6241455 - 6248628 with a Buffer of 200 meters. Additional Info : to help with the archaeological potential. Number of Aboriginal sites and Aboriginal objects found is 33

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 1829
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SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5121	HLD PAD 4	GDA	56	313291	6246031	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5122	HLD PAD 5	GDA	56	312899	6244709	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-5123	HLD PAD 6	GDA	56	313097	6244334	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	Recorders	GML Heritage Pty Ltd + Context - Surry Hills,Doctor.Tim Owen					Permits		
45-5-3209	SPL 2	AGD	56	313051	6241800	Open site	Valid	Modified Tree (Carved or Scarred) : 2		
	Contact Searle	Recorders	Biosis Pty Ltd - Sydney					Permits		
45-5-3210	SPL 3	AGD	56	313187	6241793	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	Contact Searle	Recorders	Biosis Pty Ltd - Sydney					Permits		
45-5-4814	Scar Tree 11	GDA	56	312550	6242220	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4816	Scar Tree 8	GDA	56	312672	6242236	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4817	Scar Tree 9	GDA	56	312672	6242225	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4818	Scar Tree 10	GDA	56	312560	6242248	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4819	Riverlands Scar Tree 7	GDA	56	312704	6242251	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636

Report generated by AHIMS Web Service on 26/09/2019 for Matthew Kelleher for the following area at Datum :GDA, Zone : 56, Eastings : 312345 - 314681, Northings : 6241455 - 6248628 with a Buffer of 200 meters. Additional Info : to help with the archaeological potential. Number of Aboriginal sites and Aboriginal objects found is 33

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AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 1829
Client Service ID : 452619

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4822	Riverlands Scar Tree 1	GDA	56	312771	6242427	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4823	Riverlands Scar Tree 2	GDA	56	312770	6242434	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4824	Riverlands Scar Tree 3	GDA	56	312759	6242392	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4825	Riverlands Scar Tree 4	GDA	56	312750	6242402	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4826	Riverlands Scar Tree 5	GDA	56	312745	6242310	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4827	Riverlands Scar Tree 6	GDA	56	312736	6242256	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4828	Riverlands Scar Tree 13	GDA	56	312722	6242511	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4829	Riverlands Scar Tree 12	GDA	56	312732	6242569	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4830	Riverlands Scar Tree 14	GDA	56	312718	6242459	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4831	Riverlands Scar Tree 15	GDA	56	312712	6242455	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636

Report generated by AHIMS Web Service on 26/09/2019 for Matthew Kelleher for the following area at Datum :GDA, Zone : 56, Eastings : 312345 - 314681, Northings : 6241455 - 6248628 with a Buffer of 200 meters. Additional Info : to help with the archaeological potential. Number of Aboriginal sites and Aboriginal objects found is 33

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Extensive search - Site list report

Your Ref/PO Number : 1829
Client Service ID : 452619

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		
45-5-4832	Riverlands Scar Tree 16	GDA	56	312649	6242331	Open site	Not a Site	Modified Tree (Carved or Scarred) : -		103636
	Contact	Recorders	Dummy Organisation for AHIMS APP Users,Doctor.Paul Wynn					Permits		

Report generated by AHIMS Web Service on 26/09/2019 for Matthew Kelleher for the following area at Datum :GDA, Zone : 56, Eastings : 312345 - 314681, Northings : 6241455 - 6248628 with a Buffer of 200 meters. Additional Info : to help with the archaeological potential. Number of Aboriginal sites and Aboriginal objects found is 33

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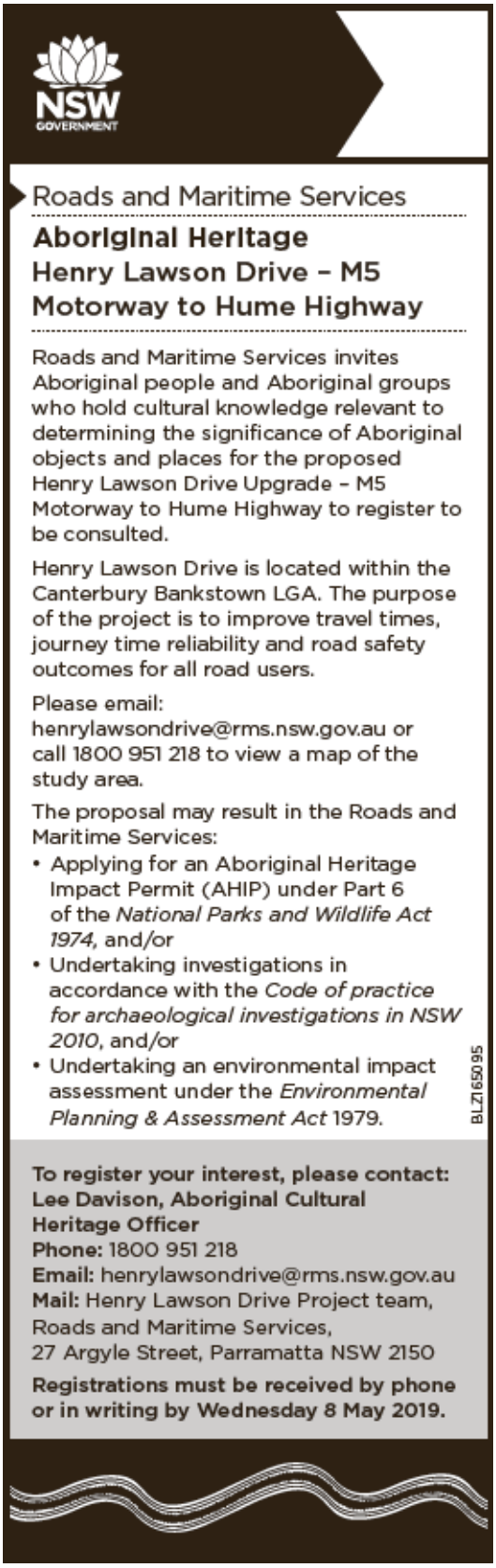
Appendix B Advertisement for registration of interest



NSW GOVERNMENT

Roads and Maritime Services

Aboriginal Heritage
Henry Lawson Drive – M5 Motorway to Hume Highway

Roads and Maritime Services invites Aboriginal people and Aboriginal groups who hold cultural knowledge relevant to determining the significance of Aboriginal objects and places for the proposed Henry Lawson Drive Upgrade – M5 Motorway to Hume Highway to register to be consulted.

Henry Lawson Drive is located within the Canterbury Bankstown LGA. The purpose of the project is to improve travel times, journey time reliability and road safety outcomes for all road users.

Please email: henrylawsondrive@rms.nsw.gov.au or call 1800 951 218 to view a map of the study area.

The proposal may result in the Roads and Maritime Services:

- Applying for an Aboriginal Heritage Impact Permit (AHIP) under Part 6 of the *National Parks and Wildlife Act 1974*, and/or
- Undertaking investigations in accordance with the *Code of practice for archaeological investigations in NSW 2010*, and/or
- Undertaking an environmental impact assessment under the *Environmental Planning & Assessment Act* 1979.

BLZ1650 95

To register your interest, please contact:
Lee Davison, Aboriginal Cultural Heritage Officer
Phone: 1800 951 218
Email: henrylawsondrive@rms.nsw.gov.au
Mail: Henry Lawson Drive Project team, Roads and Maritime Services, 27 Argyle Street, Parramatta NSW 2150

Registrations must be received by phone or in writing by Wednesday 8 May 2019.

Appeared in:
The Indigenous Times, Friday 12 April 2019
Canterbury Bankstown Express, Tuesday 16 April 2019
Koori Mail, Wednesday 24 April 2019

Appendix C Salvage Excavation Methodology

Methodology

Research Aims

The main aims of the proposed salvage excavation program are:

- To salvage a representative sample of identified archaeological site prior to development impact.
- To analyse the salvaged archaeological material to gain and conserve knowledge and understanding of the scientific and cultural information exhibited by the activities associated with ridgelines and along major water courses in the region.
- To use the excavation results to gain insight into the subsurface archaeology of the adjacent areas not being impacted by the proposal. This would increase future educational opportunities and allow more informed management of Aboriginal heritage.

The further scientific aim of the salvage excavation program would be to determine the subsurface integrity, extent, spatial distribution and nature of the cultural deposit and the specific types of associated archaeological/cultural activities.

- Determining the integrity of the deposit involves assessing the degree of disturbance which is present.
- Determining the statistical extent of the sites and/or activity areas involves identifying the boundaries associated with the identified archaeological deposit.
- Assessing the spatial distribution involves identifying the presence/absence of archaeological material across the identified archaeological sites.
- The nature of the sites refers to the type of activities indicated by the artefactual material (e.g. primary production, domestic knapping, hunting camps). The goal would be to retrieve entire assemblages from specific activities if such activities were present.
- Retrieved assemblages would be compared with the results from other relevant archaeological projects in order to assess significance.

Research Questions

The results of the proposed salvage excavation would increase our understanding of subsurface archaeology of the study area. In particular, research would focus on the archaeologically-identifiable cultural activities that took place on elevated landforms the Prospect Creek/Georges River catchment.

> **Question 1**: What cultural activities are archaeologically identifiable at sites HLD Site 6 (AS) and HLD Site 7 (AS) compared to sites along the Georges River and its tributaries? Are there differences in activities between these two locations?
>
> **Question 2**: What are the taphonomic features of archaeological sites HLD Site 6 (AS) and HLD Site 7 (AS)? What does this indicate about site integrity and artefact survivability for similar landforms?
>
> **Question 3**: What does the artefact assemblages from sites HLD Site 6 (AS) and HLD Site 7 (AS) indicate about access to artefact raw materials at these sites? Are they comparable with the assemblage from Henry Lawson Drive Rockshelter?

What can we expect?

It is anticipated that differences in stone tool assemblages may be related to different cultural activities (e.g. primary reduction vs maintenance flaking). The science of archaeology is paramount to any research question and it is important to stress that the goal for the salvage program for all excavated sites is straight forward: to retrieve a viable sample for comparative analysis using established techniques (see Field Methods below). In this regard interpretation would not precede data collection. The proposed archaeological program would systematically sample the relevant area using standard techniques with the outcome being a viable, robust and comparable sample. Analysis of the sample would follow and interpretations would be made distinctly separate from the results.

Archaeological Salvage Areas
Salvage excavation would be undertaken at identified archaeological sites HLD Site 6 (AS) and HLD Site 7 (AS). Salvage excavation of the sites would focus on the extraction of collections of artefacts related to activity areas and geomorphic information.

FIELD METHODS
The goal of the field excavation program is to recover significant assemblages of artefacts

Salvage Program
In order to achieve the most robust and comparable result, KNC advocates an open area salvage excavation. The first phase in open area salvage is to establish the statistical boundaries of the previously identified archaeological deposit. In other words, recording the spread of activities across the site/landscape. This approach is designed to salvage the spatial properties of the site as shown in the lithic continuum.

Phase 1
A series of 1 m^2 squares are excavated on a transect grid at 15 metre intervals overlain on each site to mark the spread of lithics and related geomorphic activity .

GDA 94 coordinates would be recorded for each square to enable three dimensional modelling. Statistical salvage following this method is highly beneficial because it creates a robust inter-site sample, sufficiently random, critical for regional comparative analysis. No other method is as efficient or effective. It is anticipated that a minimum of 5m^2 would be excavated within each site during Phase 1.

Individual excavation squares measuring 1 m^2 would be hand excavated in stratigraphic units (Unit A, Unit B, etc.). Squares would be excavated until the basal layer or culturally sterile deposit is reached (usually 25-35 cm). Previous excavation of the podzolic soils associated with the area indicates no archaeological stratigraphy within units. As such the A1 and A2 soil layers are culturally one layer (suffering from cyclical soil transfer resulting in a mixed cultural profile within the soil) and can be salvaged as one unit where possible. All excavated deposit would be wet sieved using nested 5.0 mm and 2.5 mm sieves. Where potential micro-debitage is recovered 1.0mm sieves will be utilised.

The location of each excavated square would be identified on a surveyed plan of the site. Stratigraphic sections detailing the stratigraphy and features within the excavated deposit would be drawn and all squares would be photographed. Soil samples as well as thin section profiles (where feasible) would also be collected. The stratigraphy of all excavated areas would be fully documented and appropriate records archived.

Phase 2
Open area salvage of significant deposit follows the Phase 1 assessment. Additional 1 m^2 squares, constituting an open area, will be excavated around information bearing deposits along the excavation grid. Information bearing deposits are identified by triggers such as: significant quantities of artefacts, variations in raw material, unusual artefacts, chronological material and/or taphonomic indicators. In this context chronologic material is anything that can be used to date artefacts or deposit: charcoal or charcoal bearing deposit (e.g. hearth ash), sandy deposit, gravels (e.g. aluminium feldspar). Phase 2 open area investigation would expand to encompass entire activity areas. The location of Phase 2 open area investigation would be based on Phase 1 results.

Where possible, carbon samples will be collected and analysed for material relating to both the archaeology and geomorphology. Where appropriate cosmogenic and radiometric dating of soils and rock surfaces will be applied (Nishiizumi et al. 1986, 1993).

Analysis

Artefacts would be analysed on a comparable level with previous analyses of excavated assemblages. Information derived from this analysis; in particular the identification of specific artefact types and their distributions and associations; would be used to put together interpretations about how sites were used, where sites were located across the landscape, the age of sites and to assess cultural heritage values. By comparing different areas it would be possible to determine whether there were differences in the kinds of activities carried out and if different activities were related to different landforms.

A range of stone artefacts may be present across the salvage areas and the analysis would expand accordingly to account for artefact variability. All information would be recorded in database form (MS Excel). Various types of evidence would be used to determine the kinds of activities that were carried out. A short description of the proposed analysis in outlined below.

- Field analysis would record basic data, such as material type, number and any significant technological characteristics, such as backing or bipolar techniques; added to this would be any provenance data such as pit ID and spit number. The purpose of the field recording is twofold: 1) establish a basic recording of artefacts retrieved and 2) to allow on-going assessment of the excavation regime (e.g. whether higher stratigraphic resolution is required while digging).
- Detailed (laboratory) analysis would entail recording a larger number of characteristics for each individual artefact. These details would be recorded in matrices suitable for comparative analysis (e.g. multivariate and univariate) of the excavated assemblage on a local and regional basis.
- Lithic characteristics to be recorded cover a range of basic information but are not limited to these categories (see example below). For transparency, terms and category types would in large part be derived from Holdaway and Stern (2004).

Sample Categories		
Record Number	% Cortex	Flake Type
Pit ID	Length	Termination Type
Spit Number	Width	Core Type
Count	Thickness	Number of Scars (Core)
Raw Material	Weight	Scar Type (Core)
Colour	Modification	Shape of Flake
Quality	Reduction Type	Platform Type

- A detailed explanation and glossary would be provided with the final excavation report.
- Minimum Number of Flake (MNF) calculations formulated by Hiscock (2000, 2002) would be undertaken where applicable (although past experience indicates MNF calculations would not be required for this excavation program).

The analysis of artefacts recovered during the excavation program would be undertaken in a transparent and replicable fashion so as to permit the comparison of the entire excavated assemblage with data from other areas. This would also allow for an interpretation of the study area's archaeological significance.

Field Team

KNC directors, Dr Matthew Kelleher and Alison Nightingale, would be responsible for the salvage excavation program. Dr Matthew Kelleher would direct the excavation component of the Aboriginal archaeological assessment. Matthew has extensive experience in managing archaeological excavations and research projects. Matthew would also be the principal contact for the overall Aboriginal archaeological assessment for the project. The salvage excavation will be undertaken in association with registered Aboriginal stakeholders.