



**MULGOA ROAD / CASTLEREAGH ROAD CORRIDOR UPGRADE
STAGE 1, JEANETTE STREET TO BLAIKIE ROAD**

**Aboriginal Archaeological Survey Report
Stage 2 PACHCI**

Prepared for Arup on behalf of Roads and Maritime Services

Penrith Local Government Area

May 2018

Ref. 1708

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Executive Summary

Roads and Maritime Services proposes to upgrade Mulgoa Road from Jeanette Street, Regentville (south of the interchange with the M4 Motorway) to the north of Blaikie Road, Jamisontown (Figure 1). Mulgoa Road is a regionally important traffic route for both the Penrith Central Business District (CBD) and the broader Western Sydney region and is one of two main access points from Penrith to the M4 Motorway. The proposal is driven by the existing road congestion and the anticipated population and local employment growth in the region, including the North West Priority Growth Area and Western Sydney Priority Growth Area.

Kelleher Nightingale Consulting Pty Ltd was engaged by Arup on behalf of Roads and Maritime to prepare an Aboriginal archaeological survey report to inform the Review of Environmental Factors and concept design for the proposed works.

This assessment was prepared in accordance with the Stage 2 requirements of the Roads and Maritime *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (Roads and Maritime 2011) and the Office of Environment and Heritage *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*.

No Aboriginal archaeological sites, objects or potential archaeological deposits were identified within the study area.

No further assessment of Aboriginal heritage is warranted for the proposed works.

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1 Introduction

1.1 Project background

Roads and Maritime Services (Roads and Maritime) proposes to upgrade Mulgoa Road from Jeanette Street, Regentville (south of the interchange with the M4 Motorway) to the north of Blaikie Road, Jamisontown (Figure 1). Mulgoa Road is a regionally important traffic route for both the Penrith Central Business District (CBD) and the broader Western Sydney region and is one of two main access points from Penrith to the M4 Motorway. The proposal is driven by the existing road congestion and the anticipated population and local employment growth in the region, including the North West Priority Growth Area and Western Sydney Priority Growth Area.

Kelleher Nightingale Consulting Pty Ltd (KNC) was engaged by Arup on behalf of Roads and Maritime to prepare an Aboriginal archaeological survey report to inform the Review of Environmental Factors (REF) and concept design for the proposed works.

This assessment was prepared in accordance with the Stage 2 requirements of the Roads and Maritime *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (Roads and Maritime 2011) and the Office of Environment and Heritage (OEH) *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (OEH 2010).

1.2 Summary of findings

No Aboriginal archaeological objects or potential archaeological deposits were identified within the study area. No Aboriginal cultural features were identified within the study area by the Deerubbin Local Aboriginal Land Council (Appendix A).

No further assessment of Aboriginal heritage is warranted for the proposed works.

1.3 Investigator / contributors

A full list of investigator / contributors to the current study is included in Table 1 below.

Table 1. Investigator / contributor

Investigator / Contributor	Affiliation	Role
Dr Matthew Kelleher	Kelleher Nightingale Consulting	Reporting, Survey, Advisor and Review
Ben Anderson	Kelleher Nightingale Consulting	Reporting, GIS
Steve Randall	Deerubbin Local Aboriginal Land Council	Cultural Heritage Advisor, Survey

1.4 Project description

Roads and Maritime proposes to upgrade Mulgoa Road from Jeanette Street, Regentville (south of the interchange with the M4 Motorway) to the north of Blaikie Road, Jamisontown (Figure 1).

The proposal forms the first stage of a broader program to upgrade the Mulgoa Road/Castlereagh Road corridor between Glenmore Parkway, Glenmore Park and Andrews Road, Penrith located within the Western Sydney region of the Roads and Maritime network and the local government area (LGA) of Penrith. The proposal (also known as 'Mulgoa Road Stage 1') was identified as the first priority based on traffic modelling carried out by Roads and Maritime across the Mulgoa Road/Castlereagh Road corridor.

Mulgoa Road is a regionally important traffic route for both the Penrith Central Business District (CBD) and the broader Western Sydney region and is one of two main access points from Penrith to the M4 Motorway. The proposal is driven by the existing road congestion and the anticipated population and local employment growth in the region, including the North West Priority Growth Area and Western Sydney Priority Growth Area.

The proposal would include widening the existing Mulgoa Road carriageway from two travel lanes to three travel lanes in each direction between Jeanette Street and Blaikie Road, extending the slip lanes entering the M4 Motorway, and modifying access to the Homemakers Centre at Wolseley Street. Upgrading the intersections at Factory Road, Jeanette Street, M4 Motorway, Wolseley Street, Glenbrook Street, Blaikie Road and Hutchinson Crescent and Peter Court service roads.

The works identified would ease congestion, improve travel times and improve performance around the M4 Motorway interchange.

The proposal is located south of the Penrith CBD and is characterised by a mixture of residential, business and commercial and uses, including the Penrith Homemaker Centre. There are a range of transport uses throughout the proposal area, including public and private bus routes and pedestrian and cycling infrastructure.

Construction of the proposal would be staged to minimise disruption to local traffic flows and to maintain access to residences and businesses. Construction staging would be further investigated as the project is developed, however it is anticipated work would first be carried out on either side of the existing traffic lanes and behind the existing piers beneath the M4 Motorway overbridge followed by work within the existing road corridor and decommissioning of the Wolseley Street access tunnel.

The proposal includes the following key features:

- Widening a 1.3km section of Mulgoa Road between Jeanette Street and Blaikie Road (including tie-ins) to allow for three travel lanes in each direction
- Extending the slip lanes on Mulgoa Road entering the M4 Motorway
- Interface with the M4 Smart Motorway project ramp designs
- Provision of retaining walls to support widening under the existing M4 bridges
- Removal of the grade separated access to the Homemakers Centre at Wolseley Street
- Provision of an active transport corridor, including a 3.5 m wide shared path along the eastern side of Mulgoa Road
- Re-construction of Huron Place to become a shared transit zone (low speed environment)
- Provision of bus prioritisation measures at the Blaikie Road, Glenbrook Street and Wolseley Street intersections
- Upgraded drainage to manage increased surface runoff and flows to local waterways
- A noise wall between Mulgoa Road and Hutchinson Crescent, extending between Glenbrook Street in the north and the M4 eastbound entry ramp in the south
- Relocation of underground utilities
- Tree planting and landscaping to match the vision for the whole of the Mulgoa Road corridor
- Temporary establishment of a construction compound site.

Construction of the proposal would commence in early-2020 (subject to planning approval) and would be completed by mid-2021, weather permitting.

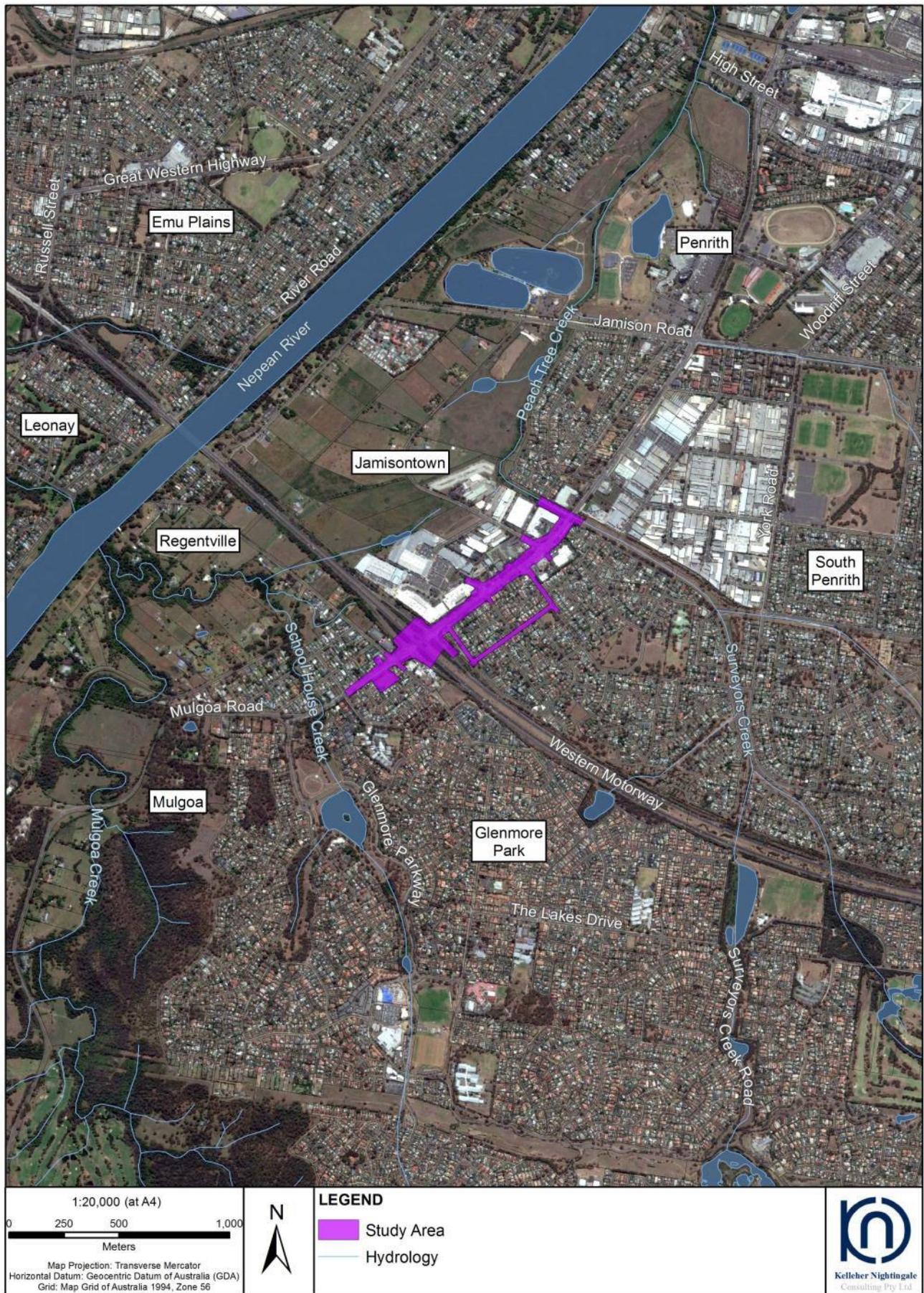


Figure 1. Study area location



Figure 2. Detail of study area

2 Aboriginal stakeholder consultation

Roads and Maritime has developed the PACHCI 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. In accordance with the PACHCI, the early stages of Roads and Maritime projects involve consultation with Local Aboriginal Land Councils and registered Native Title holders/claimants.

The project has been conducted in consultation with the Deerubbin Local Aboriginal Land Council (DLALC). No Native Title holders/claimants are currently registered for the study area.

DLALC were contacted by KNC at the commencement of the project to discuss the proposed works and invited to participate in the archaeological survey.

The archaeological survey of the study area was arranged with DLALC for 13 September 2017. Steve Randall from DLALC participated in the survey. Subsequent to the field survey, DLALC have provided a survey and cultural assessment report for the Roads and Maritime in accordance with the Roads and Maritime PACHCI. No Aboriginal cultural features were identified within the study area (Appendix A).

3 Review of previous archaeological investigations

3.1 AHIMS web services

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 13 October 2017 to identify registered (known) Aboriginal sites or declared Aboriginal places within or adjacent to the study area (Client service ID 306728). The search results are attached as Appendix B.

The AHIMS Web Service database search was conducted within the following coordinates (GDA, Zone 56):

Eastings: 283400 - 285550
 Northings: 6259800 - 6261750
 Buffer: 0 metres (the search coordinates included a buffer around the study area).

The AHIMS search results showed:

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

The type and distribution of registered Aboriginal sites within these coordinates are shown in Figure 3. The frequencies of site types within the search area are shown in Table 2.

Table 2. Frequency of site types and context from AHIMS database search

Site Context	Site Feature	Number	Frequency
Open	Artefact	11	100
Total		11	100

3.2 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:

- Penrith Local Environmental Plan 2010
- Roads and Maritime Heritage Register
- State Heritage Register and State Heritage Inventory
- Commonwealth Heritage List
- National Heritage List
- Australian Heritage Places Inventory
- Register of the National Estate

No items of Aboriginal heritage were listed or registered on these databases within the study area.



Figure 3. AHIMS search results

3.3 Previous archaeological investigations

The study area and adjacent lands have been subject to several archaeological investigations. These investigations have been undertaken prior to residential developments at Glenmore Park and Mulgoa and prior to upgrade works for the M4 Motorway. The results of investigations pertinent to the current report are presented below.

Glenmore Park/Mulgoa Rise

Dallas undertook an archaeological survey of the South Penrith Development Site (the future suburb of Glenmore Park) in 1981. The survey encompassed an area of approximately 800 hectares on the southern side of the Western Motorway between Mulgoa Creek and The Northern Road. The survey identified 20 surface artefact scatters and seven isolated artefacts. The sites were located on elevated locations or hills adjacent to School House Creek or an unnamed tributary of Surveyors Creek. Modern land-use practices such as ploughing were found to have disturbed many of the identified sites along Surveyors Creek while sites near School House Creek were found to be more intact. Low density artefact scatters with five or less artefacts constituted half the identified sites and most sites had less than 10 artefacts. Artefacts were predominantly flakes and flaked pieces made from chert and silcrete with some examples of mudstone and quartz. One basalt edge-ground hatchet was also identified.

Dallas and Steele conducted an Aboriginal archaeological survey and assessment of a portion of Lot 6800 DP 1013970, Glenmore Park (Dallas and Steele 2001a). No Aboriginal stone artefacts or culturally modified trees were identified during the survey. The slopes adjacent to Surveyors Creek were considered to have been disturbed by landuse practices and were assessed as having low archaeological potential; however, one area of potential archaeological sensitivity was identified within the Surveyors Creek corridor.

A subsurface testing program of the area of potential archaeological sensitivity was subsequently undertaken in 2001 (Dallas and Steele 2001b). The program comprised 18 1m x 1m test trenches that were excavated in successive 10cm spits using a backhoe fitted with a flat (batter) bucket and five 1x1m test squares which were manually excavated in 5cm spits using hand tools. Soil profiles were found to be relatively uniform across the area with a depth between 20cm and 40cm. A total of 73 stone artefacts were recovered during the program. The artefacts were predominantly made from silcrete with smaller quantities of tuff and quartz also recovered. Artefacts recovered during the excavation were predominantly flakes and flake fragments. Backed artefacts, cores, broken hatchet head fragments, retouched fragments and a scraper were also found. Artefacts were distributed in low densities across the tested area; however, one area contained a relatively higher artefact density and was interpreted as a knapping location.

The recovered stone material included a large volume of fragments which could not be attributed to a formal artefact type. These fragments represented a stone type not naturally occurring within the soil profile and were considered likely to be the remains of (artefactual) flaked material. The low density spatial distribution of artefacts and large quantities of stone fragments outside the knapping location were interpreted as reflecting the effect of natural process such as inundation from floodwaters and possible redeposition of material from upstream (Dallas and Steele 2001b: 47-48).

The Glenmore Park Southern Release Area, encompassing approximately 225 hectares west of the Northern Road, south of Ridgetop Drive and Mulgoa Nature Reserve, was assessed by Navin Officer in 2003. The assessment included a review of background information and a field survey. The survey identified eight archaeological sites and two areas of potential archaeological deposit (PAD). The sites were generally low density artefact scatters or isolated artefacts located on low hills or elevated positions adjacent to creeks. The artefacts were predominantly made from silcrete with minor quantities of chert, tuff and volcanic material also identified. Artefact types were primarily flakes and flaked pieces. A single backed artefact, scraper, core, grindstone and ground edge hatchet were also found.

Much of the original landscape of Glenmore Park was considered to have been drastically altered by past landuse practices. The central portion of Glenmore Park was disturbed through the quarrying operations and subsequent regeneration of the Mulgoa Quarry. Historical landuse for agricultural and pastoral purposes had resulted in widespread vegetation clearance of much of the land, with some remnant vegetation in the south and isolated possible old growth trees across the landscape.

M4 Motorway

An archaeological survey for Aboriginal sites within the M4 Motorway corridor between Parramatta and Emu Plains, including a portion of the current study area, was conducted in 1996 (Brayshaw and Haglund 1996). The archaeological survey identified 20 Aboriginal archaeological sites that were predominantly low density artefact scatters (less than five artefacts) and isolated artefacts. No Aboriginal archaeological sites or areas of potential archaeological deposit were identified within the current study area. Much of the road corridor was found to be heavily disturbed, resulting in an archaeological record that was not considered to be reflective or representative of past Aboriginal occupation and use of this area; however, two artefact scatters located near South Creek were found to have relatively high artefact density and low disturbance. These sites were located in close proximity to major waterways on defined topography such as terraces or level hills/ridges with limited disturbance from modern landuse practices and protection from fluvial activity and erosion.

Silcrete artefacts dominated the recorded assemblages, with lower numbers of indurated mudstone, quartz, quartzite and igneous materials also identified. The assemblage comprised 70% flakes or flake fragments and 30% cores or core fragments. The high proportion of broken or damaged artefacts was considered to be the result of disturbance and post-discard breakage.

An Aboriginal archaeological survey and cultural heritage assessment of the M4 Motorway corridor, including a portion of the current study area, was undertaken by KNC as part of the M4 Managed Motorway (M4MM) project (KNC 2013; KNC 2016a). The investigation, a follow-up from the 1996 Brayshaw and Haglund assessment, included a review of background information, including identification of previously recorded Aboriginal sites registered on the Aboriginal Heritage Information Management System (AHIMS), sites known to the local Aboriginal community or others and any archaeologically sensitive landforms or areas or potential archaeological deposit in the project area.

The investigation identified 33 Aboriginal archaeological sites within the M4MM corridor including two previously unrecorded artefact scatters. No Aboriginal archaeological sites or areas of potential archaeological deposit were identified within the current study area. The survey revisited the previously recorded sites to assess subsequent disturbance and archaeological potential. The majority of sites were found to be highly disturbed with no intact archaeological deposit due to modern landuse practices and natural processes. An Aboriginal Heritage Impact Permit (AHIP number C0002113) was issued for the M4MM corridor, including a portion of the current study area.

3.4 Previously identified sites in the vicinity of the study area

Previous archaeological investigations have identified three Aboriginal archaeological sites situated within 250 metres of the current study area. These sites are discussed below.

M4- 19B Regentville (AHIMS 45-5-4569)

Site M4-19B Regentville was a surface artefact scatter that was identified by Brayshaw and Haglund during an archaeological survey of the M4 Motorway corridor. The site was situated on the western slope of a small ridge overlooking the M4 Motorway approximately 160 metres south east of the current study area. The site was located within the M4 Motorway corridor, approximately 16 metres north Manifold Crescent. The artefact scatter comprised two indurated mudstone flakes that were identified within a disturbed deposit of predominantly gravel lag, with no archaeological potential.

SP 7 (AHIMS 45-5-0305)

Site SP 7 was a surface artefact scatter that was identified by Dallas during an archaeological survey of the South Penrith Development Site and was approximately 180 metres south west of the current study area. The site was situated on the northern slope of a ridge approximately 150 metres south west of an unnamed north west flowing creek and 500 metres north east of School House Creek. The artefact scatter comprised of four artefacts which were identified on a ground surface exposure measuring approximately 7 x 8 metres within a small clump of trees. The artefacts consisted of two secondary flakes and two waste flakes which were made from mudstone, silcrete and quartz. The site had been disturbed by ploughing and the artefacts were identified on a deflated deposit of basal clay and ironstone nodules.

SP 20 South Penrith (AHIMS 45-5-0418)

Site SP 20 South Penrith was a surface artefact scatter that was identified by Dallas during an archaeological survey of the South Penrith Development Site and was approximately 240 metres south west of the current study area. The site was located on the west bank of School House Creek and adjacent to Mulgoa Road. The artefact scatter comprised 13 artefacts which were identified within a shallow depression and at least eight artefacts which were identified in situ within a road cutting. The artefacts within the depression were recorded and comprised of one utilised core, three flakes, one broken flake, six flaked pieces and two chips made from silcrete, chert and quartz.

4 Landscape context

The study area is located on the Cumberland Plain, a gently undulating and generally low-lying physiographic region of the Sydney Basin. The Sydney Basin is a large geological feature stretching from Batemans Bay in the south to Newcastle in the north and Lithgow in the west. The formation of the basin began between 250 to 300 million years ago when river deltas gradually replaced the ocean that had extended as far west as Lithgow.

The topography of the study area is characterised by flat, open depression and slope landforms which form the interface between northern slopes of a ridgeline and the flood plain of the Nepean River. The study area is located between School House Creek in the south and Surveyors Creek in the north which flow into the Nepean River approximately 1.25 kilometres west and 3 kilometres north of the study area respectively. Archaeologically, the Nepean River and its major tributaries would have been focal points for past Aboriginal land use activity.

The underlying geology of the study area is characterised by Cranebrook Formation geology along the low lying areas of the Nepean River floodplain and members of the Wiannamatta Group within the adjacent slopes (Figure 5). Cranebrook Formation geology (Qpc) is characterised by a basal layer of pebble and cobble clast gravels below sand, silt and clay. The gravels comprise clasts of quartz, quartzite, chert, porphyry, granite, hornfels, sandstone and silcrete. Cranebrook Formation geology contains raw material types that were utilised by past Aboriginal people. Areas where these materials were exposed at the surface, such as within creek channels, are likely to have been exploited by past Aboriginal people.

The lowest formation of the Wianamatta Group, Ashfield Shale (Rwa), encompasses the lower slopes of the study area. Ashfield Shale was formed from subaqueous deposits and consists of dark-grey to black sideritic claystone and siltstone which grades upward into a fine sandstone-siltstone laminate (Clark and Jones 1991). Bringelly Shale (Rwb) is the uppermost formation the Wianamatta Group and is present on the upper slopes. Bringelly Shale is a complex geology that formed from coastal alluvial deposits and consists of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff (Clark and Jones 1991). The interface between the Ashfield Shale and Bringelly Shale is composed of a small band of Minchinbury Sandstone, an intermediary lithology representing an original strandline boundary between the shallow-water subaqueous sediments of the Ashfield Shale and the more recent alluvial plain sediments of the Bringelly Shale.

The soil landscapes within the study area are tied to the topography and underlying geology (Figure 5). The alluvial Richmond soil landscape is present on the generally flat quaternary terraces adjacent to the Nepean River. Richmond soils are characterised by deep brown soils, red earths and red podzolic soils on terrace surfaces, plastic clays in drainage lines and earthy sands on terrace edges. Surface soils are moderately erodible due to high sand content and are prone to waterlogging and flooding, being generally associated with the margins of an active major floodplain along the Nepean River. Aboriginal land use and the associated discarding of stone artefacts are likely to have occurred in areas of Richmond soils due to their proximity to permanent water sources; however, the dynamic nature of these areas are likely to have had a variable impact on the preservation of Aboriginal sites.

The erosional Luddenham soil landscape is situated on low rolling to steep hills with narrow convex ridges and crests, moderately inclined slopes and narrow drainage lines. The landscape comprises shallow dark podzolic soils or massive earthy clays on crests, moderately deep red podzolic soils on upper slopes and moderately deep yellow podzolic soils and prairie soils on lower slopes and drainage lines. The Luddenham soil landscape has a high erosional susceptibility with moderate surface movement potential. The steeper hill slopes of the Luddenham Soil Landscapes are subject to minor gully erosion and moderate sheet erosion in areas that have been stripped of vegetation. Aboriginal sites within these areas are likely to be disturbed low density scatters exposed by the eroding landscape. However, landforms and vegetation that create stability for the soil landscape could have preserved Aboriginal sites.

European settlement of the area began in the early 19th century when land grants were made to free settlers, members of the military and some officials (Thorp 1986: 12). The first grants were made in the Mulgoa Valley which began with 1000 acres being granted to Captain Daniel Woodruff in 1804. The land grants were primarily utilised for agriculture and widespread native vegetation clearance was conducted in order to prepare the land for growing wheat and cattle grazing. By 1817 the foundations for the landscape of the present day were developing with the establishment of the Western Road (now the Great Western Highway) and a township at Penrith.

Landuse practices have had a variable impact on the landscape within the project area. Road corridors have modified the landscape by creating cuttings and artificial embankments in addition to modifying the course of several waterways including Surveyors Creek. Below ground utilities have also been constructed within the study area and where trenching has taken place this has modified the landscape and disturbed subsurface deposits.

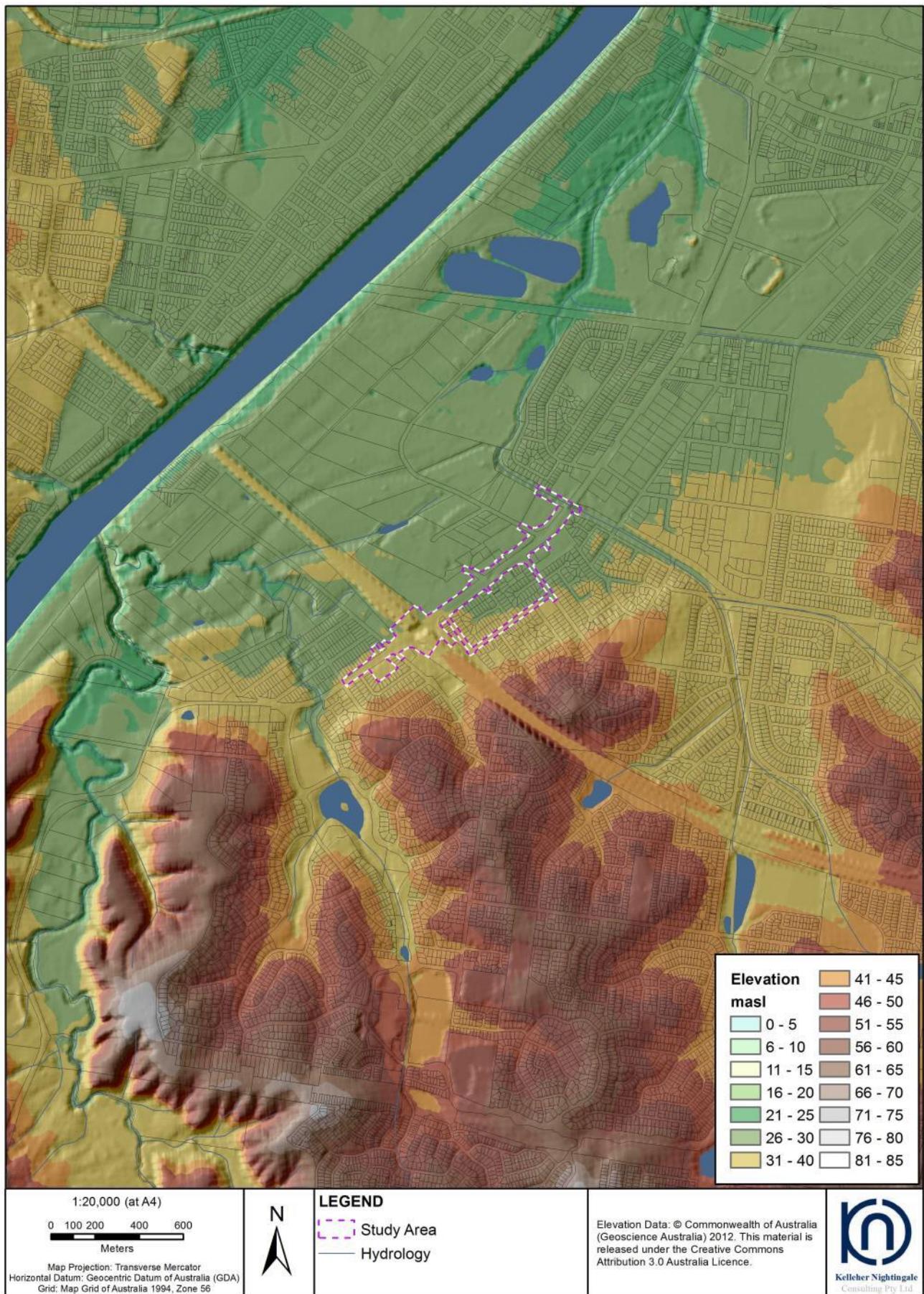


Figure 4. Topography of the study area

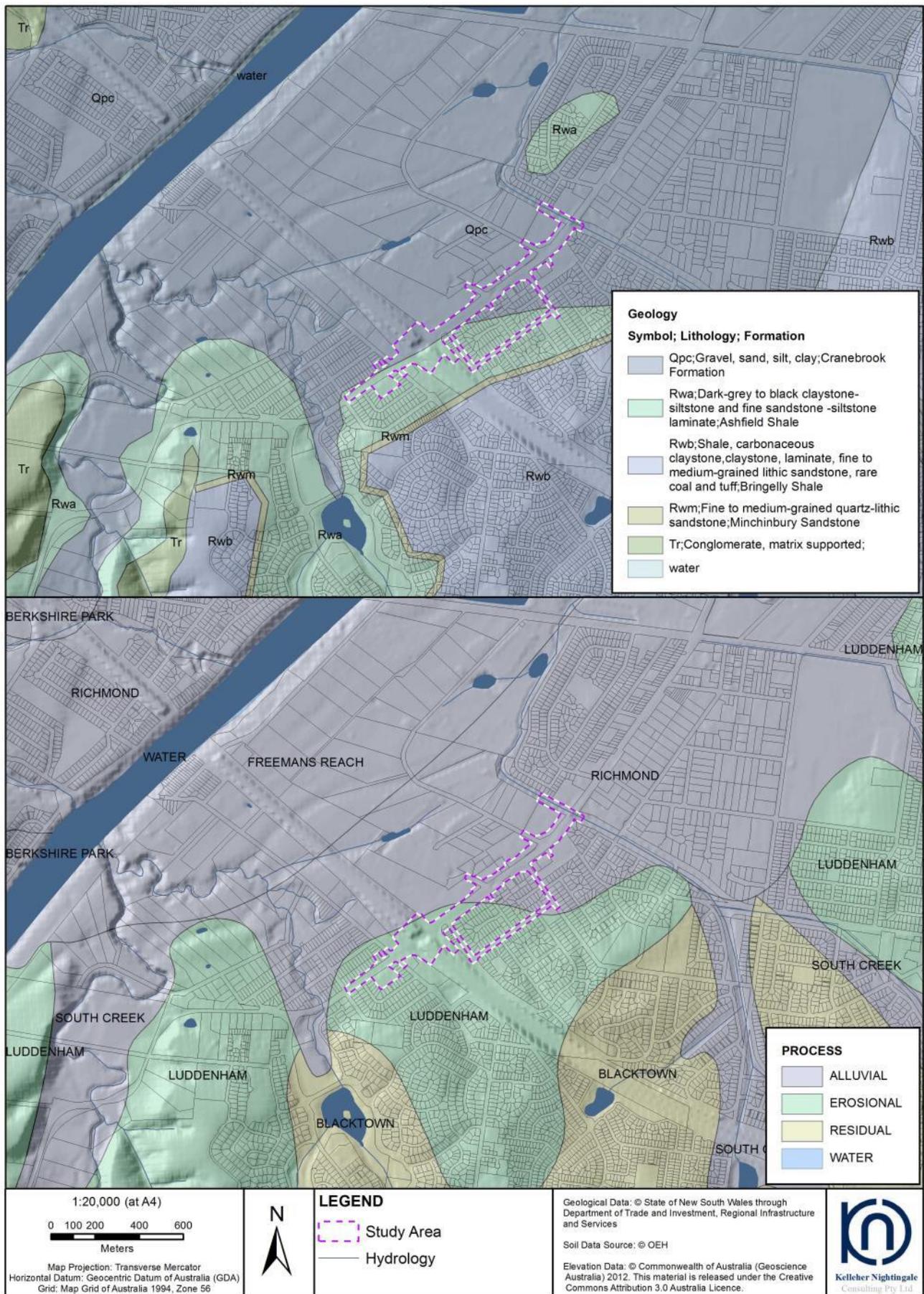


Figure 5. Geology and soil landscapes of the study area

5 Regional character and site predictions

Previous archaeological investigations have provided data on site distribution, site typology and lithic raw material use that aid in assessing the archaeological character of the region. Site frequency and density can be related to key landscape factors including distance to water, landform, degree of slope, soil landscape and proximity to environmental resources.

Archaeological sites in the region generally occur as surface artefact scatters and isolated artefacts that have been identified across the various landforms, geologies and soil landscapes. The study area is located within a landscape with moderate to high levels of subsurface disturbance including the construction of roads, the installation of below ground utilities, past rural activities, landscaping and erosion. Within these contexts Aboriginal objects are unlikely to survive in situ and the archaeological potential of such sites is generally low. Conversely, ground surface visibility is often increased by these processes, leading to increased identification of surface artefacts in these areas.

Based on information from previous archaeological investigations, landscape context and regional character, site predictions for the study area include the following:

- Archaeological sites are likely to consist of open artefact scatters and/or isolated artefacts on flat and slope landforms.
- It can be expected that silcrete will be the most commonly encountered artefact raw material, with occasional occurrences of quartz, chert and siliceous tuff/mudstone.
- Clearance of the majority of original vegetation lessens the likelihood of identifying culturally modified trees, but old growth trees may be present in the study area and have the potential to display scars of Aboriginal origin.
- The identification of archaeological sites is likely to be affected by differential visibility of the ground surface, but successful assessment of areas of potential archaeological deposit can be made based on landform and other environmental factors such as disturbance, degree of slope and distance to water.

6 Sampling strategy and field methods

The aim of the archaeological survey was to conduct a full coverage, pedestrian survey of the study area and to record any Aboriginal archaeological sites or areas with potential to contain Aboriginal objects. The study area was arbitrarily divided into three survey units based on landform and the physical features (Figure 6).

Survey Unit 1 encompassed the southern portion of the study area between Spencer Street and Clyburn Avenue. The survey unit had been largely cleared of native vegetation and contained a mixture of residential and commercial premises in addition to several road corridors including the M4 Motorway overpass. The survey unit comprised flat slope landforms that formed the northern slope of a ridge and drainage channel of an unnamed tributary of School House Creek.

Survey Unit 2 covered the central portion of the study area from Clyburn Avenue to Glenbrook Street. The survey unit contained a mixture of residential and commercial premises with landscaped and revegetated nature strips in addition to several road corridors. The survey unit comprised flat and lower slope landforms that formed the interface between the ridge slope and the floodplain of the Nepean River.

Survey Unit 3 encompassed the northern portion of the study area from Glenbrook Street to Surveyors Creek. The survey unit contained a mixture of commercial premises with landscaped and revegetated nature strips, the canalised channel of Surveyors Creek and several road corridors. The survey unit comprised flat and open depression landforms that formed the floodplain of the Nepean River and creek bank of Surveyors Creek.

Based on the archaeological background and landform context of the study area, the survey team closely inspected any areas of surface exposure for artefacts, evidence of intact soils and any mature trees for evidence of Aboriginal bark removal. Assessments of soil disturbance were also made during the survey.

All survey units were inspected by pedestrian survey. The archaeological survey was conducted on 13th September 2017. The survey team comprised Matthew Kelleher (KNC) and Steve Randall (DLALC).

The survey team were equipped with high resolution aerial photography and topographic maps showing the study area boundary. A non-differential GPS receiver was used for spatial recordings. All GPS recordings were made using the Geocentric Datum of Australia (GDA) coordinate system. Detailed notes on the condition of the survey unit were compiled by the survey team including an assessment of surface visibility, vegetation coverage, modern disturbance and current land use.



Figure 6. Survey units and landform

7 Survey results

No Aboriginal archaeological objects, sites or potential archaeological deposits were identified within the study area.

The study area exhibited substantial ground disturbance with no potential for natural ground surface or intact buried surfaces containing Aboriginal objects. Survey coverage is discussed below.

7.1 Survey coverage analysis

Surface exposure across the study area was low to moderate and visibility within surface exposures was high. Surface exposure varied considerably within the survey area and was dependant on vegetation density, natural processes such as erosion and modern land use practices. Despite the lack of surface visibility it was still possible to assess the area based on landform and visible disturbance.

Details of survey and landform coverage are outlined in Tables 3 and 4 below.

Table 3. Survey coverage

Survey Unit	Landform	Area (m ²)	Visibility (%)	Exposure (%)	Effective Coverage (m ²)	Effective Coverage (%)
1	Flat	36,586	70	30	7,683	21
1	Slope	24,460	70	20	3,424	14
2	Flat	46,577	60	20	5,589	12
2	Slope	5,084	60	20	610	12
3	Flat	21,796	60	20	2,616	12
3	Open Depression	9,055	60	10	543	6

Table 4. Landform coverage

Landform	Area (m ²)	Area Effectively Surveyed (m ²)	% of Landform Effectively Surveyed	# of Sites	# of Artefacts or Features
Flat	104,959	15,888	15	0	0
Open Depression	9,055	543	6	0	0
Slope	29,543	4,034	14	0	0

The survey found that the study area had been heavily disturbed by previous landscaping, road and footpath construction, earthworks and the installation of underground utilities. In summary, the study area exhibited: no archaeology, low archaeological potential and high levels of ground disturbance.

8 Analysis and discussion

Background research, AHIMS records and archaeological field survey did not identify Aboriginal archaeological objects or potential archaeological deposits within the study area. The archaeological field survey found that overall ground surface exposure across the study area was low to moderate and restricted to areas where natural processes or land use practices including erosion and vehicle movement had removed vegetation or restricted its growth. Limitations to visibility within these areas included detritus and introduced material such as woodchips. The ground surface was not visible within the majority of the study area due to dense grasses and other vegetation cover in addition to footpaths and roads. Despite the lack of surface visibility it was still possible to assess the archaeological potential based on landform and disturbance.

The survey found that the study area was highly disturbed and modified environment exhibiting little potential artefact survivability. No Aboriginal archaeological objects, sites or potential archaeological deposits were identified during the field survey within the study area.

8.1 Aboriginal settlement history of the study area

The physical evidence of Aboriginal landscape use in the area predominantly consists of artefact scatters and isolated artefacts. Previous studies have demonstrated the relationship between artefact densities and proximity to water sources and landform. Relatively elevated landforms along the margins of creeks (especially those offering permanent water) and rivers would have been favourable for occupation by Aboriginal people and the survivability of archaeological information. This is reflected in the archaeological record by higher artefact densities recorded at these sites, potentially reflecting repeated or more intensive use of these locations.

Archaeological investigations in the vicinity of the study area have shown that while artefact scatters and isolated finds occur, artefact density is generally low. This likely reflects a temporal use of the area by past Aboriginal people due to the inability of local water sources for supporting long term occupation.

No Aboriginal archaeological objects, sites or potential archaeological deposits were identified within the study area.

9 Significance assessment

No Aboriginal archaeological objects or potential archaeological deposits were identified within the study area. No Aboriginal cultural features were identified within the study area by the Deerubbin Local Aboriginal Land Council (Appendix A).

10 Impact assessment

No Aboriginal archaeological objects or potential archaeological deposits were identified within the study area and the area was found to be extensively disturbed by modern land use practices. This assessment concluded that the proposed works will not impact on Aboriginal archaeological objects, sites or potential archaeological deposits.

11 Legislative considerations

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 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)].

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 or desecrate 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); and
- contravention of any condition of an Aboriginal Heritage Impact Permit.

Under section 87 (1) it is a defence 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 against prosecution under section 86 (2) 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”.

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 Aboriginal Heritage Impact Permit (AHIP) is required for an activity which will harm an Aboriginal object.

12 Management and recommendations

No Aboriginal archaeological objects or potential archaeological deposits were identified within the study area. No Aboriginal cultural features were identified within the study area by the Deerubbin Local Aboriginal Land Council (Appendix A).

No further assessment of Aboriginal heritage is warranted for the proposed works.

Construction contractors should complete a toolbox to summarise the Roads and Maritime *Unexpected Archaeological Finds Procedure*. Harm to Aboriginal archaeological objects is not permitted and Roads and Maritime *Unexpected Archaeological Finds Procedure* will be used in the event of uncovering an unexpected archaeological find during Roads and Maritime activities.

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Appendix A LALC Report



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Roads and Maritime Services
Level 7, 27-31 Argyle Street
PARRAMATTA NSW 2050

Our Ref: 2832

20 October 2017

PROTECTION OF ABORIGINAL CULTURAL HERITAGE

Mulgoa Road Stage 1 Project
South Penrith

Attention: Matthew Allen, Project Development Manager,

A representative of the Deerubbin Local Aboriginal Land Council inspected the Mulgoa Road Stage 1 Project Wednesday, 13th September 2017. An Aboriginal cultural heritage assessment was undertaken to evaluate the likely impact the proposed upgrade works has on the cultural heritage of the land.

Due to the major infrastructure for the road easements of Mulgoa Road and the M4 as well as landscaping from past works. No Aboriginal cultural materials (in the form of stone artefacts, for example) was located during the assessment.

Deerubbin Local Aboriginal Land Council therefore, has no objections to the upgrade of Mulgoa Road Stage 1 Project areas.

Yours Faithfully,

(Steven Randall
Aboriginal Cultural Heritage Officer)

C.c. Miranda Firman – Office of Environment & Heritage

C.c. Matthew Kelleher – Kelleher Nightingale Consulting

Appendix B

AHIMS Extensive Search Results



Office of Environment & Heritage

AHIMS Web Services (AWS)
Extensive search - Site list report

Your Ref/PO Number : 1708

Client Service ID : 306728

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status	SiteFeatures	SiteTypes	Reports
45-5-1074	Clyburn Avenue;	AGD	56	284630	6260060	Open site	Valid	Artefact :-	Open Camp Site	103155,103360
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-0418	SP 20 South Penrith	AGD	56	283620	6260050	Open site	Valid	Artefact :-	Open Camp Site	256,1018,103155,103360
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-0538	RP#2 Regentville	AGD	56	283550	6260780	Open site	Valid	Artefact :-	Open Camp Site	1018,103155,103360
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-0299	SPL	AGD	56	283770	6259780	Open site	Valid	Artefact :-	Open Camp Site	256,260,1018,103155,103360
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-0302	SP 4;	AGD	56	283820	6259620	Open site	Valid	Artefact :-	Open Camp Site	256,260,1018,103155,103360
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-0304	SP 6;	AGD	56	283880	6259630	Open site	Valid	Artefact :-	Open Camp Site	256,260,1018,103155,103360
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-0305	SP 7;	AGD	56	284240	6260040	Open site	Valid	Artefact :-	Open Camp Site	256,260,1018,103155,103360
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-3576	Clyburn Avenue (Penrith)	GDA	56	284630	6260060	Open site	Valid	Artefact :-		3694,103155,103360
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-4569	M4- 19B Regentville	GDA	56	284607	6260253	Open site	Destroye d	Artefact :-		
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-4570	M4-20B Clyburn Avenue	GDA	56	285012	6260099	Open site	Destroye d	Artefact :-		
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									
45-5-4577	M4-19A Regentville	GDA	56	284979	6259986	Open site	Destroye d	Artefact :-		
	<u>Contact</u>									
	<u>Recorders</u>									
	<u>Permits</u>									

Report generated by AHIMS Web Service on 13/10/2017 for Benjamin Anderson for the following area at Datum :GDA, Zone : 56, Eastings: 283400 - 285550, Northings : 6259800 - 6261750 with a Buffer of 0 meters. Additional Info : Archaeological Assessment. Number of Aboriginal sites and Aboriginal objects found is 11

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