MAMRE ROAD UPGRADE STAGE 1

Aboriginal Cultural Heritage Assessment Report

Prepared for Aurecon on behalf of Transport for NSW

Penrith Local Government Area

July 2021

Ref. 2010

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Document Information

Project Name	Mamre Road Upgrade Stage 1 Aboriginal Cultural Heritage Assessment Report
Project Number	2010
Version	1.0
Client Name	Aurecon on behalf of Transport for NSW
Recipient	Zoe McLaughlin
Issue Date	12 July 2021
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Approved by	Dr Matthew Kelleher

Executive Summary

Transport for NSW (TfNSW) propose to upgrade about 3.8 kilometres of Mamre Road between the M4 Motorway, St Clair and Erskine Park Road, Erskine Park to a four-lane divided road (the proposal). Mamre Road (Main Road 536) is a State Road connecting Elizabeth Drive in the south to the M4 Motorway and Great Western Highway in the north. Kelleher Nightingale Consulting Pty Ltd (KNC) was engaged by Aurecon on behalf of TfNSW to prepare an Aboriginal cultural heritage assessment report (CHAR) for the proposal. The proposal area and a suitable buffer to allow for design changes and refinements form the study area for this report.

Aboriginal archaeological assessment undertaken in accordance with the *Code of Practice* and TfNSW PACHCI identified eight Aboriginal archaeological sites (comprising nine AHIMS registrations) that would be at least partially impacted by the proposal. The sites comprise three surface artefact scatters with associated subsurface archaeological deposits, three subsurface archaeological deposits, one low density surface artefact scatter and one surface isolated artefact. Archaeological and cultural significance of the identified Aboriginal sites is defined by the information exhibited by each site. The archaeological sites located within the proposal area are a mix of low and moderate significance sites.

Archaeological impact mitigation (salvage excavation) is recommended where sites of at least moderate significance are to be impacted, as the scientific and archaeological value of the sites is linked to the information the sites contain. Salvage excavation is recommended for the impacted portions of Mamre Road AFT 1, Mamre Road AFT 2, Mamre Road AFT 3, Mamre Road AFT 4, Mamre Road AFT 5 and MWP-AD5/MWP-AD6. Salvage excavations must be completed prior to any activities which may harm Aboriginal objects at these site locations.

Salvage mitigation for low significance sites Mamre Road 1 and Mamre Road IF 1 is not warranted as these sites are located in disturbed contents; however, community collection is required prior to any activities which may harm Aboriginal objects at the sites.

A land based AHIP should be obtained under section 90 of the *National Parks and Wildlife Act 1974* for the part of the Mamre Road Upgrade – Stage 1 proposal area which is not already covered under existing AHIPs. The AHIP should include Aboriginal objects associated with sites:

Mamre Road 1	AHIMS 45-5-3167	Low Significance	Total Impact
Mamre Road AFT 1	AHIMS 45-5-5337	Moderate Significance	Partial Impact
Mamre Road AFT 2	AHIMS 45-5-5336	Moderate Significance	Total Impact
Mamre Road AFT 3	AHIMS 45-5-5335	Moderate Significance	Partial Impact
Mamre Road AFT 4	AHIMS tbc	Moderate Significance	Partial Impact
Mamre Road AFT 5	AHIMS tbc	Moderate Significance	Partial Impact
Mamre Road IF 1	AHIMS 45-5-5338	Low Significance	Total Impact
MWP-AD5/MWP-AD6	AHIMS 45-5-4815/45-5-4813	Moderate Significance	Total Impact

Management measures have been recommended for Aboriginal objects situated within the non-impacted portions of the four Aboriginal archaeological sites (Mamre Road AFT 1, Mamre Road AFT 3, Mamre Road AFT 4 and Mamre Road AFT 5) to ensure that these areas are avoided by any proposed development and construction activities. The non-impacted portion of the sites (outside of the AHIP boundary) should be marked as environmentally sensitive “no-go zones” on the Construction Environmental Management Plan (CEMP) prior to construction activities to ensure the site areas are avoided and not impacted by the proposed works. Workers should be inducted as to appropriate protection measures for Aboriginal heritage.

This CHAR has been prepared to support the application for an AHIP. It has been prepared in accordance with the Heritage NSW *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*. The CHAR complies with the TfNSW *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (RMS 2011). It builds on the results of previous assessments and consultation regarding the proposal.

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1 Introduction

1.1 Proponent and consultants

Transport for NSW (TfNSW) propose to upgrade about 3.8 kilometres of Mamre Road between the M4 Motorway, St Clair and Erskine Park Road, Erskine Park to a four-lane divided road (the proposal). Mamre Road (Main Road 536) is a State Road connecting Elizabeth Drive in the south to the M4 Motorway and Great Western Highway in the north. The proposal area and a suitable buffer to allow for design changes and refinements form the study area for this report (Figure 1).

Kelleher Nightingale Consulting Pty Ltd (KNC) was engaged by Aurecon on behalf of TfNSW to prepare an Aboriginal cultural heritage assessment report (CHAR) for the proposal. The CHAR has been prepared in accordance with Stage 3 of the TfNSW *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (RMS 2011) and Heritage NSW *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH 2011).

1.2 Location and scope of activity

The proposal is located within the City of Penrith local government area (LGA) in Sydney, New South Wales (NSW). The proposal forms Stage 1 of the larger Mamre Road Upgrade Project, which is proposed to be delivered by TfNSW in two stages. Overall, the Mamre Road Upgrade Project would involve upgrades to a 10 kilometre long section of Mamre Road between the M4 Motorway, St Clair and Kerrs Road, Kemps Creek. Mamre Road is a key transport corridor, which provides connections to the Western Sydney Employment Area and the proposed Western Sydney Aerotropolis. A key aim of the proposal is to improve road safety and movement between the M4 Motorway and Erskine Park Road through increasing the capacity of Mamre Road, which would support future economic and residential growth in the surrounding area.

Key features of the proposal would include:

- an upgrade of Mamre Road to a four-lane divided road with a wide central median that would allow for widening to six lanes in the future, if required
- changes to intersections with Mamre Road including:
  - an upgrade to the existing signalised intersection at Banks Drive including a new western stub for access and a U-turn facility
  - a new signalised intersection at Solander Drive including a new western stub for access and a U-turn facility
  - a new signalised intersection at Luddenham Road with new turning lanes
  - an upgrade to the existing signalised intersection at Erskine Park Road with new turning lanes
  - modified intersection arrangements (left in, left out only) at McIntyre Avenue and Mandalong Close
- a new shared path along the eastern side of Mamre Road and provision for a future shared path on the western side
- reinstatement of bus stops near Banks Drive with provision for additional bus infrastructure in the future
- changes to property access to Mamre House, Erskine Park Rural Fire Service and other private properties
- drainage and flooding infrastructure upgrades including culvert crossings, water quality basins, grass swales and channel tail-out work
- new traffic control facilities including new traffic signals and relocation of existing electronic variable message signage
- roadside furniture and street lighting
- noise walls along the eastern side of Mamre Road at St Clair
- utility relocations
- establishment of temporary ancillary facilities to support construction including compound sites, stockpile and laydown locations, temporary access tracks, temporary waterway crossings and concrete batching plants

Construction of the proposal is expected to start in 2022 and be completed in late 2025, subject to approval, funding and weather considerations. Construction of the proposal is planned to be carried out in two stages: early work and main construction work. Early work would involve utility relocations, site establishment activities, property adjustments and other low impact work required to facilitate construction. The study area includes both the early works and main construction works areas with additional areas to accommodate design modifications and refinements.

1.3 Statutory controls and development context

The proposal is for road infrastructure carried out by TfNSW to be assessed under Division 5.1 of the *Environmental Planning and Assessment Act 1979*. Aboriginal objects would be harmed by the proposal and an application for an AHIP would be made under section 90A of the *National Parks and Wildlife Act 1974*. This CHAR has been prepared to support the AHIP application. It has been prepared in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*. The CHAR complies with the TfNSW *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (RMS 2011).

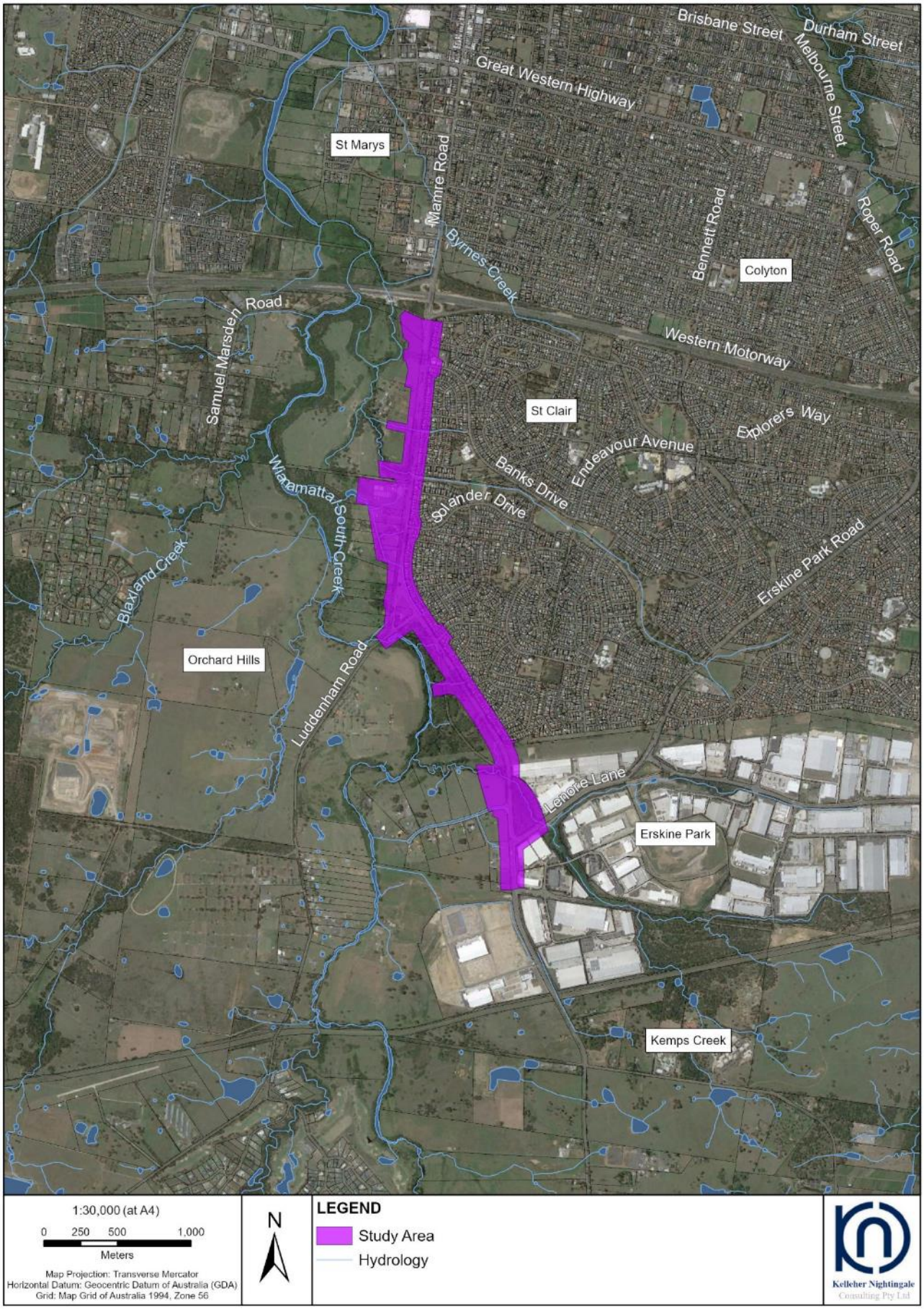

Figure 1. Location of the study area

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)].

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 (archaeological 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 61 of the *National Parks and Wildlife Regulation 2019* 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 *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 Heritage NSW guide.

This CHAR has been prepared to accompany an application for an AHIP made by TfNSW for Aboriginal objects within the proposal area, including those associated with Aboriginal sites Mamre Road 1, Mamre Road AFT 1, Mamre Road AFT 2, Mamre Road AFT 3, Mamre Road AFT 4, Mamre Road AFT 5, Mamre Road IF 1 and MWP-AD5/MWP-AD6.

2 Landscape Context

2.1 Topography and hydrology

The study area is located on the Cumberland Plain, a low lying and gently undulating subregion 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 (Clark and Jones 1991).

The study area is situated on the western side of a north-south orientated ridge and a series of low lying hills which form the watershed that divides the catchment areas of Wianamatta/South Creek to the west and Ropes Creek to the east (Figure 2). The study area is characterised by the crest, flat, open depression and slope landforms which form the interface between the Wianamatta/South Creek floodplain and the elevated landforms of the ridge and low lying hills.

Wianamatta/South Creek flows north through the wide flood plain to the west of study area and is flanked by terrace flats and paleochannels. The confluences of several major tributary creeks including Badgerys Creek, Blaxland Creek, Cosgroves Creek and Kemps Creek occur within this area. Wianamatta/South Creek continues flowing north for approximately 30 kilometres before converging with the Hawkesbury River near Windsor.

Drainage within the study area comprises modified first and second order drainage lines which flow north west into Wianamatta/South Creek or Kemps Creek. A number of large dams have been constructed throughout the area within former creek channels, altering the area's hydrology and drainage patterns. In addition, several creeks have been modified by culverts along Mamre Road.

2.2 Geology and soils

The basal geology of the study area is dominated by Bringelly Shale while Quaternary alluvial floodplain deposits are present along the low lying areas adjacent to Wianamatta/South Creek and Kemps Creek (Figure 3). Bringelly Shale geology is composed of shale, carbonaceous claystone, claystone, laminate, fine to medium-grained lithic sandstone, rare coal and tuff (Clark and Jones 1991) and underlies the crests, slopes and drainage lines of the majority of the study area. Alluvial floodplain deposits comprise fine-grained sand, silt and clay that deposited in association with fluvial activity along the various creek corridors.

The basal geology is overlain by South Creek soils within the immediate vicinity of major creeks, transitioning to Blacktown soils on the adjacent elevated areas (Figure 3). The alluvial South Creek soil landscape is characterised by flat landforms with incised channels that are subject to frequent episodes of inundation, erosion and aggradation. The landscape contains deep structured loams and clays overlying bedrock or relict soils. The South Creek soil landscape may retain archaeological deposit but due to its location on active floodplains, integrity of deposit may be compromised due to repeated episodes of erosion and deposition caused by fluvial activity.

The residual Blacktown soil landscape is located on gently undulating rises with broad rounded ridges and crests with gently inclined concave slopes. The landscape is characterised by shallow to moderately deep red and brown podzolic soils on crests grading to yellow podzolic soils on lower slopes and drainage lines. Erosional susceptibility of this soil landscape is relatively low but is increased where surface vegetation is not maintained (Bannerman, Hazleton, and Tille 1990). Blacktown soils are conducive to artefact survivability, however their acid chemistry quickly removes organics and their deflationary tendency often results in a temporal collapse, where archaeological objects from multiple time periods accumulated within a single cultural soil layer.

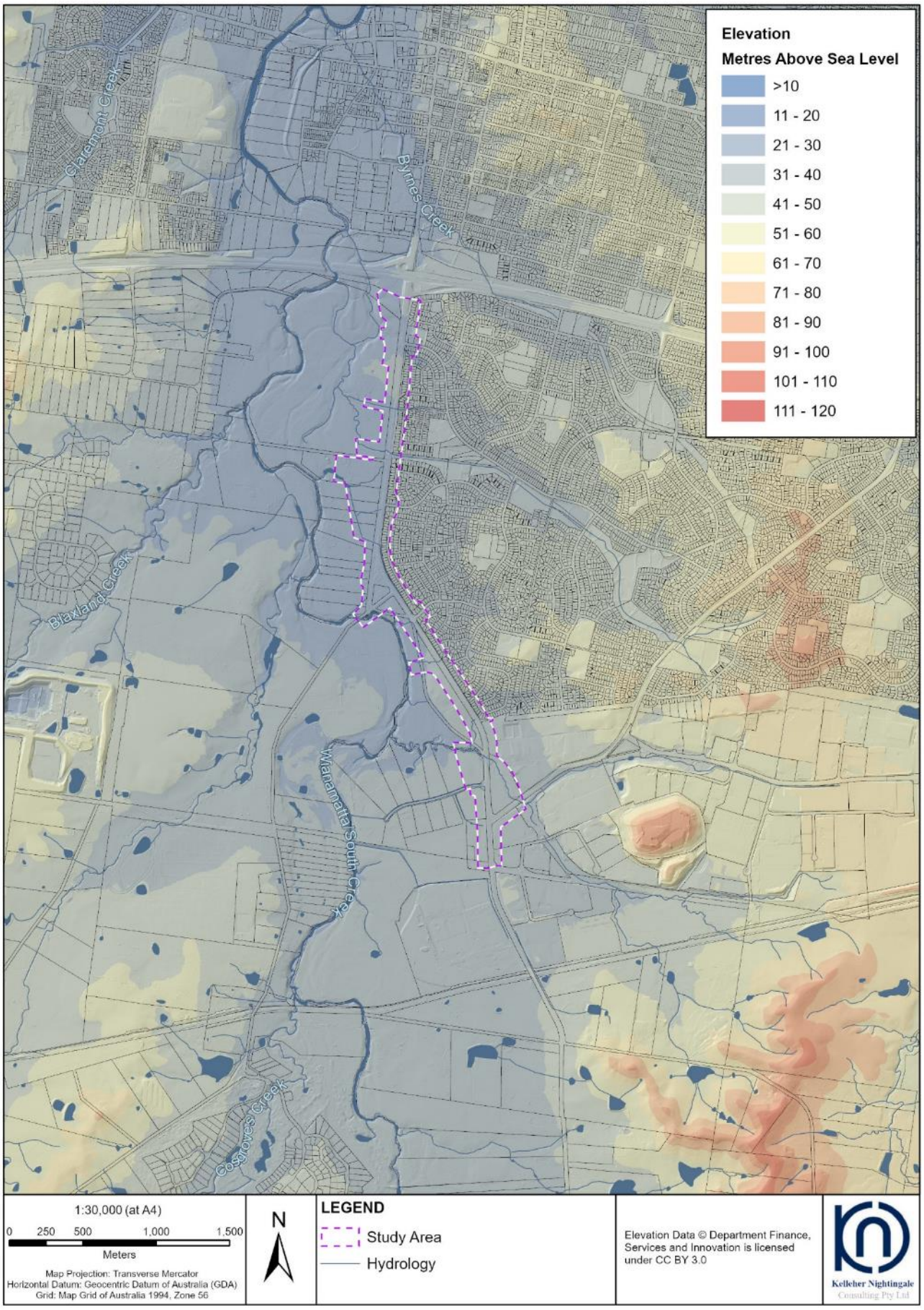

Figure 2. Topography of the study area

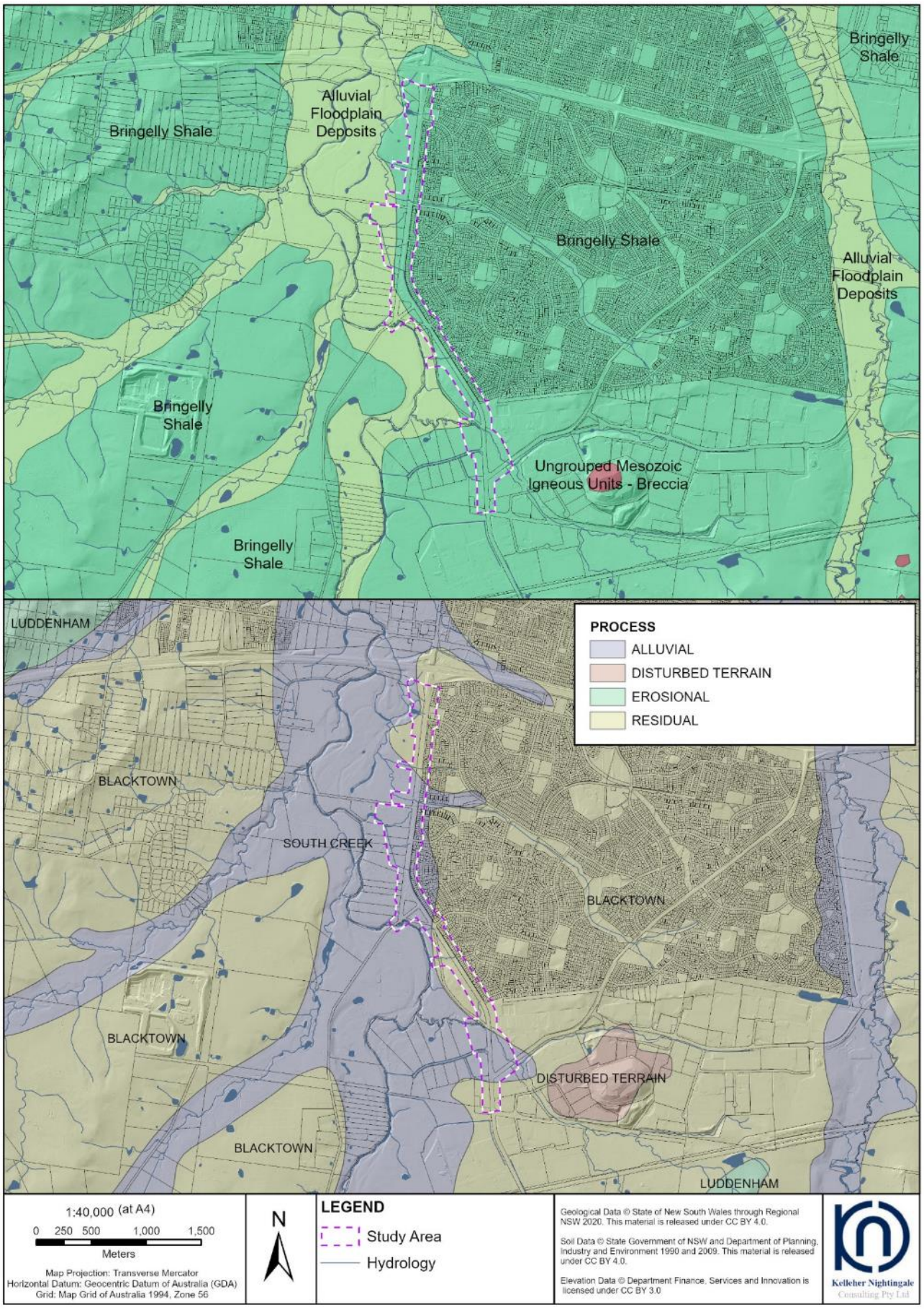

Figure 3. Geology and soil landscapes of the study area

2.3 Vegetation

The distribution of native vegetation within the study area has been affected by historic and contemporary European 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 and climate (NPWS 2002). The clearance of native vegetation across the majority of the study area by European settlers has left only small areas of native vegetation. These areas are classified as Shale Plains Woodlands, Shale Hills Woodland and Alluvial Woodland.

Shale Plains Woodland is the most widely distributed native vegetation community on the Cumberland Plain and generally occurs on flat to gently sloping terrain and low elevation with soils derived from Wianamatta Shale or well drained Holocene Alluvium geology. Shale Plains Woodland is characterised by a canopy dominated by *Eucalyptus moluccana* (grey box) *and E. tereticornis* (forest red gum), a shrub stratum dominated by *Bursaria spinose* (blackthorn) and a ground stratum comprising a mixture of grasses.

Shale Hills Woodland generally occurs on higher elevations and steeper terrain than Shale Plains Woodland with soils derived from Wianamatta Shale geology. Shale Hills Woodland is characterised by a canopy dominated by *E. moluccana* (grey box and *E. tereticornis* (forest red gum), a small tree stratum of *Acacia implexa* (lightwood) and commonly occurring *Eucalyptus* species, a shrub stratum dominated by *Bursaria spinose* (blackthorn) and a ground stratum of grasses and herbs.

Alluvial Woodland is found adjacent or in close proximity to minor watercourses with draining soils derived from Wianamatta Shale geology. Alluvial Woodland commonly includes an upper tree stratum of *E. amplifolia* (cabbage gum) and *E. tereticornis* (forest red gum), a small tree stratum of *Acacia parramattensis* (Parramatta green wattle) and *Casuarina glauca* (swamp she-oak), an often sparse shrub stratum of dominated by *Bursaria spinose* (blackthorn) and an often dense ground stratum of grasses.

2.4 Land use disturbance

British occupation of the study area began in the early nineteenth century with the establishment of several large estates adjacent to Wianamatta/South Creek. In 1804, Reverend Samuel Marsden was granted 1,030 acres adjacent to Wianamatta/South Creek with a larger portion on the western side of the creek in the Parish of Claremont and a smaller portion on the eastern side of the creek in the Parish of Melville, which included parts of the current study area.

The property was named after The Plains of Mamre mentioned in Genesis and by the time of his death in 1838 would encompass 1,500 acres (Graham Brooks and Associates 2003: 19). The historical homestead, known as Mamre was originally constructed in the 1820s (Aurecon *2021*: 43). Land use practices during this period were largely focused on grazing stock with orcharding becoming popular during the 1840s (Aurecon *2021*: 38).

Luddenham Road began as a dirt track connecting John and Gregory Blaxland's estates at Lee Holme and Luddenham which were established in the early nineteenth century. The road was metalled in 1897 and gazetted as a Government Road in 1900 (Aurecon *2021*: 52). In 1892, a road was established from St Marys municipal boundary to the Orphan School Road (Elizabeth Drive) which followed the eastern boundary of the properties on Wianamatta/South Creek. The road, was initially called Liverpool Road and is now known as Mamre Road, was upgraded to a main road in the early twentieth century (Aurecon *2021*: 37).

The properties on the western side of Mamre Road remain predominantly cleared of native vegetation and utilised for rural and semi-rural agricultural practices such as crop cultivation and grazing cattle. During the second half of the twentieth century, the region began to transition away from a predominance of rural land use practices with the urban redevelopment of St Clair and the construction of light industrial structures at Erskine Park. Public road corridors have modified the landscape by creating cuttings and artificial embankments in addition to modifying the course of several waterways. Several above and below ground utilities have also been constructed along the road corridors.

3 Ethnohistoric Context

Aboriginal people living throughout Australia in the late eighteenth century belonged to a multitude of groups that spoke approximately 250 distinct languages and several hundred dialects (Walsh 1993: 1). Prior to the British invasion, the study area was inhabited by Aboriginal people who generally lived in groups of one or more extended families that were associated with particular areas (Attenbrow 2002: 29; Watt 2019:5). These groups were interconnected through marriage and large gatherings of several groups occurred for specific purposes such as communal participation in subsistence gathering activities, initiations, funerals and ritual combat (Attenbrow 2002: 29). Aboriginal Customary law and practices, while varying across Australia "included responsibilities of various kinds for land and for objects and ideas associated with land, complex structures of kinship and family groupings, patterns and rules of marriage and child care, and procedures for the conduct and resolution of disputes" (ALRC 1986).

The subsistence activities of Aboriginal people living inland were not as dependant on fish and shellfish as groups closer to the coast and relied on small animals and plant foods in addition to seasonally available freshwater mullet and eels (Kohen 1986:77; Tench 1793:230). Possums and gliders were hunted in a number of ways, including smoking out the animal by lighting a fire in the base of a hollow tree, burning tracts of land and gathering the stranded animals, as well as cutting toeholds in trees (Kohen 1993:10; Tench 1793:82).

Traps were constructed along waterways for catching birds and small animals (Hunter 1793). Large groups of Aboriginal people participated in hunting kangaroos, which were flushed out toward awaiting hunters by lighting small grass fires (Bladen 1897: 751). A commensalism between the Aboriginal people of the Sydney region and dingos was also present during the late eighteenth and nineteenth centuries (Tench 1789). Aboriginal people living in the region during the late eighteenth and nineteenth centuries made a range of items from perishable materials including canoes, huts, containers, nets, spears, womera, clubs and shields. Ochres of red, yellow and white were used on items and as personal decoration while body piercings and scarification were also practiced.

The history of Aboriginal people who lived in Australia during the eighteenth and nineteenth centuries is disproportionately reliant on contemporary documents created by a small number of individuals from Europe or of European descent. Initially, the British were unable to converse with the Aboriginal people living in the Sydney region. Watkin Tench, who published a contemporary account of the British occupation in Australia during the late eighteenth century 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 1793: 51).

The study of society, culture and material culture by Europeans during the eighteenth and nineteenth centuries was influential in the development of many social sciences that exist today and, as such, prominence has been given to the documents created by Europeans during this time and, in consequence, the perceptions, beliefs and bias of their authors. As a result, the Aboriginal people who were involved in these events and the history of the eighteen and nineteenth centuries incorrectly appear "invisible, unrelated to important local historical events, or passive victims of colonisation" (Heritage NSW 2011: 6).

The spatial extent of the Aboriginal languages spoken during the eighteenth and nineteenth centuries and many of the names currently used to describe them are contentious due to these issues (Troy 1990: 2). Most of the information used to study Aboriginal languages was published in the second half of the nineteenth century by amateur anthropologists who interpreted, often without acknowledgement, information given to them by individuals from the contemporary Aboriginal community (Thomas 2007: 89; Attenbrow 2010: 30). The Aboriginal people who inhabited the study area spoke or understood what is known as the Sydney Language (Troy 1994: 1; Attenbrow 2002). Dialects of the Sydney Language were spoken or understood by Aboriginal people who lived in an area extending along the coast from Broken Bay to the Georges River and inland to the Hawkesbury River. Dharug (also referred to as Daruk or Darug) is generally used to refer to the inland dialect and Eora (also referred to as Iyora) is generally used to refer to the coastal dialect.

In 1770, the crew of a British Royal Navy research vessel called the HM Bark Endeavour charted the eastern coastline of a continent largely unknown to the Europeans at the time. As the coastline was charted, landmarks were given names by the crew who also documented several observations of Aboriginal people which they could see on the shoreline. While the crew of the HM Bark Endeavour were unsuccessful in their attempts to interact with the Aboriginal people living in the Sydney region and unable to know what the landmarks they recorded were called, the British from this period onwards generally failed to acknowledge the existence of existing Aboriginal placenames, despite often being aware of their existence, and "subsequently assigned European names to features that commemorated important events, people and places from their own culture" (Windsor 2009: 72). The renaming of the topographic features, animals and plants of Australia by the British effectively erased existing Aboriginal names that may have been used for thousands of years.

On 22 August 1770, Lieutenant James Cook who commanded the Endeavour claimed the eastern half of the continent, which he called New South Wales, for the United Kingdom. Cook did so in complete disregard for the rights of the Aboriginal people already inhabiting the continent and despite failing to gain the consent of Aboriginal people as he was instructed to do by the British Admiralty. 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 which encompassed almost a quarter of the world's population and landmass by 1909 (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: 240). 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 (Banner 2005; Doukakis 2006).

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 at Warrane (also spelt Waran, War-ran, Warrang and Wee-rong), a small bay which they would call Sydney Cove. The British First Fleet contained over 1,000 people including marines, officials and convicts. Phillip, who was commissioned Captain General and Governor in Chief of the Territory of New South Wales by King George III of the United Kingdom, was instructed to take precautions to protect the British colony against attack from them in addition to documenting information on the numbers of Aboriginal people living in the region and advising the British government on a "manner Our Intercourse with these people may be turned to the advantage of this country" (Governor Phillip's Instructions 25 April 1787).

The British were governed by legal regime based on the common law and classified Aboriginal people living in New South Wales as British subjects who were entitled to individual protection under the law (ALRC 1986). In practice, a legal pluralism existed within the region until 1816 with the British largely unable to enforce colonial laws outside the occupied areas where Aboriginal customary laws continued to be practiced (ALRC 1986; Ford and Salter 2008: 74-75). Aboriginal people who the British perceived to have committed crimes such as theft or murder, were treated as enemies of the state and while "at least 17 Aboriginal people had been incarcerated in the colony before 1816, all were held as hostages, not criminals" (Ford and Salter 2008: 72).

The British were frequently intimidated by armed groups or attacked outside the settlement and David Collins, who was Deputy Judge Advocate and Lieutenant-Governor of the colony, attributed the responsibility to the British individuals involved who were often convicts and who he believed had been punished for committing crimes such as theft. Karskens suggests that these actions were part of an attempt by Aboriginal groups living in the area to restrict the expansion of British occupation which by November of 1788, had extended to Parramatta where the British establish a government farm called Rose Hill (Karskens 2016: 44). British exploration and occupation in the late eighteenth century were influenced by the administration's desire to grant land to emancipists, in addition to the need to produce food to support the colony. Exploration and occupation were focused along the major waterways in the region which could be traversed by European style watercraft and where well-watered alluvial soils suitable for cultivation were found (Gill 1965: 543-544). Between 1788 and 1791, the British sent parties to survey the Parramatta River, Broken Bay, Botany Bay and the Hawkesbury River and lower reaches of Georges Rivers.

Early British accounts described the Sydney region 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 along the coast, the Aboriginal people living inland who they referred to as the 'woods tribes' (also called the Hunter's or Woodman's tribe) and the Aboriginal people who lived in the adjacent mountains. David Collins noted that the inland and coastal groups had a different dialect, songs, dances, subsistence and some implements (Collins 1798: 557-589). The British use of the term 'tribes' when referencing specific Aboriginal groups continued into the late nineteenth 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. It is likely these groups were small territorial clans and local clans of extended family groups, forming larger mobs or bands through social and cultural links including marriage and communal participation in subsistence activities.

Several of the groups were identified during the late eighteenth and nineteenth centuries in the vicinity of the study area including the Gomerrigal (or Gomerigal or Gomerrigal-Tongarra) who were possibly the later named 'South Creek Tribe' associated with Wianamatta/South Creek, the 'Mulgoa Tribe' (also referred to as Mulgowy) associated with the Mulgoa Valley, the Boorooberongal (also referred to as the Buruberongal) and the Bè-dia-gal (also referred to as the Bedigal) who the British encountered between Parramatta and the Hawkesbury River (Attenbrow 2002: 24-26; Goodall and Cadzow 2009:31; Russell 1941: 20). 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).

By 1789, the British found that their previous attempts to engage with Aboriginal people had been unsuccessful. Governor Phillip decided to capture and detain Aboriginal individuals by force and against their will in the belief that subsequent kind treatment would result in the engagement they desired (Hunter 1793[2003]: 118). The British kidnapped Arabanoo, an Aboriginal man who died of smallpox in April 1789, and then Coleby and Woollarwarree Bennalong who subsequently escaped their captivity. Phillip was speared when attempting to contact Woollarwarree Bennalong after his escape; however, his decision not to retaliate but instead to negotiate is thought to have resulted in the change in relations with Woollarwarree Bennelong, his family and friends who subsequently moved into the colony (Karskens 2016: 48).

During March and May 1789, the British documented widespread fatalities amongst the Aboriginal population of the Sydney region which they attributed to an outbreak of smallpox. The British were familiar with smallpox which was the most

widespread and deadly disease in the British Isles in the eighteenth century (Dowling 1997: 89). Prior exposure of the British to smallpox and the policy of isolation of infected individuals are likely to have contributed to the low level of infection within colony (Dowling 1997: 89); however, outbreak was devastating to the Aboriginal community.

Later accounts from British explorers of Aboriginal people who bore smallpox scars from the outbreak indicate that the disease spread over a large area that possibly included the Wellington Valley in the west and Jervis Bay and Port Phillip in the south (Dowling 1997: 63). The source of the smallpox outbreak is unclear due to the limited information in contemporary accounts; however, the virus was almost certainly brought to Australia by ship as was the case with seven other outbreaks of smallpox in Australia that were recorded during the nineteenth century (Dowling 1997: 52). The smallpox outbreak of 1789 drastically altered the size and structure of the Aboriginal population living in the Sydney region and in the aftermath, a number of Aboriginal people moved into the British settlement (Troy 1994: 8).

Aboriginal people living across the Sydney region during the last decade of the eighteenth century were living in a range of circumstances due to proximity to the areas occupied by the British and the connections and associations of Aboriginal groups and individuals. Aboriginal people played a crucial role as guides and translators for the British. Colebee and an Aboriginal man called Boladaree guided the British and acted as intermediaries with the Aboriginal people that they encountered between Parramatta and the Hawkesbury. The British used European items as gifts during these journeys and found that metal hatchets were particularly sought after (Attenbrow 2002: 103). The metal hatchet of Tommy Bundle is in the collection of the Australian Museum in Sydney (Attenbrow 2002: 103; Figure 8.16).

A young Aboriginal man called Bundle (also spelt Bon-del, Bundal, Bundell or Burreach) travelled with Captain Hill to Norfolk Island on board the brig *Supply* in 1791 becoming the first Aboriginal person to have sailed on a British ship beyond Australia (SLNSW 2010: 1). Bennelong and Yemmerrawanne sailed with Arthur Philip to England in the following year and several other Aboriginal people were listed as crew on British ships during this period including Nanbarry and Bungaree (SLNSW 2010: 17). Cultural practices continued within and on the peripheries of the British settlements with an initiation ceremony taking place at Wogganmully, which the British called Farm Cove, in February 1795. The initiates included Nanbarry, Colebee's nephew and Pemulwuy, a member of the Bè-dia-gal, who had speared John McEntire in 1790 was also present.

In 1791, small lots on the fertile eastern and western slopes of Prospect Hill were granted by Governor Philip to time-expired convicts and a further government farm was established at Toongabbie in April 1792; however, it was not until the British occupation along the Hawkesbury River, which began in 1794, that the colony began to be self-sustaining (Gill 1965: 543-544). Land along the Hawkesbury was granted to free settlers, many of whom were former soldiers and by 1795, an estimated 400 people occupied 30 miles of the riverfront (Gill 1965: 543-544). In the same year, a herd of wild cattle that had escaped from the colony seven years earlier was relocated by two convicts on a hunting expedition south of the Nepean River. The Campbelltown-Camden area became known to the British as the Cow Pastures (also called the Cowpastures Plain or Vaccary Forest) and remained largely unoccupied by the British until the early nineteenth century in order to preserve the herd. John Warby, a former convict who had been granted 50 acres at Prospect in 1792, was appointed stockman of the herd in 1803. The presence of the herd was known by the Aboriginal people living in the area who drew them beside a depiction of kangaroo on the wall of a sandstone rock shelter located in the suburb of Kentlyn which is known as Bull Cave.

British occupation along the Parramatta River, Hawkesbury River and Georges River during last decade of the eighteenth century impeded Aboriginal people's use of the landscape by restricting access to and removing food sources (Ferguson 1941: 88). Several droughts during this time are likely to have placed further strain of the resources used by Aboriginal people. In 1795, David Collins reported that large groups of Aboriginal people had been taking corn from the British farms on the Hawkesbury and that "an open war seemed about this time to have commenced between the natives and the settlers" (Collins 1798: 415-416). Raiding by Aboriginal groups and retaliatory killings by Aboriginal people and the British was reported on the peripheries of the colony along Hawkesbury River and at Prospect Hill, Toongabbie and outside Parramatta during the last decade of the eighteenth century (Collins 1798: 178, 275-276, 292, 304, 326-327).

In June 1795, the acting governor Captain William Paterson sent a detachment of the NSW Corps "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 gibblets [sic] in different places, whereon the bodies of all they might kill were to be hung" (Collins 1798: 416). Paterson stated that the soldiers were sent to the Hawkesbury after five British settlers had been killed and several wounded in the preceding weeks and that he "very much feared they would abandon the settlement entirely, and given[sic] up the most fertile spot which has yet been discovered in the colony" (Bladen 1895: 307). On the night after the arrival of the detachment, the soldiers fired on and pursued Aboriginal people that they believed had come to a farm to plunder it (Bladen 1895: 307). The officer stated that between seven and eight people were killed and one man, five women and some children were taken captive back to Sydney, including a women and child that had been wounded by shot (Bladen 1895: 307-8; 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). In the same year, land along the Georges River and Prospect Creek was granted, which Governor Hunter called 'Bank's Town' after Sir Joseph Banks.

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).

During 1804 and 1805 several raids were made by Aboriginal people across the region including an attack on James Dunlap at Prospect in May 1805 (Natives 1804: 2; Natives 1805b: 3), the killing of two stockmen on John Macarthur's Farm at Camden by Aboriginal people 'from the interior of the mountains" (Sydney 1805a: 3) and raids associated with an Aboriginal man called Musquito (also spelt Mosquito, Musquetta, Bush Muschetta or Muskito) on properties in the Hawkesbury River and Georges River districts. In July 1804, the Sydney Gazette reported that Reverend Samuel Marsden and the residentiary magistrate Mr Arndell met with two Aboriginal men from Richmond Hill called Yaragowby and Yaramandy (Yellowmundee) and requested their help in ending the conflict while providing gifts of food and clothes to take back to Aboriginal people who were friendly to the British (Natives 1804b:2). Two weeks later, it was reported that Major White and Nabbin (also referred to as Terribandy), two Aboriginal men who the British believed were involved in the violence, had been killed at Richmond Hill (Sydney 1804b: 2).

In 1804, Marsden was grated 1,030 acres adjacent to Wianamatta/South Creek with a larger portion on the western side of the creek in the Parish of Claremont and a smaller portion on the eastern side of the creek in the Parish of Melville, which included parts of the current study area. Samuel Marsden was a controversial figure in the history of Australia during the late eighteen and early nineteenth centuries due in part to his role as a magistrate in Parramatta, a wealthy landholder and his influence on the religious development of the British colony in Australia and missionary work in New Zealand (Yarwood 1967). The property was named after The Plains of Mamre mentioned in Genesis and by the time of his death in 1838 would encompass 1,500 acres (Graham Brooks and Associates 2003: 19). His landholdings by 1836 totalled 12,000 acres with 20,000 sheep and 1,100 cattle spread over several properties (Graham Brooks and Associates 2003: 20).

In April 1805, a series of meetings between 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 provided Marsden with the names of six individuals. 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 Hills in May 1805 (Sydney 1805a: 3). Musquito was captured with the help of Aboriginal people and exiled without charge to Norfolk Island and later Tasmania. Tedbury was released in August 1805 after assurances from Aboriginal people who assisted the British in capturing Musquito were given for 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.

British occupation and policy changed significantly under Lachlan Macquarie, who became Governor of New South Wales on 1 January 1810. During his time as governor, there was a rapid expansion of the British population in New South Wales from approximately 10,000 in 1810 to almost 30,000 in 1821 (Australian Bureau of Statistics 2008). Macquarie established several towns on the Hawkesbury/Nepean Rivers and approved the 1813 expedition, led by Gregory Blaxland, William Lawson and William Charles Wentworth, which enabled the British to expand west of the Blue Mountains and oversaw the subsequent expansion of British occupation west of the mountains and into the Illawarra from 1815.

British occupation of the region expanded during the governorship of Macquarie with the first land grants in the Mulgoa Valley in 1810 and several large areas granted across the region to former soldiers and free settlers that included 1,500 acres granted to Charles Throsby (Glenfield), 1,100 acres granted to Charles Hook (Denbigh) in 1812, 6,710 acres grated to John Blaxland (Luddenham) between the Nepean and the western Branch of Wianamatta/South Creek in 1813 and 3,000 acres granted to William Howe (Glenlee) in 1818. Major roads including Cowpasture Road (part of present day Camden Valley Way) and Bringelly Road in addition to several towns including Liverpool, Campbelltown, Camden and Narellan were also established during this time (Casey and Lowe 2010, Liston 1988: 50; Paul Davies 2011).

The expansion of European settlements 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). Macquarie, in response to conflict in the Appin region during 1814, conducted an enquiry which found that the settlers and their convict labourers had initiated the aggression and Macquarie

warned the British colonists not to take the law into their own hands and that Aboriginal people were protected under colonial law (Hale and Koeneman 2010: 3).

Macquarie issued a Government and General Order for the establishment of the Native Institution at Parramatta on 10 December 1814, which would be a residential school for Aboriginal children aged between four and sixteen where they would "be instructed in common, Reading, Writing, and Arithmetic; That the Boys shall also be instructed in Agriculture, Mechanical Arts, and such common Manufactures as may best suit their Ages, and respective Dispositions; That the Girls Shall also be taught Needle-work". The order also stipulated that "no Child, after having been admitted into the Institution, shall be permitted to leave it, or be taken away by any Person whatever (whether Parents or other Relatives) until such Time as the Boys shall have attained the Age of Sixteen Years, and the Girls Fourteen Years; at which Ages they shall be respectively discharged".

On 28 December 1814, Macquarie convened a meeting at the marketplace in Parramatta which he had invited and requested that Aboriginal people attend. The meeting, which would be the first of an annual conference, feast and distribution of goods held at Parramatta until 1835 was attended by approximately 60 Aboriginal families and several Aboriginal children who attended were enrolled in the Native Institution at Parramatta (Sydney 1814: 2). Billy, of South Creek (possibly Billy Nurragingy) was one of the children attending the Native Institution in 1815. The establishment of the native Institution and annual conference were part a change in policy that occurred during the governorship of Macquarie that exerted greater control over Aboriginal people and focused on changing the way in which Aboriginal people lived by promoting Christianity, British social practices and European farming techniques.

The actions taken by Macquarie in 1814 did not stop the hostilities and by April 1816, he ordered soldiers from the 46th Regiment (South Devonshire) 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 response of Aboriginal people and the British to the reprisal raids varied. A group of Aboriginal people including Kogi, Bundle, Boodbury and their families sheltered with Charles Throsby at Glenfield during this period and were actively protected by Throsby who stopped Kogi from being apprehended (Organ 1990: 61). Throsby was a large landholder at this time and had previously used his connections with two Aboriginal men to find a route into the Illawarra in 1815 which further expanded his landholdings (Organ 1990: 48). The reprisal raids were provided with Aboriginal guides including Bundle, Budbury, Colebee (son of Yellowmundee), Nurragingy (also referred to as Creek Jemmy or Jamie) and Tindale. It is unclear what the Aboriginal guides thought of the raids; however, the raids had met with little success prior to Captain Wallis being deserted by his Aboriginal guides Bundle and Budbury and British guide John Warby (Liston 1988: 54).

Reported sightings of Aboriginal people on Broughton's farm at Appin led Wallis' 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).

In May 1816, Governor Macquarie proclaimed that in response to the killing of British settlers and the destruction of cattle, grain and property along the Nepean, Grose and Hawkesbury Rivers a military force had been sent to drive Aboriginal people away from the settlements which resulted in the death and wounding of several Aboriginal people that may have included innocent men, women and children (Macquarie 1816: 1). The proclamation declared that Aboriginal people were no longer allowed to be armed with weapons within one mile of British settlements or farms occupied or owned by a British subject and were no longer allowed to gather in groups exceeding six individuals near a farm "on Pain of being considered Enemies, and treated accordingly" (Macquarie 1816: 1). Governor Macquarie's proclamation from May 1816 also stated that Aboriginal people:

> *assembling in large Bodies or Parties armed, and or fighting and attacking each other on the Plea of inflicting Punishments on Transgressors of their own Customs and Manners, at or near Sydney, and other principle Towns and Settlements in the Colony, shall be henceforth wholly abolished, as a barbarous Custom, repugnant to the British Laws, and strongly militating against the Civilisation of the Natives, which is an Object of the Highest Importance to effect, if possible* (Macquarie 1816: 1).

Accounts of combat between Aboriginal parties practicing customary law was relatively common within the Sydney Gazette prior to Macquarie's proclamation. Sydney Gazette reported that in March 1805 a punishment ordeal was endured by Kogi near Prospect. 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). A subsequent report in the Sydney Gazette three weeks later noted that Kogi had recovered from his wounds and was traveling to the Hawksbury to assist in the trial of an offender (Sydney 1805a: 3). Despite Macquarie's attempt to stop the practice within the occupied area, Kogi and his group were noted attending a gathering in Sydney in 1824 at which customary law combat occurred.

The conflict eventually ended through the outlawing of individuals and an eventual amnesty in November 1816 (Liston 1988: 54-55). On 25 May 1816, Macquarie noted in his journal that:

> *On this occasion I invested Nurragingy, alias Creek Jemmy with my Order of Merit by presenting him with a handsome Brass Gorset or Breast Plate, having his name inscribed thereon in full - as chief of the South Creek Tribe - I also promised him and his friend Colebee a Grant of 30 acres of land on the South Creek between them as an additional Reward for their fidelity to Government and their recent good conduct.*

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 of giving breastplates was "an attempt in many instances at social control and domination in the form of 'a badge of distinction', equating and imposing European values and social hierarchy on Aboriginal people and societies (Norris 2019: 32)

Colebee and Nurragingy selected an area in the suburb of Colebee as the location of the grant which Brook and Kohen (1991: 44-45) suggest they chose based on its proximity to the abundant raw materials located at Plumpton Ridge and proximity to the important watercourses of Eastern Creek and Bells Creek. The grant was registered on 31 August 1819 in Colebee's name alone and his heirs "to have and to hold for ever" (Macquarie 1819 [in Brook and Kohen 1991: 38]). A further three land grants along Richmond Road were registered on the same date to three British colonists, including Reverend Robert Cartwright, who Brook and Kohen (1991: 42-43) suggest were part of a plan by Macquarie to shape the nature of the settlement.

During the first half of the nineteenth century, the Aboriginal people of the Sydney Region lived in a range of circumstances that were increasingly entangled with the British. Settlements and land grants restricted movement across and access to traditional lands that Aboriginal people relied upon for subsistence and cultural activities. The displaced had to either move away from their Country or seek employment, often as labourers in settlements, on rural properties or ships (Backhouse 1843: 304; Hassall 1902: 3). Some access to traditional lands continued, possibly associated with employment on the larger estates, with corroborees documented until at least the 1850s on properties including Camden Park, Denbigh and Denham Court (Liston 1988: 57; Hassall 1902: 3).

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). Some individuals were appointed as constables including Bundle, who was appointed a constable of Upper Minto in 1822 and Colebee, who was appointed a constable of the District of Windsor in 1825 (GGO 1825: 4. Liston 1988: 57-59).

Daniel Moowattin (also spelt Mow-watty, Mowwatting, Moowatting and Moowattye), a Darug man born at Parramatta around 1791, became the guide, interpreter and helper of George Caley who collected botanical specimens for Joseph Banks and travelled to Norfolk, Tasmania and England with him (Smith 2005). Aboriginal people continued to be listed as crew on British ships including Bundle, Willamanna and Boatswain Maroot (SLNSW 2010: 18).

The trial, conviction and execution of Daniel Moowattin in 1816 represented a shift in British judicial practice from the existing legal pluralism to the enforcement of territorial sovereignty (Ford and Salter 2008). While the trial ultimately focused on Daniel Moowattin's familiarity with British law and customs, it was also part of the wide scale reform of colonial governance in the Macquarie period which sought to expand British territorial sovereignty and jurisdiction (Ford and Salter 2008: 64-65).

The expansion of British occupation beyond the Cumberland Plain resulted in the movement of Aboriginal people from the peripheries and within the occupied area with the annual feasts at Parramatta attracting Aboriginal people from further afield including west of the Blue Mountains and Port Macquarie. The annual feasts appear to have been a time when the parents were able to see their children at the Native Institution, as noted by Macquarie in his journal on 12 January 1817:

> *This day Nurragingy (als. Creek Jemmy) the Chief of the South Creek, and Mary-Mary the Chief of the Mulgowy – Natives – with their respective Tribes amounting to 51 (men, women & children) Persons, paid me a visit at Parramatta – and were entertained in the Govt. Domain there by direction of Mrs. Macquarie with Breakfast and Dinner this Day; the 17 Native Children at the Institution having also been entertained with Fruit and presented to their Parents & Relatives belonging to those two Tribes.*

Reverend James Hassell noted that on one occasion in the 1830s, an estimated 600 to 700 Aboriginal people were camped between Paramatta and Prospect for the annual feast (Hassell 1902: 17).

A settlement developed around the Colebee and Nurragingy land grant, with other Aboriginal families including Bobby Nurragingy (son of Nurragingy) and his wife settling on lands along Richmond Road adjacent to the land grant. By 1821, thirteen residents were living in the area (GML 2004: 22). The settlement became known as Black Town (GML 2004: 22). In 1843 the grant was transferred to Maria Lock, Colebee's younger sister and continued to be owned by her descendants until the twentieth Century when the title was revoked by the Aborigines Protection Board (Parry 2005). In 1823, the Native

Institution was moved to land adjoining the Colebee and Nurragingy land grant where it operated until 1833. Reverend Samuel Marsden was appointed the school committee's chairman by Governor Brisbane in 1823 but was dismissed in 1824. From 1823 onwards, historical records also indicate that a number of Aboriginal people were present in the area, and were camping along Bells Creek in order to remain near their children who were in the Institution (Bickford 1981:15).

Colebee, Nurragingy and his son Bobby attended a meeting in Windsor on 28 August 1826 to discuss the beneficial effect of employing Aboriginal people in the police department and Colebee made several resolutions that included the districts embracing Black Town, cruelty to animals be prevented and that rivers to the most insignificant jet should be protected (To The Editor 1826: 4). William Walker recalled that during the late 1830s Nurragingy (who he called Jamie), his wife and their sons Bobby and Billy had a camping place on Wianamatta/South Creek, near Macquarie Street at Windsor and that Billy would work on some farms in the region (Walker 1890: 7). He noted that "Jamie wore a brass plate suspended by a string from his neck, bearing his name, and which he said had been given him by good Governor Macquarie" (Walker 1890: 7).

James Backhouse recorded visiting Charles Marsden and his family at their property on Wianamatta/South Creek in the 1830s. In his account, Backhouse noted that Aboriginal people from a group associated with Wianamatta/South Creek were living beside the creek in the vicinity of the property and that they assisted with the agricultural operations of settlers (Backhouse 1943: 304). Charles Marsden provided Backhouse with Simeon as a guide for his onward journey to Penrith who was noted as a member of the Wianamatta/South Creek group (Backhouse 1943: 304).

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). In 1837, a British Parliamentary Select Committee published a report on the situation of Aboriginal peoples in British colonies around the world that acknowledged that it didn't appear that the territorial rights of Aboriginal people in Australia were considered and that Aboriginal people had been the victims of many acts of murder and violence that had been committed by British civilians and military parties (PSCAPS 1837: 10). Aboriginal cultural and traditions were not acknowledged by the report which instead recommended the protection of Aboriginal people from abuses, the provision of critical supplies and conversion to Christianity. In 1837, the governor of New South Wales was directed by the Colonial Office:

> *that it is necessary from the moment the Aborigines of this Country are declared British Subjects they should, as far as possible, be taught that the British Laws are to supersede their own, so that any native, who is suffering under their own customs, may have the power of an appeal to those of Great Britain, or, to put this in its true light, that all authorized persons should in all instances be required to protect a native from the violence of his fellows, even though they be in the execution of their own laws.* (HRA 1924: 34)

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-nineteenth 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). 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 Gundungurra (Goodall and Cadzow 2009: 86; Thomas 2007: 3).

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).

The migration of Aboriginal people from outside the Cumberland Plain for economic or social reasons was also documented in the second half of the nineteenth 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, the Burragorang Valley 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.

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 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

The current scientific understanding of the human occupation of the Australian continent is that Aboriginal people have lived in Australia for at least the last 40,000-60,000 years (Bowdler 2010: 182). Archaeological evidence shows that the Sydney Region has been occupied since at least 18,000 years ago (Attenbrow 2010: 3). Aboriginal archaeological sites with deposits that have returned earlier dates have been reported; however, these dates are problematic due to the limitations of the technology and evidence being used (Attenbrow 2010: 3-4).

Archaeological investigation is reliant on the artefacts or physical evidence of human activities which have survived anywhere from centuries to thousands of years. The oldest of these artefacts are likely to represent a small fraction of the objects that were used by Aboriginal people with even the most robust organic materials unlikely to survive in contexts older than 6,500 years (Attenbrow 2010: 3). The most numerous surviving artefacts in the Sydney Region were made from stone and were discarded in either open landscape settings or within closed landscape settings, primarily rock shelters. The accumulation of stone artefacts in both settings may have occurred over a large time span and have been subject to a range of geomorphic processes and human activities; however, due to the nature of closed context sites, the artefacts deposited within these sites may retain some level of chronological association within stratigraphically distinct units while open context sites are generally palimpsests in which chronological association between stone artefacts and any datable features present are often difficult to determine (see Attenbrow 2010; White 2018).

British accounts from the late eighteenth and nineteenth centuries portrayed the lifestyle and culture of Aboriginal people as static and unchanging; however, information from archaeological investigations demonstrate that this is incorrect. Instead, archaeological investigations have shown that significant changes have occurred within the types of artefacts used, artefact raw materials and the spatial distribution and density of Aboriginal archaeological sites while Aboriginal people adapted to an ever-changing landscape and environment.

Archaeological excavations at Aboriginal archaeological sites with stratified deposits during the twentieth century, such as Emu Cave near Lapstone Creek, demonstrated that the types and abundance of artefacts and raw materials changed over the last 10,000 years (Attenbrow 2012: 102-103; Megaw 1974). Around 10,000 years ago, the artefact assemblage from Aboriginal archaeological sites in the region was characterised by a preference for relatively large artefacts made from indurated mudstone/tuff (IMT) using free hand percussion. Formal tools were predominantly retouched flakes while flaked pebble tools have also found at some sites dating to this phase.

Approximately 5,000 years ago, there was a general decline in IMT artefacts, an increase in smaller artefacts made from locally available materials, higher artefact density and the introduction of backed artefacts and edge ground artefacts. Small, flaked stone artefacts with steep retouch known as backed artefacts were extensively made across the region between 3,500 and 1,500 years ago (Robertson, Attenbrow, and Hiscock 2009: 296). Residue and use-wear analysis of backed artefacts indicate that they were used for cutting, incising, and scraping of animal and plant materials (Robertson, Attenbrow, and Hiscock 2009: 298).

Edge ground hatchets, which are frequently referred to by the British during the late eighteenth and early nineteenth centuries, occur in the archaeological record of south eastern Australia from around 4,000 years ago while significantly older examples have been recovered in the north of Australia (Attenbrow 2012: 102). Edge ground hatchets were made primarily made from water worn metamorphic stone that was ground on an abrasive surface, such as sandstone, to produce an edge and were used primarily for cutting wood, stripping bark and other woodworking tasks (Corkill 2005: 48; Stokes 2015: 70). Analysis of edge ground hatchets from the region have shown that the metamorphic and igneous stone required were only accessible at certain locations such as the Hawkesbury/Nepean River and the Shoalhaven River (Stokes 2015). The distribution of sandstone outcrops would have also influenced the creation and maintenance of edge ground hatchets.

During the last 1,500 years, the use of backed artefacts substantially decreased or disappeared across the region and there was a general increase in edge ground hatchets during this period. Along the coast and within sandstone geology, archaeological assemblages from this period contain a larger proportion of quartz and bipolar artefacts while silcrete and IMT continued to be used on the western Cumberland Plain. The general variation in artefact assemblages from Aboriginal archaeological sites on coastal and inland sites has been interpreted as suggesting social changes occurred during this period which restricted the access of coastal groups to the raw materials of the western Cumberland Plain (Attenbrow 2012: 156).

4.1 Mamre Road Upgrade: Stage 2 PACHCI, 2020

An archaeological assessment was undertaken for the Mamre Road Upgrade Project which, at the time, encompassed the existing Mamre Road corridor and portions of adjacent properties between M4 Motorway in the north and Kerrs Road in the south (KNC 2020). The assessed area encompassed the Mamre Road Upgrade Stage 1 study area.

The assessment included a desktop review of previous archaeological investigations and environmental context in addition to archaeological field survey which was undertaken with representatives from the Deerubbin Local Aboriginal Land Council. The assessment noted that several archaeological investigations had been undertaken within and in the vicinity of the current study area that consisted of archaeological assessments that had been undertaken as part of the planning process for residential, industrial, commercial and infrastructure projects during the past 40 years.

The review of previously recorded Aboriginal archaeological sites which had been recorded on the Aboriginal Heritage Information Management System (AHIMS) found that 173 Aboriginal archaeological sites and six areas of potential archaeological deposit (PAD) had been previously registered within two kilometres of the assessment area, including six within the current study area (Figure 4). The previously recorded Aboriginal archaeological sites generally correlated to the intensity of archaeological investigations with registered sites predominantly recorded in areas where urban or light industrial redevelopment had occurred.

Relatively few Aboriginal archaeological sites had been recorded in areas where land use remained predominantly agricultural. As such, the spatial distribution of previously registered Aboriginal archaeological sites was unlikely to be an accurate representation of archaeological site distribution across the search area; however, general spatial patterns were visible that allow for the identification of areas where Aboriginal archaeological sites may occur due to similarities of landform, geology and land use practices.

The previously recorded Aboriginal archaeological sites were predominantly surface stone artefact scatters or isolated stone artefacts (n=159); however, other feature types were also recorded including modified tree (carved or scarred) and grinding groove. The assessment noted that the Wianamatta shale geology which has been mapped across the majority of the region did not contain suitable stone for making flaked artefacts; however, several unmapped sources had been identified, primarily as redeposited gravels within alluvial deposits along Wianamatta/South Creek in the vicinity of Luddenham Road, approximately 1.5 kilometres to the south west and near the former Kemps Creek Aerodrome approximately 4.5 kilometres to the south. Other sources were noted near the Nepean River and Georges River. The absence of locally accessible stone suitable for making stone artefacts did not appear to have had a significant impact on the distribution of Aboriginal archaeological sites in the region which appeared instead to be influenced by the proximity and reliability of fresh water.

Previous studies generally found higher stone artefact densities within artefact scatters that were located on relatively elevated landforms along the margins of creeks (especially those offering permanent water) and rivers, potentially reflecting repeated or more intensive use. Elevated locations on hilltops and ridge crests further from water sources tend to display a different archaeological signature, chiefly a sparser stone artefact distribution and less evidence for ‘everyday’ or utilitarian activities, suggesting that these areas were often used differently.

The assessment noted that the current study area contained a portion of the curtilage of a historic homestead and the associated property, known as “Mamre” which is an item on the NSW State Heritage Register (SHR Item 00264), the Penrith City Council Local Environment Plan 2010 (Item 228) and the Register of the National Estate (Place ID 3116). The SHR listing for “Mamre” included criteria of historical, associative and social significance relevant to Aboriginal cultural heritage. The Statement of Heritage Impact prepared for the Mamre Road Upgrade Stage 1 REF provides a comprehensive assessment of the SHR heritage values (see Section 4.3).

Elsewhere the survey identified four surface artefact scatters (Mamre Road 1, Mamre Road AFT 1-3), three subsurface archaeological deposits (MWP-AD5/ MWP-AD6, MWP-AD7 and MWP-AD8), two isolated surface artefacts (Mamre Road IF and MWP-IF1) and three areas of potential archaeological deposit (Mamre Road PADs 1-3) within the current study area. The assessment determined that one additional archaeological site (MR3 (Prospect)) that had been registered on AHIMS within the study area had been subsequently destroyed.

An area of potential archaeological deposit (Mamre Road PAD 1) was partially located within the curtilage of the “Mamre” SHR listed item. The remaining portions of the SHR curtilage for this item within the study area had visible disturbance and low Aboriginal archaeological potential.

The Aboriginal archaeological sites identified within the study area were predominantly located on elevated locations in close proximity to the major water source of Wianamatta/South Creek. These locations exhibited low levels of visible subsurface disturbance and had moderate archaeological potential. In contrast, isolated surface artefacts were located in highly disturbed contexts within the Mamre Road corridor and were considered unlikely to contain intact subsurface deposits.

[This content has deliberately been omitted from this version due to cultural sensitivity]

Figure 4. Stage 2 PACHCI assessment area with AHIMS results and SHR item curtilage

Ground surface visibility was noted in areas where natural processes, such as erosion, or land use practices, such as vehicle movement and recent ground excavation had removed vegetation or restricted its growth. Limitations to visibility within these areas included leaf litter, vegetation growth and introduced material such as blue metal along the road corridor. The ground surface was not visible within the majority of the study area due to exotic grasses and other vegetation cover in addition to modern structures, footpaths and roads. Despite the lack of surface visibility, it was still possible to assess the archaeological potential based on topographic location and visible subsurface disturbance.

The survey found that the majority of the surveyed area contained no potential for subsurface archaeology due to ground surface disturbance from modern land use practices including the construction of buildings and roads, the installation of above and below ground utilities, landscaping and market gardens.

The assessment recommended that future design for the proposal should avoid impact to the identified sites, areas of PAD and SHR item where possible and that if impact could not be avoided, further assessment would be required. The assessment noted that the further investigation would involve a test excavation of sites with moderate archaeological significance and areas of PAD to determine the intactness, extent and significance of any subsurface archaeological deposits.

4.2 Mamre Road Upgrade Stage 1: Aboriginal Archaeological Test Excavation Report, 2021

An archaeological test excavation was undertaken at the Aboriginal archaeological sites with moderate archaeological significance and areas of PAD within the current study area as recommended by the Stage 2 PACHCI assessment (KNC 2021). The test excavation program was carried out between 28 January and 5 February 2021 by KNC archaeologists and field representatives of registered Aboriginal stakeholder groups in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010a).

The test excavation program aimed to determine the intactness, extent and significance of any subsurface archaeological deposits within the current study area at four Aboriginal archaeological sites (Mamre Road AFT 1, Mamre Road AFT 2, Mamre Road AFT 3 and MWP-AD5/ MWP-AD6), and three areas of potential archaeological deposit (Mamre Road PAD 1, Mamre Road PAD 2 and Mamre Road PAD 3) (Figure 5). A total of 107, 50-centimetre test squares were excavated across the four Aboriginal archaeological sites and three areas of PAD.

No subsurface Aboriginal objects were recovered during the test excavation at Mamre Road PAD 1, which overlapped the eastern boundary of 'Mamre', a SHR listed item (SHR Item 00264) with criteria of historical, associative and social significance relevant to Aboriginal cultural heritage (see KNC 2020). Soil profiles were less than 20 centimetres deep and displayed characteristics consistent with ploughing and erosion. The test excavation determined that there was no potential for subsurface archaeological deposits within the study area where it overlapped the curtilage of SHR Item 00264.

The results were consistent with the zones of Aboriginal archaeological sensitivity outlined in the Mamre conservation management plan (Graham Brooks and Associates 2003: 49). The conservation management plan determined from contextual information that areas closer to Wianamatta/South Creek and in the vicinity of minor tributaries were of high and moderate sensitivity (Graham Brooks and Associates 2003: 47-49). The conservation management plan noted that while the remaining areas "are likely to contain archaeological materials deposited by Aboriginal people moving to and from more favourable campsite locations, archaeological deposits are likely to be extensively disturbed as a result of vegetation clearance and destumping, ploughing and stock trampling in times of wet weather" (Graham Brooks and Associates 2003: 48)

The test excavation confirmed the presence of subsurface archaeological deposits at the four previously recorded sites (Mamre Road AFT 1, Mamre Road AFT 2, Mamre Road AFT 3 and MWP-AD5/ MWP-AD6). Subsurface archaeological deposits were also confirmed at two (Mamre Road PAD 2 and Mamre Road PAD 3) of the three areas of potential archaeological deposit and these areas were subsequently renamed Mamre Road AFT 4 and Mamre Road AFT 5.

The test excavation program at Mamre Road AFT 1 was undertaken within the southern portion of the identified archaeological site extent, immediately south of an unnamed west flowing tributary creek. The program recovered 77 artefacts and 29 undiagnostic angular fragments. All 19 test squares containing lithic material. The assemblage consisted of flakes and flaking debitage with no cores, modified flakes or formal tools recovered during the test excavation. The spatial distribution of artefacts was characterised by a general low to moderate artefact density across the tested area with a moderate to high artefact density in the deposit on the crest of the landform.

The test excavation program at Mamre Road AFT 2 recovered 34 artefacts and 3 undiagnostic angular fragments with 10 of the 15 test squares excavated. The assemblage consisted of flakes and flaking debitage while one IMT flake that exhibited use-ware was also identified. No cores or formalised tools were recovered. The spatial distribution of artefacts was characterised by low to moderate artefact density within the western test squares north of an unnamed drainage line and low artefact density with a localised moderate artefact density within the test squares south of the drainage line.

[This content has deliberately been omitted from this version due to cultural sensitivity]

Figure 5. Study area with test excavation locations

The test excavation program at Mamre Road AFT 3 recovered 33 artefacts and 5 undiagnostic angular fragments from 15 of 22 test squares excavated. The assemblage consisted of flakes, flaking debitage and one silcrete proximal flake fragment was identified as a backed artefact fragment. No cores, modified flakes or other formal tools were recovered. The test excavation was undertaken across the site extent in three main locations: north (flat), central (flat/ slope) and south (crest). The spatial distribution of artefacts was characterised by low artefact density across the test areas with a localised moderate artefact density within the northern testing area. On the crest landform, the test squares with no artefacts were located closest to the existing road corridor indicating that previous land use activities may have disturbed this area.

The test excavation program at Mamre Road PAD 2 recovered 48 artefacts and eight undiagnostic angular fragments from 12 of 13 test squares excavated. The assemblage consisted of flakes and flaking debitage in addition to one silcrete flake with retouch along its distal margin that was also recovered. No cores, modified flakes or other formal tools were recovered. The spatial distribution of artefacts was characterised by low artefact density across the test areas with a low to moderate artefact density in the south western test squares. Due to the presence of Aboriginal artefacts, the site was renamed Mamre Road AFT 4.

The test excavation program at Mamre Road PAD 3 was undertaken in three areas (north, east and west) to avoid visible surface disturbance from ploughing. The program recovered 28 artefacts and 3 undiagnostic angular fragments from nine of 16 test squares excavated. The assemblage consisted of flakes and flaking debitage, one silcrete flake with use ware and one silcrete unidirectional core. The spatial distribution of artefacts was characterised by low artefact density across the eastern area, a low to moderate artefact density in the western area and a localised low artefact density in the northern area. Due to the presence of Aboriginal artefacts, the site was renamed Mamre Road AFT 5.

The test excavation program at MWP-AD5/MWP-AD6 was undertaken with the additional aim to confirm if the two previously recorded subsurface archaeological deposits were part of a single Aboriginal archaeological site. The program recovered 63 artefacts and 12 undiagnostic angular fragments from 16 out of 19 test squares excavated. The assemblage consisted of flakes and flaking debitage in addition to one silcrete asymmetric backed artefact. The spatial distribution of artefacts was characterised by low to moderate artefact density across the western portion of the site and a dispersed low artefact density within the north eastern portion of the site. The test excavation confirmed that the two previously recorded AHIMS registrations were part of a subsurface archaeological deposit that extended across the crest, flat and gentle slope landforms.

The results of the test excavation demonstrated that the spatial distribution of Aboriginal archaeological sites within the study area was impacted by land use and natural processes; however, some inter- and intra-site patterning and evidence of Aboriginal land use has remained. Overall, flat landforms appeared to retain the most stable soils, and yielded concentrations of subsurface stone artefacts. Blacktown soil landscapes across the tested areas retained the highest frequency of stone artefacts, due to the residual nature of these soils. South Creek soil landscapes across the tested areas were generally found to be vulnerable to fluvial activity and erosion potentially resulting in the truncation of soil profiles and removal of sediments that may have contained Aboriginal objects.

The artefact assemblages from all six sites with subsurface archaeological deposits contained a low number of artefacts retaining cortical surfaces and few cores, modified flakes or formal tools were recovered. The artefact assemblages from the sites indicate that they were utilised for activities primarily focused on the use of tertiary and secondary flakes. The artefact assemblage recovered from the test excavations varied in several ways from the results of the salvage excavation that was undertaken at South Creek 1 (SC1), immediately north of Mamre Road AFT 1 and South Creek 2 (SC2), approximately 140 metres to the north west (KNC 2019).

The salvage excavation at South Creek 1 (SC1) recovered 6,478 artefacts from 225 square metres which included cores or core fragments made from silcrete (n=154), IMT (n=20), chert (n=6) and quartz (n=5), and 116 modified flakes or formal tools. The deposit at South Creek 1 (SC1) also contained a significant number of non-diagnostic angular fragments (n=1,917). Cortical surfaces were present on the majority of cores and many had limited reduction. The salvage excavation at South Creek 2 (SC2) recovered 1,756 artefacts from 50 square metres that included 33 silcrete cores, five IMT cores, one hammerstone fragment and 35 modified flakes or formal tools. The deposit also contained 536 non diagnostic angular fragments. Most of the cores retained cortical surfaces and several retained over 50 percent cortex.

The artefact assemblages from South Creek 1 (SC1) and South Creek 2 (SC2) demonstrate that lithic reduction was occurring in close proximity to the current study area and in particular site Mamre Road AFT 1. The results of the test excavation program may indicate that the Aboriginal archaeological sites within the study area were utilised for different activities than those undertaken at South Creek 1 (SC1) and South Creek 2 (SC2) or may represent temporary separate activities to South Creek 1 (SC1) and South Creek 2 (SC2), possibly reflecting adaptation to landscape or social changes. Further archaeological investigations within the current study area would contribute to our understanding of the activities which were occurring at the sites and inter- and intra-site connectivity across the study area.

4.3 Mamre Road Upgrade Stage 1: Statement of Heritage Impact, 2021

A Statement of Heritage Impact (SOHI) was prepared for the proposed Mamre Road Upgrade Stage 1 (Aurecon 2021). The SOHI included an assessment of the likely impact of the proposed works on historical heritage, including the eastern boundary of "Mamre" which is a historic homestead and the associated property listed on the State Heritage Register (SHR Item 00264), Penrith City Council Local Environment Plan 2010 (Item 228) and the Register of the National Estate (Place ID 3116). "Mamre" was gazetted on the NSW State Heritage Register as historic heritage on the 2 April 1999. The SHR Criteria for the item included:

SHR Criteria a (Historical significance):

> *The Mamre property represents an important site in the post-contact history of Aboriginal survival and adaptation to non traditional social, economic and political practices. Namely, the remnants of the clans who occupied the entire Sydney area prior to contact began to congregate and ultimately work on a few properties such as Mamre. Several accounts report the `South Creek' tribe occupying the property of Charles Marsden as late as 1835 (Backhouse 1843). This patterning is reported to have continued for some period after the cessation of convict transportation*.

SHR Criteria b (Associative significance):

> *It is likely that Mamre possesses strong or special association for the descendants of Aboriginal people whom have been documented to have lived or worked on the property by researchers such as Laura Murray Cree (1995). The importance of Mamre to the wider Aboriginal community will most likely reinforce this assessment criterion.*

SHR Criteria d (Social significance):

> *The potential archaeological resource within the Mamre property is likely to have particular importance to the local Aboriginal community as an example of the possible survival of archaeological evidence in the face of ongoing urban expansion and development that is characteristic of the surrounding region. Whilst archaeological sites may have been in the past impacted by agricultural and pastoral pursuits, the considerable section of the South Creek catchment contained within the property has avoided more invasive subdivision and residential housing development. Consultation with the Deerubbin Local Aboriginal Land Council, the Darug Custodian Aboriginal Corporation and the Darug Tribal Aboriginal Corporation will determine the level of significance of this criterion.*

The SOHI assessment determined that:

> *Mamre House and its grounds represent an important site in the post-contact history of Aboriginal survival and adaptation to the processes of colonisation and dispossession in the Western Sydney region. Several historical accounts report the 'South Creek' tribe occupying (and likely working) on the pastoral property of Charles Marsden as late as 1835* (Aurecon 2021: 55).

The assessment also noted that accounts from employees working on the grounds and at Mamre House documented that:

> *there are a number of local Aboriginal people which visit the grounds, particularly around South Creek, to continue traditional practices and maintain their connection to Country. This includes using barks and woods from trees along the banks of South Creek for manufacturing bowls and artworks, and smoking ceremonies.* (Aurecon 2021: 55)

The SOHI assessment concluded that:

> *Although it has been documented in historical sources that Aboriginal peoples continued to occupy and use the grounds at Mamre and along South Creek for traditional practices and ceremonies during the early years of the property, no tangible artefacts or material evidence of this post-contact occupation has been found, either within the historic homestead building, surrounding areas or outbuildings.*
>
> *It is not anticipated that the proposal would impact on the post-contact Aboriginal cultural heritage values associated with Mamre House and the wider cultural landscape. The proposal would give rise to some opportunities to interpret these values and better convey this history of post contact occupation and interaction to the broader community, including those who visit and use Mamre House* (Aurecon 2021: 55)

The results of the assessment undertaken as part of the SOHI are consistent with the results of the test excavation at Mamre Road PAD 1 (Section 4.2) which was undertaken within the portion of the study area that overlapped the eastern boundary of 'Mamre'. The test excavation program at Mamre Road PAD 1 determined that there was no potential for subsurface archaeological deposits within the study area where it overlapped the curtilage of SHR Item 00264.

No other items of historical heritage with Aboriginal cultural heritage values were identified within the study area.

5 Aboriginal Community Consultation

5.1 Stakeholder identification and registration of interest

TfNSW is committed to effective consultation with Aboriginal communities regarding TfNSW activities and their potential for impact on Aboriginal cultural heritage. The TfNSW 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 TfNSW 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 *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010b) and the requirements of Clause 60 of *the National Parks and Wildlife Regulation 2019*.

Investigations for the Mamre Road Upgrade Stage 1 project have included consultation with the Aboriginal community groups and individuals as listed in Table 1 below.

Table 1. Registered Aboriginal parties*

Registered Aboriginal party	Representative and/or Contact Person
Deerubbin Local Aboriginal Land Council	Steve Randall
A1 Indigenous Services	Carolyn Hickey
Amanda Hickey Cultural Services	Amanda DeZwart
ARAGUNG	Jamie Eastwood
Barraby	Lee Field
Butucarbin Aboriginal Corporation	Jennifer Beale
Corroboree Aboriginal Corporation	Marilyn Carroll-Johnson
Darug Custodian Aboriginal Corporation	Justine Coplin
Dharug Ngurra	Dirk Schmitt
Didge Ngunawal Clan	Paul Boyd & Lilly Carroll
Freeman & Marx	Clive Freeman
Gulaga	Wendy Smith
Jason Davison	Jason Davison
Kamilaroi-Yankuntjatjara Working Group	Phil Khan
Merrigarn	Shaun Carroll
Muragadi Heritage Indigenous Corporation	Jesse Carroll Johnson
Murrabidgee Mullangari	Darleen Johnson
The Men's Shack Indigenous Corporations	Rod Hickey
Waawaar Awaa	Rodney Gunther
Wailwan Aboriginal Group	Phillip Boney
Warragil Cultural Services	Aaron Slater
Widescope Indigenous Group	Steven Hickey
Wurrumay	Vicki Slater
Yulay Cultural Services	Arika Jalomaki
Yurrandaali	Bo Field

*one additional Aboriginal stakeholder has registered for the Mamre Road Upgrade Stage 1 project but has chosen to withhold their details in accordance with item 4.1.5 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010b)

The formal consultation process included:

- advertising for registered Aboriginal parties (Appendix A);
- government agency notification letters;
- notification of closing date for registration;
- ongoing compilation of registrants list;
- provision of project information;
- provision of proposed cultural heritage report assessment methodology (allowing 28 day review) outlining the proposed test excavation and PACHCI Stage 3 assessment methodologies;
- an Aboriginal Focus Group (AFG) meeting was held on 6 November 2020 to discuss the findings of the Stage 2 PACHCI and development of the proposed test excavation and PACHCI Stage 3 assessment methodologies (Appendix C);
- provision of draft CHAR for review (a 28 day review period was provided);
- an AFG meeting was held on 24 May 2021 to discuss the findings of the test excavation program, the draft CHAR and the proposed mitigation (Appendix C);
- ongoing consultation with the local Aboriginal community including regular project updates.

5.2 Provision of proposed CHAR and test excavation methodology

All registered stakeholders were provided with a copy of the proposed text excavation methodology and CHAR methodology as part of an information package provided ahead of the first Aboriginal Focus Group (AFG) meeting. Stakeholders were requested to review the information and provide any comments or cultural information that may affect, inform or refine the methodology. Formal responses were received from A1 Indigenous Services, ARAGUNG, Amanda Hickey Cultural Services, Freeman & Marx, Kamilaroi-Yankuntjatjara Working Group, Murrabidgee Mullangari, Merrigarn, Muragadi Heritage Indigenous Corporation, Wailwan Aboriginal Group, Warragil Cultural Services, Widescope Indigenous Group, Wurrumay and Yulay Cultural Services. Comments are attached in full in Appendix B and summarised below.

A1 Indigenous Services stated that they supported the methodology (email received 25/10/2020).

ARAGUNG advised that they agreed with and supported the proposed CHAR and test excavation methodologies (email received 27 October 2020).

Amanda Hickey Cultural Services stated that they supported the methodology (email received 15/11/2020).

Freeman & Marx were supportive of the methodology and noted that the test excavation would provide better understanding of the cultural context (email received 22/10/2020).

Kamilaroi-Yankuntjatjara Working Group noted that they supported the recommendations in the methodology (email received 30/10/2020).

Murrabidgee Mullangari advised that they endorsed the recommendations made in the methodology (email received 26/10/2020).

Merrigarn stated that they agreed with the recommendations of the methodology (email received 18/11/2020).

Muragadi Heritage Indigenous Corporation advised that they agreed with the recommendations of the methodology (email received 18/11/2020).

Wailwan Aboriginal Group noted that they did not have any specific issues with the methodology (email received 22/10/2020).

Warragil Cultural Services agreed with the terms of the methodology (email received 22/10/2020).

Widescope Indigenous Group advised that they supported the recommendations outlined in the methodology (email received 3/11/2020).

Wurrumay stated that they agreed with the methodology (email received 17/11/2020).

Yulay Cultural Services advised that they had reviewed the methodology (email received 27/10/2020).

Stakeholders were also invited to attend an Aboriginal focus group meeting during the review period to discuss the proposed assessment methodology for the CHAR and the proposed test excavation methodology. The AFG meeting was held on 6/11/2020 and attended by representatives from TfNSW, KNC and registered Aboriginal stakeholder groups and individuals. The AFG meeting minutes are attached in Appendix C.

5.3 Review of draft CHAR

The draft CHAR was provided to stakeholders for a 28 day review and comment period. Stakeholders were invited to comment on the Aboriginal cultural significance of the study area and the identified sites, along with the recommendations presented in the report. Formal responses were received from Corroboree Aboriginal Corporation, Kamilaroi-Yankuntjatjara Working Group, Muragadi Heritage Indigenous Corporation and Waawaar Awaa. Comments from these stakeholders are attached in full in Appendix B and summarised below.

Corroboree Aboriginal Corporation stated that they agreed with the CHAR (email received 10/05/2021).

Kamilaroi-Yankuntjatjara Working Group advised that they supported the draft CHAR and agreed with the recommendations (email received 19/05/2021).

Muragadi Heritage Indigenous Corporation stated that they agreed with the recommendations made in the draft CHAR (email received 17/05/2021).

Waawaar Awaa advised that they supported the salvage methodology and mitigation measures in the draft CHAR (letter dated 18/05/2021). Waawaar Awaa recommended that the CEMP include an unexpected finds procedure (letter dated 18/05/2021). All TfNSW construction and maintenance activities are required to follow *Heritage Procedure 2: Unexpected Heritage Items* (RMS 2015).

An Aboriginal stakeholder who had chosen to withhold their details in accordance with item 4.1.5 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010b) advised that they agreed with the CHAR (email received 9/05/2021). A redacted version of the response is attached in Appendix B.

Stakeholders were invited to attend an Aboriginal focus group meeting during the review period to discuss the findings of the test excavation program, the draft CHAR and the proposed mitigation. The AFG meeting was held on 24/05/2021 and attended by representatives from TfNSW, KNC and registered Aboriginal stakeholder groups and individuals. The AFG meeting minutes are attached in Appendix C.

5.4 Aboriginal cultural heritage values

The study area has cultural value for the local Aboriginal community. The identified cultural values are both specific to the "Mamre" property (see Section 4.3) and a wider feeling of attachment and responsibility for the land. Mamre House and grounds retain intangible cultural values as part of the cultural landscape of Wianamatta/South Creek and the wider Cumberland Plain (Aurecon 2021: 55).

The SOHI assessment for the Mamre Road Upgrade Stage 1 project noted that:

> *It is likely that Mamre possesses strong or special association for the descendants of Aboriginal people who have been documented to have lived or worked on the property, as well as for the broader Aboriginal community of Western Sydney.*

No information relating to Mamre has been provided by the stakeholders to date.

Cultural values become tangible when tied to identified Aboriginal objects found at archaeological sites; however, the presence of Aboriginal objects is not required for a location to have value for the Aboriginal community. Aboriginal sites may also have social, spiritual or landscape values which are not tangible.

Kamilaroi-Yankuntjatjara Working Group stated that the "whole area is highly significant to us Aboriginal People from the past and present as all of this area was used for camping and hunting" (email dated 30/10/2020). Kamilaroi-Yankuntjatjara Working Group also advised that "[t]here is always potential to find burial sites" (email received 19/05/2021).

Some of the Aboriginal cultural heritage values expressed by stakeholders for the study area and wider region include:

- ancestral association with the land, including connection and descendance from the original traditional owners;
- responsibility to look after the land, including the heritage sites, plants and animals, creeks, rivers and the land itself;
- artefact sites and landscape features;
- culturally modified trees;
- connectivity of sites throughout the landscape;
- creek lines, particularly larger landscape features and waterways such as Wianamatta/South Creek;
- Indigenous plants and animals; and
- general concern for burials, as their locations are not always known and they can be found anywhere.

6 Summary and Analysis of Background Information

Analysis of the background information presented in the preceding chapters allows an assessment of the cultural heritage values within the impact assessment 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 within and around the impact assessment area was used and what sort of events took place in the past.

The study area and surrounding region are known to have been important to and extensively used by past Aboriginal people. The resources of Wianamatta/South Creek and its tributaries were of great importance to the Aboriginal people living in the region at the time of the British invasion and the subsequent British occupation these areas restricted access to and removed resources used by Aboriginal people. The response to the occupation varied between groups, individuals and over time due to proximity to the occupied areas, personal association and external factors, such as periods of drought. Pemulwuy, Tedbury and Musquito became synonymous with the conflict between the British and Aboriginal people through the late eighteenth and early nineteenth centuries while others, such as Colebee and Nurragingy, formed connections with British officials and individual landholders. Government policies further restricted the movement of Aboriginal people and actively attempted to make them adopt European culture; however, Aboriginal culture endures to this day across the Cumberland Plain and has influenced many aspects of Australian culture including in the names of animals, localities, creeks and rivers. The long struggle for recognition, self-determination and acknowledgement forms part of the Aboriginal cultural heritage story and lived experience of contemporary Aboriginal people. Members of the contemporary Aboriginal community continue to experience connection with the area through cultural and family associations.

Archaeological investigations have been undertaken in the region over several decades and have revealed physical traces of a range of Aboriginal land use activities which have survived in the form of Aboriginal archaeological sites. The investigations have shown that changes occurred in the spatial distribution and density of Aboriginal archaeological sites, the types of artefacts and artefact raw materials over the last 10,000 years that are likely to reflect the adaptation of Aboriginal people to an ever-changing landscape and environment while variations between the artefact assemblages of coastal and inland Aboriginal archaeological sites in the last 1,500 years may reflect social changes. The Aboriginal archaeological sites identified in the region have been predominantly surface artefact scatters, isolated artefacts and subsurface archaeological deposits of varying artefact density and integrity. Culturally modified trees with bark removal scars and areas of grinding grooves have also been recorded but in significantly lower numbers.

Soil landscape, vegetation and land use practices have been identified as factors influencing the preservation of Aboriginal archaeological sites in the region. Soil landscapes subject to high levels of erosion or fluvial activity are unlikely to retain in situ Aboriginal objects while areas where sediment has been deposited contain Aboriginal objects that are without spatial context. Land use practices, including vegetation clearance, construction, trenching and bulk earthworks have variable effects on the preservation of culturally modified trees and subsurface archaeological deposits across the region. These processes, and the intensity of previous archaeological studies, distort our perception of Aboriginal land use through the spatial distribution of known sites.

Despite this imbalance, general trends can still be observed. Previous archaeological investigations have shown that the distribution of Aboriginal archaeological sites in the region has been highly influenced by the reliability and permanence of fresh water sources in addition to underlying geology. Investigations in the region have found higher stone artefact density and site frequency along the margins of major watercourses including Wianamatta/South Creek where elevated and stable micro-topographic landforms have suffered minimal disturbance. Elevated locations on hilltops and ridge crests further from major watercourses tend to display a different archaeological signature, chiefly a sparser artefact and site density. This may be linked to the unsuitability of these areas for the activities which produced the Aboriginal objects that survive in the archaeological record or an intentional use of these areas for a different purpose.

6.1 Summary of known Aboriginal archaeological sites within the study area

Review of background information, Aboriginal community consultation and archaeological assessment, including archaeological survey and test excavation, has resulted in the identification of 11 Aboriginal archaeological sites containing Aboriginal objects within the study area. The sites comprise three surface artefact scatters with associated subsurface archaeological deposits, five subsurface archaeological deposits, one low density surface artefact scatter and two surface isolated artefacts. One additional AHIMS registered site, MR3 (Prospect), had been destroyed and was no longer extant.

The proposed works overlap an area that has been previously assessed for Aboriginal cultural heritage values and is already covered under an existing Aboriginal heritage impact permit (AHIP C00002113). As TfNSW are the holder for AHIP C0002113, any works related to the current proposal undertaken within the boundary of AHIP C00002113 will be required to comply with the existing permit conditions.

The study area contains a portion of the curtilage of a historic homestead and the associated property, known as "Mamre" which is an item on the NSW State Heritage Register (SHR Item 00264), the Penrith City Council Local Environment Plan 2010 (Item 228) and the Register of the National Estate (Place ID 3116). The SHR listing for "Mamre" includes criteria of historical, associative and social significance relevant to Aboriginal cultural heritage. No Aboriginal archaeological sites or objects have been identified within the portion of the study area that overlaps the SHR registered curtilage of the item during the survey and test excavations undertaken for the proposal.

The Aboriginal archaeological sites identified in the study area are shown in Figure 6 and are detailed in Table 2 below. The AHIMS registered item within the study area that has been previously destroyed is highlighted in grey. Mamre Road AFT 4 and Mamre Road AFT 5 were identified as a result of the test excavation program (see Section 4.2) and as such the AHIMS numbers for these sites remain to be confirmed (tbc).

Table 2. Identified Aboriginal archaeological sites within the study area

Site name	AHIMS number	Site feature/s	Status
Mamre Road 1	45-5-3167	Surface artefact scatter	Valid
Mamre Road AFT 1	45-5-5337	Surface and subsurface archaeological deposit	Valid
Mamre Road AFT 2	45-5-5336	Surface and subsurface archaeological deposit	Valid
Mamre Road AFT 3	45-5-5335	Surface and subsurface archaeological deposit	Valid
Mamre Road AFT 4 (formerly Mamre Road PAD 2)	tbc	Subsurface archaeological deposit	Valid
Mamre Road AFT 5 (formerly Mamre Road PAD 3)	tbc	Subsurface archaeological deposit	Valid
Mamre Road IF 1	45-5-5338	Surface isolated artefact	Valid
MWP-AD5/ MWP-AD6	45-5-4815/ 45-5-4813	Subsurface archaeological deposit	Valid
MWP-AD7	45-5-4812	Subsurface archaeological deposit	Valid
MWP-AD8	45-5-4811	Subsurface archaeological deposit	Valid
MWP-IF1	45-5-4810	Surface isolated artefact	Valid
MR3 (Prospect)	45-5-4138	Surface isolated artefact	Destroyed

[This content has deliberately been omitted from this version due to cultural sensitivity]

Figure 6. Identified Aboriginal archaeological sites and SHR item within the study area

6.2 Archaeological sites within the study area

Site Name: Mamre Road 1
AHIMS ID: 45-5-3167

Site Mamre Road 1 was a low density surface artefact scatter situated on a flat landform approximately 140 metres north east of an unnamed north west flowing tributary of South Creek. The site was located on the eastern side of Mamre Road, approximately 150 metres south of Pine Creek Circuit. The site comprised two silcrete artefacts which were identified within a heavily disturbed context adjacent to an underground wastewater pipeline.

The site area was inspected during the archaeological survey for the proposal. The area had been heavily disturbed by the construction of Mamre Road and installation underground utilities. No artefacts were identified at the site and it was assessed as having no intact archaeological deposit and no archaeological potential due to extensive disturbance.

Site Name: Mamre Road AFT 1
AHIMS ID: 45-5-5337

Site Mamre Road AFT 1 was a surface artefact scatter, subsurface archaeological deposit and associated area of potential archaeological deposit located on a gently sloping terrace landform. The landform was dissected by several west flowing drainage lines that combined with unnamed north flowing former channel of Wianamatta/South Creek along the western boundary of the site. The site was situated on the western side of the intersection of Mamre Road and Banks Drive and extended north to the M4 Motorway corridor.

An archaeological survey for the proposal identified two silcrete artefacts within a surface exposure on an unsealed vehicle track. The artefacts comprised one proximal flake fragment and one retouched flake. Visible surface disturbance was low across the landform with little evidence of subsurface disturbance beyond the erosion on the track. The landform was considered to display moderate archaeological potential for subsurface archaeological deposits.

An archaeological test excavation was undertaken within the southern area of the site. The test excavation consisted of 19 test squares which were generally excavated along two east-west oriented transects, parallel and approximately 30 metres south of the unnamed tributary and along two north-south oriented transects which were located on the crest of the landform, parallel and approximately 20 metres west of the existing Mamre Road.

The majority of soil profiles demonstrated geomorphological modification through modern topsoil development and truncation of the profile. The deepest profiles had an average depth of 50 centimetres and occurred in the test squares along the north-south oriented transects. Shallower and more disturbed soil profiles with an average depth of 22 centimetres were identified within test squares along the east-west oriented transects.

The test excavation confirmed the presence of a subsurface archaeological deposit at the site with all 19 test squares containing lithic material. A total of 77 artefacts and 29 undiagnostic angular fragments were recovered during the test excavation at Mamre Road AFT 1. Extrapolated to square metres, the mean artefact density across the tested area was 22.3 artefacts per square metre. The spatial distribution of artefacts was characterised by a general low to moderate artefact density across the tested area with a moderate to high artefact density in the deposit on the crest of the landform.

Silcrete was the predominant artefact raw material within the assemblage from Mamre Road AFT 1 with minor components of IMT, chert, quartz and quartzite also present. The artefact assemblage from Mamre Road AFT 1 comprised complete flakes (n= 44), proximal flake fragments (n=18), distal flake fragments (n=10) and medial flake fragments (n=5). No cores, modified flakes or formal tools were identified in the assemblage. The majority of artefacts within the assemblage were small in size and retained no cortex.

The results of the test excavation at Mamre Road AFT 1 confirmed the presence of subsurface archaeological material within this landform. The low number of artefacts with cortex and absence of cores within the assemblage indicated that activities at the site were primarily focused on the use of tertiary and secondary flakes. The absence of modified flakes and formalised tools indicate that the activities were not focused on the maintenance or creation of flakes and tools.

Site Name: Mamre Road AFT 2
AHIMS ID: 45-5-5336

Site Mamre Road AFT 2 was a surface artefact scatter and subsurface archaeological deposit situated on a terrace landform approximately 80 metres east of an unnamed north flowing tributary of South Creek. The landform was dissected by several west flowing drainage lines that combined with unnamed north flowing former channel of Wianamatta/South Creek along the western boundary of the site. The site was located on the western side of Mamre Road adjacent to the intersection of Solander Drive.

An archaeological survey undertaken as part of the archaeological investigations for the proposal identified three silcrete artefacts within a surface exposure on a horse training track. The artefacts consisted of one medial flake fragment, one heat affected flaked fragment and one piece of heat shattered debitage. Visible surface disturbance was low and comprised past vegetation clearance across the site and erosion within the track. The landform extent was clearly defined by market gardens to the north, road construction to the east and an unnamed creek and associated flood plain to the south and west. The landform was considered to display moderate archaeological potential for subsurface archaeological deposits.

An archaeological test excavation was undertaken at the site as part of the archaeological investigation for the proposal (see Section 4.2). The test excavation consisted of 15 test squares which were excavated north and south of an unnamed west flowing drainage line. The northern most transects were aligned roughly east to west across the terrace flat adjacent to the surface artefact exposure and horse training track. Some test squares were offset from surface artefacts and trees.

The test squares south of the drainage line were oriented north-west to south east and north-south to test a microtopographic variation in slope and identify the level of disturbance within the portion of the landform that was located in the existing road corridor. Soil profiles were relatively shallow in depth and displayed variation in preservation of the A1 horizon across the test squares with depth of deposit ranging from 20 centimetres to 40 centimetres. The presence of iron-manganese nodules and a bleached A2 horizon within some of the test squares indicated that parts of the area were subject to periodic inundation.

The test excavation confirmed the presence of a subsurface archaeological deposit at the site with 10 of the 15 test squares containing lithic material. A total of 34 artefacts and 3 undiagnostic angular fragments were recovered during the test excavation. Extrapolated to square metres, the mean artefact density across the tested area was 9.9 artefacts per square metre. The spatial distribution of artefacts was characterised by low to moderate artefact density within the western test squares north of the drainage line and low artefact density with a localised moderate artefact density within the test squares south of the drainage line.

Subsurface artefacts were not recovered from the four test squares excavated in the vicinity of the surface artefact scatter identified during the survey within a horse training track. The soil profile within the squares appeared to have been truncated and did not contain an A1 horizon. The artefacts recovered during the test excavation at Mamre Road AFT 2 were predominantly located within the upper 10 centimetres of the deposit and as such, the absence of the A1 horizon within the squares adjacent to the horse training track may indicate that the majority of the subsurface archaeological deposit in this area has been removed with only remnant surface artefacts remaining.

Silcrete was the predominant artefact raw material within the assemblage from Mamre Road AFT 2 with minor components of chert, IMT and quartz also present. The artefact assemblage from Mamre Road AFT 2 comprised complete flakes (n= 18), proximal flake fragments (n=8), distal flake fragments (n=6) and medial flake fragments (n=2). One IMT flake was recovered that exhibited use ware. No cores or formalised tools were recovered. The majority of artefacts within the assemblage were small in size and retained no cortex.

The results of the test excavation at Mamre Road AFT 2 confirmed the presence of subsurface archaeological material within this landform. The low number of artefacts with cortex and absence of cores within the assemblage indicated that activities at the site were primarily focused on the use of tertiary and secondary flakes.

Site Name: Mamre Road AFT 3
AHIMS ID: 45-5-5335

Site Mamre Road AFT 3 was an isolated surface artefact and subsurface archaeological deposits which were located on crest, slope and flat landforms adjacent to the eastern bank of Wianamatta/South Creek. The site was situated on the south western side of Mamre Road, south of the intersection with Luddenham Road and within Lot 24 DP1114968, Lot 1 DP217319 and Lot 11 DP238969.

An archaeological survey undertaken as part of the archaeological investigations for the proposal identified one silcrete retouched flake within an area of sheet erosion on the crest of a westerly inclined spur. Visible surface disturbance was low across the crest, slope and flat landforms. The landforms were considered to display moderate archaeological potential for subsurface archaeological deposits.

An archaeological test excavation was undertaken at the site as part of the archaeological investigation for the proposal (see Section 4.2). The test excavation consisted of 22 test squares which were excavated in three areas: north (flat), central (flat/ slope) and south (crest).

The northern area comprised three test squares that were positioned along an east-west oriented transect on an elevated flat approximately 60 metres north of an unnamed west flowing tributary creek and 70 metres north east of Wianamatta/South Creek. The central area consisted of seven test squares that were located along two north-south oriented transects parallel to the existing Mamre Road corridor and south and east of a former road corridor. The area was immediately north of an unnamed west flowing tributary creek and immediately south of an area of low-lying swampy ground adjacent to the unnamed tributary creek that formed the southern boundary of the northern test area. The southern area was located on the crest in the vicinity of the surface artefact findspot and consisted of 12 test squares that were positioned at regular intervals along three north-west to south-east oriented transects with a further test square that was excavated between two transects.

Soil profiles were generally shallow in depth and displayed some variation between the crest landform (southern testing area) and the elevated flat and gentle slope landforms (northern and central testing areas). The deepest soil profiles occurred in the northern testing area and the shallowest soil profiles were located on the crest in the south testing area. The soil profile within the test squares on the crest indicated that the deposit had been deflated due to erosion while the soil profile in the other two areas generally exhibited bleached A2 horizons indicating these areas were subject to periodic inundation.

The test excavation confirmed the presence of a subsurface archaeological deposit at the site with 15 of 22 test squares containing lithic material. A total of 33 artefacts and 5 undiagnostic angular fragments were recovered during the test excavation. The spatial distribution of artefacts was characterised by low artefact density across the test areas with a localised moderate artefact density within the northern testing area. On the crest landform, the test squares with no artefacts were located closest to the existing road corridor indicating that previous land use activities may have disturbed this area.

The artefacts were almost exclusively made from silcrete with four IMT artefacts also recovered. The artefact assemblage from Mamre Road AFT 3 comprised flakes (n= 12), proximal flake fragments (n=10), distal flake fragments (n=9) and medial flake fragments (n=2). One silcrete proximal flake fragment was identified as a backed artefact fragment. No cores or other formalised tools were present within the artefact assemblage from Mamre Road AFT 3. The majority of artefacts within the assemblage were small in size and retained no cortex.

The results of the test excavation at Mamre Road AFT 3 confirmed the presence of subsurface archaeological material within the tested landforms. The low number of artefacts with cortex and absence of cores within the assemblage indicated that activities at the site were primarily focused on the use of tertiary and secondary flakes.

Site Name: Mamre Road AFT 4 (formerly Mamre Road PAD 2)
AHIMS ID: tbc

Mamre Road AFT 4 was a subsurface archaeological deposit situated on an elevated landform adjacent to an unnamed north west flowing creek. The site was located approximately 10 metres west of Mamre Road and 70 metres west of the intersection of Apollo Close and Andy Court. The site was originally identified as an area of PAD (Mamre Road PAD 2) by an archaeological survey undertaken as part of the archaeological investigations for the proposal. The area had low levels of visible surface disturbance except for some piles of dumped sandstone rubble that were present within the north western portion of the landform. The area extent was clearly defined by a drainage cut to the north, road construction to the east and an unnamed creek to the south and west.

An archaeological test excavation was undertaken at the site as part of the archaeological investigation for the proposal (see Section 4.2). The test excavation comprised 13 test squares of which six were excavated along a north-south oriented transect parallel to the existing Mamre Road corridor and near the eastern boundary of the site. The remaining test squares were generally excavated along two east-west transects, parallel to an unnamed west flowing tributary creek in the southern portion of the site. During the test excavation program, artefacts were identified within a graded area immediately north of the southern tested area and outside the current study area.

Soil profiles were variable in depth with deposits between 17 and 45 centimetres deep. Soil profiles demonstrated some inconsistent truncation and removal of A1 and A2 horizons across the tested area. The presence of ferromanganese nodules within the deposit indicated that the area was subject to periodic inundation.

The test excavation confirmed the presence of a subsurface archaeological deposit at the site with 12 of 13 test squares containing lithic material. A total of 48 artefacts and 8 undiagnostic angular fragments were recovered during the test excavation. The spatial distribution of artefacts was characterised by low artefact density across the test areas with a low to moderate artefact density in the south western test squares. The artefacts were almost exclusively made from silcrete with four IMT artefacts and one quartz artefact also recovered. The artefact assemblage consisted of complete flakes (n =

25), proximal flake fragments (n=13), distal flake fragments (n=7) and medial flake fragments (n=3). One silcrete flake had retouched along its distal margin. No cores or other formal tools were present within the assemblage. The majority of artefacts within the assemblage were small in size and retained no cortex.

The results of the test excavation at Mamre Road AFT 4 confirmed the presence of subsurface archaeological material within the tested landforms. The low number of artefacts with cortex and absence of cores within the assemblage indicated that activities at the site were primarily focused on the use of tertiary and secondary flakes. As a result of the test excavation program, Mamre Road PAD 2 was renamed Mamre Road AFT 4.

Site Name: Mamre Road AFT 5 (formerly Mamre Road PAD 3)
AHIMS ID: tbc

Mamre Road AFT 5 was a subsurface archaeological deposit situated on an elevated flat adjacent to an unnamed north west flowing tributary of Wianamatta/South Creek. The site was located adjacent to western side of the existing Mamre Road corridor and approximately 130 metres south west of Pine Creek Circuit. The site was originally identified as an area of PAD (Mamre Road PAD 3) by an archaeological survey undertaken as part of the archaeological investigations for the proposal. The area had low levels of visible surface.

An archaeological test excavation was undertaken at the site as part of the archaeological investigation for the proposal (see Section 4.2). The test excavation comprised 16 test squares, which were excavated in three areas. The north western area contained three test squares which were excavated along a transect oriented roughly north-south on microtopographic spur crest. The eastern area consisted of eight test squares situated on a microtopographic simple slope landform between a south-west flowing drainage line and the existing Mamre Road corridor. The western area comprised five test squares that were excavated along an east-west oriented transect parallel to the northern bank of an unnamed tributary creek.

Soil profiles were shallow to moderate in depth and displayed variation consistent with differential erosion on the microtopographic landforms. The soil profiles within the test squares excavated in the north western area contained deposits less than 10 centimetres in depth. The deepest deposits were recorded within the test squares excavated in the eastern part of the site and contained bleached A2 horizons with ferromanganese inclusions indicating periodic inundation. The test squares located adjacent to the tributary creek contained relatively shallow deposits and appeared to have been truncated.

The test excavation confirmed the presence of a subsurface archaeological deposit at the site with nine of 16 test squares containing lithic material. A total of 28 artefacts and 3 undiagnostic angular fragments were recovered during the test excavation. The spatial distribution of artefacts was characterised by low artefact density across the eastern area, a low to moderate artefact density in the western area and a localised low artefact density in the north western area.

The artefacts were almost exclusively made from silcrete with two IMT artefacts and three quartz artefacts also recovered. The artefact assemblage consisted of complete flakes (n = 12), distal flake fragments (n=11) and proximal flake fragments (n=4). One silcrete flake with use ware and one silcrete unidirectional core were also recovered. The majority of artefacts within the assemblage were small in size and retained no cortex.

The results of the test excavation at Mamre Road AFT 5 confirmed the presence of subsurface archaeological material within the tested areas. The low number of artefacts with cortex and a core within the assemblage indicated that activities at the site were primarily focused on the creation or use of tertiary flakes. As a result of the test excavation program, Mamre Road PAD 3 was renamed Mamre Road AFT 5.

Site Name: Mamre Road IF 1
AHIMS ID: 45-5-5338

Site Mamre Road IF 1 was an isolated surface artefact that was identified during the survey for the proposal within a disturbed context on a gentle slope approximately 100 metres north east of an unnamed west flowing tributary of Wianamatta/South Creek. The artefact was located within the Mamre Road corridor approximately 15 metres east of Mamre Road and 500 metres north of Erskine Park Road.

The artefact was one silcrete flake fragment that was located within a surface exposure at the base of a power pole. The area had a high level of visible surface exposure from road construction and utility installation. The site was considered to display low archaeological potential due to a high level of visible disturbance.

Site Name: Mamre West Precinct Archaeological Deposit 5/ Mamre West Precinct Archaeological Deposit 6 (MWP-AD5/MWP-AD6)
AHIMS ID: 45-5-4815/45-5-4813

Mamre West Precinct Archaeological Deposit 5/ Mamre West Precinct Archaeological Deposit 6 (MWP-AD5/MWP-AD6) was a low to moderate density archaeological deposit situated on the crest, flat and gentle slope landforms overlooking the southern bank of an unnamed tributary of Wianamatta/South Creek. The site was located within Lot 201 DP1013539, approximately 40 metres to the west of the existing Mamre Road. An archaeological test excavation undertaken as part of the Mamre West Precinct recovered four silcrete artefacts consisting of two complete flakes, one proximal flake and one distal flake. The artefacts were recovered from two distinct locations (MWP-AD5 and MWP-AD6); however, limited information is available on the test excavation and it is unclear if the subsurface deposit between the two locations was tested.

The site area was inspected during the archaeological survey for the proposal (see Section 4.1). The existing Mamre Road corridor had extensive visible disturbance from the construction of an embankment and artificial drainage; however, the adjacent area exhibited low visible disturbance. The survey determined that the two AHIMS registered sites were likely to form part of a subsurface archaeological deposit that extended across the crest, slope and flat landforms that formed a low lying spur adjacent to the junction of two unnamed tributary creeks. The area, encompassing previously registered sites MWP-AD5 and MWP-AD6 was assessed as having moderate archaeological potential.

An archaeological test excavation was undertaken at the site for the proposal (see Section 4.2). The test excavation comprised 19 test squares which were excavated along five transects. A transect was placed along a lower slope and four transects were placed across the flat, slope and crest of a low lying spur. The test excavation squares were positioned to avoid an area ploughing in the middle of the site area.

Soil profiles were shallow to moderate in depth and were generally stable on the crest and flat landforms, while those located the lower slope transects yielded shallower soils, indicating some level of profile erosion and truncation. A bleached A2 horizon and ferromanganese nodules were present within the soil profiles and indicated that the area had been subject to periodic inundation.

The test excavation confirmed that the two previously recorded AHIMS registrations were part of a subsurface archaeological deposit that extended across the crest, flat and gentle slope landforms. A total of 16 out of 19 test squares contained lithic material comprising 63 artefacts and 12 undiagnostic angular fragments. The spatial distribution of artefacts was characterised by low to moderate artefact density across the western portion of the site and a dispersed low artefact density within the north eastern portion of the site.

Silcrete was the predominant artefact raw material within the assemblage from Mamre Road AFT 1 with minor components of IMT, chert, quartz and petrified wood also present. The artefact assemblage consisted of complete flakes (n = 25), distal flake fragments (n=21), proximal flake fragments (n=13) and medial flake fragments (n=4). One silcrete distal flake fragment with backing retouch forming an asymmetric backed artefact was recovered during the test excavation. No cores or other formalised tools were identified. The majority of artefacts within the assemblage were small in size and retained no cortex.

The results of the test excavation at MWP-AD5/MWP-AD6 confirmed the presence of subsurface archaeological material within the tested areas. The presence of a backed artefact within the assemblage indicated that a range of activities were undertaken at the site.

Site Name: Mamre West Precinct Archaeological Deposit 7 (MWP-AD7)
AHIMS ID: 45-5-4812

Mamre West Precinct Archaeological Deposit 7 (MWP-AD7) was low density archaeological deposit situated on the upper slope landform of a low lying spur that separated two unnamed north flowing tributary creeks. The site was located within Lot 215 DP1013539, approximately 40 metres to the west of the existing Mamre Road. An archaeological test excavation undertaken as part of the Mamre West Precinct recovered one multi-directional glass core from the site. Limited information is available on the test excavation and it is unclear if any further test squares were excavated at the site.

The site area was inspected during the archaeological survey for the proposal. The existing Mamre Road corridor had extensive visible disturbance from the construction of an embankment and artificial drainage while the adjacent property had been subject to moderate visible disturbance from drainage works, revegetation and stockpiles. The site was assessed as having low archaeological potential due to visible and recorded subsurface disturbance.

Site Name: Mamre West Precinct Archaeological Deposit 8 (MWP-AD8)
AHIMS ID: 45-5-4811

Mamre West Precinct Archaeological Deposit 8 (MWP-AD8) was a low density archaeological deposit situated on the crest landform of a low lying spur that separated two north flowing unnamed tributary creeks. The site was located within Lot 215 DP1013539, approximately 40 metres to the west of the existing Mamre Road. An archaeological test excavation undertaken as part of the Mamre West Precinct recovered two IMT flakes and one piece of IMT debitage from the site. Limited information is available on the test excavation and it is unclear if any further test squares were excavated at the site.

The site area was inspected during the archaeological survey for the proposal. The existing Mamre Road corridor had extensive visible disturbance from the construction of an embankment and artificial drainage while the adjacent property had been subject to moderate visible disturbance from drainage works, revegetation and stockpiles. The site was assessed as having low archaeological potential due to visible and recorded subsurface disturbance.

Site Name: Mamre West Precinct Isolated Find 1 (MWP-IF1)
AHIMS ID: 45-5-4810

MWP-IF1 was an isolated artefact situated on a flat landform approximately 300 metres south west of an unnamed tributary of South Creek. The site was located within Lot 216 DP1013539 approximately 50 west of Mamre Road and 90 metres south west of the intersection of Mamre Road and Erskine Park Road. The artefact was an unexhausted silcrete core, found within a disturbed context amongst introduced fill.

The site area was inspected during the archaeological survey. The existing Mamre Road corridor had extensive visible disturbance from the construction of an embankment, artificial drainage and underground utilities. The adjacent property had been subject to moderate visible disturbance from drainage works, revegetation and stockpiles. The site was assessed as having low archaeological potential due to visible and recorded subsurface disturbance.

Site Name: MR 3
AHIMS ID: 45-5-4138

MR 3 was an isolated surface artefact that was located in a disturbed context near a drainage line. The artefact comprised a silcrete cobble with two negative flake scars that was identified within the road corridor on the western side of Mamre Road. The site area was inspected during the archaeological survey for the proposal. The registered site location was within the existing Mamre Road corridor on the western side of the intersection of Mamre Road and Erskine Park Road. The site appeared to have been impacted by subsequent upgrade works to the intersection and the site was assessed as being no longer extant.

7 Cultural Heritage Values and Statement of Significance

7.1 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.

Significance assessments can generally be described under three broad headings (Pearson and Sullivan 1995:7):

- value to groups such as Aboriginal communities
- value to scientists and other information gatherers
- value to the general public in the context of regional, state and national heritage.

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* (DECCE 2010b) requires significance assessment according to criteria established in the *Australia ICOMOS Burra Charter* (Australia ICOMOS 2013). 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; and
- 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 Heritage NSW *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. "Social or cultural value can only be identified though consultation with Aboriginal people" (OEH 2011:8).
- Spiritual value - refers to the intangible values and meanings embodied in or evoked by a place which make it important to the spiritual identity, traditional knowledge, art or practices of a cultural group. Spiritual value is strongly connected to social value.

Significance assessment for identified archaeological sites focusses on the social/spiritual, historic, scientific and aesthetic significance of Aboriginal heritage values as identified in *The Burra Charter* (Australia ICOMOS 2013). The identification of significance is developed in consultation with the registered Aboriginal stakeholders. Assessed values for the sites within the study area are detailed below.

Cultural / social significance

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 and is determined by the Aboriginal community.

It has been identified during the consultation process that the local area has cultural heritage value (social value) to the local Aboriginal community. No specific cultural or social values for the sites within the study area have been provided by the registered Aboriginal stakeholders to date.

Historic significance

Community consultation and historical research has not identified any information regarding specific historical significance of identified Aboriginal archaeological sites in or near the study area. No specific historical values for the sites within the study area have been provided by the registered Aboriginal stakeholders to date. Archaeologically, the study area does not contain these values in relation to Aboriginal heritage.

Scientific / archaeological significance

For archaeologists, scientific significance refers to the potential of a site to contribute to current research questions. Alternately, a site may be an in situ repository of demonstrably important information, for example rare artefacts of unusually high antiquity.

Scientific significance is assessed using criteria to evaluate the contents of a site, state of preservation, integrity of deposits, representativeness of the site type, rarity/uniqueness and potential to answer research questions on past human behaviour. Heritage NSW's recommended criteria for assessing archaeological significance include:

- Archaeological Research Potential - significance may be based on the potential of a site or landscape to explain past human behaviour and can incorporate the intactness, stratigraphic integrity or state of preservation of a site, the association of the site to other sites in the region (connectivity), or a datable chronology.

- Representativeness - all sites are representative of those in their class (site type/subtype) however the issue here relates to whether particular sites should be conserved to ensure a representative sample of the archaeological record is retained. Representativeness is based on an understanding of the regional archaeological context in terms of site variability in and around the study area, the resources already conserved and the relationship of sites across the landscape.

- Rarity – which defines how distinctive a site may be, based on an understanding of what is unique in the archaeological record and consideration of key archaeological research questions (i.e. some sites are considered more important due to their ability to provide certain information). It may be assessed at local, regional, state and national levels.

High significance is usually attributed to sites which are so rare or unique that the loss of the site would affect our ability to understand an aspect of past Aboriginal use/occupation of an area. In some instances a site may be considered highly significant because it is now rare due to destruction of the archaeological record through development.

Moderate (medium) significance is attributed to sites which provide information on an established research question. Sites with moderate significance are those that offer the potential to yield information that will contribute to the growing holistic understanding of the Aboriginal cultural landscape of the project area. Archaeological investigation of moderately significant sites will contribute knowledge regarding site type interrelationships, cultural use of landscape features and occupation patterns.

Low significance is attributed to sites which cannot contribute new information about past Aboriginal use/occupation of an area. This may be due to site disturbance or the nature of the site's contents.

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.

Regarding Aboriginal sites identified within the study area, no specific aesthetic values have been identified by registered Aboriginal parties to date. Archaeologically; the study area does not contain these values.

7.2 Statement of Significance

The study area contains 11 Aboriginal archaeological sites as defined under the *National Parks and Wildlife Act 1974*. Based on the values assessment, the following levels of significance were ascribed to the sites:

Table 3. Assessed significance of Aboriginal archaeological sites within the study area

Significance	Site Name	Justification
Moderate	Mamre Road AFT 1 Mamre Road AFT 2 Mamre Road AFT 3 Mamre Road AFT 4 Mamre Road AFT 5 MWP-AD5/ MWP-AD6	• These sites offer good research potential as they represent intact archaeological deposits • Further investigation would add to our understanding of Aboriginal activities on landforms adjacent to Wianamatta/South Creek and its tributaries
Low	Mamre Road 1 Mamre Road IF 1 MWP-AD7 MWP-AD8 MWP-IF1	• The portion of these sites within the study area are highly disturbed and showed very little potential for further archaeology investigation • 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 region

8 The Proposed Activity and Impact Assessment

TfNSW propose to upgrade about 3.8 kilometres of Mamre Road between the M4 Motorway, St Clair and Erskine Park Road, Erskine Park to a four-lane divided road.

Key features of the proposal would include:

- an upgrade of Mamre Road to a four-lane divided road with a wide central median that would allow for widening to six lanes in the future, if required
- changes to intersections with Mamre Road including:
  - an upgrade to the existing signalised intersection at Banks Drive including a new western stub for access and a U-turn facility
  - a new signalised intersection at Solander Drive including a new western stub for access and a U-turn facility
  - a new signalised intersection at Luddenham Road with new turning lanes
  - an upgrade to the existing signalised intersection at Erskine Park Road with new turning lanes
  - modified intersection arrangements (left in, left out only) at McIntyre Avenue and Mandalong Close
- a new shared path along the eastern side of Mamre Road and provision for a future shared path on the western side
- reinstatement of bus stops near Banks Drive with provision for additional bus infrastructure in the future
- changes to property access to Mamre House, Erskine Park Rural Fire Service and other private properties
- drainage and flooding infrastructure upgrades including culvert crossings, water quality basins, grass swales and channel tail-out work
- new traffic control facilities including new traffic signals and relocation of existing electronic variable message signage
- roadside furniture and street lighting
- noise walls along the eastern side of Mamre Road at St Clair
- utility relocations
- establishment of temporary ancillary facilities to support construction including compound sites, stockpile and laydown locations, temporary access tracks, temporary waterway crossings and concrete batching plants

Construction of the proposal is expected to start in 2022 and be completed in late 2025, subject to approval, funding and weather considerations. Construction of the proposal is planned to be carried out in two stages: early work and main construction work. Early work would involve utility relocations, site establishment activities, property adjustments and other low impact work required to facilitate construction. The study area includes both the early works and main construction works areas.

The proposal area overlaps an area that has been previously assessed for Aboriginal cultural heritage values and is already covered under an existing Aboriginal heritage impact permit (AHIP C00002113). As TfNSW are the holder for AHIP C0002113, any works related to the current proposal undertaken within the boundary of AHIP C00002113 will be required to comply with the existing permit conditions.

Proposed impacts to sites identified within the study area are detailed in Table 4 and shown in Figure 7. In total, eight Aboriginal archaeological sites (comprising nine AHIMS registrations) would be at least partially impacted by the proposal. Aboriginal archaeological sites within the study area and outside the proposal area are highlighted in grey.

Table 4. Proposed impact to Aboriginal archaeological sites within the study area

Name	AHIMS number	Significance	Type / Degree of Harm	Consequence of Harm
Mamre Road 1	45-5-3167	Low	Direct / Total	Total loss of value
Mamre Road AFT 1	45-5-5337	Moderate	Direct / Partial	Partial loss of value
Mamre Road AFT 2	45-5-5336	Moderate	Direct / Total	Total loss of value
Mamre Road AFT 3	45-5-5335	Moderate	Direct / Partial	Partial loss of value
Mamre Road AFT 4	tbc	Moderate	Direct / Partial	Partial loss of value
Mamre Road AFT 5	tbc	Moderate	Direct / Partial	Partial loss of value
Mamre Road IF 1	45-5-5338	Low	Direct / Total	Total loss of value
MWP-AD5/ MWP-AD6	45-5-4815/ 45-5-4813	Moderate	Direct / Total	Total loss of value
MWP-AD7	45-5-4812	Low	No Impact	No loss of value
MWP-AD8	45-5-4811	Low	No Impact	No loss of value
MWP-IF1	45-5-4810	Low	No Impact	No loss of value

[This content has deliberately been omitted from this version due to cultural sensitivity]

Figure 7. Proposal area and Aboriginal heritage

9 Mitigating Harm

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 in relation to the proposed works. While conservation is the best approach when considering Aboriginal heritage, impacts on Aboriginal heritage could not completely be avoided due to the proposal involving an upgrade of an existing road, within a limited area.

Early identification of Aboriginal heritage allowed refinement of the impact to reduce impacts to three Aboriginal archaeological sites located within the study area (Mamre Road AFT 3, Mamre Road AFT 4 and Mamre Road AFT 5) and avoided impact to MWP-AD7, MWP-AD8 and MWP-IF1 (Figure 5).

The Aboriginal sites located within the proposal area have been impacted by past land use activities and would be further impacted by current land use practices. Low lying areas and drainage lines have been variably impacted by fluvial activity and would continue to be impacted.

Scientific confidence has been achieved through archaeological investigations (Section 4). Regarding Aboriginal cultural heritage value confidence, no specific cultural or social values expressed by these sites have been identified to date (Section 5). As detailed in Sections 6 and 7, the assessment has determined that the portions of Aboriginal archaeological sites within the study area contain a mixture 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, previous archaeological investigations have identified the presence of Aboriginal archaeological sites in the region that predominantly contained the same site features as the sites identified within the study area. Many of the previously recorded Aboriginal archaeological sites have subsequently been destroyed by residential, commercial and infrastructure construction; however, elevated landforms in close proximity to Wianamatta/South Creek and its tributaries retain potential for archaeological deposits containing high archaeological significance and have been largely avoided by urban expansion.

Management measures have been developed for the proposal to ensure non-impacted portions of Aboriginal archaeological sites are not inadvertently impacted by the proposed activities. Proposed management measures to be implemented during construction of the proposal would include protective fencing, identification of Aboriginal sites in the CEMP and, toolbox talks.

9.1 Mitigation Measures

The proposal area contains eight Aboriginal archaeological sites (comprising nine AHIMS registrations). Recommendations for the mitigation of impacts to the identified Aboriginal archaeological sites have been developed based on the principles of Ecologically Sustainable Development (ESD), environmental context and condition, background research and consultation with stakeholders documented in the preceding sections.

The impacted Aboriginal archaeological sites Mamre Road 1 and Mamre Road IF 1 are considered to display low archaeological value and significance. The sites are located within the existing Mamre Road corridor where visible disturbance was noted and are unlikely to retain intact subsurface archaeological deposits. Community collection is required prior to the commencement of works affecting these sites.

The impacted portions of sites Mamre Road AFT 1, Mamre Road AFT 2, Mamre Road AFT 3, Mamre Road AFT 4, Mamre Road AFT 5 and MWP-AD5/MWP-AD6 are considered to display moderate significance based on their scientific value and potential to inform on Aboriginal landscape use of Wianamatta/South Creek and its tributaries. The significance of harm to the portions of the sites within the study area is moderate, given the sites' overall moderate archaeological significance.

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 activities which were undertaken at these sites and the effect of land use disturbance and natural processes on subsurface archaeological deposits in the vicinity of Wianamatta/South Creek. 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 and future management of archaeological sites in the region.

Management measures should be implemented for Aboriginal objects situated outside the proposal area to ensure avoidance of objects not covered by an AHIP. Management measures to be implemented include protective fencing and identification of 'no-go zones' on maps within the Construction Environmental Management Plan.

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 5 below.

Table 5. Mitigation measures for impacted Aboriginal archaeological sites

Site name	Degree of harm	Significance of harm	Management and mitigation measures
Mamre Road 1	Total	Low	Community collection AHIP required prior to commencement of works affecting the site.
Mamre Road AFT 1	Partial	Moderate	Barrier fencing to be erected on the AHIP boundary for the extent of the area to ensure that no construction impact extends into the portion of the site outside the proposal area. Portion of area outside of proposal area should be identified on the Construction Environmental Management Plan (CEMP) as environmentally sensitive no-go zone to ensure no impact. Archaeological salvage excavation of impacted portion of site. AHIP required prior to commencement of works affecting the site.
Mamre Road AFT 2	Total	Moderate	Archaeological salvage excavation of impacted portion of site. AHIP required prior to commencement of works affecting the site.
Mamre Road AFT 3	Partial	Moderate	Barrier fencing to be erected on the AHIP boundary for the extent of the area to ensure that no construction impact extends into the portion of the site outside the proposal area. Portion of area outside of proposal area should be identified on the Construction Environmental Management Plan (CEMP) as environmentally sensitive no-go zone to ensure no impact. Archaeological salvage excavation of impacted portion of site. AHIP required prior to commencement of works affecting the site.

Site name	Degree of harm	Significance of harm	Management and mitigation measures
Mamre Road AFT 4	Partial	Moderate	Barrier fencing to be erected on the AHIP boundary for the extent of the area to ensure that no construction impact extends into the portion of the site outside the proposal area. Portion of area outside of proposal area should be identified on the Construction Environmental Management Plan (CEMP) as environmentally sensitive no-go zone to ensure no impact. Archaeological salvage excavation of impacted portion of site. AHIP required prior to commencement of works affecting the site.
Mamre Road AFT 5	Partial	Moderate	Barrier fencing to be erected on the AHIP boundary for the extent of the area to ensure that no construction impact extends into the portion of the site outside the proposal area. Portion of area outside of proposal area should be identified on the Construction Environmental Management Plan (CEMP) as environmentally sensitive no-go zone to ensure no impact. Archaeological salvage excavation of impacted portion of site. AHIP required prior to commencement of works affecting the site.
Mamre Road IF 1	Total	Low	Community collection AHIP required prior to commencement of works affecting the site.
MWP-AD5 and MWP-AD6	Total	Moderate	Archaeological salvage excavation of impacted portion of site. AHIP required prior to commencement of works affecting the site.

10 Summary and Recommendations

A total of eight Aboriginal archaeological sites are situated within the proposal area. An AHIP is being sought for Aboriginal objects within the boundaries of the proposal area, incorporating the Aboriginal archaeological sites listed in Table 6.

The proposed works overlap an area that has been previously assessed for Aboriginal cultural heritage values and is already covered under an existing AHIP (AHIP C00002113). As TfNSW are the AHIP holder for AHIP C0002113, any works related to the current proposal undertaken within existing AHIP area will be required to comply with the existing AHIP conditions.

Aboriginal Heritage Impact Permit

An application for an Aboriginal Heritage Impact Permit should be made under section 90A of the *National Parks and Wildlife Act 1974* for the land and associated objects within the boundaries of the proposal area, excluding the area within the boundary AHIP C0002113 (Figure 8). The AHIP should also be sought for the specified Aboriginal sites and Aboriginal objects contained within the sites listed below in Table 6.

Table 6. Aboriginal archaeological sites and scope for which an AHIP is being sought.

Name	AHIMS number	Significance	Scope of AHIP
Mamre Road 1	45-5-3167	Low	Total Impact
Mamre Road AFT 1	45-5-5337	Moderate	Partial Impact
Mamre Road AFT 2	45-5-5336	Moderate	Total Impact
Mamre Road AFT 3	45-5-5335	Moderate	Partial Impact
Mamre Road AFT 4	tbc	Moderate	Partial Impact
Mamre Road AFT 5	tbc	Moderate	Partial Impact
Mamre Road IF 1	45-5-5338	Low	Total Impact
MWP-AD5/MWP-AD6	45-5-4815/45-5-4813	Moderate	Total Impact

Salvage Excavation

The AHIP would include provision for impact mitigation through archaeological salvage excavation. Salvage excavation would be required at sites Mamre Road AFT 1, Mamre Road AFT 2, Mamre Road AFT 3, Mamre Road AFT 4, Mamre Road AFT 5 and MWP-AD5/MWP-AD6. Salvage excavation must be completed prior to any activities (including pre-construction activities) which may harm Aboriginal objects at these locations. Salvage excavation activities would be undertaken in accordance with the methodology attached as Appendix D.

Community Collection

The AHIP would include provision for community collection at sites Mamre Road 1 and Mamre Road IF 1. Community collection must be completed prior to any activities (including pre-construction activities) which may harm Aboriginal objects at these locations. Community collection activities would be undertaken in accordance with the methodology attached as Appendix D.

Site Protection

The edge of the AHIP area adjacent to the non-impacted portion of sites Mamre Road AFT 1, Mamre Road AFT 2, Mamre Road AFT 3, Mamre Road AFT 4, and Mamre Road AFT 5 should be demarcated with protective fencing and listed in the CEMP. These areas should be identified as “no-go zones” on the CEMP maps and workers inducted as to appropriate protection measures and requirements to comply with conditions in the adjacent AHIP.

Collected/Salvaged Aboriginal Objects

The short term management of collected Aboriginal objects is 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 stakeholders 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.

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Figure 8. AHIP application area

Glossary of Terms

A1 Horizon	The A1 Horizon is the uppermost layer of mineral soil with organic matter content and significant biological activity. The horizon is usually darker in colour than the A2 horizon.
A2 Horizon	The A2 Horizon is usually paler in colour than the A1 horizon
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
Axial Initiation	A type of fracture initiation caused by compressive stress that results in fracturing in a symmetrical fashion without ring crack or bulb of force. Also known as wedging initiation.
B Horizons	Subsoil horizons consisting of one or more mineral layers differing to the A Horizon by clay, iron, aluminium or organic matter concentrations, structure and/or consistence, and colour.
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.
Broken Backed Artefact	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.
Bending Initiation	A type of fracture initiation resulting from an acute angle between the platform and surface of the core. Bending initiations create flakes without clear ring cracks or well-defined bulbs of percussion. Also known as lipped flakes
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 Flake	Exhibiting the characteristics of direct percussion such as a bulb of percussion or ripple marks created from Hertzian initiations
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.
Hertzian Initiation	A type of fracture initiation where the fracture extends from a ring crack into the core before bending back towards the free face, creating a bulb of force (or cone) on ventral surface of a detached flake.
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.).
Soil Horizons	A vertical sequence of layers (horizons or units) which constitute a soil profile. Each soil horizon is defined by features reflecting soil formation processes.
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).
Undiagnostic/Non-Diagnostic Lithic Material	A piece of stone suitable for knapping or other human modification but lacking the attributes of an artefact. In areas where this material does not occur naturally this may have an association with procurement activities related to the creation of stone artefacts.
Use-Wear	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

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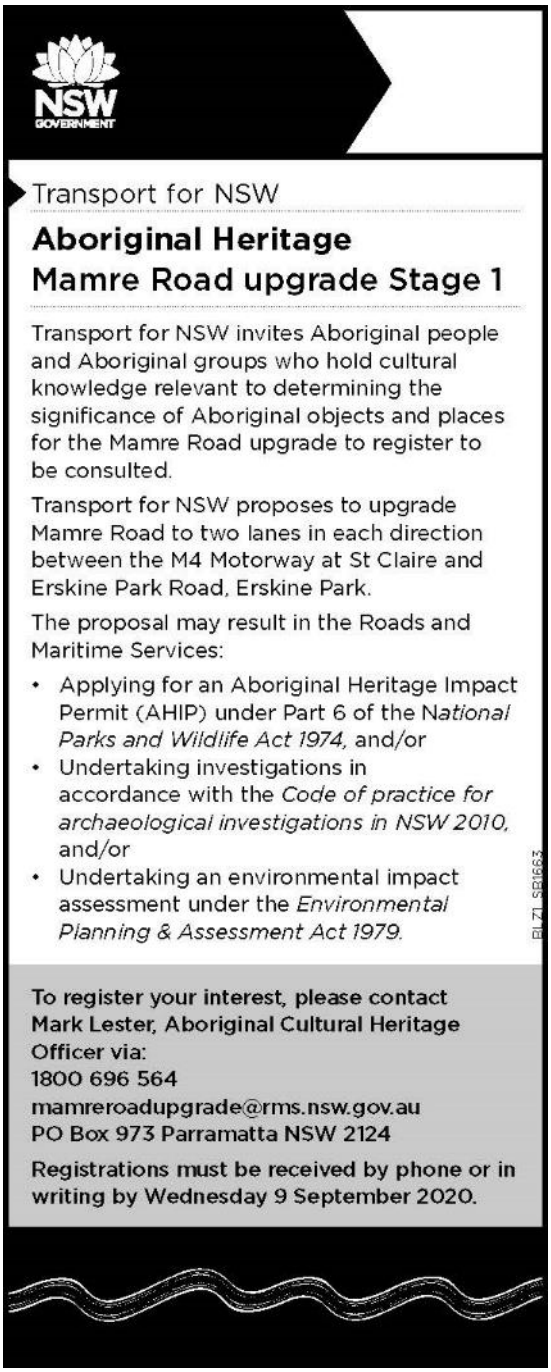
Appendix A Advertisement for registration of interest



NSW GOVERNMENT

Transport for NSW

Aboriginal Heritage
Mamre Road upgrade Stage 1

Transport for NSW invites Aboriginal people and Aboriginal groups who hold cultural knowledge relevant to determining the significance of Aboriginal objects and places for the Mamre Road upgrade to register to be consulted.

Transport for NSW proposes to upgrade Mamre Road to two lanes in each direction between the M4 Motorway at St Claire and Erskine Park Road, Erskine Park.

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*.

EL 21_SP1663

To register your interest, please contact Mark Lester, Aboriginal Cultural Heritage Officer via:
1800 696 564
mamreroadupgrade@rms.nsw.gov.au
PO Box 973 Parramatta NSW 2124

Registrations must be received by phone or in writing by Wednesday 9 September 2020.

Appeared in: The Koori Mail

Publication dates: Wednesday, 26 August 2020

Appendix B Aboriginal Community Comments

From: Corrroboree Aboriginal Corporation <corroboreecorp@bigpond.com>
Sent: Monday, 10 May 2021 11:22 AM
To: Shirley Luong
Subject: Re: Mamre Road upgrade stage 1 - Aboriginal Cultural Heritage Assessment Report - CAC

Hi Shirley
We agree with the report.

Kind regards
Marilyn Carroll-Johnson
Director
Corroboree Aboriginal Corporation
[redacted]
Ph: 0288244324
E: corroboreecorp@bigpond.com
Address: PO Box 3340
ROUSE HILL NSW 2155

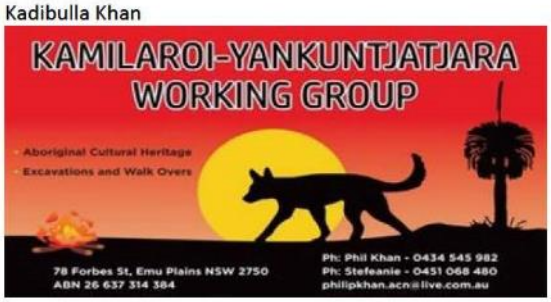
From: [redacted]
Sent: Wednesday, 19 May 2021 10:03 AM
To: Shirley Luong
Subject: Re: Mamre Road upgrade stage 1 - Aboriginal Cultural Heritage Assessment Report - KYWG

Dear Shirley,

Thank you for your draft ACHAR for Mamre Road Upgrade stage 1. The sight has significance to Aboriginal people as there are water ways in close proximity to the study area, this suggests Aboriginal people would camp, hunt, gather resources for everyday living. There is always potential to find burial sites. We agree to your recommendations and support your draft ACHAR, we also look forward to further consultation about the proposed project.

Kind Regards

Kadibulla Khan



From: jesse johnson <muragadi@yahoo.com.au>
Sent: Monday, 17 May 2021 4:44 AM
To: Shirley Luong
Subject: Re: Mamre Road upgrade stage 1 - Aboriginal Cultural Heritage Assessment Report - MHIC
Attachments: Mamre_Road_Upgrade_PACHCI_Stage_3_v0.6 LR.PDF

Hi Shirley
I have read the project information and draft CHAR for the above project, I agree with the recommendations made.
Kind regards
Jesse Johnson

From: Rodney Gunther <waawaar.awaa@gmail.com>
Sent: Tuesday, 18 May 2021 11:09 PM
To: Shirley Luong
Subject: Re: Mamre Road upgrade stage 1 - Aboriginal Cultural Heritage Assessment Report - WAAC
Attachments: Mamre Road upgrade stage 1 Aboriginal Cultural Heritage Assessment Report.docx

Hi Shirley,

Please find attached Waawaar Awaa Aboriginal Corporation response to the draft ACHAR.

regards

Rodney Gunther

From: [redacted]
Sent: Sunday, 9 May 2021 7:52 PM
To: Shirley Luong
Cc: Mamre_Road_S1
Subject: Re: Mamre Road upgrade stage 1 - Aboriginal Cultural Heritage Assessment Report - [redacted]

Hello Shirley
We agree with report.

Cheers
[redacted]

Appendix C AFG Minutes

Objective Ref A34958326

Transport for NSW

MINUTES

Mamre Road Upgrade Stage 1 - Aboriginal Focus Group Meeting

Date	6 November 2020		
Time	11:30pm to 12:20pm		
Venue	Microsoft Teams		
Chairperson	Shirley Luong		
Invitees	Shirley Luong	SL	TfNSW - A/Project Development Manager, Mamre Road
	Xi Lin	XL	TfNSW - Environment Officer
	Maliha Fairoze	MF	TfNSW - Project Development Officer
	Jo Damcevski	JD	TfNSW - Senior Aboriginal Engagement Specialist
	Tabatha Cann	TC	TfNSW - Aboriginal Cultural Heritage Officer
	Matthew Kelleher	MK	Kelleher Nightingale Consulting - Director / Archaeologist
Apologies:	Brendan Cameron	BC	TfNSW – Communication and Stakeholder Engagement Officer

		Responsible/ Due Date
1.	**Project Background, Scope and Objectives**	
1.1	**Background** Mamre Road Upgrade Stage 1 is between the M4 Motorway and Erskine Park Road and is about 3.8km in length. As Western Sydney develops there will be greater need for commercial and industrial vehicles to have better access to major motorways to and from the Aerotropolis and Western Sydney Employment Area. Mamre Road is an important transport corridor within this area to facilitate this access. In February 2019 the Premier announced funding to construction for a 3.8 km section of Mamre Road between the M4 Motorway and Erskine Park Road.	SL - Note
1.2	**Scope** This project includes the upgrade of a two lane undivided road to a four lane divided road with a wide central median which will include provision for an	SL - Note

MINUTES – Mamre Road Upgrade Stage 1 - Aboriginal Focus Group Meeting Held on 6/11/20

Objective Ref A34958326

		Responsible/ Due Date
	additional two lanes in the future. The project also includes construction of new signalised intersections at Luddenham Road and Solander Drive, upgrading the existing signalised intersections at Erskine Park Road and Banks Drive and changes to access at Mandalong Close and McIntyre Avenue to left in and left out only.	
1.3	**Objectives** This upgrade is aiming to achieve the following objectives: • Improve road safety in line with the NSW Road Safety Strategy 2012-2021 Safe System Directions and Safer Roads Key Focus; • Improve movement between M4 Motorway and Erskine Park Road for general traffic, freight and bus services operating along the corridor serving adjacent catchments; • Improve quality of service, sustainability & liveability by providing facilities for walking & cycling and future public transport needs; • Support economic growth and productivity by providing road capacity for projected freight and general traffic volumes; • Provide a safe and efficient environment for all road users (during construction, operation, and maintenance); • Improve travel times; and • Improve urban design and visual aspects.	SL - Note
2.	**Aboriginal Heritage Assessment and Assessment Methodology**	
2.1	The Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) was completed for both stages (stages 1 and 2) of Mamre Road Upgrade (between the M4 Motorway to Kerrs Road). The REF will be undertaken for Mamre Road upgrade stage 1. The South Creek primary study area wraps around the corridor. There is evidence of artefacts in this corridor and Mamre House is a structure with a lot of Aboriginal heritage. Looking at the geology, there are alluvial formations near South Creek to the west of Mamre Road.	MK - Note
2.2	Two surveys (in 2017 and 2020) have been completed along the Mamre Road corridor. AFT 1: connected to M4. Portion of this AFT will be impacted. Artefacts has been found here. Historic property Mamre house: this is listed for Aboriginal value. Wider study area has impact on heritage listing. PAD1/2: Same formation as you go towards south of the road. No artefact were identified with pad 1 or 2. But there is high probability. AFT2: Surface visibility artefacts have come out. AFT 3: Closest to South Creek. More artefacts were found on the bank. High energy from creek will cause damage but low will not impact.	MK - Note

MINUTES – Mamre Road Upgrade Stage 1 - Aboriginal Focus Group Meeting Held on 6/11/20

Objective Ref A34958326

		Responsible/ Due Date
	PAD3: Undamaged drainage channel; feeds into south creek. Minor terrace. Low lying deposit. Artefacts were found on the other side of the road. MWP-AD5/ MWP-AD6/ MWP-IF1: multiple listings on each polygon. Known archaeological objects are in these sections. Extent and intactness is unknown. Some materials were identified but not a significant amount Luddenham Road tree is also of great significance.	
2.3	Comments on the methodology will close on 19 November 2020. The test excavation program is planned to commence the week of 23 November. The scope will be finalised in the next few weeks. Sharing cultural value regarding Mamre House will be welcome.	MK - Note
3.	**Questions and Answers**	
3.1	**Site officer application form** Information will be provided following the meeting to registered Aboriginal parties. This form will need to be sent back to TfNSW within two weeks. Timeframes have been specified under item 2.3.	SL - Note
3.2	**Interpretations** It is still too early for interpretations. This will be determined after the draft report has been completed and shared with the stakeholders. Any cultural information is welcome from the participants. MK can assist with archaeology. How and what the interpretation would look like will depend on the information and what comes out of the design. Email JD [Post meeting note: emails to be provided to Lee Davison (Lee.Davison@transport.nsw.gov.au)] with any suggestions.	MK - Note
	Meeting closed 12:20pm.	

MINUTES – Mamre Road Upgrade Stage 1 - Aboriginal Focus Group Meeting Held on 6/11/20

Mamre Road Upgrade Stage 1

Aboriginal Focus Group Meeting
6 November 2020

1

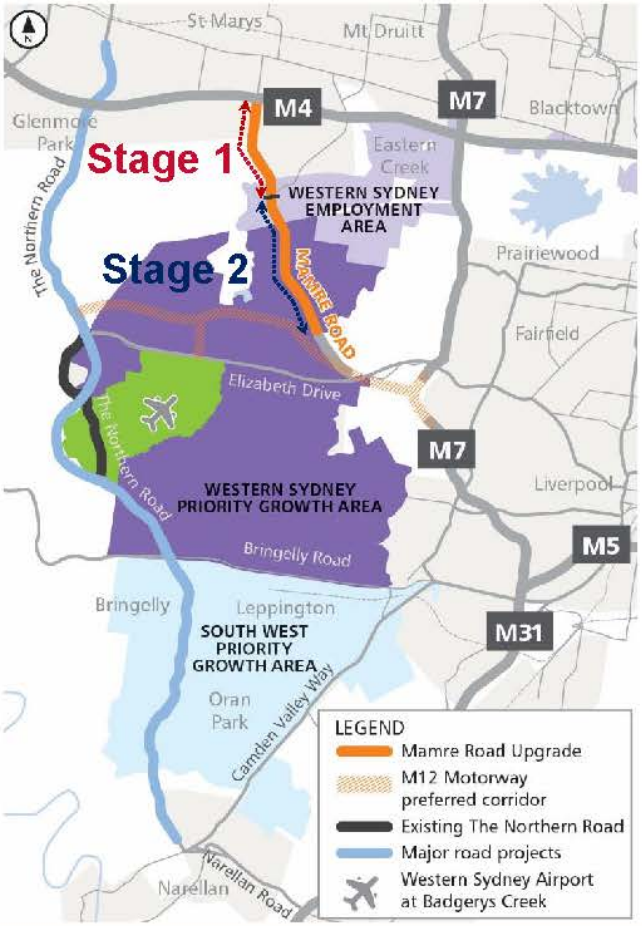
Acknowledgement to Country

Introduction

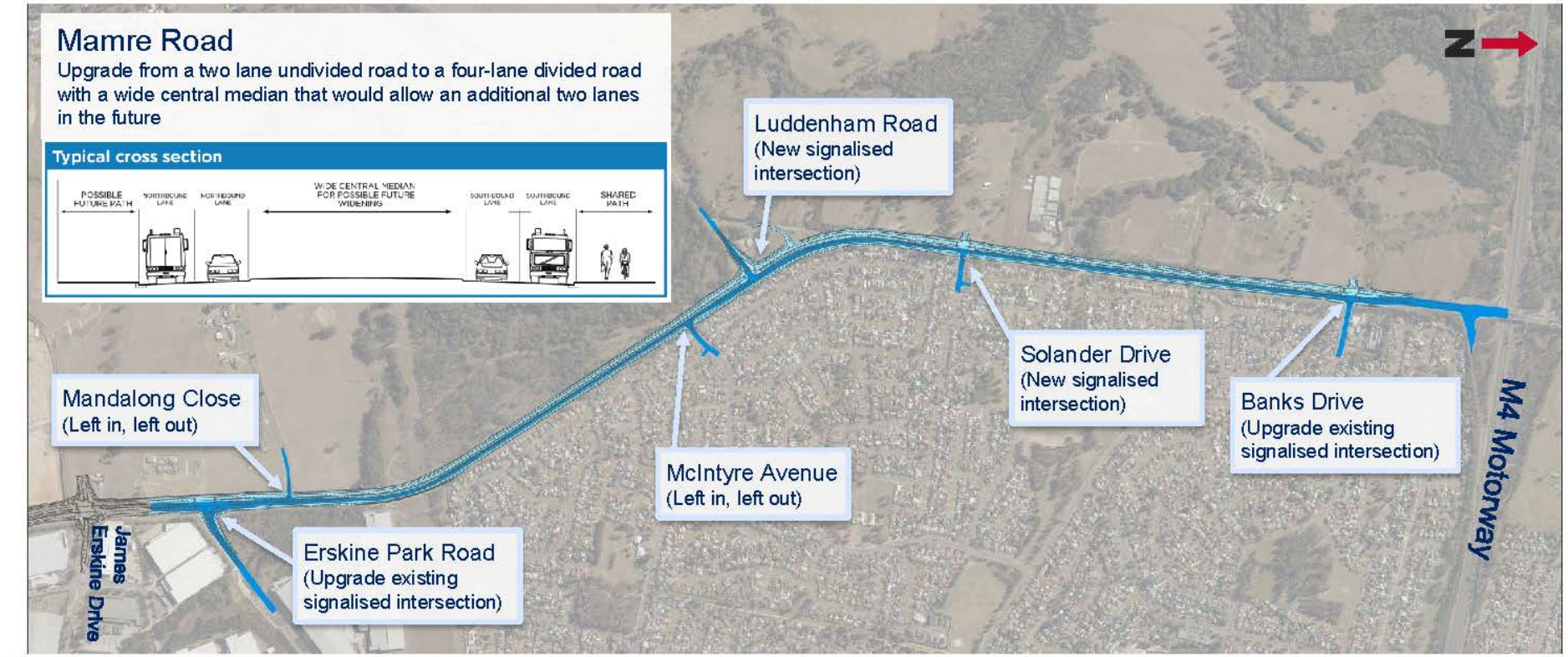
- Matthew Kelleher – Director / Archaeologist, Kelleher Nightingale Consulting Pty Ltd
- Jo Damcevski – Senior Aboriginal Engagement Specialist, TfNSW
- Shirley Luong – A/Project Development Manager, TfNSW
- Maliha Fairoze – Project Development Officer, TfNSW
- Brendan Cameron – Communications and Stakeholder Engagement Officer, TfNSW
- Xi Lin – Environment Officer, TfNSW

Project Background

- Western Sydney Employment Area
  - Generally zoned as industrial
  - Mamre Road precinct
- Western Sydney Aerotropolis (previously known as Western Sydney Priority Growth Area)
  - Identified as flexible employment (future industrial, commercial and other employment-related developments)
- As Western Sydney develops there will be greater need for commercial and industrial vehicles to have better access to major motorways to and from the Aerotropolis and Western Sydney Employment Area. Mamre Road is an important transport corridor within this area to facilitate this access.
- In February 2019 the Premier announced funding to construction for a 3.8 km section of Mamre Road between the M4 Motorway and Erskine Park Road.



Project Scope



Project Objectives

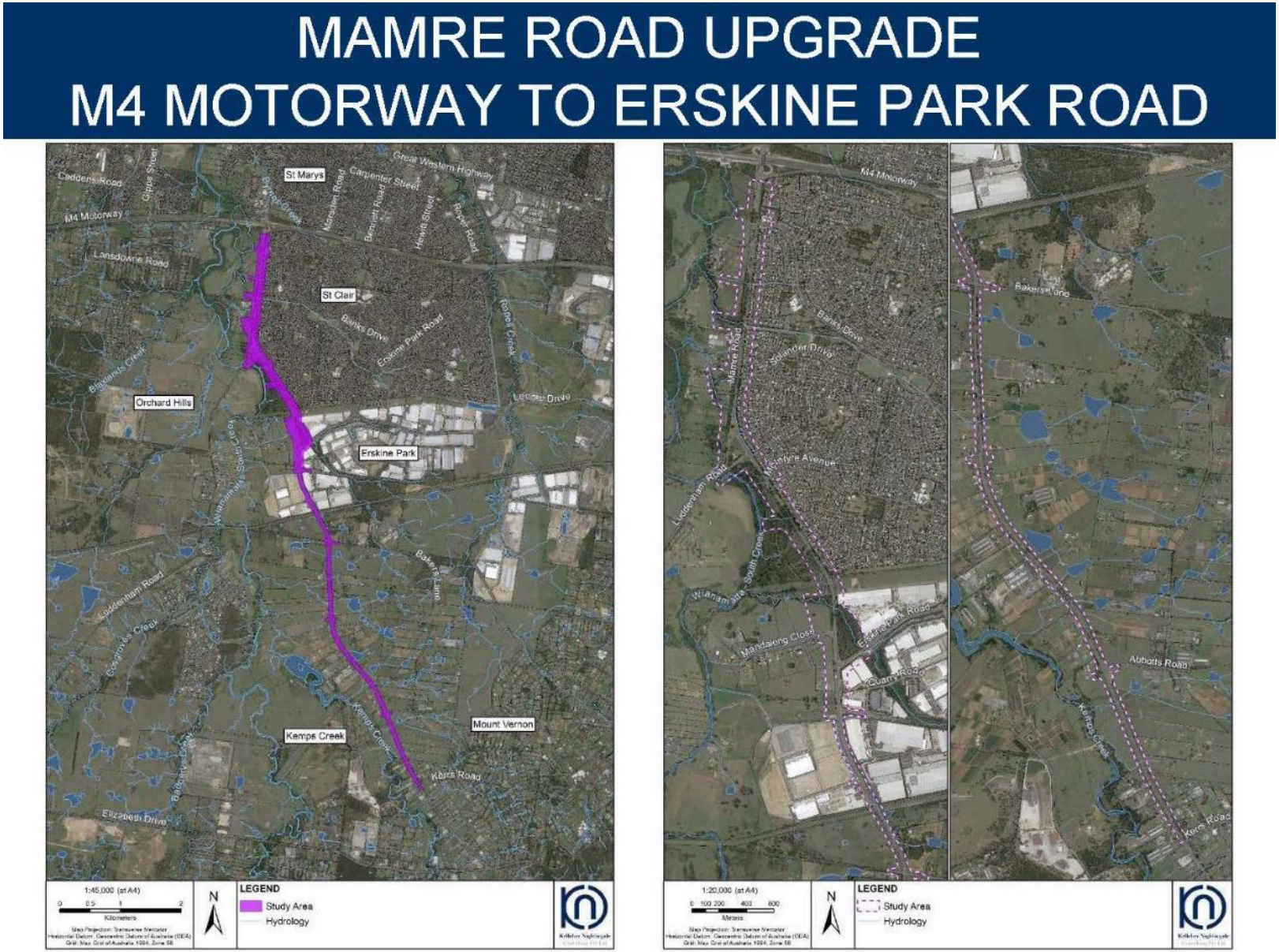
- Improve road safety in line with the NSW Road Safety Strategy 2012-2021 Safe System Directions and Safer Roads Key Focus;
- Improve movement between M4 Motorway and Erskine Park Road for general traffic, freight and bus services operating along the corridor serving adjacent catchments;
- Improve quality of service, sustainability & liveability by providing facilities for walking & cycling and future public transport needs;
- Support economic growth and productivity by providing road capacity for projected freight and general traffic volumes;
- Provide a safe and efficient environment for all road users (during construction, operation, and maintenance);
- Improve travel times; and
- Improve urban design and visual aspects.

MAMRE ROAD UPGRADE
M4 MOTORWAY TO ERSKINE PARK ROAD

Aboriginal Heritage Assessment and Assessment Methodology

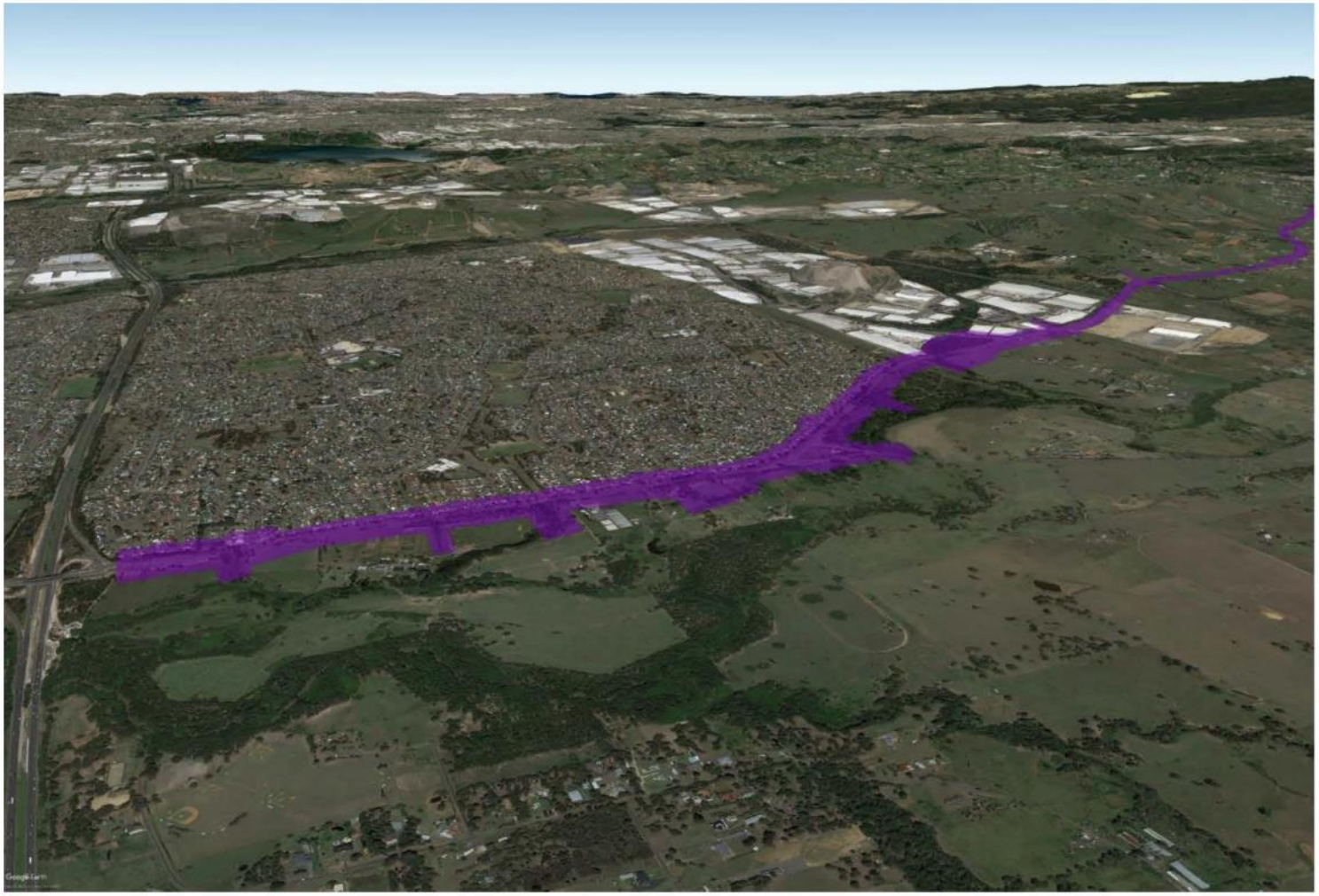


Kelleher Nightingale Consulting Pty Ltd

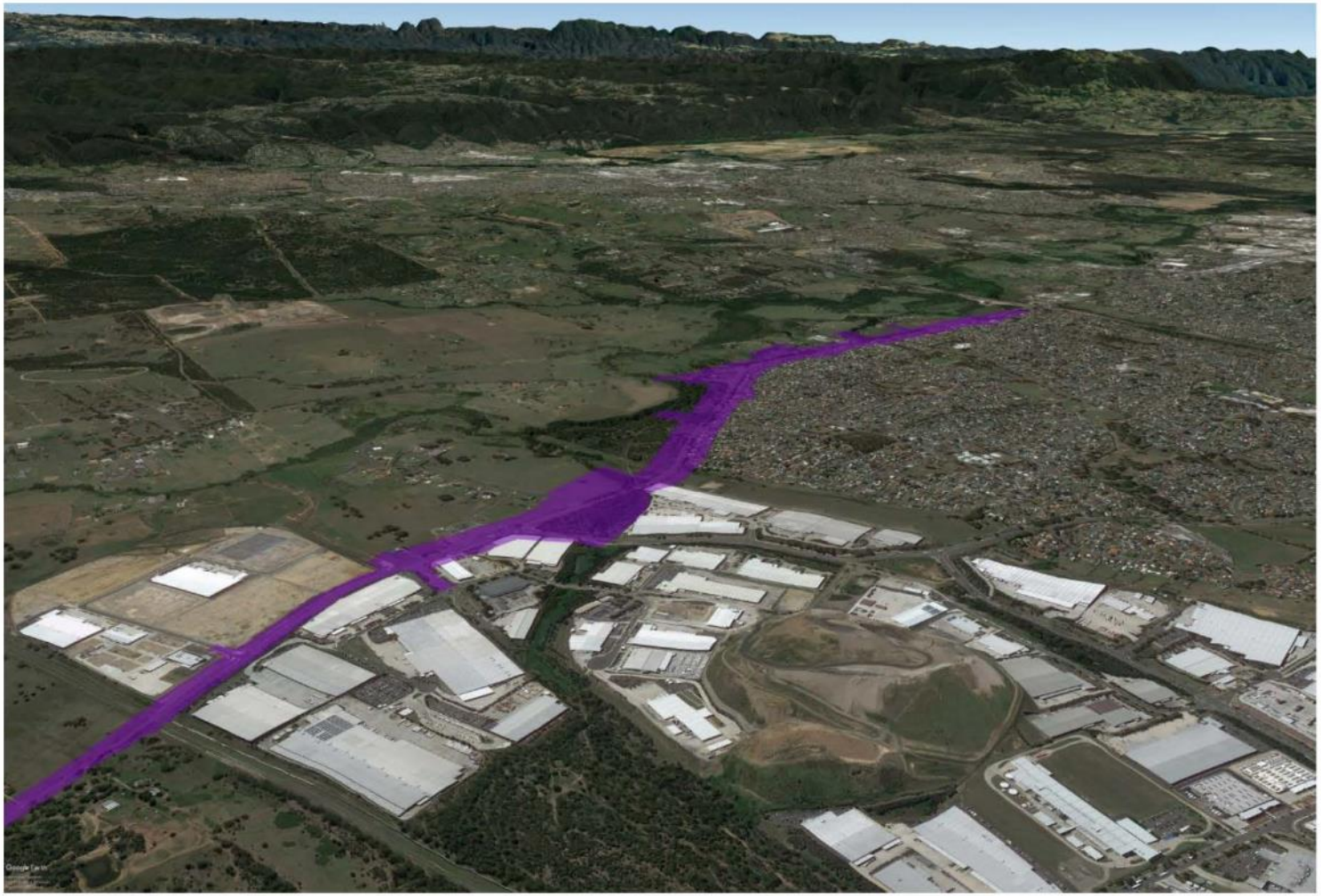

MAMRE ROAD UPGRADE
M4 MOTORWAY TO ERSKINE PARK ROAD
Caddens Road
Great Western Highway
St Marys
Carpenter Street
Bennett Road
Hawle Street
Robert Road
M4 Motorway
Lansdowne Road
St Clair
Banks Drive
Erskine Park Road
Robin Creek
Orchard Hills
Erskine Park
Luddenham Road
Bakers Lane
Kemps Creek
Mount Vernon
Kerrs Road
Elizabeth Drive
1:45,000 (at A4)
LEGEND
Study Area
Hydrology
Mamre Road
Splendor Drive
Mighty'e Avenue
Wianamatta South Creek
Mandaleng Close
Abbotts Road
1:20,000 (at A4)
LEGEND
Study Area
Hydrology

MAMRE ROAD UPGRADE
M4 MOTORWAY TO ERSKINE PARK ROAD

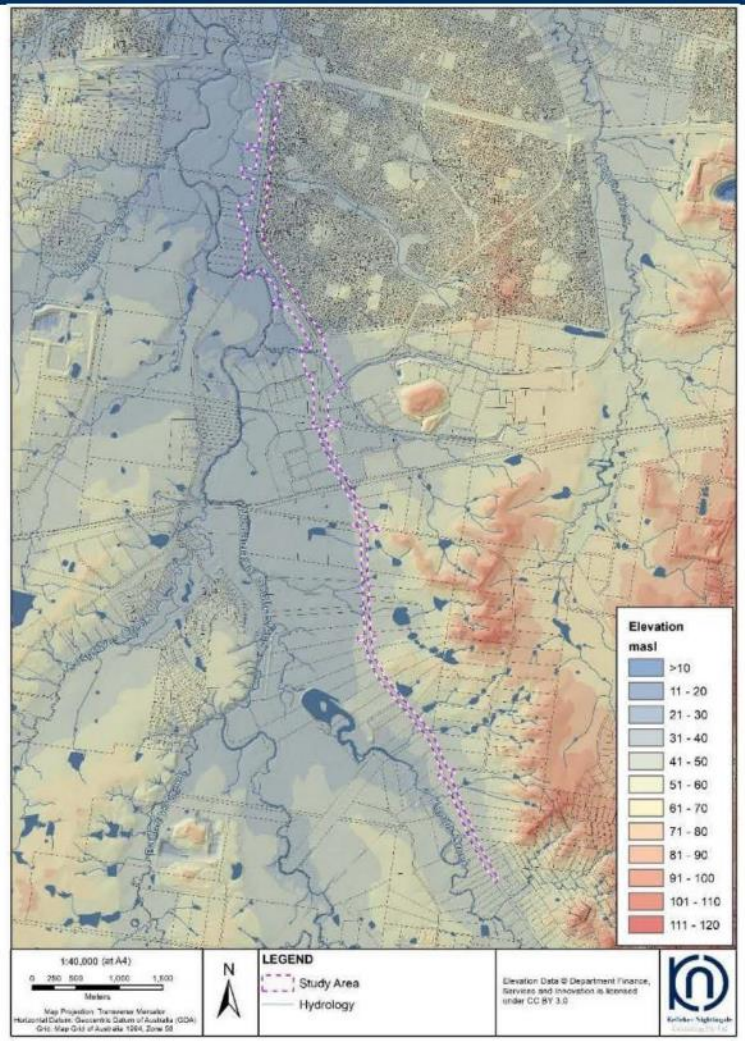
MAMRE ROAD UPGRADE
M4 MOTORWAY TO ERSKINE PARK ROAD

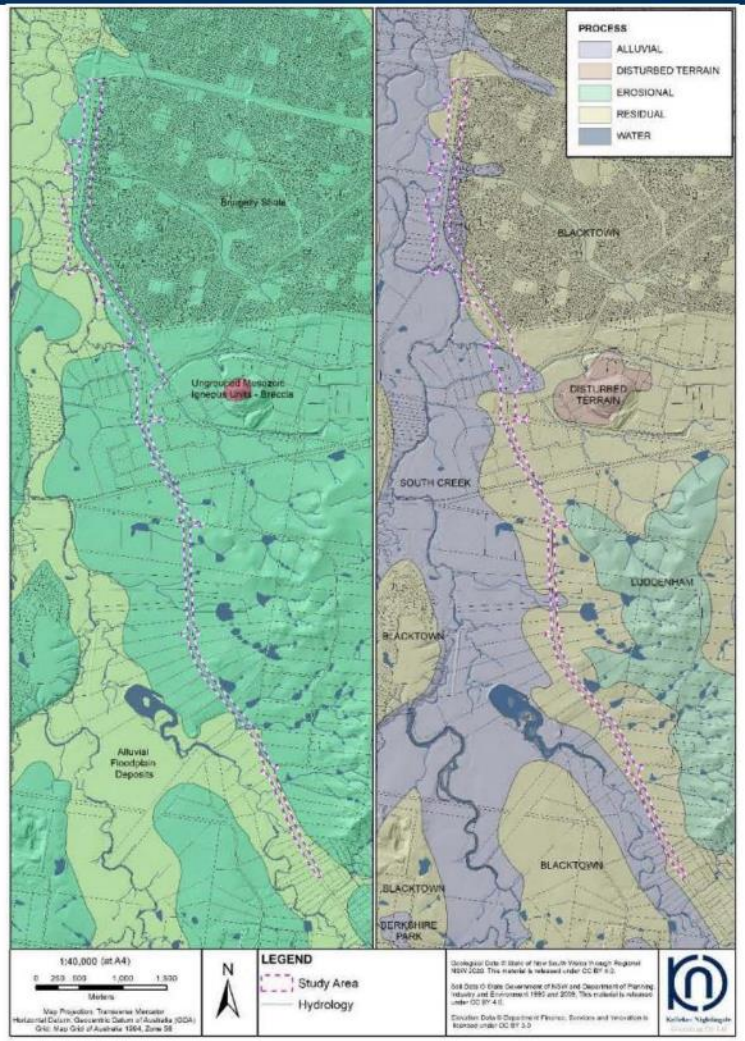


MAMRE ROAD UPGRADE
M4 MOTORWAY TO ERSKINE PARK ROAD

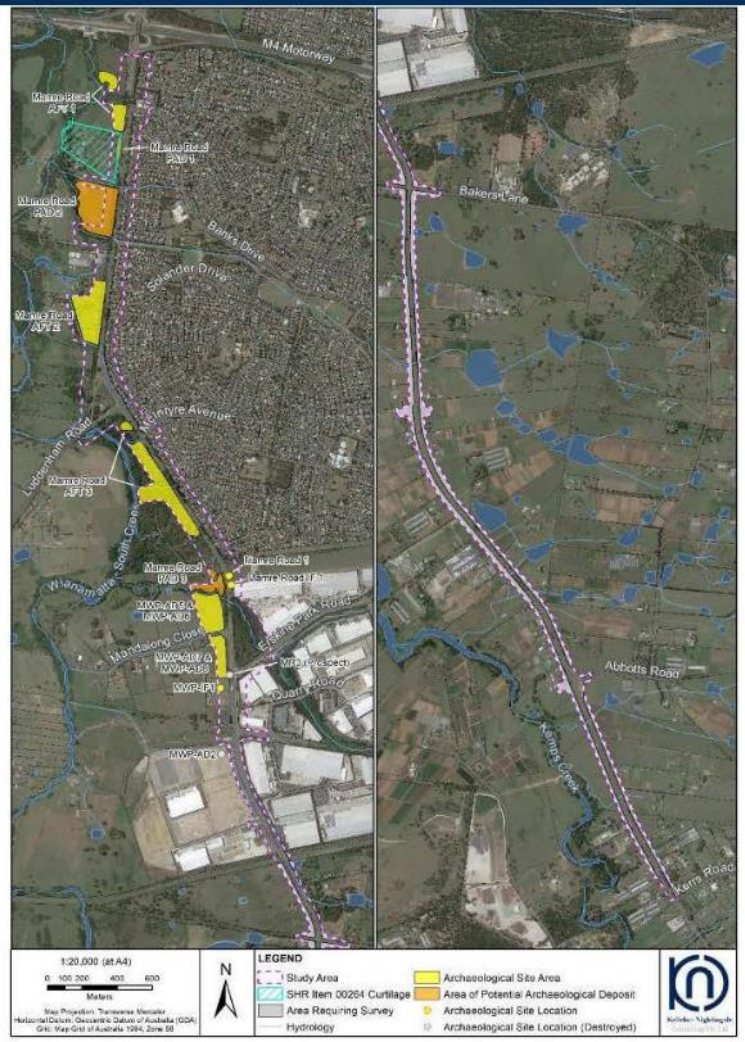


MAMRE ROAD UPGRADE
M4 MOTORWAY TO ERSKINE PARK ROAD



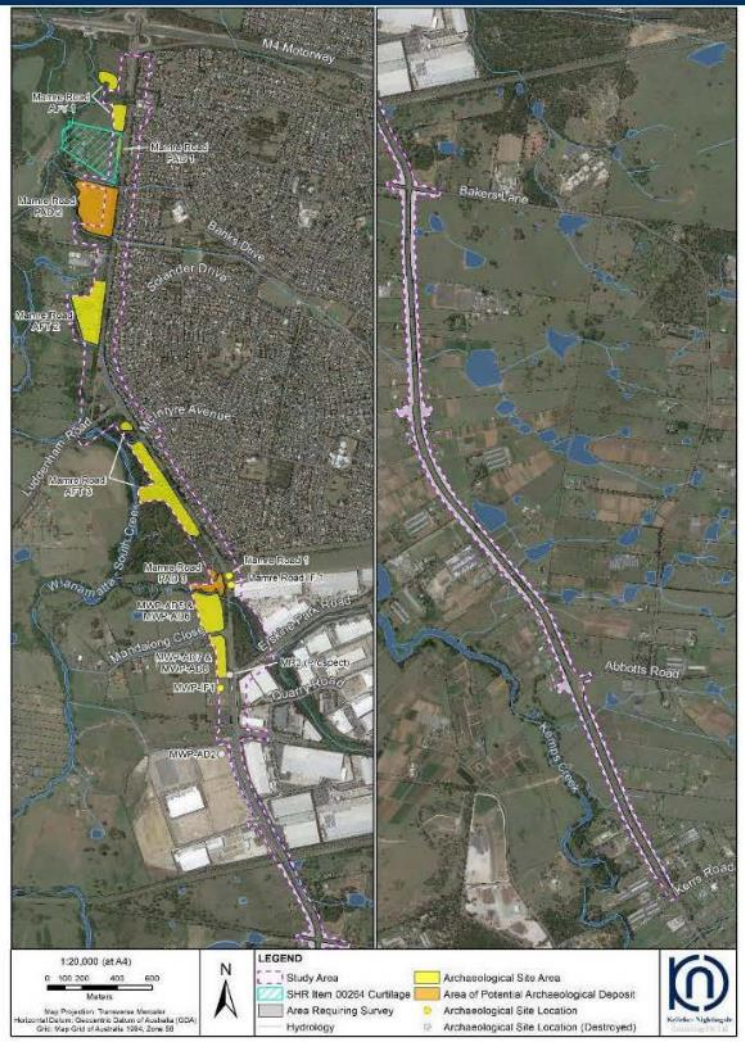


MAMRE ROAD UPGRADE
MAMRE ROAD AFT 1

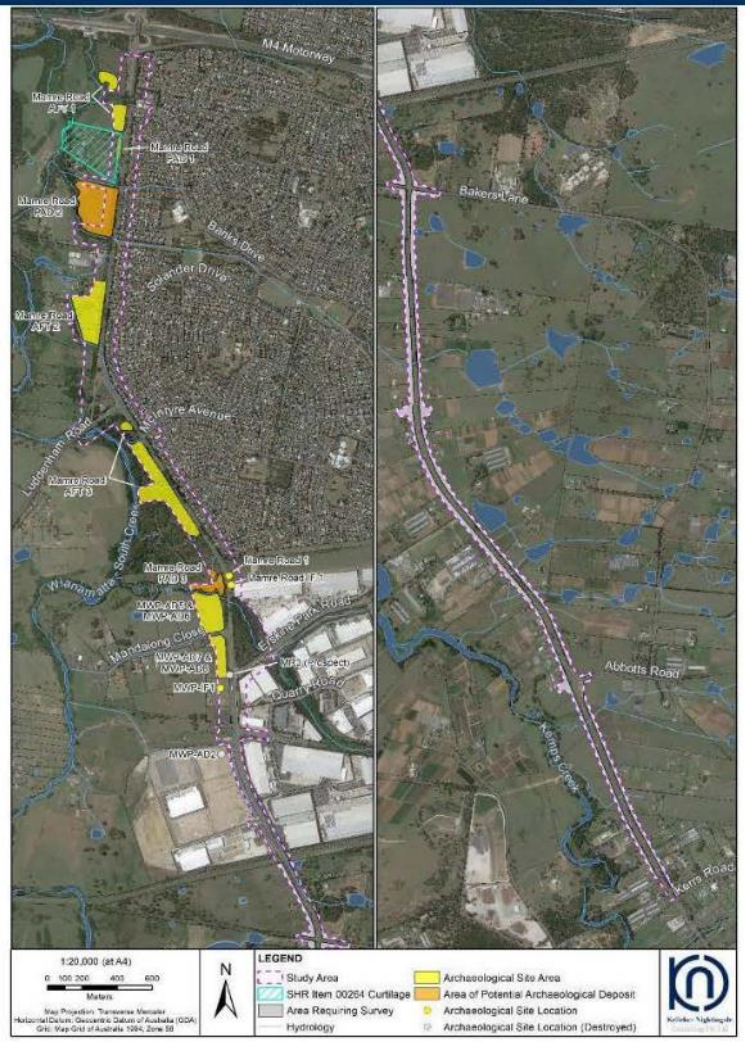


MAMRE ROAD UPGRADE
MAMRE ROAD AFT 1

MAMRE ROAD UPGRADE
MAMRE ROAD PAD 1

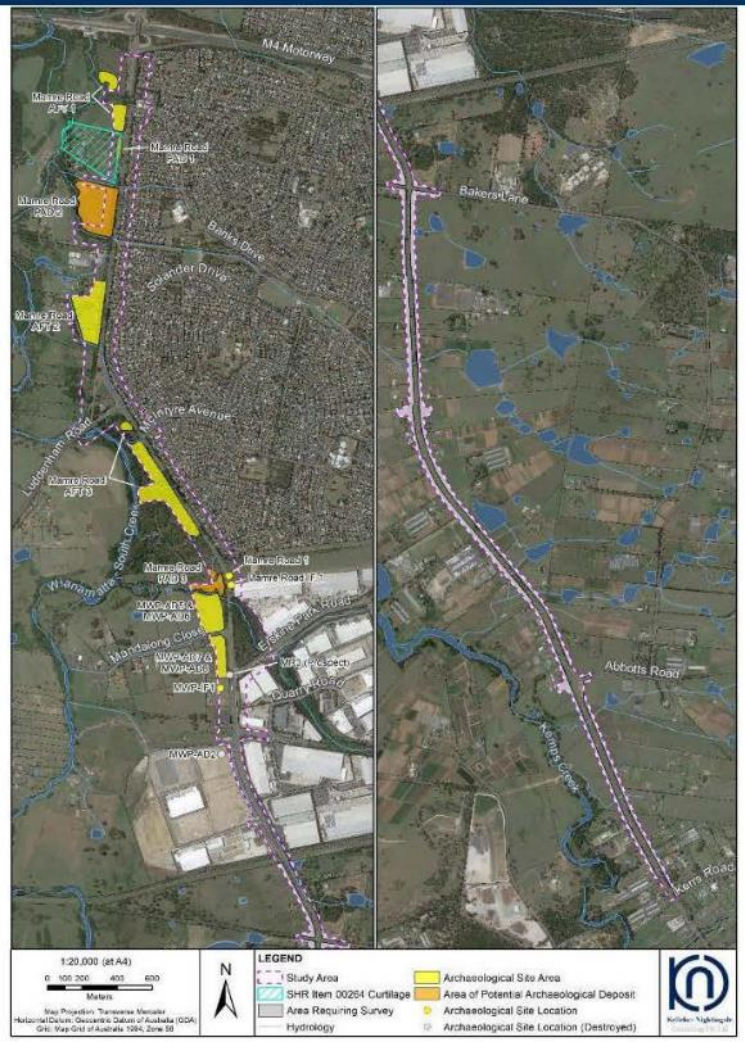


MAMRE ROAD UPGRADE
MAMRE ROAD PAD 2



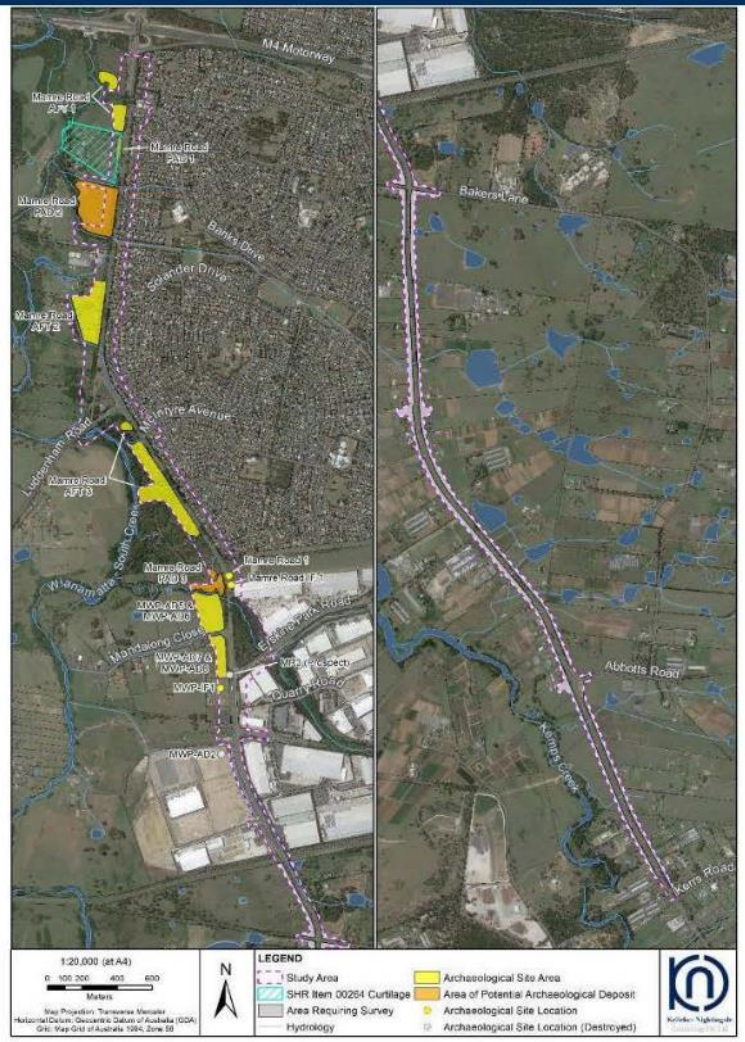
MAMRE ROAD UPGRADE
MAMRE ROAD AFT 2

MAMRE ROAD UPGRADE
MAMRE ROAD AFT 3

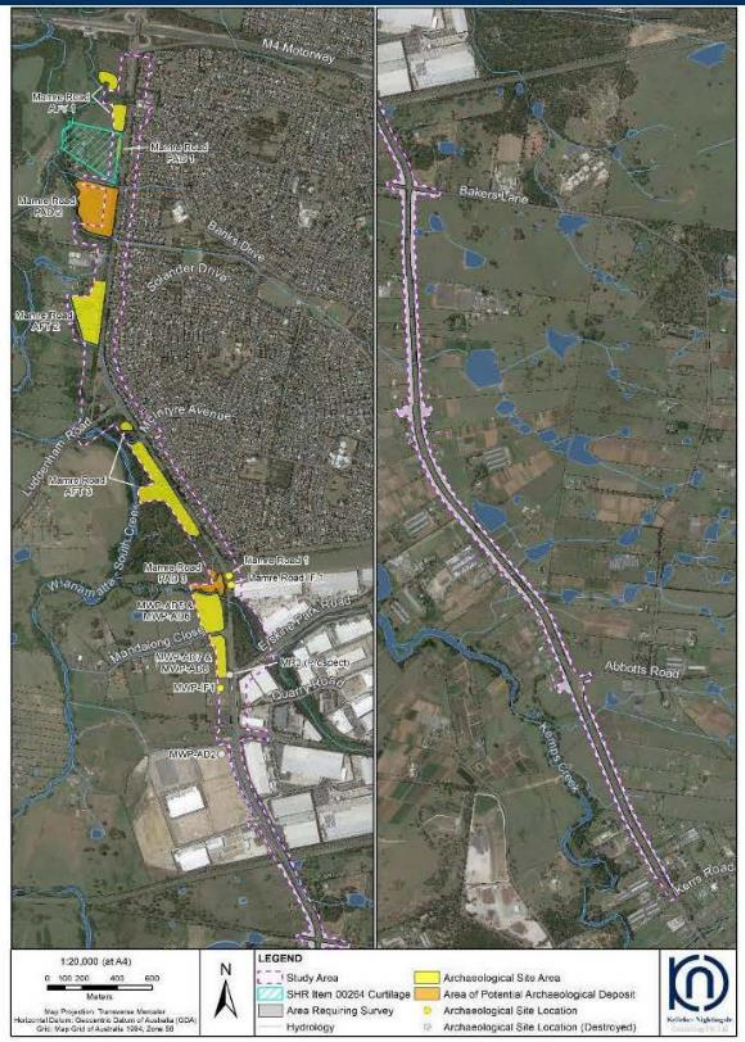


MAMRE ROAD UPGRADE
MAMRE ROAD PAD 3
MAMRE ROAD 1 AND MAMRE ROAD IF 1

MAMRE ROAD UPGRADE
MWP-AD5 & MWP-AD6



MAMRE ROAD UPGRADE
MWP-AD7, MWP-AD8 and MWP-IF1



MAMRE ROAD UPGRADE
M4 MOTORWAY TO ERSKINE PARK ROAD

Objective Ref A37795128

Transport for NSW

MINUTES

Mamre Road Upgrade Stage 1 - Aboriginal Focus Group Meeting 2

Date	24 May 2021		
Time	11:00 am to 12:00pm		
Venue	Microsoft Teams		
Chairperson	Shirley Luong		
Invitees	Shirley Luong	SL	TfNSW - A/Project Development Manager, Mamre Road
	Xi Lin	XL	TfNSW - Environment Officer
	Maliha Fairoze	MF	TfNSW - Project Development Officer
	Brendan Cameron	BC	TfNSW – Communication and Stakeholder Engagement Officer
	Lee Davison	LD	TfNSW - Aboriginal Community & Heritage Partner
	Matthew Kelleher	MK	Kelleher Nightingale Consulting - Director / Archaeologist
Apologies:			

		Responsible/ Due Date
1.	**Project Background, Scope and Objectives**	
1.1	**Background** Mamre Road Upgrade Stage 1 is between the M4 Motorway and Erskine Park Road and is about 3.8km in length. As Western Sydney develops there will be greater need for commercial and industrial vehicles to have better access to major motorways to and from the Aerotropolis and Western Sydney Employment Area. Mamre Road is an important transport corridor within this area to facilitate this access. In February 2019 the Premier announced funding to construction for a 3.8 km section of Mamre Road between the M4 Motorway and Erskine Park Road.	SL - Note
1.2	**Scope** This project includes the upgrade of a two lane undivided road to a four lane divided road with a wide central median which will include provision for an	SL - Note

MINUTES – Mamre Road Upgrade Stage 1 - Aboriginal Focus Group Meeting 2 Held on 24/05/21

Objective Ref A37795128

		Responsible/ Due Date
	additional two lanes in the future. The project also includes construction of new signalised intersections at Luddenham Road and Solander Drive, upgrading the existing signalised intersections at Erskine Park Road and Banks Drive and changes to access at Mandalong Close and McIntyre Avenue to left in and left out only. There will also be 2 major culverts as part of this project.	
1.3	**Timeframe** • REF display in August 2021 (subject to approvals) • Determination in November / December 2021 which is when the CHAR will be finalised and the project will apply for an AHIP • Commencing early works construction mid-2022 and main construction works late 2022	SL - Note
2.	**Aboriginal Heritage Assessment and Assessment Methodology**	
2.1	As part of the test program, seven locations were investigated with six positive results. Overall there are eight sites that are impacted by the project. Six are of moderate size and two quite small with mostly partial impact.	MK - Note
2.2	Archaeology details shared: • **AFT1** ○ 19 test squares - got 70 artefacts ○ 2 different types of dirt in this area; dark layer (contemporary (last 50 -100 years). Blacktown soils (mixture of Blacktown and alluvium) interface here and lower levels are where artefacts are likely to be found. Missing lighter section would mean missing archaeology • **PAD2 -** Mamre house - listed for aboriginal heritage values as well but relates to more of the western side. Very little to the east and nothing on the outskirts. Whole eastern section is quite disturbed from utilities and road construction. All soils are contemporary dark unit. Unless it's close to Mamre House it's missing archaeology. • **PAD2 (AFT4)** - Disturbed layer - nothing but in combination of 2 - humic and lighter and interface and lower is where you get archaeology (full flakes) good quality material. Close to creek, have some channels at creek. Not true primary production but secondary. • **PAD3** – large box culvert is located at this area ○ Getting general disturbance to north - drainage line - more intact. More disturbance rather than less ○ All around drainage lines - ephemeral creeks getting decent results were not disturbed from previous roadworks ○ Where getting more disturbance ○ Black dots are manganese - smaller but results of longer in-situ process. Ground is more stable and more flood effected location • **AFT3** ○ Some areas of higher ground (red) but mostly is old	MK - Note

MINUTES – Mamre Road Upgrade Stage 1 - Aboriginal Focus Group Meeting 2 Held on 24/05/21

Objective Ref A37795128

		Responsible/ Due Date
	○ Some decent results due to stable location ○ Get some anomalies to north related to channel that comes in ○ Most ground is low lying and swampy ○ Northern section is closets you can get ○ Further away but higher ground ○ Different activities at AFT3 based on proximity and elevation ○ TS 7 - disturbed layer with clays mixed ○ TS15 alluvia deposits underneath ○ TS2 contemporary upper unit, strange interface (possibly ploughed or impacted in the past) ○ Range of artefacts that have come out ○ A lot of interest but a lot of disturbance • **PAD3 - MWP - 5 and 6** ○ North side (AFT5) • More disturbance around drainage line • Patchy but decent results • Getting more primary activity rather than domestic activity • Little disturbance in some areas • Greater level of disturbance shown in TS12 • Good quality and primary material ○ Southern side (MWP 5 and 6) • Water at most times if not at all times • Paddock doesn't exhibit same disturbance as road corridor • More intact • Getting upper unit (aerated pastoral property soil) still has artefact but has been tilled • Tilled, added material, increased volume, made looser, artefacts moved up, more intact as horizon • TS13 got upper agriculture unit but stable subsurface you get artefacts that will drop into clay. They interface then cycle down in dryer conditions • Getting some of the better artefacts - a range of things • Better portions of archaeology along road	
2.3	We are on the edges of where deposits are usually located, most are further to the west on the other side of South Creek. For this project we touch on large archaeological deposits but don't intersect them. For this project we collect from lower density then salve 6 large ones Cultural values are historically documented (recorded trees and multiple events recorded) which are not impact by this program. South creek catchment is important location but it is not being directly impact by road works, only impacted on the edges	MK - Note

MINUTES – Mamre Road Upgrade Stage 1 - Aboriginal Focus Group Meeting 2 Held on 24/05/21

Objective Ref A37795128

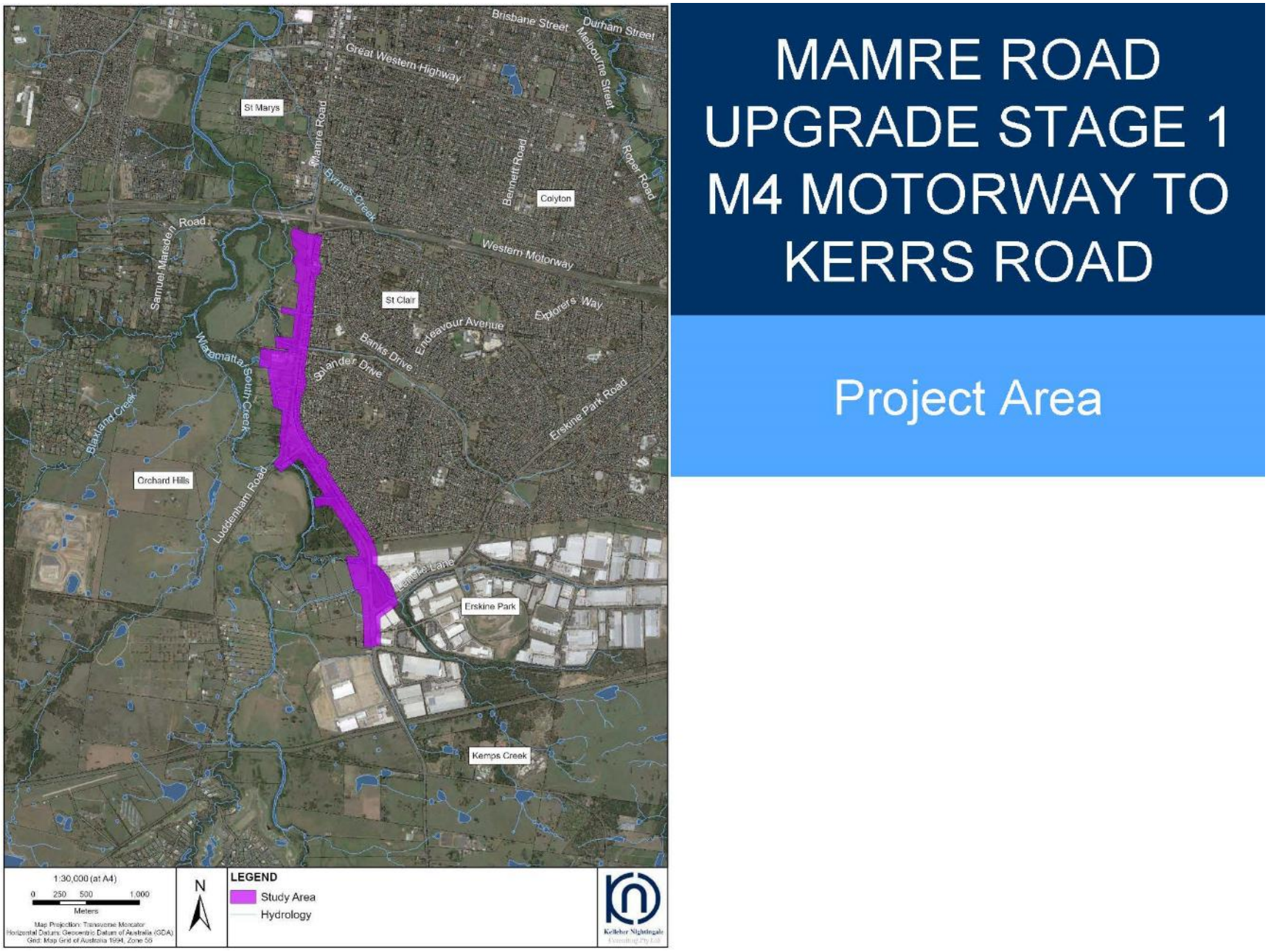
		Responsible/ Due Date
2.4	CHAR comment close in two weeks on 4 June. Please send comments via email. Lee Davison and Shirley Luong can also be contacted regarding any comments. Map, photos/ images included in the CHAR and presentation will be distributed to the attendees. AHIPS and salvage work is planned to occur in 2022 Q1, attendees will be kept updated on the progress.	MK - Note
	Meeting closed 11:45pm.	

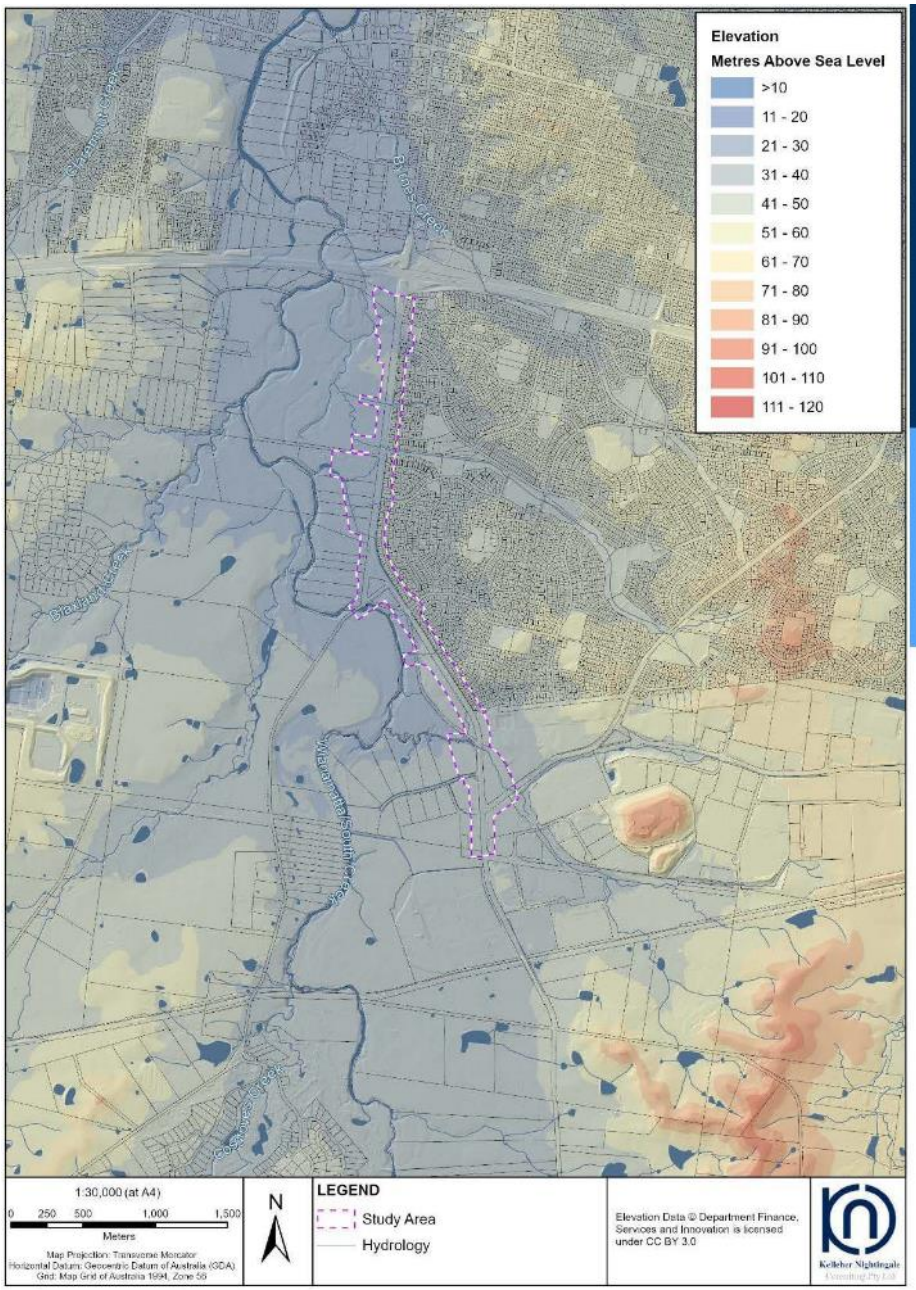
MINUTES – Mamre Road Upgrade Stage 1 - Aboriginal Focus Group Meeting 2 Held on 24/05/21

MAMRE ROAD UPGRADE STAGE 1
M4 MOTORWAY TO KERRS ROAD

Aboriginal Heritage Assessment

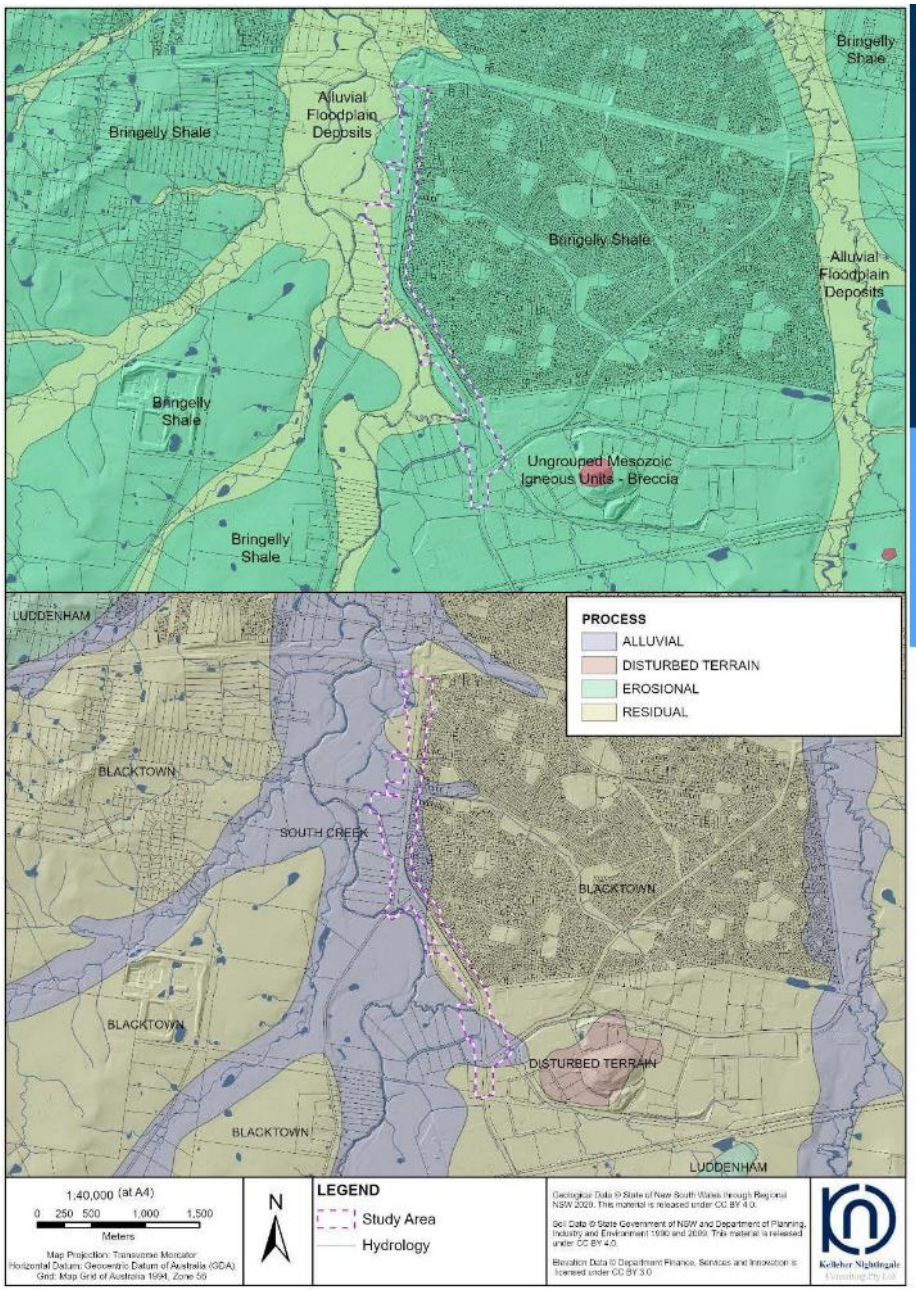
Kelleher Nightingale Consulting Pty Ltd


MAMRE ROAD
UPGRADE STAGE 1
M4 MOTORWAY TO
KERRS ROAD
Project Area
Brisbane Street
Durham Street
Great Western Highway
Melbourne Street
St Marys
Mamre Road
Roper Road
Bennett Road
Byrnes Creek
Colyton
Samuel Marsden Road
Western Motorway
St Clair
Explorers Way
Endeavour Avenue
Banks Drive
Solander Drive
Erskine Park Road
Blaxland Creek
Orchard Hills
Luddenham Road
Lenore Lane
Erskine Park
Kemps Creek
1:30,000 (at A4)
0 250 500 1,000
Meters
Map Projection: Transverse Mercator
Horizontal Datum: Geocentric Datum of Australia (GDA)
Grid: Map Grid of Australia 1994, Zone 56
N
LEGEND
Study Area
Hydrology
Kelleher Nightingale



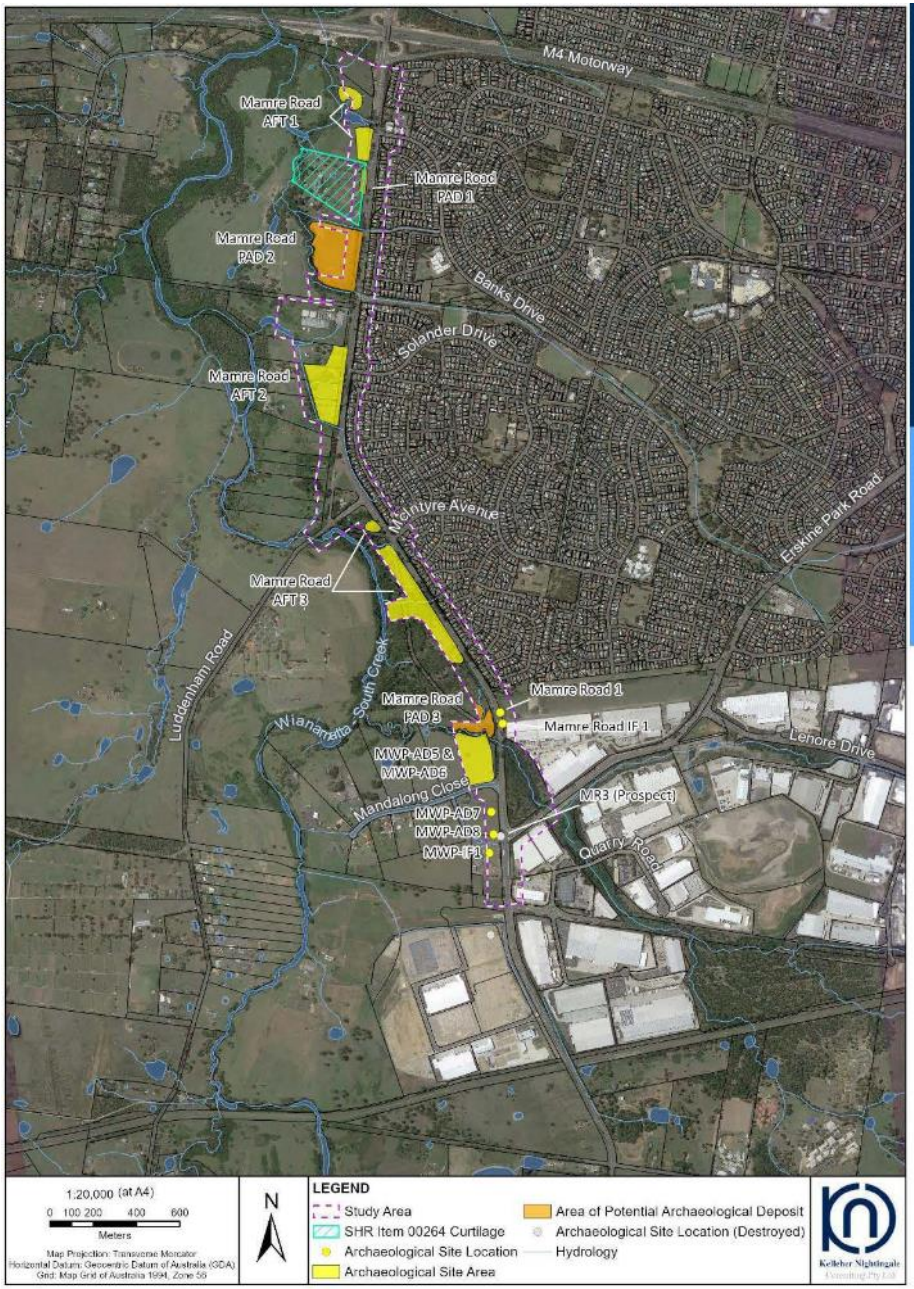
MAMRE ROAD UPGRADE STAGE 1 M4 MOTORWAY TO KERRS ROAD

Topography



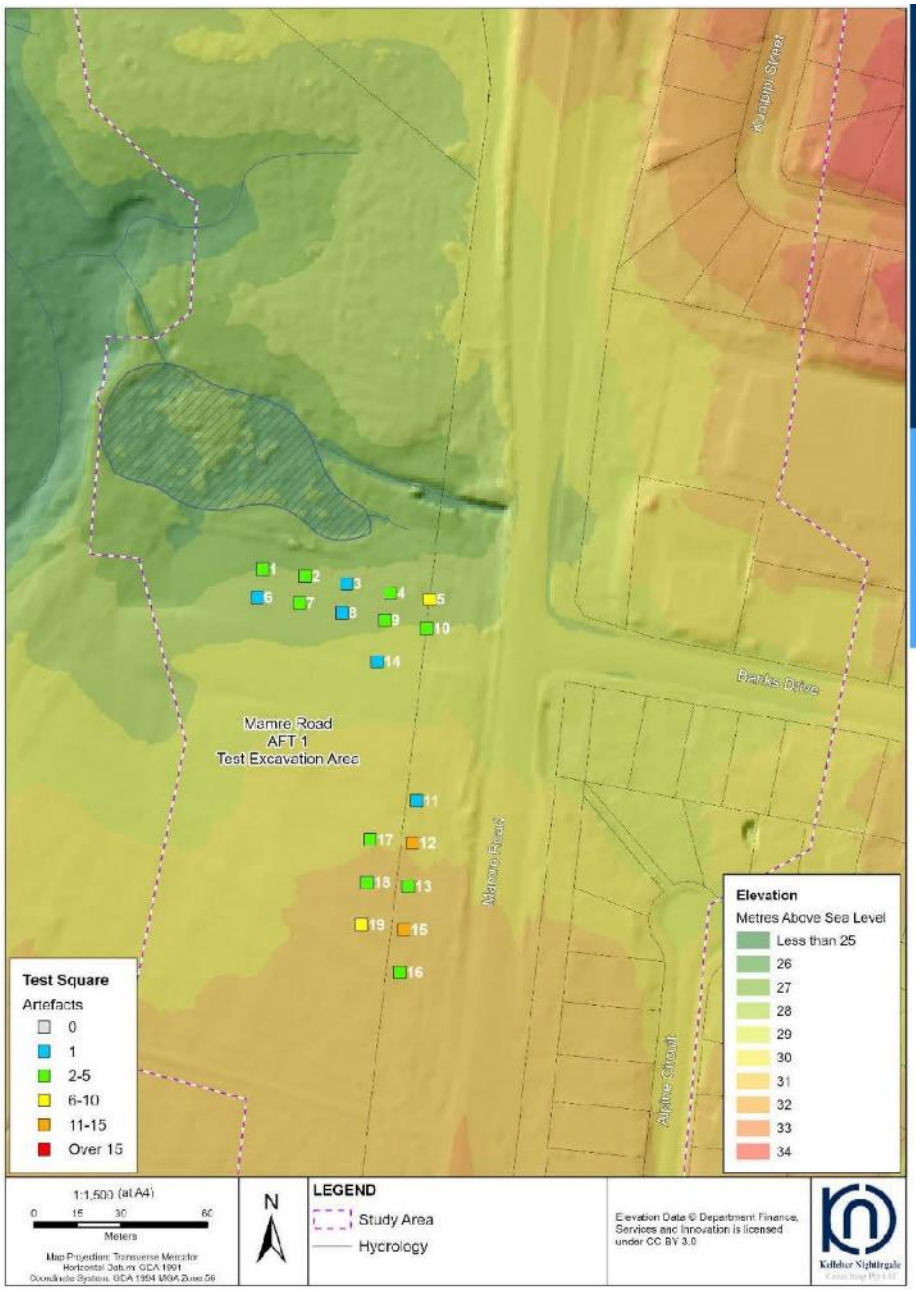
MAMRE ROAD UPGRADE STAGE 1 M4 MOTORWAY TO KERRS ROAD

Geology and Soil Landscapes



MAMRE ROAD UPGRADE STAGE 1 M4 MOTORWAY TO KERRS ROAD

PACHCI Stage 2 Results



MAMRE ROAD UPGRADE STAGE 1 M4 MOTORWAY TO KERRS ROAD

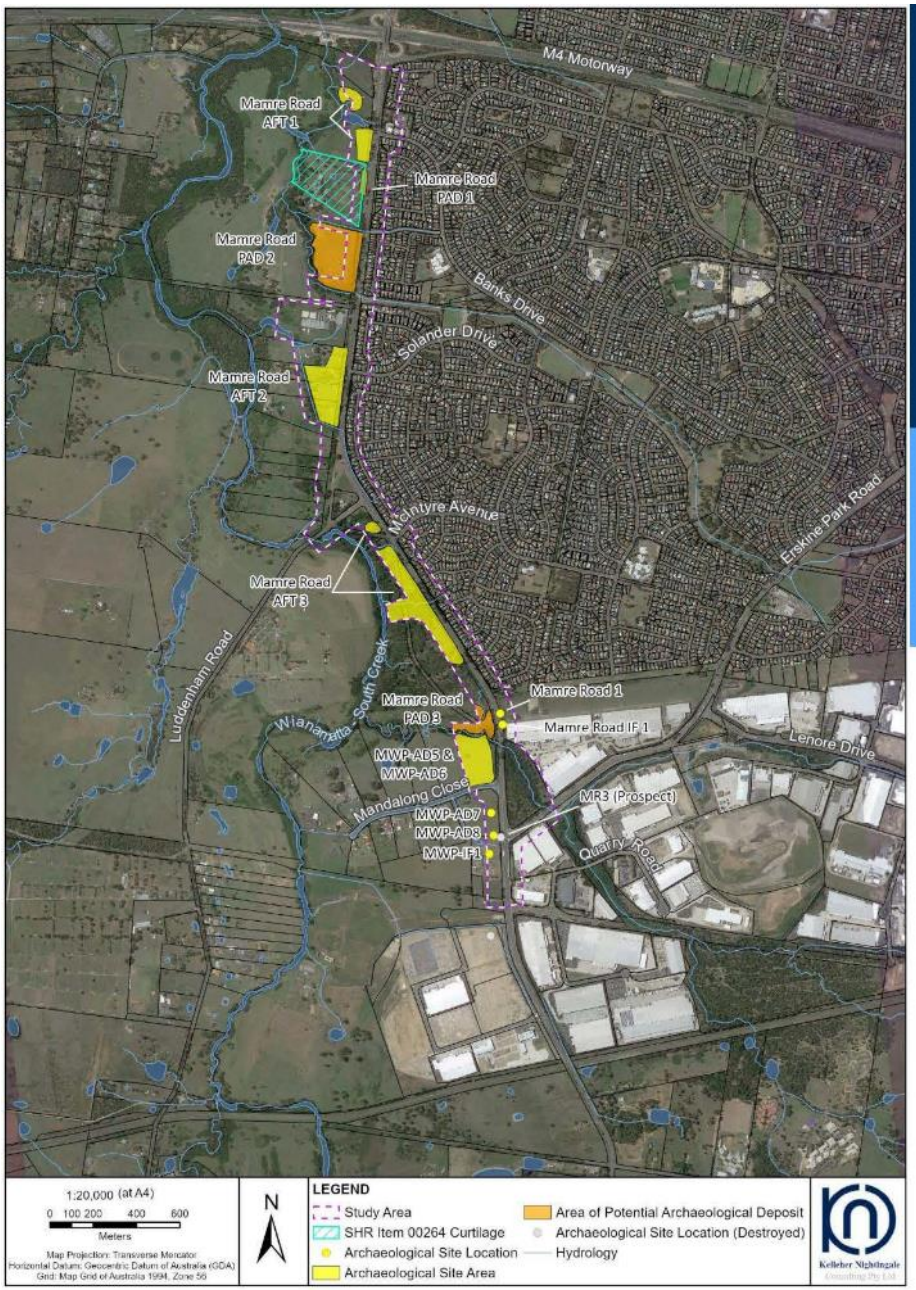
Mamre Road AFT 1

MAMRE ROAD UPGRADE STAGE 1

Mamre Road AFT 1

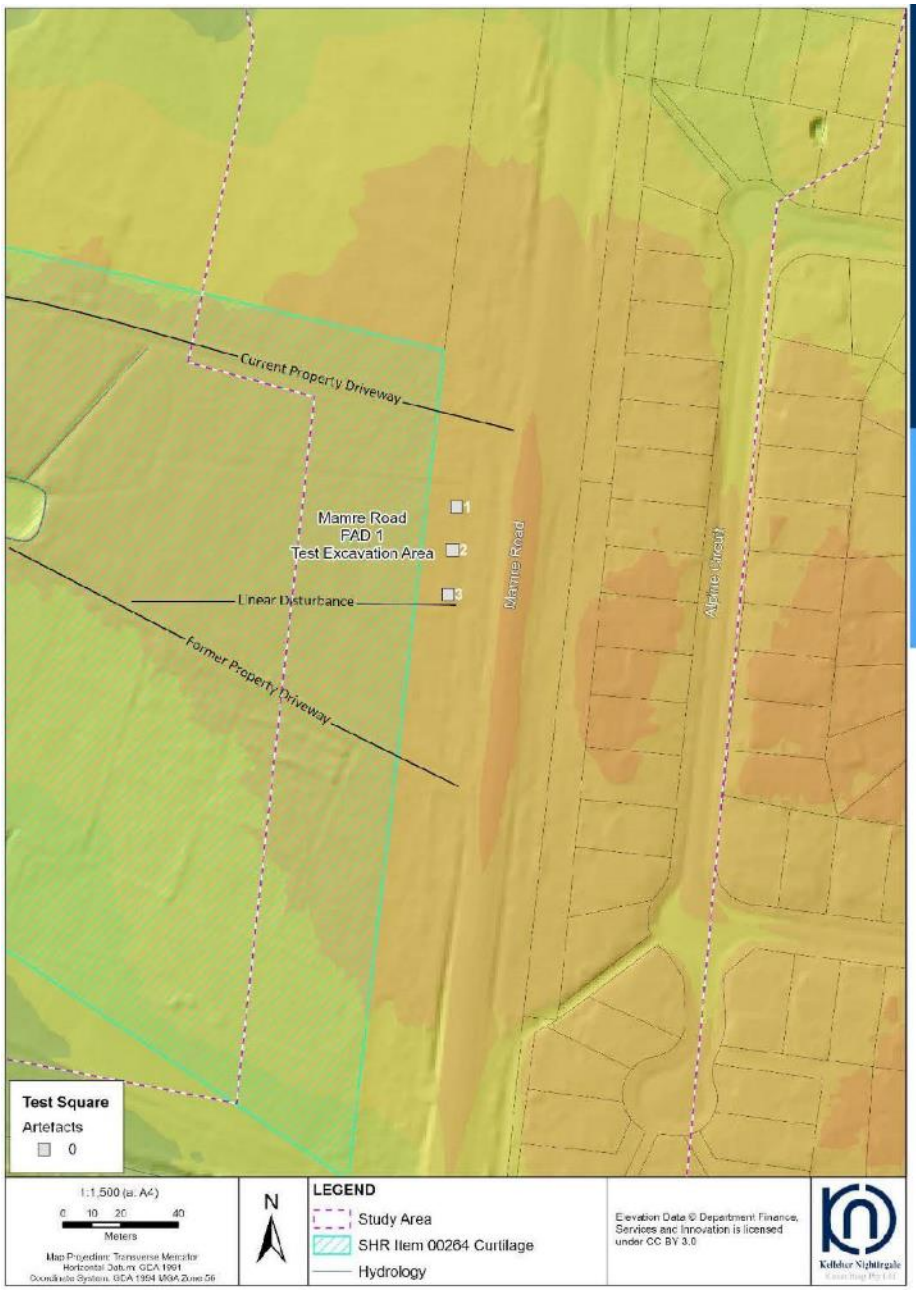
TS 5 South Section

TS 15 West Section



MAMRE ROAD UPGRADE STAGE 1 M4 MOTORWAY TO KERRS ROAD

PACHCI Stage 2 Results



MAMRE ROAD UPGRADE STAGE 1 M4 MOTORWAY TO KERRS ROAD

Mamre Road PAD 1

MAMRE ROAD UPGRADE STAGE 1

Mamre Road PAD 1

Appendix D Archaeological Salvage Methodology

Research Aims

The main aims of the proposed salvage excavation program are:

- To salvage a representative sample of identified archaeological sites 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 Question

The results of the proposed salvage excavation would increase our understanding of subsurface archaeology of the proposal area. In particular, research would focus on the archaeologically identifiable cultural activities that took place on landforms within the Wianamatta/South Creek catchment.

> **Question 1**: Are cultural activities archaeologically identifiable within the Wianamatta/South Creek catchment area at Aboriginal archaeological sites: Mamre Road AFT 1, Mamre Road AFT 2, Mamre Road AFT 3, Mamre Road AFT 4, Mamre Road AFT 5 and MWP-AD5/MWP-AD6? What are the archaeologically identifiable cultural activities and are there any differences in the identifiable activities at these locations?
>
> **Question 4**: Do the artefact assemblages from the Aboriginal archaeological sites differ to those recovered from other salvage excavation programs in the vicinity, such as the program undertaken for the M4 Motorway Upgrade. Are there differences in raw material or artefact type and how do these differences compare to other sites in the wider region?
>
> **Question 5**: What are the taphonomic features of the Aboriginal archaeological sites and what does this indicate about site integrity and artefact survivability for similar landforms?

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 straightforward: 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 areas 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 within the impacted areas of Aboriginal archaeological sites Mamre Road AFT 1, Mamre Road AFT 2, Mamre Road AFT 3, Mamre Road AFT 4, Mamre Road AFT 5 and MWP-AD5/MWP-AD6. Salvage excavation of these 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 and investigation of contributing geomorphic processes.

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 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 10 m^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 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).

Community collection

Community collection will be undertaken at sites Mamre Road 1 and Mamre Road IF 1. The collected objects will be recorded as part of the salvage report and included in the excavation assemblage for long term storage.

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 impact assessment area's archaeological significance.