

Aboriginal Cultural Heritage Assessment Report

Parramatta Light Rail Stage 2





PARRAMATTA LIGHT RAIL STAGE 2

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ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

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Appendix B AHIMS Extensive search results

Appendix C Test Excavation Methodology

Appendix D Archaeological Survey Report (PACHCI Stage 2)

Appendix E Deerubbin LALC Survey Report

Appendix F Section drawings and spitsheets of PLR2 PAD5 Broadoaks Park

Appendix G Cultural Values Assessment (Artefact, 2023)

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GLOSSARY AND ABBREVIATIONS

Term/Acronym	Definition
Aboriginal artefact/object	Means 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.
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AMBS	Australian Museum Business Services
Amended project	The project incorporating the amendments described in the Amendment Report.
ВР	Before Present
Burra Charter	The Australia ICOMOS Charter for Places of Cultural Significance, The Burra Charter, 2013
DCP	Development Control Plan
DECCW	Former NSW Department of Environment, Climate Change and Water
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
Exhibited project	The project described in the EIS.
GPOP	Greater Parramatta and the Olympic Peninsula
GPS	Global Positioning System
Grinding grooves	Usually oval-shaped indentations in sandstone outcrops. These grooves were made when Aboriginal people shaped and sharpened stone axes by grinding them against the sandstone. As a fine-grained material, rubbing stone axes against sandstone provided a sharp edge that could be used for cutting.
Heritage Act	NSW Heritage Act 1977
HNSW	Heritage New South Wales
ICOMOS	International Council on Monuments and Sites
IHO	Interim Heritage Order
IMT	Indurated Mudstone Tuff
KNC	Kelleher Nightingale Consulting
Knapping	(or lithic/stone reduction) Knapping is shaping of a suitable stone material (hard, homogenous, elastic, brittle, isotropic raw materials) into a stone tool by removing piece or pieces. The reduction of the stone can be done striking or applying pressure via other stones or bone/antler as hammers.
LAA	Licensed Asbestos Assessor
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
Material culture	Physical objects made or modified by a human
NHL	National Heritage List
NNTT	National Native Title Tribunal

Term/Acronym	Definition			
NPW Act	NSW National Parks and Wildlife Act 1974			
NSW	New South Wales			
NTA	Commonwealth Native Title Act 1993			
OEH	Former NSW Office of Environment and Heritage			
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation (Roads and Maritime Services, 2012)			
PAD	Potential Archaeological Deposit is an area identified with potential for artefacts to occur below the ground surface. PADs occur over time, as artefacts are covered by sediment such as dirt/sand or are moved by erosion to new areas which may then be covered by sediment. These artefacts remain under the ground surface and when excavated provide important spatial and temporal information about Aboriginal land use. As PADs are located below the ground, artefacts can only be recovered through archaeological excavation in consultation with the local Aboriginal community.			
PHALMS	Parramatta Historical Archaeological Landscape Management Study			
PLR2	Parramatta Light Rail Stage 2 – acronym used for labelling project PADs			
project	The project (for which Transport for NSW is seeking approval) is the construction and operation of Stage 2 of Parramatta Light Rail.			
Project site	Refers to the area that would be directly disturbed by construction of the project (for example, as a result of ground disturbance and the construction of foundations for structures). It includes the location of construction activities, compounds and work sites, and the location of permanent infrastructure (Figure 1.3).			
RAPs	Registered Aboriginals Parties			
RL	Reduced Level			
SEARs	Secretary's Environmental Assessment Requirements			
SEPP	State Environmental Planning Policy			
Shell middens	Shell middens are accumulation of the debris of shellfish. Shell middens often also include other material such as the bones of birds and fish, stone artefacts, and charcoal from campfires. Shell middens are usually found on the coast, but can also be found in inland lakes, swamps and along riverbanks and inlets. They can range from thin scatters of shells to deep layered deposits that have built up over a longer period of time.			
SHI	State Heritage Inventory			
SHR	State Heritage Register			
Study area	The study area includes the project alignment and earlier route options plus a 50 metre buffer either side.			
SU	Survey Unit			
Test Pit (TP)	A test pit is a 500 millimetre x 500 millimetre excavation unit.			
Test Square (TS)	A test square is a larger excavation unit that is one metre x one metre, and made up of four test pits. TP TP 1 m			
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Transport for NSW Transport for NSW is the lead agency of the NSW Transport cluster.

EXECUTIVE SUMMARY

Project overview

Parramatta Light Rail will deliver an integrated light rail service that supports the population and employment growth expected throughout the Greater Parramatta and the Olympic Peninsula area (GPOP). It will integrate with existing and future modes of transport, including buses, trains, ferries and active transport (pedestrian and cycle networks), as well as Sydney Metro West services and the existing road network.

Parramatta Light Rail will be delivered in stages to keep pace with development:

- Stage 1 will connect Westmead to Carlingford via the Parramatta central business district
 (CBD) and Camellia. The construction and operation of Parramatta Light Rail Stage 1 was
 approved by the NSW Minister for Planning in May 2018. Major construction is underway, with
 the track installation complete and light rail stop construction in progress. Stage 1 is expected
 to start operating in 2024. Further information on Stage 1 is provided at Parramatta Light Rail
- Transport for NSW is now proposing to construct and operate Stage 2 of Parramatta Light Rail ('the project'). Stage 2 would connect the Parramatta CBD and Stage 1 to Camellia, Rydalmere, Ermington, Melrose Park, Wentworth Point and Sydney Olympic Park.

Assessment process

An environmental impact statement (EIS) was prepared to assess the potential impacts of the project, and to identify the management measures to address those impacts. The EIS was exhibited by the NSW Department of Planning and Environment from 9 November 2022 to 16 December 2022.

The EIS was supported by a range of technical papers, which provided detailed assessments of the potential impacts of the project as they relate to the key environmental issues defined by the Secretary's environmental assessment requirements (SEARs). This included Technical Paper 4 (Preliminary Aboriginal Cultural Heritage Assessment Report).

Additional assessment of the potential impacts of the project to Aboriginal cultural heritage has been undertaken since exhibition of the EIS. The assessment has been undertaken to assist with considering and responding to issues raised in submissions and during consultation with stakeholders, assessing the impacts of the proposed amendments (see Table 1.1) and to further progress commitments made in the EIS.

The Preliminary Aboriginal Cultural Heritage Assessment Report, originally prepared to support the EIS, has been updated based on the additional assessment undertaken.

Study area and methodology

The study area for the project is located across the City of Parramatta and City of Ryde Local Government Areas (LGAs) and the Deerubbin and Metropolitan Local Aboriginal Land Council (LALC) boundaries.

Consultation with Aboriginal stakeholders has commenced in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010) and the requirements of Clause 60 of the National Parks and Wildlife Regulation 2019. It is noted that consultation with Registered Aboriginal Parties (RAPs) for the project is ongoing.

Background research included a review of previous studies and database searches on the Aboriginal archaeological and historical context of the study area and surrounds. The presence of the Parramatta Sand Body (a geological formation dating from the Pleistocene associated with significant Aboriginal archaeology) was also identified within the Parramatta CBD section of the project site (i.e. area of disturbance).

The assessment has been informed by work undertaken in accordance with the *Procedure for Aboriginal cultural heritage consultation and investigation* (PACHCI) (Roads and Maritime Services, 2012). In accordance with PACHCI, an archaeological field survey was undertaken with

representatives from the LALCs in January and February 2022 to further assess the archaeological potential of the study area based on landscape context, previously identified archaeology and the extent of prior disturbance.

The Archaeological Survey Report (Appendix D) prepared in accordance with PACHCI 2 was provided to the RAPs for comment and review along with a draft Test Excavation Methodology (now updated and included in Appendix C). The first AFG meeting was held both in person, at the Transport for NSW Parramatta office and online on 22 July 2022. During the consultation period, comments were received from RAPs in writing and during the site visit. Details on these comments and how they have been addressed are outlined in section 9.6, including changes that were made to the test excavation methodology following consultation and agreement with the RAPs.

The Aboriginal archaeological test excavation program commenced on 31 October 2022 and was overseen by archaeologists and RAP Site Officers. Its purpose was to assess and inform the archaeological potential of the project site, but excavations were not able to be completed safely, or in accordance with the test excavation methodology due to the presence of asbestos or deep levels of fill. However, test excavations at one PAD in Rydalmere (PLR2 PAD5 Broadoaks Park AHIMS 45-6-4076) were completed with eight artefacts found in the fill layers. The test excavation program determined that this PAD location is highly disturbed and has no archaeological value.

A cultural values assessment has been prepared by an anthropologist, which included a desktop review of available ethnographic information, a site inspection and detailed cultural interviews with three cultural knowledge holders to assess the potential cultural and spiritual impacts associated with the project (see sections 9.1 to 9.5 and Appendix G).

Impact assessment

The impact assessment has been informed by desktop research, the results of the archaeological survey, test results from one PAD in Rydalmere (PLR2 PAD5 Broadoaks Park) and the findings of the cultural values assessment in Appendix G. Test excavations commenced on 31 October 2022 but were not able to be completed due to the presence of asbestos or deep levels of fill, and so is a limitation to the assessments for three PADs.

Thirteen registered sites (AHIMS 45-6-2785, AHIMS 45-6-2786, AHIMS 45-6-2683, AHIMS 45-6-2559, AHIMS 45-6-3582, AHIMS 45-6-3767, AHIMS 45-6-3818, AHIMS 45-6-2686, AHIMS 45-6-1523, AHIMS 45-6-2978, AHIMS 45-6-2795, AHIMS 45-6-2679 and AHIMS 45-6-4097) and one PAD (PLR2 PAD2 Melrose Park Public School Oval) are located within 200 metres of the project site. These sites would not be impacted by construction or operation of the project.

Two known Aboriginal heritage sites (AHIMS 45-6-2977 and AHIMS 45-6-4015) are located within the project site on Macquarie Street in the Parramatta CBD. Two shell middens (AHIMS 45-6-4078 and AHIMS 45-6-4079) were recently identified in Melrose Park during a site visit and registered on the AHIMS. One is located within the project site (45-6-4079), while the other (45-6-4078) has been identified around 30 metres east of the project site but has been included for assessment in this report, as it is within 50 metres (which is the distance prescribed under Requirement 14 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010) and could be at risk, depending on the extent of the midden.

In addition, four potential archaeological deposits (PADs) with either high or moderate archaeological potential were identified in the project site in Rydalmere, Ermington and Melrose Park. This included areas of undisturbed parklands and nature strips.

The assessment concluded that four AHIMS sites and three PAD sites may be at least partially impacted by construction of the project (see Table 0.1).

The cultural values assessment identified a number of overlapping themes that constitute contemporary cultural values from the perspective of the three participants These themes have been arranged under seven headings:

- Country and connection to Country
- waterways provide food and resources
- travel and communication

- histories of disruption and disconnection
- environmental decay / urban development
- difficulty with archaeology failure to embrace cultural values
- people of note in the area.

During a site visit and interviews with three cultural knowledge holders, the importance of Songlines and sight lines were noted, as was the importance of the Parramatta River for resources and as an area of great spiritual importance. The issues of prohibition on accessing the Country and the need for accessing the Country was raised for healing Country.

The confinement of large parts of the project site to existing road and rail transport infrastructure corridors would avoid impact to other surrounding sites and PADs and has lessened landscape disturbance required to construct the project to some degree. However, given the linear nature of the project and surrounding spatial constraints including topography/landscape and existing development, route selection is unlikely to be able to avoid all impacts to Aboriginal archaeological sites. Mitigative salvage excavation is likely to be required for all archaeological sites exhibiting high and moderate to low significance.

Table 0.1: Assessment of impacts

Suburb	PAD/Site Name	Assessed significance	Extent of impact	Type of impact	Consequence of impact
Melrose Park	Ermington Boat Ramp PLR2 PAD1	High	Total (as all of the PAD is located in the project site)	Direct (ground disturbance, excavation and vegetation clearing resulting from bridge works and from vehicle and plant movements)	Partial or total loss of value
Melrose Park	AHIMS 45-6- 4078 (Ermington SHL 01)	High	Partial (as the shell midden is within 50 metres of the project site)	Direct (risk of vibration due to vehicle and plant movement) Indirect (impact to visual connections between heritage items and landscape)	Partial or total loss of value
Melrose Park	AHIMS 45-6- 4079 (Ermington SHL 02)	High	Total (as all of the shell midden is located in the project site)	Direct (ground disturbance, excavation and vegetation clearing resulting from bridge works and from vehicle and plant movements) Indirect (impact to visual connections between heritage items and landscape)	Partial or total loss of value
Rydalmere	Rydalmere Wharf PLR2 PAD3	High	Partial (as not all of the PAD is located in the project site)	Direct (ground disturbance, excavation and vegetation clearing resulting from bridge works and from vehicle and plant movements)	Partial or total loss of value
Rydalmere	Broadoaks Park PLR 2 PAD5 (AHIMS 45-6-4076)	None	Total (as all of the PAD is located in the project site)	Direct (ground disturbance and vehicle and plant movements at the proposed compound site)	N/A (no archaeological value)
Ermington	Ken Newman Park PLR2 PAD6	Moderate	Partial (as not all of the PAD is located in the project site)	Direct (ground disturbance, excavation and vegetation clearing, and potential landscaping works, and from vehicle and plant movements)	Partial or total loss of value

Suburb	PAD/Site Name	Assessed significance	Extent of impact	Type of impact	Consequence of impact
Parramatta CBD	AHIMS 45-6- 2977 (Macquarie St PAD 3)	High/ Moderate	Partial (as not all of the PAD is located in the project site)	Direct (ground disturbance and excavation as a result of constructing the turnback facility)	
	AHIMS 45-6- 4015 (Church St PAD 1)	Moderate	Partial (as not all of the PAD is located in the project site)	Direct (ground disturbance and excavation as a result of constructing the turnback facility)	

RAP review of the draft ACHAR was supportive of the assessment and its recommendations. Following discussions at the second Aboriginal Focus Group meeting, an additional recommendation has been included for the reburial of artefacts recovered during the test excavations to date. The artefacts are recommended to be reburied on Country near to their find location prior to construction of the project commencing.

Next steps

Further investigation (testing) is required for three potential archaeological deposits (PAD1 Ermington Boat Ramp, PAD3 Rydalmere Wharf and PAD6 Ken Newman Park), two AHIMS sites in the Parramatta CBD and two AHIMS middens sites in Melrose Park to determine the presence, extent, and scientific significance of areas of identified archaeological sensitivity.

A project specific methodology to reflect the need for mechanical excavation at PLR2 PAD 3, asbestos management requirements, and to ensure a safe working environment will be prepared in consultation with RAPs to allow for the recommencement of testing, which would take place prior to construction. The testing will also be carried out in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). Following this, updated assessments of significance would be prepared, in consultation with RAPs, along with a review and update of mitigation measures in section 10.4.

1 INTRODUCTION

1.1 Parramatta Light Rail

The NSW Government's Greater Sydney Region Plan *A Metropolis of Three Cities* (Greater Sydney Commission, 2018) outlines a vision for a three-city metropolis. The Central River City covers the four local government areas of the City of Parramatta, Blacktown City, Cumberland City and The Hills Shire. *A Metropolis of Three Cities* highlights Greater Parramatta as the focal point for the Central River City, with employment growth and public transport being of key importance.

The Greater Parramatta and the Olympic Peninsula area (GPOP), which extends from Westmead and Parramatta in the west to Sydney Olympic Park to the east, is fast emerging as the heart of Sydney's Central River City and is set to grow and change significantly over the next 20 years. Forecasts predict that GPOP will accommodate almost 170,000 new residents by 2041. Employment opportunities will also grow, with an additional 100,000 jobs predicted by 2041 (SGS, 2017).

Parramatta Light Rail will deliver an integrated light rail service that supports the population and employment growth expected throughout GPOP. It will integrate with existing and future modes of transport, including buses, trains, ferries and active transport (pedestrian and cycle networks), as well as Sydney Metro West services and the existing road network.

Parramatta Light Rail will be delivered in stages to keep pace with development:

- Stage 1 will connect Westmead to Carlingford via the Parramatta central business district
 (CBD) and Camellia. The construction and operation of Parramatta Light Rail Stage 1 was
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 to start operating in 2024. Further information on Stage 1 is provided at Parramatta Light Rail
- Transport for NSW is now proposing to construct and operate Stage 2 of Parramatta Light Rail ('the project'). Stage 2 would connect the Parramatta CBD and Stage 1 to Camellia, Rydalmere, Ermington, Melrose Park, Wentworth Point and Sydney Olympic Park.

Figure 1.1 provides an overview of the Parramatta Light Rail network showing both stages.

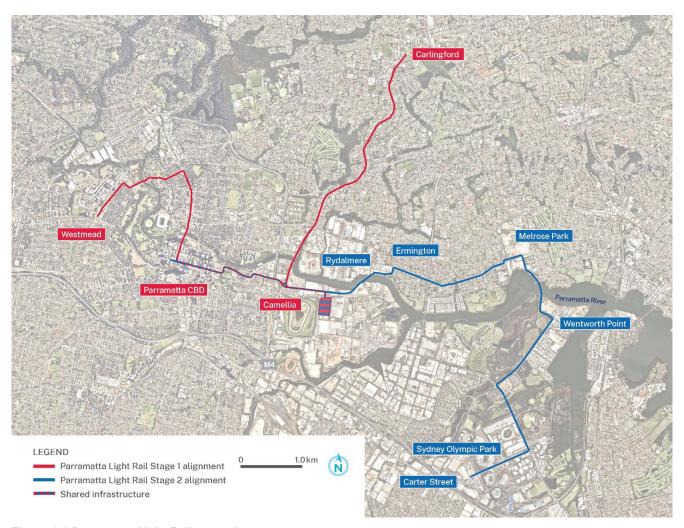


Figure 1.1 Parramatta Light Rail network

1.2 Approval and assessment requirements

1.2.1 Approval requirements

The project is critical State significant infrastructure and is subject to approval by the NSW Minister for Planning under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act* 1979 (NSW) (EP&A Act).

The project is also determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) and requires approval from the Australian Minister for the Environment and Water.

An environmental impact statement (EIS) was prepared to assess the potential impacts of the project, and to identify the management measures to address those impacts. The EIS was exhibited by the NSW Department of Planning and Environment from 9 November 2022 to 16 December 2022. The EIS was also prepared to support Transport for NSW's application for approval of the project under the EPBC Act.

The EIS was supported by a range of technical papers, which provided detailed assessments of the potential impacts of the project as they relate to the key environmental issues defined by the Secretary's environmental assessment requirements (SEARs). This included Technical Paper 4 (Preliminary Aboriginal Cultural Heritage Assessment Report).

1.2.2 Responding to submissions and proposed amendments

During the exhibition period, stakeholders and members of the community were able to review the EIS, participate in consultation and engagement, activities, and make a written submission to the Department of Planning and Environment for consideration in its assessment of the project.

Transport for NSW has prepared a submissions report to address the Planning Secretary's request to submit a response to the issues raised in submissions to the EIS during public exhibition and DPE's State Significant Infrastructure and State Significant Project Guidelines.

During and following public exhibition of the EIS, Transport for NSW has undertaken further investigations and is proposing a number of design amendments to the project. The aim of these amendments is to address issues raised during consultation and in submissions, and to minimise the potential impacts of the project. A summary of the proposed amendments is provided in Table 1.1. Further information is provided in the Amendment Report.

Table 1.1: Summary of amendments

Proposed amendment	Overview
Camellia foreshore to Rydalmere alignment and bridge	As described in section 5.4.2 and Appendix D of the EIS, investigation of an alternative alignment between Camellia and Rydalmere (the 'Camellia foreshore to Rydalmere option') was ongoing in parallel with development of the EIS. It is now proposed to amend the project to incorporate this alternative alignment of the light rail track, active transport link and bridge over the Parramatta River.
	The new alignment extends along the Sandown Line corridor in Camellia; however, instead of crossing south over to Grand Avenue, it continues along the Parramatta River foreshore in Camellia before extending across a new bridge structure and along the boundary of Eric Primrose Reserve in Rydalmere.
	The bridge design has been amended and includes different pier arrangements in the river. It is also proposed to locate the light rail stop at John Street closer to Rydalmere Wharf.
Bridge between Melrose Park and Wentworth Point	The project as described in the EIS included a bridge located between the southern end of Wharf Road in Melrose Park and the northern end of Wentworth Point. It is proposed to amend the alignment and locate the bridge further to the west to avoid direct impacts to residential properties. The works would also include removing the existing high voltage transmission tower at Melrose Park and relocating the wires to three new poles located to the west of the original tower.
Bridge at Hill Road	The project as described in the EIS included retaining the Hill Road bridge in Sydney Olympic Park and providing a new bridge for light rail vehicles on the western side of the existing bridge.
	It is now proposed to remove the existing bridge at Hill Road and construct a new bridge, which would accommodate road traffic and light rail vehicles in an on-road (segregated) running corridor to reduce impacts on Narawang Wetland.

In addition, refinements are proposed to the location of the traction power substation near Atkins Road, and the cut and fill volumes generated during earthworks.

1.3 Project overview

The project comprises two main elements:

- construction of about 10 kilometres of light rail infrastructure between Camellia and the Carter Street precinct adjacent to Sydney Olympic Park
- operation of about 13 kilometres of light rail alignment between the Parramatta CBD and the Carter Street precinct, including a section of infrastructure constructed by Parramatta Light Rail Stage 1 between Camellia and the Parramatta CBD.

Further information on the location of the project, and a description of the project site for the purposes of this document, is provided in the Amendment Report.

1.3.1 Key features

The key features of the project (as amended), which are shown on Figure 1.2, include:

Light rail track and bridges

- new 10 kilometre long dual light rail track, with 14 stops, between the Parramatta Light Rail Stage 1 line in Camellia and the Carter Street precinct adjacent to Sydney Olympic Park
- two bridges over the Parramatta River between Camellia and Rydalmere, and between Melrose Park and Wentworth Point
- a bridge over Silverwater Road between Rydalmere and Ermington
- other bridge works in Ken Newman Park and Sydney Olympic Park.

Active and public transport integration

The project would also deliver:

- about 9.5 kilometres of new active transport links between Camellia and the Carter Street precinct, which would connect with the existing cycling and pedestrian network
- interchanges with other forms of public transport, including trains, ferries, buses and Sydney Metro West, with the main interchanges located in the Parramatta CBD, Rydalmere and Sydney Olympic Park
- a light rail and pedestrian zone (no through vehicle access) within Sydney Olympic Park along Dawn Fraser Avenue between Australia Avenue and Olympic Boulevard
- bus access over the proposed bridge between Melrose Park and Wentworth Point.

Other works

Works proposed to support the project's operation:

- turnback facilities, including along part of Macquarie Street in the Parramatta CBD
- adjustments to the Parramatta Light Rail stabling and maintenance facility at Camellia
- five new traction power substations to convert electricity to a form suitable for use by light rail vehicles
- new and improved open spaces and recreation facilities at Eric Primrose Reserve, Ken Newman Park and the Atkins Road stop.

Further information on the project's features is provided in the updated project description chapters in Appendix A of the Amendment Report.

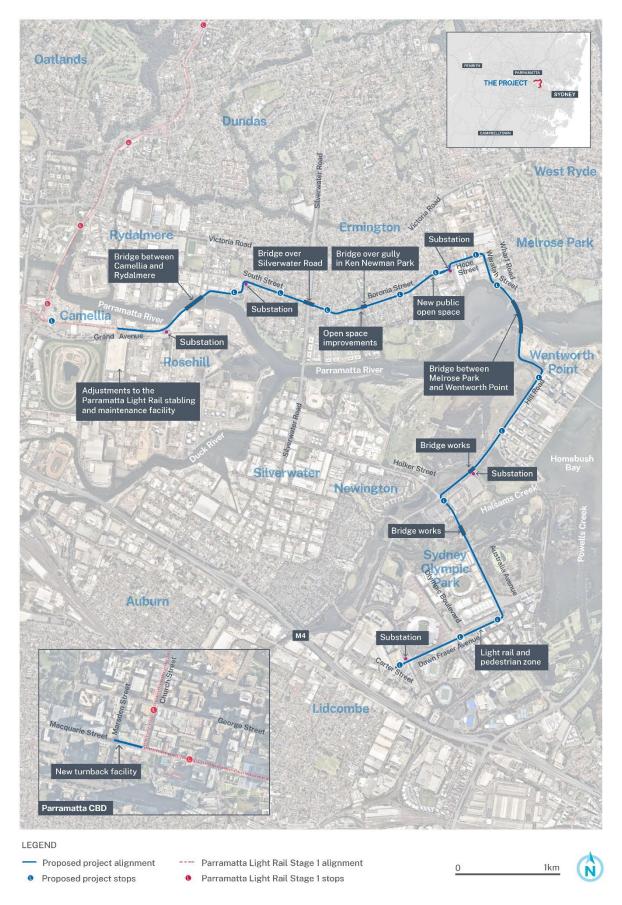


Figure 1.2 Key features of the project

1.3.2 Operation

The project would operate between the Parramatta CBD and the Carter Street precinct, using a section of the Parramatta Light Rail Stage 1 alignment and the alignment constructed as part of the project.

Between the Parramatta CBD and Camellia, the project would operate along about three kilometres of the Parramatta Light Rail Stage 1 alignment. Parramatta Light Rail Stage 2 services would terminate at the Stage 1 Parramatta Square stop to allow customers direct and convenient access to Parramatta's CBD, and interchange with Parramatta Stage 1 light rail services, trains, buses and Sydney Metro West.

From Camellia, the project would operate along the light rail infrastructure proposed as part of Stage 2, terminating at the proposed Carter Street stop.

The project would operate as a turn-up-and-go light rail service from 5am to 1am, seven days a week, in line with Parramatta Light Rail Stage 1. The project would have travel times of around 29 minutes from the Carter Street stop in Lidcombe to the proposed Sandown Boulevard stop in Camellia, and a further seven minutes to the Parramatta Square stop in the Parramatta CBD.

Further information on the project's operation is provided in the Amendment Report.

1.3.3 Timing

It is anticipated that construction would start in 2025, subject to obtaining all necessary approvals, and the first passenger services are proposed to start from 2030/2031.

An indicative construction methodology is provided in the Amendment Report.

1.4 Purpose and scope of this report

Additional assessment of the potential Aboriginal heritage impacts of constructing and operating the project has been undertaken since exhibition of the EIS. The assessment has been undertaken to assist with considering and responding to issues raised in submissions and during consultation with stakeholders, assessing the impacts of the proposed amendments and to further progress commitments made in the EIS.

The Preliminary Aboriginal Cultural Heritage Assessment Report, originally prepared to support the EIS, has been updated based on the additional assessment undertaken.

The purpose of this report is to assess the potential Aboriginal heritage impacts of constructing and operating the project. This report:

- provides an updated assessment of the project (as amended)
- addresses the relevant SEARs listed in Table 1.2
- describes the existing environment with respect to Aboriginal heritage
- assesses the impacts of constructing and operating the project on Aboriginal heritage
- provides additional information as required to respond to issues raised in submissions and during consultation
- recommends measures to mitigate and manage the impacts identified.

The methodology for the assessment is described in Section 1.5.

Table 1.2: Secretary's environmental assessment requirements (Aboriginal heritage)

Requirement Where it is addressed in this report 1. Direct and/or indirect impacts (including cumulative A summary of the known sites and potential archaeological impacts) to the heritage significance of: deposits (PADs) is provided in sections 5.2.3, 5.2.4, 7.3.7 and a) Aboriginal places, objects and cultural heritage values, as defined under the National Parks and A discussion of cultural heritage values and significance Wildlife Act 1974 and in accordance with the assessment is provided in section 9, with a detailed cultural principles and methods of assessment identified in values assessment in Appendix G. the current guidelines; and A discussion of impacts (including cumulative impacts) is provided b) Aboriginal places of heritage significance, as in sections 10.2 and 10.3. defined in the Standard Instrument - Principal Local There are no Aboriginal places of heritage significance in the Environmental Plan. Ryde Local Environmental Plan 2014 or the Parramatta Local Environmental Plan 2011. 2. Identify and describe the Aboriginal cultural values Section 7 details the findings of the archaeological that exist across the whole area that will be affected (surface) survey which identified a number of potential by the proposal and document these in an Aboriginal archaeological deposits (PADs) for further investigation. Cultural Heritage Assessment Report (ACHAR). This Section 8 provides information on the test excavation may include the need for surface survey and test that was able to be completed. excavation. Section 9 provides a summary of the cultural values assessment that is provided in Appendix G. 3. The identification of cultural heritage values must Cultural heritage values have been identified in be conducted in accordance with the Code of Practice accordance with these documents (see also sections for Archaeological Investigation of Aboriginal Objects 9.1, 9.2, 9.3 and 9.4). in New South Wales (DECCW 2010) (the Code), and be guided by the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011). 4. Consultation with Aboriginal people must be Section 3 details Aboriginal community consultation, undertaken and documented in accordance with and a log of consultation activities is provided in Aboriginal cultural heritage consultation requirements Appendix A. for proponents 2010 (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR. 5. Impacts on Aboriginal cultural heritage values must An assessment of cultural heritage values is provided in Appendix be assessed and documented in the ACHAR. The G and summarised in sections 9 and 10. Recommended ACHAR must demonstrate attempts to avoid impact mitigation measures are provided in sections 10.4 and 12.2. upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts. 6. In situations where the test excavation The Code was followed for the test excavation program, methodology stipulated in Requirement 16 of the in addition to a site specific test excavation Code is not appropriate (e.g. in areas detailed in methodology for areas where both Aboriginal and non-Requirement 14 of the Code; in areas of deep sand Aboriginal heritage values had been identified (refer to deposits; or in areas where historical archaeological Appendix C). excavations area also taking place), a site-specific test excavation methodology should be developed. 7. Where archaeological investigations of Aboriginal An initial Test Excavation Methodology was prepared objects are proposed these must be conducted by a (see Appendix C) to guide test excavations that suitably qualified archaeologist, in accordance with commenced on 31 October 2022, which were overseen section 1.6 of the Code of Practice for Archaeological by suitably qualified archaeologists (see section 1.7). Investigation of Aboriginal Objects in NSW (DECCW However, testing was not able to be completed safely, 2010). or in accordance with the test excavation methodology due to the presence of asbestos or deep levels of fill. As such, a project specific methodology to reflect the need for mechanical excavation at PLR2 PAD 3, asbestos management requirements, and to ensure a safe working environment will be prepared in consultation with RAPs to allow for the

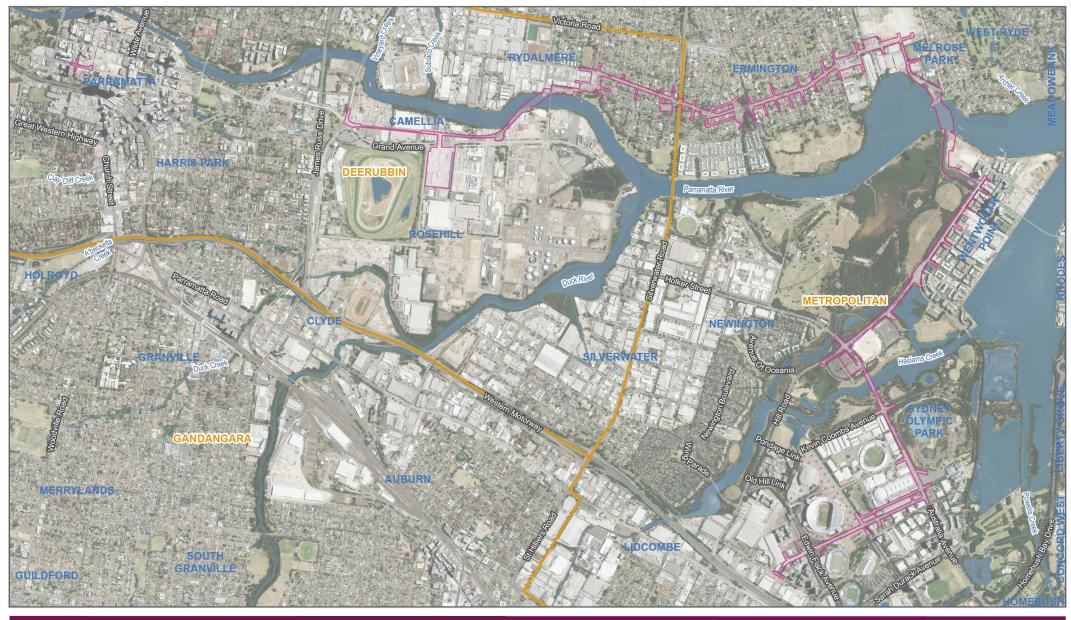
Requirement	Where it is addressed in this report
	recommencement of testing, which would take place prior to construction.
8. Any Aboriginal objects recorded as part of the assessment must be documented and notified to Heritage NSW by recording on the Aboriginal Heritage Information Management System.	Aboriginal objects recorded during the test excavation program in November 2022 have been recorded to AHIMS (PLR2 PAD5 Broadoaks Park 45-6-4076). Two new AHIMS sites (45-6-4078 and 45-6-4079) were recently identified in Melrose Park during a site visit and registered on the AHIMS in February 2023.
9. The ACHAR must outline procedures to be followed if unexpected Aboriginal objects, burials or skeletal material are uncovered at any stage during the life of the proposal.	Section 11.2 provides mitigation measures that would be implemented to manage any unexpected finds.

1.5 Report methodology

The guiding documents for this assessment are the Code of Practice for Archaeological Investigation of Aboriginal objects in NSW (DECCW, 2010) (The Code), the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (DECCW, 2011) and the Procedure for Aboriginal Cultural Heritage Consultation and Investigation (PACHCI) (Roads and Maritime Services, 2012).

The methodology to prepare this ACHAR included the following:

- defining a study area which encompassed route options (plus a 50 metre buffer)
- undertaking background research on the Aboriginal archaeological and historical context of the study area and surrounds, including:
- reviewing previous studies/investigations
- searching the NSW Aboriginal Heritage Information Management System (AHIMS) database and State Heritage Inventory (SHI) to identify existing registered sites
- documenting the results of an archaeological survey undertaken in accordance with The Code (see section 7.1 and section 7.2 for more details on the survey methodology)
- undertaking consultation with relevant Government agencies and local Aboriginal stakeholders in accordance with legislative requirement and the *Aboriginal Cultural Heritage Consultation* Requirements for Proponents (DECCW, 2010a) (see section 3 for more information on the consultation process)
- undertaking an impact assessment of the direct/indirect (including cumulative impacts) to Aboriginal heritage for the project site (i.e. the area to be disturbed by the construction and operation of the project as shown in Figure 1.3)
- preparation of a cultural values assessment by an anthropologist, which included a desktop review of
 available ethnographic information and detailed cultural interviews with three cultural knowledge holders
 to assess the potential cultural and spiritual loss of the project (see sections 9.1 to 9.5 and Appendix G)
- a test excavation methodology which was prepared in consultation with Aboriginal stakeholders to guide
 the testing program (refer Appendix C). Test excavations commenced on 31 October 2022 but were not
 able to be completed safely, or in accordance with the test excavation methodology due to the presence
 of asbestos or deep levels of fill. A project specific methodology to reflect the need for mechanical
 excavation at PLR2 PAD 3, asbestos management requirements, and to ensure a safe working
 environment will be prepared in consultation with RAPs to allow for the recommencement of testing,
 which would take place prior to construction
- providing recommendations and mitigation measures to minimise impacts to Aboriginal heritage during the next phases of the project.





Project site

Local Aboriginal Land Council area



Grid: GDA 1994 MGA Zone 56

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Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Project No. 12557728
Revision No. 2
Date 08/03/2023

Project site

FIGURE 1.3

1.6 Limitations

1.6.1 Document scope

This report is limited to an assessment of archaeological potential in the study area and possible impacts to a defined project site (the area where ground disturbing works would be required for construction).

The archaeological significance of Aboriginal heritage values is based on identified significance recorded in the NSW Aboriginal Heritage Management System (AHIMS) database, advice and recommendations from RAPs, Deerubbin and Metropolitan LALC Site Officers (refer Appendix E), and previous studies.

1.6.2 Archaeological survey

An archaeological survey was conducted in consultation with Deerubbin and Metropolitan Local Aboriginal Land Council (LALC) Site Officers and was limited to publicly accessible areas within the study area.

The survey aimed to ground truth areas of potential archaeological sensitivity identified in previous studies and to assess the Aboriginal archaeological heritage potential within the study area. The Parramatta CBD area of the study area was not surveyed, as it had previously been assessed for Parramatta Light Rail Stage 1, as such the information and assessment from the Parramatta Light Rail Aboriginal Cultural Heritage Assessment Report (KNC, 2017) has been relied upon for the Parramatta CBD area.

The survey described in section 7 does not constitute a comprehensive archaeological survey as, it was considered that a systematic survey of the study area would not contribute much information at this stage due to grass coverage and vegetation being clearly identifiable in all suburbs. As such, a comprehensive archaeological survey was not recommended by the archaeologists, and this approach was supported by the LALC Site Officers.

1.6.3 Test excavations

Further investigation (testing) is required for three potential archaeological deposits (PAD1 Ermington Boat Ramp, PAD3 Rydalmere Wharf and PAD6 Ken Newman Park), two AHIMS sites in the Parramatta CBD and two AHIMS middens sites in Melrose Park to determine the presence, extent, and scientific significance of areas of identified archaeological sensitivity.

Test excavations commenced on 31 October 2022 but were not able to be completed safely, or in accordance with the test excavation methodology due to the presence of asbestos or deep levels of fill, and so is a limitation to the assessments for several PADs. Further investigation (testing) is required for three potential archaeological deposits (PAD1 Ermington Boat Ramp, PAD3 Rydalmere Wharf and PAD6 Ken Newman Park), two AHIMS sites in the Parramatta CBD and two AHIMS middens sites in Melrose Park to determine the presence, extent, and scientific significance of areas of identified archaeological sensitivity.

A project specific methodology to reflect the need for mechanical excavation at PLR2 PAD 3, asbestos management requirements, and to ensure a safe working environment will be prepared in consultation with RAPs to allow for the recommencement of testing, which would take place prior to construction. The testing will also be carried out in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). Following this, updated assessments of significance would be prepared, in consultation with RAPs, along with a review and update of mitigation measures in section 11.

1.6.4 Project information

The information contained in this report is based on information provided by Transport for NSW, as well as information obtained through the course of this assessment via site visits and previous field work.

1.7 Authorship and acknowledgements

Heritage Consultant Dr. Bengi Selvi-Lamb (PhD in Archaeology) prepared this report with assistance from Senior Heritage Consultant Sarah van der Linde (MA in Cultural Heritage) and Senior Heritage Consultant Dr.

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

Gary Marriner (PhD in Archaeology). Heritage Manager Susan Kennedy (BA in Anthropology/Archaeology, MA in Maritime Archaeology, Bachelor of Laws) has reviewed this report.

The test excavation program was overseen by Dr Bengi Selvi-Lamb, supporting archaeologists and RAP Site Officers. The cultural values assessment included in Appendix G was prepared by Dr. Elizabeth Bonshek (PhD in Anthropology, MA of Arts), a Senior Heritage Consultant from Artefact Heritage.

The author would like to acknowledge the assistance of Felicity Barry (Senior Heritage Specialist, Transport for NSW) for her contributions to this report.

2 LEGISLATIVE CONTEXT

Aboriginal cultural heritage in NSW is protected by the *National Parks and Wildlife Act 1974* which is overseen by Heritage NSW. Aboriginal cultural heritage includes tangible and intangible cultural heritage values. Aboriginal cultural heritage may also be protected through listings under the *Heritage Act 1977*, also overseen by Heritage NSW. The *Environmental Planning and Assessment Act 1979* (EP&A Act) and other environmental planning instruments trigger the requirement for the investigation and assessment of Aboriginal cultural heritage as part of the development approval process. The EP&A Act includes the sustainable management of built and cultural heritage (including Aboriginal heritage) as one of its objectives.

2.1 National Parks & Wildlife Act 1974

2.1.1 Harm to Aboriginal objects and places

The NSW *National Parks and Wildlife Act 1974* (NPW Act) is the principal act providing protection for Aboriginal cultural heritage in NSW. The objectives of the Act includes the conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including but not limited to (i) places, objects and features of significance to Aboriginal people...".

The NPW Act provides protection for Aboriginal objects irrespective of their significance (archaeological or cultural heritage significance) or land tenure. It also protects Aboriginal Places, which can include intangible cultural heritage values as well as Aboriginal objects. However, Aboriginal Places must be assessed and gazetted under the Act and are linked to a specific location. Section 86 of the NPW Act states:

- "A person must not harm or desecrate an object that the person knows is an Aboriginal object
- A person must not harm an Aboriginal object
- A person must not harm or desecrate an Aboriginal place."

Under the NPW Act, it is an offence to harm an Aboriginal object or place. Harm under the NPW Act is defined as any act that: destroys defaces or damages the object; moves the object from the land on which it has been situated; causes or permits the object to be harmed. However, it is a defence from prosecution if the proponent can demonstrate 1) that harm was authorised under Section 90 of the NPW Act, or 2) that the proponent exercised due diligence in respect to Aboriginal cultural heritage. The due diligence defence states that if a person or company has exercised due diligence, liability from prosecution under the NPW Act will be removed or mitigated if it later transpires that an Aboriginal object was harmed. If an Aboriginal object is identified during the proposed activity, all activity within that area must cease and Heritage NSW notified (DECCW, 2010c, p.13). The due diligence defence does not authorise continuing harm.

2.1.2 Notification of Aboriginal objects

Under Section 89A of the NPW Act, the proponent must report all Aboriginal objects and places to the Secretary of Department of Premier and Cabinet of Heritage NSW within a reasonable time, unless already registered on the Aboriginal Heritage Information Management System (AHIMS).

2.2 National Parks & Wildlife Regulation 2019

The National Parks & Wildlife Regulation 2019 (NPW Regulation) provides a framework for undertaking activities and exercising due diligence in respect to Aboriginal heritage. The NPW Regulation 2019 outlines the recognised due diligence codes of practice, procedures for Aboriginal Heritage Impact Permit (AHIP) applications, and Aboriginal cultural heritage consultation requirements amongst other regulatory processes.

2.2.1 Investigating and assessing Aboriginal cultural heritage

There are a number of procedural guidelines supporting archaeological practice in NSW. The publications relevant to the investigation and assessment of Aboriginal cultural heritage include:

- Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011)
- Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010a)
- Code of Practice For Archaeological Investigation of Aboriginal Objects in NSW (The Code) (DECCW, 2010b).

The Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010a) codifies a process for consultation with Aboriginal people who hold cultural knowledge relevant to determining the significance of Aboriginal cultural heritage. The requirements are consistent with the NPW Regulation and seek to conserve Aboriginal objects and places of significance to Aboriginal people. Consultation is therefore a fundamental part of the Aboriginal cultural heritage assessment process.

2.3 Heritage Act 1977

The NSW *Heritage Act 1977* provides protection for environmental heritage including historic places, structures, relics, moveable objects and landscapes of significance. The *Heritage Act 1977* also affords protection to Aboriginal cultural heritage and Aboriginal archaeology of State heritage significance through listings on the State Heritage Register (SHR) or being the subject of an Interim Heritage Order (IHO).

No Aboriginal places included on the SHR or subject to an IHO are located within the project site. It is noted that the Newington Armament Depot and Nature Reserve (SHR No. 01850) includes discussion of Aboriginal archaeology within the *Conservation Management Plan* (Tanner Architects, 2013). However, it is not proposed to undertake works within the curtilage of SHR No. 01850. Additionally, Robin Thomas Reserve is listed for Aboriginal cultural heritage values, archaeology (Aboriginal and historical) and a Pleistocene sand body which extends through the Parramatta CBD, as *Ancient Aboriginal and Early Colonial Landscape* (SHR No. 01863) which is 700 metres west of the study area but would not be impacted by Stage 2 works.

2.4 Aboriginal Land Rights Act 1983

The purpose of this legislation is to provide land rights for Aboriginal people within NSW and to establish Local Aboriginal Land Councils (LALCs). The land able to be claimed by LALCs on behalf of Aboriginal people is certain Crown land that (under Section 36):

- a. Is able to be lawfully sold, leased, reserved or dedicated.
- b. Is not lawfully used or occupied.
- c. Will not, or not likely, in the opinion of the Crown Lands minister, be needed for residential purposes.
- d. Will not, or not likely, be needed for public purposes.
- e. Does not comprise land under determination by a claim for Native Title.
- f. Is not the subject of an approved determination under Native Title.

Claims for land are through application to the Office of the Registrar, *Aboriginal Land Rights Act 1983*. The project site is within the boundaries of the Deerubbin and Metropolitan LALCs and is not subject to any Aboriginal land claims.

2.5 Native Title Act 1993

The Commonwealth *Native Title Act 1993* establishes a structure for the protection and recognition of native title where:

- Aboriginal people have a native title interest to maintain traditional customs and laws
- Aboriginal people have sustained connection with the land or waters in question
- the native title rights and interests are recognised by the common law of Australia.

The *Native Title Act 1993* establishes processes to determine where native title exists, how activities affecting upon native title may be carried out, and to provide compensation where native title is impaired or extinguished. The *Native Title Act 1993* provides Aboriginal people who hold native title rights and interests, or who have made a native title claim, the right to be consulted and in some cases, to participate in decisions about activities proposed to be undertaken on the land.

A search of the Native Title Register was undertaken on 31 May 2022 There are no Native Title claims within the study area.

2.6 Aboriginal and Torres Strait Islander Heritage Protection Act 1984

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 can protect areas and objects that are of particular significance to Aboriginal and Torres Strait Islander people. The Act allows the Environment Minister, on the application of an Aboriginal or Torres Strait Islander person or group of persons, to make a declaration to protect an area, object or class of objects from a threat of injury or desecration.

No places declared under the Act are within the study area.

3 ABORIGINAL COMMUNITY CONSULTATION

3.1 Early engagement

Transport for NSW has developed the PACHCI to provide a consistent means of effective consultation with Aboriginal communities about activities which may impact on Aboriginal cultural heritage and to ensure a consistent assessment process for activities across NSW. The PACHCI aligns with NSW regulatory processes for Aboriginal community consultation as required by clause 60 of the National Parks and Wildlife Regulation 2019

During earlier planning stages of the project, representatives from Transport for NSW met with Deerubbin LALC on 7 December 2018 to introduce the project including route options being considered.

Representatives from the Metropolitan LALC and the Deerubbin LALC then participated in the archaeological survey conducted on 24 January and 4 February 2022 respectively, in accordance with PACHCI. The Site Officers provided input on cultural significance and identified the potential for impacts on Aboriginal heritage.

3.2 Aboriginal cultural heritage consultation requirements

The aim of consultation is to integrate cultural and archaeological knowledge and provide registered stakeholders with information to make decisions on Aboriginal cultural heritage. For the preparation of this ACHAR, consultation with Aboriginal stakeholders has been undertaken in accordance with the OEH *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (OEH, 2010b) ('Consultation Requirements') and the requirements of clause 60 of the *National Parks and Wildlife Regulation 2019*.

The Consultation Requirements outline a four stage Aboriginal consultation process and mandate specific timeframes for each stage, which and are discussed in the following sections. Consultation documentation for each stage undertaken for the project is included in Appendix A.

3.2.1 Stage 1 Notification and registration

Stage 1 requires that Aboriginal people who hold cultural information are identified, notified and invited to register an expression of interest in the assessment. This identification process should draw on reasonable sources of information including: the relevant Heritage NSW Environment Protection and Regulation Group regional office, the relevant LALC(s), the Register of Aboriginal Owners, the Native Title Tribunal, Native Title Services Corporation, local council(s) and the relevant Local Land Services, as well as placing an advertisement in a local newspaper circulating in the general location of the activity. Aboriginal organisations and/or individuals identified should be notified of the activity and invited to register an expression of interest for Aboriginal consultation.

The notification and registration process for the project included the following:

- letters requesting the details of any Aboriginal people that may hold cultural knowledge relevant to the study area were sent to the following organisations on 10 September 2021 (in accordance with step 4.1.2 of the Consultation Requirements):
- City of Parramatta Council
- City of Ryde Council
- Local Land Services Greater Sydney
- Deerubbin LALC
- Metropolitan LALC
- NTScorp
- Heritage NSW
- Office of the Registrar (under the Aboriginal Land Rights Act 1983)
- a notice was placed in Auburn Review, Koori Mail and Parramatta News on 11 October 2021 (in accordance with step 4.1.3)

- an online search of the National Native Title Tribunal was undertaken on 20 September 2021, returning no native title claims in the study area
- Aboriginal people or organisations identified at step 4.1.2 were then provided with a letter on 28-29 October 2021 inviting them to register for the project.

At the completion of stage 1, a total of 29 individuals representing 27 groups registered their interest (see Table 3.1).

Table 3.1: RAPs who registered interest for Parramatta Light Rail Stage 2

Organisation	Representative
A1 Indigenous Services	Carolyn Hickey
Aragung Aboriginal Cultural Heritage Site Assessments	Jamie Eastwood
Barraby Cultural Services	Lee Field
Butucarbin Aboriginal Corporation	Jennifer Beale & Lowanna Gibson
Clive Freeman	Clive Freeman
Darug Custodian Aboriginal Corporation	Justine Coplin
Didge Ngunawal Clan	Lillie Carroll & Paul Boyd
Gilay Consultants	Carolyn Slater
Ginninderra Aboriginal Corporation	Krystle Carroll-Elliott
Goobah Developments	Basil Smith
Kamilaroi Yankuntjatjara Working Group	Phil Khan
Merrigarn	Shaun Carroll
Muragadi Heritage Indigenous Corporation	Jesse Johnson
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson
Tocomwall	Danny Franks
Waawaar Awaa Aboriginal Corporation	Rodney Gunther
Wailwan Aboriginal Group	Philip Boney
Warragil Cultural Services	Aaron Slater
Widescope Indigenous Group	Steven Hickey
Wori Wooilywa	Daniel Chalker
Wurrumay Pty Ltd	Vicky Slater
Yulay Cultural Services	Arika Jalomaki
Yurrandaali Cultural Services	Bo Field
Amanda Hickey Cultural Services	Amanda De Zwart
Koori Digs	Korri Currell
Details withheld	Name withheld
Details withheld	Name withheld

3.2.2 Stage 2 Presentation of information about the project

The aim of stage 2 is to provide the registered Aboriginal parties (RAPs), identified during stage 1, information about the scope of the project and the proposed heritage assessment process.

In accordance with step 4.1.6 of the Consultation Requirements, a list of registered Aboriginal stakeholders and a copy of the published step 4.1.3 advertisement were forwarded to Heritage NSW, Deerubbin LALC and Metropolitan LALC (except for two RAPs who requested their details be withheld in accordance with step 4.1.5 of the Consultation Requirements).

The RAPs were invited to participate in an Aboriginal Focus Group (AFG) meeting held on 22 July 2022 and were presented with an overview of the proposed test excavation methodology (now updated with feedback and included in Appendix C), Archaeological Survey Report (ASR) (Appendix D), and cultural assessment methodology. Comments were sought on any areas of cultural significance during this AFG. A site visit was conducted on 8 August 2022 in consultation with RAPs to give an opportunity to visit the study area and to identify cultural heritage values (see Table 3.2).

Test excavations commenced on 31 October 2022 at PLR2 PAD1 Ermington Boat Ramp in Melrose Park, with RAP Site Officers in attendance (see Table 3.3). However, test excavations were paused on 2 November 2022 due to an unexpected asbestos find. All RAPs were informed about the asbestos that was encountered onsite with regular updates provided as to the next steps.

Test excavations recommenced with additional personal protective equipment (PPE) and under the supervision of a licensed asbestos assessor (LAA) at PLR2 PAD1 Ermington Boat Ramp on 13 December 2022, following the preparation of an exposure control plan and an asbestos awareness training session that was held onsite for archaeologists and RAP Site Officers on 12 December 2022.

On the advice of the LAA, test excavations ceased on 13 December 2022, and all RAPs were notified on 14 December 2022 of the cessation of works until further notice.

Table 3.2 August site visit attendee list

Organisation/Individual	Attendee name
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson
Muragadi Heritage Indigenous Corporation	Aaron Taylor
Darug Custodian Aboriginal Corporation	Dominic Wilkins
Wailwan Aboriginal Group	Philip Boney
Widescope Indigenous Group	Steven Hickey
Butucarbin Heritage	Teagan Pittman
Kamilaroi Yankuntjatjara Working Group	Kadibulla Khan

Table 3.3 Site Officer list for test excavations

Organisation/Individual	Attendee name
A1 Indigenous Services	Carolyn Hickey
Amanda Hickey Cultural Services	Amanda De Zwart
Aragung Aboriginal Cultural Heritage Site Assessments	Korri Currell
Butacarbin	Teagan Pittman

Organisation/Individual	Attendee name
Darug Custodian Aboriginal Corp	Dominic Wilkins
Didge Ngunawal Clan	Lee Carroll, Braydon Boyd Carroll
Kamilaroi Yankuntjatjara Working Group Pty Ltd	Tyrone Pal
Muragadi Indigenous Heritage	Belinda Little
Murra Bidgee Mullangari Aboriginal Corporation	Aaron Taylor
Warragil Cultural Services	Bo Field
Yulay Cultural Services	Arika Jalomaki
Wailwan Aboriginal Group	Phil Boney, Frederick Trewlynn
Details withheld	Name withheld

3.2.3 Stage 3 Gathering information about cultural significance

Stage 3 provides the opportunity for RAPs to recommend culturally appropriate research methodologies for the cultural heritage assessment. At this stage RAPs are invited to provide input to determine the cultural significance of Aboriginal objects and/or places within the study area. In turn they are also given the opportunity to have an input into the development of any cultural heritage management options.

In addition to the Aboriginal archaeological process there would be additional consultation with RAPs and other Aboriginal stakeholders regarding the cultural design principles and interpretation aspects of the project. These activities would be undertaken concurrently to feed into the design development process and would be informed by the outcomes of the Aboriginal archaeological process. Cultural design principles and interpretation activities may include:

- heritage interpretation
- Aboriginal participation in design elements including stations, landscape and public spaces
- Aboriginal participation in focus groups and other participatory processes (such as interviews conducted for the cultural values assessment which is provided in Appendix G).

Outcomes may include the design of light rail stop elements including Aboriginal heritage interpretation aspects, as a result of consultation with Aboriginal knowledge holders and other Aboriginal stakeholders. In this regard, Bangawarra is preparing Designing with Country elements of project design separately in consultation with Aboriginal knowledge holders.

3.2.4 Stage 4 RAP review of draft ACHAR

A copy of the draft Test Excavation Methodology (now updated and included in Appendix C) and ASR (refer Appendix D) were provided to all RAPs to review between 8 July 2022 and 12 August 2022. RAPs were provided the minimum 28 days to review the documents and make comments, request revisions or provide additions that were incorporated into the Preliminary ACHAR and Test Excavation Methodology. Comments on the cultural significance of the study area that were received have been included in section 9.6.2 of this report.

The final stage of the Consultation Requirements requires all registered Aboriginal stakeholders to be provided with a copy of the draft ACHAR for a minimum 28 days to review and provide feedback. Further cultural information may be gathered at this stage and all comments received are then incorporated into the final report. Ongoing consultation with the local Aboriginal community must continue throughout the life of the project.

For this project, the Preliminary ACHAR was publicly exhibited as part of the EIS (minimum 28 days) from 9 November to 16 December 2022, allowing an opportunity for RAPs to provide feedback. In parallel, test

excavations commenced in October 2022 and a cultural values assessment was prepared by an anthropologist informed by interviews with three cultural knowledge holders. The findings of these additional investigations and assessment have informed this updated ACHAR which was provided for RAPs to review on 17 March 2023 to review until 18 April 2023 (minimum 28 days).

A summary of comments received from RAPs on the draft ACHAR and how they were incorporated into the ACHAR is presented in section 9.5.3. In general, the RAPs supported the ACHAR and its recommendations and highlighted the sensitive nature of the project site.

3.2.4.1 Aboriginal Focus Group

The RAPs were invited to participate in a second Aboriginal Focus Group (AFG) meeting held on 27 March 2023 and were presented with the following information:

- project update
- overview of archaeological investigations and updates since completion of preliminary ACHAR, including:
 - determination of significant ground disturbance at Sydney Olympic Park, with no need for further investigation
 - results of the test excavations undertaken in October and November 2022
 - two recently identified shell middens, identified by Transport for NSW cultural heritage officers within and adjacent to the project site at Melrose Park
 - · changes to impact assessment as a result of the test excavations
 - next steps, including further investigations and long term management of artefacts recovered from PAD5 at Broadoaks Park
- overview of the cultural values assessment, its outcomes and recommendations
- overview of designing with County across the project.

The AFG resulted in the following outcomes:

- confirmation that archaeological testing needs to be completed at three PADs and four AHIMS sites prior to construction.
- specifics on how archaeological testing would proceed in future is dependent on future contamination/asbestos management plans
- Transport for NSW to consider reburial of artefacts recovered from Broadoaks Park (PAD5) in an area that would be protected during construction, instead of artefacts remaining in storage throughout construction works. Transport for NSW has since confirmed this could be implemented, and a recommendation has been included within this ACHAR.

A list of RAPs who attended the AFG, both in person and online, is presented in Table 3.5.

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

Table 3.4 March 2023 AFG attendance list

Organisation/Individual	Attendee name
Aragung Aboriginal Cultural Heritage Site Assessments	Jamie Eastwood
Darug Custodian Aboriginal Corp	Justine Coplin
Didge Ngunawal Clan	Paul Boyd
Murra Bidgee Mullangari Aboriginal Corporation	Darleen Johnson
Wailwan Aboriginal Group	Phil Boney
Warragil Cultural Services	Aaron Slater
Yulay Cultural Services	Arika Jalomaki

4 ENVIRONMENTAL CONTEXT

Natural resources available to Aboriginal people and their utilisation are critical in the study area in terms of environmental context to reflect daily life.

This chapter discusses the study area and wider region as necessary, to build an understanding of the subject landscape and patterns of land use. Site types are, to varying degrees, influenced by the local environment. For example, rock shelter and rock art sites are likely to occur where the necessary geology exists. Another important influence on site distribution is the location of current and former watercourses and the availability of water throughout the year. Over the thousands of years that humans have occupied Australia considerable environmental changes have occurred, impacting on how and where Aboriginal peoples lived.

Reconstructions of Aboriginal land use patterns in the Sydney region have been undertaken predominately based on early historical accounts and reconstructions of language groups. Ethno-historical accounts are inevitably subject to the writer's colonial bias; however, they do provide valuable observations of Aboriginal customs, life and continued presence during the early period of European occupation. In discussing the ethno-history of the local area, efforts have been made to adopt commonly accepted spellings. Research regarding language groups of eastern Australia is also subject to limitations, as Aboriginal populations of the Sydney basin were the first to be decimated by the disease and violence which followed European invasion. As such, even the earliest historical records and language research in the Sydney basin is based on observations of significantly reduced and displaced Aboriginal populations. The spread of smallpox, ongoing conflict with the European colonists and reduction of available resources are key causes of Aboriginal dislocation and depopulation in the area. By 1816 Aboriginal people who remained in the region were increasingly dependent on the Europeans for food, clothing and shelter (Kohen, 1986).

A discussion of European land use provides an understanding of the modifications and disturbances to Aboriginal cultural landscapes and potential archaeological deposits which have occurred since European occupation.

The existing archaeological record is limited to certain materials and objects that were able to withstand degradation and decay and is also affected by how often a site/s were visited. As a result, the most common type of Aboriginal objects remaining in the archaeological record of the Sydney region are stone artefacts. Artefact scatters are common indicators of activity in the landscape and may comprise evidence of previous campsites (which may have high densities of artefacts) or knapping events (where a stone material will be shaped into a stone tool) or hunting activities (which may have low densities of artefacts).

4.1 Geology

The underlying geology of a landscape may provide an indication of the variety and location of Aboriginal site types which may be present within that area. For example, rock shelters may be present in geological formations with rocky outcrops, grinding grooves may be present in sandstone formations and proximity to stone tool making resources (such as a silcrete) may indicate the potential for Aboriginal sites associated with raw material quarrying and tool preparation.

The geological context of the study area is shown on Figure 4.1. In some areas the man- made fill is overlying deeper natural geological formations. Man-made fill includes 'dredged estuarine sand and mud, demolition rubble, industrial and household waste' (Herbert, 1983). The western portion of Grand Avenue and portions of the study area to the north of Parramatta River are located across quaternary deposits consisting of 'silty to peaty quartz sand, silt, and clay, ferruginous and humic cementation in places, common shell layers' (Qha) (Herbert, 1983). Man-made fill overlies a tertiary deposit of sand, clay and peat with variable levels of iron (Tm) in the eastern portion of Grand Avenue, towards Thackeray Street, Camellia.

The portion of the study area located to the north of Parramatta River consists of the Triassic aged Wianamatta Group Ashfield Shale (Rwa) which is a dark grey to black claystone-siltstone and fine sandstone-siltstone laminate (Clark and Jones, 1991). This geological formation would have provided few suitable raw stone materials for the manufacture of stone artefacts. Resources would therefore more likely have been procured from elsewhere. The Triassic Hawkesbury Sandstone geological formation also occurs within the study area, consisting of medium to coarse grained quartz sandstone with minor shale and laminate lenses. The presence of sandstone in the surrounding areas would have been an important factor for Aboriginal occupation as sandstone was used for the maintenance and manufacture of stone artefacts such as axes, as a form of shelter (if rock shelters were present), and as a medium for rock art, including engraved and pigment art. Furthermore, stone raw materials that enable conchoidal fracture played an important role in manufacturing stone artefacts.

Silcrete and quartz are predominant raw materials in Sydney's stone tool assemblages and are readily available in the Cumberland Plain and around the study area. Quartz is widely available around the project site, on the sandstone plateau situated on the Cumberland Basin in Tertiary and Quaternary deposits near the Hawkesbury/Nepean River system (Corkill, 1999). Silcrete occurs in paleochannel deposits near to the coast in Newington and the former Olympic Village near the Parramatta River, along with the western part of the Cumberland Basin, Maroota on the Hornsby Plateau and Holsworthy Army Reserve on the Woronora Plateau in the south of Sydney (Corkill, 1999).

The eastern portion of the study area includes Quaternary fluvial deposits (Qha) associated the Parramatta River estuary, that consist of silty to peaty quartz sand, silt and clay overlain by man-made fill, as well as sections of only man-made fill in the southern section (Herbert, 1983). Hawksbury Sandstone, (Rh), located in the Rydalmere area north of the Parramatta River, also consists of organic mud, peat, clay, silt, marine sand and fluvial sand.

Resource distribution and availability is heavily influenced by the type and nature of soils present within a landscape, as different soils support a range of vegetation cover. Information regarding the depth of soils also contributes to an understanding of levels of historical disturbance. Where deep soil profiles or sand bodies exist, intact archaeological deposits may remain even where substantial earthworks and modification have impacted the upper deposits. As such, it is important to note that superficial disturbance, infill and urban development does not automatically negate archaeological heritage values.

4.2 Soil landscapes

Five soil landscapes are located across the study area, not including the 'disturbed terrain' classification (Chapman et al., 2009; Chapman and Murphy, 1989). The soil landscapes are shown in Figure 4.2.

Disturbed terrain is located across level plains to hummocky landscapes, and exhibits land extensively disturbed by human activity including complete disturbance, removal or burial of soil. Local relief is less than 10 metres, and slopes at less than 30 per cent. Landfill includes soil, rock, building, and waste materials. The original vegetation of disturbed terrain areas has been completely cleared and replaced with turf or grassland. Turfed fill areas are commonly capped with up to 40 centimetres of sandy loam or up to 60 centimetres of compacted clay over fill or waste materials. Disturbed terrain is located in areas that were previously swamps, estuaries and wetlands, and was noted along lower reaches of the Parramatta River foreshores. Land uses for areas classified as disturbed terrain includes commercial and business complexes, such as the Camellia portion of the study area. Soils within areas of disturbed terrain have been disturbed to a depth of at least 100 centimetres (Chapman et al., 2009; Chapman and Murphy, 1989).

The Lucas Heights soil landscape is located across the northern embankment of the Parramatta River, as well as Hope Street, Waratah Street and the eastern portion of Boronia Street. The soil landscape consists of gently undulating crests and ridges on plateau surfaces of the Mittagong formation. Local relief is up to 30 metres, and slopes at less than 10 per cent. Rock outcropping is absent. Soils are moderately deep (50 – 150 centimetres), hard setting yellow podzolic and yellow soloths, with yellow earths on outer edges (Chapman et al., 2009; Chapman and Murphy 1989). The upper topsoil (Horizon A1) consists of up to 30 centimetres yellowish brown sandy loam, overlying 10-30 centimetres of bleached sandy clay loam as lower topsoil (Horizon A2). B Horizon is up to one metre of yellowish-brown clay. These soil layers are usually clear and erosion is low.

The Blacktown soil landscape is located across most of Sydney Olympic Park, as well as part of the north-west corner of the study area where John Street and South Street intersect. The Blacktown soil landscape consists of gently undulating rises on Wianamatta Group shales and Hawkesbury shale. Local relief to 30 metres, slopes are usually less than five per cent. Broad rounded crests and ridges with gently inclined slopes. The Blacktown soil is shallow to moderately deep (less than 100 centimetres) red and brown podzolic soils on crests, upper slopes and well drained areas; deep (150-300 centimetres) yellow podzolic and soils and soloths on lower slopes and in areas of poor drainage (Chapman et al., 2009; Chapman and Murphy 1989).

The Quaternary fluvial deposits are associated with a terrace formation known as the Parramatta Sand Body (Kelleher Nightingale Consulting (KNC), 2017). The river terrace extends from the relatively narrow floodplain along the banks of the river to the base of the adjoining shale slopes and is wider on the southern side of the river channel. The sand body is mapped based on the predictive model and auger holes investigating the extent of this alluvial terrace (Williams et al., 2021; Groundtruth Consulting, 2008; 2011) The extent of the Parramatta Sand Body is well documented beneath much of modern Parramatta which includes the Parramatta turnback facility section of the project site. However, it has not been identified in the disturbed terrain at Camellia or the reminder of the study area. A portion of the sand body is listed on the NSW State Heritage Register (SHR No. 01863) and contains significant Aboriginal archaeology.

The alluvial sand body was first identified in 2003, during salvage excavations for a residential development at the corner of George and Charles Street in the Parramatta CBD. The AHIMS site 5-6-2648 (CG1) uncovered approximately one metre deep archaeological layer which contained the sand body (Jo McDonald, 2005) Geomorphological investigations identified the alluvial nature of this sand body and its characteristics which was divided into two main periods of use:

- 1. a lower assemblage (between 20—80 centimetres from the ground surface) broadly considered to be of terminal Pleistocene age (approximately 10,000 to 20,000 years old)
- 2. and an upper assemblage (less than 20 centimetres from the ground surface) identified to be dated to the last 3,000 years (GroundTruth Consulting, 2008; 2011; Williams et al., 2021).

The Parramatta Sand Body has a well-developed but varied soil profile. Topsoil materials are generally disturbed by European activities. Where the subsoils are intact, they typically consist of yellow orange or yellow brown sandy clay with an earthy (porous) fabric that becomes paler and slightly mottled with depth. The upper parts of the soil profile are usually heavily mixed. In places the sand is cut by deposits of mottled or gleyed clay that were probably deposited in swamps or waterholes on the terrace surface. The reasonably defined levee, 50 to 100 centimetres high, along the terrace edge between Charles and Alfred streets, comprises cleaner and very slightly coarser sand than the sand found around the margins of the levee.

The profile of the sand suggests that the main body of sand is of late Pleistocene age and recent thermoluminescence dates obtained from an excavation undertaken at 140 Macquarie Street (Comber Consultants, 2010), have shown that the top of the undisturbed sand (below the level of Aboriginal occupation) is between 50,000 to 58,000 years old. Deeper sand could be much older and may relate to a period of a higher sea level about 120,000 years ago.

Recent excavations at George Street, Parramatta presented dates between 43,000 to 49,000 years old, however disturbance of a ceramic artefact in lower depths and bioturbation in upper levels raised questions about the intactness of the soil profiles (GML Heritage, 2019; Williams et al., 2021). Furthermore, excavations in Cumberland Hospital in north Parramatta uncovered similar Optically Stimulated Luminescence dates approximately 50,800 (± 3,600) years old.

The deepest sections of the Parramatta Sand Body found on the banks of the Parramatta River via these limited excavations has the potential to contain the complete stratigraphy of human occupation of the region (Williams et al., 2021). Indurated mudstone/tuff/chert stone artefacts in low densities (generally below 10 artefacts per square metre) were evaluated to reflect such deep-time occupation which were indicative of ephemeral or transient occupation. This earlier deposit becomes shallower with increasing distance from the river however, all sections of the Parramatta Sand Body contain extensive evidence from the mid-Holocene (7,000 to 5,000 years ago).

Two major phases of past use were identified by Williams et al. (2021):

- 1. initial and repeated visitation in the terminal Pleistocene and early Holocene, characterised by an indurated mudstone/tuff/chert artefacts, dominated assemblage of relatively expedient technologies
- 2. a more intense occupation of the river corridor in the mid-late Holocene, and characterised by a silcrete dominated assemblage with a variety of tool types and increasingly complex technologies (e.g. backed artefacts, heat treatment, ground axes).

Much of the original sand body is likely to have been destroyed by the construction of modern buildings, but patches of the sand body are preserved beneath modern development and on vacant land. The level of disturbance (and hence Aboriginal archaeological potential) is closely related to the nature of excavation works associated with modern development – in many cases deep excavation and the introduction of fill for foundations and basements has severely impacted the sand body. In other cases, where fill material has been placed on the existing surface, the sand body (and any associated archaeology) may be preserved intact beneath the modern urban landscape. The sand deposit is approximately 69 hectares in size, mainly four to seven metres above the Parramatta River's surface area and extending around 2.5 kilometres along the river's southern edge between Parramatta Park and Clay Cliff Creek and extends approximately up to 300 metres to inland (Figure 4.2) (Williams et al., 2021). It is documented that nearly 19 hectares of the deposit has been destroyed through urbanisation mainly in the eastern part of the Parramatta CBD. However, depending on location, the thickness of the deposit can extend up to three metres before reaching underlying geological layers, which were recorded in excavations at 140 Macquarie Street and the adjacent Cumberland Press site. The data from excavations at 2-8 River Road and 95-95A Marsden Street, both found the edge of the alluvial terrace as hypothesised by the desktop data, and proved the accuracy of the mapping.

The Glenorie soil landscape is located across most of South and Boronia Streets within the study area which is an erosional soil landscape and consists of undulating to rolling low hills on Wianamatta Group Shales. Local relief is 50-80 metres, slopes 5 – 20 per cent and includes narrow ridges, hillcrests and valleys. Glenorie soils are shallow to moderately deep (less than 100 centimetres) red podzolic soils on crests, moderately deep (70 – 150 centimetres) red and brown podzolic soils on upper slopes, deep (greater than 200 centimetres) yellow podzolic soils and greyed podzolic soils along drainage lines (Chapman et al., 2009; Chapman and Murphy, 1989). The topsoil (Horizon A1) usually consists of up to 15 centimetres of dark brown loam overlying up to 30 centimetres of brown clay loam as lower topsoil (Horizon A2). B Horizon occurs as reddish-brown clay approximately one metre thick.

The Birrong soil landscape is located across the Sydney Olympic Park Wharf and Hill Road section of the study area and consists of level to gently undulating alluvial floodplain draining Wianamatta Group shales (Chapman et al. 2009; Chapman and Murphy, 1989.) The local relief is up to five metres, slopes are less than three per cent and includes broad valley flats. Soils are deep (greater than 250 centimetres) yellow podzolic soils and yellow solodic soils (indicates a contrast between the texture of the A and B horizons, mostly that the A horizons are acidic and the B horizons are alkaline) on older alluvial terraces, deep (greater than 250 centimetres) solodic soils and yellow solonetz on current floodplain.

The Ettalong soil landscape covers a small portion of the study area to the north of Sydney Olympic Park and consists of level to very gently undulating coastal swamps (Chapman et al., 2009; Chapman and Murphy, 1989). Local relief is less than 5 metres, slopes less than two per cent. The water table is at less than 100 centimetres below ground surface. Areas have hummocky surfaces, shallow lakes and very shallow water tables. Soils are deep (less than 150 centimetres) organic acid peats, peaty podzols, and humus podzols often overlying buried siliceous sands. Soil landscapes and landforms can be indicators of favourable occupation sites. Previous archaeological studies in the region concluded that the Parramatta Sand Body and other alluvial soil landscapes are rich in archaeological deposits.

4.3 Topography and hydrology

The study area is situated on flat to undulating lowlands of the Cumberland Plain generally less than 80 metres in elevation (Attenbrow, 2010). Distance from water is an important factor affecting Aboriginal occupation patterns and therefore site distribution. Availability of fresh drinking water is likely to have had an influence on the selection of areas Aboriginal peoples inhabited, either as a transitory visit or a prolonged (or repeated) campsite area. Saltwater sources may have offered a variety of edible fish, shellfish and other marine life, and within NSW shell middens have been recorded on headlands, beaches, estuaries, and along the banks or inland rivers, creeks and lakes (OEH, 2013). Intensive development and urbanisation of the Western Sydney region has had a considerable impact on the historical alignments of water courses and ephemeral drainage lines. The Parramatta River's riverine landscape was modified as early as 1791 (Hoskins, 2015). Prior to European colonisation, the river was a shared food source, a way for transport and a territorial boundary for the Aboriginal people. These changes in the river landscape reshaped the ecology around the river and affected the natural resources which Aboriginal people can obtain.

White and McDonald (2010, p. 22) considered Aboriginal land use and distance from water in relation to the stream order (stream order assigns a numeric order to links in a stream network, based on their number of tributaries). The stream order model relates the spatial distribution of Aboriginal sites and their distance from water. The model found the following:

In first order landscapes, there is no significant difference in artefact distribution with distance from water. In second order landscapes, artefact density is highest within 50 metres of water and decreases with increasing distance from water. In fourth order landscapes, artefact density is highest 51-100 metres from water, lower closer to water and declines with increasing distance more than 100 metres from water.

The study area crosses the Parramatta River between Camellia and Rydalmere and between Melrose Park and Wentworth Point. The Parramatta River is a mangrove lined, tidal drowned valley estuary and provides both salt and freshwater resources. The river is a Strahler stream order 3 + (CT environmental, 2016, p. 11). The Parramatta River originates at Toongabbie Creek and flows eastward, fed by numerous creeks from the north and south eventually becoming Port Jackson. Creeks in the area include Ponds Creek, Subiaco Creek, Clay Cliff Creek and Vineyard Creek. Haslams Creek (formerly Hackings Creek), a southern tributary of Parramatta River, flows through the study area at Sydney Olympic Park (see Figure 4.3). Haslams Creek joins the Parramatta River at Homebush Bay. Prior to the 2000 Sydney Olympic Games, Haslams Creek consisted of a

concrete-lined stormwater channel. The creek was reconstructed in a natural shape prior to the Olympic Games. Haslams Creek is now an important estuarine ecosystem (Education and Communities, 2012).

The Parramatta River catchment is made up of 29 sub-catchments which is referred to as the Upper and Lower Parramatta River. A hydrology, flooding and water quality technical report being prepared for the environmental impact statement notes that the study area is located within the Upper Parramatta River section and are subject to mainstream and overland flooding. Mainstream flooding results from the Parramatta River and its tributaries, including Haslams Creek.

Haslams Creek is located in the south section of the study area and is a highly modified second order stream. The creek is estuarine which drains into the Parramatta River at Homebush Bay. The catchment of Haslams Creek is highly urbanised with the upper extents concrete lined opened channels and pipes. Nuwi Wetland is open to Haslams Creek which connects Narawang Wetland via a floodway under Hill Road. The floodway allows flood flows from Haslams Creek to enter Narawang Wetland. These hydrological systems encompassing the study area would have provided a variety of resources for Aboriginal people, however, the recent modifications and channelling of these waterways would have impacted most of the intact soil profiles.

4.4 Flora and fauna

The study area has been cleared of most native flora, particularly in areas identified as disturbed terrain or consisting of man-made fill. Prior to European occupation, low, eucalyptus open-forest and low eucalyptus woodland with a sclerophyll shrub understorey would have been present in the Lucas Heights soil landscape region. The Blacktown, Glenorie and Birrong soil landscapes have been almost completely cleared of eucalyptus woodland and tall open-forest (wet sclerophyll forests). The Ettalong soil landscape is located across swampy areas and vegetation is often arranged in concentric zones around the swamp. Species variation is dependent on local salinity levels and height above the water table (Chapman et al. 2009; Chapman and Murphy, 1989). The Haslams Creek's associated wetland is the Narawang Wetland. The Narawang Wetland is an artificially constructed freshwater wetland at Sydney Olympic Park covering approximately 26 hectares. It extends along a 1.6 kilometre corridor and consists of an ornamental lake, three large stormwater collection ponds and 22 smaller habitat ponds. Remnants of the eucalyptus forest are preserved in the Newington Armory (Perrin, 2008).

Original vegetation communities would have provided habitats for a variety of animals, as well as potential food and raw material sources for Aboriginal peoples. Various banksia species were collected and used to manufacture needles for basket and mat weaving, while the fruit of the geebung (Persoonia) was eaten and string and fishing lines were soaked in a geebung bark infusion to prevent fraying (Nash, 2004, p. 2-4). Eucalyptus trees were a particularly important resource; leaves were crushed and soaked for medicinal purposes, bowls, dishes and canoes were made from bark, and spears, boomerangs and shields were crafted from the hard wood (Nash, 2004, p. 8). Canoes were likely to have been made from the bark of the Bangalay (Eucalyptus botryoides), Stringybark (Eucalyptus agglomeratis), She Oak (Casuarina stricta) and River Oak (Casuarina cunninghamiana) trees, which were present in the forests surrounding the Parramatta River (Dallas, 2003, p.33), Typical animals which may have been hunted, trapped, smoked, speared, fired or clubbed by Aboriginal peoples include possums, flying foxes, goannas, wallabies and kangaroos (Dallas, 2003, p. 33). The hides, bonesand teeth of some of the larger mammals may have been used for Aboriginal clothing, ornamentation, or otherimplements (Attenbrow, 2010, p. 70-76). Smaller animals and native fruits and berries were also important to the Parramatta Aboriginal economy. Ants and grubs were valuable protein and carbohydrate sources (Dallas, 2003, p.34). The close proximity to the saltwater portion of the Parramatta River meant that fish, shellfish, eels and fishing also provided a varied diet (City of Parramatta, 2017a). Fresh water streams entering the river supportedducks, mullet, crayfish, shellfish and turtles (Dallas, 2003, p. 33).

Threatened species within the study area are presented and assessed in the Updated Biodiversity Development Assessment Report.

Much of the study area consists of disturbed land, which has been subject to historical vegetation clearing. While the majority of original vegetation and other natural features along the project site have been removed or modified, some natural features still remain. Native vegetation communities in the study area, particularly in Melrose Park, Wentworth Point and Sydney Olympic Park, are associated with riparian and intertidal environments along the Parramatta River and are characterised by mangroves, saltmarsh and Casuarina glauca (Swamp Oak). Estuarine Swamp Oak Forest and Estuarine Saltmarsh are consistent with threatened ecological communities listed under the *Biodiversity Conservation Act 2016* (NSW) (BC Act) and the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act). A series of wetlands occur south of the Parramatta River and adjacent to the project site in the Newington Nature Reserve and Millennium

Parklands, and along Haslams Creek. A range of listed threatened species are associated with these areas, including the Green and Golden Bell Frog.

The main potential for adverse impacts on biodiversity would occur during construction. About 2.6 hectares of native vegetation would be removed. This includes about 1.6 hectares of vegetation that is listed as a threatened community under the *Biodiversity Conservation Act 2016* and/or the EPBC Act. Construction of the proposed bridges has the potential to affect about one hectare of aquatic habitats (wetlands) classified as protected marine vegetation under the *Fisheries Management Act 1994*.

Construction also has the potential for indirect impacts on biodiversity as a result of activities within the project site, including edge effects and noise impacts on fauna.

Biodiversity offsets would be finalised to mitigate potential residual impacts on biodiversity in accordance with the NSW Biodiversity Offsets Scheme and in consultation with the NSW Department of Planning and Environment (Environment, Energy and Science Directorate). The potential impacts that are not avoided or offset would be managed in accordance with the biodiversity management plan.

4.5 Land use and disturbance

The environmental context of the study area indicates that it would have been most suitable for utilising resources and occupation by the Aboriginal communities of western Sydney prior to colonisation. The area would have been rich in natural resources, with the Parramatta River and freshwater creeks forming a focal point of cultural and economic activity.

Large parts of the study area, in particular the areas to the south of Parramatta River in Camellia and Sydney Olympic Park, were subject to extensive vegetation clearance, introduction of man-made fill and land remediation/reclamation from as early as 1810.

Soils within areas identified as disturbed terrain have been characterised up to a depth of 100 centimetres. However, it is possible that areas of potential archaeological deposits remain underneath areas of remediated land in Sydney Olympic Park as intact soils and geological formations may be effectively capped by overlying layers of disturbance and fill. The industrial area in Camellia is associated with land reclamation of up to 2.6 metres where intact soil profiles extend between 2.6 metres to 15.8 metres.

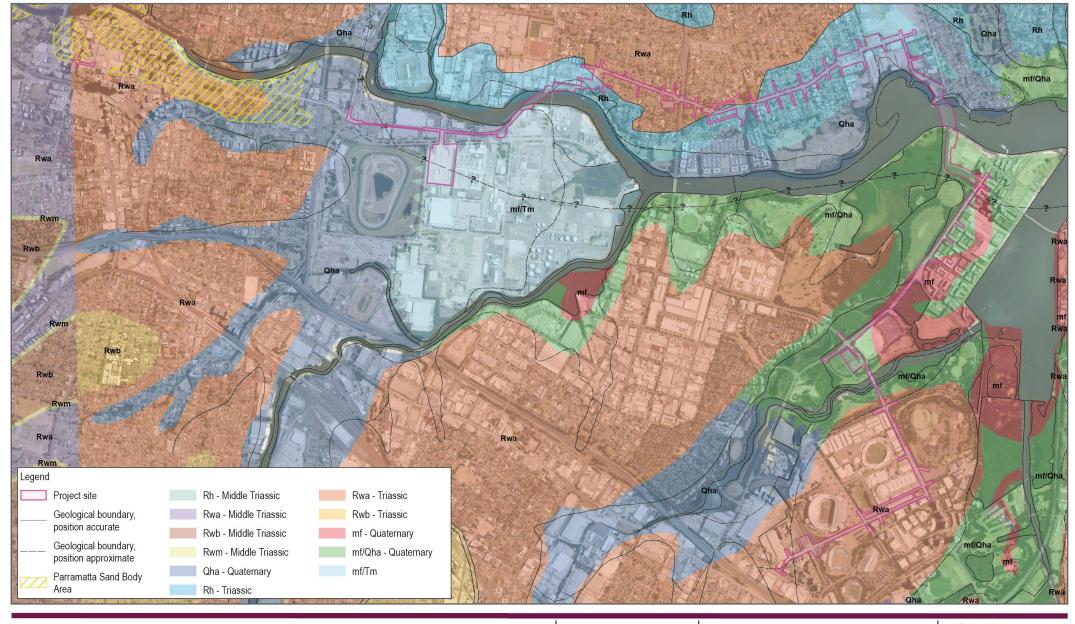
The study area is a rich cultural landscape whereby Aboriginal people maintained cultural practices prior to and following colonisation. Landscape markers surrounding the study area, such as Parramatta River are culturally significant, and there is a growing body of archaeological evidence, Aboriginal memories and historical records that demonstrate the continuation of Aboriginal cultural practices into the colonial period. Soon after Governor Phillip's arrival with the First Fleet in 1788 and founding of a penal colony at Sydney Cove, Captain Arthur Phillip and others landed at the junction of the Parramatta River and Duck River and explored the upper reaches of the Parramatta River and surrounds (Kass et al., 1996). During the exploration, Phillip's party came across Aboriginal campsites, hunting traps and fireplaces (Kass et al., 1996). Parramatta (originally known as Rose Hill) was developed as a farming settlement to feed the new English colony. Phillip chose the area as the soil was found to be more suitable for farming than the area surrounding the settlement of Port Jackson. This colonisation led to the immediate displacement of local Aboriginal communities from the land that they had inhabited for thousands of years (City of Parramatta, 2017b).

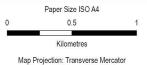
By 1790 fruit trees were planted, cattle introduced and crops, including wheat, barley, maize and oats, were being cultivated. Timber was rapidly exploited, and land was cleared for agricultural purposes, dramatically altering the landscape. One hundred convicts worked on the 'Experiment Farm' and the construction of Parramatta town. By 1789 James Ruse was occupying and cultivating land at Experiment Farm, which was later granted to him (Kass, 2008). In 1792, 30 acres of land was granted to Charles Smith on the site of what is now the North Parramatta Cumberland Hospital Precinct (Arfanis, 2015). Farming continued in the area under a succession of governors (City of Parramatta, 2017a). Tensions rose as the European colonists inexorably claimed land for their uses and depleted the resources available for local Aboriginal communities.

The traditional methods for food procurement were becoming increasingly difficult for Aboriginal people (Tanner Kibble Denton Architects (TKD Architects), 2017). Similarly, food-gathering patterns were disrupted by the lack of access to their traditional lands, due to farming by the new settlers. Limited opportunities were offered by the Europeans willing to barter spirits and tobacco, and even food, for fish. At the turn of the century, conflicts were recorded between the settlers and the Aboriginal communities in the Nepean and Hawkesbury districts. Records indicate the Parramatta region was relatively peaceable compared to the massacres of Aboriginal peoples in places such as Appin and Mulgoa (Dallas, 2003). However, it is important to note that the lack of

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

records does not indicate that violence did not occur in a region, merely that it was not recorded, or records no longer exist.)





Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56

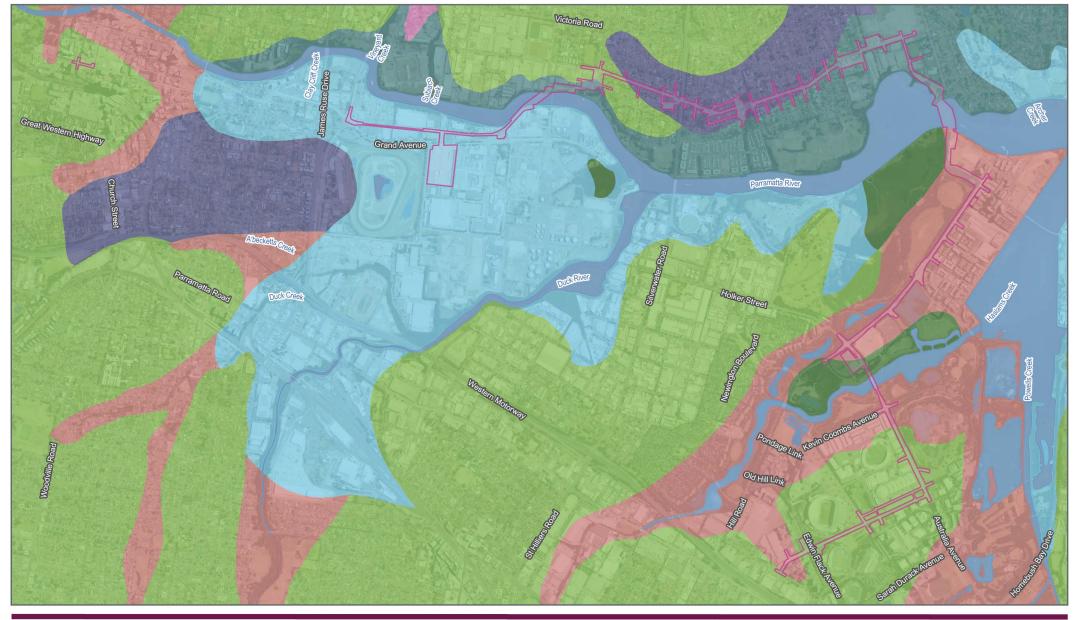


Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Geology of the project site and surrounds

Project No. **12557728** Revision No. 2

Date 08/03/2023





Paper Size ISO A4 0.5 Kilometres Map Projection: Transverse Mercator Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 56



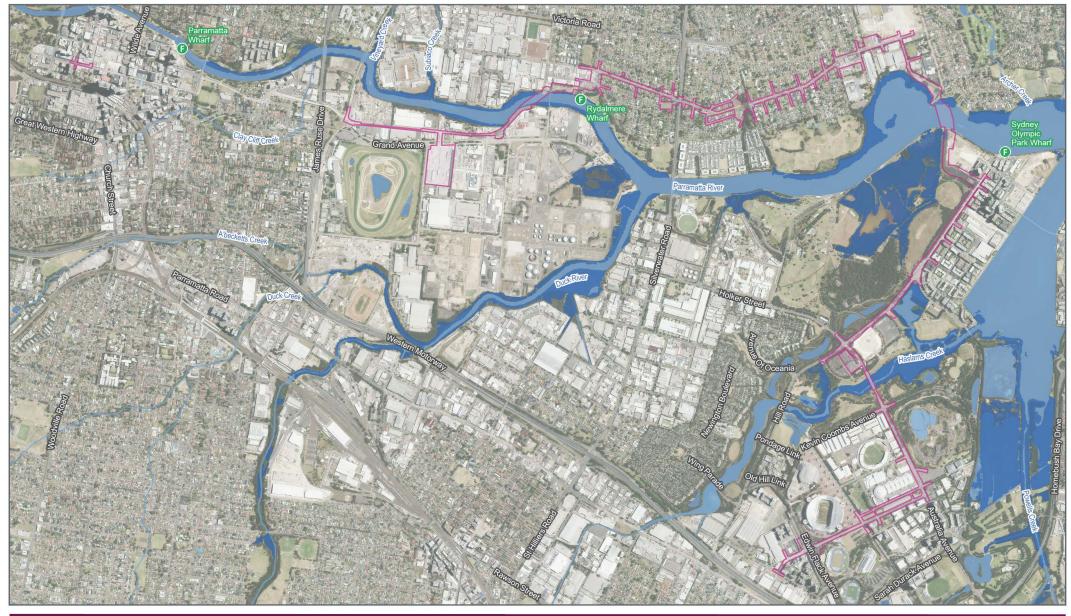


Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Soil landscapes of the project site and surrounds

Project No. 12557728 Revision No. 2 Date 08/03/2023

FIGURE 4.2





Project site

Coastal wetlands

Waterbodies

Paper Size ISO A4 Kilometres

Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Hydrology of the project site and surrounds

Project No. 12557728 Revision No. 2 Date 08/03/2023

Watercourse

Ferry Wharf

5 ARCHAEOLOGICAL CONTEXT

5.1 Aboriginal history in the area

The original inhabitants of the Parramatta region are the Burramattagal peoples, of the Darug people who first settled on the upper reaches of Parramatta River (City of Parramatta, 2017a). The term 'Darug' was only applied to a language group after 1870 (Attenbrow, 2010).

The Darug comprised a number of sub-groups often referred to as 'clans'. The Burramattagal peoples are the western-most Eora clan, who are part of the harbour-side katungal 'sea people'. Parramatta marks the border between the cultures of the sea people, and the inland paiendra or 'tomahawk people' (Flynn, 1995). The Wangal peoples are also a clan of the Eora and inhabited the southern shore of the Parramatta River. The Darug, or Dharruk, language was spoken across the Cumberland Plain region, which stretched from Appin in the south to the Hawkesbury River in the north, and west of the Georges River, Parramatta and Berowra Creek (Attenbrow, 2010, p.34). The Burramattagal peoples are likely to have spoken a common dialect with other groups who lived on the lands between Sydney Cove and Parramatta, with local variances between people on the coast and those inland. The Burramattagal peoples appear to have belonged to smaller groups, consisting of multiple extended families. These groups ranged in size from 30 to 70 plus (Dominic Steele, 2013, p. 41). The Burramattagal and Wangal peoples rotated seasonally through campsites, depending on their needs (McClymont, 2008).

Parramatta was a resource rich zone which supported Aboriginal occupation and was at the centre of human activities. The Parramatta River banks and the mostly freshwater stream now known as Clay Cliff Creek (located to the west of James Ruse Drive) were vital sources of food and living resources. The boundary between Burramattagal country and their neighbours, the Wategora clan, seems to have been the Duck River (Kohen, 1993 in McClymont, 2008).

The bark canoes of Burramattagal peoples have been recorded as holding a 'central small fire, built on a mound of soil, to cook up their fresh catch' and 'fire-stick farming', employed to burn vegetation to facilitate hunting and to change the composition of plant and animal species in the area, was also practiced by the Burramattagal people.

Aboriginal site types recorded in the Parramatta region frequently include rock shelters with deposits, open campsites (artefact scatters) and open middens. Surface scatters are generally sparse and partially disturbed (Dallas, 2003, p. 29). Grinding grooves and shell middens have also been recorded and are generally located adjacent to watercourses. Burials can be associated with shell middens, and also can be found in coastal sand dunes (Attenbrow, 2012). Culturally modified trees (or scarred trees) have been recorded on suitable remnant old growth trees. Cultural modification may comprise evidence of bark removal for the purposes such as construction of bark containers canoes or shields and, as such, vary greatly in size (Dallas, 2003,p. 29).

The history of Aboriginal people after the arrival of the First Fleet and subsequent occupation of the land by British colonists is presently poorly understood. In part this is due to a tendency to study sites away from urban centres (Irish and Goward, 2012). Aboriginal people living around Parramatta tended to avoid the early exploratory parties but as the settlement at Parramatta was established and grew in size, interactions became more frequent with European colonists. Exchanges between local Aboriginal people and the military officers were recorded as indicators of good relations during the early years of the settlement. Collins (1798) described the exchanges of fresh fish for bread and salted meat: "Since the establishment of that familiar intercourse which now subsisted between us and the natives, several of them had found it their interest to sell or exchange fish among the people of Parramatta; they being contented to receive a small quantity of either bread or salt meat in barter for mullet, bream and other fish. To the officers who resided there this proved a great convenience, and they encouraged the natives to visit them as often as they could bring them fish".

Unfortunately, this trade was stopped following the destruction of a canoe by convicts, with the ensuing conflict effectively souring the previously friendly relations (KNC, 2017).

By the 1810s, a 'Native Institution' was suggested by William Shelley to teach Aboriginal children literacy as well as religious values, domestic and agricultural skills planned to be opened in Parramatta (Brook and Kohen, 1991). The school was located on a large area (encircled by Macquarie, Marsden and Hunter Streets) near 'the Church of Parramatta'. Governor Macquarie announced the first Aboriginal Annual Feast on 28 December 1814 to mark the opening of the institution at the marketplace encouraging Aboriginal families to send their children to the institution. The feast continued as an annual gathering and event in Parramatta from 1814-1835. Macquarie and subsequent Governors used the event as an opportunity to diffuse tensions between Aboriginal people and

new settlers, to promote the Native Institution as well as to distribute clothes and blankets (Turbet, 1989). The site for the Native Institution lies within the study area in the Parramatta CBD.

Historical records from the first years of the colony document the disastrous effect smallpox had on the Aboriginal people of the area (Collins, 1798,496) which decimated the population and had an irrevocably damaging impact on social organisation (McDonald, 2008). Inevitably, with increasing British settlements and land use from the late 18th century onwards, Aboriginal people became alienated from their land and marginalised within their own country. A recent shift in research focus has however, begun to provide some indicators of the nature of continuing Aboriginal settlement in areas of the Sydney Basin after 1788 (Karskens, 2019).

This research suggests an enduring culture that adapted to change and integrated new material culture into existing practices. Art sites continued to be created in the area with new imagery such as axes and rifles being incorporated, indicating a continuation of cultural practice (Irish, 2017). At least 70 historical Aboriginal settlements are known (Irish and Goward, 2012) across the Sydney basin dating to the late 18th and 19th centuries. These include sites where Aboriginal adaptation and tenacity are present as evidenced by the creation of new object types such as flaked glass and, in a few instances, knapped ceramic. Midden sites from the post-1788 period have also been found to contain introduced items such as metal and buttons, however others from this period are known to be devoid of any introduced material. The adaptation of burial practices has also been documented, with examples including the burial of a 30 year old woman in Rose Bay whose body was arranged in a traditional manner but with the inclusion of introduced items such as scissors and other metal objects (Donlon, 2003; 2008 in Irish and Goward, 2012).

It is important to note that sites of significance to Aboriginal peoples are not limited to physical objects, markers or landscapes. Intangible cultural heritage is a living tradition and continued expression of culture. The Parramatta region is located within a culturally significant landscape to Aboriginal peoples of the past, present and future.

5.2 Aboriginal Heritage Information Management System

5.2.1 Search parameters

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database was undertaken on 3 March 2023 encompassing the study area with a buffer of around 500 metres. There are known limitations within the AHIMS database. AHIMS data has been recorded over many years in various geographic recording systems. Due to errors in reprojection of data, the registered location of some sites can be in error of up to 200 metres which is why a buffer is usually applied when undertaking searches.

The following search parameters were used:

Parramatta Light Rail Stage 2 Alignment

Datum: GDA 94 MGA Zone 56
Eastings: 316850 – 322860
Northings: 6252200 – 6257530

Sites: 19

Parramatta CBD turnback facility

Datum: GDA 94 MGA Zone 56 Eastings: 314842 – 315370 Northings:6256355 – 6256795

Sites: 13

The extensive search results are included in Appendix B.

5.2.2 Summary of extensive search

The extensive search identified 32 Aboriginal sites (see Table 5.1 and Figure 5.1). Of the 32 sites, two are listed as 'not a site' (AHIMS 45-6-2636 and AHIMS 45-6-2682), therefore the total number of registered Aboriginal sites is 30. The most common site types in the study area are PADs (17 in total), followed by artefacts (six in total) in relation to the other site types (see Table 5.2). The status of the sites provided is based on the extensive search results and some of these site cards may not be up to date.

Table 5.1 Summary of AHIMS within the searched coordinates

AHIMS	Site Name	Site Type	Status
45-6-2312	Subiaco Ck 1	Open Camp Site (Artefact)	Valid
45-6-2313	Subiaco Ck 2	Open Camp Site (Artefact)	Valid
45-6-2559	Sydney Turf Club Carpark, STC Carpark	Open Camp Site (Artefact)	Valid
45-6-1961	Ermington 1	Midden	Valid
45-6-2636	Ermington PAD	Potential Archaeological Deposit (PAD)	Not a Site
45-6-2682	Wanngal Woodland Axe- Marked Tree	Modified Tree (Carved or Scarred)	Not a Site
45-6-2683	Wanngal Woodland IF1	Potential Archaeological Deposit (PAD)	Valid
45-6-2684	Wanngal Woodland IF2	Potential Archaeological Deposit (PAD)	Valid
45-6-2685	Wanngal Woodland IF3	Potential Archaeological Deposit (PAD)	Valid
45-6-2785	Wanngal Woodland PAD2	Potential Archaeological Deposit (PAD)	Valid
45-6-2786	Wanngal Woodland PAD1	Potential Archaeological Deposit (PAD)	Valid
45-6-2864	George Kendall Ermington	Shell	Valid
45-6-3108	42 Bridge Street Rydalmere PAD	Potential Archaeological Deposit (PAD)	Valid
45-6-3039	Meadowbank Park Tennis Courts RYDE 203	Grinding Groove	Valid
45-6-3151	UWS Rydalmere OS 1	Artefact	Valid
45-6-3827	Clyde PAD 01	Potential Archaeological Deposit (PAD)	Valid
45-6-2679	Parramatta Children's Court	Potential Archaeological Deposit (PAD)	Valid*
45-6-2978	41 Hunter Street PAD	Potential Archaeological Deposit (PAD)	Valid
45-6-1523	George St Parramatta; Family Law Courts;	Artefact	Valid**
45-6-4015	Church St PAD-1	Potential Archaeological Deposit (PAD)	Valid
45-5-3630	Macquarie St PAD	Potential Archaeological Deposit (PAD)	Destroyed
45-6-2977	Macquarie St PAD 3	Potential Archaeological Deposit (PAD)	Valid
45-6-3818	St Johns Cathedral Background Artefact Scatter	Artefact	Valid

AHIMS	Site Name	Site Type	Status	
45-6-2795	150 Marsden Street Parramatta PAD	Potential Archaeological Deposit (PAD)	Valid	
45-5-4097	O'Connell St PAD1	Potential Archaeological Deposit (PAD)	Valid	
45-6-3767	85-97 Macquarie St	Potential Archaeological Deposit (PAD)	Valid	
45-6-2751	Marsden St Carpark	Artefact and Potential Archaeological Deposit (PAD)	Valid**	
45-6-3582	Macquarie Street PAD	Potential Archaeological Deposit (PAD)	Valid	
45-6-2686	Civic Place PAD	Artefact and Potential Archaeological Deposit (PAD)	Partially Destroyed	
45-6-4079	Ermington SHL 02	Shell	Valid	
45-6-4078	Ermington SHL 01	Shell	Valid	
45-6-4076	PLR2 PAD5 Broadoaks Park	Potential Archaeological Deposit (PAD)	Valid**	

^{*} The site noted as destroyed on the site card, **the site was subject to test excavations

Table 5.2: Summary of extensive AHIMS search results by site type

Site type	Frequency	Percentage
Artefact	6	20%
Potential Archaeological Deposit (PAD)*	17	56.7%
Midden	4	13.3%
Grinding Groove	1	3.3%
Artefact and Potential Archaeological Deposit (PAD)	2	6.7%
Total	30	100%

^{*} Two sites from the search results have not been included as they are not considered a valid site.

5.2.3 AHIMS within project site and surrounds (at time of public exhibition)

Two registered AHIMS sites are located within the project site.

- AHIMS 45-6-2977 is located on Macquarie Street, based on the site card map, between the
 intersections of Church Street and across to the intersection of O'Connell Street. The site was
 registered in 2011 by Comber Consultants as a PAD located in an area where the Parramatta Sand
 Body was identified with intact soil profiles.
- AHIMS 45-6-4015 is located at 197-207 Church Street and 89 Marsden Street. The site includes a PAD within the Parramatta Sand Body which has potential for Aboriginal heritage and contact archaeology. The site was recorded by Biosis in 2022 as it may hold evidence for early 19th century feasts between Aboriginal and European people including, the Native Institute for Aboriginal Children.

Thirteen registered sites are located within 200 metres:

- AHIMS 45-6-2785
- AHIMS 45-6-2786
- AHIMS 45-6-2683
- AHIMS 45-6-2559
- AHIMS 45-6-3582
- AHIMS 45-6-3767
- AHIMS 45-6-3818

- AHIMS 45-6-2686
- AHIMS 45-6-1523
- AHIMS 45-6-2978
- AHIMS 45-6-2795
- AHIMS 45-6-2679
- AHIMS 45-6-4097.

Of these, the closest to the project site is AHIMS 45-6-2785 in Sydney Olympic Park. It was identified in 2006 and has geocoordinates showing it being located 20 metres west of the study area along Hill Road in Sydney Olympic Park. It is in an area observed to have a thin amount of remnant soil with the potential to contain archaeological deposits. However, based on the description and site card map, the actual location of this PAD is around 50 metres west of the project site along Hill Road in the Millennium Parklands.

5.2.4 Recently registered AHIMS within project site and surrounds

Since public exhibition of the EIS and Technical Paper 4 (Preliminary Aboriginal Cultural Heritage Assessment Report), three new AHIMS sites have been registered following fieldwork (see Table 5.1). These sites are PLR2 PAD5 (45-6-4076) at Broadoaks Park, Rydalmere and two new shell middens (AHIMS 45-6-4078 and 45-6-4079) at Melrose Park.

PLR2 PAD5 (45-6-4076) was subject to test excavations between 1 and 2 November 2022 and the test excavations results are presented in Section 8.2. An Aboriginal Site Impact Recording Form was submitted to AHIMS system (Quarantine Station) reflecting the test excavation results.

The shell middens (AHIMS 45-6-4078 and 45-6-4079) were registered on 22 February 2023 following a site visit on 21 February 2023 by Transport for NSW cultural heritage offices and a representative of the Metropolitan LALC, which was undertaken to follow up on the potential presence of a midden noted in one of the community submissions on the EIS. These shell middens are located within the mangroves in Melrose Park. This area is located within a Coastal Wetlands Area specified in the State Environmental Planning Policy (Coastal Management) 2018 and contains protected marine vegetation under the *Fisheries Management Act 1994*. The ariel imagery of this area from 1930 indicates these sites are located in tidal river shores (Figure 5.2).

Further information regarding the middens taken from the site cards is provided as follows:

- AHIMS 45-6-4078 (Ermington SHL 01) is located 30 metres east of the project site. The shells were
 recorded within the mature mangroves and are scattered in an area around 21.5 metres in length and
 1.5 metres in depth (Plate 5.1, Plate 5.2 and Plate 5.3). Shells from five different species were identified
 during the site visit, including mud oyster, periwinkle, pippi, turban and ribbed cockle (Plate 5.4). The
 importance of the site could not be determined however, the site card has noted further advice will be
 sought from the Metropolitan LALC.
- AHIMS 45-6-4079 (Ermington SHL 02) is located within the project site. The visible extent of this site is relatively smaller than AHIMS 45-6-4078, covering an area of 15 by five metres (see Plate 5.5, Plate 5.6). A variety of shell species, including mud oyster, periwinkle, pippi, turban and ribbed cockle, were identified during the site visit (see Plate 5.7, Plate 5.8). The importance of the site could not be determined however, the site card has noted further advice will be sought from the Metropolitan LALC.

Plate 5.1 Aspect north detail of shells at 45-6-4078 (supplied by Transport for NSW)



Plate 5.3 Detail view of shell midden in mangroves (supplied by Transport for NSW)



Plate 5.2 Aspect west shell midden in length (supplied by Transport for NSW)



Plate 5.4 Detail view of shells (supplied by Transport for NSW)



Plate 5.5 Aspect south general view of AHIMS 45-6-4079 (supplied by Transport for NSW)



Plate 5.7 Detail view of shell midden in mangroves (supplied by Transport for NSW)

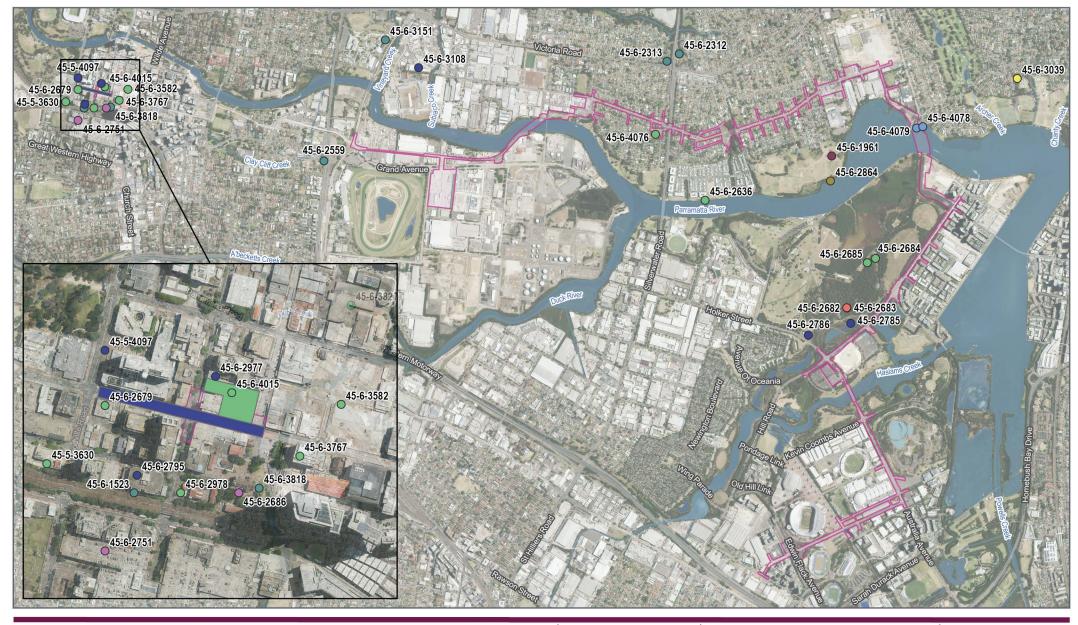


Plate 5.6 Aspect south general view of AHIMS 45-6-4079 (supplied by Transport for NSW)



Plate 5.8 Detail view of shell midden in mangroves (supplied by Transport for NSW)







Project site

Artefact : -

Artefact : -, Potential Archaeological

Deposit (PAD) : -

O Grinding Groove: 3

Potential

 Archaeological Deposit (PAD): -

Modified Tree (Carved or Scarred)

Potential Archaeological Deposit (PAD): 1

Shell:-Shell: -, Artefact: -

O Shell: 1

Paper Size ISO A4 0.5 Kilometres

Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





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AHIMS sites





Project site

O Shell: 1



Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Recently recorded AHIMS sites in Melrose Park overlain on 1930 aerial mapping | FIGURE 5.2

Data source: Study area - GHD2022, Watercourse - NSWSS2022, Wharf - TINSW2018; Imagery - Metromap Tile Service: extracted 16:03:2023, Historic map - NSV2023. Created by: dschmidt

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5.3 Archaeological literature review

City of Parramatta Council Aboriginal Heritage Study, Dallas Consulting 2003

Dallas Consulting was commissioned by City of Parramatta Council to undertake an Aboriginal heritage study, to inform future land planning, development control processes and to ensure ongoing protection and management of Aboriginal heritage places. The study used the existing AHIMS site database and environmental context to inform a predictive model of Aboriginal heritage sensitivity to inform Council's strategic planning.

The predictive modelling also used council zonings for the Parramatta LGA to inform Aboriginal sensitivity. For example, areas within 200 metres of watercourses, or with undeveloped land, were considered to hold high sensitivity. The Dallas Consulting study included the Camellia, Rydalmere and Ermington parts of the project study area and most of this was defined as having low sensitivity. Undeveloped parts of the project study area, such as Ken Newman Park, were identified as holding high sensitivity.

The entire Camellia portion of the Dallas Consulting study area was identified as an area of 'Aboriginal Association', which are areas identified as having some significance to present day Aboriginal people through current cultural or historical connections. However, in 2014, Dallas Consulting reviewed their study (which is summarised below) and noted that the "Areas of Aboriginal Association" (places of historical or cultural significance that are not registered Aboriginal sites) component of the Aboriginal heritage sensitivity mapping was unclear, incomplete and suggested it be removed.

Aboriginal Archaeological Assessment Report, Newington Armoury Adaptive Re-use and Rail Extension Project, Sydney Olympic Park, Paul Irish 2004

Paul Irish was engaged by the Sydney Olympic Park Authority to prepare an Aboriginal archaeological assessment in Newington Armoury, which is located around 200 metres west of the project study area. A survey was conducted within the woodland and nature reserve buffer zone of the Newington Armoury Precinct in 2003. This assessment established that the trees within the woodland were of insufficient age to contain scars of Aboriginal cultural origin and he determined that the scarred trees identified in previous studies were not Aboriginal modified trees.

During the survey three isolated silcrete and chert artefacts and two PADs were identified with possible silcrete manuports (stone material thought to have been transported to the area by Aboriginal people) also identified. The assessment concluded that the lack of Aboriginal archaeological material is likely to be a reflection of the early urban development of the Parramatta River, before the preservation of sites and the necessity for archaeological assessments, rather than an indication of less intense Aboriginal occupation of the area.

Preliminary cultural heritage assessment: Rosehill recycled water scheme, AMBS 2008

Australian Museum Business Services (AMBS) was commissioned by Parsons Brinckerhoff Australia Pty Ltd (PB) on behalf of Alinta Asset Management Pty Ltd (Alinta) to prepare a Preliminary Cultural Heritage Assessment in relation to the potential impacts of the Rosehill Recycled Water Scheme pipeline between Fairfield and Camellia, in western Sydney. The pipeline comprised an approximately 20 kilometre route and traverses a portion of the project study area in Camellia. The preliminary study found that areas with Aboriginal and historical archaeological potential were located within and adjacent to the pipeline corridor and were likely to be impacted by the proposal. The report recommended consultation with the Aboriginal community and continued archaeological investigations.

Parramatta Aboriginal Cultural Heritage Study Review, Dallas Consulting 2014

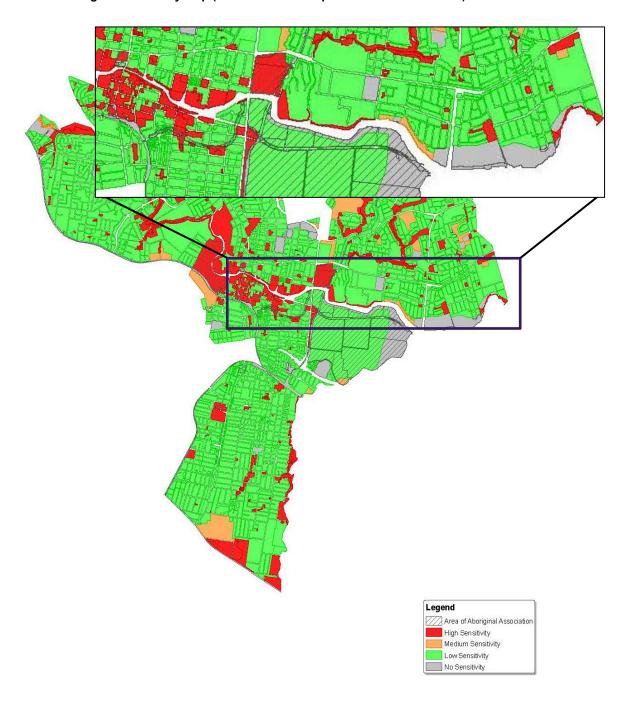
Dallas Consulting was commissioned by City of Parramatta Council to review the previous *City of Parramatta Council Aboriginal Heritage Study* (2003) and provide an updated predictive model. The review of the Aboriginal Sensitivity Map was considered necessary due to the following factors which had occurred since the 2003 study was published:

- a large number of Aboriginal heritage sites had been recorded that were not reflected in Council's mapping
- Council had revised its Local Environmental Plan (LEP) and Development Control Plan (DCP)
- NSW Aboriginal heritage legislation was amended in 2010, in a way that affected the role of councils in Aboriginal heritage management

 a number of anomalies in the Aboriginal heritage sensitivity mapping had become apparent that required investigation and correction.

The revised sensitivity mapping (Plate 5.9) reassessed part of the study area as low sensitivity, upgraded from nil (except for the mangroves along the southern embankment of Parramatta River at Camellia). Areas at Rydalmere Wharf and Ermington Boat Ramp were reassessed from medium sensitivity to high sensitivity. The area of Aboriginal Association that the 2003 study identified in Camellia was removed, as it did not include detailed or complete advice on these areas.

Plate 5.9 Revised Aboriginal Sensitivity Map (Parramatta Development Control Plan 2011)



Aboriginal heritage assessment Parramatta Light Rail Stage 1 ElS, KNC 2017

Kelleher Nightingale Consulting Pty Ltd (KNC) was engaged by WSP/Parsons Brinckerhoff on behalf of Transport for New South Wales to prepare an ACHAR to inform the EIS for Stage 1 of the Parramatta Light Rail network.

Three previously recorded Aboriginal archaeological sites, namely Cumberland Hospital East (AHIMS 45-6-3195), Harris Street Footpath/ Robin Thomas Reserve (AHIMS 45-6-3157 and AHIMS 45-6-3158) and the Sydney Turf Club Carpark (AHIMS 45-6-2559), and the presence of the Parramatta Sand Body (a geological formation dating to the Pleistocene associated with significant Aboriginal archaeology) were identified within the Stage 1 project boundary.

Site surveys identified seven PADs, along with the three previously recorded sites. Archaeological test excavation of the PADs was subsequently undertaken using a combination of hand excavated archaeological test squares and push-tubed core boreholes. Given the widespread disturbance across large portions of the investigation area, testing aimed to determine whether the project area contained intact subsurface Aboriginal archaeological deposit associated with the Parramatta Sand Body or other intact subsurface soils.

The test excavation identified intact sands containing artefacts below modern and historical disturbance in several locations within the investigation area. The test excavation results also supported previous assessments regarding the variable depth, nature and disturbance levels of the sand body. Deep excavation/removal of upper levels and replacement with fill has impacted the archaeological potential of some areas, while introduced fill above less severe disturbance has preserved artefact-bearing layers of the sands in situ at other sites.

In total, the Stage 1 project area contained five identified Aboriginal archaeological sites. Significance assessments focussed on the intactness, representativeness and research potential of these sites within the landscape and determined that the sites displayed between low and moderate-high significance. Impact assessments determined that all five sites would be at least partially impacted by the Stage 1 project. It was recommended that mitigative salvage excavation would be required for the four archaeological sites exhibiting at least moderate significance prior to any impacts. These are: Cumberland Hospital East (AHIMS 45-6-3195), Robin Thomas Reserve (AHIMS45-6-3157-8), Sydney Turf Club Carpark (AHIMS45-6-2559). The site known as PLR AFT 1 (AHIMS 45-6-3312) (exhibiting low levels of significance) required no mitigative action. A management strategy (heritage management plan) was outlined in the ACHAR which recommended a salvage excavation if the impact to AHIMS 45-6-2559 cannot be avoided.

The closest AHIMS site (45-6-2559) from Stage 1 is located 100 metres west of the Stage 2 project site.

Robin Thomas Reserve Masterplan Aboriginal Cultural Heritage Assessment Report (ACHAR), Artefact 2018

Artefact Heritage was engaged by Transport for NSW to prepare an Aboriginal Archaeological Survey Report. The survey report identified one registered AHIMS site, Robin Thomas Reserve (AHIMS 45-6-3157/ 45-6-3158), which had the potential to provide information on contact archaeology and required a section 60 approval for testing to be conducted as the site is State heritage-listed (*Ancient Aboriginal and Early Colonial Landscape*, SHR No. 01863). Therefore, an ACHAR was prepared to support an AHIP application for test excavations. The study area is included within the mapped extent of the Parramatta Sand Body which has potential to contain stratified archaeological deposits.

Previous test excavations undertaken by KNC (2017) uncovered nine silcrete artefacts below the disturbed layers. The area of Robin Thomas Reserve as indicated by AHIMS ID 45-6-3157/AHIMS 45-6-3158 was reported as having a high archaeological significance and a rare opportunity to investigate the Parramatta Sand Body. During the Aboriginal consultation undertaken as part of the ACHAR, the RAPs identified that the wider landscape in Parramatta is of significant cultural heritage value to Aboriginal people. A test excavation methodology was prepared and endorsed by the RAPs which included 18 one metre by one metre test pits within the study area aiming to understand the presence of the Parramatta Sand Body.

Robin Thomas Reserve is listed on the State Heritage Register as the *Ancient Aboriginal and Early Colonial Landscape* (SHR No. 01863) and the NSW Department of Primary Industries section 170 Heritage and Conservation Register, as well as on the Parramatta Local Environment Plan (LEP) 2011 (A2) as an archaeological site. The significance of the Parramatta Sand Body and its values are listed on the SHR register as:

The geomorphic origin of the sand body is uncertain but the present interpretation is that the sand body was deposited by the Parramatta River on a terrace 4 to 6 metres above normal water level, on either side of the river between Charles and Alfred Streets and in the eastern margin of

Parramatta Park. The sand body was deposited as a terrace (abandoned flood plain) over time during floods. The bulk of the sand body forms a levee located on the south side (right bank) of Parramatta River just above the 1:100 average recurrence interval flood level. The sand body has a well-developed, but varied, soil profile. Topsoil materials are generally disturbed by European activities. Where subsoils are intact they typically consist of yellow orange or yellow brown sandy clay with an earthy (porous) fabric that becomes paler and slightly mottled with depth. The upper parts of the soil profile are usually heavily mixed.

The profile of the sand suggests that the main body of sand is of late Pleistocene age and recent thermoluminescence dates obtained from an excavation undertaken at 140 Macquarie Street by Comber Consultants in 2010, have shown that the top of the undisturbed sand (below the level of Aboriginal occupation) is between 50,000 to 58,000 years old.

From a geomorphic perspective, the sand body has the potential to provide insight into patterns of river flow and flood events that could lead to a better understanding of the formation of the Parramatta River Valley. On a broader scale, the sand body may be able to provide valuable information about changing sea levels in the Pleistocene period with implications for possible future sea levels and coastal geography under a warming climate. In addition to the archaeological and geomorphic research value of the sand body, the Parramatta Sand Body also has the potential to provide valuable insight into the natural environment of Parramatta CBD in pre-colonial times. The fluvial sand terrace is evidence that Parramatta had a more diverse natural environment than might otherwise have been known from historical accounts, which provide few details about the natural vegetation of area. Pollen, which may be preserved within the sand body, could yield valuable information about the original vegetation of the Parramatta CBD area.

Robin Thomas Reserve – Masterplan Stage 1 Interim Aboriginal Test Excavation Report, Extent 2019

Extent Heritage was engaged by Transport for NSW to prepare an Aboriginal test excavation program and prepare an Aboriginal test excavation report following the AHIP application mentioned above. The Aboriginal archaeological test pit locations aimed to investigate the areas which will be impacted, reduce the impacts to the Parramatta Sand Body and to avoid the locations of potential historical archaeological features in this study area

Seventeen test pits were excavated by hand tools and twenty-five Aboriginal artefacts were found in total, fifteen of which were recovered from test pit 1. Most of the artefacts were found at depths below 50 centimetres from the surface, underlying the modern fill layers. Indurated mudstone/tuff was the dominant raw material type in the assemblage (total of 17 equating to 68 per cent), followed by silcrete (total of six equating to 24 per cent). Most of the artefacts were flakes (total of 18) with three cores.

The preliminary results of the test excavation suggested that the assemblage presented a low density of artefacts, which is mostly reflective of random discards and isolated events. Test pit 1 had a higher density, with 15 artefacts recovered (60 per cent), which may be evidence of knapping in this area. Based on the artefact typology and raw material procurement and use, occupation of this study area likely occurred in the late Pleistocene/early Holocene. The disturbance of the Parramatta Sand Body by historical activity has likely removed most evidence of mid-late Holocene occupation, which is supported by few silcrete artefacts and lack of backed artefacts. Artefacts typically occurred between 20 and 140 centimetres, with peak concentrations between 60-70 centimetres (total of eight equating to 32 per cent).

Parramatta Square 2 (PS2), 160-182 Church St Parramatta, Aboriginal Archaeological Excavation Report, AHIP No. C0001379, Comber Consultants 2019

Comber Consultants were engaged to undertake salvage excavations on behalf of the City of Parramatta Council for the redevelopment of Parramatta Square (previously Civic Place), a three hectare precinct located in the Parramatta CBD. The precinct is bound by Macquarie, Church, Darcy and Smith Streets. Within the precinct are six sites numbered Parramatta Square (PS) 1-6, which is located in the south eastern corner of the study area in the Parramatta CBD.

PS2 (now known as 8PS) is located at 160-180 Church Street, Parramatta, opposite St John's Cathedral. It is on the corner of Church and Darcy Streets. Testing and salvage excavation was undertaken by AHIP (No. C0001968) due to the redevelopment of Parramatta Square. The site historically sat on an alluvial terrace and water holes around the ephemeral creek line within the site possibly created a landscape rich in resources, such as fresh water, wetland plants and animals.

The lithic analysis of the assemblage of PS2 indicated a low density artefact scatter and similar to adjacent PS3 and PS5&6 sites was occupied repeatedly from at least around 7,000 Before Present (BP). The northern boundary of the site adjacent to the Town Hall (the location of the former Market Place and Aboriginal Annual Feasts) revealed the greatest concentration of artefacts. The trend was observed in this report in comparison with other sites throughout Parramatta which indicated that the density of artefacts at PS2 is consistent with its distance from the Parramatta River. Seventy four flaked glass and two stone artefacts were subject to use-wear and residue analysis. A number of glass flaked artefacts showed use-wear from shaping wood/woody plants or for sawing or engraving bone or shell, and one glass piece was used as a core to produce microblades.

Across the Parramatta Square sites a similar trend was observed where the lithic assemblage demonstrates a change over time in raw material with the deeper deposits indicating dominance of indurated mudstone/tuff/chert, while the upper deposits revealed silcrete artefacts. A silcrete knapping concentration is present along the northern boundary of the site which indicates production and/or discard of small numbers of artefacts.

Parramatta Square 3 (PS3): 153 Macquarie St Parramatta, Excavation Report, AHIP No. C0001379, Comber Consultants 2018

Aboriginal archaeological and cultural heritage assessment for the proposed redevelopment in PS3 (now known as 3PS) was undertaken by Comber Consultants. The site is the former Post Office site located at 153 Macquarie Street, Parramatta. The testing and salvage excavations uncovered an alluvial terrace across site at PS3, however, no evidence of the Parramatta Pleistocene Sand Body. The lithic analysis recorded 617 cultural lithics, including 369 artefacts. The assemblage indicates that the site was occupied repeatedly from about 10,000 years BP, in the terminal Pleistocene, through to the Holocene and contact periods.

Previous analysis across Parramatta Square contributed greatly to the knowledge of the Aboriginal occupation in the area. The artefact assemblage collected from PS3 shares similarities with the assemblages to some sites (such as 15 Macquarie Street and the RTA-G1), however they differ from those collected from other Parramatta sites (such as CG1, CG3, 101 George Street, 1 Smith Street). The results of the excavations at PS3 uncovered low artefact density (the average density across PS3 was 2.7 items per square metre) and indicate evidence for change over time in the use of raw materials. Generally, evidence for this change over raw material preference has only been identified on the Parramatta Terrace Sand previously, which was not present at PS3.

Parramatta Square 5 & 6 (PS5&6): 12-38 Darcy St Parramatta, Excavation Report, AHIP No. C0001379, Comber Consultants 2019

Comber Consultants were engaged to conduct testing and salvage of PS5 & 6 (now known as 4&6 PS) under the AHIP No. C0001413. The site comprised the former Parramatta Library, Parramatta City Council building, several Victorian terraced shopfronts, located at 12-38 Darcy Street, Parramatta CBD.

The excavations at PS5 & 6 uncovered an alluvial terrace of the Parramatta River like the other Parramatta Square sites. A similar trend to PS 2 and 3 in raw material preference which indicates a change over time with silcrete in the upper deposit and indurated mudstone/tuff/chert preferred in the lower deposit. This implies a long and ongoing Aboriginal occupation of Parramatta as a whole and Parramatta Square in particular. The excavations uncovered three hearths, and clay balls formed into a rough circle which indicates evidence of Aboriginal people cooking meat over small, leaf fuelled fires across the PS5 & 6 site. These features meet the criteria as a heat retainer hearth.

A total of 221 cultural lithics, including 126 artefacts, were recovered. The artefacts recorded evidence of being used for cutting meat and woodworking. The artefact analyses and dating of the hearths indicates that the site was initially occupied prior to 7,500 BP, continuing into around 1830. Four sets of conjoining artefacts recovered from adjacent spits provide evidence for specific cultural activities and some vertical integrity despite intensive modern land use.

The archaeology of Parramatta Square is exceptionally rare demonstrating evidence of ongoing occupation from 10,000 years ago through to the contact period well into the colonial period, when the Aboriginal Annual Feasts occurred in the market square in front of the Town Hall. The site as a whole has high significance to the Aboriginal community.

Aboriginal Archaeological Test Excavation Report AHIP C0001588: Site 45-6-3195, Parramatta North Growth Centre, Comber Consultants 2018

Comber Consultants undertook Aboriginal archaeological test excavations for the Parramatta North Urban Transformation on behalf of Urban Growth NSW. The Cumberland Hospital East (AHIMS 45-6-3195) site, which is about 1.5 kilometres north of the Parramatta CBD Stage 2 turnback facility, was excavated, and uncovered

around 1,800 Aboriginal artefacts, most of which were made from silcrete. Other raw material including glass had been knapped into stone tools, indicating archaeological evidence of contact between Aboriginal people and the new settlers and adaptation of new materials. It was suggested that these glass artefacts were likely to have been utilised for shaping, cutting and engraving of wood. The occupation density of the site was noted to be higher close to the Parramatta River, however, stretched across the site. It was suggested that the occupation in the western and southern sides of the site began more than 7,500 years ago, but as the river changed with sea level rises people appeared to move to the north and centre of the site.

There was a wetland within the centre of the site, at the location of the current oval which was occupied approximately 2,000 years ago. The location overlooked the Parramatta River and provided easy access to the resource rich wetlands. The higher density of occupation was recorded along the riverbank and up to 150 metres from the river and evidence of the Parramatta Sand Body was also found up to 150 metres from the river when the sea levels were rising and the landscape was changing dramatically, around 7500 years ago. It was noted that a site of with a long time span and with substantial numbers of artefacts and three phases of occupation is rare on the Cumberland Plain.

Desktop Aboriginal Due Diligence Rosehill Public School, RPS 2017

RPS was engaged by Conrad Gargett AMW to prepare a desktop Aboriginal due diligence report for the proposed upgrade of the Rosehill Public School, in 2017. This study area is located around 570 metres to the south-west of the project study area. No registered Aboriginal sites were located within the Rosehill study area.

The City of Parramatta Council Aboriginal Heritage Study (Dallas Consulting, 2003) originally assessed the Rosehill study as low Aboriginal sensitivity. However, the review of the heritage study (Dallas Consulting, 2014) upgraded the sensitivity of part of the school property to high. A contamination assessment (Douglas Partners, 2017) prepared for the project area indicated that some of the school grounds, including parts of the playing field, may contain imported fill between 10 and 140 centimetres in depth.

As the study area contained an area of high sensitivity, relating to the playing field in the west of the school grounds, RPS recommended further assessment in the form of an archaeological survey report in accordance with The Code.

Parramatta Light Rail Stage 2: Aboriginal Heritage Constraints Assessment, KNC 2018

In 2018 KNC was engaged by WSP Australia Pty Limited (WSP) to prepare a preliminary Aboriginal heritage constraints assessment for Stage 2 of the Parramatta Light Rail network (this project). The purpose of the assessment was to inform the early designs of the project. The assessment included two alignment options, the first option was located along South Street, Rydalmere (the northern option, but which was not progressed), and a second option located along and adjacent to Grand Avenue, Camellia (the southern option).

The KNC constraints assessment identified five archaeological features: two AHIMS registered sites and three PADs. As the alignment has been refined since the KNC constraints assessment was undertaken, three archaeological features identified by KNC are relevant to the current study area:

- Two areas of PAD located within the study area:
- Area 2: which is located south of the Parramatta River within Sydney Olympic Park in the alluvial flats and associated mudflats.
- Area 3: which is located between River Road and Spur Street, is situated within the low and mid slopes of a small ridgeline with limited previous ground disturbance.

Information on Areas 2 and 3 is provided below.

Area 2:

An area south of the Parramatta River within the Sydney Olympic Park is within the alluvial flats and associated mudflat. As such they provided abundance of resources for Aboriginal people in the past. Aboriginal heritage recorded within the nearby Millennium Park supports this location occupation model. However, the entire area has been through ground disturbances stemming from recent European occupation. The majority of the area was reclaimed in the 1880's that included dredging, placing of the fill material and modifications of the Haslams Creek alignment. The entire northern section of Newington and Wentworth Point are reclaimed estuary areas that have nil archaeological potential. The area south of Haslams Creek and to the immediate west of Homebush Bay was used for brickworks. These recent

land use activities would have removed any Aboriginal archaeological material that would have been present within this area. Considering that natural soils consist of deep alluvial deposits, it is possible that remnant patches occur north and south of Haslams Creek under imported fill material. One of these potential remnant patches may be located at the proposed Haslams Creek crossing. Further soil assessment would be required in order to confirm the presence of natural soil layers that may contain Aboriginal cultural material. This area is mapped as having moderate to low archaeological potential.

Area 3:

A section of the study area located between River Road and Spur Street is situated within the low and mid slopes of a small ridgeline with limited previous ground disturbance. Soils in this area consist of erosional clay loams that have the potential to contain archaeological deposits at shallow depths. Considering very limited and unknown levels of previous disturbance, there is a moderate to low potential for subsurface archaeological deposits to occur in this area.

One registered site is located around 100 metres west of the study area - Sydney Turf Club Carpark (AHIMS 45-6-2559).

20 Waterview Street, Putney, Curio Projects 2020

Curio Projects was engaged by Lilac Pty Ltd/Willow Frank to prepare an ACHAR for a Planning Proposal for enabling additional permitted uses including residential and retail. The site is located 2.5 kilometres east of the project study area.

The test excavation program completed as part of the ACHAR aimed to identify the extent of potential relics associated with occupation of the locale by notable emancipist James Squire and his nineteenth century brewing operation. James Squire (1754? -1822), arrived in New South Wales with the First Fleet in 1788, who was sentenced to seven years and was brewing beer for soldiers' private consumption during his time until his sentence expired in 1792.

In 1795, Squire was granted thirty acres of land in the Parish of Hunters Hill and expanded his land by purchasing nearby allotments. Squire began to cultivate hops on his Kissing Point Farm, establishing a brewery and tavern known as 'The Malting Shovel' in close proximity to the Parramatta River, accessible via Squire's private wharf. Squire was known to be sympathetic to the local Aboriginal people of the Wallumedegal people, Bennelong and Squire are known to have developed a friendship, with Bennelong eventually being buried within Squire's orchards. It was recently announced that the location of Bennelong's burial place was found, using a combination of archival evidence and physical techniques (survey and ground-penetrating radar) (Sydney Morning Herald, 20 March 2011) which is believed to be located within the front garden of 25 Watson Street, Putney- approximately 120 metres north of the 20 Waterview Street.

One isolated artefact was identified during the testing program. The Aboriginal archaeological potential of the 20 Waterview Street, Putney is considered to be low, with the most likely site type to be present being isolated artefacts in a disturbed context a site type which generally has little archaeological significance.

The historical (non-Aboriginal) test excavation program did not identify any archaeological resources associated with the Squire Brewery and Inn complex. Although, one isolated Aboriginal object was identified in Trench 3 within a highly disturbed context. The report recommended an exclusion zone be maintained around the Aboriginal object in Test Trench 3 if the artefact was to remain *in situ*, or preparation of an AHIP application to remove the Aboriginal object, if the object was required to be removed as part of the site's redevelopment.

The excavation works ceased in that area and the artefact was protected *in situ*. This ACHAR was prepared following this unexpected find. A field survey was conducted in consultation with RAPs and no Aboriginal artefacts were recorded. Based on the results of the AHIMS search, the environmental context, predictive model and physical inspection of the landform of this project area, the most likely Aboriginal site types would be shell middens, isolated artefacts and open camp sites within the project area. Therefore, based on the comments provided by the RAPs and the distance to Parramatta River, further test excavations were recommended in this report.

6 ARCHAEOLOGICAL PREDICTIVE MODEL

6.1 Overview

The purpose of an archaeological predictive model is to provide an indication of the Aboriginal objects predicted to occur within the study area and the likelihood that these objects will occur within the study area. It draws on the review of existing information from the regional and local archaeological context and from the landscape context. Another essential aspect to predicting the archaeological potential is previous land uses and the degree of disturbance across the study area. The predictive model should inform the approach to the archaeological survey and to the assessment of the archaeological sensitivity, potential, and significance. There are a number of factors that influence Aboriginal occupation of an area. These include essential subsistence resources such as food (flora and fauna) and fresh water, and secondary resources such as raw stone materials, wood and bark, animal skins and reeds for basket weaving, string, clothing and similar. Landscape features such as ridges, flat elevated areas, rock shelters and similar, may have also influenced Aboriginal occupation of an area. In addition, cultural activities may have also occurred at certain locations in the landscape for example, corroborees and initiation sites.

6.2 Predictions for study area

The Cumberland Plain region provided abundant resources for Aboriginal subsistence, especially near permanent water, and was conducive to Aboriginal occupation in the past. The Parramatta River runs through the study area, with multiple second and third order streams encircling the area. These creeks would have provided access to permanent water. These water sources would have provided the resource base for occupation, including habitats for freshwater fish, eel, and shellfish, along with larger marsupials and mammals typical of the inland area. Likewise, outcrops of silcrete nearby, and formerly deposited river gravels associated with past fluvial activity, would have provided the stone raw materials for stone tool manufacture. Resources in the study area would have been ample to enable occupation, hunting, gathering, stone procurement, ceremonies, and other cultural activities to be conducted throughout the region. Burials are mostly found in coastal shell middens and no large burials sites have been reported in the Sydney region (Attenbrow, 2010). However, burials sites can be marked by carved trees in south-eastern Australia. Carved trees associated with burials are reported in south of Sydney near Narellan and Picton (Etheridge, 1918).

The Aboriginal material most visible in the archaeological record are stone artefacts. The most frequent archaeological objects are stone artefacts in the Cumberland Plain. These objects are found as open scatters or isolated finds, and as finds and stratified deposits of flaked stone below the surface. Importantly, the presence of subsurface archaeological deposits cannot be accurately assessed based on the presence or absence of the surface archaeological record. Likewise, sub-surface archaeological deposits have been shown to be present in areas of past agricultural disturbance.

Both natural and anthropomorphic disturbance is widespread throughout Parramatta. The fluvial sand terraces of the Parramatta Sand Body have created a depositional context that is favourable to deep, stratified deposits of Aboriginal archaeology. Previous excavations have demonstrated that where these sands are intact beneath modern and historical development they can curate and contain highly significant deposits beneath the current urban landscape. Therefore, archaeological potential in the study area remains where suitable substrate exists intact below surface disturbance, or in other areas of low disturbance conducive to the preservation of archaeological deposit.

The test excavations of Parramatta Light Rail Stage 1 identified intact sands containing artefacts below modern and historical disturbance in several locations within its project area, such as Cumberland Hospital East, Robin Thomas Reserve and the intersection of Purchase Street and George Street. Recently, Williams et al. (2021) identified that the Parramatta Sand Body aligns with the Parramatta CBD section of the Stage 2 project site (Figure 4.1), however the Parramatta Light Rail Stage 1 heritage assessment of the Parramatta Sand Body has been relied upon for this part of the study area.

The test excavation results for Stage 1 also concurred with previous assessments regarding the variable depth, nature and disturbance levels of the sand body. Deep excavation/removal of upper levels and replacement with fill has impacted the archaeological potential of some areas, while introduced fill above less severe disturbance has preserved artefact- bearing layers of the sands in situ. Significant deposits are those where integrity and stability of the archaeological context is high, as this is what gives the objects meaning. High integrity also leads to increased confidence in interpretation, especially where depositional context has retained potentially stratified

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layers. The project site may contain undiscovered parts of the Parramatta Sand Body (Figure 4.1) which would contribute to this knowledge.

There are no known historical Aboriginal sites or Aboriginal missions within the study area. However, this general area has greater significance to local Aboriginal people and post contact Aboriginal archaeology may be unearthed during the test excavation program especially in relation to the Parramatta Sand Body, if identified.

Scarred trees may occur, but only in areas of remnant native woodland, which are uncommon in the heavily cleared wider Cumberland Plain as well as within the study area. Grinding grooves as well as stone quarries may be found on exposed bedrock in the wider region, though no evidence for either site type has been recorded within the study area since rock outcrops are mostly absent. Raw material sources around the study area may have not been found yet, however, it is more likely that many paleochannel deposits containing knappable rocks and sandstone outcrops are now buried beneath, or have been destroyed by, urban development (Corkill, 1999).

Most high-density archaeological sites have been associated with creek lines or other sources of permanent water. Stream order has been shown to be correlated with the size and complexity of archaeological deposits within certain distances from a waterway. Archaeological potential increases with stream order and more complex sites are often close to permanent water sources, with confluences being key locations for occupation sites. The highest artefact densities are likely to occur on terraces and lower slopes associated with second or higher order streams, especially 50 to 100 metres from fourth order streams.

These observations indicate that landforms associated with streams of second and higher order and areas that are undisturbed will have the highest archaeological sensitivity in the Cumberland Plains region.

The following predictions have been made based on the landscape context, available ethnographic observations of Aboriginal people in the region, comments and advice from the Metropolitan and Deerubbin LALC Site Officers and previous archaeological studies, in particular White and McDonald (2010).

- most of the study area has been affected by past land clearance, development, landfill and landscaping
- Parramatta Sand Body is mapped within the Parramatta CBD part of the study area which is considered to have high archaeological potential
- based on the previous research, the floodplains of the Parramatta River in the north shoreline have high archaeological potential
- the areas of relatively less disturbed parklands in the mid slope and lower slope landforms north of the Parramatta River are considered to have moderate archaeological potential, especially the areas around Ken Newman Park and Broadoaks Park
- based on the results of the AHIMS search, the environmental context and survey and consultation with LALC Site Officers, the most likely Aboriginal site types that have potential to be present in the study area would be shell middens, stone artefact scatters, isolated artefacts and subsurface archaeological deposits.

7 ARCHAEOLOGICAL SURVEY RESULTS

7.1 Approach

Representatives from the Metropolitan LALC and the Deerubbin LALC participated in an archaeological survey of the relevant sections of the study area on 24 January and 4 February 2022 respectively, to provide input on cultural significance in accordance with PACHCI Stage 2. The Deerubbin Local Aboriginal Land Council survey report was received on 26 April 2022 with a recommendation for further investigations due do the proximity of a major waterway (Appendix E).

The Parramatta CBD area of the study area was not surveyed, as it had previously been assessed for Parramatta Light Rail Stage 1, as such the information and assessment from the Parramatta Light Rail Aboriginal Cultural Heritage Assessment Report (KNC, 2017) has been relied upon for the Parramatta CBD area for survey. A desktop study of the Parramatta CBD is discussed in Section 7.3.7 including the most recent research publications for the Parramatta CBD.

7.2 Sampling strategy and field methods

The aim of the archaeological survey was to conduct a representative coverage of the study area (excluding the Parramatta CBD) on foot and to record any Aboriginal archaeological sites or potential archaeological deposits (PADs).

The survey objectives were the ground-truthing of existing Aboriginal sites, land disturbances visible based on historical aerial photographs and management plans and the assessment of the subsurface archaeological potential of landforms. The targeted areas were decided based on preliminary desktop review including the review of current and historical aerial photography.

The study area was divided into nine survey units (SUs) in six suburbs based on their physical location (i.e. landform and distance to water courses). The survey covered the accessible areas of survey units with ground surface visibility. The areas where no visible disturbance to ground surface was evident, and where intact subsurface artefacts could be present, were targeted for the survey. SUs were later recorded to Avenza Maps with their GPS coordinates based on their disturbance levels.

The following survey units were nominated for investigation:

- Melrose Park included two SUs where SU 1 encompassed Ermington Boat Ramp and the nature strip
 adjacent to power easements. SU2 was located on the northern road boundary of Waratah Street (see
 Figure 7.1)
- Ermington included one SU where SU3 encompassed Ken Newman Park and the council land strip to the west (see Figure 7.2)
- Rydalmere included two SUs where SU4 comprised Broadoaks Park and the council land strip on the
 northern side of South Street and SU5 is at Rydalmere Wharf which extended from John Street in the
 north-east to the Sydney Water easement in the west within Eric Primrose Reserve (see Figure 7.3)
- Camellia included one SU where SU6 encompassed the wetlands (mangroves) on the western side of the Thackeray Street and the council strips on both sides of Thackeray Street (see Figure 7.3)
- Wentworth Point and Sydney Olympic Park comprised three SUs where SU7 extended from the riverside walk to the Sanctuary Wentworth Point development and an additional section along the western boundary of Hill Road (see Figure 7.4). SU8 was located north of the Haslams Creek on both sides of the Holker Busway and SU9 encompassed the grassed sidewalk area on the western side of Australia Avenue, adjacent to the Brickpit (see Figure 7.5).

Two key survey variables were assessed across the study area and within each landform: visibility and exposure. Exposure addresses the areas which erosion might have revealed archaeological deposits, and visibility determines the amount of ground surface that is not covered by any vegetation. Overall survey coverage and calculated survey effectiveness was recorded in Table 7.1.

Overall visibility during the survey was 10 to 15 per cent due to grass coverage with limited exposure. Effective coverage areas in all SUs were lower due to low visibility which indicates a lower effective coverage ratio. The areas of exposure in the study area were targeted for stone artefacts, shells and other evidence of Aboriginal occupation.

Table 7.1 Summary of survey coverage in the study area

Survey Unit (SU)	Landform	SU Area (m2)	Visibility (%)	Exposure (%)	Effective Coverage Area (m2)	Effective Coverage (%)
SU1	Flat (partially disturbed)	9,538	20	10	190.76	2
SU2	Flat (partially disturbed)	3,036	20	10	60.72	2
SU3	Mid and low slope	32,191	5	5	80.47	0.2
SU4	Mid slope	4,968	10	10	49.68	1
SU5	Flat (partially disturbed)	20,290	20	20	811.60	4
SU6	Flat (disturbed)	4,610	5	-	230.00	4
SU7	Flat (disturbed)	49,910	20	10	998.20	2
SU8	Side slope (partially disturbed)	9,513	5	10	47.56	0.5
SU9	Flat (partially disturbed)	13,084	10	10	130.84	1

The total surveyed areas varied between SUs (refer Table 7.2), and some areas of sensitivity were not able to be surveyed as property access could not be arranged. Melrose Park Public School Oval was identified as an area of sensitivity/PAD, however as it is outside the project site boundary and would not be impacted, further survey is not considered to be required. Transport for NSW has committed to completing a survey of ten residential properties in Melrose Park which are considered to have potential for Aboriginal archaeology, should it be confirmed they could be impacted by the project and once property access can be arranged, prior to commencement of any physical works (see Figure 7.7 and Section 10). The wetlands on the eastern side of Thackeray Street in SU6 was not accessible however the Deerubbin LALC Site Officer confirmed no additional survey would be required, as a result of the disturbed nature of this SU.

Table 7.2 Total survey area in each SU

SU	Surveyed area
SU1	70 per cent
SU2	35 per cent
SU3	35 per cent
SU4	50 per cent
SU5	35 per cent
SU6	12 per cent
SU7	30 per cent
SU8	5 per cent
SU9	15 per cent





SU1 Ermington Boat Ramp

SU2 Waratah St

SU7 Hill Road and River Walk



Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56



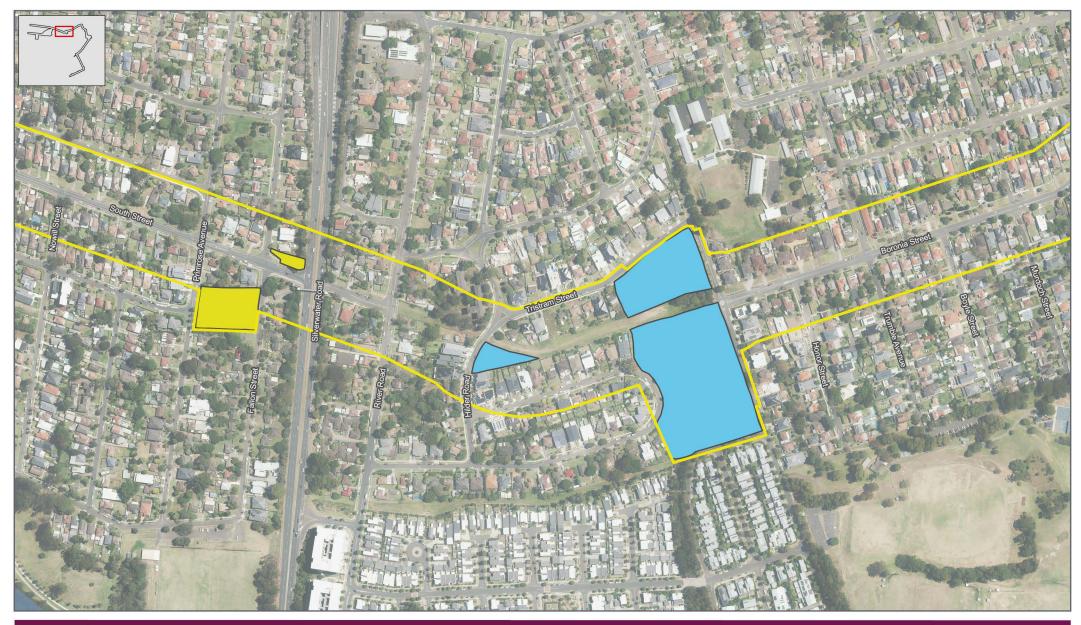


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Survey Units in Melrose Park

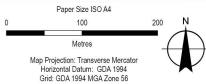
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FIGURE 7.1





SU3 Ken Newman Park SU4 Broadoaks Park





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Survey Units in Ermington and Rydalmere FIGURE 7.2 Data source: Study area - GHD2022; Survey unit - RPS2022; Precinct - Mecone2021; Wetland - DPIE2018; Road, Watercourse - NSWSS2022; Imagery - Metronap Tile Service: extracted 16/03/2023. Created by: dschmidt

Project No. **12557728** Revision No. 2 Date 08/03/2023

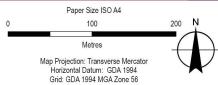




SU4 Broadoaks Park

SU5 Rydalmere Wharf

SU6 Camellia



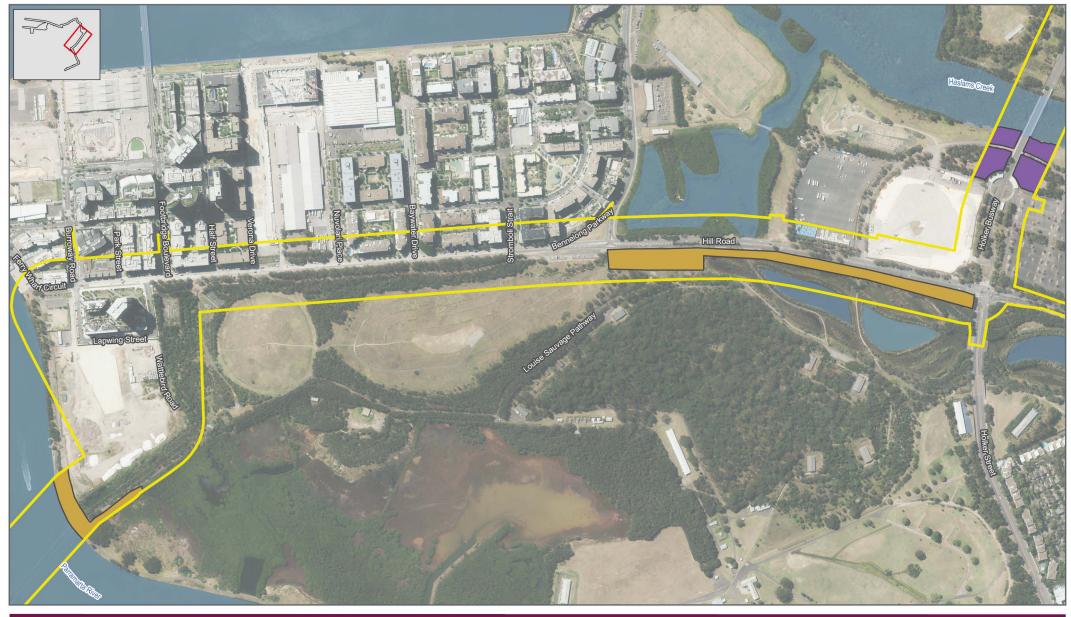


Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Survey Units in

Project No. 12557728 Revision No. 2

Date 08/03/2023





SU7 Hill Road and River Walk

SU8 Haslams Creek



Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





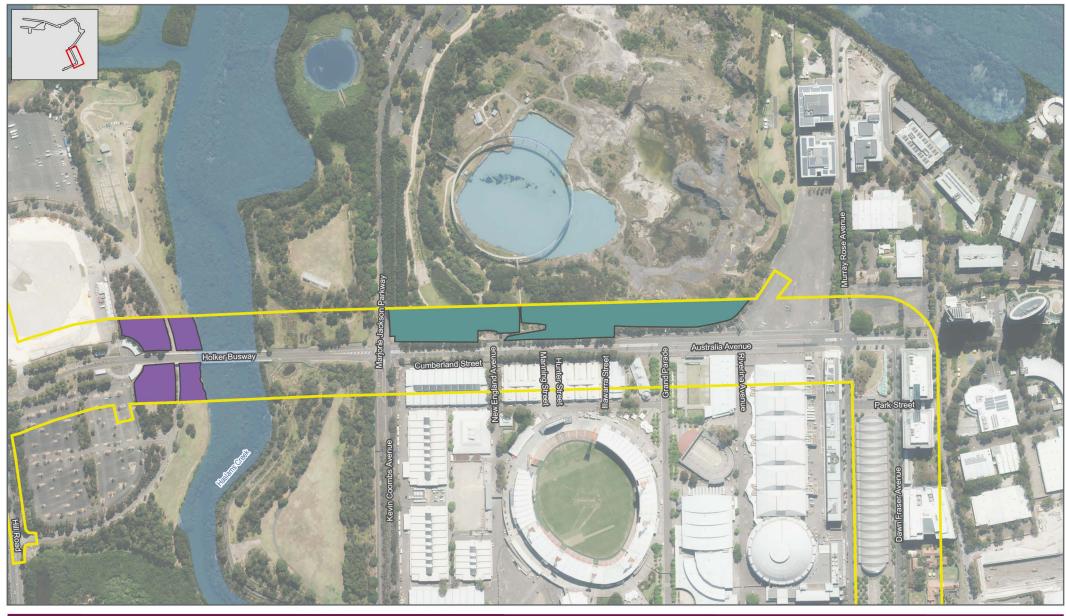
Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Survey Units in Wentworth Point

Project No. 12557728 Revision No. 2

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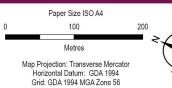
IGURE 7.4





SU8 Haslams Creek

SU9 Brickpit





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Survey Units in Sydney Olympic Park

Data source: Study area - GHD2022; Survey unit - RPS2022; Precinct - Mecone 2021; Wetland - DPIE2018; Road, Watercourse - NSWSS2022; Imagery - Metromap Tile Service: extracted 16/03/2023. Created by: dschmidt

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7.3 Results of the field survey

7.3.1 Melrose Park

Survey Unit 1 - Ermington Boat Ramp

SU1 is located on a flat landform, 100 metres from the Parramatta River. This was the first survey unit inspected on foot. The ground visibility was nil to very low due to dense grass coverage.

Disturbance was noticed in the wetlands area adjacent to Wharf Road, Ermington Boat Ramp and car park. This disturbance was associated with the presence of bitumen, demolition material and sandstone retaining walls of the historic wharf (see Plate 7.1 and Plate 7.2). Previous geotechnical investigations for the project also indicate a degree of disturbance. Previous studies from this location recorded the presence of fill material to a depth of 125 centimetres, consisting of sand and sandy clay and then alluvial silty clay to a depth of 185 centimetres and sandstone bedrock beneath this.

The grassed flats in those areas were considered to be disturbed during the regeneration of mangroves. Further north-west of the car park area, the grasslands exhibited less disturbance except for the northern boundary, which has been disturbed by the Viva Gore Bay high pressure fuel line. The northern boundary of the car park area consists of possible intact deposits which were partially disturbed on south-eastern section via the overhead power infrastructure high voltage lines (see Plate 7.3 and Plate 7.4). Throughout the later half of the 20th century, the former agricultural land west of Wharf Road was industrialised. Between 1971 and 1985 modification to the foreshore was undertaken including the construction of an artificial island to house an electricity pylon.

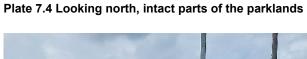
SU1 consists of 9,538 square metres of which 6,676 square metres was surveyed on foot. Two per cent of the area had surface exposure and was inspected. No Aboriginal artefacts were located during the survey. The Site Officer from the Metropolitan LALC, noted that shell middens can be the most common Aboriginal site type in this area due to the proximity to the river. Due to the proximity to known midden as well as the landform and disturbance context, the portion of the surveyed area shown on Figure 7.8 has been assessed as having high archaeological potential.

Plate 7.1 Looking south-east, mangroves on Ermington Plate 7.2 Looking east, retaining walls of shoreline Boat Ramp





Plate 7.3 Looking north-east, electrical easement in the parking area







Survey Unit 2 - Waratah Street

SU2 is located on the northern boundary of Waratah Street around 120 to 150 metres from the Parramatta River which was previously assessed as having high Aboriginal heritage potential (section 5.3), as shown on Figure 7.1. This SU was considered to have a high potential for Aboriginal heritage as intact residual soils were recorded from 40 centimetres below surface based on previous geotechnical investigations for the project. SU2 consists of 3,036 square metres of which 1,062 square metres was surveyed on foot. Two per cent of the area had surface exposure and was inspected and no Aboriginal artefacts were located during the survey. The ground visibility was around 20 per cent and mostly covered with gravels and clayey loam (see Plate 7.5 and Plate 7.6).

Plate 7.5 Looking north-west along Waratah Street



Plate 7.6 Looking north along Waratah Street

7.3.2 Ermington

Survey Unit 3 - Ken Newman Park

KNC previously reported SU3 as having potential for archaeological deposits located at shallow depths (KNC, 2018). Previous geotechnical studies undertaken as part of the project unearthed an intact clay rich residual soil profile at greater than 30 centimetres depth.

Ken Newman Park is located in mid and low slopes which have been disturbed through the installation of the Sydney Water potable water pipelines in one third of the northern section of the park (see Figure 7.2) (see Plate 7.7 and Plate 7.8). SU3 consists of 32,191 square metres of which 11,266 square metres was surveyed on foot. Ground surface visibility was 0.2 per cent and no Aboriginal artefacts were located during the survey.

The disturbed corridor to Hilder Road was excluded from the survey, except for the eastern part of the council strip on Hilder Road which has not been disturbed (see Plate 7.9). The small area of spoil shown in Plate 7.10 is comprised of silty sand and is located on the disturbed section of part by the Sydney Water potable water pipeline, therefore, does not contain intact soil profile. The ground visibility was nil except for this exposure due to the thick grass. The current tree line implies a water course is running through the park, however, no earlier water course was identified in historical imagery.

The park lies in a north-south direction and is located around 300 to 600 metres from the Parramatta River in the south and north respectively. Even though the distance to the river is greater than the archaeological predictive model proposed distance (less than 200 metres to a watercourse), this mid slope may have been preferred as campgrounds or other activities during high tides or floods as Parramatta River is subject to flooding. This assumption was supported by the Metropolitan LALC Site Officer.

Plate 7.7 Looking north to Ken Newman Park

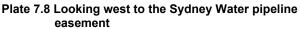






Plate 7.9 Looking north on the Hilder Road east

Plate 7.10 Looking west, disturbed soil in Ken Newman Park





7.3.3 Rydalmere

Survey Unit 4 - Broadoaks Park and surrounds

The dominant portion of SU4 is located at Broadoaks Park which is located between Primrose Avenue and Fallon Street in an east-west direction. The park is located in mid and low slopes, with disturbance areas in one third of the north section due to topsoil erosion (see Figure 7.2, Plate 7.11 and Plate 7.12). The remainder of SU4 is located on the northern section of South Street, however as this council strip/easement was observed to be disturbed by the Sydney Water potable water pipelines, it was not considered to have archaeological potential.

In total, SU4 consists of 4,968 square metres of which 1,046 square metres was surveyed on foot. One per cent of the area had surface exposure and was inspected and no Aboriginal artefacts were located during the survey.

The Deerubbin LALC Site Officer noted that the northern half of the Broadoaks Park was subject to topsoil erosion of the A horizon, with insect nests exposing the soil which consisted of clayey silt with iron stone and pebble inclusions. The remainder of the park had no ground visibility due to high grass.

Plate 7.11 Looking north-west in Broadoaks Park



Plate 7.12 Looking south to soil exposure



Survey Unit 5 - Rydalmere Wharf

SU5 has been subject to levels of disturbance from various activities including landscaping, construction of walking paths, bicycle paths and car parks as well as Sydney Water utilities. However, based on the Aboriginal heritage sensitivity map of Parramatta LGA (see Plate 5.9) the parklands of the wharf have been recorded as high archaeological sensitivity (see Figure 7.3).

Rydalmere Wharf is situated on a flat landform on the north shore of the Parramatta River, with landscape gardens and young trees (see Plate 7.13 and Plate 7.14). The foreshores of the wharf have been disturbed by the retaining wall and a footpath (see Plate 7.15 and Plate 7.16). Parklands around the wharf extend from the Sydney Water potable water pipelines in the west to John Street in the east. The northern extent of the wharf is bordered by the car park (see Plate 7.17 and Plate 7.18). The parklands are slightly elevated to the northern areas which may indicate soil integrity.

During the wharf upgrade a desktop Aboriginal heritage assessment was undertaken as a part of the Statement of Heritage Impact (City Plan Services, 2018). This report suggested that Aboriginal people have a long and enduring connection with the Rydalmere area. However, the PACHCI Stage 1 Assessment determined that it was unlikely that the proposed wharf upgrade works would impact Aboriginal cultural heritage (WSP Australia & RMS, 2018). Previous geotechnical studies in 2019 recorded intact soil matrices from beneath 120 centimetres depth, therefore, Aboriginal archaeological potential may be present under the modern disturbed layers.

SU5 consists of 20,290 square metres of which 7,245 square metres was investigated during the survey. Four per cent of effective coverage was recorded on foot via an unsystematic walk because of the low visibility. The ground visibility during the survey was very low to nil during the survey except for the tree line in the northern boundary of the parkland. One quartz piece with no diagnostic features was recorded from the surface exposure under a tree around 50 metres from the river during the survey. This quartz could have been redeposited by

disturbance or tumbling in the river (see Plate 7.18 and Plate 7.19). This SU has been recorded as high archaeological potential based on the distance to the river and the Aboriginal heritage sensitivity map (section 5.3).

Plate 7.13 Looking north-west in parklands



Plate 7.14 Looking south at Rydalmere Wharf



Plate 7.15 Looking west to retaining walls of the wharf



Plate 7.16 Looking south-west to the wharf parklands



Plate 7.17 Looking north to the car park



Plate 7.18 General location of quartz piece



Plate 7.19 Quartz piece found at the wharf



7.3.4 Camellia

Survey Unit 6 - Thackeray Street and mangroves

Camellia precinct is highly industrialised and disturbed. Therefore, within the study area SU6 is limited to the nature strips on Thackeray Street and the mangroves on Parramatta River (see Figure 7.3). Previous geotechnical investigations for the project recorded ground conditions at the south bank of the Parramatta River comprising up to 2.6 metres of fill, generally associated with land reclamation, overlying very soft silty clay and sandy clay. Holocene Alluvium was reached from 2.6 metres to 15.8 metres in depth. While much of Camellia has been subject to development from various industries, the *Wetlands* comprising mangrove swamps and salt marshes along the banks of the Parramatta River has remained largely undeveloped.

SU6 consists of 4,610 square metres however the grassland had no visibility and the elevated street line suggested that this area has high levels of ground disturbance (see Plate 7.20 and Plate 7.21). A total of 230 square metres of this SU was surveyed on foot and no Aboriginal artefacts were found during this survey.

Plate 7.20 Mangroves in Camellia



Plate 7.21 Looking south on Thackeray Street



7.3.5 Wentworth Point

Survey Unit 7 - Hill Road and river walk

Previous landfill and chemical contamination in Wentworth Point has affected the archaeological potential in the area. Therefore, SU7 was divided into two separate parts, avoiding the remediated landfill areas containing compacted waste material in Woo-la-ra (see Figure 7.4). In total, SU7 consists of 49,910 square metres of which 13,463 square metres was surveyed on foot.

The northern part of SU7 is located along the river walk, adjacent to Parramatta River (see Plate 7.22 and Plate 7.23). This part of the survey unit was previously considered to be less impacted by previous disturbance except for the footpath construction and electrical easement. The saltmarsh wetland habitat in this area is an important component of the remaining saltmarsh community in New South Wales. Since European occupation, over 80 per cent of the saltmarsh habitat in the Sydney region has been lost, and in the Upper Parramatta River area, there has been a loss of 92 per cent of the original saltmarsh area (Millennium Parklands Heritage Precinct SEPP (PCRC) Item A). However, at Wentworth Point and Sydney Olympic Park (north of Haslams Creek) the study area is situated on manmade fills with a thickness of more than two metres over the Quaternary estuarine and alluvial deposits, to allow for industrial development. The adjacent 'Sanctuary' development in Wentworth Point also recorded the presence of highly disturbed and contaminated soil samples based on geotechnical results (Roads and Maritime Services, 2013).

This section of SU7 is located on a flat landform with very low surface exposure (five per cent) due to vegetation and grass. No Aboriginal artefacts were found during the survey and based on the results from previous geotechnical studies no further investigation is required in the river walk.

The second part of SU7 is located on the west bound section of Hill Road where AHIMS 45-6-2785 was recorded by GPS coordinates. AHIMS 45-6-2785 was previously recorded as a PAD within the Newington Nature Reserve and was mapped around 50 metres outside of the project site based on the site card map and description. This area was subject to landscaping of the wetlands and located on a flat landform (see Plate 7.24 and Plate 7.25). The surface visibility was low to nil due to shrubs and leaves. No Aboriginal artefacts were identified during the survey.

Plate 7.22 Looking north to Parramatta River



Plate 7.23 Looking south-west on river walk



Plate 7.24 Looking south to Millennium Parklands



Plate 7.25 Looking south to Millennium Parklands



7.3.6 Sydney Olympic Park

Survey Unit 8 - Haslams Creek

SU8 consists of Haslams Creek, mangroves and the banks of the creek (see Figure 7.5). The broad area has been remediated due to previous landfilling activities and now contains waste material which has been compacted and capped. The creek's riverbed has also been subjected to change via concrete channelling. However, KNC previously identified that the slopes on each side of the Holker Busway bridge, north of Haslams Creek, have low to moderate potential (KNC, 2018).

The alluvial flats in the area would have provided many resources to the Aboriginal people (see Plate 7.26 and Plate 7.27). Therefore, the presence of the intact soil profile may have archaeological potential due to the close distance to the watercourse. SU8 consists of 9,513 square metres of which 0.5 per cent was survey for effective coverage. In total, 470 square metres was surveyed on foot. The ground surface visibility was nil due to grassland and no Aboriginal artefacts were identified during the survey.

Plate 7.26 Looking north-east to Holker Busway



Plate 7.27 Holker Busway and Haslams Creek



Survey Unit 9 - Brickpit

SU9 consists of the nature strip on the eastern side of Australia Avenue adjacent to the Brickpit at Sydney Olympic Park (see Figure 7.5). The area is within a flat landform with extensive grass coverage and disturbance from a footpath/cycling lane and may present an intact soil profile.

SU9 consists of 13,084 square metres of which 1,962 square metres was surveyed on foot. Ground surface exposure was around one per cent of the area. The ground surface visibility was low (10 per cent) during the survey due to the grass. The area was subject to an unsystematic visual inspection as a result of this low visibility (see Plate 7.28 and Plate 7.29). Dark brown silty loam was exposed on the ground surface and additional disturbance was visible from an old stormwater pipe on the eastern side of the nature strip towards the Brickpit. No Aboriginal artefacts were identified during the survey. The undisturbed nature strip in this location is partially within the project site.

Plate 7.28 Looking north-west to Brickpit



Plate 7.29 Looking east towards to Brickpit



Following the site survey, Kerry Darcovich (Senior Manager Environment & Ecology) from the Sydney Olympic Park Authority provided additional information in late 2022 that indicated SU7, SU8 and SU9 are located on disturbed land (see Plate 7.30 and Plate 7.31) and that the area has been extensively disturbed prior to and during remediation and revegetation carried out as part of Sydney Olympic Park construction works. The 1951 aerial photography (see Plate 7.32) shows that the Narawang Wetland and Haslams Creek survey sites were within the footprint of the former Wentworth Bay, so were within estuarine waters at that time, prior to filling and reclamation of Wentworth Bay in the 1950s. Based on the scale of disturbance, there would be no archaeological potential in SU7, SU8 and SU9, therefore no further investigations (such as archaeological testing) are considered necessary.

Plate 7.30 Narawang Wetland in 1990s (SOPA)



Plate 7.31 Holker Busway (Bingham-Hall, 1999)





Plate 7.32 1951 aerial photography of former Wentworth Bay (Historical Imagery, 2020)

7.3.7 Parramatta CBD (desktop)

As noted previously, the area of the project site in the Parramatta CBD was not confirmed at the time of the archaeological survey conducted on 24 January 2022 and documented in the ASR for the project (refer Appendix C). However, this area was previously assessed for Parramatta Light Rail Stage 1. As such, information and assessment from *Parramatta Light Rail Aboriginal Cultural Heritage Assessment Report* (KNC, 2017) and subsequent investigations have been relied upon for this area. Since, Parramatta Light Rail Stage 1 was assessed, additional analysis and research in the Parramatta CBD has updated the knowledge on heritage values in this area. The following section identifies the key results from both the KNC study and an updated desktop analysis. This section also considers archaeological results from sites excavated immediately adjacent to the Parramatta CBD turnback facility to provide relevant context.

The Parramatta CBD area was surveyed by KNC in December 2016. Based on the archaeological background and landform context, the survey inspected areas of surface exposure for artefacts and evidence of intact soils and considered long term flood activity. The survey concluded that most of the study area contained little to no potential for subsurface archaeology due to disturbance from land use practices. These included the construction of buildings and roads, the installation of utilities, landscaping, and bulk earthworks. Low lying areas along the banks of Parramatta River and major creeks were likely to have been heavily disturbed by high energy flooding events, which could washout subsurface deposits. Soils on adjacent slopes were often disturbed and eroded. Aboriginal archaeological sites/PADs that were identified by KNC's survey in the Parramatta CBD is shown in Table 7.3,

Plate 7.33 and Plate 7.34.

Table 7.3 Identified Aboriginal archaeological sites/PADs in the Parramatta CBD precinct following field survey (KNC, 2017)

Location of precinct	Identified Aboriginal sites/PADs
Between Victoria Road and Purchase Street (inclusive of Robin Thomas Reserve)	Harris St Footpath/Robin Thomas Reserve
	PLR PAD 1
	PLR PAD 2
	PLR PAD 3

Plate 7.33 Identified Aboriginal archaeological sites/PADs in each precinct following field survey (KNC, 2017)

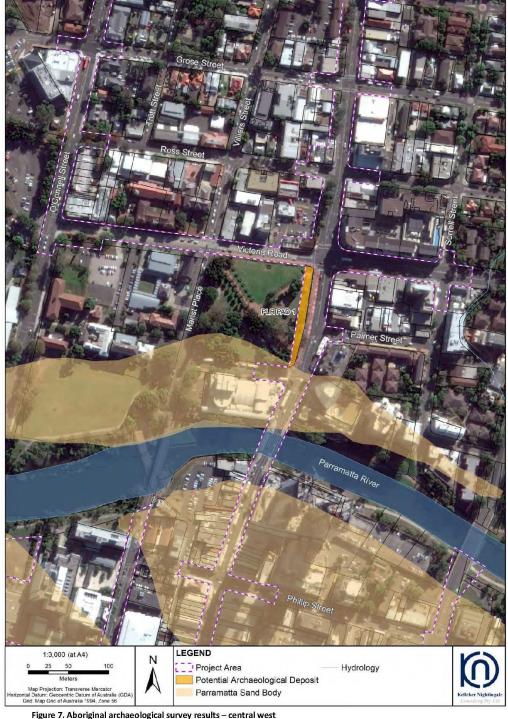


Figure 7. Aboriginal archaeological survey results – central west

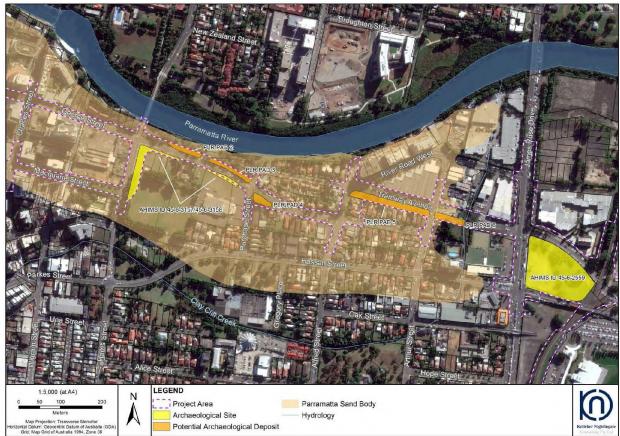


Plate 7.34 Identified Aboriginal archaeological sites/PADs in each precinct following field survey (KNC, 2017)

Figure 8. Aboriginal archaeological survey results – central east

In addition to database searches which revealed two AHIMS sites (AHIMS 45-6-2977 and 45-6-4015) within the project site, a high-level desktop assessment has been undertaken for the section of the Parramatta CBD project site. This was undertaken to capture further research and investigation that has taken place since the Parramatta Light Rail Stage 1 assessments as seen in Williams et. al. 2021. This section aims to identify Aboriginal archaeological potential for the Parramatta CBD turnback facility by analysing the investigations in proximity to the project site.

150 Marsden Street

Studies on Marsden Street uncovered archaeological potential in the Parramatta CBD. While the focus of these studies was historical archaeology, the results provide an indication of the surviving resource immediately west of Marsden Street and should be considered when assessing the likelihood of any Aboriginal archaeological potential. The site was recognised in the Parramatta Historical Archaeological Landscape Management System (PHALMS) study to be one of exceptional archaeological value and of possible State significance (GML, 2000).

The excavations at 150 Marsden Street revealed that the area was at the base of a depression running between the higher ridges of Macquarie and George Streets (Thorp, 2007). This site was substantially modified over the course of two centuries of occupation which resulted in the removal of the A1 topsoil. Very few small remnants of the A2 soil profile remained on site. B-horizon clay was uncovered largely during the excavations (Cultural Resources Management & Austral Archaeology Pty Ltd (CRM & Austral), 2009a). Channels were dug to control water run-off across the site.

The site had a substantial slope running from the higher end at the east gradually levelling to a flat area at the western end. There was evidence to indicate that a small stream or creek crossed the site at the base of this slope. The excavation also revealed that the topsoil from the site had been comprehensively removed possibly around the mid-19th century. The 150 Marsden Street site remained part of the backyard of allotments to the north and south up until around 1811. After 1811, the site became a residential allotment and construction of two dwellings, by Thomas Shaw sometime between 1811 and 1823 caused the removal of all topsoil and its replacement by a thick clay layer.

Nevertheless, the 150 Marsden Street site was subject to test excavations for Aboriginal occupation prior to the commencement of the historical excavation and fourteen test pits were excavated and recorded (CRM & Austral, 2009b). No evidence of Aboriginal occupation was found in this phase or the subsequent historical excavation, even though several Aboriginal heritage sites have been excavated within proximity. The topography and the poor condition of the land suggested that this was not a place attractive to either the earliest European colonists or to the local Darug people.

134-140 Marsden Street and 45-47 Macquarie Street

Excavations on 134-140 Marsden Street & 45-47 Macquarie Street revealed the remains of four 'convict huts', one of which had a brick lined well adjacent to the cellar. A test trench around this site was excavated to determine the depth of significant archaeological layers and ascertain the surviving condition of the site. The test trench indicated that the whole of the Macquarie Street frontage was well preserved, except for disturbance from the concrete piling (Edward Higginbotham & Associates (EH&A 2017), 2017). However, on Marsden Street the A1 and A2 horizons had been largely disturbed by 20th century demolition, leaving only features cut into the natural clay. Most of the archaeological evidence (artefact dating and stratigraphy) dates the construction of the cellar to the 1830s, when the site was partially occupied by the Shepherd and Flock Inn (1825-1870), but there is some evidence to suggest that the cellar may have belonged to the Wheatsheaf Hotel between 1801-1808. These convict huts were located around eight metres AHD under the footings of the late 19th century terraced house which had destroyed any earlier evidence.

No Aboriginal heritage assessment took place at this site except for pollen analysis of one natural soil sample. The 'natural' soil sample that preserved microfossil evidence of the pre-European vegetation, revealed savannah grassland occupying the higher river terraces within the Parramatta District and stands of casuarinas (presumed to be the river-oak *Casuarina cunninghamii*) growing along the upper (freshwater) reaches of the Parramatta River (Macphail, 2012). Eucalypt trees seem to have been rare around the site.

An analysis of findings relevant to the study area

The Parramatta Sand Body was uncovered during excavations at 15 Macquarie Street and the Children's Court (about 200 metres west from the project site). The approximate height of the upper layer with Aboriginal cultural deposits was nine metres AHD (Owen et al., 2022). The Parramatta Sand Body generally formed a sand terrace with an upper surface between four to nine metres AHD on the south side of the Parramatta River and eight to 14 metres AHD on the northern side. A section of the sand body was also mapped in the area bounded by O'Connell, Macquarie and Marsden Streets which intersects with another body of alluvium between these two locations an area of high ground (about 10 metres AHD). This body appears to be underlain by a mixture of clay and sand that is probably older than the Parramatta Sand Body (Groundtruth Consulting, 2008). This body has been mapped separately, however, the exact location where the two materials interface and its distribution remain uncertain.

Modern buildings have destroyed a very large proportion of the original sand body in the Parramatta CBD, however any remaining nineteenth century buildings are likely to retain some undisturbed sand beneath their foundations except where cellars have been excavated (Groundtruth Consulting, 2008). Another example of this is at 330 Church Street, where the development excavated to nine metres below ground surface, whereas the excavations indicated that the already truncated sand unit occurred only between two to three metres below the surface in this location (Williams et al., 2021).

On the other hand, it was noted by Groundtruth Consulting (2008) that most roads and footpaths can also be expected to preserve some intact sand. Particular attention should be given to any proposed excavation of roads and footpaths in areas of the sand body and investigation of major works for service line installation etc, by test excavation or drilling to check the presence and integrity of the sand body and its archaeological potential. However, recent monitoring works conducted by Umwelt Environmental & Social Consultants along Macquarie Street footpath uncovered disturbed soil profiles (personal communication with Umwelt). It is noted the results these works have not been formally reported at the time of writing and have been provided by Heritage NSW to inform this report. Monitoring works took place on 20-31 and 44 Macquarie Street and 144 Marsden Street. The trench on 144 Marsden Street (see point B on Plate 7.35) which is within the project site revealed a layer of fill up to 800 millimetres in depth, including a layer of road base, redeposited Blacktown soil landscape with historical fill of small sandstone and bricks. No intact soil profiles with potential Aboriginal archaeology were identified. A second trench location overlapping with project site is located on 20 Macquarie Street (see point C on Plate 7.35) which uncovered fill layers of builders' sand and concrete rubble up to a 700 millimetre depth. No natural soil profiles were identified in this location.

Recently, an overview on the Parramatta Sand Body discussed that archaeological deposits found immediately beneath the layer of current development across Parramatta, usually were found within approximately 40

centimetres of the current surface (Williams et al., 2021). Previous excavations on Marsden and Macquarie Streets uncovered disturbance and removal of topsoil and A horizons. However, the street frontage was found undisturbed on 45-47 Macquarie Street which may suggest intact soil profile of the Parramatta Sand Body under the road alignment (Figure 7.6). 150 Marsden Street displays a different landform than the project site, which was a depression, therefore A horizons may be intact on the project site of Marsden Street which was on the ridgeline of Macquarie Street.

The archaeological investigations in 134-140 Marsden Street & 45-47 Macquarie Street uncovered historical archaeological deposits at depth below the road surface as the site was built up due to localised flooding. Based on the excavations in the vicinity and previous assessments on intactness of the Parramatta Sand Body within the project site, there is a high possibility that the road alignment would contain preserved and intact sand body surviving underneath existing road fabric (AHIMS 45-6-4015 and AHIMS 45-6-2977), considering this area has been not disturbed by prior infrastructure.

Macguarie Street

A

B

Company of the street of the stree

Plate 7.35 Monitoring locations along Macquarie Street (Umwelt Environmental & Social Consultants 2022)



Legend

Artefact : -

Artefact : -, Potential Archaeological Deposit (PAD):-

O Potential Archaeological Deposit (PAD) : -

Potential Archaeological Deposit (PAD) : 1

Project site

Parramatta Sand Body Area

Previous excavations



Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Previous studies in

Project No. 12557728 Revision No. 2 Date 08/03/2023

7.3.8 Areas not surveyed

As noted in section 7.2, some sections of the study area identified as having Aboriginal archaeological sensitivity were not able to be surveyed.

Melrose Park Public School (oval) is located partially within the study area on a flat landform with likely minimal disturbance 200 metres from the Parramatta River and as such is considered to have high Aboriginal heritage potential. During the survey, the oval was observed from the nearby footpath and the ground exposure seemed to be very low due to high grass. It was also noted that the path in the middle of the oval was being resurfaced exposing some topsoil in the process (see Plate 7.36 and Plate 7.37). No Aboriginal artefacts were observed from the footpath. No further investigations are recommended for the Melrose Park Public School (oval) as it is outside of the project site boundary and would not be impacted.

Ten residential properties, adjacent to Wharf Road, are located within the study area (see Figure 7.7). Any undisturbed gardens and backyards of these properties may hold Aboriginal heritage potential based on their distance to the Parramatta River and PAD1. Transport for NSW has committed to completing a survey of the ten residential properties in Melrose Park, in consultation with the LALC Site Officers, should it be confirmed they could be impacted by the project and once property access can be arranged (see section 10.4). However. following exhibition of the EIS, the Melrose Park to Wentworth Point bridge has been realigned further west to avoid direct property impacts, which has avoided these two areas of archaeological sensitivity and the potential for harm.

Additionally, the mangroves along Camellia were not accessible to survey. As a result of the disturbed nature the Deerubbin LALC Site Officer confirmed that no further investigations are necessary in Camellia.

Plate 7.36 Looking south to Melrose Park Public School Plate 7.37 Looking east, the construction works in the oval



school oval





Legend

Study area

Areas of Aboriginal archaeological sensitivity recommended for future survey if direct impacts cannot be avoided

Paper Size ISO A4
0 20 40
Metres

Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Areas of Aboriginal archaeological sensitivity recommended for future survey

Project No. 12557728 Revision No. 2 Date 16/03/2023

FIGURE 7.7

7.4 Summary of archaeological survey and desktop analysis

The survey was undertaken in accordance with the recording requirements stipulated in The Code and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW, 2011). This included identifying landforms and landscapes including visibility and exposure for each survey unit. The effective coverage data (around 13 per cent) for the survey indicated that generally there were poor ground surface visibility across the study area which significantly reduced the possibility of identifying surface evidence of past-Aboriginal occupation.

Where Aboriginal sites are present in the study area, these are likely to be within pockets of undisturbed parklands, nature strips adjacent to watercourses and within 200 metres of the river with limited previous ground disturbance. A total of five PADs (PLR2 PAD1, PLR2 PAD2, PLR2 PAD3, PLR2 PAD5 and PLR2 PAD6) were identified within the study area, as a result of the archaeological field survey and in consultation with LALC Site Officers:

- three PADs (PLR2 PAD1 and PLR2 PAD3 within the project site, and PLR2 PAD2 outside the project site) were identified with high archaeological potential as they were in close proximity to a known site or landform such as a river or creek
- two PADs (PLR2 PAD5 and PLR2 PAD6) were identified as having moderate archaeological potential
 which despite their distance to watercourses being greater than 200 metres, it was considered that
 these areas could be routes to inland.

One PAD (PLR2 PAD2) was identified, but is outside of the project site, and would not be impacted.

No Aboriginal artefacts were identified during the survey.

The survey also included general discussion with the LALCs with respect to the Aboriginal cultural heritage values of the study area and surrounds. Both Site Officers emphasised the important role of the Parramatta River for surrounding Aboriginal communities as a food source, as well as gathering and ceremonial places along the river. Eel traps and shell middens associated with the river are considered highly significant for Aboriginal people.

In addition to the survey, two AHIMS (AHIMS 45-6-2977 and 45-6-4015) sites were identified within the project site in Parramatta CBD based on desktop analysis. AHIMS 45-6-2977 is identified to have high archaeological potential as it is located where the Parramatta Sand Body is known to have intact soil profiles. AHIMS 45-6-4015 is identified with moderate archaeological potential due to its potential for contact archaeology and potential to hold evidence for the Native Institute for Aboriginal Children. Since public exhibition of the EIS and Technical Paper 4 (Preliminary Aboriginal Cultural Heritage Assessment Report), two AHIMS sites (45-6-4078 and 45-6-4079) were recorded in Melrose Park following a site visit by Transport for NSW. These shell middens have been identified as having high archaeological potential as they are located within the mangroves of Parramatta River.

7.4.1 PADs/sites identified with high archaeological potential

This section summarises the PADs identified in the study area during the survey or desktop research, and documented in the ASR as having high archaeological potential. In the Preliminary ACHAR, the PADs had been defined for a larger area in order to address archaeological potential and to accommodate options for design refinement in the ACHAR. Recently registered AHIMS shell middens in Melrose Park have also been included in this section.

PLR2 PAD1 Ermington Boat Ramp, Melrose Park (9,204 m²)

The Ermington Boat Ramp area has been previously identified as having high archaeological potential (Dallas Consulting, 2014), and the less disturbed parts of this area have been recorded as an area of potential archaeological deposit following the survey (see Figure 7.8) The less disturbed areas include:

- the nature strip north-west of the overhead high voltage lines
- the northern (SU2) boundary of Waratah Street.

PAD1 is located in the Lucas Heights Soil Landscape, which is formed *in situ* by weathering material, namely residual soil. This soil type is favourable for artefact durability, except for organic material, which may result as an accumulation of artefacts from the different occupation levels. The survey indicated that the area had been modified by landscaping, the Viva Energy fuel pipeline and the high voltage power easement, however,

archaeological investigations at sites in the region have uncovered intact archaeological deposits beneath modern disturbance. The area has been assessed as having the potential for subsurface Aboriginal archaeological deposits due to its proximity to the Parramatta River and the shell midden (AHIMS 45-6-1961) on the west coast of the unnamed bay in Ermington.

PLR2 PAD2 Melrose Park Public School Oval (7,972 m²)

Melrose Park Public School oval has been identified as an area of potential archaeological deposit based on landform features and distance to Parramatta River and noting the likely minimal disturbance of the oval which indicates potential for sub-surface archaeological deposits (see Figure 7.8). The location was observed from the footpath with the Metropolitan LALC Site Officer, although not directly surveyed. The elevation of this area associated with the Parramatta River would have been less impacted by flooding and so the disturbance from historic and modern land use has been limited. This PAD was excluded from the project site as part of design refinement and would not be impacted by the works.

PLR2 PAD3 Rydalmere Wharf (18,447 m²)

Rydalmere Wharf and parklands (Eric Primrose Reserve) around the wharf have been identified as an area of potential archaeological deposit on the flat, gently sloping area to the north of the parklands (see Figure 7.9). While previous construction of amenities, car parks and vegetation removal has been undertaken in the area, the landform remains largely intact. Although bicycle paths and landscaping have partially disturbed the area; the wharf has been assessed as having potential for subsurface archaeological deposits below the modern disturbance due to its proximity to the Parramatta River.

A review of the draft WSP Golder Factual Contamination Report (WSP, 2022) was undertaken to provide an indication of the subsurface conditions in Eric Primrose Reserve Rydalmere, and builds on previous research of these areas that was included in the Archaeological Survey Report (see Appendix D).

As part of the contamination investigation undertaken by WSP Golder, six boreholes (BH355, LDPH236, BHMW353, BH354, BH355 and LDBH356) were drilled in Eric Primrose Reserve in locations associated with potentially sensitive heritage areas.

In BH355 a fill layer was detected up to 1.5 metres followed by clayey silty sand up to 2.5 metres (fine to medium grained brown grey with orange, trace wood fragments). This alluvial soil may contain A1 horizon of Lucas Heights soil landscape as described in Section 4.2.

Borehole LDBH236 was drilled in the road surface of the car park and identified a different soil profile below the 1.9 metres fill (asphalt, gravel and clay). From 1.9 metres to four metres depth an alluvial soil of sandy clay (dark grey to black fine grained sand with silt with slight rotten egg smell) was identified followed by a residual soil of sandy clay.

Four of the boreholes in Eric Primrose Reserve provide an indication of the soil profile within the amended project site boundary – BHMW353, BH354, BH355 and LDBH356. These indicate that there is between 700 millimetres (BHMW353) and 1500 millimetres (BH355) of fill across this area with the fill containing brick fragments, glass, and in one instance (BH355), asbestos. The presence of asbestos indicates that the fill was deposited between around 1910 and 1980 and most likely from around 1945 onwards.

Alluvial soil was recorded beneath the fill layer in these boreholes. This alluvial soil has the potential for archaeological evidence, based on the information from multiple boreholes there is a possibility for intact soil profiles below the fill layers. The proximity of Parramatta River and the rich resources of the location prior to colonisation indicates high potential for Aboriginal archaeology.

AHIMS 45-6-2977 (Macquarie St PAD 3)

This PAD is located on Macquarie Street, based on the site card map, between the intersections of Church Street and across to the intersection of O'Connell Street (see Figure 7.10). The site was registered in 2011 by Comber Consultants as a PAD located in an area where the Parramatta Sand Body was identified with intact soil profiles.

AHIMS 45-6-4078 (Ermington SHL 01)

This shell midden site is located 30 metres east of the project site. The shells are recorded within the mature mangroves and the visible extent of the site is over 20 metres in length. This site was registered in February 2023 by Transport for NSW and it has been assessed as high significance due to its proximity to Parramatta River and potential to possess information on Aboriginal gathering activities.

AHIMS 45-6-4079 (Ermington SHL 02)

This site is located within the project site. The visible extent of the shell midden covers an area of 15 by five metres. This site was registered in February 2023 by Transport for NSW, and it has been assessed as high significance due to its proximity to Parramatta River and potential to possess information on Aboriginal gathering activities.

7.4.2 PADs/sites identified with moderate archaeological potential

This section summarises the PADs identified in the study area during the survey or desktop research, and documented in the ASR as having moderate archaeological potential. In the Preliminary ACHAR, the PADs had been defined for a larger area in order to address archaeological potential and to accommodate options for design refinement in the ACHAR.

PLR2 PAD5 Broadoaks Park, Rydalmere (4,369 m²)

Broadoaks Park is located on a mid slope with very limited and unknown levels of previous disturbance (see Figure 7.9). The topsoil (A horizon - brown clay loam) was observed during the survey to be eroded in the central areas of the park but intact in the south. These erosional soils are associated with poor preservation of archaeological material which is likely to occur at shallow depths.

Broadoaks Park was initially assessed as having high archaeological potential in the Aboriginal Sensitivity Map (Dallas, 2014) but based on the distance to the water, was revised to moderate archaeological potential. Due to the elevation of the parkland and undisturbed condition in the south of this area was assessed to have a moderate level of archaeological potential. However, the assessment was revised to having no archaeological potential following the test excavations due to absence of *in situ* soil profile and fill layers.

PLR2 PAD6 Ken Newman Park, Ermington (32,191 m²)

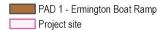
Ken Newman Park is situated on the low and mid slopes of a small ridgeline (see Figure 7.9). The park is located on the intersection of two soil landscapes – Lucas Heights and Glenorie. Residual and erosional loams in this area have the potential to contain archaeological deposits at shallow depths. Ken Newman Park was initially assessed as high archaeological potential in the Aboriginal Sensitivity Map (Dallas, 2014) but based on the distance to the water has been revised as moderate archaeological potential. This assessment is subject to change following archaeological testing. Considering the very limited previous disturbance, except for Sydney Water potable water pipelines crossing the parkland, this park has been assessed as having moderate archaeological potential, especially noting the limited impact the site would expect to see from flooding due to its elevation.

AHIMS 45-6-4015 (Church St PAD 1)

This PAD is located at 197-207 Church Street and 89 Marsden Street, which partially overlaps with AHIMS 45-6-2977 on the footpath of Macquarie Street (see Figure 7.10). The site includes a PAD within the Parramatta Sand Body which may hold evidence for early 19th century feasts between Aboriginal and European people including, the Native Institute.







Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56

Paper Size ISO A4





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

PADs identified in **Melrose Park**

Project No. 12557728 Revision No. 2

Date 16/03/2023

FIGURE 7.8





PAD 3 - Rydalmere Wharf

PAD 5 - Broadoaks Park

PAD 6 - Ken Newman Park

Project site

Paper Size ISO A4



Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

PADs identified in

Project No. 12557728 Revision No. 2 Date 16/03/2023

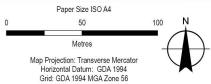




PAD 1 - Church Street

PAD 3 - Macquarie Street

Project site





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

PADs identified in Parramatta CBD

Project No. 12557728 Revision No. 2

Date 16/03/2023

FIGURE 7.10

8 TEST EXCAVATION RESULTS

8.1 Overview

Additional investigations were required in four areas within the project site which were identified to have high or moderate potential based on the results of the field survey and background research.

The Aboriginal archaeological test excavation was planned in conjunction with the non-Aboriginal testing program to understand the nature and extent of any Aboriginal heritage values in accordance with the Code. The test excavation methodology in Appendix C was applied during the program, and three millimetre static mechanical wet sieving was employed for the sieving of all soil profiles.

The test excavation program commenced on 31 October 2022 and was overseen by Dr Bengi Selvi Lamb, supporting archaeologists and RAP Site Officers.

Test excavations were not able to be completed safely, or in accordance with the test excavation methodology due to the presence of asbestos or deep levels of fill. A revised methodology to reflect the need for mechanical excavation at PLR2 PAD 3, asbestos management requirements, and to ensure a safe working environment will be prepared in consultation with RAPs to allow for the recommencement of testing, which would take place prior to construction.

8.2 Broadoaks Park PLR 2 PAD5

This site was first visited during the archaeological survey with Deerubbin LALC. The southern part of the park within the project site located a mid-slope with unknown levels of previous disturbance and exhibited low level disturbance from modern land use practices.

The test excavations were undertaken on 1-2 November 2022. Each pit was surveyed prior to the excavations by the surveyor with reduced levels (RLs) from the centre of the pit (see Figure 8.1).

A total of 12, 500x500 millimetre, Phase 1 test pits (TP) and four, 1x1 metre, Phase 2 test squares (TS) with 10 metre spacing were marked up in consultation with RAPs (as per the test excavation methodology in Appendix C).

Thirteen of the nominated 16 pits/squares were excavated during the test excavation program (see Table 8.2), with the exception of the following:

- Phase 2 TS (907) was ceased due to asbestos found in the first spit. This TS was planned to be relocated within the PAD area, however all test excavations at this location ceased on 2 November 2022 due to health and safety risks associated with asbestos contamination
- Phase 2 TS (914 and 916) were originally nominated within the historic test excavation trenches to fully
 understand the soil profile, (marked in yellow on Figure 8.1). However, they were not excavated due to
 the disturbed nature of the area and shallow sterile layer of clay (see Plate 8.1 and Plate 8.2).

Only one of the four test squares, Phase 2 TS (908), were excavated. The excavation of this TS provided sufficient data, however Quad B was abandoned due to the presence of asbestos. All three quadrants (A, C and D) of TS 908 were excavated to a sterile clay layer and no artefacts were found from these quadrants. This provided enough information in terms of sampling for test excavations. All final RLs were recorded prior to backfilling of the test pits. No archaeological value was present due to the high levels of disturbance.

8.2.1 Soil profile and summary of excavations

PLR2 PAD5 (AHIMS 45-6-4076) is located in the Glenorie soil landscape to the north of Parramatta River. Section drawings, soil type and colour for each pit and spit are provided in Appendix F. The test excavations identified three soil profiles including introduced topsoil which was moderately moist brown loam, onto brown sandy clay loam which was redeposited including demolition material, to mottled brown clay. Excavations into the base of the pit confirmed that the clay deposit identified represented the B horizon (see Table 8.1) and confirmed the absence of A Horizons which would have *in situ* archaeological evidence.





Non-Aboriginal test

PAD 5 - Broadoaks

Test Pit

■ Aboriginal Phase 2

Electricity Aboriginal Phase 1 Gas

Sewer

Water

Non Aboriginal Archeology Phase 2

Paper Size ISO A4

Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Test pit locations in PAD5 Broadoaks Park

Project No. 12557728 Revision No. 4 Date 08/03/2023

FIGURE 8.1

Table 8.1 Soil landscape of PLR2 PAD5

Soil material (Glenorie soil landscape)	Description		
A1 horizon	Usually consists of up to 150 millimetres of dark brown loam.		
A2 horizon	Up to 300 millimetres of brown clay loam as lower topsoil.		
B horizon	Reddish brown clay approximately one metre thick		

Introduced topsoil and redeposited fill layers contained modern materials such as glass, bricks and metal. Each test pit was recorded individually on spit-sheets during the excavations, including details of disturbances of each spit (see Appendix F). In line with the test excavation methodology, the first TP (901) was excavated in 50 millimetre intervals to the clay base (see Plate 8.3 and Plate 8.4) whereas 100 millimetres intervals were used for all other TPs.

The excavations identified cultural material within the introduced topsoil and redeposited fill layers alongside with glass, metal, bricks and asbestos (see Plate 8.5 and Plate 8.6). In multiple TPs asbestos was identified either during excavations or during the sieving within the demolition layer of bricks and concrete. This fill layer indicates that the area may have been used as a laydown area for previous construction works.

Eight stone tool artefacts were found within these disturbed layers in five TPs. A summary of the excavation of each pit/square is provided in Table 8.2 and a detailed artefact analysis presented in section 8.2.2.

Table 8.2 Test excavation summary of PAD5

Test pit / square number	Description	Artefact count	
TP 901	Total depth 550 millimetres excavated by hand in 50 millimetres spits. Moderately moist introduced sandy clay loam with metal, glass, roots as disturbance. Ironstones, shale and manganese as inclusions gradually onto clay loam around 250 millimetres depth terminated at clay base.	2	
TP 902	Total depth 300 millimetres excavated by hand in 100 millimetres spits. Moderately compacted orange brown silty loam with ironstone, manganese and charcoal grading to clay at the base.	1	
TP 903	Total depth 400 millimetres excavated by hand in 100 millimetres spits. Moderately moist introduced orange brown silty clay loam with sandstones grading to clay loam with ironstone and manganese. Terminated at clay base.	-	
TP 904	Total depth 100 millimetres excavated by hand in 100 millimetres spits. Compacted orange brown reformed clay loam with ironstone and burnt clay, terminated at clay.	-	
TP 905	Total depth 200 millimetres excavated by hand in 100 millimetres spits. Brown topsoil grading to silty clay with ironstone, manganese, charcoal and sandstones Terminated at orange clay at the base.	-	
TP 906	Total depth 530 millimetres excavated by hand in 100 millimetres spits. Brown introduced topsoil with ironstone, manganese reformed on banded demolition layer with bricks, glass, concrete. Gradually transforms to clay base.	-	
TS 907	Abandoned due to asbestos in the first spit.	-	
TS 908	Total depth 230 millimetres excavated by hand in 100 millimetres spits in quads. Brown silty clay loam with sterile topsoil. Grading to ironstone and charcoal inclusions with disturbance of plastic and ceramic. Abandoned due to asbestos in Quad B.	-	
TP 909	Total depth 300 millimetres excavated by hand in 100 millimetres spits. Brown silty topsoil onto reddish brown silty clay with ironstone and burnt clay. Terminated at orange clay.	-	
TP 910	Total depth 250 millimetres excavated by hand in 100 millimetres spits. Brown silty clay loam with ironstone and manganese inclusions. Terminated at clay base.	-	

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

Test pit / square number		
TP 911	Total depth 200 millimetres excavated by hand in 100 millimetres spits. Introduced browns silty clay loam with ironstone and manganese. Terminated at clay base. Asbestos was found in spit 2.	3
TP 912	Total depth 400 millimetres excavated by hand in 100 millimetres spits. Brown silty loam with ironstones. Terminated at clay base.	1
TP 913	Total depth 400 millimetres excavated by hand in 100 millimetres spits. Brown loam with ironstone manganese inclusions, grading to orange brown silty clay. Terminated at clay base.	-
TS 914	Not excavated due to erosion.	-
TP 915	Total depth 500 millimetres excavated by hand in 100 millimetres spits. Dark grey silty clay with ironstone and charcoal. A metal bar was exposed from north east corner. Silcrete angular fragment found in spit 2 on site. Terminated at clay base.	
TS 916	Not excavated due to erosion.	-

Plate 8.1 Non-Aboriginal test trench N-S direction



Plate 8.3 Base of TP 901



Plate 8.2 Non-Aboriginal test trench E-W direction



Plate 8.4 North direction of TP 901



Plate 8.5 TS 908 Looking N, asbestos found in Quad B



Plate 8.6 W Section of TP 906, demolition layer



8.2.2 Artefact analysis

A total of eight artefacts were recovered during the test excavations from five test pits. All artefacts were found in redeposited layers with evidence of disturbance such as plastic, glass and modern ceramics. These modern finds within the same spits were indicative of the displacement of Aboriginal artefacts.

The assemblage was dominated by broken flakes, mainly distal flakes, and the end of the artefact was broken, which is common for redeposited artefacts (see Table 8.3 and Figure 8.2). Over sixty per cent of the assemblage was made of silcrete, which is a readily available raw material for artefact manufacture in the local landscape. Half of the artefacts (50 per cent) were found within the first 100 millimetres from the surface (see Graph 8.1), generally most prone to disturbance due to human activities.

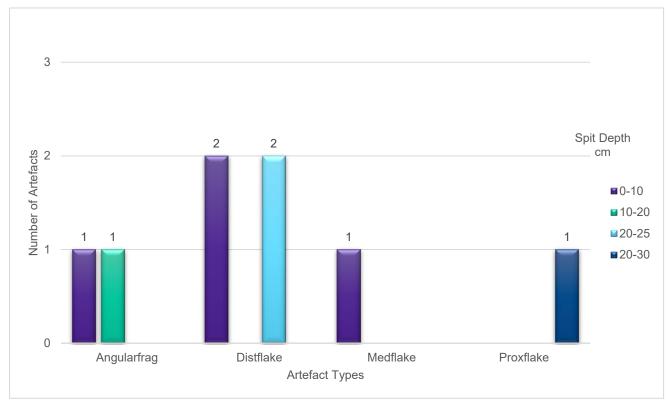
The first potential asbestos piece was found in TP 911 which also uncovered the highest number of artefacts (37 per cent of the assemblage) (see Graph 8.2). All artefacts from this test pit were found in the first 100 millimetres from the surface then asbestos was found in the following spit.

Absence of complete flakes and tools caused difficulties to assess the average size or features of the assemblage (see Plate 8.7 to Plate 8.11 for artefact photos). In addition, no artefacts had diagnostic features, such as certain type of retouch or size, raw material which often aids for relative dating and history of Aboriginal occupation. All these artefacts would have been transferred to the current site with the fill layer from an unknown location.

Table 8.3 Artefact types and raw materials of artefacts

Artefact type	Coarse Silcrete	Indurated Mudstone Tuff (IMT)	Medium Silcrete	Milky Quartz	Grand Total
Angular fragment			2		2
Distal flake	1	1	2		4
Medial flake				1	1
Proximal flake		1			1
Grand total	1	2	4	1	8

Graph 8.1 Number of artefacts in spits



Graph 8.2 Test Pits with artefacts

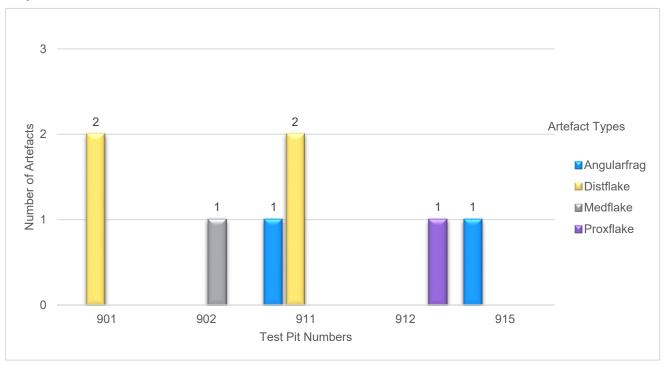


Plate 8.7 Two silcrete distal flakes from TP 901



Plate 8.9 IMT proximal flake from TP 912



Plate 8.11 Quartz medial flake from TP 902

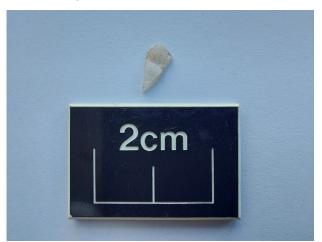


Plate 8.8 Silcrete angular fragment from TP 915

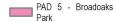


Plate 8.10 IMT distal flake, silcrete distal flake and silcrete angular fragment from TP 911









Test pits with artefacts

Test Pit

Aboriginal Phase 1

■ Aboriginal Phase 2

Non Aboriginal Archeology Phase 2

Electricity Gas

Sewer Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Water Grid: GDA 1994 MGA Zone 56



Paper Size ISO A4

Metres



Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Test Pits with Artefacts in **PAD5 Broadoaks Park**

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FIGURE 8.2

8.3 Ken Newman Park PLR2 PAD6

The test excavations at PLR2 PAD6 started simultaneously with PLR2 PAD5 on 2 November 2022. In total, 25 test squares (1x1 metre) were marked up to understand the limits of the PAD (see Figure 8.3). However, while all pits commenced excavation (TS 201, TS 203 and TS 220) (see Plate 8.12), they were later abandoned due to the presence of asbestos. The excavated soil was wet sieved on 12 December 2022, and no artefacts were identified in PLR2 PAD6.

Plate 8.12 End of TS 220



8.4 Ermington Boat Ramp PLR2 PAD1

Fieldwork commenced on 13 December 2022, under the supervision of a licensed asbestos assessor (LAA) after an exposure control plan had been developed and all site personnel had undertaken asbestos awareness training. Fifteen pits were marked up to avoid harming trees and to exclude a Viva Energy no go zone. All pits were 1x1 metres and were planned to be excavated in quadrants (see Figure 8.4). The first pit TS 109 (Plate 8.13) was abandoned based on the licensed asbestos assessor's (LAA) recommendation at 150 millimetres depth. All excavations were then ceased at this location on the advice of the LAA based on repeated asbestos finds. Any future excavations would need to consider the presence of asbestos contamination and be undertaken in accordance with the provisions of the *Contaminated Land Management Act 1997*, as relevant.

Section drawings and detailed recording of TS 109 were not completed due to health and safety risks. The excavated soil was also not sieved due to health and safety risks from the identified asbestos.

Asbestos samples from both locations (PLR2 PAD1 and PLR2 PAD6) were analysed and confirmed as amosite, chrysotile types of asbestos.

Plate 8.13 End of TS 109



8.5 Rydalmere Wharf PLR2 PAD3

Excavations in this PAD were planned to commence in the second half of the test excavation program. However, the contamination investigations undertaken by WSP Golder (WSP, 2022) provided an indication of the subsurface conditions in Eric Primrose Reserve and identified intact soil deposits overlaying by thick fill layers as mentioned in section 7.4.1 that would not be able to be hand dug as proposed by the test excavation methodology, along with the presence of asbestos.

Test excavation in this PAD would require mechanical clearing of the fill layer prior to the commencement of hand dug test pits to fully understand the Aboriginal heritage values. As such an updated excavation methodology, developed in consultation with RAPs would be required for this PAD.





Non-Aboriginal test

PAD 6 - Ken Newman

Project site

Aboriginal Phase 1

Aboriginal Phase 2

Non Aboriginal Archeology Phase 2

Electricity

Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56

Paper Size ISO A4

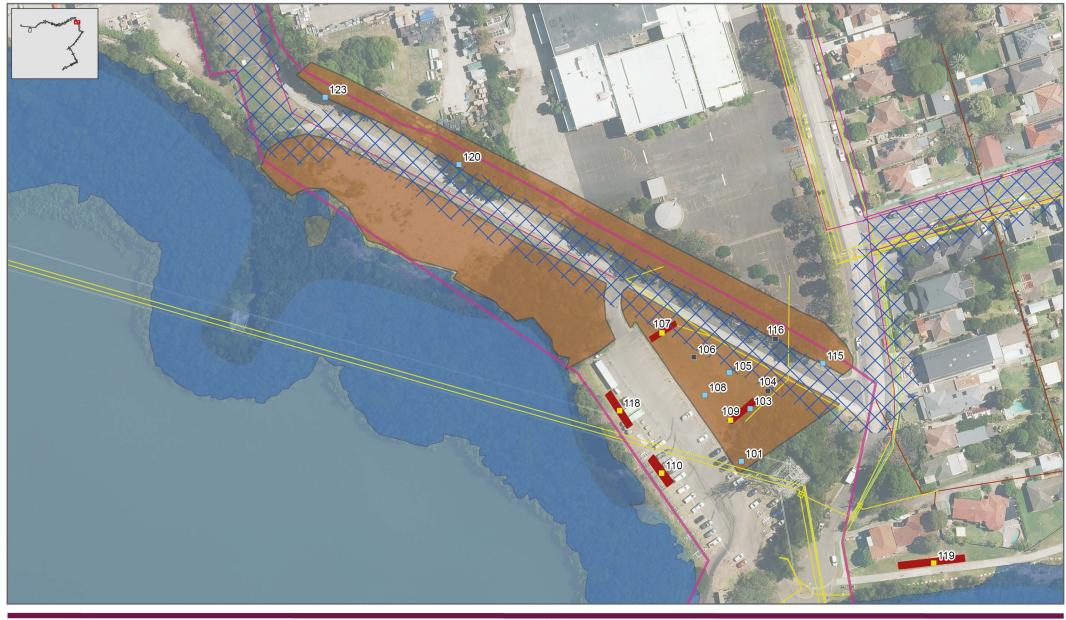




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Test pit locations in PAD6 Ken Newman Park

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Non-Aboriginal test

Coastal wetlands

PAD 1 - Ermington Boat Ramp

Test Pit

Aboriginal Phase 1

■ Aboriginal Phase 2

Non Aboriginal Archeology Phase 2

Electricity

Sewer - Water

No works zone

Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56

Paper Size ISO A4





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Test pit locations in PAD1 Ermington Boat Ramp

FIGURE 8.4

Data source: Study area - GHD2022, Precinct - Mecone2021, Remediated land - SOPA2010, Test pit - RPS2022, Road, Watercourse - NSWSS2022, Imagery-Metromap Tille Service: extracted 08/03/2023. Created by: Imanasan

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9 CULTURAL VALUES ASSESSMENT

A cultural values assessment has been prepared by Dr Elizabeth Bonshek (PhD Anthropology) from Artefact Heritage, which included a desktop review of available ethnographic information, a site visit and detailed cultural interviews with three cultural knowledge holders to assess the potential cultural and spiritual impacts of the project. The study area of this assessment extended beyond the archaeological study area and was focused around eight precincts (refer Figure 3 of Appendix G).

The full cultural values assessment is provided in Appendix G with a summary provided in the sections below, including quotations sourced from the report.

No specific locations were mapped for cultural values, however the report identified a number of overlapping themes that constitute contemporary cultural values in the study area from the perspective of the three participants.

The seven themes identified for the broader region during the research were:

- Country and connection to Country
- waterways provide food and resources
- travel and communication
- histories of disruption and disconnection
- environmental decay / urban development
- difficulty with archaeology failure to embrace cultural values
- people of note in the area.

During the site visit and interviews with three cultural knowledge holders, the importance of Songlines and sight lines were noted, as was the importance of the Parramatta River for resources and for being an area of great spiritual importance. The need for accessing the Country was raised, and the prohibition on the access the Country.

9.1 Cultural and spiritual value

The importance and nature of **Country and spiritual connection to Country** was raised by the cultural knowledge holders during the interviews. The importance of Parramatta River as a Songline was emphasised, including the spiritual and cultural wellbeing through access to essential resources from the river and the surrounding creeks as well as connection (travel and communication) between people from different Countries.

The Country was described as "sick" due to environmental degradation including development and polluting industries located in and around the study area, which has destroyed the ecosystem of the waterways. However if Aboriginal people can practice their cultural values this may heal the Country.

It was noted by Dr Bonshek "I was told that people have been prevented from physically accessing Country (in this instance, Parramatta River) which has resulted in disruption of their cultural practices; historical events have also resulted in the loss of cultural practices and in turn have disrupted people's ability to perform their cultural and ceremonial practices (their cultural values). People have been alienated from Country; their language lost; their children taken away - yet they are asked through the interview process to describe their cultural values, and to do so within a process which they feel will inevitably lead to further development."

Songlines are spiritual connections to the ancestors, and knowledge comes from them and identified in the Country and connection to Country. The Parramatta River is a Songline and was created in the Dreamtime by the movement of the Grey Eel. The land is described as old as the Dreamtime, travels routes are located on Songlines, which are a way of passing knowledge. The sky and the stars are important as well as land and the waterways. The energy of the Country cannot be lost and people need to reconnect to this energy.

The Parramatta River is spiritually significant as it is a meeting of fresh and salt water. The riverbanks were burial places and because of this practice, the works of the project should avoid these areas and stick to already developed areas.

Many records of significance were identified **food and resources**. Mangroves were used to make boomerangs, as well as providing food like crabs, eels and Warragul greens (similar to English spinach). These wetlands are

breeding grounds for fish, birds, and provides resources to make fishing technology. To protect their babies women used to place the babies on Shea Oaks leaves, which repels the snakes.

The centre of the theme for **travel and communication** was the Parramatta River which is a border between groups as well as a meeting point for trade. Main resources of fish, the wood for making canoes, shell for barb points, the silcrete from the Cumberland Plain were in the centre of this trade. Lines of sight enabled people to see smoke signals, communications were made for people traveling into the area. Travel was seasonal and people would ask permission to go to another Country. Therefore, these communications were essential for so many activities such as feasting and gatherings.

The **histories of disruption and disconnection** theme highlighted that histories have been taken from Aboriginal people, including the elders knowledge. The fear of losing their children interrupted the teaching Darug language and culture. The "bad history" Parramatta, holds such as the Native Institution where the Aboriginal children were taken, needs to be made public.

Burial grounds along the riverbank have been disturbed, environmental resources have been lost. Aboriginal people have a vibrant cultural life and ongoing connection to Country, therefore, their stories should be told and their language should be restored. The artefacts "need" to be returned to their "proper place".

Urban development has resulted in the pollution of the Country and the land and water has become sick. The Country needs healing as it is "sick" (also "unhappy") because people are not looking after the Country. A sustainable way of living and "developing" is needed, as consultation was viewed as a ticking box exercise and a way that developers could obtain legitimacy for their projects. The process of consultation on Aboriginal cultural values is only meaningful when these practices were applied and used to help maintain the health of the Country. A broader view is needed for Aboriginal cultural values rather than just the AHIMS sites.

These views were more defined under the theme of **difficulty with archaeology**. The word midden is used by many people to refer to 'rubbish tips". However, middens are gathering places, sustainable use of resources and their metres of depth holds the histories. The flaked off pieces are still artefacts, they are not discards. The culturally and spiritually important sites are not limited to AHIMS sites. Cultural values go deeper than soil profiles while archaeology is limited to material culture and objects does not incorporate soil, water, sky, stars, sound and sight, which exist across past, present and future.

The final theme of the cultural values interviews was **important people in the area**. Maria Lock was acknowledged for educational achievements in the nineteenth century, and contemporary artist Joe Hurst and athlete Cathy Freeman were acknowledged for their contributions.

These values of exceptional significance provide evidence of ongoing occupation, land use and traditional lifestyle across Darug Country, demonstrating the long-enduring and continuous Darug occupation of, and connection to, the Parramatta area.

The study area is therefore considered likely to have high cultural and spiritual significance to the local Aboriginal community.

The cultural values assessment provided a number of broader considerations around development in the area as well as project specific considerations which are recommended to be addressed during the next stages of design development (see section 12.2).

9.2 Historical value

The study area holds potential to be of historical value and significance to local Aboriginal people in connection with the wider area in this part of Parramatta, associated with early interactions between European colonists and Aboriginal people at the Parramatta settlement.

The AHIMS sites (45-6-2977 and AHIMS 45-6-4015) in the Parramatta CBD have potential hold information on the Parramatta Native Institute. The story of the Aboriginal children would be made public and the history of the Native Institution has high historic value to truth telling and Aboriginal People.

During the cultural interviews the potential for burials along the river was raised multiple times, even though there are no recorded burial or contact sites within the study area. The potential burials and contact sites would have high historical value. However, this will be further investigated through the community consultation process with the RAPs, particularly via review of the draft ACHAR.

Following RAP review of the draft ACHAR, the following statement of cultural significance was received in relation to historic value:

The Parramatta area is a culturally important place with archaeological finds dating back 14,000 years, and First Nations memory of the area dating back even further. We believe any projects in the area need to be mindful due to the very significant cultural materials found in digs nearby and the artefacts found preserved in the Parramatta Sand Body.

9.3 Scientific significance assessment

Archaeological value refers to the importance of a landscape, area, place or object based on its rarity, representativeness, and the extent to which it may contribute to further understanding and information about past Aboriginal occupation (OEH, 2011:9).

Criteria for archaeological significance have been developed in accordance with the principles of The Code and best practice assessment processes as set out in the Burra Charter. The following archaeological significance criteria have been used: rarity, representativeness, research potential and education potential. These are defined in Table 9.1.

Table 9.1: Archaeological significance criteria

Criteria	Description
Rarity	What are the unique and distinctive features of a site, how many are left? Is this a good example of its type? What characteristics might demonstrate this? Is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practiced? Is it in danger of being lost or of exceptional interest?
Representativeness	How much variability (outside and / or inside the subject area) exists, what is already conserved, how much connectivity is there?
Research potential	What is the potential of a site to shed a light into past human behaviour and to contribute on intra-regional relationships? Is the subject area important in demonstrating a distinctive way of life, custom, process, land-use function or design no longer practised? Is it in danger of being lost or of exceptional interest? Can Aboriginal objects from a site, provide information about changes in the cultural practices of Aboriginal people through time including post contact archaeology? Are there post contact questions that could be investigated here? Where do historical and Aboriginal occupation areas coincide and may require combined investigation as part of this project including Parramatta Sand Body?
Education potential	Does the subject area contain teaching sites or sites that may have teaching potential?

Two known Aboriginal heritage sites (AHIMS 45-6-2977 and AHIMS 45-6-4015) are located within the project site on Macquarie Street in the Parramatta CBD. In Melrose Park, one AHIMS site (45-6-4079) is within the project site and the second AHIMS site (45-6-4078) is in close proximity to the project site (less than 50 metres). AHIMS 45-6-4078 is recorded as being more than 20 metres in length and, as the AHIMS site locations are recorded as single point, the extent of this site may be within the project site. In addition, four PADs with either high or moderate archaeological potential were identified in the project site in Rydalmere, Ermington, Melrose Park and Sydney Olympic Park.

One PAD was recorded in Melrose Park (PLR2 PAD2) as within the study area during the site survey, however, it is outside the project site boundary and would not be impacted, and so is not included the table below.

Test excavations were finalised in Broadoaks Park (PLR2 PAD5, AHIMS 45-6-4076) which has informed the assessment of significance of this PAD. The park was established with demolition, refill and introduced topsoil. There was no indication of intact soil profile above the sterile clay layer. Therefore, no further investigations would be required, as no archaeological value was present, due to the identified disturbance. A preliminary assessment of the archaeological significance of the remaining PADs is summarised in Table 9.2 and would be updated following the completion of the test excavation program.

Table 9.2 Assessment of the archaeological significance of the AHIMS sites and PADs

PAD/AHIMS	Suburb	Rarity	Represent- ativeness	Research potential	Education potential
PLR2 PAD1 Ermington Boat Ramp	Melrose Park	High	High	High	High
AHIMS 45-6-4078 (Ermington SHL 01)	Melrose Park	High	High	High	High
AHIMS 45-6-4079 (Ermington SHL 02)	Melrose Park	High	High	High	High
PLR2 PAD3 Rydalmere Wharf	Rydalmere	High	High	High	High
PLR2 PAD5 Broadoaks Park	Ermington	Low/None	Low/None	Low/None	Low/None
PLR2 PAD6 Ken Newman Park	Ermington	Moderate	Moderate	Moderate	Moderate
AHIMS 45-6-2977 (Macquarie St PAD 3)	Parramatta CBD	High/Moderate	High/Moderate	High/Moderate	High/Moderate
AHIMS 45-6-4015 (Church St PAD 1)	Parramatta CBD	Moderate	Moderate	Moderate	Moderate

9.4 Aesthetic value

The Parramatta River is identified as culturally and spiritually significant, and highly significant resource wise. The importance of the river also extends to the aesthetic value to the local Aboriginal community. If identified, gathering places may have aesthetic value. Additionally, the stone tools uncovered during the test excavations may have aesthetic value. This theme will be further investigated through the community consultation process with the RAPs, particularly via review of the draft ACHAR.

Following RAP review of the draft ACHAR, the following statement of cultural significance was received in relation to aesthetic value:

From a First Nations perspective, the presence or absence of archaeological evidence due to the land being taken and areas being disturbed does not alter the sacredness of the land, the trees, the waterways, and the fauna that remain. Caring for Country and preserving our culture is at the heart of what this is all about.

9.5 Assessment of significance

To assess the significance of Aboriginal heritage values, consultation with relevant Aboriginal stakeholders must be undertaken as per the *Aboriginal cultural heritage consultation requirements for proponents 2010*. Aboriginal people are recognised as the determinants of their own heritage. As such, consultation is the way in which an assessment of Aboriginal cultural heritage values is informed. As per the Commonwealth *Ask First* guide (Collet and Pocock, 2012), cultural significance is determined in accordance with relevant Aboriginal cultural groups before decisions can be made regarding the management of places and heritage values.

The cultural values assessment in Appendix G has identified social and cultural values within the study area that are important to the local Aboriginal community. Consultation with RAPs was undertaken to discuss the appropriate and respectful mitigation strategies (refer sections 11.1, 11.2 and 11.3 for mitigation measures) for any identified impacts to Aboriginal cultural values as a result of the project.

Comprehensive archaeological and cultural values significance assessments have been undertaken and the project site would contain areas of moderate/high cultural significance along the river as well as in the broader landscape.

9.5.1 Aboriginal stakeholder comments

Three RAPs provided comment on the draft ACHAR (see Table 9.4). RAP comments were supportive of this ACHAR and its recommendations. Ginninderra Aboriginal Corporation also provided a statement of cultural significance which has been included within the above cultural values assessment.

9.5.2 Local Aboriginal Land Councils

Deerubbin LALC and Metropolitan LALC Site Officers did not report any previously unidentified cultural material within the study area during the 2022 survey. Both Deerubbin LALC and Metropolitan LALC Site Officers supported completing the survey when property access can be arranged and prior to any physical works commencing (including any with testing in areas of archaeological potential). Both recommended further investigations to inform the ACHAR and project design, and supported further investigations including test excavations.

The Metropolitan LALC Site Officer also emphasised the high cultural significance of the Parramatta River and its surrounds, and the importance of incorporating this significance into heritage interpretation and the design elements of the project.

A representative from the Metropolitan LALC also attended a site inspection with Transport for NSW cultural heritage officers on 21 February 2023 to identify two shell middens at Melrose Park (see also section 5.2.4).

9.5.3 Registered Aboriginal Parties (RAPs)

Comments received from RAPs on the Archaeological Survey Report (ASR) and draft Test Excavation Methodology during the consultation period (8 July to 12 August 2022) are summarised below including how feedback was incorporated into the updated Test Excavation Methodology in Appendix C (see Table 9.3).

Comments received from RAPs in relation to the draft ACHAR during the minimum 28 day consultation period (18 March to 18 April 2023) are summarised below, including how feedback was incorporated into the final ACHAR (see Table 9.4).

Table 9.3 Summary of RAP comments on the ASR and draft Test Excavation Methodology

Organisation/ Individual	Contact name	Response received via / Date	RAP comments	Project response
Koori Digs	Korri Currel	Email / 17 July 2022	Agrees with methodology for the project.	-
A1 Indigenous Services	Carolyn Hickey	Email / 20 July 2022	Supports the ASR and Test Excavation Methodology.	-
Yurrandaali Cultural Services	Bo Field	Email / 21 July 2022	Supports the methodology for this project, would like to participate in the upcoming fieldwork.	-
Warragil cultural services	Aaron Slater	Email / 22 July 2022	Agrees and supports the methodology in place for the Parramatta Light Rail Stage 2 test excavations. Suggestion to use smaller sieve screen (1-2 mm) to determine smaller artefacts as otherwise could miss micro lithics.	Appendix C Test Excavation Methodology updated to incorporate this feedback: "If the test excavations uncover knapping spaces (stone tool making areas), soil samples will be collected to be sieved in a flotation tank where the upper mesh size is 0.5 millimetres to collect all micro debitage" in consultation with this RAP (see p.18).
Ginninderra Aboriginal Corporation	Krystle Carroll-Elliott	Email / 21 July 2022	Agrees with the recommendations outlined in the Test Excavation Methodology.	-
Barraby Cultural Services	Lee Field	Email / 21 July 2022	Agrees with the methodology for this project, would like to participate in the upcoming fieldwork.	-
Amanda Hickey Cultural Services	Amanda De Zwart	Email/ 26 July 2022	Support the methodology and looking forward to working on this project.	-
Muragadi Heritage Indigenous Corporation	Jesse Johnson	Email/ 26 July 2022	Endorses the recommendations.	-
Kamilaroi Yankuntjatjara Working Group	Kadibulla Khan	In person/ 8 August 2022	PAD3 Broadoaks Park. Rydalmere, 10 metre spacing with 50x50 cm pits was suggested due to the small size of the park to increase the sampling size. If hand excavation is not possible within the conservation buffer in Narawang Wetland (due).	Suggestion 1 has been incorporated in Appendix C Test Excavation Methodology (see p.8). Suggestion 2 regarding mechanical excavations within PAD7 Hill Road West addressed in Section 7.3.6, however no

Organisation/ Individual	Contact name	Response received via / Date	RAP comments	Project response
			to the level of the water table), mechanical excavations were suggested to gather information on Aboriginal activities in wetlands such as hunting animals, gathering herbs and utilising resources including contact archaeology in disturbed landscape.	further investigations are necessary in Sydney Olympic Park due to extensive disturbance.
Widescope Indigenous Group	Steven Hickey	In person / 8 August 2022	Supports 1x1 metres test squares in Aboriginal testing program. Additional suggestions: 1. Further investigations suggested within the mangroves at PAD3 Rydalmere Wharf, which would be impacted by the construction works post-approval. It was noted that mangroves were rich in resources and often utilised for hunting and fishing. 2. At PAD7 Hill Road West, if intact topsoil is present, based on the geotechnical analysis, it is suggested to have monitoring and sieving of the topsoil during early works due to the close distance to a known AHIMS site.	Suggestion 1 regarding the mangroves at PAD3 Rydalmere Wharf would be incorporated in a tailored methodology for PLR2 PAD3. Suggestion 2 regarding monitoring excavations at PAD7 Hill Road West, and the recommendations for further site investigations addressed in Section 7.3.6, however no further investigations are necessary in Sydney Olympic Park due to extensive disturbance.
Muragadi Heritage Indigenous Corporation	Aaron Taylor	In person / 8 August 2022	1. Suggested test pit location change in PAD 5 Ken Newman Park, to include the drainage line that was inspected on 8 August 2022. 2. Further investigations suggested within the mangroves at PAD3 Rydalmere Wharf, which would be impacted by the construction works post-approval. It was noted that mangroves were rich in resources and often utilised for hunting and fishing.	Suggestion 1 has been incorporated in Appendix C Test Excavation Methodology (see p.13). Suggestion 2 regarding the mangroves at PAD3 Rydalmere Wharf would be incorporated in a tailored methodology for PLR2 PAD3.
Murra Bidgee Mullangari Aboriginal Corporation	Ryan Johnson	In person / 8 August 2022	If hand excavation is not permitted within the conservation buffer in Narawang Wetland, mechanical excavations were suggested to gather information on Aboriginal activities in wetlands such as hunting animals, gathering herbs and utilising resources including contact archaeology in disturbed landscape.	Suggestion regarding mechanical excavations within PAD7 Hill Road West addressed in Section 7.3.6, however no further investigations are necessary in Sydney Olympic Park due to extensive disturbance.
Kamilaroi Yankuntjatjara Working Group	Phil Khan	Email / 9 August 2022	Agrees and supports the ASR.	-

Organisation/ Individual	Contact name	Response received via / Date	RAP comments	Project response
Wurrumay	Vicky Slater	Email / 12 August 2022	Agrees with the minutes of the AFG meeting and methodology, tools and PADs. Made a number of suggestions in relation to the Site Officer application process.	Transport for NSW reviewed this feedback when selecting Site Officers for the project.
Yulay Cultural Services	Arika Jalomaki	Email / 15 August 2022	Agrees with the methodology for this project.	-
Waawaar Awaa Aboriginal Corporation	Rodney Gunther	Email / 17 August 2022	Supports the draft methodology for the project and supports the following: avoid or minimise impact to known Aboriginal cultural heritage conduct a site survey of the proposed development areas undertake test excavations for any areas of ground disturbance.	The Appendix C Test Excavation Methodology has been prepared and updated in consideration of these principles.
Darug Custodian Aboriginal Corporation	Justine Coplin	Email / 23 August 2022	Supports the recommendations set out in this report. Notes that this area is significant to the Darug people due to the evidence of continued occupation, within proximity to this project site which are all connected that hold Aboriginal heritage and past history, evidence of the Darug lifestyle, however, due to the rapid development of Sydney many of Aboriginal sites have been destroyed. Emphasises the increasing involvement of Aboriginal organisations and individuals who do not hold cultural knowledge of the Western Sydney area which prevents genuine local Aboriginal organisations to care for cultural heritage.	-

Table 9.4 Summary of RAP comments on the draft ACHAR

Organisation/ Individual	Contact name	Response received via / Date	RAP comments	Project response
Kamilaroi Yankuntjatjara Working Group	Phil Khan	Email / 13 April 2023	Agrees with and supports recommendations.	-
Ginninderra Aboriginal Corporation	Krystle Carroll-Elliott	Email / 19 April 2023	Agrees with ACHAR recommendations and provided the following statement of cultural significance in relation to the project area: The Parramatta area is a culturally important place with archaeological finds dating back 14,000 years (so far), and First Nations memory of the area dating back even further. We believe any projects in the area need to be mindful due to the very significant cultural materials found in digs nearby and the artefacts found preserved in the PSB. From a First Nations perspective, the presence or absence of archaeological evidence due to the land being taken and areas being disturbed does not alter the sacredness of the land, the trees, the waterways, and the fauna that remain. Caring for Country and preserving our culture is at the heart of what this is all about.	
Details withheld	Details withheld	Email / 23 April 2023	Agrees with ACHAR assessment.	-

10 IMPACT ASSESSMENT

This impact assessment has been informed by desktop research, the results of the archaeological survey, test results from one PAD in Rydalmere (PLR2 PAD5 Broadoaks Park) and the findings of the cultural values assessment in Appendix G. Further investigation (testing) is required for three potential archaeological deposits (PAD1 Ermington Boat Ramp, PAD3 Rydalmere Wharf and PAD6 Ken Newman Park), two AHIMS sites in the Parramatta CBD and two AHIMS middens sites in Melrose Park to determine the presence, extent, and scientific significance of areas of identified archaeological sensitivity.

A project specific methodology to reflect the need for mechanical excavation at PLR2 PAD 3, asbestos management requirements, and to ensure a safe working environment will be prepared in consultation with RAPs to allow for the recommencement of testing, which would take place prior to construction. The testing will also be carried out in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011). Following this, updated assessments of significance would be prepared, in consultation with RAPs, along with a review and update of mitigation measures in section 10.4.

10.1 Consideration of the alternatives – avoiding and minimising harm

Background research and archaeological field survey has identified the likely presence of four Aboriginal archaeological sites and four registered AHIMS sites that may be impacted by the project which have been assessed in this report.

The confinement of large parts of the project alignment to existing road and rail transport infrastructure corridors has avoided impact to other surrounding sites and PADs and lessened the amount of landscape disturbance required to construct the project, to some degree. However, given the linear nature of the project and surrounding spatial constraints including topography/landscape and existing development, route selection was not able to avoid all potential impacts to Aboriginal archaeological sites.

The preferred southern alignment through Camellia avoided one registered Aboriginal site (AHIMS 45-6-3108) and one PAD (Area 1, in KNC, 2017) in Rydalmere associated with a northern alignment option previously under consideration, which extended along South Street through the industrial area before connecting to the current alignment at John Street / South Street.

Additionally, 13 registered AHIMS sites (AHIMS 45-6-2785, AHIMS 45-6-2786, AHIMS 45-6-2683, AHIMS 45-6-2559, AHIMS 45-6-3582, AHIMS 45-6-3767, AHIMS 45-6-3818, AHIMS 45-6-2686, AHIMS 45-6-1523, AHIMS 45-6-2978, AHIMS 45-6-2795, AHIMS 45-6-2679 and AHIMS 45-6-4097) and one PAD (PLR2 PAD2) are located within 200 metres of the project site but would not be impacted by construction or operation of the project.

The key potential impacts to PADs within the project site include possible destruction and/or movement during the construction of infrastructure. Specifically, the construction of the two river bridge crossings, are likely to damage areas of high archaeological potential. However, it is noted design development is progressing and would aim to minimise construction impacts. For example, relocation/refinement of compound areas or impacts to mangroves could be mitigated through the use of temporary work platforms that extend over the environmentally sensitive areas, and to enable avoidance of any identified culturally sensitive areas.

10.2 Impact assessment

Two known Aboriginal heritage sites (AHIMS 45-6-2977 and AHIMS 45-6-4015) are located within the project site on Macquarie Street in the Parramatta CBD. Two shell middens (AHIMS 45-6-4078 and AHIMS 45-6-4079) were recently identified in Melrose Park during a site visit and registered on the AHIMS. One is located within the project site (45-6-4079), while the other (45-6-4078) has been identified around 30 metres east of the project site but has been included for assessment in this report, as it is within 50 metres (which is the distance prescribed under Requirement 14 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010) and could be at risk, depending on the extent of the midden.

AHIMS 45-6-4078 is recorded as being more than 20 metres in length and as the AHIMS site locations are recorded as single point, the extent of this site may be within the project site. In addition, four potential archaeological deposits (PADs) with either high or moderate archaeological potential were identified during the site surveys in the project site in Rydalmere, Ermington and Melrose Park. These are listed in Table 10.1, along with a summary of the significance assessment and assessment of potential impacts.

One PAD was recorded in Melrose Park (PLR2 PAD2) as within the study area during the site survey, however, it is outside the project site boundary and would not be impacted, and so is not included in the impact assessment or table below.

These four AHIMS sites and four PADs could potentially be impacted by the construction of the project. A high level identification of potential impacts associated with the project is outlined below, based on categories of potential impacts drawn from comparable projects. Identifying potential impacts at this stage of the project links into the overall adoption of precaution taken across the technical assessments.

The categories are:

- construction phase impacts: surface. For example vehicle and plant movement, compaction impacts from vehicle movements and temporary containers and sheds, impacts to sites, places and Aboriginal cultural landscapes
- construction phase impacts: subsurface. For example any ground breaking activities i.e. excavation, heavy plant movement, installation of fence posts, geotechnical or contamination investigations which may impact Aboriginal archaeological deposits
- construction phase impacts: indirect / visual. For example impact to significant views and vistas of heritage items, impact to visual connections between heritage items and landscape features, impacts to Aboriginal cultural landscapes
- operational phase impacts that comprise the individual and cumulative impacts associated with the
 operation and life of the project. These may include impacts to visual connections between heritage
 items and landscape features and impacts to Aboriginal cultural landscapes. The operational phase
 may also include positive impacts for heritage values, such as improved public access to heritage areas
 and heritage interpretation.

The key potential impacts to sites within the project site include possible destruction and/or movement during the installation of infrastructure. Specifically, the construction of two Parramatta River bridge crossings, are likely to damage areas of high Aboriginal archaeological potential. However, it is noted design development is progressing and would aim to minimise construction impacts. For example, relocation/refinement of compound areas or impacts to mangroves could be mitigated through the use of temporary work platforms that extend over the environmentally sensitive areas, and to enable avoidance of any identified culturally sensitive areas.

Table 10.1: Assessment of impacts

Suburb	PAD/Site Name	Assessed significan ce	Scope of impact	Type of impact	Consequence of impact
Melrose Park	PLR2 PAD1 Ermington Boat Ramp	High	Total (as all of the PAD is located in the project site)	Direct (ground disturbance, excavation and vegetation clearing resulting from bridge works and from vehicle and plant movements)	Partial or total loss of value
Melrose Park	AHIMS 45-6- 4078 (Ermington SHL 01)	High	Partial (as the shell midden is within 50 metres of the project site)	Direct (risk of vibration due to vehicle and plant movement) Indirect (impact to visual connections between heritage items and landscape)	Partial or total loss of value
Melrose Park	AHIMS 45-6- 4079 (Ermington SHL 02)	High	Total (as all of the shell midden is located in the project site)	Direct (ground disturbance, excavation and vegetation clearing resulting from bridge works and from vehicle and plant movements) Indirect (impact to visual connections between	Partial or total loss of value

Suburb	PAD/Site Name	Assessed significan ce	Scope of impact	Type of impact	Consequence of impact
				heritage items and landscape)	
Rydalmere	PLR2 PAD3 Rydalmere Wharf	High	Partial (as not all of the PAD is located in the project site)	Direct (ground disturbance, excavation and vegetation clearing resulting from bridge works and from vehicle and plant movements)	Partial or total loss of value
Rydalmere	PLR2 PAD5 Broadoaks Park (AHIMS 45-6-4076)	None	Total (as all of the PAD is located in the project site)	Direct (ground disturbance and vehicle and plant movements at the proposed compound site)	N/A (no archaeological value)
Ermington	PLR2 PAD6 Ken Newman Park	Moderate	Partial (as not all of the PAD is located in the project site)	Direct (ground disturbance, excavation and vegetation clearing, and potential landscaping works, and from vehicle and plant movements)	Partial or total loss of value
Parramatta CBD	AHIMS 45-6- 2977 (Macquarie St PAD 3)	rate	Partial (as not all of the PAD is located in the project site)	Direct (ground disturbance and excavation as a result of constructing the turnback facility)	Partial or total loss of value
Parramatta CBD	AHIMS 45-6- 4015 (Church St PAD 1)	Moderate	Partial (as not all of the PAD is located in the project site)	Direct (ground disturbance and excavation as a result of constructing the turnback facility)	Partial or total loss of value

10.3 Cumulative impacts

When considered in isolation, the environmental impacts and benefits of an individual project may not be significant. However, when combined with the effects of other developments, the cumulative effects can potentially result in a greater extent, magnitude or duration of impacts. Identifying potential cumulative impacts assists in developing appropriate management measures and provides a basis for coordinated regional planning and environmental monitoring.

The cumulative impacts of the Parramatta Light Rail Stage 2 project with other development within the vicinity of the alignment has been assessed in Table 10.2.

The cumulative impacts of the project and other development within the vicinity of the alignment would consist of the introduction of new infrastructure along the alignment. This includes light rail track and stops, wires, poles, and associated ancillary works, as well as the introduction of bridges, most notably two across the Parramatta River. The cumulative impacts are considered in Table 10.2.

Table 10.2 Cumulative impacts of the project with other developments in the vicinity of the alignment

Project	Location & description	Impacted AHIMS sites and PADs	Interaction with project
Parramatta Leagues Club Hotel	17-19 O'Connell Street (Lot 369 of DP752058, Lot 7054 of DP1074335). The site is commonly known as 1 Eels Place, Parramatta. It is south of the current Parramatta	45-5-4630	The project is located approximately one kilometre north from the project site along Macquarie Street. The cumulative archaeological impact of

Project	Location & description	Impacted AHIMS sites and PADs	Interaction with project
	Leagues Club building and north of Western Sydney Stadium. The site of the building and public domain work has an area of approximately 4,360m2.		this project would be negligible due to its distance from the project site.
Private hospital and hotel	41-43 Hunter Street, Parramatta (Lot 1 of DP27310) The site is located on the corner of Hunter Street and Marsden Street and is approximately 200 metres south of the project site along Macquarie Street.	45-6-2978	The project would interact with the project site along Marsden Street. The cumulative impact would be negligible as no additional excavation is proposed. However, due to proximity to the Parramatta Native Institute's proposed location cultural impacts to local Aboriginal community may be high. The cumulative impact would be high to any Aboriginal and contact archaeology and further mitigation measures would be required as part of the development of the Heritage management plan and Heritage interpretation strategy (see Table 11.1)
Sydney Metro West	Sydney Metro West will service Westmead, Greater Parramatta, Sydney Olympic Park, The Bays Precinct and the Sydney CBD linking new communities to rail services with intermediate stations. Works include construction of new underground metro service, metro stations, stabling and maintenance facilities, and associated infrastructure.	45-6-3627 (the Clyde stabling and maintenance facility) 45-6-2977, 45-6-4015, 45-6-3582, 45-6-376, 45-6-2679 in Parramatta CBD	The Clyde stabling and maintenance facility is located approximately 800 metres south of the project site at Camellia on Colquhoun Street. The cumulative impact of this would be negligible due to its distance from the project site. The Parramatta Metro Station construction site would be located on the north-eastern boundary of the project site bounded by George, Macquarie, Church and Smith streets. The cumulative impact of this would be moderate to the registered AHIMS sites along with the Parramatta Light Rail Stage 2 turnback facility and further mitigation measures would be required as part of the development of the Heritage management plan and Heritage interpretation strategy (see Table 11.1) Sydney Olympic Park Metro Station construction site connects to the project site along Dawn Fraser Avenue. The cumulative impact of this would be negligible as no known Aboriginal heritage sites will be affected.
Powerhouse Parramatta	34-54 & 30B Phillip Street and 338 Church Street, Parramatta (Lot 1 of DP128474, Lot 2 of DP1247122 and Lot 1 of DP1247122)	45-6-3193	The project is located approximately 550 metres north from the project site at Macquarie Street. The cumulative archaeological impact would be negligible due to the distance from the project site.
Mixed-use development – retail, commercial and hotel	197 Church Street, Parramatta. The development would see the redevelopment of heritage item Shop (and potential archaeological site) (Parramatta LEP Item No.I655) Two tower mixed-use development comprising two storey retail podium,	45-6-4015	The project site interacts with the mixed-use development at the corner of Church and Macquarie Streets. The site has been recorded to have potential for contact archaeology and is adjacent to the project site on Macquarie Street. The cumulative impact would be moderate to potential

Project	Location & description	Impacted AHIMS sites and PADs	Interaction with project
	25 storey commercial office tower and 32 storey hotel accommodation tower; and four basement levels for car parking and hotel ballroom.		Aboriginal and contact archaeology and further mitigation measures would be required.
Draft Camellia- Rosehill Precinct (Place Strategy)	The master plan includes three sub precincts and covers approximately 320 hectares across Camellia, Rosehill, and a portion of Clyde. Development within the immediate vicinity of this project site includes a proposed town centre, a foreshore linear park along Parramatta River, a new urban plaza at James Ruse Drive and a new primary school and central local park.	45-6-2559, 45-6-3627	The master plan interacts the project site along Grand Avenue and the proposed stop 'Sandown Boulevard'. The cumulative impact would be negligible to 45-6-2559 as the harm was avoided during Stage 1 works. However, if future impacts to AHIMS 45-6-2559 is greater than identified an amendment to the mitigation measures would be required. Development of a foreshore park and active transport network along the Parramatta River would have a direct physical impact on Aboriginal archaeological potential, through the construction of pathways and associated amenities as well as would impact from a sociocultural perspective for local Aboriginal people.
Viva Energy Clyde Western Area	Remediation of the south-western part of the Clyde Terminal site. The site is located at Durham Street on the Camellia Peninsula and consists of the following lots: Lot 398 DP41324 Lots 100 and 101 of DP1168951 Lot 101 of DP809340 Lot 2 of DP224288 Lot 1 of DP383675	nil	The northern boundary of the site directly interacts with the project site along Grand Avenue (including a section of Durham Street) as it extends across the Parramatta River to John Street. The cumulative impact of these works would be negligible.
Camellia Waste Facility	37 Grand Avenue Camellia (Lot 1 of DP539890) The site is approximately 2.3 hectares in area and is zoned IN3 Heavy Industrial.	Nil	The site interacts with the Parramatta Light Rail alignment on the southern boundary along Grand Avenue and the eastern boundary as it runs across Parramatta River. The cumulative impact of this would be nil in relation to identified Aboriginal archaeology.
Melrose Park North Planning Proposal	The Melrose Park North Planning Proposal applies to the Northern Precinct of the Melrose Park Urban Renewal Precinct.	Nil	The southern boundary of the site is located along the project site on Hope Street. The site would interact with the project site along Hope Street, Hughes Avenue and Wharf Road. The cumulative impact would be negligible.
Holdmark Planning Proposal (Melrose Park Southern Precinct)	The Melrose Park South precinct comprises of land bounds by Hope Street to the north, Wharf Road to the east, Parramatta River to the south and Atkins Road to the west. The eastern boundary is shared with the City of Ryde Council	45-6-1961, 45-6-4078, 45-6-4079 and Ermington Boat Ramp PLR2 PAD1	The site would interact with the project site along Hope Street, Hughes Avenue, Wharf Road, Waratah Street and Mary Street. The site has been recorded to include a shell midden which is close proximity to the project site. Two shell middens were recorded (AHIMS 45-6-4078, 45-6-4079) within the study area. Additional PADs are identified within

Project	Location & description	Impacted AHIMS sites and PADs	Interaction with project
			the project site during this assessment, therefore the cumulative impacts would be moderate to potential Aboriginal archaeology, potential burials and further mitigation measures would be required as part of the development of the Heritage management plan and Heritage interpretation strategy (see Table 11.1).

10.4 Changes in impacts between the exhibited project and amended project

The Aboriginal cultural heritage study area for the project encompassed both the exhibited and amended project site.

The key changes in impacts between the exhibited project and amended project are summarised as follows:

- The amended project between Camellia and Rydalmere would now intersect the western section of PAD3 (avoiding the eastern section), however impacts still need to be confirmed based on the outcomes of test excavations, which were not able to be undertaken at this location. As such the impact assessment for PAD3 remains unchanged from the Preliminary ACHAR.
- The reduction of the project site at Melrose Park, due to the amended location of the bridge between Melrose Park and Wentworth Point, has avoided an area of potential archaeological sensitivity (see Figure 7.7), and no further investigations are required.
- The amendment to the bridge at Hill Road is still within the study area considered for Aboriginal cultural heritage, and within an area where the landform has been previously disturbed. As with all previously identified PADs in Sydney Olympic Park, the potential for Aboriginal heritage has been removed in the ACHAR based on this additional research.

11 RECOMMENDED MITIGATION MEASURES

11.1 Mitigation measures – project design and planning

11.1.1 Test excavation of PADs and update to assessments of significance

Test excavations commenced on 31 October 2022 but were not able to be completed safely, or in accordance with the test excavation methodology at three PADs (PLR2 PAD 1 Ermington Boat Ramp, PLR2 PAD 3 Rydalmere Wharf and PLR2 PAD 6 Ken Newman Park) due to the presence of asbestos or deep levels of fill.

A project specific methodology to reflect asbestos management requirements and to ensure a safe working environment, will be prepared in consultation with RAPs to allow for the recommencement of testing, would take place prior to construction. Test excavations are also required for the two recently recorded shell middens in Melrose Park (AHIMS 45-6-4078 and AHIMS 45-6-4079) and would form part of the project specific methodology.

The road alignment of Parramatta turnback facility may contain intact Parramatta Sand Body (AHIMS 45-6-2977 and AHIMS 45-6-4015). Noting the limitations to being able to undertake testing in an active road corridor, a tailored test excavation methodology (and salvage) for this location would be prepared and implemented, following a planning approval being obtained. This testing would seek to confirm the presence and integrity of the Parramatta Sand Body and its archaeological potential and would be undertaken prior to any physical works commencing in conjunction with geotechnical investigations.

Testing will be carried out in accordance with *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). Following this, updated assessments of significance would be prepared, in consultation with RAPs, along with a review and update of mitigation measures in section 10.4.

Where harm cannot be avoided, it is recommended a testing/salvage methodology be prepared in consultation with RAPs to ensure appropriate management of significant values in instances where they may be impacted. If Aboriginal objects are located during testing, salvage of the site could not be undertaken until the project is approved and a salvage methodology prepared.

11.2 Mitigation and management measures – construction

Mitigation measures are recommended for sites exhibiting high and moderate – low heritage significance within the project site, as. Aboriginal objects are likely to retain significance to Aboriginal people regardless of their assessed archaeological or scientific values.

- Sites that are identified in this ACHAR as being disturbed with no archaeological value will not
 require mitigation where there are no cultural values identified. This will likely be in locations as being
 highly disturbed and exhibiting low archaeological value.
- Significant archaeological sites identified in the ACHAR, where harm cannot be avoided and that
 would be totally or partially impacted, would require mitigation because they exhibit at least moderately
 intact archaeological deposit, relatively intact soil structure, information bearing archaeological objects
 and Aboriginal cultural value. Mitigation through archaeological salvage excavation may be required for
 impacts to these sites.

Recovery of information through archaeological salvage excavation would partially offset the loss caused by construction of the project in these areas. Salvage excavation can only occur after project approval is obtained and must be completed prior to any activities which may harm Aboriginal objects at these site locations.

In cases where the project would have a partial impact information gained from a salvage excavation offers a better understanding of the contents, nature and significance of the remaining non-impacted portions of the sites. Non-impacted portions of the sites would require management measures to be implemented during construction to ensure no impact. Where the project results in a collection of Aboriginal objects recovered during testing and salvage, the project would ensure that the collection is appropriately managed long term in a safe place. This may include cultural repatriation, reburial or lodgement at an agreed and culturally appropriate keeping place.

Table 11.1: Aboriginal heritage mitigation measures – construction

No	Aspect	Mitigation measure	
1	Heritage management plan	An Aboriginal Cultural Heritage Management Plan would be required to facilitate a preconstruction mitigation plan, enable the transition to construction and then guide the ongoing archaeological management under the construction program.	
2	Aboriginal archaeological sites to be impacted	Design development and construction planning would aim to avoid direct impacts on identified objects/sites of Aboriginal heritage potential as far as reasonably practicable. The Aboriginal archaeological sites identified via test excavations which would be impacted by construction activities would be documented, and site specific mitigation measures identified. Any Aboriginal objects discovered must be identified in the Heritage Interpretation Strategy and include registration in the Aboriginal Heritage Information Management System (AHIMS) register.	
3	Salvage excavations	Where project impacts cannot be avoided and salvage is considered a suitable mitigation, a tailored salvage methodology would be prepared for salvage excavations and referred to the RAPs for comment prior to finalisation. Salvage excavations should aim to minimise harm by salvaging the artefacts in consultation with RAPs, where destruction of archaeological sites of significance cannot be avoided.	
4	Continued Aboriginal community consultation	The consultation with the Aboriginal community regarding the project should be ongoing throughout the life of the project.	
		Aboriginal consultation would continue to be undertaken in accordance with the <i>Procedure for Aboriginal Cultural Heritage Consultation and Investigation</i> (Roads and Maritime Services, 2012) and the <i>Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010</i> (DECCW, 2010b). This includes managing potential impacts on objects/aspects of cultural significance in consultation with registered Aboriginal parties and provided in the ACHAR.	
5	Heritage interpretation	A Heritage Interpretation Strategy would be developed to guide incorporation of appropriate interpretation and integration of Aboriginal and non-Aboriginal heritage in the design.	
		The strategy would be prepared and implemented in accordance with <i>Interpreting Heritage Places and Items: Guidelines</i> (NSW Heritage Office, 2005) and the <i>Heritage Interpretation Policy</i> (NSW Heritage Council, 2005).	
		The strategy would include measures to ensure a meaningful design response to Aboriginal heritage and cultural values. It would be developed in consultation with relevant stakeholders, including registered Aboriginal parties.	
		The design would include appropriate interpretation of Aboriginal heritage in accordance with the heritage interpretation strategy	
6	Aboriginal cultural heritage induction	All site workers and personnel involved in site impact works associated with the project site must be inducted and briefed the possible identification of Aboriginal objects during construction and their responsibilities according to the provisions of the <i>National Parks and Wildlife Act 1974</i> and the <i>Heritage Act 1977</i> .	
7	Unexpected finds procedure for Aboriginal object/s	If suspected Aboriginal objects are identified during construction the <i>Unexpecte Heritage Finds Procedure</i> (Transport for NSW, 2022) must be followed. This would be outlined within the Construction Environmental Management Plan (CEMP) and associated subplans for the project.	
8	Unexpected finds procedure for human remains	Protocols must be provided that ensure the risk of encountering burials is appropriately managed. If human remains/burials are identified, work must immediately cease, the site must be secured, NSW Police must be contacted and Heritage NSW must be notified.	
		All human remains in, on or under the land must not be harmed. If suspected human remains are located during any stage of the proposed works the Unexpected Heritage Finds Procedure (Transport for NSW, 2022) must be followed. This would be outlined within the CEMP and associated subplans for the project.	
9	Short and long term management of Aboriginal objects	Artefacts recovered during the test excavation program would be securely stored in an interim capacity until they are appropriately repatriated (reburied) or transferred to a secure, suitable and culturally appropriate keeping place supported by RAPs.	

No Aspect Mitigation measure		Mitigation measure
		The long term management of Aboriginal objects (recovered from both testing and any salvage) would be resolved in conjunction with RAPs for the project.

11.3 Mitigation and management measures – operation

No additional mitigation measures for Aboriginal heritage are considered necessary specific to operation.

12 CONCLUSION AND RECOMMENDATIONS

12.1 Conclusion

This report has considered the landscape and archaeological context of the study area, the archaeological potential and significance of the project site, the cultural values and the potential impacts of the proposed works on the archaeological resources within the project site.

The project site contains several landforms classified as being highly archaeologically sensitive based on previous studies across Parramatta, the distribution of registered AHIMS sites in the vicinity of the project site, and a site survey. Completion of the test excavation program will further inform the archaeological potential. If present, the Parramatta Sand Body and associated terrace and lower slope features are the landscape features that are particularly archaeologically sensitive. These landforms would have provided access to permanent water and would have been abundant in resources necessary for pre-contact and post-contact Aboriginal ways of life.

The cultural values assessment identified a number of overlapping themes that constitute contemporary cultural values from the perspective of the three participants. These themes have been arranged under seven headings:

- Country and connection to Country
- waterways provide food and resources
- travel and communication
- histories of disruption and disconnection
- environmental decay / urban development
- difficulty with archaeology failure to embrace cultural values
- people of note in the area.

During the site visit and interviews with cultural knowledge holders, the importance of Songlines and sight lines were noted, as was the importance of the Parramatta River for resources and for being area of great spiritual importance. The issues of prohibition on accessing the Country and the need for accessing the Country was raised for healing Country.

The cultural values assessment provided a number of broader considerations around development in the area as well as project specific considerations which are recommended to be addressed during the next stages of design development (see section 12.2).

Mitigative salvage excavation would be required for the archaeological sites exhibiting high, moderate and low significance prior to any impacts, as Aboriginal objects are likely to retain significance to Aboriginal people regardless of their assessed archaeological or scientific values. Recovery of information through archaeological salvage excavation will partially offset the loss caused by construction of the project by increasing our understanding, strengthening our interpretation and bettering our recognition of Aboriginal heritage within the modern city of Parramatta. Salvage excavation can only occur after a planning approval is obtained. Salvage excavation must be completed prior to any activities which may harm Aboriginal objects. The results of cultural values assessment and RAP consultation would form a key part of this assessment of Aboriginal cultural heritage, guiding both the significance and management approach of the project.

12.2 Recommendations

Recommendation 1: Further assessment and test excavation

Due to the level of asbestos encountered during the test excavation program in late 2022 or deep levels of fill, only limited archaeological testing could be undertaken to inform this ACHAR. However, test excavations are still required in three PADs (PLR2 PAD1 Ermington Boat Ramp, PLR2 PAD3 Rydalmere Wharf and PLR2 PAD6 Ken Newman Park) to determine the heritage impact of the proposed works. Test excavations are also required for the two recently recorded shell middens in Melrose Park (AHIMS 45-6-4078 and AHIMS 45-6-4079) to understand the extent of these sites and to determine the heritage impact of the proposed works.

A project specific methodology to reflect the need for mechanical excavation at PLR2 PAD 3, asbestos management requirements, and to ensure a safe working environment will be prepared in consultation with

RAPs to allow for the recommencement of testing, which would take place prior to construction. The testing will also be carried out in accordance with the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (OEH, 2011) and the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010). Following this, updated assessments of significance would be prepared, in consultation with RAPs, along with a review and update of mitigation measures in section 11.

Recommendation 2: Aboriginal Cultural Heritage Management Plan

An Aboriginal Cultural Heritage Management Plan would be required to facilitate a preconstruction mitigation plan, enable the transition to construction and then guide the ongoing archaeological management under the construction program. This plan would be prepared as part of the Construction Environmental Management Plan (CEMP) in consultation with Heritage NSW. Specific measures would be identified in consultation with a qualified archaeologist. The objectives and strategies of the plan in relation to Aboriginal heritage would include the following:

- archaeological research design and excavation methodology. This should also include any archaeological testing, if not undertaken prior to obtaining planning approval
- measures to minimise impacts on Aboriginal heritage values with consideration of the recommendations in section 7 of the cultural values assessment (see Appendix G)
- details on management measures to be implemented to prevent and minimise impacts on Aboriginal sites.

Aboriginal heritage awareness training should be provided to all contractors to ensure recognition of heritage values and associated procedures to be implemented in the event of the discovery of Aboriginal heritage finds (that is, unexpected finds), or the discovery of human remains.

Recommendation 3: Heritage Interpretation – Aboriginal Heritage

A Heritage Interpretation Strategy would be developed to guide incorporation of appropriate interpretation and integration of Aboriginal and non-Aboriginal heritage in the design.

The strategy would be prepared and implemented in accordance with *Interpreting Heritage Places and Items:* Guidelines (NSW Heritage Office, 2005) and the *Heritage Interpretation Policy* (NSW Heritage Council, 2005).

The strategy would include measures to ensure a meaningful design response to Aboriginal heritage and cultural values. It would be developed in consultation with relevant stakeholders, including registered Aboriginal parties and with consideration of the recommendations in section 7 of the cultural values assessment (see Appendix G).

The design would include appropriate interpretation of Aboriginal heritage in accordance with the heritage interpretation strategy.

Recommendation 4: Reburial of Aboriginal objects on Country

The artefacts recovered during the test excavations at Broadoaks Park (PAD5) should be reburied on County in consultation with RAPs prior to commencement of construction of the project.

The artefact assemblage is to be reburied within the project site in a location at Broadoaks Park that will not be impacted, or utilised as a construction compound, during the construction phase of the project.

Reburial should be undertaken in accordance with Requirement 26 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects* (DECCW 2010). The exact location of the reburial is to be determined in consultation with RAPs.

After the artefacts have been reburied, the area should be sectioned off from the remainder of the project site to ensure no inadvertent harm occurs and documented accordingly as part of the Heritage Management Plan.

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Appendix A Consultation Log

This appendix contains request	culturally sensitive in	formation that has	been withheld – info	rmation available on

Appendix B AHIMS Extensive search results

This appendix contains request	culturally sensitive in	formation that has	been withheld – info	rmation available on

Appendix C Test Excavation Methodology

ABORIGINAL ARCHAEOLOGICAL TEST EXCAVATION METHODOLOGY – PARRAMATTA LIGHT RAIL STAGE 2

Introduction

Transport for NSW is preparing an environmental impact statement for the proposed construction and operation of the Parramatta Light Rail Stage 2 (the 'project'), which includes preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR) in accordance with the Secretary's Environmental Assessment Requirements (SEARs).

The study area for the project is located across the Parramatta and Ryde Local Government Areas (LGAs) and the Deerubbin and Metropolitan Local Aboriginal Land Council (LALC) boundaries and encompasses the preferred route and alternative options for connecting Parramatta Light Rail Stage 1 to Sydney Olympic Park (see Figure 0.1).

An Archaeological Survey Report (ASR) has been prepared for the project and identified eight potential archaeological deposits (PADs) in the study area. Seven of these PADs are within the project site boundary and would be potentially impacted by construction activities and so have been nominated for further investigation. The findings of these investigations will inform an updated ACHAR to be provided with the Response to Submissions along with design refinement and future management actions.

An additional two PADs (AHIMS 45-6-2977 and 45-6-4015) were also identified within the Parramatta CBD section of the project site. However, the Parramatta CBD section of the study area has previously been assessed for Parramatta Light Rail Stage 1. As such the information and assessment from the *Parramatta Light Rail Aboriginal Cultural Heritage Assessment Report* (KNC, 2017) and revised database searches will be utilised for the ACHAR. Further, it is known that two AHIMS sites are located within the Parramatta CBD section of the study area which encompasses the Parramatta Native Institute:

- AHIMS 45-6-2977 is located on Macquarie Street, based on the site card map, between the
 intersections of Church Street and across to the intersection of O'Connell Street. The site was
 registered in 2011 by Comber Consultants as a PAD located in an area where the Parramatta Sand
 Body was identified with intact soil profiles. The Native Institution for Aboriginal Children which was
 located on a large area encircled by Macquarie, Marsden and Hunter Streets is adjacent to this AHIMS
 site.
- AHIMS 45-6-4015 is located at 197-207 Church Street and 89 Marsden Street. The site includes a PAD within the Parramatta Sand Body which has potential for Aboriginal heritage and contact archaeology. The site was recorded by Biosis in 2022 as it may hold evidence associated with early 19th century feasts between Aboriginal and European people including the Native Institute for Aboriginal Children.

Both AHIMS sites (45-6-2977 and 45-6-4015) are located within the urbanised Parramatta CBD. The project would require saw cutting of the road asphalt and footpath paving, and mechanical excavations of fill material to establish a turnback facility on Macquarie Street.

Depending on the fill levels and construction methodology, excavation could extend to intact soil profiles and impact potential archaeological deposits. Given the constraints of the site as an operational road, it is not proposed to undertake testing, but it is recommended that the design and construction methodology are refined based on geotechnical investigations to avoid intact soil profiles, where possible. Where impacts are unavoidable, a combined testing/salvage of this area will be undertaken prior to physical works commencing and a site-specific methodology for combined testing and salvage will be prepared for the ACHAR.

Purpose

This site-specific methodology for the Camellia to Carter Street precinct section of the project has been prepared by RPS and details actions for

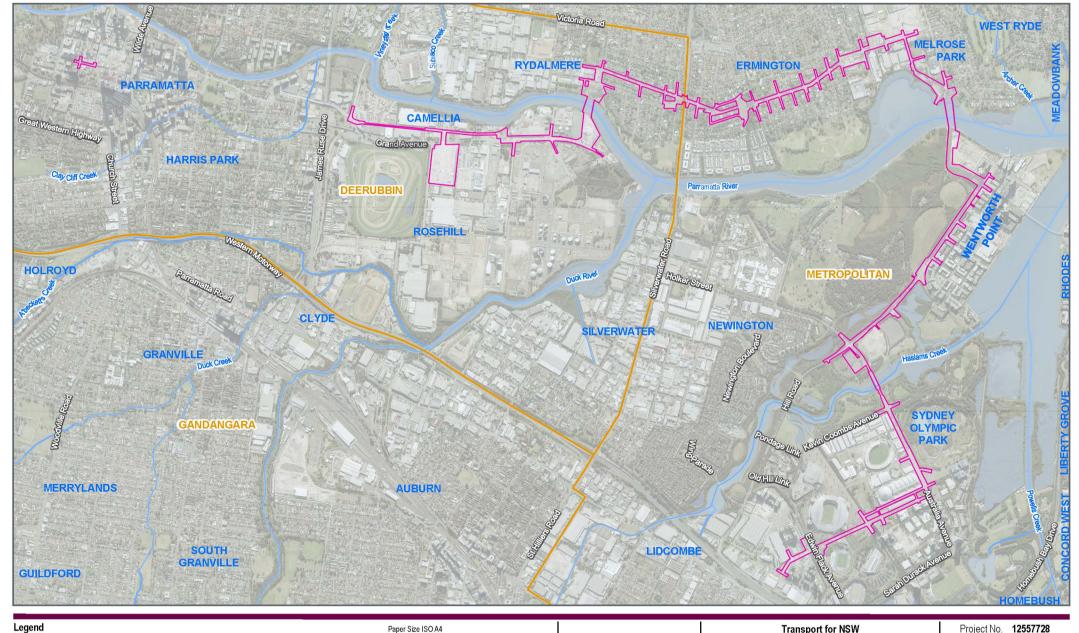
• a survey of previously inaccessible areas of Aboriginal archaeological sensitivity, should it be confirmed they could be impacted by the project and once property access can be arranged (see Figure 0.2).

 a test excavation program for the nominated project site (i.e. area that may be disturbed by construction) and an additional area outside the project site at PAD3 Rydalmere Wharf to accommodate an alternative Camellia foreshore to Rydalmere option that is being considered by Transport for NSW (refer Appendix D of the EIS).

Of note is that PLR2 PAD2 Melrose Park Public School Oval, which was identified during the survey, is <u>outside</u> the project site and would not be impacted and so no further investigation is recommended.

This methodology has been prepared with consideration of *The Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW, 2010) ('The Code') the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (Roads and Maritime Services, 2012) (PACHCI) and outcomes of Archaeological Survey Report. This site specific methodology was prepared in consideration of non-Aboriginal excavations as stated in SEARs to address the requirement for areas detailed in Requirement 14 of *The Code*; in areas of deep sand deposits; or in areas where historical archaeological excavations area also taking place.

The Archaeological Survey Report and a draft methodology was provided to Registered Aboriginal Parties (RAPs) to review and comment over a minimum 28 day period (between 8 July 2022 to 12 August 2022) in accordance with consultation requirements. Comments and feedback from the RAPs are outlined in Section 8.3.2 of the Preliminary ACHAR and responses have been incorporated into this Test Excavation Methodology which includes the modified approach to testing in response to RAP comments about the coverage of test pits in Broadoaks Park.



Project site

Local Aboriginal Land Council area



Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56 O CPS MAKING COMPLEASY

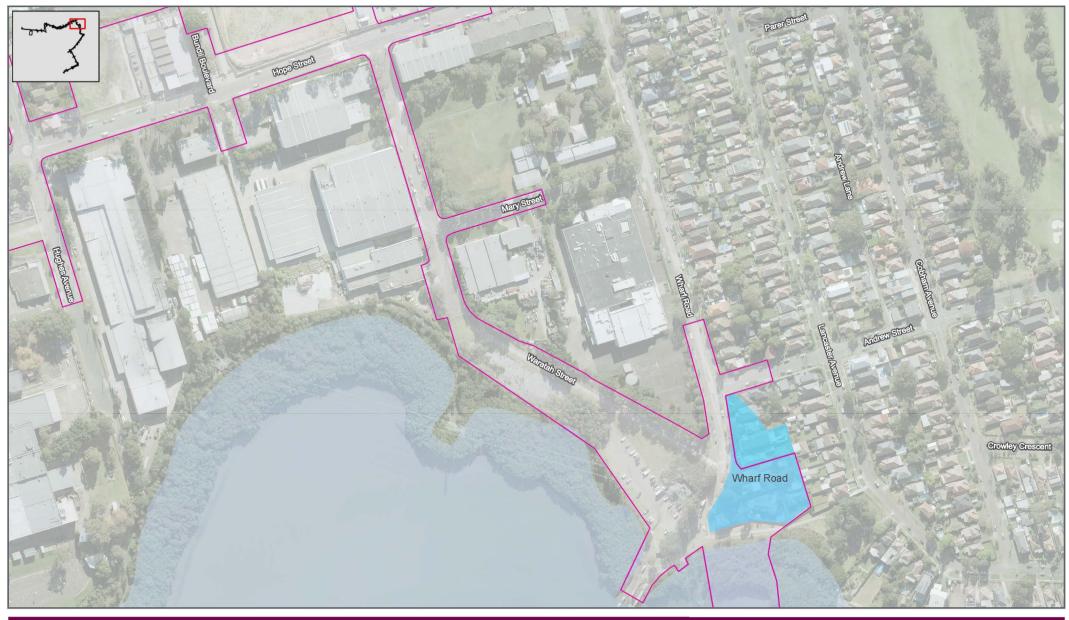
Transport for NSW
Parramatta Light Rail Stage 2 EIS
Aboriginal Cultural Heritage

Project No. **12557728**Revision No. **2**

Date **22/08/2022**

Project site

FIGURE 0.1



Legend

Project site

Archaeological senstivity areas not surveyed

Paper Size ISO A4 Metres

Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Areas of Aboriginal archaeological sensitivity recommended for future survey Project No. 12557728 Revision No. 2

Date 07/10/2022

FIGURE 0.2

Overview of test excavations and interface with non-Aboriginal archaeology

The aim of this test excavation is to identify Aboriginal occupation and understand the land use of the Aboriginal people within the project site. As a result of these methodological differences, a tailored Aboriginal heritage test excavation methodology has been designed and is outlined in this document.

A separate but integrated Archaeological Research and Excavation Framework (AREF) is being prepared to detail the methodology for non-Aboriginal archaeological test excavation.

The locations that require test excavation for non-Aboriginal archaeological resources overlap with those with potential for Aboriginal archaeology. Subsurface impacts have been limited in these areas which means that both the Aboriginal and non-Aboriginal archaeological resource may be relatively intact. Evidence from both periods of occupation may be present in the same stratigraphic units and an integrated approach needs to be taken to ensure an appropriate outcome that meets the requirements of both the *Heritage Act 1977* and the *National Parks and Wildlife Act 1974*.

Table 1 details locations where there is direct overlap between the Aboriginal and non-Aboriginal test excavation programs. Non-Aboriginal test excavation program will take place in three sites which include PAD1 – Ermington Boat Ramp, PAD5 – Broadoaks Park and PAD6 – Ken Newman Park following the Aboriginal test excavations. The indicative test trench locations for these three HAMUS compared to Aboriginal test squares are shown in Figure 0.3, Figure 0.4 and Figure 0.5.

The only location where historical test excavation may be undertaken but which would not have Aboriginal archaeological testing is in Camellia (Historical Archaeological Management Unit (HAMU) 03). This area is located in the eastern end of Grand Avenue (37 Grand Avenue) and likely to be highly contaminated and disturbed. The final decision on non-Aboriginal archaeological test excavation at HAMU3 will be dependent on the results of geotechnical investigations. However, this area is assessed as having no Aboriginal archaeological potential in Section 7.3.4 of the Archaeological Survey Report.

Table 1 The three locations where both Aboriginal and non-Aboriginal archaeological test excavation will occur

Aboriginal archaeology test ex. location	Non-Aboriginal archaeology test ex. location	Potential	Description of historical significance	Indicative number of non- Aboriginal test trenches
PAD1 – Ermington Boat Ramp	HAMU 15 – Ermington Wharf & Archer Park HAMU 16 – East end of Wharf Road & Koonadan Reserve	 High potential for Aboriginal heritage Medium potential for non-Aboriginal heritage 	This land was granted to Edmund Lockyer in 1792 who farmed the land. Subdivision plans from the 1840s and 1850s indicate that numerous farming-related structures including cottages, barns, and paddocks in the area	3 test trenches of 15 x 1 metres 1 test trench of 10 x 1 metres 1 test trench of 25 x 2 metres
PAD5 – Broadoaks Park	HAMU 07 – Broadoaks Park	 Moderate potential for Aboriginal heritage High potential for non- Aboriginal heritage. 	This area was part of the Vineyard Estate, established by Philip Schafer in 1791 and later owned by Hannibal Macarthur which was used for farming in the late 18th and early 19th century.	2 test trenches of 20 x 2 metres
PAD6 – Ken Newman Park	HAMU 11 – Ken Newman Park	 Moderate potential for Aboriginal heritage High potential for non- Aboriginal heritage. 	This area is a part of land which granted to marines from the First Fleet from 1792 onwards. The area broadly was used for farming in the late 18th and early 19th century.	2 test trenches of 20 x 2 metres

An archaeologist experienced in Aboriginal excavation will be on site at all times during the non-Aboriginal archaeology test excavation program. If any Aboriginal artefacts are uncovered during the non-Aboriginal test excavation program they will be recorded, analysed, and reported in the ACHAR test excavation results.

The non-Aboriginal archaeological program will only commence following the completion of the Aboriginal archaeology test excavation program. This will allow the results of the Aboriginal test excavation program to directly feed into the methodology for non-Aboriginal archaeological test excavations with three likely scenarios:

1. No Aboriginal objects are identified

Test excavations for non-Aboriginal archaeology will continue as outlined in AREF following standard practice for non-Aboriginal archaeological test excavation.

2. Some Aboriginal objects are identified (Low Density, < 5 artefacts per square metre)

Test excavation for non-Aboriginal archaeology will continue if the amount of Aboriginal objects remains below this threshold. The threshold for the cessation of excavations is proposed to be set at five objects per spit (100 millimetre depth level) per square metre, or if any of the following features are encountered:

- burials or human remains
- middens
- hearths
- unusual raw material types
- rare artefact types.

3. <u>Numerous Aboriginal objects are identified (Medium- High Density, 5 or more artefacts per square metre)</u>

In this situation, non-Aboriginal archaeological test excavation will not be undertaken at the proposed location. Another location in the vicinity may be selected if the Aboriginal archaeology test pits in that area have a level of Aboriginal cultural heritage below the threshold outlined above.

Test excavation for Aboriginal archaeology will also be undertaken in multiple areas where there is unlikely to be a historical archaeological resource. These locations area detailed in Table 2. The test excavation program is focused on the project site (i.e. area to be disturbed during construction), with the exception of the western section of PLR2 PAD3 Rydalmere Wharf which is to accommodate an alternative Camellia foreshore to Rydalmere option that is being considered by Transport for NSW. This area of PAD3 has not yet been assessed for non-Aboriginal archaeological potential but would be in further detail should this option be progressed. In this location, excavations will be entirely undertaken according to the Aboriginal test excavation methodology. These trenches will also be examined by an archaeologist trained in recognising and recording historical archaeology and where evidence of historical occupation is found, it will be recorded in line with the methodology outlined in the AREF.

Table 2 Locations where only Aboriginal archaeological test excavation will occur compared to Historical Archaeological Management Units (below HAMUS will not be tested)

Aboriginal archaeology test ex. location	Historical Archaeological Management Unit
PAD3 – Rydalmere Wharf	HAMU 05 – Rydalmere Wharf and Park
PAD4 – Haslams Creek	HAMU 19 – Hill
PAD7 – Hill Road West	North of HAMU 19
PAD8 – Brickpit, Australia Avenue	East of HAMU 22

The non-Aboriginal test excavations proposed for the project will be undertaken initially with the use of a small (~5 tonne) mechanical excavator under the supervision of a suitably qualified and experienced archaeologist. If any relics (any deposit, artefact, object or material evidence that relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and is of State or local heritage significance) are encountered, then mechanical excavation will cease and hand excavation commence. The indicative number of trenches, expansion (if required) and anticipated historical archaeological resource are included in Table 1.

The non-Aboriginal test excavation methodology will include following:

- the Aboriginal test excavation program will commence prior to any mechanical excavations in these
 locations. An archaeologist from the historical archaeology team will be present to for the duration of
 these fieldworks to identify all heritage values uncovered and vice versa
- each test trench would be marked out clearly on the ground prior to excavation. If services are located within the intended excavation area consideration will be given to relocating the trench. The immediate local environment will also be examined with a preference to avoiding areas close to trees etc
- any surface material such as grass of gravel would be mechanically excavated
- if the surface material is hard-standing (e.g. concrete or asphalt) then this will be saw-cut first to minimise damage to the surrounding surfaces
- at all stages of mechanical excavation, a flat bladed bucket (mud bucket) is to be used. This process will involve strip excavation of 50-100 millimetre layers with close monitoring
- a suitable qualified and experienced archaeologist will monitor all mechanical excavation. After clearing
 the surface materials mechanical excavation will be utilised to remove any substantial fill deposits or
 other overburden that is not of archaeological significance
- if suspected archaeological deposits, structures, or features are encountered mechanical excavation will ceased
- once exposed, archaeological features will be examined with minor hand excavations. Each test trench
 will include a hand dug sondage, that will be excavated to archaeological sterile layers in order to
 characterise the entire soil profile
- after recording each trench will be covered with a layer of 140 gsm geofabric and backfilled. Mechanical compression of backfill may not be appropriate depending on the nature of the archaeology found.

The primary aim of the non-Aboriginal test excavation is to confirm the presence of non-Aboriginal archaeological evidence and clarify the extant soil profile. However, the Aboriginal archaeological test excavation will consist of entirely hand excavated 1x1 metre test excavation squares, dug in 100 millimetre spits. The squares will be combined as four 50x50 centimetre test excavation units into 1x1 metre test excavation square (as stated in Section 3.1, Requirement 16a-5, of *The Code*), to understand the site characteristics, and will be placed on a systematic grid in each site.

Aims of the Aboriginal test excavation program

The aims of the test excavation program are as follows:

- to determine if the project site contains subsurface Aboriginal archaeological deposits, including evidence for contact archaeology and positive evidence of sensitive landforms such as stone artefact assemblages and shell middens among intact soils profiles
- to understand the integrity of the deposits by assessing the degree of disturbance which is present
- to determine the extent of the sites where present and identify the boundaries
- to understand the Aboriginal land use and the utilisation of the resources within the project site.

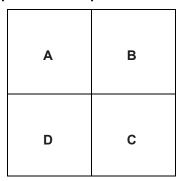
Sampling strategy

The Code which requires that a sampling strategy must be developed for all test excavations. This site specific methodology is prepared in consideration of historical potential of the three sites listed in Table 1. For this project, a two phase sampling strategy is proposed to understand the characteristics and limits of the sites, where present, and has been designed to inform and assess the Aboriginal archaeological impacts.

The test excavation program will target the areas of the study area that are likely to be subject to disturbance as a result of construction works for the project, including temporary compounds and utility locations where compaction and ground disturbance likely cannot be avoided (referred to as the project site).

The number of the test squares provided in Table 5 are located within the project site/construction footprint and will be the focus for the test excavation program. The test squares are a number of 1 x 1 metre pits combined by 50 x 50 centimetres test pits divided into quadrants as shown in Table 3. The quadrants will be assigned clockwise in all test squares and they will be numbered first with their PAD number and then consecutively. For example, 1-05A is the first test pit of the fifth test square in PAD1 in Melrose Park. The test excavation program will take place across the areas designated as having subsurface impacts and will include both inside and outside of the PADs to clarify extent.

Table 3 Sample of a test square



The test excavation program will provide a good sample of the project site via spacing between 20 to 30 metres test squares which will allow prediction of densities across the site and an assessment of archaeological significance. Further, 10 metre spacing has been applied in PAD5 Broadoaks Park in response to RAP comments to allow a more detail sampling for this small grassland.

A summary of the two phase sampling strategy is detailed below.

Phase 1 -

a) Survey (on foot) of previously inaccessible areas of the study area, if design development and construction planning confirm these areas would be in the project site and could be impacted. These areas include privately owned houses in Melrose Park (refer Figure 0.2). The survey would be undertaken in consultation with LALCs, once property access can be arranged and prior to any physical works being undertaken. If impacts are identified by the project and cannot be avoided,

further physical investigation of the PAD will be undertaken to clarify its archaeological significance with RAP consultation to guide the approach to management.

b) AND Phase 1 test excavation program of PADs in high and moderate archaeological potential areas. Phase 1 test squares will be laid out on the boundaries of the PAD and will have between 40 to 60 metres spacing depending on the size of the PAD. The 1x1 metre test squares will be established along the transects for maximum coverage (42 test squares in total of six locations, and 11 additional 50x50 cm test pits in PAD5 Broadoaks Park). The PAD boundaries are based on the identified landform and the test excavation program will aim to clarify the site extent. Detailed information on the transect length and number of the pits in each location are listed in Table 4. Indicative Phase 1 test square locations are shown on Figure 0.3, Figure 0.4, Figure 0.5, Figure 0.6, Figure 0.7 and Figure 0.8.

Supplementary, 10 metre spacing via 50x50 centimetre test pits was suggested by RAPs for PAD5 Broadoaks Park, due to small size of the park. The spacing of test pits in this location has been revised to incorporate this suggestion (Figure 0.5). A total number of 11 50x50 centimetre Phase 1 test pits would be placed in between four 1x1 metre Phase 2 test squares to reduce the spacing to 10 metres in this location.

Preliminary analysis of the results from the Phase 1 test excavations will aim to inform the Phase 2 test excavation program.

Phase 2 – in consultation with RAPs on site, and based on Phase 1 test excavation program results, two scenarios have been considered:

a) Phase 2 test excavation to understand the extent of the PADs. Additional 1x1 metre test squares would be excavated along the same transects reducing the spacing between pits to 20 or 30 metres for high and moderate archaeological potential respectively (in total 63 test pits of 1x1 metre is recommended). The detailed information on the transect length and number of the pits in each location is listed in Table 4.

OR

b) Expansion of a Phase 1 test square would aim to understand the limits of Aboriginal occupation (where there are highly significant Aboriginal heritage values found in the Phase 1 test square). The original test square, which is 1 square metre in total, can be expanded continuously by up to further 2x2 metres, where test excavation would not exceed total 0.5 per cent of the total PAD area. The expansion options through the thresholds would be employed to ensure the clear quantification of the significant area without removing it.

These thresholds are:

- high artefact densities, knapping floors, debitage, contact artefacts (e.g. hundreds of production waste for stone tools, namely conjoining debitage)
- a hearth or midden material indicating an Aboriginal occupation (to expose the feature not suggesting the excavation of the midden)
- rare or unusual artefact types (an imported tool e.g. tula adze)
- unusual raw material types, evidence of contact archaeology (e.g. flaked glass).

However, the program's preference is not to expand these areas, but to note their presence and to employ Phase 2 test excavation squares in between the Phase 1 test squares to ensure the PAD's archaeological potential of specific contexts (archaeological signature) is clearly understood, including extent to guide the design options and management of the project. Therefore, expansion of test pits is not recommended as an automatic step in this early design stage, this information should guide management of the sites with RAPs.

In order to understand the complete soil profile, one Phase 2 test square is located within the non-Aboriginal test trenches as shown in Figure 0.3, Figure 0.4 and Figure 0.5 in line with the Aboriginal test excavation program grid. The locations of the non-Aboriginal test trenches are indicative and will be subject to machine excavations of removing the fill and disturbance. These Phase 2 test squares will be hand excavated, following the completion of the non-Aboriginal test excavation program where no Aboriginal heritage was present to identify and record the complete soil profile in these areas.

Where artefacts, soil and charcoal samples are suitable for further analysis identified, all will be collected accordingly to prevent human contamination or destruction of residues. Charcoal samples from all cultural features with dateable charcoal will be collected for dating. The number of samples taken will depend on the nature and integrity of the archaeological deposits for optically stimulated luminescence (OSL) samples which will be undertaken by a suitably qualified geoarchaeologist. If flaked glass artefacts are uncovered with moderate or high probability, further use wear analysis may be conducted to verify evidence of contact archaeology. The total excavated area will not exceed 0.5 per cent of the total PAD area as per Requirement 16a of *The Code* (see Table 5). The number and location of the pits chosen to be expanded will be decided in consultation with RAPs on site and as limited by *The Code* requirements.

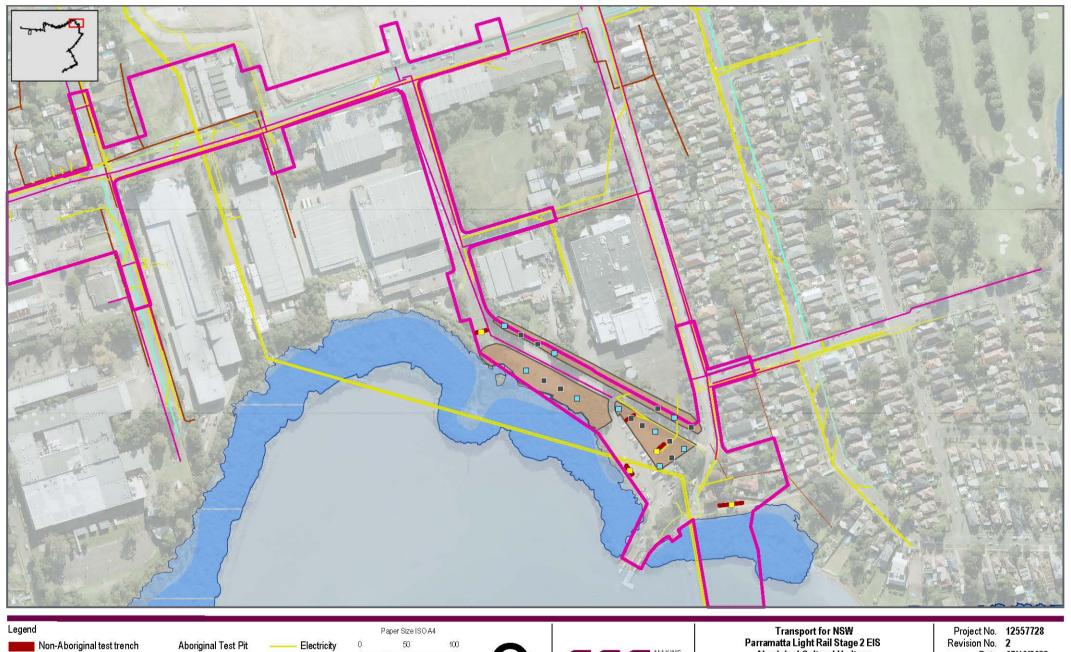
The test pits are also not located in any mapped coastal wetlands (shown in the figures below) thereby triggering additional approvals under the State Environmental Planning Policy (Resilience and Hazards) 2021 outside the EIS process.

Table 4 Summary of proposed test square locations in the project site

Excavation area	Suburb	Archaeological potential	Landform and distance to water	Potential scope of impact	Sampling strategy	Number of test squares	Spacing between test squares
PLR2 PAD1 Ermington Boat Ramp	Melrose Park	High	Flat – 60 m	Total / Direct	2 transects of 80 m and 180 m, 1x1m test squares	10 x Phase 1 13 x Phase 2	Phase 1 – 40 m Phase 2 – 20 m
PLR2 PAD3 Rydalmere Wharf	Rydalmere	High	Flat – 5 m	Partial / Direct	6 transects varying between 60 m to 150 m, 1x1 m test squares	16 x Phase 1 22 x Phase 2	Phase 1 – 60 m Phase 2 – 20 m
PLR2 PAD4 Haslams Creek	Sydney Olympic Park	High	Mid slope – 60 m	Partial / Direct	2 transects of 20 m, 1x1m test squares	3 x Phase 1 1 x Phase 2	Phase 1 – 20 m Phase 2 – 20 m
PLR2 PAD5 Broadoaks Park	Rydalmere	Moderate	Mid slope – 430 m	Total / Direct	3 transects of 60 m, 50x50 cm test pits and 1x1m test squares	11 x Phase 1 50x50 cm pits 4 x Phase 2 1x1 m test square	Phase 1 – 10 m Phase 2 – 10 m
PLR2 PAD6 Ken Newman Park	Ermington	Moderate	Mid and lower slope – 350 m	Partial / Direct	6 transects varying between 20 m to 150 m, 1x1 m test squares	11 x Phase 1 14 x Phase 2	Phase 1 – 60 m Phase 2 – 30 m
PLR2 PAD7 Hill Road West	Sydney Olympic Park	Moderate	Flat – 420 m	Partial / Direct	1 transect of 250 m, 1x1m test squares	5 x Phase 2	Phase 2 – 50 m
PLR2 PAD8 Brickpit, Australia Avenue	Sydney Olympic Park	Moderate	Flat – 260 m	Partial / Direct	1 transect of 280 m, 1x1m test squares	2 x Phase 1 4 x Phase 2	Phase 1 – 60 m Phase 2 – 30 m

Table 5 Number of test squares in relation to total PAD area (not exceeding 0.5%)

Excavation area	Suburb	PAD area (m²)	0.5% of PAD (m ²)	Number of test squares for Phase 1	Number of test squares for Phase 2	Total number of test squares	Total excavation area (m²)
PLR2 PAD1 Ermington Boat Ramp	Melrose Park	9,204	46.0	10	13	23	23
PLR2 PAD3 Rydalmere Wharf	Rydalmere	18,447	92.2	16	22	38	38
PLR2 PAD4 Haslams Creek	Sydney Olympic Park	3,650	18.3	3	1	4	4
PAD5 Broadoaks Park	Rydalmere	4,369	21.8	11 test pits (50x50cm)	4 test squares (1x1m)	15 (combination of test pits and squares)	6.75
PLR2 PAD6 Ken Newman Park	Ermington	32,191	161.0	11	14	25	25
PLR2 PAD7 Hill Road West	Sydney Olympic Park	21,495	107.5		5	5	5
PLR2 PAD8 Brickpit, Australia Avenue	Sydney Olympic Park	5,411	27.1	2	4	6	6





Phase 1 Gas Phase 2 Sewer

Water

Phase 2

Metres Map Projection: Transverse Mercator Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 56

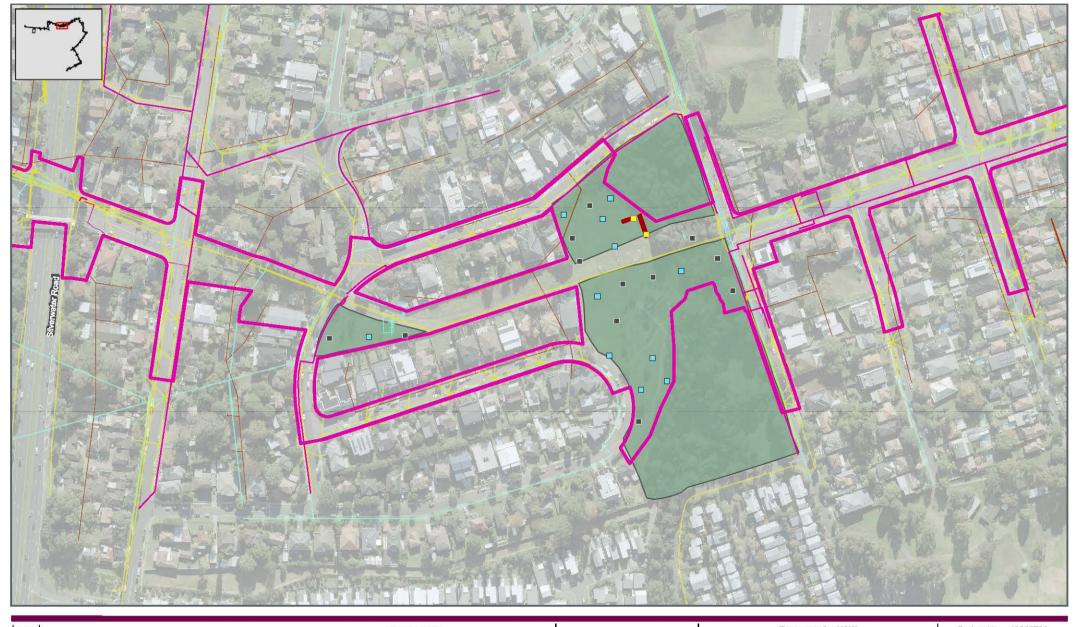


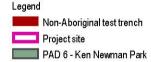
Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Indicative testing locations for Melrose Park

Date 07/10/2022

FIGURE 0.3





Aboriginal Test Pit Electricity

Phase 1 Gas

Phase 2 Sewer

Phase 2 Water

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Metres

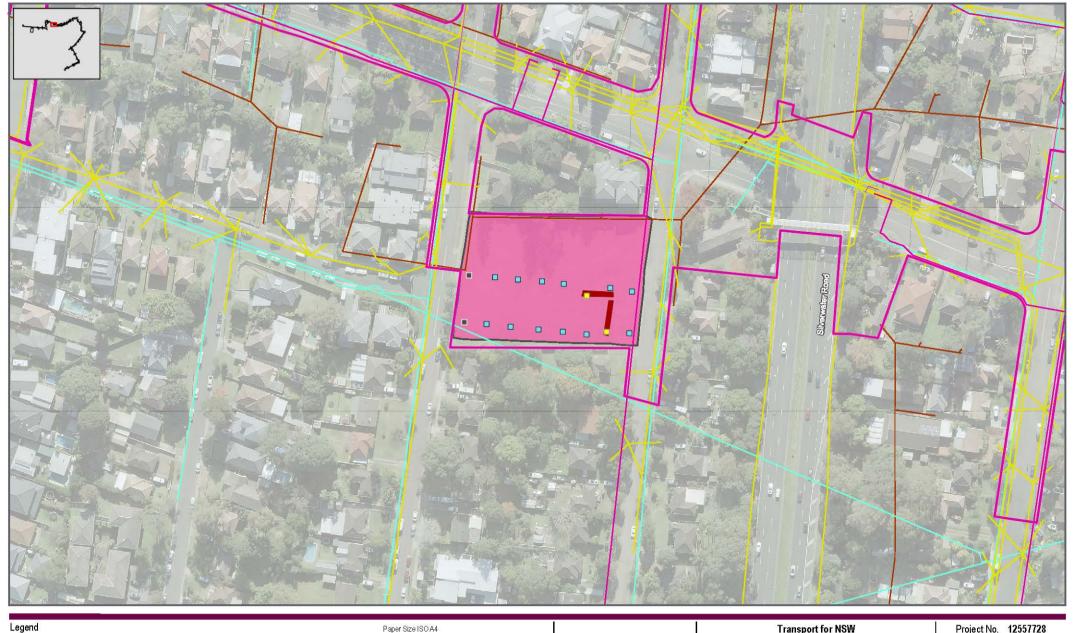
Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56

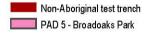


Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Indicative testing locations for Ermington Project No. 12557728
Revision No. 2
Date 22/08/2022

FIGURE 0.4





Aboriginal Test Pit Electricity Phase 1 Gas Phase 2 Sewer

Water

Phase 2

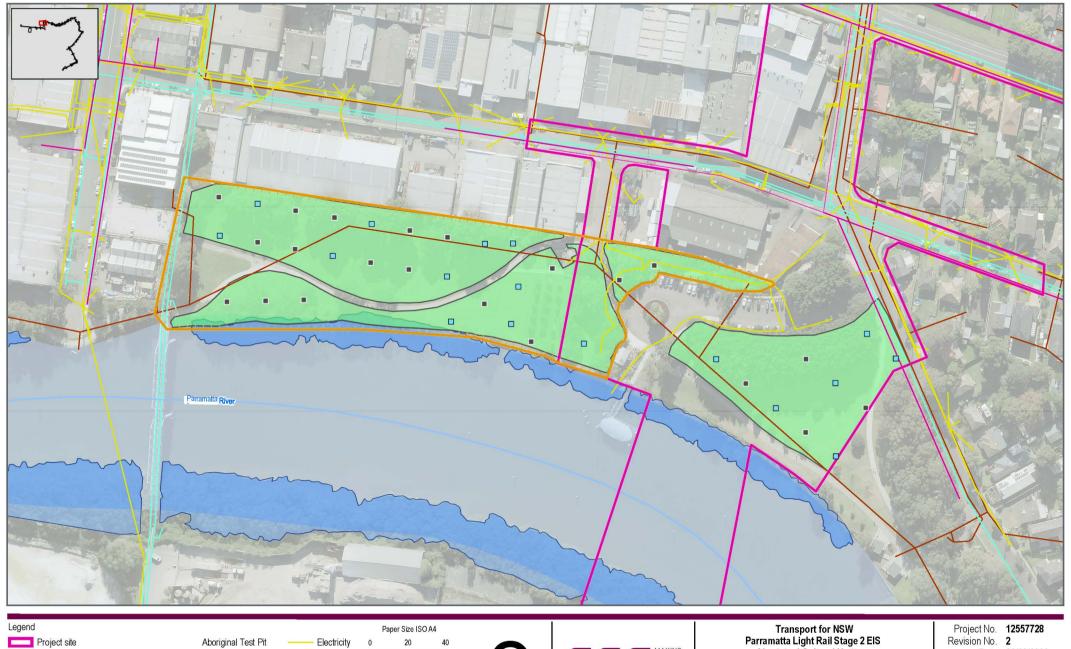
Metres Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56



Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Indicative testing locations for Rydalmere

Project No. 12557728 Revision No. 2 Date 22/08/2022







Metres Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56

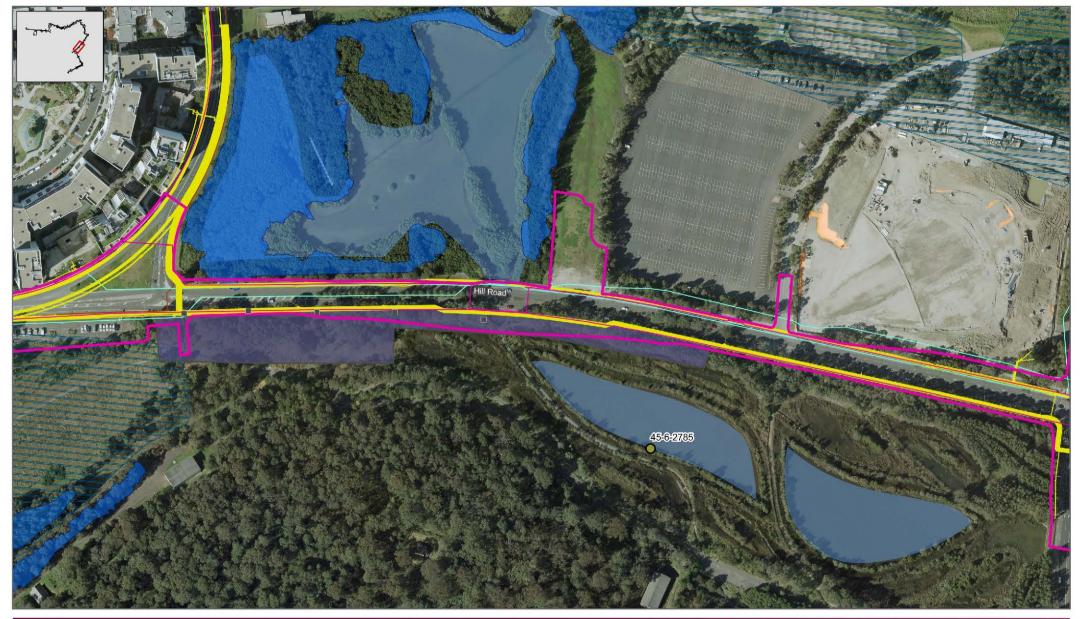


Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Indicative testing locations for Rydalmere

Date 22/08/2022

FIGURE 0.6



Legend C::::J Project site

Remediated land

Coastal wetlands

PAD 7 - Hill Road West

AHIMS listed PAD Electricity

--Gas --Sewer

Aboriginal Test Pit ■ Phase 2

PaperSize ISO A4 50 Water Metres

Map Projection: Transverse Mercator Horizontal Datum: GOA 1994 Grid: GOA 1994 MGAZone 56





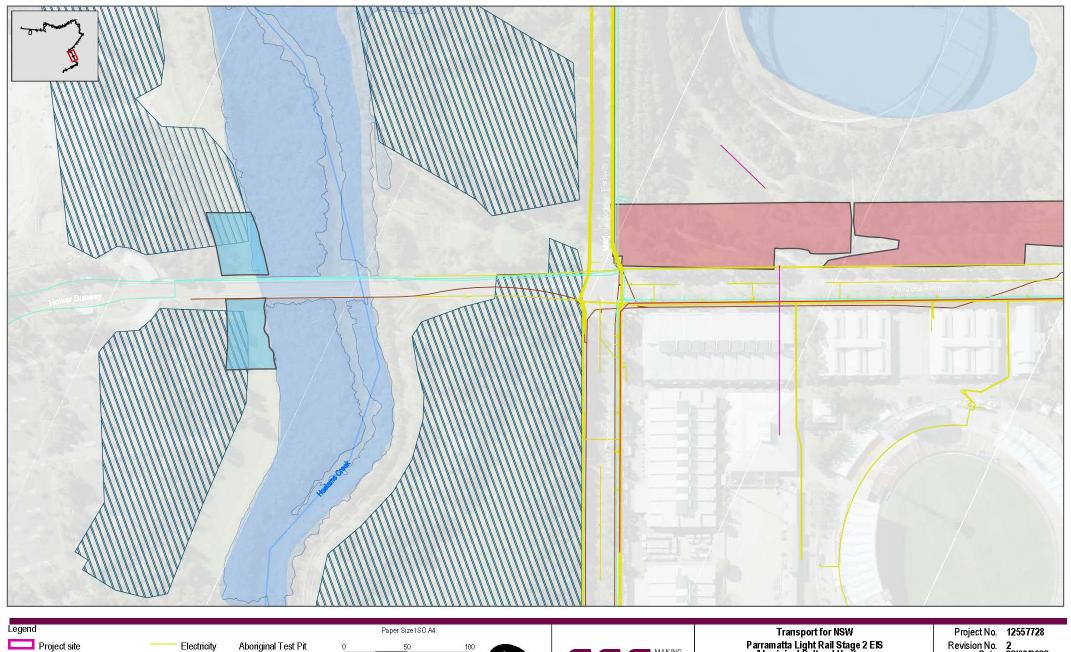
Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Indicative testing locations for **Sydney Olympic Park**

Project No. 12557728 Revision No. 2

Date 22/08/2022

FIGURE 0.7





Metres Map Projection: Transverse Mercator Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 56



Parramatta Light Rail Stage 2 ElS Aboriginal Cultural Heritage

Indicative testing locations for

Revision No. 2 Date 22/08/2022

Research questions

Key research questions aimed to be answered by this test excavation program are detailed below.

- 1. Does the project site contain intact subsurface Aboriginal archaeological deposit across the alluvial and/or erosional soil profiles?
- 2. How much disturbance is present in PADs, in terms of the integrity of the Aboriginal heritage deposits?
- 3. Is there stratified deposit within the project site, is it possible to determine the occupation periods?
- 4. Which cultural activities are archaeologically identifiable within the project site by the evidence of assemblage characteristics and variations in the region?
- 5. How can the Aboriginal archaeological deposit (if recovered) be interpreted in a local and regional context?
- 6. What are the archaeological and cultural significance of the sites to contemporary Aboriginal people and cultural knowledge holders?
- 7. Can discrete occupational phases be identified within the deposits where possible by dating methods of optically stimulated luminescence (OSL) and/or radiocarbon (C14)?

Field methods

Following a review of *The Code*, the methods below will be employed for subsurface investigation in the form of an Aboriginal archaeological test excavation.

- Test excavation squares will be placed on grids in each area, following the landscape of the PADs as identified by in the Archaeological Survey Report (Appendix D of the Preliminary ACHAR) and described in Table 4.
- The test square intervals will vary in each excavation area based on the high or moderate potential regularly spaced between 20 metres to 50 metres. They may be offset to avoid harming trees or underground services.
- The test pits will stretch across all PADs including the parts of no archaeological exposure or visibility.
- All test pits will be 1x1 metres in Phase 1.
- Phase 2 of the test excavation program may combine the original test square, which is 1 square metre in total, continuously by up to further 2x2 metres.
- Total area of the test excavation units will not exceed 0.5 per cent of the PAD or site.
- All test pits will be excavated by hand tools.
- The first excavation unit of a PAD/excavation area will be excavated and recorded in 50 millimetre spits at each area, the rest of the test squares will be excavated by 100 millimetre spits depending on sediment profile or stratigraphic sequence and will be excavated to the base of Aboriginal heritage containing soils (which will be decided in each excavation area). Excavations will be finalised when the bedrock is reached or will be excavated to archaeological sterile layers. Due to occupational health and safety concerns, hand excavation will cease at a depth of 1.5 metres or where the water table is reached or contaminated soils are encountered.
- If excavation is required to be deeper than 1.5 metres, benching (via a series of steps) may be required. The purpose of this method is to cover for excavation below 1.5 metres if they are anticipated, otherwise *The Code* is employed. (If benching is required, one 1x1 metre square will be excavated each side to a maximum of 1 metres which will allow the test pit to go deeper than 1.5 metres but so as not to exceed 0.5 per cent of the total PAD).
- On-site processing of excavated soils and artefact retrieval would be undertaken via a combination of
 dry and wet sieving appropriate to the soil landscape, through a nested five millimetre to three millimetre
 sieve. Artefacts will be collected from the sieves and placed in bags according to test square
 provenance.

- If the test excavations uncover knapping spaces (stone tool making areas), soil samples will be
 collected to be sieved in a flotation tank where the upper mesh size is 0.5 millimetres to collect all micro
 debitage.
- Detailed recording of all units would be undertaken, requiring the completion of a detailed excavation recording form (spit sheet) for each test square. The recording forms include following: site details, date, pit no, coordinates (Easting – Northing, datum), excavator (archaeologist), number of spits, soil description; inclusion, colour (Munsell) and pH of each spit, depth of each spit, section drawing and photo catalogue number.
- Preliminary stone artefact/lithic analysis will be undertaken on site to respond triggers mentioned above.
- Samples for scientific analysis will be collected during the excavations based on soil profiles. Optically stimulated luminescence (OSL) samples will be collected, if archaeologically significant soil profiles (such as Parramatta Sand Body) uncovered, by a qualified geoarchaeologist. The sampling strategy will be decided on case by case basis.
- Radiocarbon samples will be collected from shell middens and hearths as required to identify absolute chronologies. At least one sample will be collected from each feature, where identified.
- If any hearths are uncovered during test excavation, the limits of the hearth will be followed within the test square. If the hearth is partially in a test square the adjacent test square will be excavated (as phase 2- refer to page 9) to the same level to expose the complete feature. The hearth will be then excavated in half and all contents will be collected for flotation. Section drawings will be made prior to the completion of the excavation of the hearth.
- High resolution digital photographs will be taken of each test square and at least one section will be recorded as well as scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects.
- A qualified surveyor will be on site for recording geo-coordinates and conversions to GDA94. The
 location of each test square will be spatially recorded using either a Total Station or high-resolution
 GPS. The top and bottom RLs (reduced to AHD) of each test square will be recorded by either a Total
 Station or an automatic optical level (Dumpy level).
- If any burials or human remains are uncovered during test excavation, as a precautionary principle, the
 following must be applied to all physical remains suspected to be Aboriginal ancestral remains: No
 further disturbance or movement of these remains, and all work at the location will cease, as well as
 notifying NSW Police and the Environment Line.
- If any middens are uncovered during test excavation, attributes and features will be recorded without excavating the midden. The following precautionary measures will take place: no harm to the midden in any way, recording the full range of shells where possible, drawing and photography of any obvious changes in midden stratigraphy where middens are visible in the section.
- If any non-Aboriginal objects are found during the Aboriginal test excavation, they will be labelled appropriately and combined with non-Aboriginal testing program artefacts and analysed as detailed in the AREF.
- If non-Aboriginal archaeological features are encountered during Aboriginal testing, their significance will be assessed by one of the historical Excavation Directors nominated in the AREF. If they are found to be of significance, then excavations for the purposes of Aboriginal testing will cease in that square.
- The test squares will be backfilled following the excavations.

Recording

Each test square will be recorded with detailed descriptions of the landform, the soil profile, any evidence of disturbance and/or features, as well as depth of excavation, number of spits and the number of buckets required to remove the soil on a recording form. For each spit, plastic zip-lock bags labelled with site name, square number, spit number, and date should be retained for artefact retrieval.

At least one zip-lock bag will be retained for each spit, even if no artefacts were recovered, to ensure each excavation unit was accounted for and allow for spatial analysis.

Photographic recording will occur at the completion of each unit or when an archaeological feature is uncovered. A photographic record should be taken of at least one wall section in each test square. Together with a section drawing where required, the photographs will allow for a detailed record of the stratigraphic sequence present at the site.

Analysis

Any Aboriginal objects, including lithics, shell and bone will be explained in detail of their nature and scientific significance. Lithic artefacts are the most common artefact types in Aboriginal archaeological excavations. Therefore, an analysis for lithic artefacts has been outlined in this section. Where present, shell and bone artefacts will be analysed to understand the procurement strategies.

Further scientific analysis may be required during the test excavation program. Optical stimulated luminescence dating (OSL) and radiocarbon (C14) dating samples will be collected during the fieldwork where suitable samples are present (such as an *in situ* hearth for charcoal sample) and intact soil profiles that are significant to Aboriginal heritage (e.g. Parramatta Sand Body). Analysis of such samples will inform an absolute chronology of the sites and material heritage found and enable an interpretation of the sites in the wider landscape. Where relevant, archaeologically significant soil samples, dateable charcoal samples will be recovered and analysed for each site.

Both the Aboriginal and non-Aboriginal test excavation programs will adjust the final location of test pits in the field to avoid harming any trees. No trees will be removed, and the test pits will be offset from the transects where necessary, along with a note on the spit sheets (the distance and direction of the offset) and correct geocoordinates will be recorded by a surveyor.

Artefact analysis will include washing/cleaning, re-bagging and labelling and photographic recording of artefacts. All material culture unearthed during the excavations will be evaluated; stone tools, fish/animal bones and bone tools and shells will be subject to artefact analysis in order to provide the occupation levels across the site and time.

The artefact analysis will record key attributes of raw material, cortex, artefact type, flake/core type, platform type, and dimensions, as well as a photographic record of a representative sample of artefacts. All recorded information will be noted via Microsoft Excel in order to statistically analyse the results. Lithic artefact attributes will be recorded with a range of information including, but not limited to. the categories listed in Table 6, in order to identify the assemblage characteristics and to investigate regional trends. Basic artefact analysis will be carried out on site for all artefacts, to record artefact numbers from each pit, type of a significant artefact where applicable, raw materials to allow assessments for the archaeological test excavation program. A tailored artefact analysis will be designed based on the assemblage of each site and attribute analysis will be undertaken. If flaked glass artefacts are uncovered, they will be analysed within the lithic assemblage.

Information gathered from detailed analysis would be used to inform the site formations within different landforms, preferences of the occupants in comparison to other sites within the landscape. The utilisation of the site can contribute to dating of the site and understanding the cultural values. The comparable dataset which will be created during the artefact analysis may help future investigations for the Aboriginal material culture in the broader region Post excavation analysis will be planned based on test excavation results, including a tailored comparative analysis and use-wear analysis.

The result of the analysis will inform the updated ACHAR to be provided with Response to Submissions. The test excavations will be undertaken to inform the possible impacts of the proposed works within Parramatta Light Rail Stage 2 construction. Following the completion of archaeological test excavation program within the project site, a post-excavation report detailing the results of the Aboriginal archaeological investigation works will be prepared.

Where Aboriginal consultation indicates salvage excavations of the selected sites is appropriate, an appropriate salvage excavation methodology and research design will be prepared in consultation with the RAPs with the following aims: a) to collect and salvage a representative sample where impacts cannot be avoided, b) to consider conservation, interpretive and educational outcomes. Where relevant the research design may need to address a combined approach to Aboriginal and non-Aboriginal salvage excavations or project interaction. Requirements for salvage will only take place once planning approval for the project has been obtained and in accordance with any conditions of the approval.

Table 6 Lithic artefact analysis categories

Attributes fo	or each artefact				
Cortex %	Location Of Cortex	Artefact Type	Raw Material	Colour	Recording Date
Termination Type (Flake/Tools only)	Flake Form	Platform Type	Platform Width (Flake/Tools only)	Platform Thickness (Flake/Tools only)	Platform Surface (Flake/Tools only)
Nm of Flake Scars	Flake/Tool/Core Type	Retouch Type (Flake/Tools only)	Retouch Location (Flake/Tools only)	Shape of retouch (Flake/Tools only)	Artefact no.
Length	Width	Thickness	Weight	Site ID / Test square / Spit no	Test square / Spit no.

Management of Aboriginal artefacts

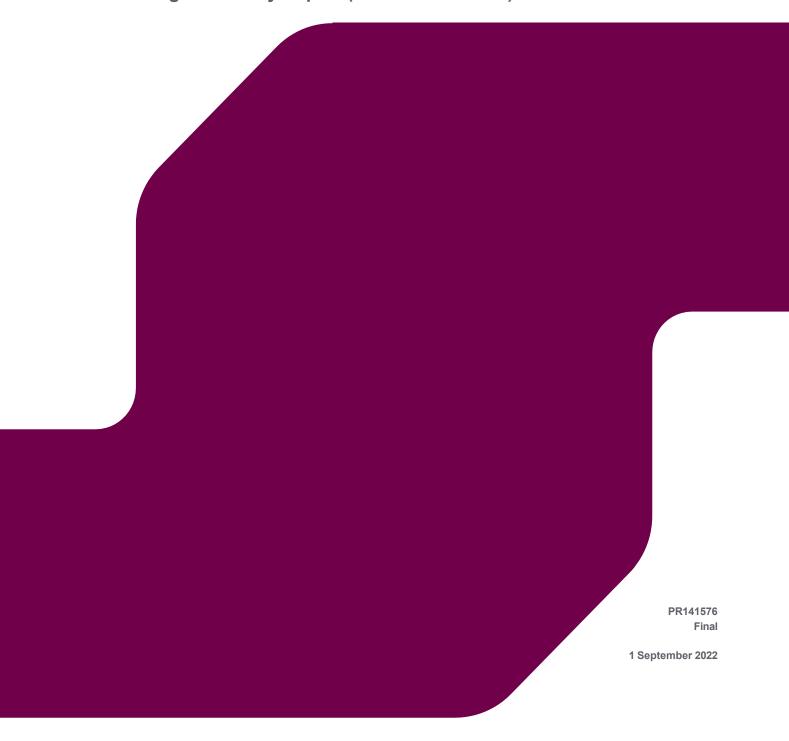
The long-term management options for any Aboriginal artefacts recovered from the project site test excavations will be decided in consultation with RAPs. Every artefact will be recorded with a unique artefact number and stored in zip-lock bags. All artefacts will contain an archival grade tag filled with permanent marker including information on excavation area, test pit number and spit number. During the test excavations and construction works the artefacts will be kept in a locked storage room in the RPS Sydney office.

Appendix D Archaeological Survey Report (PACHCI Stage 2)



PARRAMATTA LIGHT RAIL STAGE 2

Archaeological Survey Report (PACHCI STAGE 2)



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REPORT

Docum	Document status						
Version	Purpose of document	Authored by	Reviewed by	Approved by	Review date		
	Final	B.Selvi-Lamb	S.Kennedy, N.Green	S.Kennedy	01.09.2022		

Approval for issue	
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Prepared by: Prepared for:

RPS Transport for NSW

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Appendix A Aboriginal Test Excavation Methodology

Appendix B AHIMS Extensive Search Results

Appendix C PACHCI Stage 2 Survey Report – Deerubbin LALC

Appendix D A guide for archaeological test excavation

GLOSSARY AND ABBREVIATIONS

Term/Acronym	Definition
Aboriginal artefact/object	Means 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.
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AMBS	Australian Museum Business Services
ВР	Before Present
Burra Charter	The Australia ICOMOS Charter for Places of Cultural Significance, The Burra Charter, 2013
DCP	Development Control Plan
DECCW	Former NSW Department of Environment, Climate Change and Water
e.g.	for example
EIS	Environmental Impact Statement
EPA	NSW Environment Protection Authority
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2021
GPOP	Greater Parramatta and Olympic Park corridor
GPS	Global Positioning System
Grinding grooves	usually oval-shaped indentations in sandstone outcrops. These grooves were made when Aboriginal people shaped and sharpened stone axes by grinding them against the sandstone. As a fine-grained material, rubbing stone axes against sandstone provided a sharp edge that could be used for cutting.
Heritage Act	NSW Heritage Act 1977
HNSW	Heritage New South Wales
ICOMOS	International Council on Monuments and Sites
IHO	Interim Heritage Order
KNC	Kelleher Nightingale Consulting
Knapping	(or lithic/stone reduction) Knapping is shaping of a suitable stone material (hard, homogenous, elastic, brittle, isotropic raw materials) into a stone tool by removing piece or pieces. The reduction of the stone can be done striking or applying pressure via other stones or bone/antler as hammers.
LALC	Local Aboriginal Land Council
LEP	Local Environmental Plan
LGA	Local Government Area
Material culture	Physical objects made or modified by a human
NHL	National Heritage List
NNTT	National Native Title Tribunal
NPW Act	NSW National Parks and Wildlife Act 1974
NSW	New South Wales
NTA	Commonwealth Native Title Act 1993
OEH	Former NSW Office of Environment and Heritage

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Term/Acronym	Definition
PACHCI	Procedure for Aboriginal Cultural Heritage Consultation and Investigation (Roads and Maritime Services, 2012)
PAD	A potential archaeological deposit is an area identified with potential for artefacts to occur below the ground surface. PADs occur as, over time, artefacts are covered by sediment such as dirt or sand or are moved by erosion to new areas which may then be covered by sediment. These artefacts remain under the ground surface and when excavated provide us with important spatial and temporal information about Aboriginal land use. As PADs are located below the ground, artefacts can only be recovered through archaeological excavation. This is always done in consultation with the local Aboriginal community.
PHALMS	Parramatta Historical Archaeological Landscape Management Study
Project	The project (for which Transport for NSW is seeking approval) is the construction and operation of Stage 2 of Parramatta Light Rail.
RAPs	Registered Aboriginal Parties
SEARs	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
Shell middens	Shell middens are accumulation of the debris of shellfish. Shell middens often also include other material such as the bones of birds and fish, stone artefacts, and charcoal from campfires. Shell middens are usually found on the coast, but can also be found in inland lakes, swamps and along riverbanks and inlets. They can range from thin scatters of shells to deep layered deposits that have built up over a longer period of time.
SHI	State Heritage Inventory
SHR	State Heritage Register
Study area	The study area encompasses the preferred route and alternative options for connecting Parramatta Light Rail Stage 1 to Sydney Olympic Park (see Figure 1.2).
SU	Survey Unit
Transport for NSW	Transport for NSW is the lead agency of the NSW Transport cluster.

1 INTRODUCTION

1.1 Background

Parramatta Light Rail will deliver an integrated light rail service that supports population and employment growth expected throughout the Greater Parramatta to Olympic Peninsula (GPOP) area. It will integrate with existing and future modes of transport, including buses, trains, ferries and active transport (pedestrian and cycle networks), as well as Sydney Metro services and the existing road network.

Parramatta Light Rail will be delivered in stages to keep pace with development (see Figure 1.1)

Stage 1 will connect Westmead to Carlingford via the Parramatta central business district (CBD) and Camellia. The construction and operation of Parramatta Light Rail Stage 1 was approved by the NSW Minister for Planning in May 2018. Major construction is underway and Stage 1 is expected to start operating in 2023. Further information on Stage 1 is available at Parramatta Light Rail | Parramatta (nsw.gov.au).

• Transport for NSW is now proposing to construct and operate Stage 2 of Parramatta Light Rail ('the project'). Stage 2 would connect the Parramatta CBD and Stage 1 to Camellia, Rydalmere, Ermington, Melrose Park, Wentworth Point and Sydney Olympic Park.

In June 2021, the NSW Government committed \$50 million over the next three years to continue planning and development works for Stage 2. This funding will go towards planning, utilities and geotechnical investigations, as well as progressing the development of the project's environmental impact statement (EIS).

The project has been declared State Significant Infrastructure and Secretary's Environmental Assessment Requirements (SEARs) for Aboriginal heritage have been issued (see Table 1.1).

Table 1.1: SEARs for Aboriginal heritage

Key Issue and Desired Performance Outcomes

Requirement

Current Guidelines

6. Heritage – Aboriginal The design, construction and operation of the proposal facilitates, to the greatest extent possible, the long-term protection, conservation and management of the heritage significance of Aboriginal objects and places. The design, construction and operation of the proposal avoids or minimises impacts, to the greatest extent possible, on the heritage significance of Aboriginal objects and places.

- 1. Direct and/or indirect impacts (including cumulative impacts) to the heritage significance of: (a) Aboriginal places, objects and cultural heritage values, as defined under the National Parks and Wildlife Act 1974 and in accordance with the principles and methods of assessment identified in the current guidelines; and (b) Aboriginal places of heritage significance, as defined in the Standard Instrument Principal Local Environmental Plan.
- 2. Identify and describe the Aboriginal cultural values that exist across the whole area that will be affected by the proposal and document these in an Aboriginal Cultural Heritage Assessment Report (ACHAR). This may include the need for surface survey and test excavation.
- 3. The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010) (the Code), and be guided by the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011).
- 4. Consultation with Aboriginal people must be undertaken and documented in accordance with Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW). The significance of cultural heritage values for Aboriginal people who have a cultural association with the land must be documented in the ACHAR.
- Impacts on Aboriginal cultural heritage values must be assessed and documented in the ACHAR. The ACHAR must demonstrate attempts to avoid

Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011) Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW) Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010) AHIMS Aboriginal Site Recording Form AHIMS Aboriginal Site Impact Recording Form Care Agreement application form Connecting with Country (Government Architect NSW, 2020) The Australia ICOMOS **Burra Charter**

Key Issue and Desired Performance Outcomes

Requirement

Current Guidelines

impact upon cultural heritage values and identify any conservation outcomes. Where impacts are unavoidable, the ACHAR must outline measures proposed to mitigate impacts.

- 6. In situations where the test excavation methodology stipulated in Requirement 16 of the Code is not appropriate (e.g. in areas detailed in Requirement 14 of the Code; in areas of deep sand deposits; or in areas where historical archaeological excavations area also taking place), a site-specific test excavation methodology should be developed.
- 7. Where archaeological investigations of Aboriginal objects are proposed these must be conducted by a suitably qualified archaeologist, in accordance with section 1.6 of the Code.
- 8. Any Aboriginal objects recorded as part of the assessment must be documented and notified to Heritage NSW by recording on the Aboriginal Heritage Information Management System.
- 9. The ACHAR must outline procedures to be followed if unexpected Aboriginal objects, burials or skeletal material are uncovered at any stage during the life of the proposal.

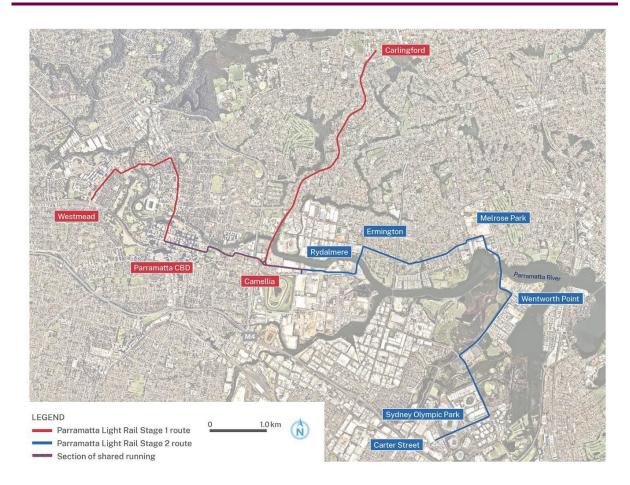


Figure 1.1 Parramatta Light Rail network

1.2 Purpose and scope of this report

Transport for NSW recognises that the development of its projects has the potential to impact Aboriginal cultural heritage and has developed the *Procedure for Aboriginal Cultural Heritage Consultation and Investigation* (PACHCI) (Roads and Maritime Services, 2012). This procedure aligns with NSW regulatory processes for Aboriginal community consultation, as required by clause 60 of the National Parks and Wildlife Regulation 2019, and details a four-stage process for investigating potential impacts to Aboriginal heritage:

- Stage 1 is the completion of a desktop risk assessment
- Stage 2 comprises further assessment and a site survey with specific Aboriginal stakeholders and an archaeologist
- Stage 3 involves the preparation of an Aboriginal Cultural Heritage Assessment Report (ACHAR) (and may also involve testing)
- Stage 4 is the implementation of project mitigation measures (which may include salvage).

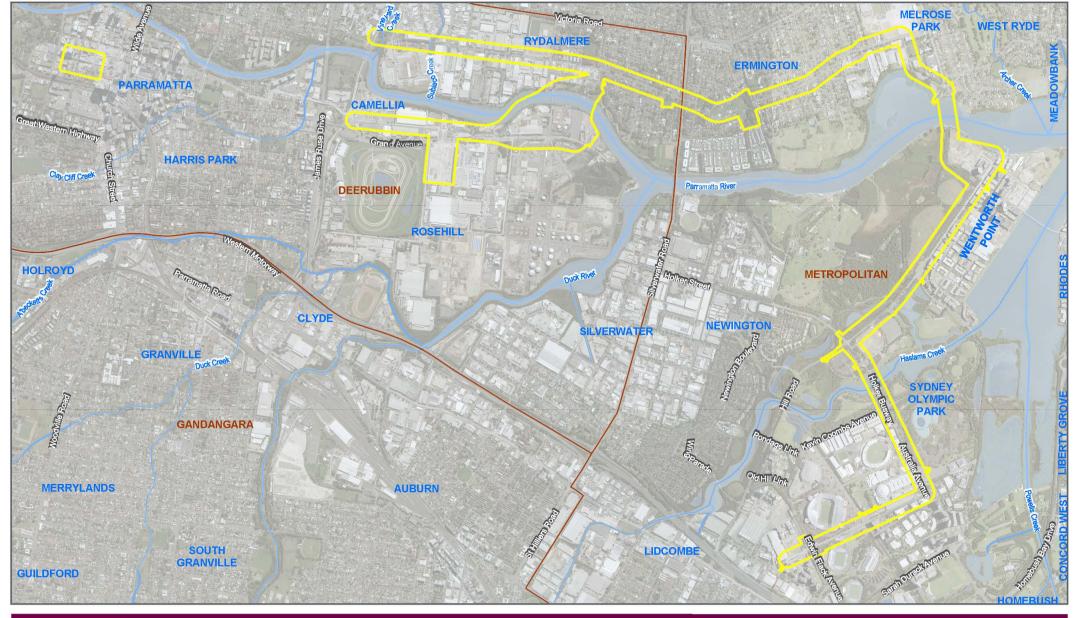
The Parramatta Light Rail (Stage 2) Scoping Report (Transport for NSW, 2019) was informed by an Aboriginal Heritage Constraints Assessment (Kelleher Nightingale Consulting (KNC), 2018) that identified potential areas of Aboriginal archaeological sensitivity that may be impacted by the construction of the project, Subsequently, an ACHAR is required to be prepared as part of the SEARs issued for the project (see Table 1.1).

However in order to engage with Aboriginal stakeholders early in the planning phase and to inform the preparation of the ACHAR, a PACHCI Stage 2 Archaeological Survey Report (this document) has been prepared by RPS on behalf of Transport for NSW.

The purpose of this Archaeological Survey Report is to:

- undertake a literary review of available data, including Aboriginal Heritage Information System (AHIMS) and State Heritage Inventory (SHI) searches and previous studies/investigations from the study area
- outline the results of the site survey
- provide an assessment of archaeological potential
- provide a preliminary significance assessment
- provide a methodology for test excavations for Aboriginal heritage (see Appendix A)
- identify recommendations for further investigations, such as test excavations.

The study area for the project is located across the Parramatta and Ryde Local Government Areas (LGAs) and the Dehubbing and Metropolitan Local Aboriginal Land Council (LALC) boundaries and encompasses the preferred route and alternative options for connecting Parramatta Light Rail Stage 1 to Sydney Olympic Park (see Figure 1.2).





Study area

Local Aboriginal Land Council area



Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56



Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Project No. 12557728 Revision No. 2 Date 22/06/2022

Study area

FIGURE 1.2

1.3 Limitations

This report has been prepared in accordance with PACHCI Stage 2 and is not intended as an ACHAR in response to the SEARs. As such, the following limitations are noted below.

• Consultation with cultural knowledge holders: was undertaken with Dehubbing and Metropolitan Local Aboriginal Land Council (LALC) Site Officers in accordance with PACHCI Stage 2. Transport for NSW acknowledges that consultation in accordance with Aboriginal cultural heritage consultation requirements for proponents 2010 (DECCW) is required for the project and has begun this process.

Archaeological survey:

- A site survey was conducted with Deerubbin and Metropolitan LALC Site Officers on 24 January 2022 and 4 February 2022 which aimed to groundtruth areas of potential archaeological sensitivity identified in previous studies, and to assess the Aboriginal archaeological heritage potential within the study area.
- The survey was constrained by site access and poor surface visibility. As such, a Comprehensive
 Archaeological Survey was not recommended by the archaeologists and this approach was supported
 by the LALC Site Officers.
- The site survey with LALC Site Officers was limited to publicly accessible areas within the study area. As such some areas of potential archaeological sensitivity in Melrose Park (ten private properties and the Melrose Park Public School Oval) were not able to be surveyed at this time. However, Transport for NSW has committed to completing the survey of these areas once property access has been arranged, prior to any physical works progressing.
- The section of the study area at Parramatta CBD was not surveyed with LALC Site Officers as it was assessed by the Stage 1 and those investigations have been relied upon.
- **Significance assessment:** the archaeological significance of Aboriginal heritage values is based on identified significance, advice and recommendations received from the Deerubbin and Metropolitan LALC Site Officers and previous studies. A comprehensive significance assessment will form part of the ACHAR being prepared in consultation with Registered Aboriginal Parties (RAPs) in response to the SEARs.

The information contained in this report is based on information provided by the client, as well as information obtained through the course of this assessment via site visits and previous field work.

1.4 Authorship

Heritage Consultant Dr Bengi Selvi-Lamb (PhD in Archaeology) prepared this report with assistance from Senior Heritage Consultant Sarah van der Linde (MA in Cultural Heritage) and Senior Heritage Consultant Dr Gary Marriner (PhD in Archaeology). Heritage Manager Susan Kennedy (BA in Anthropology/Archaeology and MA in Maritime Archaeology) has reviewed this report.

2 LEGISLATIVE CONTEXT

Aboriginal cultural heritage in NSW is protected by the *National Parks and Wildlife Act 1974* which is overseen by Heritage NSW. Aboriginal cultural heritage includes tangible and intangible cultural heritage values. Aboriginal cultural heritage may also be protected through listing under the *Heritage Act 1977*, also overseen by Heritage NSW. The *Environmental Planning and Assessment Act 1979* (EP&A Act) and other environmental planning instruments trigger the requirement for the investigation and assessment of Aboriginal cultural heritage as part of the development approval process. The EP&A Act includes the sustainable management of built and cultural heritage (including Aboriginal heritage) as one of its objectives.

2.1 National Parks & Wildlife Act 1974

2.1.1 Harm to Aboriginal objects and places

The NSW National Parks and Wildlife Act 1974 (NPW Act) is the principal act providing protection for Aboriginal cultural heritage in NSW. The objectives of the NPW Act provides for the conservation of objects, places or features (including biological diversity) of cultural value within the landscape, including but not limited to (i) places, objects and features of significance to Aboriginal people...".

The NPW Act provides protection for Aboriginal objects irrespective of their significance (archaeological or cultural heritage significance) or land tenure. It also protects Aboriginal Places, which can include intangible cultural heritage values as well as Aboriginal objects. However, Aboriginal Places must be assessed and gazetted under the Act and are linked to a specific location.

Section 86 of the NPW Act states:

- "A person must not harm or desecrate an object that the person knows is an Aboriginal object
- A person must not harm an Aboriginal object
- "A person must not harm or desecrate an Aboriginal place."

Under the NPW Act, it is an offence to harm an Aboriginal object or place. Harm under the NPW Act is defined as any act that: destroys defaces or damages the object; moves the object from the land on which it has been situated; causes or permits the object to be harmed. However, it is a defence from prosecution if the proponent can demonstrate 1) that harm was authorised under Section 90 of the NPW Act, or 2) that the proponent exercised due diligence in respect to Aboriginal cultural heritage. The due diligence defence states that if a person or company has exercised due diligence, liability from prosecution under the NPW Act will be removed or mitigated if it later transpires that an Aboriginal object was harmed. If an Aboriginal object is identified during the proposed activity, all activity within that area must cease and Heritage NSW notified (DECCW, 2010c, p.13). The due diligence defence does not authorise continuing harm.

2.1.2 Notification of Aboriginal objects

Under Section 89A of the NPW Act, the proponent must report all Aboriginal objects and places to the Secretary of Department of Premier and Cabinet of Heritage NSW within a reasonable time, unless already recorded on the Aboriginal Heritage Information Management System (AHIMS).

2.2 National Parks & Wildlife Regulation 2019

The National Parks & Wildlife Regulation 2019 (NPW Regulation) provides a framework for undertaking activities and exercising due diligence in respect to Aboriginal heritage. The NPW Regulation 2019 outlines the recognised due diligence codes of practice, procedures for Aboriginal Heritage Impact Permit (AHIP) applications, and Aboriginal cultural heritage consultation requirements amongst other regulatory processes.

2.2.1 Investigating and assessing Aboriginal cultural heritage

There are a number of procedural guidelines supporting archaeological practice in NSW. The publications relevant to the investigation and assessment of Aboriginal cultural heritage include:

Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011)

- Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010a)
- Code of Practice For Archaeological Investigation of Aboriginal Objects in NSW (The Code) (DECCW, 2010b).

The Aboriginal Cultural Heritage Consultation Requirements for Proponents (DECCW, 2010a) codifies a process for consultation with Aboriginal people who hold cultural knowledge relevant to determining the significance of Aboriginal cultural heritage. The requirements are consistent with the NPW Regulation and seek to conserve Aboriginal objects and places of significance to Aboriginal people. Consultation is therefore a fundamental part of the Aboriginal cultural heritage assessment process.

2.3 Heritage Act 1977

The NSW *Heritage Act 1977* provides protection for environmental heritage including historic places, structures, relics, moveable objects and landscapes of significance. The *Heritage Act 1977* also affords protection to Aboriginal cultural heritage and Aboriginal archaeology of State heritage significance through listings on the State Heritage Register (SHR) or being the subject of an Interim Heritage Order (IHO).

No Aboriginal places included on the SHR or subject to an IHO are located within the study area. It is noted that the Newington Armament Depot and Nature Reserve (SHR No. 01850) includes discussion of Aboriginal archaeology within the *Conservation Management Plan* (Tanner Architects, 2013) however, it is not proposed to undertake works within the curtilage for SHR No. 01850. Additionally, Robin Thomas Reserve is listed for Aboriginal cultural heritage values, archaeology (Aboriginal and historical) and a Pleistocene sand body which extends through the Parramatta CBD, as *Ancient Aboriginal and Early Colonial Landscape* (SHR No. 01863) which is 700 metres west of the study area but would not be impacted from Stage 2 works.

2.4 Aboriginal Land Rights Act 1983

The purpose of this legislation is to provide land rights for Aboriginal people within NSW and to establish Local Aboriginal Land Councils (LALCs). The land able to be claimed by LALCs on behalf of Aboriginal people is certain Crown land that (under Section 36):

- a. Is able to be lawfully sold, leased, reserved or dedicated.
- b. Is not lawfully used or occupied.
- c. Will not, or not likely, in the opinion of the Crown Lands minister, be needed for residential purposes.
- d. Will not, or not likely, be needed for public purposes.
- e. Does not comprise land under determination by a claim for Native Title.
- f. Is not the subject of an approved determination under Native Title.

Claims for land are through application to the Office of the Registrar, *Aboriginal Land Rights Act 1983*. The study area is within the boundaries of the Deerubbin and Metropolitan LALCs and is not subject to any Aboriginal land claims.

2.5 Native Title Act 1993

The Commonwealth *Native Title Act 1993* establishes a structure for the protection and recognition of native title where:

- Aboriginal people have a native title interest to maintain traditional customs and laws
- Aboriginal people have sustained connection with the land or waters in question
- the native title rights and interests are recognised by the common law of Australia.

The *Native Title Act 1993* establishes processes to determine where native title exists, how activities affecting upon native title may be carried out, and to provide compensation where native title is impaired or extinguished. The *Native Title Act 1993* provides Aboriginal people who hold native title rights and interests, or who have made a native title claim, the right to be consulted and in some cases, to participate in decisions about activities proposed to be undertaken on the land.

A search of the Native Title Register was undertaken on 31 May 2022. There are no Native Title claims within the study area.

2.6 Aboriginal and Torres Strait Islander Heritage Protection Act (1984)

The Aboriginal and Torres Strait Islander Heritage Protection Act 1984 can protect areas and objects that are of particular significance to Aboriginal and Torres Strait Islander people. The ATSIHP Act allows the Environment Minister, on the application of an Aboriginal or Torres Strait Islander person or group of persons, to make a declaration to protect an area, object or class of objects from a threat of injury or desecration.

No places declared under the Act are located within the study area.

3 ABORIGINAL COMMUNITY CONSULTATION

3.1 Consultation undertaken to date

Transport for NSW has developed the PACHCI to provide a means of effective consultation with Aboriginal communities regarding activities which may impact on Aboriginal cultural heritage and to ensure a consistent assessment process for activities across NSW. The PACHCI aligns with NSW regulatory processes for Aboriginal community consultation as required by clause 60 of the National Parks and Wildlife Regulation 2019.

During earlier planning stages of the project, representatives from Transport for NSW met with Deerubbin LALC on 7 December 2018 to provide an introduction to the project including route options being considered.

Representatives from the Metropolitan LALC and the Deerubbin LALC then participated in an archaeological survey conducted on 24 January and 4 February 2022 respectively, in accordance with PACHCI Stage 2. The site officers provided input on cultural significance and identified the potential for impacts on Aboriginal heritage (see Appendix C for copy of Deerubbin LALC survey report). At the time of writing this report, Metropolitan LALC survey report has not been provided.

3.2 Planned consultation

Aboriginal community consultation will be undertaken to review this Archaeological Survey Report and Test Excavation Methodology and to develop the ACHAR for the project in accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW, 2010a). Consultation activities include:

- registering Aboriginal Parties for the project
- providing reports and test excavation methodology to Registered Aboriginal Parties to review (minimum 28 calendar days)
- inviting Registered Aboriginal Parties to attend Aboriginal Focus Group meetings. No site walk has been scheduled, but is available to RAPs if requested
- survey of previously inaccessible areas, once property access can be arranged, prior to any physical works commencing
- inviting applications for Site Officers to support test excavations
- involvement in the post approval stage (e.g. salvage).

4 ENVIRONMENTAL CONTEXT

Natural resources available to Aboriginal people and how they are used are critical in the study area in terms of environmental context to reflect daily life.

This chapter discusses the study area and wider region as necessary, in order to build an understanding of the subject landscape and patterns of land use. Site types are, to varying degrees, influenced by the local environment. For example, rock shelter and rock art sites are likely to occur where the necessary geology exists. Another important influence on site distribution is the location of current and former watercourses and the availability of water throughout the year. Over the thousands of years that humans have occupied Australia considerable environmental changes have occurred, impacting on how and where Aboriginal peoples lived.

Reconstructions of Aboriginal land use patterns in the Sydney region have been undertaken predominately based on early historical accounts and reconstructions of language groups. Ethno-historical accounts are inevitably subject to the writer's colonial bias; however, they do provide valuable observations of Aboriginal customs, life and continued presence during the early period of European occupation. In discussing the ethno-history of the local area, efforts have been made to adopt commonly accepted spellings. Research regarding language groups of eastern Australia is also subject to limitations, as Aboriginal populations of the Sydney basin were the first to be decimated by the disease and violence which followed European invasion. As such, even the earliest historical records and language research in the Sydney basin is based on observations of significantly reduced and displaced Aboriginal populations. The spread of smallpox, ongoing conflict with the European colonists and reduction of available resources are key causes of Aboriginal dislocation and depopulation in the area. By 1816 Aboriginal people who remained in the region were increasingly dependent on the Europeans for food, clothing and shelter (Kohen, 1986).

A discussion of European land use provides an understanding of the modifications and disturbances to Aboriginal cultural landscapes and potential archaeological deposits which have occurred since European occupation.

The existing archaeological record is limited to certain materials and objects that were able to withstand degradation and decay and is also affected by how often a site/s were visited. As a result, the most common type of Aboriginal objects remaining in the archaeological record of the Sydney region are stone artefacts. Artefact scatters are common indicators of activity in the landscape and may comprise evidence of previous campsites (which may have high densities of artefacts) or knapping events (where a stone material will be shaped into a stone tool) or hunting activities (which may have low densities of artefacts).

4.1 Geology

The underlying geology of a landscape may provide an indication of the variety and location of Aboriginal site types which may be present within that area. For example, rock shelters may be present in geological formations with rocky outcrops, grinding grooves may be present in sandstone formations and proximity to stone tool making resources (such as a silcrete) may indicate the potential for Aboriginal sites associated with raw material quarrying and tool preparation.

The geological context of the study area is shown in Figure 4.1. In some areas man- made fill is overlying deeper natural geological formations. Man-made fill includes 'dredged estuarine sand and mud, demolition rubble, industrial and household waste' (Herbert, 1983). The western portion of Grand Avenue and portions of the study area to the north of Parramatta River are located across quaternary deposits consisting of 'silty to peaty quartz sand, silt, and clay, ferruginous and humic cementation in places, common shell layers' (Qha) (Herbert, 1983). Man-made fill overlies a tertiary deposit of sand, clay and peat with variable levels of iron (Tm) in the eastern portion of Grand Avenue, towards Thackeray Street, Camellia.

The portion of the study area located to the north of Parramatta River consists of the Triassic aged Wianamatta Group Ashfield Shale (Rwa) which is a dark grey to black claystone-siltstone and fine sandstone-siltstone laminate (Clark and Jones, 1991). This geological formation would have provided few suitable raw stone materials for the manufacture of stone artefacts. Resources would be more likely to have been procured from elsewhere. The Triassic Hawkesbury Sandstone geological formation also occurs within the study area, consisting of medium to coarse grained quartz sandstone with minor shale and laminate lenses. The presence of sandstone in the surrounding areas would have been an important factor for Aboriginal occupation as sandstone was used for the maintenance and manufacture of stone artefacts such as axes, as a form of shelter (if rock shelters were present), and as a medium for rock art, including engraved and pigment art. Furthermore, stone raw materials that enable conchoidal fracture played an important role in manufacturing stone artefacts. Silcrete and quartz are predominant raw materials in Sydney's stone tool assemblages and are readily available

in the Cumberland Plain and around the study area. Quartz is widely available around the study area, on the sandstone plateau situated on the Cumberland Basin in Tertiary and Quaternary deposits near the Hawkesbury/Nepean River system (Corkill, 1999). Silcrete occurs in paleochannel deposits near to the coast in Newington and the former Olympic Village near the Parramatta River, along with the western part of the Cumberland Basin, Maroota on the Hornsby Plateau and Holsworthy Army Reserve on the Woronora Plateau in the south of Sydney (Corkill, 1999).

The eastern portion of the study area includes Quaternary fluvial deposits (Qha) associated the Parramatta River estuary, that consisting of silty to peaty quartz sand, silt and clay overlain by man-made fill, as well as sections of only man-made fill in the southern section (Herbert, 1983). Hawksbury Sandstone (Rh) located in Rydalmere area north of the Parramatta River also consists of organic mud, peat, clay, silt, marine sand and fluvial sand.

Resource distribution and availability is heavily influenced by the type and nature of soils present within a landscape, as different soils support a range of vegetation cover. Information regarding the depth of soils also contributes to an understanding of levels of historical disturbance. Where deep soil profiles or sand bodies exist, intact archaeological deposits may remain even where substantial earthworks and modification have impacted the upper deposits. As such, it is important to note that superficial disturbance, infill and urban development does not automatically negate archaeological heritage values.

4.2 Soil landscapes

Five soil landscapes are located across the study area, not including the 'disturbed terrain' classification (Chapman et al., 2009; Chapman and Murphy, 1989). The soil landscapes are shown in Figure 4.2.

Disturbed terrain is located across level plains to hummocky landscapes, and exhibits land extensively disturbed by human activity including complete disturbance, removal or burial of soil. Local relief is less than 10 metres, and slopes at less than 30 per cent. Landfill includes soil, rock, building, and waste materials. The original vegetation of disturbed terrain areas has been completely cleared and replaced with turf or grassland. Turfed fill areas are commonly capped with up to 40 centimetres of sandy loam or up to 60 centimetres of compacted clay over fill or waste materials. Disturbed terrain is located in areas that were previously swamps, estuaries and wetlands, and were noted along lower reaches of the Parramatta River foreshores. Land uses for areas classified as disturbed terrain includes commercial and business complexes, such as the Camellia portion of the study area. Soils within areas of disturbed terrain have been disturbed to a depth of at least 100 centimetres (Chapman et al. 2009; Chapman and Murphy, 1989).

The Lucas Heights soil landscape is located across the northern embankment of the Parramatta River, as well as Hope Street, Waratah Street and the eastern portion of Boronia Street. The soil landscape consists of gently undulating crests and ridges on plateau surfaces of the Mittagong formation. Local relief is up to 30 metres, and slopes at less than 10 per cent. Rock outcropping is absent. Soils are moderately deep (50 – 150 centimetres), hard setting yellow podzolic and yellow soloths, with yellow earths on outer edges (Chapman et al., 2009; Chapman and Murphy, 1989). The upper topsoil (Horizon A1) consists of up to 30 centimetres yellowish brown sandy loam, overlying 10-30 centimetres of bleached sandy clay loam as lower topsoil (Horizon A2). B Horizon is up to one metre of yellowish brown clay. These soil layers are usually clear and erosion is low.

The Blacktown soil landscape is located across most of Sydney Olympic Park, as well as part of the north-west corner of the study area where John Street and South Street intersect. The Blacktown soil landscape consists of gently undulating rises on Wianamatta Group shales and Hawkesbury shale. Local relief to 30 metres, slopes are usually less than five per cent. Broad rounded crests and ridges with gently inclined slopes. The Blacktown soil is shallow to moderately deep (less than 100 centimetres) red and brown podzolic soils on crests, upper slopes and well drained areas; deep (150-300 centimetres) yellow podzolic and soils and soloths on lower slopes and in areas of poor drainage (Chapman et al., 2009; Chapman and Murphy, 1989).

The Quaternary fluvial deposits are associated with a terrace formation known as the Parramatta Sand Body (Kelleher Nightingale Consulting (KNC), 2017). The river terrace extends from the relatively narrow floodplain along the banks of the river to the base of the adjoining shale slopes, wider on the southern side of the river channel. The sand body is mapped based on the predictive model and auger holes investigating the extent of this alluvial terrace (Williams et al., 2021; Groundtruth Consulting, 2008; 2011). The extent of the Parramatta Sand Body is well documented beneath much of modern Parramatta which includes the Parramatta turnback facility section of the study area. However, it has not been identified in the disturbed terrain at Camellia or the reminder of the study area. A portion of the sand body is listed on the NSW State Heritage Register (SHR No. 01863) and contains significant Aboriginal archaeology.

The alluvial sand body was first identified in 2003, during salvage excavations for a residential development at the corner of George and Charles Street in the Parramatta CBD. The AHIMS site 5-6-2648 (CG1) uncovered an approximate one metre deep archaeological layer which contained the sand (Jo McDonald, 2005). Geomorphological investigations identified the alluvial nature of this sand body and its characteristics which was divided into two main periods of use:

- 1. a lower assemblage (between 20-80 centimetres from the ground surface) broadly considered to be of terminal Pleistocene age (approximately 10,000 to 20,000 years old)
- 2. and an upper assemblage (less than 20 centimetres from the ground surface) identified to be dated to the last 3,000 years (GroundTruth Consulting, 2008; 2011; Williams et al., 2021).

The Parramatta Sand Body has a well-developed but varied soil profile. Topsoil materials are generally disturbed by European activities. Where the subsoils are intact, they typically consist of yellow orange or yellow brown sandy clay with an earthy (porous) fabric that becomes paler and slightly mottled with depth. The upper parts of the soil profile are usually heavily mixed. In places the sand is cut by deposits of mottled or gleyed clay that were probably deposited in swamps or waterholes on the terrace surface. The reasonably defined levee, 50 to 100 centimetres high, along the terrace edge between Charles and Alfred Streets, comprises cleaner and very slightly coarser sand than the sand found around the margins of the levee. The profile of the sand suggests that the main body of sand is of late Pleistocene age and recent thermoluminescence dates obtained from an excavation undertaken at 140 Macquarie Street (Comber Consultants, 2010), have shown that the top of the undisturbed sand (below the level of Aboriginal occupation) is between 50,000 to 58,000 years old. Deeper sand could be much older and may relate to a period of a higher sea level about 120,000 years ago.

Recent excavations at George Street, Parramatta presented dates between 43,000 to 49,000 years old, however, disturbance of a ceramic artefact in lower depths and bioturbation in upper levels raised questions about the intactness of the soil profiles (GML Heritage, 2019; Williams et al., 2021). Furthermore, excavations in Cumberland Hospital in north Parramatta uncovered similar Optically Stimulated Luminescence dates approximately 50,800 (± 3,600) years old.

The deepest sections of the Parramatta Sand Body found on the banks of the Parramatta River via these limited excavations, which has the potential to contain the complete stratigraphy of human occupation of the region (Williams et al., 2021). Indurated mudstone/tuff/chert stone artefacts in low densities (generally below 10 artefacts per square metre) were evaluated to reflect such deep-time occupation which were indicative of ephemeral or transient occupation. This earlier deposit becomes shallower with increasing distance from the river however, all sections of the Parramatta Sand Body contain extensive evidence from the mid-Holocene (7,000 to 5,000 years ago).

Two major phases of past use were identified by Williams et al. (2021):

- 1. initial and repeated visitation in the terminal Pleistocene and early Holocene, characterised by an indurated mudstone/tuff/chert artefacts, dominated assemblage of relatively expedient technologies
- a more intense occupation of the river corridor in the mid-late Holocene, and characterised by a silcrete
 dominated assemblage with a variety of tool types and increasingly complex technologies (e.g. backed
 artefacts, heat treatment, ground axes).

Much of the original sand body is likely to have been destroyed by the construction of modern buildings but patches of the sand body are preserved beneath modern development and on vacant land. The level of disturbance (and hence Aboriginal archaeological potential) is closely related to the nature of excavation works associated with modern development – in many cases deep excavation and the introduction of fill for foundations and basements has severely impacted the sand body. In other cases, where fill material has been placed on the existing surface, the sand body (and any associated archaeology) may be preserved intact beneath the modern urban landscape. The sand deposit is approximately 69 hectares in size, mainly four to seven metres above the Parramatta River's surface area and extending around 2.5 kilometres along the river, up to 300 metres to inland (Figure 4.1) (Williams et al., 2021). It is documented that nearly 19 hectares of the deposit has been destroyed through urbanisation mainly in the eastern part of the Parramatta CBD.

The Glenorie soil landscape is located across most of South and Boronia Streets within the study area which is an erosional soil landscape and consists of undulating to rolling low hills on Wianamatta Group Shales. Local relief is 50-80 metres, slopes 5 – 20 per cent and includes narrow ridges, hillcrests and valleys. Glenorie soils are shallow to moderately deep (less than 100 centimetres) red podzolic soils on crests, moderately deep (70 – 150 centimetres) red and brown podzolic soils on upper slopes, deep (greater than 200 centimetres) yellow podzolic soils and greyed podzolic soils along drainage lines (Chapman et al., 2009; Chapman and Murphy, 1989). The topsoil (Horizon A1) usually consists of up to 15 centimetres of dark brown loam overlying up to 30

centimetres of brown clay loam as lower topsoil (Horizon A2). B Horizon occurs as reddish brown clay approximately one metre thick.

The Birrong soil landscape is located across the Sydney Olympic Park Wharf and Hill Road section of the study area and consists of level to gently undulating alluvial floodplain draining Wianamatta Group shales (Chapman et al., 2009; Chapman and Murphy, 1989.) The local relief is up to five metres, slopes are less than three per cent and includes broad valley flats. Soils are deep (greater than 250 centimetres) yellow podzolic soils and yellow solodic soils (indicates a contrast between the texture of the A and B horizons, mostly that the A horizons are acidic and the B horizons are alkaline) on older alluvial terraces, deep (greater than 250 centimetres) solodic soils and yellow solonetz on current floodplain.

The Ettalong soil landscape covers a small portion of the study area to the north of Sydney Olympic Park and consists of level to very gently undulating coastal swamps (Chapman et al., 2009; Chapman and Murphy, 1989). Local relief is less than 5 metres, slopes less than two per cent. The water table is at less than 100 centimetres below ground surface. Areas have hummocky surfaces, shallow lakes and very shallow water tables. Soils are deep (less than 150 centimetres) organic acid peats, peaty podzols, and humus podzols often overlying buried siliceous sands. Soil landscapes and landforms can be indicators favourable occupation sites. Previous archaeological studies in the region concluded that the Parramatta Sand Body and other alluvial soil landscapes are rich in archaeological deposits.

4.3 Topography and hydrology

The study area is situated on flat to undulating lowlands of the Cumberland Plain generally less than 80 metres in elevation (Attenbrow, 2010). Distance from water is an important factor affecting the Aboriginal occupation patterns and therefore site distribution. Availability of fresh drinking water is likely to have had an influence on the selection of areas Aboriginal peoples inhabited, either as a transitory visit or a prolonged campsite area. Saltwater sources may have offered a variety of edible fish, shellfish and other marine life, and within NSW shell middens have been recorded on headlands, beaches, estuaries, and along the banks or inland rivers, creeks and lakes (OEH, 2013). Intensive development and urbanisation of the Western Sydney region has had a considerable impact on the historical alignments of water courses and ephemeral drainage lines. The Parramatta River's riverine landscape was modified as early as 1791 (Hoskins, 2015). Prior to European colonisation the river was a shared food source, a way for transport and a territorial boundary for the Aboriginal people. The changes in the river landscape reshaped the ecology around the river and affected the natural resources which Aboriginal people could obtain.

White and McDonald (2010, p.22) considered Aboriginal land use and distance from water in relation to the stream order (stream order assigns a numeric order to links in a stream network, based on their number of tributaries). The stream order model relates the spatial distribution of Aboriginal sites and their distance from water. The model found the following:

In first order landscapes, there is no significant difference in artefact distribution with distance from water. In second order landscapes, artefact density is highest within 50 metres of water and decreases with increasing distance from water. In fourth order landscapes, artefact density is highest 51-100 metres from water, lower closer to water and declines with increasing distance more than 100 metres from water.

The study area crosses the Parramatta River between Camellia and Rydalmere and between Melrose Park and Wentworth Point. The Parramatta River is a mangrove lined, tidal drowned valley estuary and provides both salt and freshwater resources. The river is a Strahler stream order 3 + (CT Environmental, 2016, p. 11). The Parramatta River originates at Toongabbie Creek and flows eastward, fed by numerous creeks from the north and south eventually becoming Port Jackson. Creeks in the area include Ponds Creek, Subiaco Creek, Clay Cliff Creek and Vineyard Creek. Haslams Creek (formerly Hackings Creek), a southern tributary of Parramatta River, flows through the study area at Sydney Olympic Park (see Figure 4.3). Haslams Creek joins the Parramatta River at Homebush Bay. Prior to the 2000 Sydney Olympic Games, Haslams Creek consisted of a concrete-lined stormwater channel. The creek was reconstructed in a natural shape prior to the Olympic Games. Haslams Creek is now an important estuarine ecosystem (Education and Communities, 2012).

The Parramatta River catchment is made up of 29 sub-catchments which is referred to as the Upper and Lower Parramatta River. A hydrology, flooding and water quality technical report being prepared for the environmental impact statement notes that the study area is located within the Upper Parramatta River section and are subject to mainstream and overland flooding. Mainstream flooding results from the Parramatta River and its tributaries, including Haslams Creek.

Haslams Creek is located in the south section of the study area and is a highly modified second order stream. The creek is estuarine which drains into the Parramatta River at Homebush Bay. The catchment of Haslams Creek is highly urbanised with the upper extents concrete lined opened channels and pipes. Nuwi Wetland is open to Haslams Creek which connects Narawang Wetland via a floodway under Hill Road. The floodway allows flood flows from Haslams Creek to enter Narawang Wetland. These hydrological systems encompassing the study area would have provided a variety of resources for Aboriginal people, however, the recent modifications and channelling of these waterways would have impacted most of the intact soil profiles.

4.4 Flora and fauna

The study area has been cleared of most native flora, particularly in areas identified as disturbed terrain or consisting of man-made fill. Prior to European occupation, low, eucalyptus open-forest and low eucalyptus woodland with a sclerophyll shrub understorey would have been present in the Lucas Heights soil landscape region. The Blacktown, Glenorie and Birrong soil landscapes have been almost completely cleared of eucalyptus woodland and tall open-forest (wet sclerophyll forests). The Ettalong soil landscape is located across swampy areas and vegetation is often arranged in concentric zones around the swamp. Species variation is dependent on local salinity levels and height above the water table (Chapman et al., 2009; Chapman and Murphy, 1989). Haslams Creek's associated wetland is the Narawang Wetlands which is an artificially constructed freshwater wetland at Sydney Olympic Park covering approximately 26 hectares. It extends along a 1.6 kilometre corridor and consists of an ornamental lake, three large stormwater collection ponds and 22 smaller habitat ponds. Remnants of the eucalyptus forest are preserved in the Newington Armory (Perrin, 2008).

Original vegetation communities would have provided habitats for a variety of animals, as well as potential food and raw material sources for Aboriginal people. Various banksia species were collected and used to manufacture needles for basket and mat weaving, while the fruit of the geebung (*Persoonia*) was eaten and string and fishing lines were soaked in a geebung bark infusion to prevent fraying (Nash, 2004, p. 2-4). Eucalyptus trees were a particularly important resource; leaves were crushed and soaked for medicinal purposes, bowls, dishes and canoes were made from bark, and spears, boomerangs and shields were crafted from the hard wood (Nash, 2004, p. 8). Canoes were likely to have been made from the bark of the Bangalay (*Eucalyptus botryoides*), Stringybark (*Eucalyptus agglomeratis*), She Oak (*Casuarina stricta*) and River Oak (*Casuarina cunninghamiana*) trees, which were present in the forests surrounding the Parramatta River (Dallas, 2003, p.33).

Typical animals which may have been hunted, trapped, smoked, speared, fired or clubbed by Aboriginal peoples include possums, flying foxes, goannas, wallabies and kangaroos (Dallas, 2003, p. 33). The hides, bones and teeth of some of the larger mammals may have been used for Aboriginal clothing, ornamentation, or other implements (Attenbrow, 2010, p. 70-76). Smaller animals and native fruits and berries were also important to the Parramatta Aboriginal economy. Ants and grubs were valuable protein and carbohydrate sources (Dallas, 2003, 34). The close proximity to the saltwater portion of the Parramatta River meant that fish, shellfish, eels and fishing also provided a varied diet (City of Parramatta, 2017a). Fresh water streams entering the river supported ducks, mullet, crayfish, shellfish and turtles (Dallas, 2003, p. 33).

4.5 Land use and disturbance

The environmental context of the study area indicates it would have been most suitable for utilising resources and for occupation by the Aboriginal communities of western Sydney prior to colonisation. The area would have been rich in natural resources, with the Parramatta River and freshwater creeks forming a focal point of cultural and economic activity.

Large parts of the study area, in particular the areas to the south of Parramatta River in Camellia and Sydney Olympic Park, were subject to extensive vegetation clearance, introduction of man-made fill and land remediation/reclamation from as early as 1810.

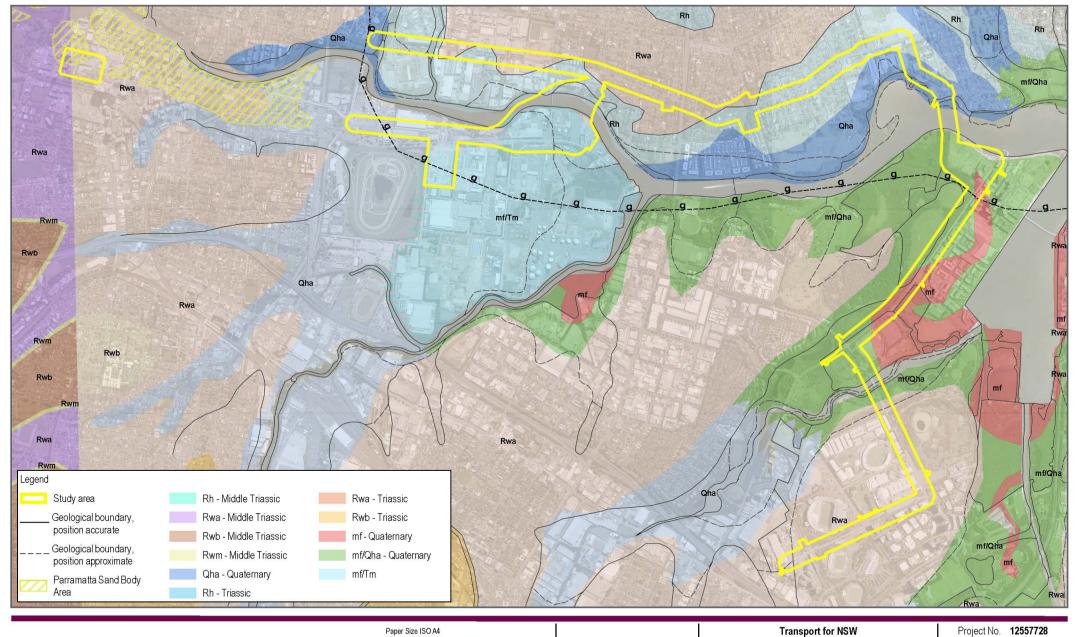
Soils within areas identified as disturbed terrain have been characterised up to a depth of 100 centimetres. However, it is possible that areas of potential archaeological deposits remain underneath areas of remediated land in Sydney Olympic Park as intact soils and geological formations may be effectively capped by overlying layers of disturbance and fill. The industrial area in Camellia is associated with land reclamation of up to 2.6 metres where intact soil profiles extend between 2.6 metres to 15.8 metres.

The study area is a rich cultural landscape whereby Aboriginal people maintained cultural practices prior to and following colonisation. Landscape markers surrounding the study area, such as Parramatta River are culturally

significant, and there is a growing body of archaeological evidence, Aboriginal memories and historical records that demonstrates the continuation of Aboriginal cultural practices into the colonial period. Soon after Governor Phillip's arrival with the First Fleet in 1788 and founding of a penal colony at Sydney Cove, Captain Arthur Phillip and others landed at the junction of the Parramatta River and Duck River and explored the upper reaches of the Parramatta River and surrounds (Kass et al., 1996). During the exploration, Phillip's party came across Aboriginal campsites, hunting traps and fireplaces (Kass et al., 1966 in Dallas, 2003, p. 36). Parramatta (originally known as Rose Hill) was developed as a farming settlement to feed the new English colony. Phillip chose the area as the soil was found to be more suitable for farming than the area surrounding the settlement of Port Jackson. This colonisation led to the immediate displacement of local Aboriginal communities from the land that they had inhabited for thousands of years (City of Parramatta, 2017b).

By 1790 fruit trees were planted, cattle introduced and crops including wheat, barley, maize and oats were being cultivated. Timber was rapidly exploited, and land was cleared for agricultural purposes, dramatically altering the landscape. One hundred convicts worked on the 'Experiment Farm' and the construction of Parramatta town. By 1789 James Ruse was occupying and cultivating land at Experiment Farm, which was later granted to him (Kass, 2008). In 1792, 30 acres of land was granted to Charles Smith on the site of what is now the North Parramatta Cumberland Hospital Precinct (Arfanis, 2015). Farming continued in the area under a succession of governors (City of Parramatta, 2017a). Tensions rose as the European colonists inexorably claimed land for their uses and depleted the resources available for local Aboriginal communities.

The traditional methods for food procurement were becoming increasingly difficult for Aboriginal people (TKDA Architects, 2017). Similarly, food-gathering patterns were disrupted by the lack of access to their traditional lands, due to farming by the new settlers. Limited opportunities were offered by the Europeans willing to barter spirits and tobacco, and even food, for fish. At the turn of the century, conflicts were recorded between the settlers and the Aboriginal communities in the Nepean and Hawkesbury districts. Records indicate the Parramatta region was relatively peaceable compared to the massacres of Aboriginal peoples in places such as Appin and Mulgoa (Dallas, 2003). However, it is important to note that the lack of records does not indicate that violence did not occur in a region, merely that it was not recorded, or records no longer exist.





Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56 MAKING COMPLEX EASY

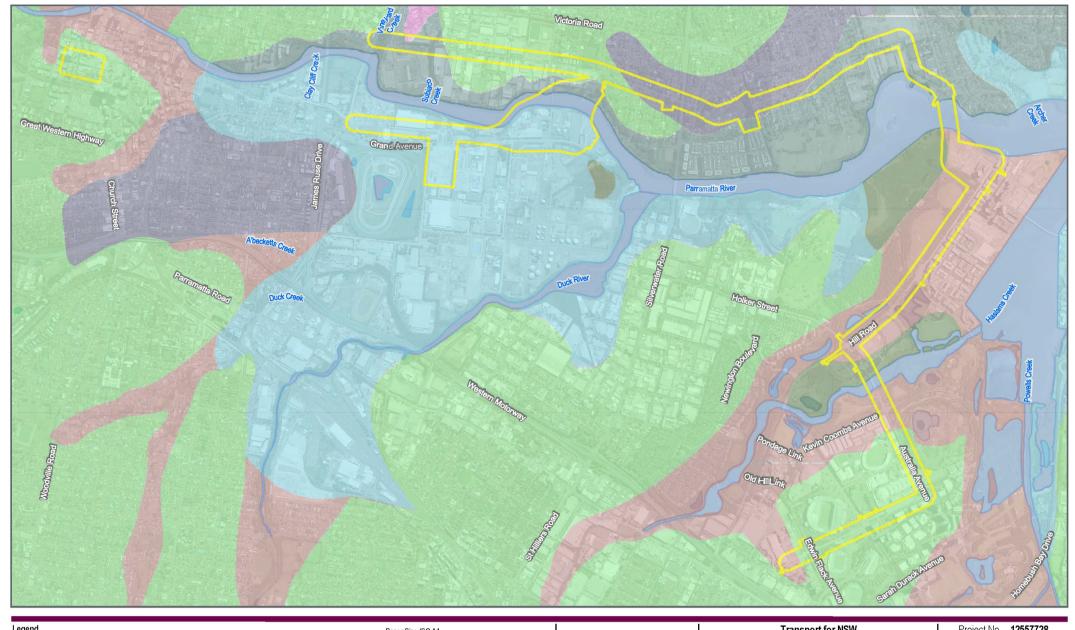
Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Geology of the study area and surrounds

Project No. 12557728
Revision No. 2

Date **15/06/2022**

FIGURE 4.1







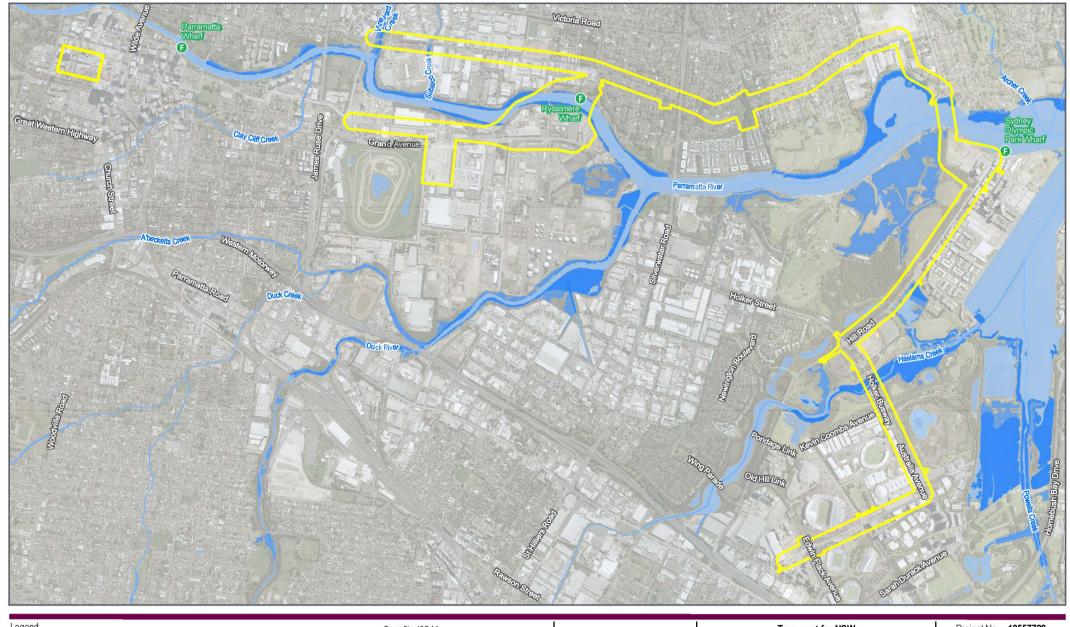


Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Soil Landscapes of the study area and surrounds

Project No. **12557728** Revision No. 2 Date 15/06/2022

FIGURE 4.2





Paper Size ISO A4 Kilometres Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56



Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Hydrology of the study area and surrounds

Project No. 12557728 Revision No. 2 Date 15/06/2022

5 ARCHAEOLOGICAL CONTEXT

5.1 Aboriginal history in the area

The original inhabitants of the Parramatta region are the Burramattagal peoples, of the Darug people who first settled on the upper reaches of Parramatta River (City of Parramatta, 2017a). The term 'Darug' was only applied to a language group after 1870 (Attenbrow, 2010).

The Darug comprised a number of sub-groups often referred to as 'clans'. The Burramattagal peoples are the western-most Eora clan, who are part of the harbour-side katungal 'sea people'. Parramatta marks the border between the cultures of the sea people, and the inland paiendra or 'tomahawk people' (Flynn, 1995). The Wangal peoples are also a clan of the Eora and inhabited the southern shore of the Parramatta River. The Darug, or Dharruk, language was spoken across the Cumberland Plain region, which stretched from Appin in the south to the Hawkesbury River in the north, and west of the Georges River, Parramatta and Berowra Creek (Attenbrow, 2010, p. 34). The Burramattagal peoples are likely to have spoken a common dialect with other groups who lived on the lands between Sydney Cove and Parramatta, with local variances between people on the coast and those inland. The Burramattagal peoples appear to have belonged to smaller groups, consisting of multiple extended families. These groups ranged in size from 30 to 70 plus (Dominic Steele, 2013, p. 41). The Burramattagal and Wangal peoples rotated seasonally through campsites, depending on their needs (McClymont, 2008).

Parramatta was a resource rich zone which supported Aboriginal occupation and was at the centre of human activities. The Parramatta River banks and the mostly freshwater stream now known as Clay Cliff Creek (located to the west of James Ruse Drive) were vital sources of food and living resources. The boundary between Burramattagal country and their neighbours, the Wategora clan, seems to have been the Duck River (Kohen, 1993 in McClymont, 2008).

The bark canoes of Burramattagal peoples have been recorded as holding a 'central small fire, built on a mound of soil, to cook up their fresh catch' and 'fire-stick farming', employed to burn vegetation to facilitate hunting and to change the composition of plant and animal species in the area, was also practiced by the Burramattagal people.

Aboriginal site types recorded in the Parramatta region frequently include rock shelters with deposits, open campsites (artefact scatters) and open middens. Surface scatters are generally sparse and partially disturbed (Dallas, 2003, p. 29). Grinding grooves and shell middens have also been recorded and are generally located adjacent to watercourses. Burials can be associated with shell middens, and also can be found in coastal sand dunes (Attenbrow, 2012). Culturally modified trees (or scarred trees) have been recorded on suitable remnant old growth trees. Cultural modification may comprise evidence of bark removal for the purposes such as construction of bark containers canoes or shields and as such vary greatly in size (Dallas, 2003, p. 29).

The history of Aboriginal people after the arrival of the First Fleet and subsequent occupation of the land by British colonists is presently poorly understood. In part this is due to a tendency to study sites away from urban centres (Irish and Goward, 2012). Aboriginal people living around Parramatta tended to avoid the early exploratory parties but as the settlement at Parramatta was established and grew in size, interactions became more frequent with European colonists. Exchanges between local Aboriginal people and the military officers were recorded as indicators of good relations during the early years of the settlement. Collins (1798), described the exchanges of fresh fish for bread and salted meat: "Since the establishment of that familiar intercourse which now subsisted between us and the natives, several of them had found it their interest to sell or exchange fish among the people of Parramatta; they being contented to receive a small quantity of either bread or salt meat in barter for mullet, bream and other fish. To the officers who resided there this proved a great convenience, and they encouraged the natives to visit them as often as they could bring them fish".

Unfortunately, this trade was stopped following the destruction of a canoe by convicts, with the ensuing conflict effectively souring the previously friendly relations (KNC, 2017).

By the 1810s, a 'Native Institution' was suggested by William Shelley to teach Aboriginal children literacy as well as religious values, domestic and agricultural skills and planned to be opened in Parramatta (Brook and Kohen, 1991). The school was located on a large area (encircled by Macquarie, Marsden and Hunter Streets) near 'the Church of Parramatta'. Governor Macquarie announced the first Aboriginal Annual Feast on 28 December 1814 to mark the opening of the institution at the marketplace encouraging Aboriginal families to send their children to the institution. The feast continued as an annual gathering and event in Parramatta from 1814-1835. Macquarie and subsequent governors used the event as an opportunity to diffuse tensions between Aboriginal people and

new settlers, to promote the Native Institution as well as to distribute clothes and blankets (Turbet, 1989). The site for the Native Institution lies within the study area at Parramatta CBD.

Historical records from the first years of the colony document the disastrous effect smallpox had on the Aboriginal people of the area (Collins, 1798, 496) which decimated the population and had an irrevocably damaging impact on social organisation (McDonald, 2008). Inevitably with increasing British settlements and land use from the late 18th century onwards, Aboriginal people became alienated from their land and marginalised within their own country. A recent shift in research focus has however begun to provide some indicators of the nature of continuing Aboriginal settlement in areas of the Sydney Basin after 1788 (Karskens, 2019).

This research suggests an enduring culture that adapted to change and integrated new material culture into existing practices. Art sites continued to be created in the area with new imagery such as axes and rifles being incorporated indicating a continuation of cultural practice (Irish, 2017). At least 70 historical Aboriginal settlements are known (Irish and Goward, 2012) across the Sydney basin dating to the late 18th and 19th centuries. These include sites where Aboriginal adaptation and tenacity are present as evidenced by the creation of new object types such as flaked glass and, in a few instances, knapped ceramic. Midden sites from the post-1788 period have also been found to contain introduced items such as metal and buttons however others from this period are known to be devoid of any introduced material. The adaptation of burial practices has also been documented with examples including the burial of a 30 year old woman in Rose Bay whose body was arranged in a traditional manner but with the inclusion of introduced items such as scissors and other metal objects (Donlon, 2003; 2008 in Irish and Goward, 2012).

It is important to note that sites of significance to Aboriginal peoples are not limited to physical objects, markers or landscapes. Intangible cultural heritage is a living tradition and continued expression of culture. The Parramatta region is located within a culturally significant landscape to Aboriginal peoples of the past, present and future.

5.2 Aboriginal Heritage Information Management System

5.2.1 Search parameters

An extensive search of the Aboriginal Heritage Information Management System (AHIMS) database was undertaken on 5 April 2022 encompassing the study area with a buffer of around 500 metres. There are known limitations within the database as AHIMS data has been recorded over many years in various geographic recording systems. Due to errors in reprojection of data, the registered location of some sites can be in error of up to 200 metres which is why a buffer is usually applied when undertaking searches.

The following search parameters were used:

Parramatta Light Rail Stage 2 Alignment

Datum: GDA 94 MGA Zone 56 Eastings: 316850 – 322860 Northings: 6252200 – 6257530

Sites: 16

Parramatta CBD turnback facility

Datum: GDA 94 MGA Zone 56 Eastings: 314842 – 315370 Northings:6256355 – 6256795

Sites: 13

The extensive search results are included in Appendix B.

5.2.2 Summary of extensive search

The extensive search identified 29 Aboriginal sites (refer to Table 5.1 and Figure 5.1). Of the 29 sites, two are listed as 'not a site' (AHIMS 45-6-2636 and AHIMS 45-6-2682), therefore the total number of registered Aboriginal sites is 27. The most common site types in the search area are PADs (16 in total), followed by artefacts (six in total) in relation to the other site types (see Table 5.2). The status of the sites provided is based on the extensive search results and some of these site cards may not be up to date.

Table 5.1: Summary of AHIMS within the searched coordinates

AHIMS	Site name	Site type	Status
45-6-2312	Subiaco Ck 1	Open Camp Site	Valid
45-6-2313	Subiaco Ck 2	Open Camp Site	Valid
45-6-2559	Sydney Turf Club Carpark, STC Carpark	Open Camp Site	Valid
45-6-1961	Ermington 1	Midden	Valid
45-6-2636	Ermington PAD	Potential Archaeological Deposit (PAD)	Not a Site
45-6-2682	Wanngal Woodland Axe-Marked Tree	Modified Tree (Carved or Scarred)	Not a Site
45-6-2683	Wanngal Woodland IF1	Potential Archaeological Deposit (PAD)	Valid
45-6-2684	Wanngal Woodland IF2	Potential Archaeological Deposit (PAD)	Valid
45-6-2685	Wanngal Woodland IF3	Potential Archaeological Deposit (PAD)	Valid
45-6-2785	Wanngal Woodland PAD2	Potential Archaeological Deposit (PAD)	Valid
45-6-2786	Wanngal Woodland PAD1	Potential Archaeological Deposit (PAD)	Valid
45-6-2864	George Kendall Ermington	Shell	Valid
45-6-3108	42 Bridge Street Rydalmere PAD	Potential Archaeological Deposit (PAD)	Valid
45-6-3039	Meadowbank Park Tennis Courts RYDE 203	Grinding Groove	Valid
45-6-3151	UWS Rydalmere OS 1	Artefact	Valid
45-6-3827	Clyde PAD 01	Potential Archaeological Deposit (PAD)	Valid
45-6-2679	Parramatta Children's Court	Potential Archaeological Deposit (PAD)	Valid*
45-6-2978	41 Hunter Street PAD	Potential Archaeological Deposit (PAD)	Valid
45-6-1523	George St Parramatta Family Law Courts;	Artefact	Valid**
45-6-4015	Church St PAD-1	Potential Archaeological Deposit (PAD)	Valid
45-5-3630	Macquarie St PAD	Potential Archaeological Deposit (PAD)	Destroyed
45-6-2977	Macquarie St PAD 3	Potential Archaeological Deposit (PAD)	Valid
45-6-3818	St Johns Cathedral Background Artefact Scatter	Artefact	Valid
45-6-2795	150 Marsden Street Parramatta PAD	Potential Archaeological Deposit (PAD)	Valid
45-5-4097	O'Connell St PAD1	Potential Archaeological Deposit (PAD)	Valid
45-6-3767	85-97 Macquarie St	Potential Archaeological Deposit (PAD)	Valid
45-6-2751	Marsden St Carpark	Artefact and Potential Archaeological Deposit (PAD)	Valid**
45-6-3582	Macquarie Street PAD	Potential Archaeological Deposit (PAD)	Valid
45-6-2686	Civic Place PAD	Artefact and Potential Archaeological Deposit (PAD)	Partially Destroyed

 $^{^{\}star}$ The site noted as destroyed on the site card, ** The site was subject to test excavations

Table 5.2: Summary of extensive AHIMS search results by site type

Site type	Frequency	Percentage
Artefact	6	22%
Potential Archaeological Deposit (PAD)*	16	59%
Midden	2	7.5%
Grinding Groove	1	4%
Artefact and Potential Archaeological Deposit (PAD)	2	7.5%
Total	27	100%

^{*}Two sites from the search results have not been included as they are not considered a valid site.

5.2.3 AHIMS within study area and surrounds

Two registered sites are located within the study area (see Figure 5.1).

- AHIMS 45-6-2977 is located on Macquarie Street, based on the site card map, between the intersections
 of Church Street and across to the intersection of O'Connell Street. The site was registered in 2011 by
 Comber Consultants as a PAD located in an area where the Parramatta Sand Body was identified with
 intact soil profiles.
- AHIMS 45-6-4015 is located at 197-207 Church Street and 89 Marsden Street. The site includes a PAD within the Parramatta Sand Body which has potential for Aboriginal heritage and contact archaeology. The site was recorded by Biosis in 2022 as it may hold evidence for early 19th century feasts between Aboriginal and European people including, the Native Institute for Aboriginal Children.

Thirteen registered sites are located within 200 metres of the study area (see Figure 5.1):

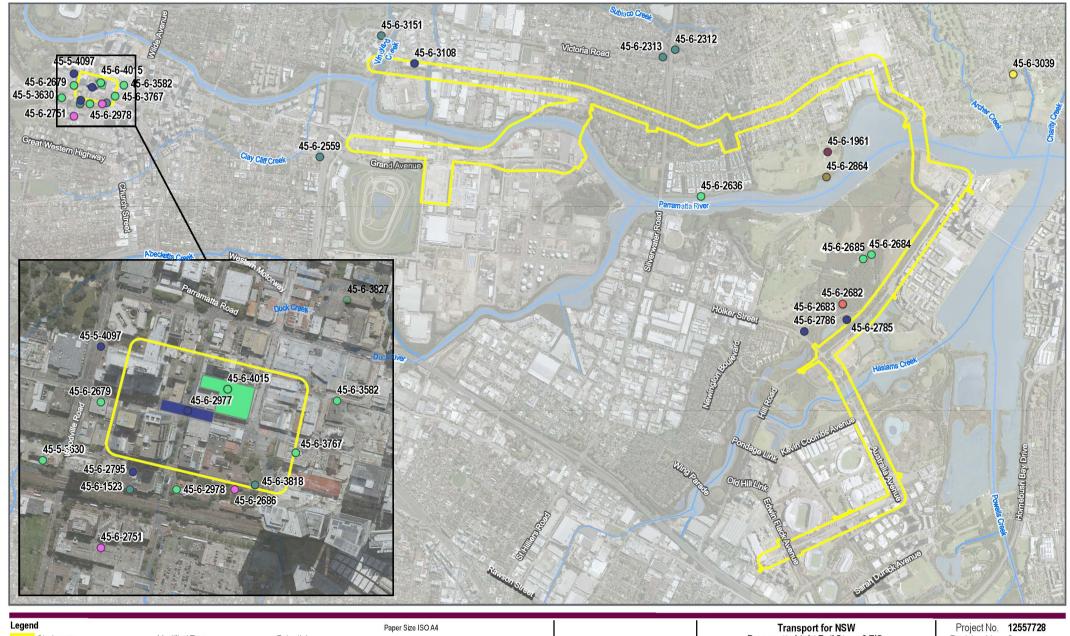
- AHIMS 45-6-2785
- AHIMS 45-6-2786
- AHIMS 45-6-2683
- AHIMS 45-6-2559
- AHIMS 45-6-3582
- AHIMS 45-6-3767
- AHIMS 45-6-3818
- AHIMS 45-6-2686
- AHIMS 45-6-1523
- AHIMS 45-6-2795

AHIMS 45-6-2978

AHIMS 45-6-2679

- AHIMS 45-6-4097.

Of these, AHIMS 45-6-2785, was identified in 2006 and has geocoordinates showing it being located 20 metres west of the study area along Hill Road in Sydney Olympic Park. It is in an area observed to have a thin amount of remnant soil with the potential to contain archaeological deposits. However, based on the description and site card map, the actual location of this PAD is around 50 metres west of the study area along Hill Road in the Millennium Parklands.





Artefact : -Artefact : -, Potential

Archaeological Deposit (PAD): -

Orinding Groove: 3

Modified Tree (Carved or Scarred):

Potential Archaeological Deposit (PAD): -

Potential Archaeological Deposit (PAD): 1

Shell: -Shell: -, Artefact: -

Kilometres Map Projection: Transverse Mercator Horizontal Datum: GDA 1994

Grid: GDA 1994 MGA Zone 56



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AHIMS within the study area and surrounds

Revision No. 2

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5.3 Archaeological literature review

City of Parramatta Council Aboriginal Heritage Study, Dallas Consulting 2003

Dallas Consulting was commissioned by City of Parramatta Council to undertake an Aboriginal heritage study to inform future land planning development control processes and to ensure ongoing protection and management of Aboriginal heritage places. The study used the existing AHIMS site database and environmental context to inform a predictive model of Aboriginal heritage sensitivity to inform Council's strategic planning.

The predictive modelling also used council zonings for the Parramatta LGA to inform Aboriginal sensitivity. For example, areas within 200 metres of watercourses, or with undeveloped land, were considered to be of high sensitivity. The Dallas Consulting study included the Camellia, Rydalmere and Ermington parts of the project study area and most of this was defined as having low sensitivity. Undeveloped parts of the project study area, such as Ken Newman Park, were identified as high sensitivity.

The entire Camellia portion of the Dallas Consulting study area was identified as an area of 'Aboriginal Association', which are areas identified as having some significance to present day Aboriginal people through current social or historical connections. However in 2014, Dallas Consulting reviewed their study (which is summarised below) and noted that the 'Areas of Aboriginal Association' (places of historical or cultural significance that are not registered Aboriginal sites) component of the Aboriginal heritage sensitivity mapping was unclear and incomplete and suggested it be removed.

Aboriginal Archaeological Assessment Report, Newington Armoury Adaptive Re-use and Rail Extension Project, Sydney Olympic Park, Paul Irish 2004

Paul Irish was engaged by the Sydney Olympic Park Authority to prepare an Aboriginal archaeological assessment in Newington Armoury which is located around 200 metres west of the project study area. A survey was conducted within the woodland and nature reserve buffer zone of the Newington Armoury Precinct in 2003. This assessment established that the trees within the woodland were of insufficient age to contain scars of Aboriginal cultural origin and determined that the scarred trees identified in previous studies were not Aboriginal modified trees.

During the survey three isolated silcrete and chert artefacts and two PADs were identified with possible silcrete manuports (stone material thought to have been transported to the area by Aboriginal people) also identified. The assessment concluded that the lack of Aboriginal archaeological material is likely to be a reflection of the early urban development of the Parramatta River, before the preservation of sites and the necessity for archaeological assessments, rather than an indication of less intensive Aboriginal occupation of the area.

Preliminary cultural heritage assessment: Rosehill recycled water scheme, AMBS 2008

Australian Museum Business Services (AMBS) was commissioned by Parsons Brinckerhoff Australia Pty Ltd on behalf of Alinta Asset Management Pty Ltd (Alinta) to prepare a Preliminary Cultural Heritage Assessment in relation to the potential impacts of the Rosehill Recycled Water Scheme pipeline between Fairfield and Camellia, in western Sydney. The pipeline comprised an approximately 20 kilometre route and traversed a portion of the project study area in Camellia. The preliminary study found that areas with Aboriginal and historical archaeological potential were located within and adjacent to the pipeline corridor and were likely to be impacted by the proposal. The report recommended consultation with the Aboriginal community and continued archaeological investigations.

Parramatta Aboriginal Cultural Heritage Study Review, Dallas Consulting 2014

Dallas Consulting was commissioned by City of Parramatta Council to review the previous *City of Parramatta Council Aboriginal Heritage Study* (2003) and provide an updated predictive model. The review of the Aboriginal Sensitivity Map was considered necessary due to the following factors which had occurred since the 2003 study was published:

- a considerable number of Aboriginal heritage sites had been recorded that were not reflected in Council's mapping
- Council had revised its Local Environmental Plan (LEP) and Development Control Plan (DCP)
- NSW Aboriginal heritage legislation had been amended in 2010, in a way that affected the role of councils in Aboriginal heritage management
- a number of anomalies in the Aboriginal heritage sensitivity mapping had become apparent that required investigation and correction.

The revised sensitivity mapping (Plate 5.1) reassessed part of the study area in Camellia as low sensitivity, upgraded from nil (except for the mangroves along the southern embankment of Parramatta River at Camellia). Areas at Rydalmere Wharf and Ermington Boat Ramp were reassessed from medium sensitivity to high sensitivity. The area of Aboriginal Association that the 2003 study identified in Camellia was removed, as it did not include detailed or complete advice on these areas.

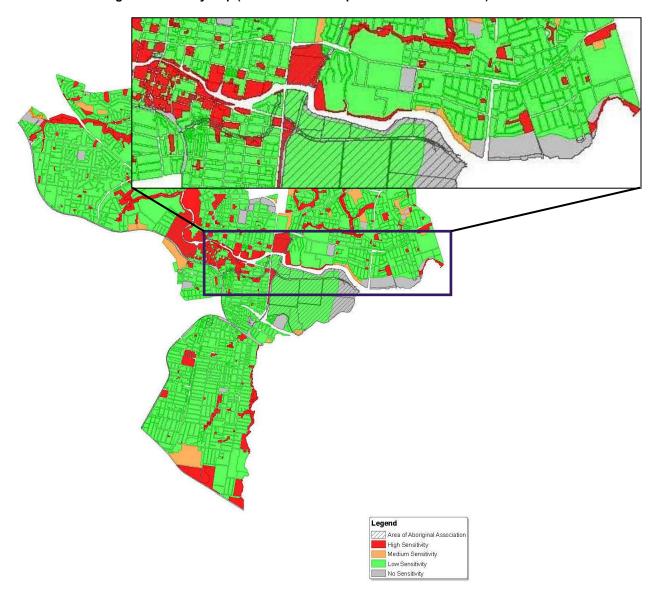


Plate 5.1 Revised Aboriginal Sensitivity Map (Parramatta Development Control Plan 2011)

Aboriginal heritage assessment Parramatta Light Rail Stage 1 EIS, KNC 2017

KNC was engaged by WSP/Parsons Brinckerhoff on behalf of Transport for New South Wales to prepare an ACHAR to inform the EIS for Stage 1 of the Parramatta Light Rail network.

Three previously recorded Aboriginal archaeological sites, namely Cumberland Hospital East (AHIMS 45-6-3195), Harris Street Footpath/ Robin Thomas Reserve (AHIMS 45-6-3157 and AHIMS 45-6-3158) and the Sydney Turf Club Carpark (AHIMS 45-6-2559) and the presence of the Parramatta Sand Body (a geological formation dating to Pleistocene associated with significant Aboriginal archaeology) were identified within the Stage 1 project boundary.

Site surveys identified seven PADs, along with the three previously recorded sites. Archaeological test excavation of the PADs was subsequently undertaken using a combination of hand excavated archaeological test squares and push-tubed core boreholes. Given the widespread disturbance across large portions of the

investigation area, testing aimed to determine whether the project area contained intact subsurface Aboriginal archaeological deposit associated with the Parramatta Sand Body or other intact subsurface soils.

The test excavation identified intact sands containing artefacts below modern and historical disturbance in several locations within the investigation area. The test excavation results also supported previous assessments regarding the variable depth, nature and disturbance levels of the sand body. Deep excavation/removal of upper levels and replacement with fill has impacted the archaeological potential of some areas, while introduced fill above less severe disturbance has preserved artefact-bearing layers of the sands in situ at other sites.

In total, the Stage 1 project area contained five identified Aboriginal archaeological sites. Significance assessments focussed on the intactness, representativeness and research potential of these sites within the landscape and determined that the sites displayed between low and moderate-high significance. Impact assessments determined that all five sites would be at least partially impacted by the Stage 1 project. It was recommended that mitigative salvage excavation would be required for the four archaeological sites exhibiting at least moderate significance prior to any impacts. These are Cumberland Hospital East (AHIMS 45-6-3195) in north Parramatta (1.5 kilometres north of Stage 2), Robin Thomas Reserve (AHIMS 45-6-3157-8) in Parramatta CBD (700 metres east of Stage 2), Sydney Turf Club Carpark (AHIMS 45-6-2559). The site known as PLR AFT 1 (AHIMS 45-6-3312) (exhibiting low levels of significance) required no mitigative action. A management strategy (heritage management plan) was outlined in the ACHAR which recommended a salvage excavation if the impact to AHIMS 45-6-2559 cannot be avoided.

The closest AHIMS site (45-6-2559) from Stage 1 is located around 100 metres west of the Stage 2 study area.

Robin Thomas Reserve Masterplan Aboriginal Cultural Heritage Assessment Report (ACHAR), Artefact 2018

Artefact Heritage was engaged by Transport for NSW to prepare an Aboriginal Archaeological Survey Report. The survey report identified one registered AHIMS site, Robin Thomas Reserve (AHIMS 45-6-3157/ 45-6-3158) which had the potential to provide information on contact archaeology and required a section 60 approval for testing to be conducted as the site is State heritage-listed (*Ancient Aboriginal and Early Colonial Landscape*, SHR No. 01863). Therefore, an ACHAR was prepared to support an AHIP application for test excavations. The study area is included within the mapped extent of the Parramatta Sand Body which has potential to contain stratified archaeological deposits.

Previous test excavations undertaken by KNC (2017) which uncovered nine silcrete artefacts below the disturbed layers. The area of Robin Thomas Reserve, as indicated by AHIMS ID 45-6-3157/AHIMS 45-6-3158, was reported as having a high archaeological significance and a rare opportunity to investigate the Parramatta Sand Body. During the Aboriginal consultation undertaken as part of the ACHAR, the RAPs identified that the wider landscape in Parramatta is of significant cultural heritage value to Aboriginal people. A test excavation methodology was prepared and endorsed by the RAPs which included 18 one metre by one metre test pits within the study area aiming to understand the presence of the Parramatta Sand Body.

Robin Thomas Reserve is listed on the State Heritage Register as the *Ancient Aboriginal and Early Colonial Landscape* (SHR No. 01863) and the NSW Department of Primary Industries section 170 Heritage and Conservation Register, as well as on the Parramatta Local Environment Plan (LEP) 2011 (A2) as an archaeological site. The significance of the Parramatta Sand Body and its values are listed on the SHR register as:

The geomorphic origin of the sand body is uncertain but the present interpretation is that the sand body was deposited by the Parramatta River on a terrace 4 to 6 metres above normal water level, on either side of the river between Charles and Alfred Streets and in the eastern margin of Parramatta Park. The sand body was deposited as a terrace (abandoned flood plain) over time during floods. The bulk of the sand body forms a levee located on the south side (right bank) of Parramatta River just above the 1:100 average recurrence interval flood level. The sand body has a well-developed, but varied, soil profile. Topsoil materials are generally disturbed by European activities. Where subsoils are intact they typically consist of yellow orange or yellow brown sandy clay with an earthy (porous) fabric that becomes paler and slightly mottled with depth. The upper parts of the soil profile are usually heavily mixed.

The profile of the sand suggests that the main body of sand is of late Pleistocene age and recent thermoluminescence dates obtained from an excavation undertaken at 140 Macquarie Street by Comber Consultants in 2010, have shown that the top of the undisturbed sand (below the level of Aboriginal occupation) is between 50,000 to 58,000 years old.

From a geomorphic perspective, the sand body has the potential to provide insight into patterns of river flow and flood events that could lead to a better understanding of the formation of the

Parramatta River Valley. On a broader scale, the sand body may be able to provide valuable information about changing sea levels in the Pleistocene period with implications for possible future sea levels and coastal geography under a warming climate. In addition to the archaeological and geomorphic research value of the sand body, the Parramatta Sand Body also has the potential to provide valuable insight into the natural environment of Parramatta CBD in pre-colonial times. The fluvial sand terrace is evidence that Parramatta had a more diverse natural environment than might otherwise have been known from historical accounts, which provide few details about the natural vegetation of area. Pollen, which may be preserved within the sand body, could yield valuable information about the original vegetation of the Parramatta CBD area.

Robin Thomas Reserve- Masterplan Stage 1 Interim Aboriginal Test Excavation Report, Extent 2019

Extent Heritage was engaged by Transport for NSW to undertake a test excavation program and prepare an Aboriginal test excavation report following the AHIP application mentioned above. The Aboriginal archaeological test pit locations aimed to investigate the areas which would be impacted, reduce the impacts to the Parramatta Sand Body and to avoid the locations of potential historical archaeological features in this study area.

Seventeen test pits were excavated by hand tools and twenty-five Aboriginal artefacts were found in total, fifteen of which were recovered from test pit 1. Most of the artefacts were found at depths below 50 centimetres from the surface, underlying the modern fill layers. Indurated mudstone/tuff was the dominant raw material type in the assemblage (total of 17 equating to 68 per cent), followed by silcrete (total of six equating to 24 per cent). Most of the artefacts were flakes (total of 18) with three cores.

The preliminary results of the test excavation suggested that the assemblage presented a low density of artefacts, which is mostly reflective of random discards and isolated events. Test pit 1 had a higher density with 15 artefacts recovered (60 per cent) which may be evidence of knapping in this area. Based on the artefact typology and raw material procurement and use, occupation of this study area likely occurred in the late Pleistocene/early Holocene. The disturbance of the Parramatta Sand Body by historical activity has likely removed most evidence of mid-late Holocene occupation, which is supported by few silcrete artefacts and lack of backed artefacts. Artefacts typically occurred between 20 and 140 centimetres, with peak concentrations between 60-70 centimetres (total of eight equating to 32 per cent).

Parramatta Square 2 (PS2), 160-182 Church St Parramatta, Aboriginal Archaeological Excavation Report, AHIP No. C0001379, Comber Consultants 2019

Comber Consultants were engaged to undertake salvage excavations on behalf of the City of Parramatta Council for the redevelopment of Parramatta Square (previously Civic Place), a three hectare precinct located in the Parramatta CBD. The precinct is bound by Macquarie, Church, Darcy and Smith Streets. Within the precinct are six sites numbered Parramatta Square (PS) 1-6, which is located south eastern corner of the study area in Parramatta CBD.

PS2 (now known as 8PS) is located at 160-180 Church Street, Parramatta, opposite St John's Cathedral. It is on the corner of Church and Darcy Streets. Testing and salvage excavation was undertaken by AHIP (No. C0001968) due to the redevelopment of Parramatta Square. The site is historically sat on an alluvial terrace and water holes around the ephemeral creek line within the site possibly created a landscape rich in resources, such as fresh water, wetland plants and animals.

The lithic analysis of the assemblage of PS2 indicated a low density artefact scatter and similar to adjacent PS3 and PS5&6 sites was occupied repeatedly from at least around 7,000 Before Present (BP). The northern boundary of the site adjacent to the Town Hall (the location of the former Market Place and Aboriginal Annual Feasts) revealed the greatest concentration of artefacts. A trend was observed in this report in comparison with other sites throughout Parramatta, which indicated that the density of artefacts at PS2 is consistent with its distance from the Parramatta River. Seventy four flaked glass and two stone artefacts were subject to use-wear and residue analysis. A number of glass flaked artefacts showed use-wear from shaping wood/woody plants or for sawing or engraving bone or shell, and one glass piece was used as a core to produce microblades.

Across the Parramatta Square sites, a similar trend was observed, where lithic assemblage demonstrates a change over time in raw material with the deeper deposits indicating dominance of indurated mudstone/tuff/chert, while the upper deposits revealed silcrete artefacts. A silcrete knapping concentration is present along the northern boundary of the site which indicates production and/or discard of small numbers of artefacts.

Parramatta Square 3 (PS3): 153 Macquarie St Parramatta, Excavation Report, AHIP No. C0001379, Comber Consultants 2018

Aboriginal archaeological and cultural heritage assessment for the proposed redevelopment in PS3 (now known as 3PS) was undertaken by Comber Consultants. The site is the former Post Office site located at 153 Macquarie Street, Parramatta. The testing and salvage excavations uncovered an alluvial terrace across site at PS3, however, no evidence of the Parramatta Pleistocene Sand Body. The lithic analysis recorded 617 cultural lithics, including 369 artefacts. The assemblage indicates that the site was occupied repeatedly from about 10,000 years BP, in the terminal Pleistocene, through to the Holocene and contact periods.

Previous analysis across Parramatta Square contributed greatly to the knowledge of the Aboriginal occupation in the area. The artefact assemblage collected from PS3 shares similarities with the assemblages to some sites (such as 15 Macquarie Street and the RTA-G1), however they differ from those collected from other Parramatta sites (such as CG1, CG3, 101 George Street, 1 Smith Street). The results of the excavations at PS3 uncovered low artefact density (the average density across PS3 was 2.7 items per square metre) and indicate a similar trend, evidence for change over time in the use of raw materials. Generally, evidence for this change over raw material preference has only been identified on the Parramatta Terrace Sand previously, which is not present at PS3 or other Parramatta Square sites.

Parramatta Square 5 & 6 (PS5&6): 12-38 Darcy St Parramatta, Excavation Report, AHIP No. C0001379, Comber Consultants 2019

Comber Consultants were engaged to conduct testing and salvage of PS5 & 6 (now known as 4&6 PS) under the AHIP No. C0001413. The comprises the former Parramatta Library, Parramatta City Council building, several Victorian terraced shopfronts which is located at 12-38 Darcy Street, Parramatta CBD.

The excavations at PS5 & 6 uncovered an alluvial terrace of the Parramatta River like the other Parramatta Square sites. A similar trend to PS 2 and 3 in raw material preference which indicates a change over time with silcrete in the upper deposit and indurated mudstone/tuff/chert preferred in the lower deposit. This implies a long and ongoing Aboriginal occupation of Parramatta as a whole and Parramatta Square in particular. The excavations uncovered three hearths, and clay balls formed into a rough circle which indicates evidence of Aboriginal people cooking meat over small, leaf fuelled fires across the PS5 & 6 site. These features meet the criteria as a heat retainer hearth.

A total of 221 cultural lithics, including 126 artefacts, were recovered. The dating of the hearths and artefact analyses indicate that the site was initially occupied prior to 7,500 BP, continuing into around 1830. Four sets of conjoining artefacts recovered from adjacent spits provide evidence for specific cultural activities and some vertical integrity despite intensive modern land use.

The archaeology of Parramatta Square is exceptionally rare demonstrating evidence of ongoing occupation from 10,000 years ago through to the contact period well into the colonial period, when the Aboriginal Annual Feasts occurred in the market square in front of the Town Hall. The site as a whole has high significance to Aboriginal community.

Aboriginal Archaeological Test Excavation Report AHIP C0001588: Site 45-6-3195, Parramatta North Growth Centre, Comber Consultants 2018

Comber Consultants undertook Aboriginal archaeological test excavations for the Parramatta North Urban Transformation on behalf of Urban Growth NSW. The Cumberland Hospital East (AHIMS 45-6-3195) site, which is about 1.5 kilometres north of Parramatta CBD Stage 2 turnback facility, was excavated and uncovered around 1,800 Aboriginal artefacts, most of which were made from silcrete. Other raw material including glass had been knapped into stone tools, indicating archaeological evidence of contact between Aboriginal people and the new settlers and adaptation of new materials. It was suggested that these glass artefacts were likely to have been utilised for shaping, cutting and engraving of wood. The occupation density of the site was noted to be higher close to the Parramatta River, however, stretched across the site. It was suggested that the occupation in the western and southern sides of the site began more than 7,500 years ago, but as the river changed with sea level rises people appeared to move to the north and centre of the site.

There was a wetland within the centre of the site, at the location of the current oval which was occupied approximately 2,000 years ago. The location overlooked the Parramatta River and provided easy access to the resource-rich wetlands. The higher density of occupation was recorded along the riverbank and up to 150 metres from the river. Evidence of the Parramatta Sand Body was also found up to 150 metres from the river when the sea levels were rising and the landscape was changing dramatically, around 7500 years ago. It was noted that a site of with a long time span and with substantial numbers of artefacts and three phases of occupation is rare on the Cumberland Plain.

Desktop Aboriginal Due Diligence Rosehill Public School, RPS 2017

RPS was engaged by Conrad Gargett AMW to prepare a desktop Aboriginal due diligence report for the proposed upgrade of the Rosehill Public School in 2017. This study area is located around 570 metres to the south-west of the project study area. No registered Aboriginal sites were located within the Rosehill study area.

The City of Parramatta Council Aboriginal Heritage Study (Dallas Consulting, 2003) originally assessed the Rosehill study area as low Aboriginal sensitivity. However, the review of the heritage study (Dallas Consulting, 2014) upgraded the sensitivity of part of the school property to high. A contamination assessment (Douglas Partners, 2017) prepared for the site indicated that some of the school grounds, including parts of the playing field, may contain imported fill between 10 centimetres and 140 centimetres in depth.

As the study area contained an area of high sensitivity, relating to the playing field in the west of the school grounds, RPS recommended further assessment in the form of an archaeological survey report in accordance with The Code.

Parramatta Light Rail Stage 2: Aboriginal Heritage Constraints Assessment, KNC 2018

In 2018 KNC was engaged by WSP Australia Pty Limited (WSP) to prepare a preliminary Aboriginal heritage constraints assessment for Stage 2 of the Parramatta Light Rail network (this project). The purpose of the assessment was to inform the early designs of the project. The assessment included two alignment options, the first option was located along South Street, Rydalmere (the northern option, but which was not progressed), and a second option located along and adjacent to Grand Avenue, Camellia (the southern option).

The KNC constraints assessment identified five archaeological features: two AHIMS registered sites and three PADs. As the alignment has been refined since the KNC constraints assessment was undertaken, three archaeological features identified by KNC are relevant to the current study area.

- Two areas of PAD are located within the current study area:
 - Area 2: which is located south of the Parramatta River within Sydney Olympic Park in the alluvial flats and associated mudflats.
 - Area 3: which is located between River Road and Spur Street is situated within the low and mid slopes of a small ridgeline with limited previous ground disturbance.

Information on Areas 2 and 3 is provided below.

Area 2:

An area south of the Parramatta River within the Sydney Olympic Park is within the alluvial flats and associated mudflat. As such they provided abundance of resources for Aboriginal people in the past. Aboriginal heritage recorded within the nearby Millennium Park supports this location occupation model. However, the entire area has been through ground disturbances stemming from recent European occupation. The majority of the area was reclaimed in the 1880's that included dredging, placing of the fill material and modifications of the Haslams Creek alignment. The entire northern section of Newington and Wentworth Point are reclaimed estuary areas that have nil archaeological potential. The area south of Haslams Creek and to the immediate west of Homebush Bay was used for brickworks. These recent land use activities would have removed any Aboriginal archaeological material that would have been present within this area. Considering that natural soils consist of deep alluvial deposits, it is possible that remnant patches occur north and south of Haslams Creek under imported fill material. One of these potential remnant patches may be located at the proposed Haslams Creek crossing. Further soil assessment would be required in order to confirm the presence of natural soil layers that may contain Aboriginal cultural material. This area is mapped as having moderate to low archaeological potential.

Area 3:

A section of the study area located between River Road and Spur Street is situated within the low and mid slopes of a small ridgeline with limited previous ground disturbance. Soils in this area consist of erosional clay loams that have the potential to contain archaeological deposits at shallow depths. Considering very limited and unknown levels of previous disturbance, there is a moderate to low potential for subsurface archaeological deposits to occur in this area.

One registered site is located around 100 metres west of the current project study area – Sydney Turf Club Carpark: (AHIMS 45-6-2559).

20 Waterview Street, Putney, Curio Projects 2020

Curio Projects were engaged by Lilac Pty Ltd/Willow Frank to prepare an ACHAR for a Planning Proposal for enabling additional permitted uses including residential and retail. The site is located 2.5 kilometres east of the project study area.

The test excavation program completed as part of the ACHAR aimed to identify the extent of potential relics associated with occupation of the locale by notable emancipist James Squire and his nineteenth century brewing operation. James Squire (1754? -1822), arrived in New South Wales with the First Fleet in 1788, who was sentenced to seven years and was brewing beer for soldiers' private consumption during his time until his sentence expired in 1792.

In 1795, Squire was granted thirty acres of land in Parish of Hunters Hill and expanded his land by purchasing nearby allotments. Squire began to cultivate hops on his Kissing Point Farm, establishing a brewery and tavern

known as 'The Malting Shovel' in close proximity to the Parramatta River, accessible via Squire's private wharf. Squire was known to be sympathetic to the local Aboriginal people of the Wallumedegal people, Bennelong and Squire are known to have developed a friendship, with Bennelong eventually being buried within Squire's orchards. It was recently announced that location of Bennelong's burial place was located, using a combination of archival evidence and physical techniques (survey and ground-penetrating radar) (Sydney Morning Herald, 20 March 2011) which is believed to be located within the front garden of 25 Watson Street, Putney-approximately 120 metres north of the 20 Waterview Street.

One isolated artefact was identified during the testing program. The Aboriginal archaeological potential of the 20 Waterview Street, Putney is considered to be low, with the most likely site type to be present being isolated artefacts in a disturbed context, a site type which generally has little archaeological significance.

The historical (non-Aboriginal) test excavation program did not identify any archaeological resources associated with the Squire Brewery and Inn complex. Although, one isolated Aboriginal object was identified in Trench 3 within a highly disturbed context. The report recommended an exclusion zone be maintained around the Aboriginal object in Trench 3 was recommended if the artefact was to remain *in situ*, or preparation of an AHIP application to remove the Aboriginal object, if the object was required to be removed as part of the site's redevelopment. The excavation works ceased in that area and the artefact was protected in situ and an ACHAR was prepared following this unexpected find. Consecutively, a field survey was conducted in consultation with RAPs and no Aboriginal artefacts were recorded. Based on the results of the AHIMS search, the environmental context, predictive model and physical inspection of the landform of this project area, the most likely Aboriginal site types would be shell middens, isolated artefacts and open camp sites within the project area. Therefore, based on the comments provided by the RAPs and the distance to Parramatta River, further test excavations were recommended in this report.

6 ARCHAEOLOGICAL PREDICTIVE MODEL

6.1 Overview

The purpose of an archaeological predictive model is to provide an indication of the Aboriginal objects predicted to occur within the study area and the likelihood that these objects will occur within the study area. It draws on the review of the existing information from the regional and local archaeological context and from the landscape context. Another essential aspect to predicting the archaeological potential is previous land uses and the degree of disturbance across the study area. The predictive model should inform the approach to the archaeological survey and to the assessment of the archaeological sensitivity, potential, and significance. There are a number of factors that influence Aboriginal occupation of an area. These include essential subsistence resources such as food (flora and fauna) and fresh water, and secondary resources such as raw stone materials, wood and bark, animal skins and reeds for basket weaving, string, clothing and similar. Landscape features such as ridges, flat elevated areas, rock shelters and similar, may have also influenced Aboriginal occupation of an area. In addition, cultural activities may have also occurred at certain locations in the landscape; for example, corroborees and initiation sites.

6.2 Predictions for study area

The Cumberland Plain region provided abundant resources for Aboriginal subsistence, especially near permanent water and was conducive to Aboriginal occupation in the past. The Parramatta River runs through the study area, with multiple second and third order streams encircling the area. These creeks would have provided access to permanent water. These water sources would have provided the resource base for occupation, including habitats for freshwater fish, eel, and shellfish, along with larger marsupials and mammals typical of the inland area. Likewise, outcrops of silcrete nearby and formerly deposited river gravels associated with past fluvial activity would have provided the -stone raw materials for stone tool manufacture. Resources in the study area would have been ample to enable occupation, hunting, gathering, stone procurement, ceremonies, and other cultural activities to be conducted throughout the region. Burials are mostly found in coastal shell middens and no large burials sites has been reported in the Sydney region (Attenbrow, 2010). However, burials sites can be marked by carved trees in south-eastern Australia. Carved trees associated with burials are reported in south of Sydney near Narellan and Picton (Etheridge, 1918).

The Aboriginal material most visible in the archaeological record are stone artefacts. The most frequent archaeological objects are -stone artefacts in the Cumberland Plain. These objects are found as open scatters or isolated finds, and as finds and stratified deposits of flaked stone below the surface. Importantly, the presence of subsurface archaeological deposits cannot be accurately assessed based on the presence or absence of the surface archaeological record. Likewise, sub-surface archaeological deposits have been shown to be present in areas of past agricultural disturbance.

Both natural and anthropomorphic disturbance is widespread throughout Parramatta. The fluvial sand terraces of the Parramatta Sand Body have created a depositional context that is favourable to deep, stratified deposits of Aboriginal archaeology. Previous excavations have demonstrated that where these sands are intact beneath modern and historical development they can curate and contain highly significant deposits beneath the current urban landscape. Therefore, archaeological potential in the study area remains where suitable substrate exists intact below surface disturbance, or in other areas of low disturbance conducive to the preservation of archaeological deposit.

The test excavations of Parramatta Light Rail Stage 1 identified intact sands containing artefacts below modern and historical disturbance in several locations within its project area. These previous investigations have identified the Parramatta Sand Body aligns with the Parramatta CBD part of the Stage 2 study area (Figure 4.1), the Parramatta Light Rail Stage 1 heritage assessment of the Parramatta Sand Body has been relied upon for this part of the study area.

The test excavation results for Stage 1 also concurred with previous assessments regarding the variable depth, nature and disturbance levels of the sand body. Deep excavation/removal of upper levels and replacement with fill has impacted the archaeological potential of some areas, while introduced fill above less severe disturbance has preserved artefact-bearing layers of the sands in situ. Significant deposits are those where integrity and stability of the archaeological context is high, as this is what gives the objects meaning. High integrity also leads to increased confidence in interpretation, especially where depositional context has retained potentially stratified layers. The study area may contain undiscovered parts of the Parramatta Sand Body (Figure 4.1) which would contribute to this knowledge.

There are no known historical Aboriginal sites or Aboriginal missions within the study area. Post contact Aboriginal archaeology may be unearthed during the test excavation program especially in relation to the Parramatta Sand Body, if identified.

Scarred trees may occur, but only in areas of remnant native woodland, which are uncommon landscape in the heavily cleared wider Cumberland Plain as well as within the study area. Grinding grooves as well as stone quarries may be found on exposed bedrock in the wider region, though no evidence for either site type has been recorded within the study area since rock outcrops are mostly absent. Raw material sources around the study area may have not been found yet, however, it is more likely that many paleochannel deposits containing knappable rocks and sandstone outcrops are now buried beneath or have been destroyed by urban development (Corkill, 1999).

Most high-density archaeological sites have been associated with creek lines or other sources of permanent water. Stream order has been shown to be correlated with the size and complexity of archaeological deposits within certain distances from a waterway. Archaeological potential increases with stream order and more complex sites are often close to permanent water sources, with confluences being key locations for occupation sites. The highest artefact densities are likely to occur on terraces and lower slopes associated with second- or higher order streams, especially 50 to 100 metres from fourth order streams.

These observations indicated that landforms associated with streams of second- and higher order and areas that are undisturbed will have the highest archaeological sensitivity in the Cumberland Plains region.

The following predictions have been made based on the basis of the landscape context, available ethnographic observations of Aboriginal people in the region, comments and advice from the Metropolitan and Deerubbin LALC Site Officers and previous archaeological studies, in particular (White and McDonald, 2010).

- Most of the study area has been affected by past land clearance, development, landfill and landscaping.
- Parramatta Sand Body is mapped within the Parramatta CBD part of the study area which is considered to have high archaeological potential.
- Based on the previous research, the floodplains of the Parramatta River in the northern shoreline are considered to have high archaeological potential.
- The areas of relatively less disturbed parklands in the mid slope and lower slope landforms north of the Parramatta River are considered to have moderate archaeological potential, especially the areas around Ken Newman Park and Broadoaks Park.
- Based on the results of the AHIMS search, the environmental context and survey and consultation with LALC Site Officers, the most likely Aboriginal site types that have potential to be present in the study area would be shell middens, stone artefact scatters, isolated artefacts and subsurface archaeological deposits.

7 ARCHAEOLOGICAL SURVEY RESULTS

7.1 Approach

Representatives from the Metropolitan LALC and the Deerubbin LALC participated in an archaeological survey of the relevant sections of the study area on 24 January and 4 February 2022 respectively, to provide input on cultural significance in accordance with PACHCI Stage 2. The Deerubbin Local Aboriginal Land Council survey report was received on 26 April 2022 with a recommendation for further investigations due do the proximity of a major waterway (Appendix C).

The Parramatta CBD area of the study area was not surveyed, as it had previously been assessed for Parramatta Light Rail Stage 1 as such the information and assessment from the *Parramatta Light Rail Aboriginal Cultural Heritage Assessment Report* (KNC, 2017) has been relied upon for the Parramatta CBD area of the study area.

The Parramatta CBD area was assessed by KNC following a survey in December 2016. Based on the archaeological background and landform context, the survey inspected any areas of surface exposure for artefacts and evidence of intact soils and considered long term flood activity. The survey concluded that most of the Stage 1 study area contained little to no potential for subsurface archaeology due to disturbance from land use practices including the construction of buildings and roads, the installation of utilities, landscaping and bulk earthworks. Low lying areas along the banks of Parramatta River and major creeks are likely to have been heavily disturbed by high energy flooding events, which may washout subsurface deposits. Soils on adjacent slopes were often disturbed and eroding. The project notes that since the Parramatta Light Rail stage 1 project further research and investigation has taken place such as Williams et. al. 2021 which will be addressed in more detail in the ACHAR.

Aboriginal archaeological sites/PADs that identified by KNC's survey in Parramatta CBD is shown in Table 7.1 and Plate 7.1, Plate 7.2.

Table 7.1 Identified Aboriginal archaeological sites/PADs in each precinct following field survey (KNC, 2017)

Precinct name	Location	Identified Aboriginal sites/PADs	
Parramatta CBD Precinct	(inclusive of Robin Thomas Reserve)	Harris St Footpath/Robin Thomas Reserve	
(in		PLR PAD 1	
		PLR PAD 2	
		PLR PAD 3	

Plate 7.40 Identified Aboriginal archaeological sites/PADs in each precinct following field survey (KNC,

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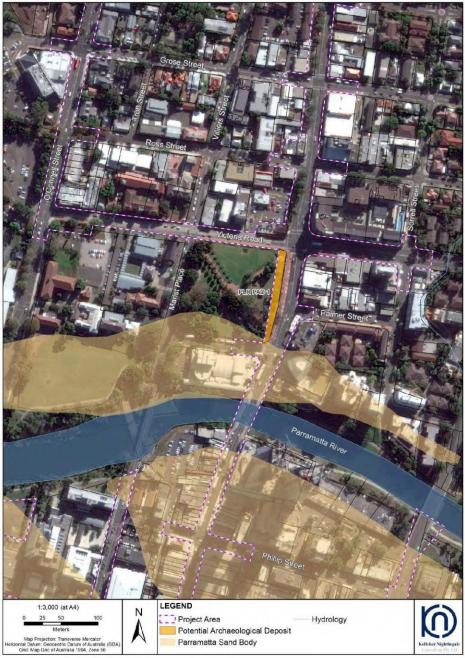


Figure 7. Aboriginal archaeological survey results – central west



Plate 7.2 Identified Aboriginal archaeological sites/PADs in each precinct following field survey (KNC, 2017)

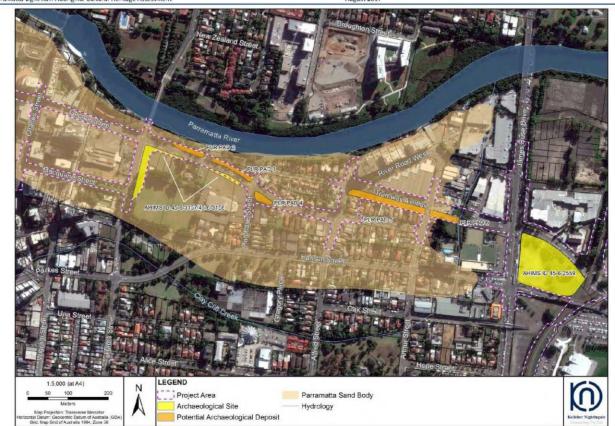


Figure 8. Aboriginal archaeological survey results - central east



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7.2 Sampling strategy and field methods

The aim of the archaeological survey was to conduct a representative coverage of the study area (excluding the Parramatta CBD) on foot and to record any Aboriginal archaeological sites or potential archaeological deposits (PADs).

The survey objectives were the ground-truthing of existing Aboriginal sites, land disturbances visible based on historical aerial photographs and management plans and the assessment of the subsurface archaeological potential of landforms. The targeted areas were decided based on preliminary desktop review including the review of current and historical aerial photography.

The study area was divided into nine survey units (SUs) in six suburbs based on their physical location (i.e. landform and distance to water courses). The survey covered the accessible areas of survey units with ground surface visibility. The areas where no visible disturbance to ground surface was evident, and where intact subsurface artefacts could be present, were targeted for the survey. SUs were later recorded to Avenza Maps with their GPS coordinates based on their disturbance levels.

The following survey units were nominated for investigation.

Melrose Park included two SUs where SU 1 encompassed Ermington Boat Ramp and the nature strip
adjacent to power easements. SU2 was located on the northern road boundary of Waratah Street (see
Figure 7.1).

- Ermington included two SUs where SU3 encompassed Ken Newman Park and the council land strip to the west. SU4 comprised Broadoaks Park and the council land strip on the northern side of South Street (see Figure 7.2)
- Rydalmere included one SU at Rydalmere Wharf (SU4) which extended from John Street in the north-east to the Sydney Water easement in the west within Eric Primrose Reserve (see Figure 7.3).
- Camellia included one SU where SU5 encompassed the wetlands (mangroves) on the western side of the Thackeray Street and the council strips on both sides of Thackeray Street (see Figure 7.3).
- Wentworth Point and Sydney Olympic Park comprised three SUs where SU6 extended from the riverside
 walk to the Sanctuary Wentworth Point development and an additional section along the western boundary
 of Hill Road (see Figure 7.4). SU7 was located north of the Haslams Creek on both sides of the Holker
 Busway and SU8 encompassed the grassed sidewalk area on the western side of Australia Avenue,
 adjacent to the Brickpit (see Figure 7.5).

Two key survey variables were assessed across the study area and within each landform: visibility and exposure. Exposure addresses the areas which erosion might have revealed archaeological deposits, and visibility determines the amount of ground surface that is not covered by any vegetation. Overall survey coverage and calculated survey effectiveness was recorded in Table 7.2.

Overall visibility during the survey was 10 to 15 per cent due to grass coverage with limited exposure. Effective coverage areas in all SUs were lower due to low visibility which indicates a lower effective coverage ratio. The areas of exposure in the study area were targeted for stone artefacts, shells and other evidence of Aboriginal occupation.

Table 7.2: Summary of survey coverage in the study area

Survey Unit (SU)	Landform	SU Area (m²)	Visibility (%)	Exposure (%)	Effective Coverage Area (m²)	Effective Coverage (%)
SU1	Flat (partially disturbed)	9,538	20	10	190.76	2
SU2	Flat (partially disturbed)	3,036	20	10	60.72	2
SU3	Mid and low slope	32,191	5	5	80.47	0.2
SU4	Mid slope	4,968	10	10	49.68	1
SU5	Flat (partially disturbed)	20,290	20	20	811.60	4
SU6	Flat (disturbed)	4,610	5	-	230.00	4
SU7	Flat (disturbed)	49,910	20	10	998.20	2
SU8	Side slope (partially disturbed)	9,513	5	10	47.56	0.5
SU9	Flat (partially disturbed)	13,084	10	10	130.84	1

The total surveyed areas varied between SUs (refer Table 7.3), and some areas of sensitivity were not able to be surveyed as property access could not be arranged (see Figure 7.6). However, Transport for NSW has committed to completing survey of the Melrose Park Public School Oval and ten residential properties in Melrose Park which are considered to have potential for Aboriginal archaeology once property access can be arranged and prior to commencement of any physical works (see Section 10). The wetlands on the eastern side of Thackery Street in SU7 was not accessible however the Deerubbin LALC Site Officer confirmed no additional survey would be required, as a result of the disturbed nature of this SU.

Table 7.3: Total survey area in each SU

SU	Surveyed area
SU1	70 per cent
SU2	35 per cent
SU3	35 per cent
SU4	50 per cent
SU5	35 per cent
SU6	12 per cent
SU7	30 per cent
SU8	5 per cent
SU9	15 per cent

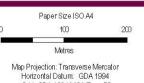




SU1 Ermington Boat Ramp

SU2 Waratah St

| SU2 Waratan St | SU7 Hill Road and River Walk



Grid: GDA 1994 MGA Zone 56



Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

> Survey Units in Melrose Park

Project No. 12557728 Revision No. 2

Date 16/06/2022





SU3 Ken Newman Park SU4 Broadoaks Park

Paper Size ISO A4 100 Metres Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56



Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Survey Units in Ermington

Project No. 12557728 Revision No. 2 Date 16/06/2022





SU4 Broadoaks Park

SU5 Rydalmere Wharf
SU6 Camellia

Paper Size ISO A4

0 100 200

Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Gnd: GDA 1994 MGA Zone 56



Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Survey Units in Rydalmere and Camellia Project No. 12557728
Revision No. 2
Date 16/06/2022





SU7 Hill Road and River Walk

SU8 Haslams Creek



Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56

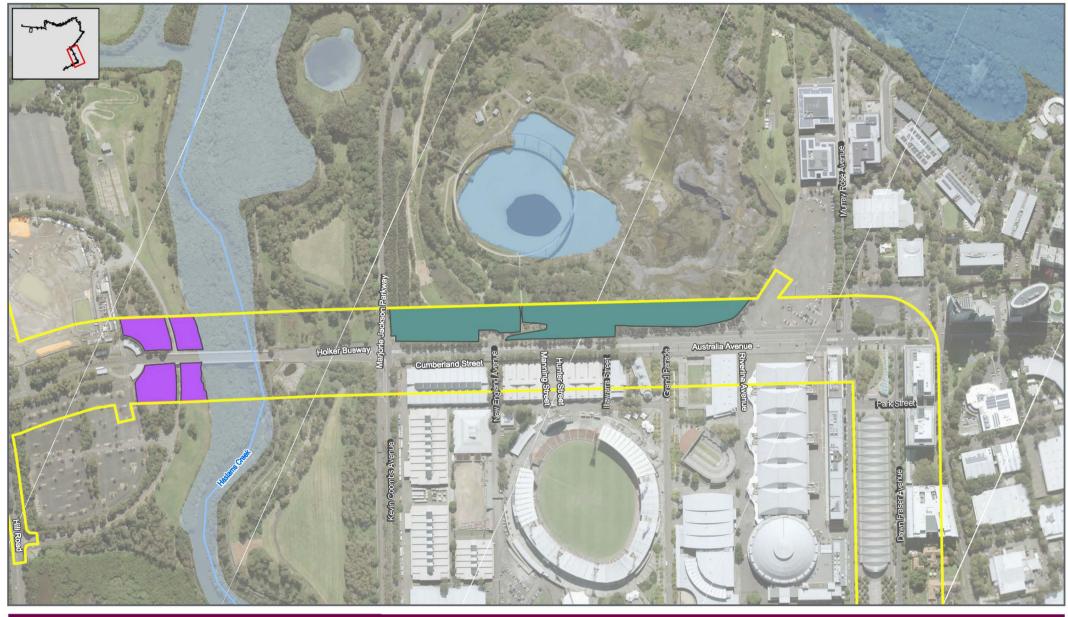




Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Survey Units in Wentworth Point

Project No. **12557728**Revision No. **2**Date **16/06/2022**





SU8 Haslams Creek
SU9 Brickpit

Paper Size ISO A4

0 100 200

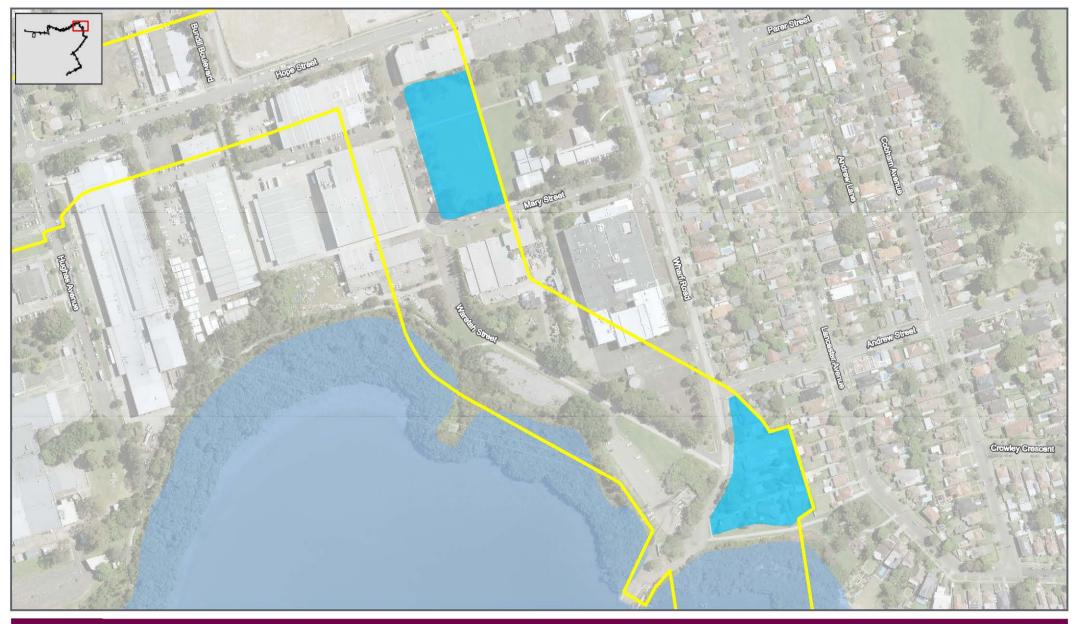
Metres

Map Projection: Transverse Mercator
Horizontal Datum: GDA 1994
Grid: GDA 1994 MGA Zone 56



Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Survey Units in Sydney Olympic Park Project No. 12557728
Revision No. 2
Date 16/06/2022







Archaeological senstivity areas not surveyed

Paper Size ISO A4 20 40 Metres

Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56



Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

Areas of Aboriginal archaeological sensitivity recommended for future survey Project No. 12557728 Revision No. 2

Date 20/06/2022

7.3 Results of the field survey

7.3.1 Melrose Park

Survey Unit 1 - Ermington Boat Ramp

SU1 is located on a flat landform, 100 metres from the Parramatta River. This was the first survey unit inspected on foot. The ground visibility was nil to very low due to dense grass coverage.

Disturbance was noticed in the wetlands adjacent to Wharf Road, Ermington Boat Ramp and car park. This disturbance was associated with the presence of bitumen, demolition material and sandstone retaining walls of the historic wharf (Plate 7.3 and Plate 7.4). Previous geotechnical investigations for the project also indicate a degree of disturbance. Previous studies from this location recorded the presence of fill material to a depth of 125 centimetres, consisting of sand and sandy clay and then alluvial silty clay to a depth of 185 centimetres with sandstone bedrock beneath.

The grassed flats in those areas were considered to be disturbed during the regeneration of mangroves. Further north-west of the car park area, the grasslands exhibited less disturbance except for the northern boundary, which has been disturbed by the Viva Gore Bay high pressure fuel line. The northern boundary of the car park area consists of possible intact deposits which were partially disturbed on south-eastern section via the overhead power infrastructure high voltage lines (see Plate 7.5 and Plate 7.6).

SU1 consists of 9,538 square metres of which 6,676 square metres was surveyed on foot. Two per cent of the area had surface exposure and was inspected. No Aboriginal artefacts were located during the survey. The Site Officer from the Metropolitan LALC noted that shell middens are the most common Aboriginal site type in this area due to the proximity to the river. Due to the proximity to known middens as well as the landform and disturbance context, the portion of the surveyed area shown on Figure 7.7 has been assessed as having high archaeological potential.

Plate 7.3 Looking south-east mangroves on Ermington Boat Ramp



Plate 7.4 Looking east retaining walls of shoreline



Plate 7.5 Looking north-east electrical easement in the parking area



Plate 7.6 Looking north intact parts of the parklands



Survey Unit 2 - Waratah Street

SU2 is located on the northern boundary of Waratah Street around 120 to 150 metres from the Parramatta River, which was previously assessed as having high Aboriginal heritage potential (Section 5.3), as shown on Figure 7.1. This SU was considered to have a high potential for Aboriginal heritage as intact residual soils were recorded from 40 centimetres below surface based on previous geotechnical investigations for the project. SU2 consists of 3,036 square metres of which 1,062 square metres was surveyed on foot. Two per cent of the area had surface exposure and was inspected. No Aboriginal artefacts were located during the survey. The ground visibility was around 20 per cent and mostly covered with gravels and clayey loam (see Plate 7.7 and Plate 7.8).

Plate 7.7 Looking north-west along Waratah Street





7.3.2 Ermington

Survey Unit 3 - Ken Newman Park

KNC previously reported SU3 as having potential for archaeological deposits located at shallow depths (KNC, 2018). Previous geotechnical studies undertaken as part of the project unearthed an intact clay rich residual soil profile at greater than 30 centimetres depth.

Ken Newman Park is located in mid and low slopes which have been disturbed through the installation of the Sydney Water potable water pipelines in one third in the northern section of the park (see Figure 7.2) (see Plate 7.9 and Plate 7.10). SU3 consists of 32,191 square metres of which 11,266 square metres was surveyed on foot. Ground surface visibility was 0.2 per cent, which was the area inspected and no Aboriginal artefacts were located during the survey.

The disturbed corridor to Hilder Road was excluded from the survey, except for the eastern part of the council strip on Hilder Road which has not been disturbed (see Plate 7.11). The small area of spoil shown in Plate 7.12 is comprised of silty sand and is located on the disturbed section of part by the Sydney Water potable water pipelines, therefore, does not contain intact soil profile. The ground visibility was nil except for this spoil exposure due to the thick grass. The current tree line implies a water course could extend through the park, however, no earlier water course was identified in historical imagery.

The park lies in a north-south direction and is located around 300 to 600 metres from the Parramatta River in the south and north respectively. Even though the distance to the river is greater than the archaeological predictive model proposed distance (less than 200 metres to a watercourse), this mid slope may have been preferred as campgrounds or other activities during high tides or floods as Parramatta River is subject to flooding. This assumption was supported by the Metropolitan LALC Site Officer.

Plate 7.9 Looking north to Ken Newman Park



Plate 7.11 Looking north towards Hilder Road



Plate 7.10 Looking west to the Sydney Water assets corridor



Plate 7.12 Looking west disturbed soil in Ken Newman Park



Survey Unit 4 - Broadoaks Park and surrounds

The dominant portion of SU4 is located at Broadoaks Park which is located between Primrose Avenue and Fallon Street in east-west direction. The park is located in mid and low slopes, with disturbance areas in one third of the north section due to topsoil erosion (see Figure 7.2, Plate 7.13 and Plate 7.14). The remainder of SU4 is located on the northern section of South Street, however as this council strip was observed to be disturbed by the Sydney Water potable water pipelines, it was not considered to have archaeological potential.

In total, SU4 consists of 4,968 square metres of which 1,046 square metres was surveyed on foot. One per cent of the area had surface exposure and was inspected and no Aboriginal artefacts were located during the survey.

The Deerubbin LALC Site Officer noted that the northern half of the Broadoaks Park was subject to topsoil erosion of the A horizon with insect nests exposing the soil which consisted of clayey silt with iron stone and pebble inclusions. The remainder of the park had no ground visibility due to high grass.

Plate 7.13 Looking north-west in Broadoaks Park



Plate 7.14 Looking south to soil exposure



7.3.3 Rydalmere

Survey Unit 5 - Rydalmere Wharf

SU5 has been subject to levels of disturbance from various activities including landscaping, construction of walking paths, bicycle paths and car parks as well as Sydney Water utilities. However, based on the Aboriginal heritage sensitivity map of Parramatta LGA (see Plate 5.1). the parklands of the wharf have been recorded as high archaeological sensitivity (see Figure 7.3).

Rydalmere Wharf is situated on a flat landform on the north shore the Parramatta River with landscaped gardens and young trees (see Plate 7.15 and Plate 7.16). The foreshores of the wharf have been disturbed by the retaining wall and a footpath (see Plate 7.17 and Plate 7.18). Parklands around the wharf extend from the Sydney Water potable water pipelines in the west to John Street in the east. The northern extent of the wharf is bordered by the car park (see Plate 7.19 and Plate 7.20). The parklands are slightly elevated to the northern areas which may indicate soil integrity.

During the wharf upgrade a desktop Aboriginal heritage assessment was undertaken as a part of the Statement of Heritage Impact (City Plan Services, 2018). This report suggested that Aboriginal people have a long and enduring connection with the Rydalmere area. However, the PACHCI Stage 1 Assessment determined that it was unlikely that the proposed wharf upgrade works would impact Aboriginal cultural heritage (WSP Australia & Roads and Maritime Services, 2018). Previous geotechnical studies in 2019 recorded intact soil matrices from beneath 120 centimetres depth, therefore, Aboriginal archaeological potential may be present under the modern disturbed layers.

SU5 consists of 20,290 square metres of which 7,245 square metres was investigated during the survey. Four per cent of effective coverage was recorded on foot via an unsystematic walk because of the low visibility. The ground visibility during the survey was very low to nil during the survey except for the tree line in the northern

boundary of the parkland. One quartz piece with no diagnostic features was recorded from the surface exposure under a tree around 50 metres from the river during the survey. This quartz could have been redeposited by disturbance or tumbling in the river (see Plate 7.20 and Plate 7.21). This SU has been recorded as high archaeological potential based on the distance to the river and the Aboriginal heritage sensitivity map (Section 5.3).

Plate 7.15 Looking north-west in parklands



Plate 7.16 Looking south at Rydalmere Wharf



Plate 7.17 Looking west to retaining walls of the wharf



Plate 7.18 Looking south-west to the wharf parklands



Plate 7.19 Looking north to the car park



Plate 7.20 General location of quartz piece



Plate 7.21 Quartz piece found near the wharf



7.3.4 Camellia

Survey Unit 6 - Camellia - Thackery Street and mangroves

Camellia precinct is highly industrialised and disturbed. Therefore, within the study area SU6 is limited to the nature strips on Thackeray Street and the mangroves on Parramatta River (see Figure 7.3). Previous geotechnical investigations for the project recorded ground conditions at the south bank of the Parramatta River comprising up to 2.6 metres of fill generally associated with land reclamation overlying very soft silty clay and sandy clay. Holocene Alluvium was reached from 2.6 metres to 15.8 metres depth.

SU6 consists of 4,610 square metres however the grassland had no visibility and the elevated street line suggested that this area has high levels of ground disturbance (see Plate 7.22 and Plate 7.23). A total of 230 square metres of this SU was surveyed on foot and no Aboriginal artefacts were found during this survey.

Plate 7.22 Mangroves in Camellia



Plate 7.23 Looking south on Thackeray Street



7.3.5 Wentworth Point and Sydney Olympic Park

Survey Unit 7 - Hill Road and river walk

Previous landfill and chemical contamination in Wentworth Point has affected the archaeological potential in the area. Therefore, SU7 was divided into two separate parts avoiding the remediated landfill areas containing compacted waste material in Woo-la-ra (see Figure 7.4). In total, SU7 consists of 49,910 square metres and 13,463 square metres was surveyed on foot.

The northern part of SU7 is located along the river walk, adjacent to Parramatta River (see Plate 7.24 and Plate 7.25). This part of the survey unit was previously considered to be less impacted by previous disturbance except for the footpath construction and electrical easement. However, at Wentworth Point and Sydney Olympic Park (north of Haslams Creek), the study area is situated on manmade fill with a thickness of more than two metres over the Quaternary estuarine and alluvial deposits, to allow industrial development. The adjacent 'Sanctuary' development in Wentworth Point also recorded the presence of highly disturbed and contaminated soil samples based on geotechnical results (Roads and Maritime Services, 2013). This section of SU7 is located on a flat landform with very low surface exposure (five per cent) due to vegetation and grass. No Aboriginal artefacts were found during the survey and based on the results from previous geotechnical studies no further investigation is required in the river walk.

The second section of SU7 is located on the western side of Hill Road where AHIMS 45-6-2785 was recorded by GPS coordinates. AHIMS 45-6-2785 was previously recorded as a PAD within the Newington Nature Reserve and is mapped around 50 metres outside of the study area based on the site card map and description. This area was subject to landscaping of the wetlands and located on a flat landform (see Plate 7.26 and Plate 7.27). The surface visibility was low to nil due to shrubs and leaves. No Aboriginal artefacts were identified during the survey.

Plate 7.24 Looking north to Parramatta River



Plate 7.26 Looking south to Millennium Parklands



Plate 7.25 Looking south-west on river walk



Plate 7.27 Looking south to Millennium Parklands



Survey Unit 8 - Haslams Creek

SU8 consists of Haslams Creek, mangroves and the banks of the creek (see Figure 7.5). While the broad area has been remediated due to previous landfilling activities and now contains waste material which has been compacted and capped. The creek's riverbed has also been subject to change via concrete channelling. However, KNC previously identified the slopes on each side of the Holker Busway bridge, north of Haslams Creek, as having low to moderate potential (KNC, 2018).

The alluvial flats in the area would have provided many resources to the Aboriginal people (see Plate 7.28 and Plate 7.29). Therefore, the presence of the intact soil profile may have archaeological potential due to the close distance to the watercourse. SU8 consists of 9,513 square metres of which 0.5 per cent was survey for effective coverage. In total, 470 square metres were surveyed on foot. The ground surface visibility was nil due to grassland and no Aboriginal artefacts were identified during the survey.

Plate 7.28 Looking north-east to Holker Busway



Plate 7.29 Holker Busway and Haslams Creek



Survey Unit 9 - Brickpit

SU9 consists of the nature strip on the eastern side of Australia Avenue, adjacent to the Brickpit at Sydney Olympic Park (see Figure 7.5). The area is within a flat landform with extensive grass coverage and disturbance from a footpath/cycling lane and may present an intact soil profile.

SU9 consists of 13,084 square metres of which 1,962 square metres was surveyed on foot. Ground surface exposure was around one per cent of the area. The ground surface visibility was low (10 per cent) during the survey due to the grass. The area was subject to an unsystematic visual inspection as a result of this low visibility (see Plate 7.30 and Plate 7.31). Dark brown silty loam was exposed on the ground surface and additional disturbance was visible from an old stormwater pipe on the eastern end of the nature strip towards the Brickpit. No Aboriginal artefacts were found identified the survey.

Plate 7.30 Looking north-west to Brickpit



Plate 7.31 Looking east towards to Brickpit



7.3.6 Areas not surveyed

As noted in Section 7.2, some areas identified as having Aboriginal archaeological sensitivity were not able to be surveyed.

Melrose Park Public School (oval), is located partially within the study area on a flat landform with likely minimal disturbance 200 metres from the Parramatta River and as such is considered to have high Aboriginal heritage potential (see Figure 7.6). During the survey, the oval was observed from the nearby footpath and the ground exposure seemed to be very low due to high grass. It was also noted that the path in the middle of the oval was being resurfaced exposing some topsoil in the process (see Plate 7.32 and Plate 7.33). No Aboriginal artefacts were observed from the footpath.

Ten residential properties, adjacent to Wharf Road, are located within the study area (see Figure 7.6). Any undisturbed gardens and backyards of these properties may hold Aboriginal heritage potential based on their distance to the Parramatta River and PAD1.

Additionally, the mangroves along Camellia were not accessible to survey, however, as a result of the disturbed nature the Deerrubin LALC Site Officer confirmed that no further investigations are necessary in Camellia.

Transport for NSW has committed to completing a survey of the areas in Melrose Park, should it be confirmed they could be impacted by the project and once property access can be arranged in consultation with the LALC Site Officers (see also Section 10).

Plate 7.32 Looking south to Melrose Park Public School Plate 7.33 Looking east, the construction works in the oval



school oval



7.4 Summary of archaeological survey

The survey was undertaken in accordance with the recording requirements stipulated in The Code and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (DECCW, 2011). This included identifying landforms and landscapes including visibility and exposure for each survey unit. The effective coverage data (around 13 per cent) for the survey indicated that generally there were poor ground surface visibility across the study area which significantly reduced the possibility of identifying surface evidence of past-Aboriginal occupation.

Where Aboriginal sites are present in the study area, these are likely to be within pockets of undisturbed parklands, nature strips adjacent to watercourses and within 200 metres of the river with limited previous ground disturbance. A total of eight PADs were identified within the study area, as a result of the archaeological field survey and in consultation with LALC Site Officers. Four PADs were identified with high archaeological potential (as they were in close proximity to a known site or landform such as a river or creek) and an additional four PADs were identified as having moderate archaeological potential (which despite their distance to watercourses being greater than 200 metres, it was considered that these areas could be routes to inland).

No Aboriginal artefacts were identified during the survey.

The survey also included general discussion with the LALCs with respect to the Aboriginal cultural heritage values of the study area and surrounds. Both Site Officers emphasised the important role of the Parramatta River for the Aboriginal communities as a food source, as well as gathering and ceremonial places along the river. Eel traps and shell middens associated with the river are considered highly significant for the Aboriginal people.

7.4.1 PADs identified with high archaeological potential

PLR2 PAD1 Ermington Boat Ramp, Melrose Park (9,204 m²)

The Ermington Boat Ramp area has been previously identified as an area of high archaeological potential (Dallas Consulting 2014), and the less disturbed parts of this area have been recorded as an area of potential archaeological deposit following the survey. The less disturbed areas include (see Figure 7.7):

- the nature strip north-west of the overhead power infrastructure high voltage lines
- the northern boundary of Waratah Street.

PAD1 is located in the Lucas Heights Soil Landscape, which was formed *in situ* by weathering material, namely residual soil. This soil type is favourable for artefact durability except for organic material, which may result as an accumulation of artefacts from the different occupation levels. The survey indicated that the area had been modified by landscaping, the Viva Energy fuel pipeline and the high voltage power easement, however, archaeological investigations at sites in the region have uncovered intact archaeological deposits beneath modern disturbance. The area has been assessed as having the potential for subsurface Aboriginal archaeological deposits due to the proximity to the Parramatta River and the shell midden (AHIMS 45-6-1961) which is 300 metres west of the study area, on the west coast of the unnamed bay in Ermington.

PLR2 PAD2 Melrose Park Public School Oval (7,972 m²)

Melrose Park Public School Oval has been identified as an area of potential archaeological deposit based on landform features and distance to Parramatta River and noting the likely minimal disturbance of the oval which indicates potential for sub-surface archaeological deposits (see Figure 7.7). The location was observed from the footpath with the Metropolitan LALC Site Officer, although not directly surveyed. The elevation of this area associated with the Parramatta River would have been less impacted by flooding and so the disturbance from historic and modern land use has been limited.

PLR2 PAD3 Rydalmere Wharf (18,447 m²)

Rydalmere Wharf and the parklands around the wharf have been identified as an area of potential archaeological deposit on the flat, gently sloping area to the north (see Figure 7.8). While previous construction of amenities, car parks and vegetation removal has been undertaken in the area, the landform remains largely intact. Although bicycle paths and landscaping have partially disturbed the area, the wharf has been assessed as having high potential for subsurface archaeological deposits below the modern disturbance due to the proximity to the resources of the Parramatta River.

PLR2 PAD4 Haslams Creek, Sydney Olympic Park (3,650 m²)

The grassland adjacent to Holker Busway is an area of potential archaeological deposit which was previously identified based on the likelihood for natural soils comprising deep alluvial deposits along the riverbanks of Haslams Creek being located under imported material (see Figure 7.9). Therefore, due to the proximity to the watercourse this area has been assessed as having high potential for Aboriginal occupation deposits.

7.4.2 PADs identified with moderate archaeological potential

PLR2 PAD5 Broadoaks Park, Ermington (4,369 m²)

Broadoaks Park is located on a mid slope with very limited and unknown levels of previous disturbance (see Figure 7.8) The topsoil (A horizon - brown clay loam) was observed during the survey to be eroded in the central areas of the park but intact in the south. These erosional soils are associated with poor preservation of archaeological material but is still likely to occur at shallow depths.

Broadoaks Park was initially assessed as having high archaeological potential in the Aboriginal Sensitivity Map (Dallas, 2014) but based on the distance to the water was revised as moderate archaeological potential. This significance assessment is subject to change following archaeological testing which would aim to clarify archaeological significance. Due to the elevation of the parkland and undisturbed condition in the south of this area was assessed to have a moderate level of archaeological potential.

PLR2 PAD6 Ken Newman Park, Ermington (32,191 m²)

Ken Newman Park is situated on the low and mid slopes of a small ridgeline (see Figure 7.8). The park is located on the intersection of two soil landscapes; Lucas Heights and Glenorie. Residual and erosional loams in this area have the potential to contain archaeological deposits at shallow depths. Ken Newman Park was initially assessed as high archaeological potential in the Aboriginal Sensitivity Map (Dallas, 2014) but based on the distance to the water has been revised as moderate archaeological potential. This significance assessment is subject to change following archaeological testing which would aim to clarify archaeological significance. Considering the very limited previous disturbance, except for the Sydney Water potable water pipelines extending across the park, this area has been assessed as having moderate archaeological potential, especially noting the limited impact the site would expect to have seen from flooding due to its elevation.

PLR2 PAD7 Hill Road West, Sydney Olympic Park (adjacent to AHIMS 45-6-2785) (21,495 m²)

The PAD (see Figure 7.9) associated with AHIMS 45-6-2785 was recorded in 2006 within Sydney Olympic Park (Irish, 2006) (also see Figure 5.1). It contained a thin level of remnant soil with the potential to contain archaeological deposits. No surface cultural material was identified within PAD in 2006. The PAD is around 50 metres west of the study area.

However, due to the close proximity of the AHIMS site and analysis by this predictive model, an adjacent area to the west of Hill Road has been nominated as a PAD and to be included in the test excavation program to test this prediction. AHIMS 45-6-2785 was not visited during the field survey for the current study as it is located within a fenced off area of woodland in Newington Armoury.

PLR2 PAD8 Brickpit, Sydney Olympic Park (5,411 m²)

A small area of a nature strip adjacent to the Brickpit has been recorded as having moderate to low potential for archaeological deposits (see Figure 7.9). The broad area is disturbed by development and brick works. However, this flat nature strip may have subsurface Aboriginal cultural material due to its proximity to Haslams Creek.

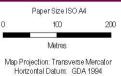




Study area

PAD 1 - Ermington Boat Ramp

PAD 2 - Melrose Public School Oval



Grid: GDA 1994 MGA Zone 56



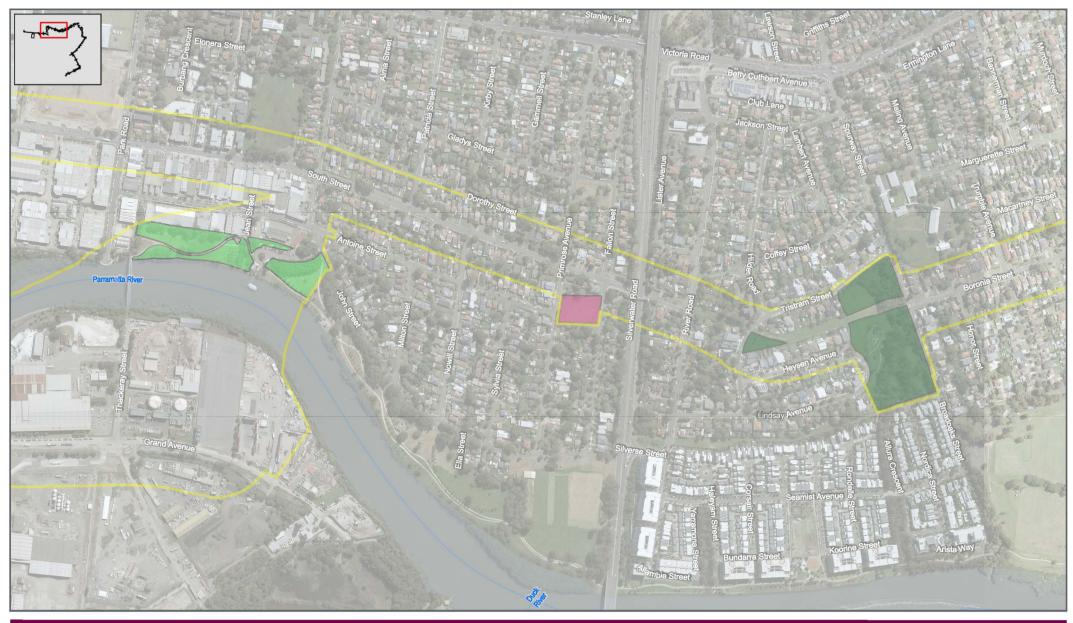
Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

PADs identified in Melrose Park

Project No. 12557728 Revision No. 2

Date 22/06/2022

FIGURE 7.7



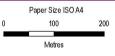


Study area

PAD 3 - Rydalmere Wharf

PAD 5 - Broadoaks Park

PAD 6 - Ken Newman Park



Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56



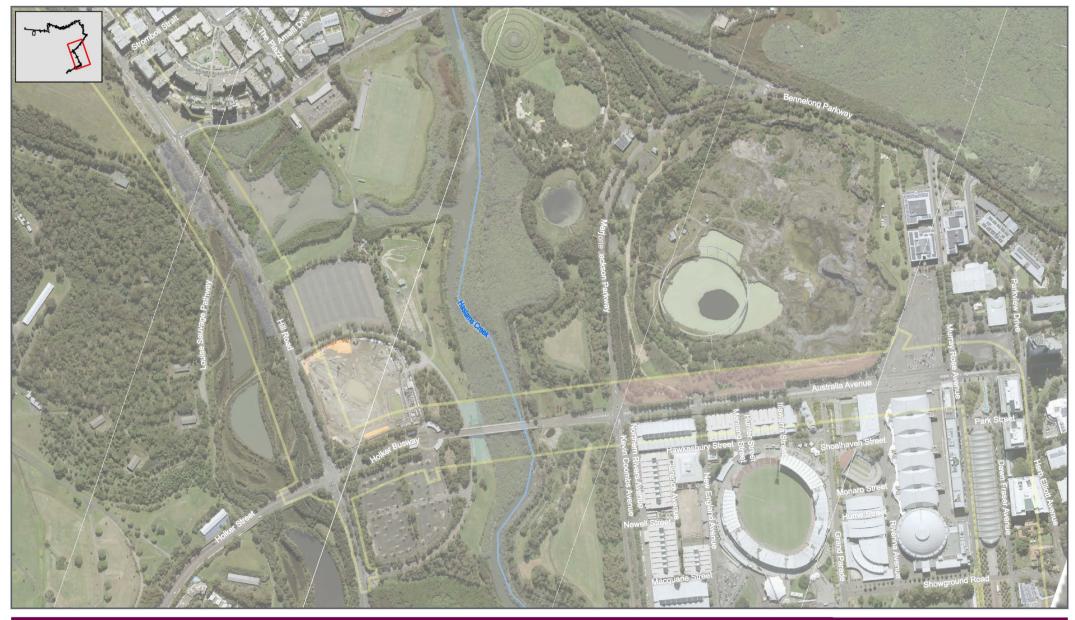


Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

PADs identified in Rydalmere and Ermington Project No. 12557728
Revision No. 2

Date 22/06/2022

FIGURE 7.8





Study area

PAD 4 - Haslams Creek

PAD 8 - Brickpit

PAD 7 - Hill Road West

Paper Size ISO A4
0 100 200

Metres

Map Projection: Transverse Mercator Horizontal Datum: GDA 1994 Grid: GDA 1994 MGA Zone 56





Transport for NSW Parramatta Light Rail Stage 2 EIS Aboriginal Cultural Heritage

PADs identified in Sydney Olympic Park

Project No. 12557728
Revision No. 2

Date **22/06/2022**

FIGURE 7.9

8 PRELIMINARY STATEMENT OF SIGNIFICANCE

In accordance with The Code and the *Burra Charter: the Australia ICOMOS Charter for Places of Cultural Significance* (Australia ICOMOS, 2013) (the Burra Charter), this section provides a preliminary assessment of the archaeological significance of the study area. Assessment of significance can only occur in consultation with RAPs.

Scientific (archaeological) value refers to the importance of a landscape, area, place or object because of its rarity, representativeness and the extent to which it may contribute to further understanding and information. Scientific value is assessed using criteria such as research potential, representativeness, rarity and education potential which are listed below.

- Research potential: Does the evidence suggest any potential to contribute to an understanding of the area and/or region and/or state's natural and cultural history?
- Representativeness: How much variability (outside and/or inside the subject area) exists, what is already conserved, how connectivity is there?
- Rarity: Is the subject area important in demonstrating a distinctive way of life, custom, process, land use, function or design no long practiced. Is it in danger of being lost or of exceptional interest?
- Education potential: Does the subject area contain evidence of teaching or evidence with teaching potential?

The degree to which an area meets the criteria is assessed as low, moderate, high or major as shown in Table 8.1 which is based on the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage* (OEH, 2011) under Part 6 of the NPW Act.

Table 8.1 Aboriginal Cultural Heritage Significance Assessment Matrix

Signi	ficance Assessment Matrix				
Significance		Potential to provide further archaeological information			
		Low	Moderate	High	
	Low	Low	Low	Moderate	
	Moderate	Low	Moderate	High	
	High	Moderate	High	Major	

8.1 Scientific significance assessment

Archaeological value refers to the importance of a landscape, area, place or object based on its rarity, representativeness, and the extent to which it may contribute to further understanding and information about past Aboriginal occupation (OEH, 2011:9).

The assessment of scientific or archaeological value (and subsequently, significance) is used to develop appropriate management and mitigation recommendations. Criteria for archaeological significance have been developed in accordance with the principles of The Code and best practice assessment processes as set out in the Burra Charter. The following archaeological significance criteria have been used: rarity, representativeness, research potential and education potential which are defined in Table 8.2.

Table 8.2: Archaeological significance criteria (Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH, 2011)

Criteria	Description
Rarity	What are the unique and distinctive features of a site, how many are left? Is this a good example of its type? What characteristics might demonstrate this? Is the subject area important in demonstrating a distinctive way of life, custom, process, land-use, function or design no longer practiced? Is it in danger of being lost or of exceptional interest?
Representativeness	How much variability (outside and / or inside the subject area) exists, what is already conserved, how much connectivity is there?

Research potential	What is the potential of a site to shed a light into past human behaviour and to contribute on intra-regional relationships? Is the subject area important in demonstrating a distinctive way of life, custom, process, land-use function or design no longer practised? Is it in danger of being lost or of exceptional interest? Can Aboriginal objects from a site, provide information about changes in the cultural practices of Aboriginal people through time including post contact archaeology? Are there post contact questions that could be investigated here? Where do historical and Aboriginal occupation areas coincide and may require combined investigation as part of this project including Parramatta Sand Body?
Education potential	Does the subject area contain teaching sites or sites that may have teaching potential?

8.2 Preliminary significance assessment of Aboriginal sites

To assess the significance of Aboriginal heritage values, consultation with relevant Aboriginal stakeholders must be undertaken as per the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW). Aboriginal people are recognised as the determinants of their own heritage. As such, consultation is the way in which an assessment of Aboriginal cultural heritage values is informed. As per the Commonwealth *Ask First* guide (Collet and Pocock, 2012), cultural significance is determined in accordance with relevant Aboriginal cultural groups before decisions can be made regarding the management of places and heritage values.

The archaeological significance of Aboriginal sites is further assessed through scientific means such as excavation, survey and analysis of artefactual material.

Two registered Aboriginal sites (AHIMS 45-6-2977, AHIMS 45-6-4015) are located on Macquarie Street within the Parramatta CBD section of the study area. A preliminary assessment of the archaeological significance of the AHIMS sites and PADs in the study area is summarised in .

Table 8.3: Preliminary assessment of the archaeological significance of the AHIMS sites and PADs in the study area

PAD/AHIMS	Suburb	Rarity	Represent- ativeness	Research potential	Education potential
PLR2 PAD1 Ermington Boat Ramp	Melrose Park	High	High	High	High
PLR2 PAD2 Melrose Park Public School	Melrose Park	High	High	High	High
PLR2 PAD3 Rydalmere Wharf	Rydalmere	High	High	High	High
PLR2 PAD4 Haslams Creek	Sydney Olympic Park	High	High	High	High
PLR2 PAD5 Broadoaks Park	Ermington	Moderate	Moderate	Moderate	Moderate
PLR2 PAD6 Ken Newman Park	Ermington	Moderate	Moderate	Moderate	Moderate
PLR2 PAD7 Hill Road West	Sydney Olympic Park	Moderate	Moderate	Moderate	Moderate
PLR2 PAD8 Brickpit	Sydney Olympic Park	Moderate	Moderate	Moderate	Moderate
AHIMS 45-6-2977 (Macquarie St PAD 3)	Parramatta CBD	High/Moderate	High/Moderate	High/Moderate	High/Moderate
AHIMS 45-6-4015 (Church St PAD 1)	Parramatta CBD	Moderate	Moderate	Moderate	Moderate

Comprehensive archaeological significance assessments, and any assessment of cultural significance are key knowledge gaps which will be addressed in the ACHAR and cultural values assessment to be prepared for the Parramatta Light Rail Stage 2 EIS.

The project also seeks to identify social and cultural values of the study area to the local Aboriginal community, in order to address appropriate and respectful mitigation strategies for any identified impacts to Aboriginal heritage presented by the project.

8.3 Aboriginal stakeholder comments

During the survey, Deerubbin LALC and Metropolitan LALC Site Officers did not report any previously unidentified cultural material within the study area. Both Deerubbin LALC and Metropolitan LALC Site Officers provided their support for completing the survey of the inaccessible areas in Melrose Park once property access can be arranged and prior to any physical works commencing along with testing in areas of archaeological potential. They both recommended further investigation is undertaken to inform the ACHAR and project design.

The Metropolitan LALC Site Officer also emphasised the high cultural significance of the Parramatta River and its surrounds, and the importance of incorporating this significance into heritage interpretation and the design elements of the project.

9 PRELIMINARY IMPACT ASSESSMENT

The study area for Stage 2 is located across the Parramatta and Ryde LGAs and the Deerubbin and Metropolitan LALC boundaries (see Figure 1.2).

The preferred southern option extending along Grand Avenue, Camellia avoided one registered Aboriginal site (AHIMS 45-6-3108) and one PAD (Area 1, in KNC, 2017) in Rydalmere. Additionally, thirteen registered AHIMS sites (AHIMS 45-6-2785, AHIMS 45-6-2786, AHIMS 45-6-2683 and AHIMS 45-6-2559, AHIMS 45-6-3582, AHIMS 45-6-3767, AHIMS 45-6-3818, AHIMS 45-6-2686, AHIMS 45-6-1523, AHIMS 45-6-2978, AHIMS 45-6-2795, AHIMS 45-6-2679 and AHIMS 45-6-4097) are located within 200 metres of the study area and are unlikely to be impacted by construction or operation of the project.

Two AHIMS sites (AHIMS 45-6-2977 and AHIMS 45-6-4015) in the Parramatta CBD and eight PADs (potential archaeological deposits with moderate to high archaeological potential) identified during the survey in Rydalmere, Melrose Park and Sydney Olympic Park could potentially be impacted by the construction of the project.

An impact assessment requires a footprint of the construction and design in detail to determine the impacts on Aboriginal heritage values which would be addressed in the ACHAR and through the test excavation program. However, in summary, the proposed works include:

- 15 stops over a 10-kilometre two-way track
- Infrastructure to connect to three transport interchanges on the Stage 1 alignment; future Sydney Metro
 West and heavy rail in Parramatta and Sydney Olympic Park; and ferry services at Rydalmere and Sydney
 Olympic Park
- 8.5-kilometre walking and bike-riding path running parallel to the light rail corridor and linking to the existing network
- a shared light rail and pedestrian zone along Dawn Fraser Avenue in Sydney Olympic Park between Australia Avenue and Olympic Boulevard
- new light rail and active transport bridges, including connections over the Parramatta River from Camellia to Rydalmere and Melrose Park to Wentworth Point.

A high level identification of potential impacts associated with the project is outlined below, based on categories of potential impacts drawn from comparable projects. Identifying potential impacts at this stage of the project links into the overall adoption of precaution taken across the technical assessments.

The categories are:

- construction phase impacts: surface. For example vehicle and plant movement, compaction impacts from vehicle movements and temporary containers and sheds, impacts to sites, places and Aboriginal cultural landscapes
- construction phase impacts: subsurface. For example any ground breaking activities i.e. excavation, heavy plant movement, installation of fence posts, geotechnical or contamination investigations which may impact Aboriginal archaeological deposits
- construction phase impacts: indirect / visual. For example impact to significant views and vistas of heritage items, impact to visual connections between heritage items and landscape features, impacts to Aboriginal cultural landscapes
- operational phase impacts that comprise the individual and cumulative impacts associated with the
 operation and life of the project. These may include impacts to visual connections between heritage items
 and landscape features and impacts to Aboriginal cultural landscapes. The operational phase may also
 include positive impacts for heritage values, such as improved public access to heritage areas and heritage
 interpretation.

The key potential impacts to sites within the study area include possible destruction and/or movement during the installation of infrastructure. Additional impact, specifically the construction of two Parramatta River bridge crossings, are likely to damage areas of high Aboriginal archaeological potential. However, it is noted design development is currently progressing and seeks to minimise construction impacts. For example, impact to mangroves may be mitigated through the use of temporary work platforms that could extend over the environmentally sensitive areas. Similarly, there may be opportunities to avoid ground disturbing works

including impacts of compaction at nominated compound areas like Broadoaks Park. The potential underwater Aboriginal heritage will be discussed in ACHAR.

However, further investigation is required in order to determine the presence, extent, and significance of areas of identified archaeological sensitivity. This investigation would consist of archaeological test excavation, which will inform the comprehensive impact assessment and appropriate design responses. See Appendix A for the Test Excavation Methodology.

10 CONCLUSIONS AND RECOMMENDATIONS

10.1 Conclusions

This report has considered the landscape and archaeological context of the study area, the archaeological potential and significance of the study area, and the potential impacts of the proposed works on the archaeological resources.

The study area contains several landforms classified as being highly archaeologically sensitive based on previous studies across Parramatta, the distribution of registered AHIMS sites in the vicinity of the study area, and a site survey. If present, the Parramatta Sand Body and associated terrace and lower slope features are landscape features that are particularly archaeologically sensitive. These landforms would have provided access to permanent water and would have been abundant in resources necessary for pre-contact Aboriginal lifeways.

Based on contextual research and the presence of suitable landforms, several areas have been identified as highly archaeologically sensitive with high potential to contain Aboriginal objects.

10.2 Recommendations

Recommendation 1: Further investigation

1a) Survey of inaccessible areas

Additional survey of those parts of the study area that were not previously surveyed in Melrose Park Public School and Wharf Road assessed as archaeologically sensitive must be surveyed prior to any physical works commencing, in consultation with the LALCs, so that potential can be confirmed along with next steps (i.e. testing).

1b) Test excavation

The identified Aboriginal heritage values in this report are likely to be impacted by the project, and further Aboriginal cultural heritage assessment is required. Transport for NSW is proposing to undertake a program of test excavations to investigate the nature and extent of Aboriginal archaeological deposits and mitigate potential impacts. Test excavation will be required to inform an assessment of archaeological significance. A test excavation methodology has been prepared for the study area and is presented in Appendix A.

If the test excavations and cultural consultation show that the area has low archaeological or cultural significance, there would be no constraints on impacts. If the PAD was shown to have a moderate archaeological or cultural significance, further mitigation measures such as salvage excavation and further mitigation measures may be recommended before impacts were to occur. If the PAD was shown to have high archaeological significance, this would inform the decisions made during project design regarding future management of that area. This includes consultation with Registered Aboriginal Parties as outlined in Recommendation 2 below. The Aboriginal cultural heritage assessment would assess the significance of Aboriginal sites/places and assess the impacts associated with the project following the test excavation program.

Recommendation 2: Aboriginal community consultation

Aboriginal community consultation must be undertaken for the project, in accordance with the *Aboriginal cultural heritage consultation requirements for proponents 2010* (DECCW). The consultative strategy should be transparent and consistent. Further consultation steps should be followed to address the knowledge gap on Aboriginal Heritage values within the study area. The best practice standards of early consultation and reduce risk to the project by identifying key cultural values early. Consultation should be ongoing for the life of the project.

Recommendation 3: Finalisation of Aboriginal Cultural Heritage Assessment Report

In accordance with the SEARs, an Aboriginal Cultural Heritage Assessment Report is required. This must be finalised on completion of the proposed archaeological test excavations (Recommendation 1) which will inform the assessment of Aboriginal cultural heritage and project impacts. Transport for NSW has also committed to undertaking cultural interviews with knowledge holders to inform the assessment of cultural values.

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Appendix A Aboriginal Test Excavation Methodology

A copy of the final Test Excavation Methodology is provided in Appendix C of the Aboriginal Cultural Heritage Assessment Report (ACHAR).

Appendix B AHIMS Extensive Search Results

A copy of the AHIMS search results is provided in Appendix B of the Aboriginal Cultural Heritage Assessment Report (ACHAR).

Appendix C PACHCI Stage 2 Survey Report – Deerubbin LALC

A copy of the Deerubbin LALC Survey Report is provided in Appendix E of the Aboriginal Cultural Heritage Assessment Report (ACHAR).

Appendix D A guide for archaeological test excavation



a guide for archaeological test excavation



Archaeological test excavation in Parramatta. (Photography by F. Barry, Heritage NSW)

Introduction

This guideline sets out the requirements for undertaking test excavation of relics of local heritage significance, relying on exception 2(d) made under section 139(4) of the *Heritage Act 1977* (exception 2(d)), published in the NSW Gazette on 18 February 2022 (the order).

Under the Heritage Act 1977, a 'relic' means any deposit, artefact, object or material evidence that:

 relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement, and

• is of State or local heritage significance.

Relics are protected under *the Heritage Act 1977*. Excavation and disturbance of land may require an excavation permit under section 140 or otherwise fall within an exception under section 139(4).

Exception 2(d) provides an exception from the requirement to hold an excavation permit for:

"Any disturbance or excavation of land for archaeological test excavation of relics of local heritage significance completed in accordance with the guideline 'Relics of local heritage significance: a guide for archaeological test excavation' published by Heritage NSW

Archaeological test excavation under the section 139(4) exception 2(d) must be in accordance with this guideline. The works must also meet the general conditions prescribed for the exceptions. See the <u>order</u> published in the NSW Gazette for full details.

This guideline sets out the test excavation requirements, including:

- 1. what test excavation is,
- 2. how to conduct test excavation under an exception, and
- 3. how to ensure the work is of an appropriate standard and the results are clearly documented.

These exceptions **DO NOT** apply to relics of State heritage significance. See the <u>s140 application</u> information on the Heritage NSW website if relics of State heritage significance are predicted.

Archaeological relics may also be listed on the State Heritage Register. These exceptions **DO NOT** apply to any relic that is State Heritage Register listed or subject to an interim heritage order. See the <u>s60 application</u> information on the Heritage NSW website for further information.

There are penalties under the *Heritage Act 1977* for failing to obtain an approval, excavation permit or comply with a relevant exception, such as a fine of up to \$1.1 million, or in serious cases, imprisonment for up to 6 months. It is therefore important to ensure you understand the requirements that apply.

If Aboriginal objects are suspected to be present on the site, management under the *National Parks and Wildlife Act 1974* is required. Visit the Heritage NSW website for more information on managing <u>Aboriginal cultural heritage</u>.

What is archaeological test excavation?

Archaeological test excavation is the process of verifying and assessing site conditions to establish the integrity, extent, and significance of relics and to determine appropriate further action. Test excavation should be limited to the smallest impact required to understand the archaeological resource and answer the testing research design.

The purpose of test excavation under exception 2(d) is to complete this basic investigation to guide the next steps for the understanding and management of any relics.

An archaeologist must direct the test excavation and recording of relics of local heritage significance during the operation. The relics may be part of a wider archaeological site or discrete features in the landscape. The program may result in the preparation of a report.

If there are known or predicted relics of State heritage significance, the test excavation exception 2(d) **DOES NOT** apply. A section 140 application may be required for your works. See the <u>historical archaeology</u> information on the Heritage NSW website.

If your project area has a relic that is subject to an interim heritage order or a listing on the State Heritage Register, the test excavation exception 2(d) **DOES NOT** apply. A section 60 application will be required for your works. See the <u>State Heritage Register items</u> information on the Heritage NSW website.

Step 1: Assess the archaeological relics

To conduct a test excavation relying on exception 2(d) and this guideline, you must assess and document the relics in a heritage management document (a heritage impact statement, archaeological assessment, etc). This document must provide:

- a short description of the type of relics and their significance against the Heritage Council guideline, <u>Assessing Significance for Historical Archaeological Sites and 'Relics</u>',
 - Note If relics of State heritage significance are identified, or they are State Heritage Register listed, or subject to an interim heritage order, exceptions **DO NOT** apply.
- a short description of the proposed activities/works with at least one map or diagram to show the location of the test trenches and their sizes.
- a description of any previous archaeological works in the area and the cumulative impact of the works (see cumulative impact section below),
- a short discussion of the test excavation and how it will answer questions to guide the understanding and management of the relics,
- a test excavation research design and excavation methodology in accordance with steps 2 and 3 below,
- the name and contact details of the historical archaeologist who will complete the archaeological works,
- confirmation that information on the test excavation will be submitted to the Heritage Council under section 146 of the Heritage Act 1977 if relics are identified.

The Heritage Council has guidelines which provide information on preparation of an historical archaeological assessment in NSW (<u>Archaeological Assessments</u> 1996, <u>Historical Archaeology</u> <u>Code of Practice</u> 2006 and <u>Assessing Significance for Historical Archaeological Sites and 'Relics'</u> 2009).

Heritage NSW has also provided a template Record of Use form that may be used in the recording of exceptions. Attach any professional advice sought for your records.

Cumulative Impact

As archaeology is non-renewable, ongoing or repeated excavation and disturbance of archaeology will deplete this resource. Consequently, the cumulative impact of activities/works on archaeology must be assessed. A cumulative impact assessment must carefully analyse any previous works at

the site and their impact over time, along with the effect of the proposed activities/works to be undertaken now.

One project by itself may be of minor impact, however several activities/works that impact archaeology, when combined, may present an unreasonable overall impact by eroding or entirely removing the resource or heritage value. Preparation for minor works using an exception must address the cumulative impact of the works. The works will not fall under the exception if they may generate more than a limited impact to relics of local heritage significance.

Strategies that can minimise cumulative impact must be considered when planning your work, such as:

- · reusing existing service trenches and utility corridors,
- consolidating ground disturbance areas, or
- building up not down.

Step 2: Prepare the test excavation research design

The research design is the framework for the investigation and identifies questions which will be addressed during the test excavation. The research questions below must be addressed as part of the archaeological program. Additional questions may be added at the discretion of the archaeologist.

The aim of archaeological testing under exception 2(d) is not to address a long list of research questions. However, the testing may highlight the potential the site has to address important substantive research questions in the future. It may be helpful to divide questions into descriptive, analytical, and interpretative sections to ensure that the test excavation is able to provide clarity on the relics of local heritage significance.

The required research questions are:

- What was identified at the site? What kinds of features and deposits?
- When were these features or deposits created? How are they phased against the site historical analysis?
- What site formation processes have occurred?
- What happened at the site?
- How does this site compare to others?
- What contexts, phases, and activity areas are evident, and how are these demonstrated by the various excavation units (trench/square/context/feature)?
- Where were the relics located?
- Compare the results with other relevant sites, related projects, and current research; how
 does the project fit into broader, regional frameworks and theoretical models if they exist?
- Indicate how and/or why the subject site differs from other sites.

Step 3: Prepare the test excavation methodology

The development of the test excavation methodology must consider the extent of any proposed impacts, the perceived significance of the site, the research design questions, levels of resourcing, site constraints and other factors. The methodology must describe how the project area will be excavated, record spatial and stratigraphic information, and if needed, remove limited relics. It must also explain why these methods have been chosen and how they will help address the research design.

A test excavation methodology must be written which covers the following aspects of investigation:

- the location of test excavation trenches and reason for selection.
- trench size and dimensions (test excavation units may be combined and excavated as necessary to understand the site characteristics),
- excavation techniques (for example, backhoe stripping, hand excavation, etc),
- site recording including:
 - o site photographs including north arrow and scale
 - o sketch plans to scale
 - stratigraphic matrix showing context relationships
 - relic management including a catalogue
 - establishment of the site datum for maps and plans including levels reduced to Australian Height Datum for identified features/contexts, with top and base of excavation
 - o context recording and a logical numbering sequence for the site (e.g. grid system)
 - illustrative maps, plans, sections, and photos, including full site plan showing location of all trenches and excavated features
 - o relic records must include trench, feature, context and phase information so that activity areas can be identified as comprehensively as the integrity of the site permits.

Step 4: Complete and report on the works

If after reading this guideline you consider the proposed archaeological test excavation meets the requirements of exception 2(d), you must document your decision and a summary of the works and keep your records for a reasonable time in accordance with the general conditions. See the order published in the NSW Gazette for full details.

Heritage NSW has information on what to include in an <u>archaeological report</u> on the Heritage NSW website. This provides a guide to information that may be appropriate to include in a testing report.

Discovery of a relic

You **do not** need to notify the Heritage Council if no relics are found. If relics are found, notification of the relic's location under section 146 of the *Heritage Act 1977* is required. As noted in general condition (h):

"A person who is aware or believes that he or she has discovered or located a relic, in any circumstances (including where works are carried out in reliance on an exception under section 139(4)), must notify the Heritage Council in accordance with section 146 of the *Heritage Act 1977*. Depending on the nature of the discovery, additional assessment and approval under the *Heritage Act 1977* may be required prior to the recommencement of excavation in the affected area(s)."

Having used exception 2(d) the process of section 146 notification should occur within a reasonable time and take the form of an email to the Heritage Council (heritagemailbox@environment.nsw.gov.au) identifying that the relic was discovered when relying on the exception referred to above and providing:

- the GPS location of the relic,
- a photograph of the relic in its location (for context), and
- a short summary of the test excavation results (no more than 500 words).

No formal acknowledgment of the notification will be provided.

If the test excavation identifies that further archaeological work is required, e.g. a salvage excavation, then a section 140 excavation permit may be necessary. See the <u>s140 information</u> on the Heritage NSW website. We recommend you submit any documentation relating to the exception, such as your completed Record of Use, with your application.

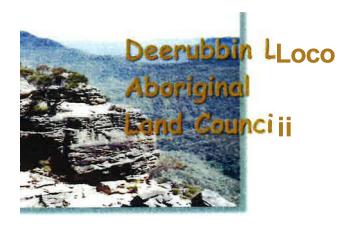
Version no. 1

Publication/copyright date

2022

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Appendix E Deerubbin LALC Survey Report



73 A, O'Connell Street, Main Gate, Cor of Dunlop & New Street, North Parramatta . (Former Correctional Centre) NSW 2151

PO Box 2341, North Parramatta NSW 1750, AUSTRALIA

ABN: 41 303 129 586 T: (02) 4724 5600 F: (02) 4722 9713

E: reception@deerubbin.org.au W: http://www.deerubbin.org.au

RPS Group Level 13, 255 Pitt Street SYDNEY NSW 2000 Our Ref: 3342

26 April 2022

SUBJECT: PROTECTION OF ABORIGINAL CULTURAL HERITAGE

Parramatta Light Rail Stage 2

Attention: Bengi Selvi- Lamb - Heritage Consultant

Are presentative of Deerubbin Local Aboriginal Land Council inspected section of Stage Light Rail Parramatta from Olympic Pk to Rosehill on Monday, 24 January 2022. An Aboriginal cultural heritage assessment was undertaken to evaluate the likely impact the proposed development has on the cultural heritage of the land.

Although no Aboriginal cultural materials (in the fonn of stone artefacts, for example) had been located on the surface during the assessments of the study area, Deerubbin Local Aboriginal Land Council, recommends, that the route be further investigated due to the proximity of a major waterway.

Yours Faithfully,

A

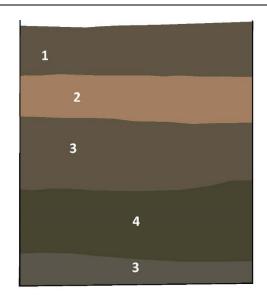
(Steven Randall Aboriginal Cultural Heritage Officer)

C.c. Barry Gunther - Office of Environment & Heritage

Appendix F Section drawings and spitsheets of PLR2 PAD5 Broadoaks Park

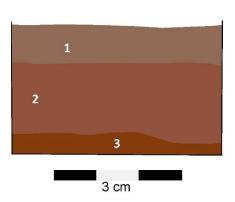
TP 901 PAD5 Broadoaks Scale 1/10 North section pH: 6 Munsell: 1-7.5 YR 2.5/2

1- 7.5 YR 2.5/2 2- 7.5 YR 2.5/2 3- 7.5 YR 2.5/2 4- 7.5 YR 3/3





TP 902 PAD5 Broadoaks Scale :1/10 North section pH: 6 Munsell: 1- 5 YR 2.5/2 2- 5 YR 3/4 3- 5 YR 4/6



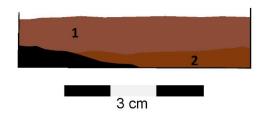


TP 903
PAD5 Broadoaks
Scale: 1/10
North Section
pH: 5 ½
Munsell:
1- 5 YR 2.5/2
2- 5 YR 3/3
3- 5 YR 3/4



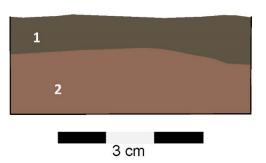
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TP 904
PAD5
Broadoaks
Scale 1/10
North Section
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Munsell:
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2- 5 YR 4/6



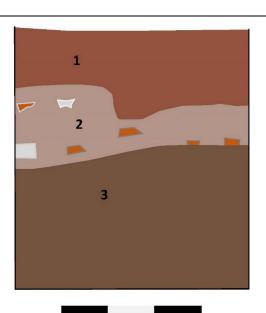


TP 905 PAD5 Broadoaks Scale 1/10 North Section pH: 6 Munsell: 1-5 YR 3/2 2-5 YR 3/4





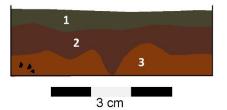
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3 cm



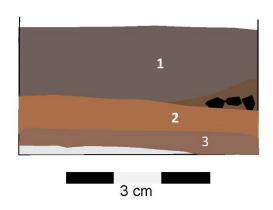
TP 908
PAD5 Broadoaks
Scale 1/20 (1x1 m
test square)
South Section
pH: 1-7½, 2-6½,
3-4
Munsell:
1-7.5 YR 3/3
2-7.5 YR 3/4
3-5 YR 4/6





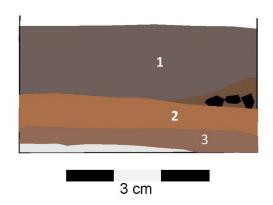
TP 910
PAD5 Broadoaks
Scale 1/10
North Section
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soil 2- 5 YR 5/5 3- 5 YR 3/4

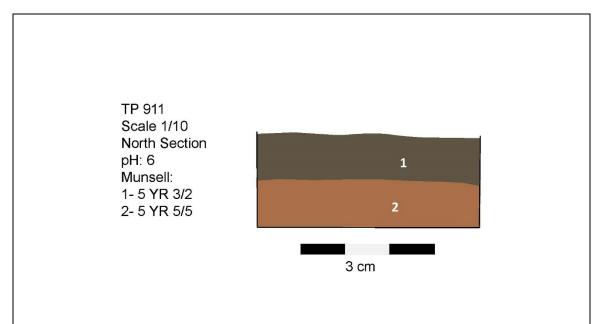




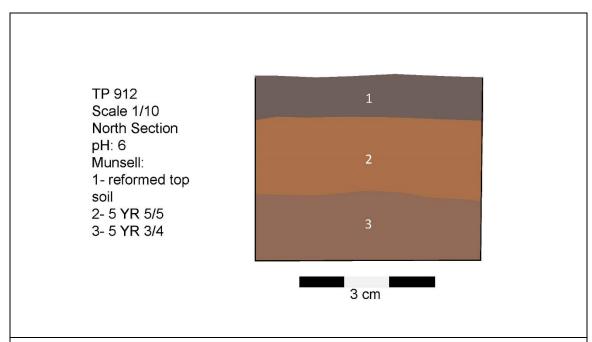
TP 910
PAD5 Broadoaks
Scale 1/10
North Section
pH: 6
Munsell:
1- reformed top
soil
2- 5 YR 5/5
3- 5 YR 3/4



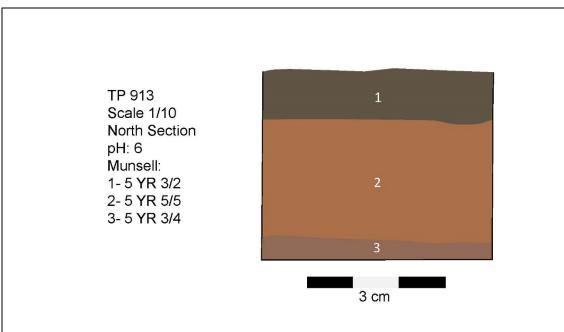




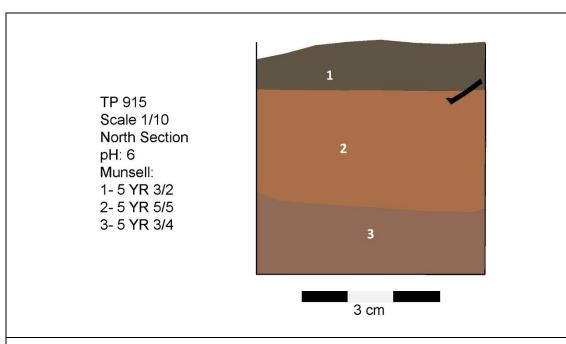




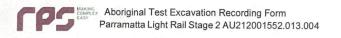












PAD/Site Name: PAD 5 B109 dog 48
Pit Nm.: 901
1/11/22

Excavator/s:	YP.	KC	.DW
		1	,010

	Bucke	et Count			
Spit	Depth (cm)	A	В	С	D
1		3		,	
2	100	2			
3	ISOM	2			
4	20.14	6			
5	250M	3.3			
6	300M	27.			
7	35° M	30			
8	3) O M	20		-	
9	YOUKOM	2			
10	CO.M. 15	30			
11	56CM	0 3			
12	The second secon	-	12		
13				<u> </u>	
14					
15			2		

							Sp	it Nn	1						COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SOLOGN STREET
	- 125	1	1	/	/	/	/		/	/	/		<u> </u>	1	Red
43	/	/	/	11	V.	V	- 4	VV	4	//		11.792			Orange
V	V	V	V	1	~	V	V	J	V	1					Brown
		233	8	-				-		-				_	Yellow
	77.3	100											1		Grey
4.	1 4			-1-						5.17	0.00				Dark Grey
					4.53					A 41	5, 74				Pale
					News.		Sn.	it Nm							
1	2	3	14	- 5	.6	7	8 -	9	.10	11	/12	13	14	15	MOISTURE
•	-	/	/-	, ,	/	1	/	9	10	1	12	13	14	15	De
J	1	1	1	1	1		/	1	1	-/	-	10 -r	1000	or Land State of J	Dry
_	-	-	-	-	•	_	_						1	A Comme	Moderately moist
7	-													1,740	Moist
1.40														0.00	Wet
							Sp	it Nm	i		/				ROOT ABUNDANCE
1	2	3	4	5	6/	7	8	/9	10	11	12	13	14	15	(number per 10 cm ²)
6		//	1	?	/				./	1					No roots (0)
	V	~	V	V	V	V	4	· *	-/						Few (1-10)
1												-		400 M	Common (11-25)
√														ht is	Many (26-99)
9/4	Dist.												7		Abundant (>100)
							2000	1							
	/			/		/	Spi	it/Nm		/				,	ROOT SIZE
1	2	3	4	5	/6	/7	18	9/	10/	11	12	13	14	15	(diameter)
V	V	V	1	~	V	/	/	V	1			1.			Fine (1-2 mm)
					1		,				7				Medium (2-5 mm)
															Coarse (>5 mm)
_								it Nm						- 1-15,	HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
								/	/			2 .	1.3	SET SE	Sharp (<0.5 cm)
				/			/		/		852			755	Abrupt (0.5-2 cm)
		1		_/		1			1/		8.55	1	be		Clear (2-5 cm)
_		_/		V	V	1	V	V						+ 100	Gradual (5-10 cm)
		3/	V.									/	20 72	1000	Diffuse (>10 cm)

							S	it Nn	n					- 1	SOIL COMPOSITION
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	COIL COIM COITION
10						1 . 3	9.29						+	1.0	Sand
				1					_				1		Loamy sand
	1	/	/	/			1		_			 			Sandy loam
	V	~	1	ý		_		1	/	_		-	2 575		Sandy clay loam
	1		-	_	1	1	1	1	/	-	-	100		-	Sandy clay loam
1		_		<u> </u>	/		/	1	/	/	/	- 31	1	-	Loam
_			+	V	1	1	1./		1	1	-	- 6	K.	-	
	-		_	-	-		V	1	-	-6			50	-	Clay loam
	+	+	-		-	-	-	-	1507 T		-		1		Silty clay loam
	-	-	-		-	-	-	- 2	1	-		-			Silt loam
	-	-	-	-	-	-		-	-				-	-	Silt
	-	-	-	-		-	-			-	Marie		-		Silty clay
							1			100					Clay
_		_						it Nn							INCLUSION TYPE
1	2	3	/4	10	9	11	/8	9	10	11/	12	13	14	15	
	·V	V	V	1/4	N	N	ju	1	//	//				7.0	Ironstone
			V	1	V	V	1	V						- 15.1	Manganese
				/	1								-		Charcoal
	17.7		1	(-								100		Burnt clay
	=	-	~	/		/	/	100							Sandstone
			V	V		V									shale
1	2	3		5	6	-	Sp 8	it Nm			12	40			INCLUSION ABUNDANCE
·	12	3		3	0	1	-	9	10	<i>y</i> 1	1	13	14	15	
V	V	_		/	1	/	9	1						1	None
	_	1	1	1			//	_			_				Very Few (<2%)
-		~	V	V	V	-	V	·/							Few (<2-10%)
	1	5.0	-												Common (10-20%)
	_													100	Many (20-50%)
						-								1.00	Abundant (50-90%)
													2		Very abundant (>90)
				1			Sp	it Nm							INCLUSION ABUNDANCE
1	2	3	4	5	6	7	8/	9	10	21/	12	13	14	15	
		-	11			30	10	û		W		-			Fine gravel (2-6 mm)
	-		V	V	V	-0									Medium gravel (7-20 mm)
															Coarse gravel (21-60 mm)
															Cobbles (61-200 mm)
														1	Stones (201-600 mm)
														\$	Boulders (601-2000 mm)
	, 0						Sp	t Nm							DISTURBANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
-			-	-	-	-	-		10		12	13	144	10	Rewaited topso
			-	-											
				-					T.E.						Ploughing
-		-	_						_						Grazing
\dashv		/						_		242					Erosion
		. /		_		_				4 -1					OTHER MATERIALS
-	V	V		-				11/1							Glass
_				1	_	100			11,000					7 -	Ceramic
					-			-2					1.7		Brick
_			27.1		16.				1				100		Concrete
	7.0					1	_		114			1			Plastic
1									1	-		10 35	A. S. C.		Metal
	19.5	11 1													

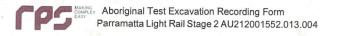
3 9 6 , co, 6 3 0 modified Damidag t husdoud Liosdat è

Broadoak Site Name/TS No: P4DS 2.5/2 @ 7.57R 2.5/2 1 7.54R 2.5/2 1/11/22 - 17.43 9757R 3 75YR Section: Munsell: 9 Scale: Date: pH: RLs:

consolving glass, metal etc. Test pit continues into topseil overlaying heavily modified fill Sitty clay - rewalted. Introduced Notes

Fill layer may be assaciated with past land use as a lay down grea for nearly construction

47P 901



PAD/Site Name: bload only PAD 5
Pit Nm.: 902
Date:
UIII 1022

Excavator/s: Kegri Tegan, Phill, Leet

	Buc	ket Count			
Spit	Depth (cm)	Α	В	С	D
1	10	5			
2	10	5			
3	10	7			
4	1	3			
5					
3, 6					
7					
8 /					
9					
10					
11					
12					
13					
14					
15					

							Sp	it Nm	l					1	COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Red
	×	7													Orange
¥	×	X													Brown
,															Yellow
															Grey
	, Y		11												Dark Grey
															Pale
							Sp	it Nm					-70.00.000.0000		MOISTURE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
X	X	×													Dry
	X	X		dar.											Moderately moist
				1											Moist
		Value is													Wet
							Sp	it Nm							ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm²)
-		X													No roots (0)
,	X														Few (1-10)
<u>×</u> _															Common (11-25)
×															Many (26-99)
															Abundant (>100)
								it Nm							ROOT SIZE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
X	X														Fine (1-2 mm)
															Medium (2-5 mm)
									2000-0					Y	Coarse (>5 mm)
4	_			-				it Nm							HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		40													Sharp (<0.5 cm)
2.0		200				57									Abrupt (0.5-2 cm)
2017															Clear (2-5 cm)
	1														Gradual (5-10 cm)
	X	X													Diffuse (>10 cm)

								it Nn					T1	100	SOIL COMPOSITION
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
										7.77		200			Sand
															Loamy sand
														-	Sandy loam
							1								Sandy clay loam
															Sandy clay
															Loam
					3										Clay loam
															Silty clay loam
															Silt loam
		. /													Silt
	X	X													Silty clay
															Clay
								it Nm							INCLUSION TYPE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	X	X													Ironstone
		X													Manganese
	8														Charcoal
	8														Burnt clay
															Sandstone
											-				
							Sp	it Nm							INCLUSION ABUNDANCE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1.00
-			-	_	-	i -	-	-	-10		12	13	14	13	Nana
\dashv							-								None None
-	~	1				-	_	-		-					Very Few (<2%)
-	8	X					-								Few (<2-10%)
						_		_							Common (10-20%)
\dashv	_														Many (20-50%)
\dashv			_						-						Abundant (50-90%)
															Very abundant (>90)
							e,	it Nm							INCLUSION ABOUT AND
_	2	3	4	5	6	7	8 8	9	10	11	12	13	14	145	INCLUSION ABUNDANCE
	-	-	~	-	U	-	0	9	10	11	12	13	14	15	F: 1/0 0
+							_								Fine gravel (2-6 mm)
1	1	~													Medium gravel (7-20 mm)
-	X	X			_									-	Coarse gravel (21-60 mm)
+		3	-	_	-										Cobbles (61-200 mm)
+	-	j													Stones (201-600 mm)
		-							-						Boulders (601-2000 mm)
								t Nm							DISTURBANCE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	-
4															Bioturbation
4															Ploughing
					1										Grazing
															Erosion
															OTHER MATERIALS
I															Glass
T															Ceramic
1	X														Brick
1				\neg											Concrete
-	\neg			\neg		_									Plastic
+						- 1	- 1	- 1	- 1	- (Metal

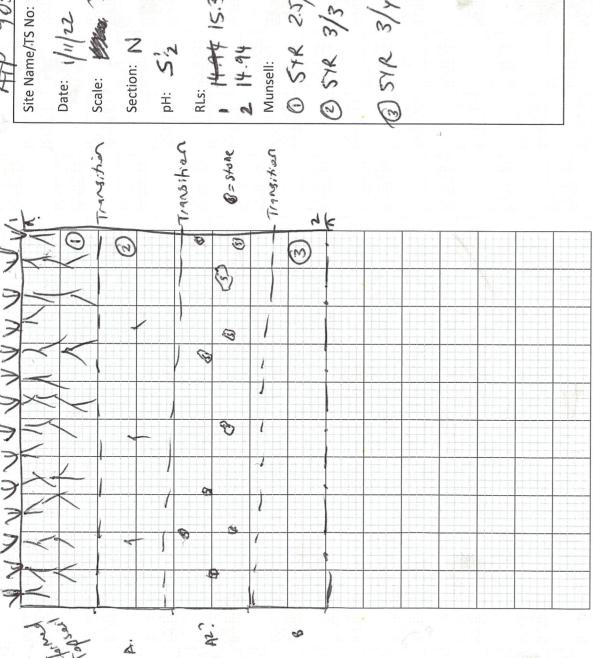
Site Name/TS No: ATP 902 @ 54R 5/4 @ 54R 4/6. RLS: 16.46 1-16.45 2-16.14 Section: N @ SYR; Munsell: pH: **6** Scale: Date: 11 chassad (5) = brick. (8) = stolle. 0 7 3 17 110 1 1/1/1 14 Lebined 1 BE SE

Aboriginal Test Excavation Recording Form
Parramatta Light Rail Stage 2 AU212001552.013.004

7/4 	Buck	cet Count			
Spit	Depth (cm)	А	В	С	D
1	10	5			
2	10 20	5			
3	30	3			
4	S.O.o.	a .		•	
5	90				
6					
7					
8					, , , , , , , , , , , , , , , , , , ,
9					
10					
11	¥				
12					
13			2		
14					
15					

							Sp	it Nm	1						COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
10		4		7'a											Red
, Y -	X	V	X												Orange
X	X	Z.	X												Brown
		33%													Yellow
		14	2												Grey
															Dark Grey
															Pale
							Sn	it Nm					200		MOISTURE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	WOSTORE
-	-		-7	3	"	'	-	3	10	- 11	12	13	14	13	Dry
	X	A	X			-	-				-			100	Moderately moist
X		~	~			-							-	S. A. S.	Moist
	100					-	-	-					150	- ALAST 12	Wet
	1000	1 1 0							L			100		.514574	vvei
							Sp	it Nm							ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm²)
		%	X										. 19		No roots (0)
4.3	X	5/50	1									- 12	10.00		Few (1-10)
X	15. 1		1 5										2	KL 1	Common (11-25)
. 1	1 1	1										7.71	14-14-1	district.	Many (26-99)
					14.							* ,	Har	40.07	Abundant (>100)
					150										
1	-	3	4			-		it Nm			10	10		Sana a	ROOT SIZE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
×	X	-	~		12.									1 45"	Fine (1-2 mm)
		1			- 19										Medium (2-5 mm)
															Coarse (>5 mm)
4	2	2	4	-		-		it Nm		- 44	40	40		1.5	HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Sharp (<0.5 cm)
	1														Abrupt (0.5-2 cm)
	X		~												Clear (2-5 cm)
X .		×	~												Gradual (5-10 cm)
9															Diffuse (>10 cm)

				· Court											
							Sp	it Nm	i						SOIL COMPOSITION
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Sand
															Loamy sand
															Sandy loam
															Sandy clay loam
															Sandy clay
															Loam
		×													Clay loam
X	8	-													Silty clay loam
	End												-		Silt loam
-		<u> </u>				1									Silt
			X								-			-	Silty clay
		-	/							 					Clay
			l									1	1		Olay
						Liber	Sn	it Nm							INCLUSION TYPE
1	2	3	4	5	6	7 -	8	9	10	11	12	13	14	15	INGEOGION THE
i -	-	X	×	V	-	1000	-	-	-10	··-	12	1.5	1	15	Ironstone
	-	0	70	^		-	-			-	-	-	-		
	-	1		V	-	-	-				-		-		Manganese
		X	X	×	_				1		-				Charcoal
		-	-		_										Burnt clay
7	*	K													Sandstone
							e,	it Nm							INCLUSION ADUNDANCE
4	1 2	1 2	1 4	-		T -7	8 8			- 44	140	40		1.45	INCLUSION ABUNDANCE
1	2	3	4	5	6	7	0	9	10	11	12	13	14	15	
			-	SA.											None
			-	X			-								Very Few (<2%)
*	*	×	X												Few (<2-10%)
															Common (10-20%)
															Many (20-50%)
															Abundant (50-90%)
															Very abundant (>90)
							C	ia Nima						1	INCLUCION A DUNDANCE
1	2	3	4	5	6	7	8 8	it Nm 9	10	11	12	13	14	15	INCLUSION ABUNDANCE
·	_		×	-	-	<u> </u>	-				12	-10	1-7	15	Fine gravel (2-6 mm)
_		8	1		-								-		Medium gravel (7-20 mm)
		0		-		-					-				Coarse gravel (21-60 mm)
			_	-	_										
			_								-				Cobbles (61-200 mm)
	_														Stones (201-600 mm)
															Boulders (601-2000 mm)
	981						Sp	it Nm							DISTURBANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	,	i													Bioturbation
	1														Ploughing
															Grazing
															Erosion
															OTHER MATERIALS
K		3 "													Glass
1-4								· .							Ceramic
	1	1													Brick
					-										Concrete
_	+	-									-				Plastic
	-	1									-	_			Metal
~	-	1	-		-										
X															Other (Specify) CAN



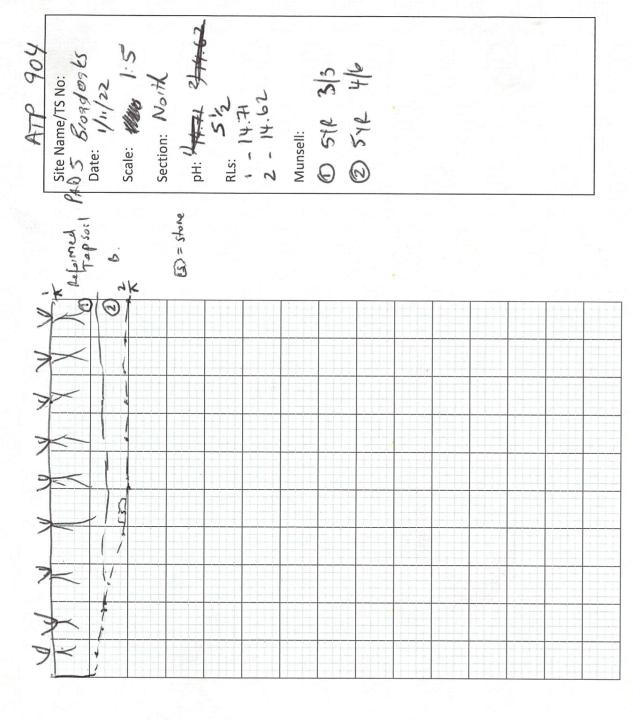
ATP 903

Excavator/s:

	Bucket Co	unt			
Spit	Depth (cm)	Α	В	С	D
1	0-10	5	1.00		
2		7			
3					
4				•	
5				1 1	
6					
7					
8					-
9					-
10					
11					
12					
13					1 1/17
14					1
15		d ones			2

							Sp	oit Nm	1						COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	- COMOGR
													0 20		Red
X							-								Orange
¥								4.1							Brown
		1000													Yellow
				- 1								-2			Grey
		9.4						3							Dark Grey
	/ 1						1 72								Pale
							Sr	it Nm	1						MOISTURE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	WOISTORE
×					-	<u> </u>		7.43.		· · ·		10	17	15	Dry
-						v		234							Moderately moist
	-	11/			-					-					Moist
	- 4														Wet
		1.50			_		-						-		vvei
							Sp	it Nm	1						ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
						_17/									No roots (0)
								111					140		Few (1-10)
4						10							- 13		Common (11-25)
	-														Many (26-99)
									111		38				Abundant (>100)
							Sn	it Nm	je						ROOT SIZE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
9	-	-	<u> </u>		_	<u>'</u>	-	-	10	11	12	13	14	15	(diameter)
547	-						-								Fine (1-2 mm)
_															Medium (2-5 mm)
		-					Sn	it Nm	18.70						Coarse (>5 mm) HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	HORIZON BOUNDARY
-	_			-	-	<u> </u>	-	-	10	- 11	12	13	14	13	Chara (s0.5 and)
			-												Sharp (<0.5 cm)
-				_	_		-								Abrupt (0.5-2 cm)
•							_						- 1		Clear (2-5 cm)
-000				_											Gradual (5-10 cm)
	1 - 1 - 1				-										Diffuse (>10 cm)

						٥,	oit Nn							OOU COMPOSITION
1 2	2 3	4	5	6	7	8	9	10	11	12	13	14	15	SOIL COMPOSITION
· -	-	+-	-	-	+-	"	-	10	11	12	13	14	15	Cond
		+		1	+-	-		-			10.000	-		Sand
_		+-	-		-	+-		-		-		_		Loamy sand
_	_	-		-	-	-		-		-				Sandy loam
-	-	+		-	-	100				-				Sandy clay loam
	_	-	-	-		+					-	1.50		Sandy clay
_	_	-	-	-	-	-						11		Loam
R		-	_		-	_		17.00						Clay loam
		-		-	_	-	-	1 100				17 -	*	Silty clay loam
-		-		_										Silt loam
_		-						-						Silt
-		_									100			Silty clay
														Clay
						Sr	it Nm	,						INCLUSION TYPE
1 2	3	4	5	6	7	8	9	10	11	12	13	14	15	INOLUGION TIPE
er.														Ironstone
			1								-			Manganese
	_		-				1							Charcoal
,	_												-	Burnt clay
+		1		-		-	-			-	-			
												- 1	-	Sandstone
							it Nm							INCLUSION ABUNDANCE
1 2	3	4	5	6	7	8	9	10	11	12	13	14	15	
-	-	-	0.63	1.0										None
-	-										1		100	Very Few (<2%)
		_												Few (<2-10%)
9														Common (10-20%)
								1 10 1		14 11 14		10 E		Many (20-50%)
					- 1									Abundant (50-90%)
														Very abundant (>90)
						Sn	it Nm							INCLUSION ABUNDANCE
1 2	3	4	5	6	7	8	9	10	11	12	13	14	15	INCLUSION ABUNDANCE
>						1	100				1 13			Fine gravel (2-6 mm)
			11	1			1.							Medium gravel (7-20 mm)
				y			-						1, 1	Coarse gravel (21-60 mm)
														Cobbles (61-200 mm)
								7. 7.						Stones (201-600 mm)
														Boulders (601-2000 mm)
														20010C13 (001-2000 IIIII)
	1.2		- 1	•			it Nm	40				1		DISTURBANCE
1 2	3	4	5	6	7	8	9	10	11	12	13	14	15	5: /
			-									9		Bioturbation
+									* 1			y 1		Ploughing
-														Grazing
	-													Erosion
_														OTHER MATERIALS
8													87	Glass
														Ceramic
														Brick
														Concrete
												-		Plastic
1														Metal
					- 1	- 1				- 1		- 1		MELAI





PAD/Site Name: PAD 5 Broadoaks
Pit Nm.: 905
Date: VII/22

Excavator/s: Belinda,

	Bucket	t Count		X	1
Spit	Depth (cm)	Α	В	G	D
1	0-10	50	33	33 PS 2 2 2 2	1000
2	10-10			No. of the last	
3	100			100	
4	D 10		40 KH 2	111111	1 1
5	A CONTRACTOR OF THE CONTRACTOR				1
6					
7	Paral VI				
8	1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1. 1				
9					1
10				,	
11					
12	3 4515		9.6	7000	
13					
14					
15	A NO.				_

							Sp	it Nm						-	COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		-			1										Red
	4	20	9						1						Orange
K	×	MI		- 1											Brown
	1416	-													Yellow
	+1	Total I													Grey
	1 - 83	1.11			1.1										Dark Grey
	173	1 07													Pale
							Sn	it Nm			1			i	MOISTURE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	MOIOTORE
	1							-		<u> </u>					Dry
	X	1								-					Moderately moist
×	-	1.0					/								Moist
,															Wet
					-										
								it Nm							ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
417		**	3 3 7								1 1 1				No roots (0)
- 11	X	3			1.7										Few (1-10)
73	•	1													Common (11-25)
X	1	. 8											1 =		Many (26-99)
200					1.								1.7		Abundant (>100)
							Sp	it Nm							ROOT SIZE
1	2,	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
×	1	V .		1			2 111					111	-		Fine (1-2 mm)
	,						1						-		Medium (2-5 mm)
		-					111 212					1 -			Coarse (>5 mm)
							Sp	it Nm					1000		HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
			1 4												Sharp (<0.5 cm)
															Abrupt (0.5-2 cm)
		39.							- 1						Clear (2-5 cm)
100	1	1)												Gradual (5-10 cm)
×		11													Diffuse (>10 cm)

			i sai	1				it Nm					1	χ.	SOIL COMPOSITION
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	3 ,			1.11				7							Sand
					11		1.7	1, 1		177		1 171			Loamy sand
							- 2	1111							Sandy loam
	11			- 1	-									1.0	Sandy clay loam
						1 .									Sandy clay
	A										-	1	1.5		Loam
												-	1		Clay loam
								0.5						12.5	Silty clay loam
-						-		1							Silt loam
															Silt
1	X														Silty clay
		""								119		91.02	¥.	100	Clay
						581	Sp	it Nm	1						INCLUSION TYPE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
× i	X	3	1 1			× 1			200		v 11				Ironstone
1	X				1								14141		Manganese
	X		1 15			y 10 13			dill'		- 27				Charcoal
			20											11	Burnt clay
1	×												1		Sandstone
							Sp	it Nm	U ,						INCLUSION ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
							2.11	0.0						1 1	None
8		199										1	7.4		Very Few (<2%)
	X	, ,													Few (<2-10%)
1												2	- 2		Common (10-20%)
			-								10.00				Many (20-50%)
						- 1								11	Abundant (50-90%)
															Very abundant (>90)
								it Nm		J. 13			7 2 1		INCLUSION ABUNDANCE
_	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
<		-0-					1					1			Fine gravel (2-6 mm)
	X	H			1		* * *	1 1					- E		Medium gravel (7-20 mm)
				11.40			1 . 1					1			Coarse gravel (21-60 mm)
											1			-	Cobbles (61-200 mm)
				17	-								- 1		Stones (201-600 mm)
															Boulders (601-2000 mm)
							Sp	it Nm							DISTURBANCE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
					17.0			100				11			Bioturbation
				- 1			100					10.11			Ploughing
					3 1										Grazing
		7.1			0.14										Erosion
		1								11					OTHER MATERIALS
4						=.17			-11		. I		1.0		Glass
							7							111	Ceramic
			- 1			- "	-					-	1		Brick
									- 1						Concrete
_															Plastic
							_	_			_				
+								- 1	1		{ 1	I			Metal

Site Name/TS No:
PAD 5 6/08 dog kg
Date: 1/1.1. Section: North SYR STR Munsell: 9 Scale: pH: RLs: (3) 0 0=54M Transition 0 0 63 BB G 8 7 13 Lews Les O Per ingland

PAD/Site Name: (A) S
Pit Nm.: 9 06
Date:

Excavator/s: Sey.

80×50 cm. TP. - TP906.

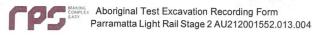
	Bucket	Count			
Spit	Depth (cm)	Α	B	С	D
1	0-10			-	1
2	10-20				
3	1.0-30				
4	20-40				1
5	45-50-7		944	1	
6	50-53				
7	13 / 2				
8					
9				1	
10				1	
11					
12				-	
13					
14			1		
15					

							Sp		COLOUR						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Red
															Orange
~	V	V	,	~	V										Brown
še 📖															Yellow
															Grey
															Dark Grey
		V													Pale
							MOISTURE								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
· ·	V	V		V	V										, Dry
/					1										Moderately moist
															Moist
															Wet
							ROOT ABUNDANCE								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm²)
	10.00														No roots (0)
	- 12	1./	V	V	V										Few (1-10)
\vee	V														Common (11-25)
	> "														Many (26-99)
															Abundant (>100)
	See al						Sp	it Nm							ROOT SIZE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
V	V	V	V	V	~										Fine (1-2 mm)
															Medium (2-5 mm)
															Coarse (>5 mm)
, ,								it Nm							HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Sharp (<0.5 cm)
															Abrupt (0.5-2 cm)
	V	`	,			_									Clear (2-5 cm)
					1	7									Gradual (5-10 cm)
V					1										Diffuse (>10 cm)

	_							it Nn						11	SOIL COMPOSITION
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
			_												Sand
		<u> </u>													Loamy sand
							<u> </u>								Sandy loam
			-				<u> </u>								Sandy clay loam
															Sandy clay
			_												Loam
-/			_												Clay loam
V	1	V		_											Silty clay loam
															Silt loam
															Silt
	*														Silty clay
						L									Clay
							Sp	it Nm							INCLUSION TYPE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
V	V	V	V	V											Ironstone
V		V	V	V											Manganese
			V	V											Charcoal
															Burnt clay
															Sandstone
							Sp	it Nm	ı		•				INCLUSION ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															None
			,												Very Few (<2%)
~	V	V													Few (<2-10%)
			V		·V										Common (10-20%)
															Many (20-50%)
															Abundant (50-90%)
															Very abundant (>90)
							Sp	it Nm							INCLUSION ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
V	1	,													Fine gravel (2-6 mm)
		V	V	1	1										Medium gravel (7-20 mm)
	~							14							Coarse gravel (21-60 mm)
															Cobbles (61-200 mm)
															Stones (201-600 mm)
															Boulders (601-2000 mm)
							Sp	it Nm							DISTURBANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
11	V						7								Bioturbation
															Ploughing
										-					Grazing
															Erosion
															OTHER MATERIALS
	·V	V	1.												Glass
	V	V	1												Ceramic
	1		100												Brick
	-	V													Concrete
															Plastic
															Metal
	- 1														Other (Specify)
															,

Site Name/TS No:
906
Date: 21/11/2022 Section: West Scale: 1,5 Munsell: Hd : RLS:

53cm



PAD/Site Name: PAD 5
Pit Nm.: 908
Date: 211112022

Excavator/s:

Anka, Bo, Dom, Tyron, Meeter, Beyr

100×100 cm. TS 908

	В	cket Count			
Spit	Depth (cm)	A	BCX	С	D
1	0-10-	3 8	1000	1 4	1.1
2	10-20	11	02.4	5	-
3	20-20	4	10 11	71	A
4	V. 30	1	518	4.	6
5			0.22		
6			100		
7			69		
8		(%.)			
9					
10					1
11					
12					
13					
14					
15					

		1													
							Sp	it Nm	1						COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		X													Red
		,													Orange
X	X	×													Brown
	1														Yellow
	14.														Grey
															Dark Grey
															Pale
							Sp	it Nm	1						MOISTURE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	MOIOTORE
															Dry
L	×														Moderately moist
															Moist
	1														Wet
							ROOT ABUNDANCE								
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
															No roots (0)
1	×	pprox													Few (1-10)
<															Common (11-25)
															Many (26-99)
															Abundant (>100)
							Sp	it Nm							ROOT SIZE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
	X	$\boldsymbol{\times}$													Fine (1-2 mm)
5															Medium (2-5 mm)
															Coarse (>5 mm)
,								it Nm							HORIZON BOUNDARY
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Sharp (<0.5 cm)
															Abrupt (0.5-2 cm)
															Clear (2-5 cm)
1	×	×													Gradual (5-10 cm)
1	- 1	- 1				7									Diffuse (>10 cm)

							oit Nn							SOIL COMPOSITION
1 2	2 3	4	5	6	7	8	9	10	11	12	13	14	15	
														Sand
														Loamy sand
														Sandy loam
														Sandy clay loam
														Sandy clay
														Loam
														Clay loam
	$\times \times$													Silty clay loam
`	-													Silt loam
														Silt
														Silty clay
														Clay
						Sp	it Nn	1			•			INCLUSION TYPE
1 2		4	5	6	7	8	9	10	11	12	13	14	15	Name .
×	X													Ironstone
3														Manganese
5	X													Charcoal
5														Burnt clay
														Sandstone
						INCLUSION ABUNDANCE								
1 2	3	4	5	6	7	8	9	10	11	12	13	14	15	
9														None
														Very Few (<2%)
>	4 X													Few (<2-10%)
	1													Common (10-20%)
														Many (20-50%)
														Abundant (50-90%)
														Very abundant (>90)
							it Nm		•					INCLUSION ABUNDANCE
2	3	4	5	6	7	8	9	10	11	12	13	14	15	
">	XX													Fine gravel (2-6 mm)
,														Medium gravel (7-20 mm)
														Coarse gravel (21-60 mm)
														Cobbles (61-200 mm)
														Stones (201-600 mm)
														Boulders (601-2000 mm)
						Sp	it Nm							DISTURBANCE
2	3	4	5	6	7	8	9	10	11	12	13	14	15	
														Bioturbation
														Ploughing
														Grazing
														Erosion
														OTHER MATERIALS
	_													Glass
														Ceramic
* ×			_											Brick
* >	<		- 1					1						DITOR
* >	<										1	- 1		Concrete
	<													Concrete Plastic
* >	<													Concrete Plastic Metal

6

Spit. 5 4.52956 4027 Whole 95603 AS Mode: original Reclaimed Quad S. asembrea

Site Name/TS No:
OAD 5 | 90 6
Date: 2/11/2072

Scale: (∶\⊘

Section: Som

PH: (0 71/2 RLS: (3) 6/12 Y SNAT

Munsell:

7.59e3/4 O 7.5 ye 38 (m

Concrete
Plastic
Metal
Other (Specify)

PAD/Site Name: PAD S
Pit Nm.: 969
Date: 2(1/22 -

50+50cm. TP 909.

	Buc	ket Count			
Spit	Depth (cm)	Α	В	4 C	\ D
1	2-16	1.			-
2	10-20	7.		-	-
3	10-20 20-20 20-30	7			
4		4			
5					
6					
7					
8					
9				-	
10					
11 •					
12					1
13				1	
14	· · · · · · · · · · · · · · · · · · ·		\		1
15					

							Sp	it Nm	1						COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	R	V													Red
		X													Orange
×	\prec														Brown
															Yellow
	The state of														Grey
	-33														Dark Grey
															Pale
							MOISTURE								
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		×													Dry
×	V														Moderately moist
															Moist /
															Wet
								it Nm							ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
*															No roots (0)
-	×	×													Few (1-10)
×															Common (11-25)
															Many (26-99)
															Abundant (>100)
								it Nm							ROOT SIZE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
	*	X													Fine (1-2 mm)
×															Medium (2-5 mm)
															Coarse (>5 mm)
								it Nm							HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Sharp (<0.5 cm)
															Abrupt (0.5-2 cm)
															Clear (2-5 cm)
_	×														Gradual (5-10 cm)
4		1													Diffuse (>10 cm)

							Sp	it Nn	1						SOIL COMPOSITION
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	COLE COM CONTON
															Sand
															Loamy sand
															Sandy loam
															Sandy clay loam
															Sandy clay
															Loam
															Clay loam
															Silty clay loam
															Silt loam
0															Silt
	\times	*													Silty clay
															Clay
T								it Nn							INCLUSION TYPE
\Box	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
d	X														Ironstone
															Manganese
															Charcoal
		×													Burnt clay
															Sandstone
							Sp	it Nm	ĺ						INCLUSION ABUNDANCE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
T															None
3		×													Very Few (<2%)
T	Y	_													Few (<2-10%)
T															Common (10-20%)
															Many (20-50%)
T															Abundant (50-90%)
															Very abundant (>90)
															, (55)
_	•	_						it Nm							INCLUSION ABUNDANCE
+	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
(2	~	×													Fine gravel (2-6 mm)
4															Medium gravel (7-20 mm)
+															Coarse gravel (21-60 mm)
1															Cobbles (61-200 mm)
1															Stones (201-600 mm)
															Boulders (601-2000 mm)
_								it Nm							DISTURBANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	V														Bioturbation
+	_														Ploughing
+															Grazing
1															Erosion
+	_														OTHER MATERIALS
1															Glass 44/20
				- 1	- 1	- 1		- 1			T				A .
+															Ceramic

200

Site Name/TS No:

909
Date: 21/11/1002Scale: 1:SScale: 1:SSection: 50.44pH: 07 + -07 + -RLs:

Munsell: 0.7 + 0.07 + -RLs: 0.7 + 5.92 0.7 + 5.92 0.7 + 5.92 0.7 + 5.92 0.7 + 5.92



PAD/Site Name: PAD 5 Broadoaks
Pit Nm.:
Date: 1/11/22 910

Excavator/s:

	Bucl	cet Count			
Spit	Depth (cm)	Α	В	c	D
1	10	4		11.00	
2	20	U		- 18°	W
3	50	17		Lien	
4	70				
5					
6					
7					
8				-	
9					
10					
11					
12					
13					
14					
15				1	

							Sp	it Nm	1						COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
-1															Red
		X													Orange
×	×	X													Brown
-		27													Yellow
															Grey
															Dark Grey
															Pale
							Sn	it Nm							MOISTURE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	WOISTORE
							1			<u> </u>			<u> </u>		Dry
X	V	X				\vdash									Moderately moist
1	1	1													Moist
\neg															Wet
							Sp	it Nm							ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
		X													No roots (0)
	4														Few (1-10)
7	1														Common (11-25)
															Many (26-99)
															Abundant (>100)
							Sp	it Nm							ROOT SIZE
1,	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
7	4														Fine (1-2 mm)
	1														Medium (2-5 mm)
															Coarse (>5 mm)
							Sp	it Nm							HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Sharp (<0.5 cm)
															Abrupt (0.5-2 cm)
															Clear (2-5 cm)
X	4	4													Gradual (5-10 cm)
W 1	1	,													Diffuse (>10 cm)

							Sr	it Nn							SOIL COMPOSITION
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	SOIL COMPOSITION
•		-	-	-	-	+-	-	-	10	111	12	13	14	13	Sand
_		-		-		-	-	-		-	-	_			Loamy sand
-		-	_		-	-	-	-		-	-				Sandy loam
			-	-	-	_	-			-	-			-	
_		`	_	_	-	-	-	-	-	-	-				Sandy clay loam
-			-				-	-	-	-	-	-		-	Sandy clay
-		_	-			-	-	-	-	-	-			-	Loam
	1/			-			-	-		-	-		-		Clay loam
_	X	-				-	-	-			-				Silty clay loam
\dashv					_		-	-			-				Silt loam
-		Λ.	_		-	-	-				-				Silt
-		X				-	<u> </u>								Silty clay
		,					<u></u>						l		Clay
							Sp	it Nm	1						INCLUSION TYPE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	4
0	X	X													Ironstone
	×	×													Manganese
	,	1													Charcoal
															Burnt clay
															Sandstone
							٥.,	ié Niss							INOLUGION ADUNDANCE
П	2	3	4	5	6	7	8 8	it Nm	10	11	12	13	14	15	INCLUSION ABUNDANCE
-		-	-7		0	-	0	9	10	- ' '	12	13	14	15	News
-		-		-			-								None
9	×	7													Very Few (<2%)
-						-									Few (<2-10%)
-		_													Common (10-20%)
-															Many (20-50%)
-															Abundant (50-90%)
															Very abundant (>90)
								it Nm							INCLUSION ABUNDANCE
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
1	4	X													Fine gravel (2-6 mm)
		,													Medium gravel (7-20 mm)
															Coarse gravel (21-60 mm)
															Cobbles (61-200 mm)
															Stones (201-600 mm)
															Boulders (601-2000 mm)
							Sp	it Nm							
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm)
	2	3	4	5	6	7	Sp 8	it Nm	10	11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation Ploughing
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation Ploughing Grazing
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation Ploughing Grazing Erosion
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation Ploughing Grazing Erosion OTHER MATERIALS
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation Ploughing Grazing Erosion OTHER MATERIALS Glass
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation Ploughing Grazing Erosion OTHER MATERIALS Glass Ceramic
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation Ploughing Grazing Erosion OTHER MATERIALS Glass Ceramic Brick
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation Ploughing Grazing Erosion OTHER MATERIALS Glass Ceramic Brick Concrete
	2	3	4	5	6	7				11	12	13	14	15	Boulders (601-2000 mm) DISTURBANCE Bioturbation Ploughing Grazing Erosion OTHER MATERIALS Glass Ceramic Brick

Site Name/TS No: PAD S Brojd ask (2) SAR 3/4 Section: North 10 514 5/8 Munsell: Scale: Date: RLs: pH: SA ż



PAD/Site Name: PAD 5 Broadogks
Pit Nm.: 911
Date:

Excavator/s:

24	Bu	cket Count		•	
Spit	Depth (cm)	A	В	С	D
1	10				
2	70	7	-		4-20
3		9 1			
4				1	-
5				11.7	
6	7.4.				
7	1.				
8					
9					
10					
11					
12					
13				,	
14					
15					

							Sp	it Nm	ı						COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Red
															Orange
X	X														Brown
ı															Yellow
	and.		100 Mg												Grey
	100		198	1.081					-1						Dark Grey
			77	19											Pale
							Sp	it Nm	li i						MOISTURE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	molorona
										13/13/11	-				Dry
V	X		1												Moderately moist
/	/														Moist
															Wet
							Sp	it Nm							ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
															No roots (0)
S	X							1							Few (1-10)
						150		1							Common (11-25)
									-						Many (26-99)
								141							Abundant (>100)
							Sp	it Nm							ROOT SIZE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
50	X									7					Fine (1-2 mm)
	/						165			7,					Medium (2-5 mm)
										19					Coarse (>5 mm)
							Sp	it Nm		2 ;			1		HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	7.7
								21 7	1999		1			-10.36	Sharp (<0.5 cm)
														3.75	Abrupt (0.5-2 cm)
												112.		-37	Clear (2-5 cm)
8	4											C Vess		160	Gradual (5-10 cm)
/	-										250.00	- Pr		1 2	Diffuse (>10 cm)

_	1,11		-		-			it Nn							SOIL COMPOSITION
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
	100			2 4137	34	100					a diam	1			Sand
				1500	1.5						25				Loamy sand
															Sandy loam
					1 - 3		1								Sandy clay loam
															Sandy clay
															Loam
										1			1		Clay loam
Ø	X									1	1		- 1		Silty clay loam
	1												~		Silt loam
	_					<u> </u>	_			_		1	7,3,	- Carlo 18 22	Silt
	1								397		-	-	-		Silty clay
	-			_	-	-							-		Clay
							1						l	-	Clay
_	-			-				it Nm						3	INCLUSION TYPE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	- Va - VI - Al-
1													179		Ironstone
صد	X														Manganese
															Charcoal
															Burnt clay
															Sandstone
							Sp	it Nm	1			-			INCLUSION ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	The state of
_								-							None
_	-														Very Few (<2%)
×	X.														Few (<2-10%)
															Common (10-20%)
															Many (20-50%)
															Abundant (50-90%)
															Very abundant (>90)
							Sp	it Nm	ı						INCLUSION ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
0	V														Fine gravel (2-6 mm)
															Medium gravel (7-20 mm)
															Coarse gravel (21-60 mm)
															Cobbles (61-200 mm)
													1, 1		Stones (201-600 mm)
															Boulders (601-2000 mm)
	1						Sn	it Nm		1	1				DISTURBANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	DIOTORDANGE
															Bioturbation
															Ploughing
								-	almie					-	Grazing
	\vdash							1	400-						
	-									-	- 0				Erosion
				-											OTHER MATERIALS
															Glass
															Ceramic
											824				Brick
				- 1						2 2	Mary Control				Concrete
			-							1	10,5 75	1			DI4:-
				-							S. C. March	mark to			Plastic
							91.1			1		ALC: T			Metal

8

Spit | Buartzite * Angolo: fogment

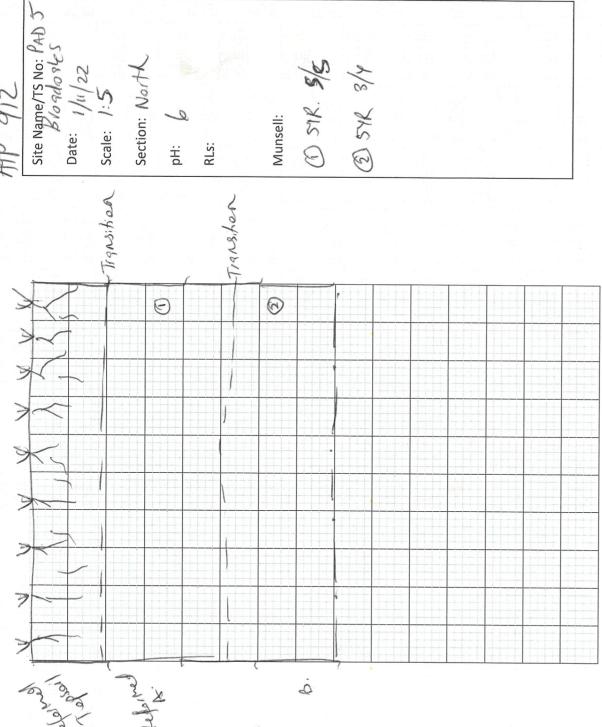
Site Name/TS No: 1. 15.66 2. 15.43 Munsell: @ SYR STS AF Section: PH: Scale: Date:

PAD/Site Name: PAD 5 Broadoaks
Pit Nm.:
Date: 1/11/22 912

	Buc	ket Count	25		
Spit	Depth (cm)	Α	В	С	D
1	0-10	11			
2	h 00	11			-
3	30 20	4.			
4	10-110	4			
5	30-40				
6					
7					
8					
9					
10					
11					
12					
13			-		
14					
15					

	7/27		7				_	'4 NI							
1	2	-	4	-	_	-		it Nm							COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	11
		3.00									17				Red
	- Parent											_			Orange
X	p	X		1 2											Brown
	1	. (Yellow
															Grey
															Dark Grey
															Pale
							Sp	it Nm	1						MOISTURE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	1 2 1
7															Dry
*	X	X							Pi i						Moderately moist
1	/														Moist
										- 1					Wet
		1													
	Spit Nm													ROOT ABUNDANCE	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
			7.7												No roots (0)
		P													Few (1-10)
V	M														Common (11-25)
	-		100												Many (26-99)
			7,1												Abundant (>100)
							Sp	it Nm		•				-	ROOT SIZE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
X	X														Fine (1-2 mm)
	,														Medium (2-5 mm)
															Coarse (>5 mm)
							Sp	it Nm							HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Sharp (<0.5 cm)
						-									Abrupt (0.5-2 cm)
															Clear (2-5 cm)
															Gradual (5-10 cm)
	7	-	_		_			_							Diffuse (>10 cm)

						Sı	oit Nr	n						SOIL COMPOSITION
1	2	3	4 5	6	7	8	9	10	11	12	13	14	15	
														Sand
														Loamy sand
														Sandy loam
														Sandy clay loam
			8											Sandy clay
														Loam
						1	1			_				Clay loam
					1				1	-		_	1.0	Silty clay loam
N>	4 Y	3			1		1							Silt loam
-														Silt
					\top									Silty clay
					1					1				Clay
									1					Olay
						Sp	oit Nn	1						INCLUSION TYPE
		3 4	1 5	6	7	8	9	10	11	12	13	14	15	Market Co.
XX	0 >	0												Ironstone
7	1													Manganese
					1									Charcoal
					1							 		Burnt clay
		\top			1									Sandstone
		-											-	Caridotorio
1 2	2 ;	3 4	5	6	T 7	Sp 8	it Nn		144	- 40	40			INCLUSION ABUNDANCE
- 4		3 2	. 3	0	1	0	9	10	11	12	13	14	15	
V C	yo y	Ø	+	-	-							_		None
6	20 7	yo	_		-									Very Few (<2%)
+	_					_								Few (<2-10%)
_	_	_												Common (10-20%)
_	_	_			-									Many (20-50%)
	_													Abundant (50-90%)
														Very abundant (>90)
							it Nn							INCLUSION ABUNDANCE
2		3 4	5	6	7	8	9	10	11	12	13	14	15	A Section 1997 All Sections
0 3	P	X												Fine gravel (2-6 mm)
														Medium gravel (7-20 mm)
														Coarse gravel (21-60 mm)
														Cobbles (61-200 mm)
														Stones (201-600 mm)
														Boulders (601-2000 mm)
						Sp	it Nm			-				DISTURBANCE
) / 4	5	6	7	8	9	10	11	12	13	14	15	
2	. 3	3 4	-					_						Bioturbation
2	2 3	4	- 1		+									Ploughing
2	3	4	-	1	1									Grazing
2	3	4		-										
2	3	4												
2	2 3	4												Erosion
2	2 3	4												Erosion OTHER MATERIALS
2	2 3	4												Erosion OTHER MATERIALS Glass
2	2 3	3 4												Erosion OTHER MATERIALS Glass Ceramic
2	3	3 4												Erosion OTHER MATERIALS Glass Ceramic Brick
2	3	3 4												Erosion OTHER MATERIALS Glass Ceramic Brick Concrete
2	3	3 4												Erosion OTHER MATERIALS Glass Ceramic Brick



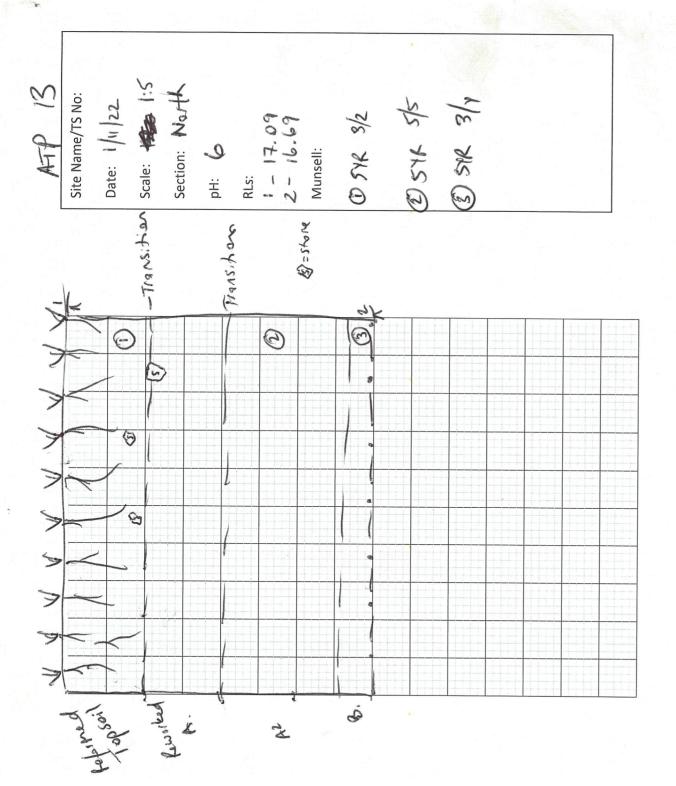
ATP 912

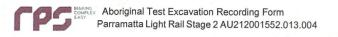
PAD/Site Name: PAD 5 B/09 dog & 5
Pit Nm.: 913
Ut | 22

	Buc	ket Count			
Spit	Depth (cm)	A	В	С	D
1	10	li.			
2	20	J			
3	30	(1			
4	YO	-			
5	10				
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					

							Sp	it Nm	1					1	COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
		L.													Red
_		X	70												Orange
	X	X	X												Brown
															Yellow
				-											Grey
		- 74													Dark Grey
															Pale
								it Nm							MOISTURE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Dry
70	X	X	X												Moderately moist
															Moist
															Wet
							Sp	it Nm							ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
			79												No roots (0)
	-	X													Few (1-10)
4	×														Common (11-25)
															Many (26-99)
															Abundant (>100)
							Sp	it Nm							ROOT SIZE
1,	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
X	X	X													Fine (1-2 mm)
		,													Medium (2-5 mm)
															Coarse (>5 mm)
,								it Nm							HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Sharp (<0.5 cm)
					1										Abrupt (0.5-2 cm)
															Clear (2-5 cm)
,	1	_^													Gradual (5-10 cm)
20	X	4	X												Diffuse (>10 cm)

						Sp	it Nn	n						SOIL COMPOSITION
1 2	3	4	5	6	7	8	9	10	11	12	13	14	15	
														Sand
														Loamy sand
														Sandy loam
														Sandy clay loam
														Sandy clay
a ×	X													Loam
														Clay loam
														Silty clay loam
														Silt loam
														Silt
	X	X												Silty clay
	1													Clay
	-		-											- July
2						Sp	it Nn	1						INCLUSION TYPE
2	3	4	5	6	7	8	9	10	11	12	13	14	15	
) >	°×	V												Ironstone
×	3 7	_												Manganese
1														Charcoal
														Burnt clay
														Sandstone
									•			-		
						-	it Nm							INCLUSION ABUNDANCE
2	3	4	5	6	7	8	9	10	11	12	13	14	15	
														None
1	X	X												Very Few (<2%)
< >	3	,												Few (<2-10%)
														Common (10-20%)
														Many (20-50%)
														Abundant (50-90%)
														Very abundant (>90)
						e.	i Alma							
2	3	4	5	6	7	8 8	it Nm 9	10	11	12	13	14	15	INCLUSION ABUNDANCE
	X	X												Fine gravel (2-6 mm)
X	1	1												Medium gravel (7-20 mm)
				E										Coarse gravel (21-60 mm)
														Cobbles (61-200 mm)
														Stones (201-600 mm)
1														Boulders (601-2000 mm)
2	3	4	5	6	7	8	t Nm	10	11	12	13	14	15	DISTURBANCE
	+	,		-	•	-	9	10	1.1	14	13	14	15	Piotu-batian
+	1												-	Bioturbation
	1													Ploughing
	1	\vdash					-							Grazing
	1						_							Erosion
+-	1	\vdash	-	_										OTHER MATERIALS
	+-	-								33.				Glass
+	+									64				Ceramic
+	-									. 10 -)				Brick
-	-			-			_			- 121				Concrete
+	-										1			Plastic
-	-			_										Metal
											i			Other (Specify)





PAD/Site Name: PAD 5 Broadoaks
Pit Nm.: 915

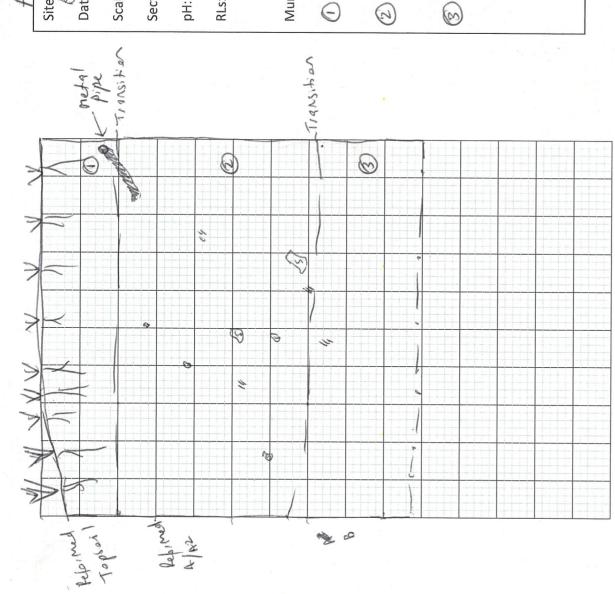
11/1/122

Excavator/s: pull, Tegen, Kom.

	Buc	ket Count		•	
Spit	Depth (cm)	A	В	C	\D
1	0-10	5		333	
2	10-70	5		3	
3	70-20	2		Ç D	
4	20-40	3) D
5	10-50.	3			
6	(Was)	- 3			
7					
8				1	1
9.					
10					
11					
12					
13					-
14					
15					-

		- 31				-01	Sp	it Nn	1						COLOUR						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15							
		100		×											Red						
	1														Orange						
				×											Brown						
	1	1463													Yellow						
	30 1-	12	,												Grey						
X	X	×	X	1											Dark Grey						
	4	4110	. 4												Pale						
							Sn	it Nm	1						MOISTURE						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	MOIOTORE						
1											<u> </u>	-			Dry						
~	X	V	X	X											Moderately moist						
3,6		~	1-	,			7								Moist						
- 12	1116	-					-								Wet						
								it Nm							ROOT ABUNDANCE (number per 10 cm ²)						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15							
		214													No roots (0)						
_	X	X	×	X				. V.							Few (1-10)						
×															Common (11-25)						
															Many (26-99)						
															Abundant (>100)						
							Sp	it Nm							ROOT SIZE						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)						
×	X	X	X	X											Fine (1-2 mm)						
X									7						Medium (2-5 mm)						
															Coarse (>5 mm)						
								it Nm					-		HORIZON BOUNDARY						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15							
															Sharp (<0.5 cm)						
															Abrupt (0.5-2 cm)						
			×	•											Clear (2-5 cm)						
			,	X											Gradual (5-10 cm)						
X	V	4		1											Diffuse (>10 cm)						

	2	_	1	-	1 4			oit Nm			1.65				SOIL COMPOSITION
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
_				-		-	_			-					Sand
_	_														Loamy sand
+	-	-			_										Sandy loam
															Sandy clay loam
				_											Sandy clay
															Loam
										3.7					Clay loam
(V	1	×													Silty clay loam
_															Silt loam
															Silt
			X	X											Silty clay
				X											Clay
							Sn	it Nm	,					-	INCLUSION TYPE
12	2	3	4	5	6	7	8	9	10	11	12	13	14	15	INCLUSION TIPE
_	0	V	V	X	_	⊢ <u>·</u>				··-			1	15	Ironstone
-		~	X	N		_					_		 		Manganese
1 ×	2	X	7	-		-					-				Charcoal
-		~	-		-					-	 				Burnt clay
+	\dashv				-						-				Sandstone
															Garidstorie
							Sp	it Nm							INCLUSION ABUNDANCE
2	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Sec. 1988
	_														None
		40%	M	V											Very Few (<2%)
	1	80	1.												Few (<2-10%)
															Common (10-20%)
															Many (20-50%)
															Abundant (50-90%)
															Very abundant (>90)
							Sn	it Nm							INCLUSION ABUNDANCE
2	2	3	4	5	6	7	8	9	10	11	12	13	14	15	INGESCION ADONDANGE
1	1	K	×	b											Fine gravel (2-6 mm)
+		^	_	1											Medium gravel (7-20 mm)
1	\dashv														Coarse gravel (21-60 mm)
1	+							\vdash							Cobbles (61-200 mm)
1	\dashv														Stones (201-600 mm)
1	\dashv														Boulders (601-2000 mm)
														-	2000 (11111)
								it Nm							DISTURBANCE
2	!	3	4	5	6	7	8	9	10	11	12	13	14	15	
+-	+														Bioturbation
+	+		_												Ploughing
+	+														Grazing
+	+														Erosion
+	+				3										OTHER MATERIALS
+	+														Glass
+	+														Ceramic
-	_														Brick
1															Concrete
															Plastic
		T	T	T											Metal
1/4					_										motor



2 Silcrete Somen Sigular agular

8-store



Aboriginal Test Excavation Recording Form
Parramatta Light Rail Stage 2 AU212001552.013.004

*		Bucket Co	ount	- N 11		
Spit	Depth (cm)		A	В	С	D
1	0-10		4	0.2 (%)		
2		5.02		the same		
3				750		
4	P. 1. 18 18 18 18 18 18 18 18 18 18 18 18 18	9 (6				
5					1-12/2-7	
6						
7	10					
8						
9				1.7		
10				4		
11						
12						
13					7.10	
14		×				
15						

								it Nm							COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
						1.0									Red
							1.5								Orange
															Brown
															Yellow
	1	171													Grey
		100													Dark Grey
															Pale
							Sp	it Nm							MOISTURE
1 :	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Dry
						9.0			1						Moderately moist
		10.00													Moist
					-							1.5.			Wet
							Sp	it Nm						- 1	ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
						11									No roots (0)
											10.00				Few (1-10)
						6									Common (11-25)
															Many (26-99)
				0											Abundant (>100)
							Sp	it Nm							ROOT SIZE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
												1 11			Fine (1-2 mm)
															Medium (2-5 mm)
	1.0			1											Coarse (>5 mm)
								t Nm							HORIZON BOUNDARY
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
			,												Sharp (<0.5 cm)
						2.00									Abrupt (0.5-2 cm)
											- >				Clear (2-5 cm)
									1		1944				Gradual (5-10 cm)
															Diffuse (>10 cm)

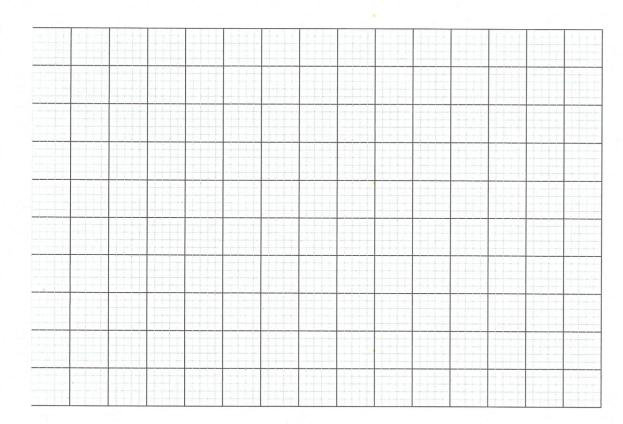
PAD/Site Name: PAD 6
Pit Nm.: ATP 20 1
2 1 1 22

Excavator/s:

SOIL COMPOSITION							it Nm				-				
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Sand		100	-		W. St.		72.			1			1		
Loamy sand	1.1														
Sandy loam															
Sandy clay loam										1111	1				
Sandy clay		- 1										. 1			-
Loam						145									
Clay loam		100													
Silty clay loam						0.12									
Silt loam															
Silt									7 7						
Silty clay					4.5										
Clay			-							1			100		
Olay															
INCLUSION TYPE		3					it Nm								
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Ironstone		1 11		8.5%		88. 78								1 1	
Manganese				4 7											
Charcoal	. 1														
Burnt clay															
Sandstone								1	1 1		1	175			
INCLUSION ABUNDANCE			. *1		- 1		it Nm	Sn	· est	4					
INCLUSION ADDINDANCE	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
None													- 69		
Very Few (<2%)															
Few (<2-10%)	-														_
Common (10-20%)	100	-													
Many (20-50%)									-						
	-								-						-
Abundant (50-90%)									_						-
Very abundant (>90)															
INCLUSION ABUNDANCE							it Nm								
	15	14	13	12	11	10	9 -	8	7	6	5	4	3	2	1
Fine gravel (2-6 mm)															
Medium gravel (7-20 mm)					1					-					
Coarse gravel (21-60 mm)	-	,											211		
Cobbles (61-200 mm)															
Stones (201-600 mm)											1				
Boulders (601-2000 mm)															
DISTURBANCE							it Nm	Spi							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Bioturbation	14 9		-							. 1					
Ploughing															
Grazing					1										
Erosion															
OTHER MATERIALS															\neg
Glass		-					\neg								
Ceramic													\neg		\dashv
							-+	-					-		-
Brick						_	-					-	-		-
Concrete									-	-		-			-
Plastic								\rightarrow				-			-
Metal									-						-
Other (Specify)														1	- 1

Site Name/TS No:

Scale:
Section:
PH:
RLs:





ASBESTAS.

	Buck	cet Count			
Spit	Depth (cm)	A	В	С	D
1	0-10	4	6		
2	() ~		3		
3					
4					
5	1				
6	\				
7					
8					
9					
10					
11		× ×			
12					
13					
14					
15					

							Sp	it Nm	1						COLOUR					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	OCCOR					
															Red					
						<u> </u>									Orange					
															Brown					
										-					Yellow					
					1					—					Grey					
										1					Dark Grey					
															Pale					
											<u> </u>			-						
								it Nm							MOISTURE					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15						
															Dry					
															Moderately moist					
				-											Moist					
															Wet					
							Sp	it Nm							ROOT ABUNDANCE (number per 10 cm²)					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)					
															No roots (0)					
															Few (1-10)					
															Common (11-25)					
															Many (26-99)					
															Abundant (>100)					
							Sp	it Nm							ROOT SIZE					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)					
															Fine (1-2 mm)					
															Medium (2-5 mm)					
															Coarse (>5 mm)					
							Sp	it Nm		-					HORIZON BOUNDARY					
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15						
															Sharp (<0.5 cm)					
															Abrupt (0.5-2 cm)					
															Clear (2-5 cm)					
															Gradual (5-10 cm)					
_																				

PAD/Site Name: PAD 6 KEN NENMAN PARK Excavator/s: Pit Nm.: 203
Date: 2-11-22

SOIL COMPOSITION							it Nm								
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Sand															
Loamy sand															
Sandy loam															
Sandy clay loam															
Sandy clay									3						
Loam														_	
Clay loam				_								_	_		_
Cidy Idaili				_			_	_	-		_				
Silty clay loam														-	
Silt loam															-
Silt															
Silty clay															
Clay															
INCLUSION TYPE							it Nm	Spi							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Ironstone															
Manganese	-														
Charcoal	-								-						-
									-	-	-			_	
Burnt clay															
Sandstone															
INCLUSION ABUNDANCE							it Nm	Spi							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
None															
Very Few (<2%)															
Few (<2-10%)															-
Common (10-20%)							-								
Many (20-50%)															
Abundant (50-90%)															
Very abundant (>90)															
INCLUSION ABUNDANCE							it Nm								
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Fine gravel (2-6 mm)															
Medium gravel (7-20 mm)															
Coarse gravel (21-60 mm)															
Cobbles (61-200 mm)															
Stones (201-600 mm)											-				
Boulders (601-2000 mm)															
boulders (601-2000 mm)															
DISTURBANCE							t Nm								
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Bioturbation															
Ploughing															
Grazing								\neg							
Erosion															
OTHER MATERIALS		-						-+							
								-						-	-
Glass								_							-
Ceramic														-	_
Brick															
Concrete															
Plastic															
Metal															\neg

Site Name/TS No:

Date:

Scale:

Section:

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pH:

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UVUL Excavator/s:

PHIL

TEEGAN

Aboriginal Test Excavation Recording Form Parramatta Light Rail Stage 2 AU212001552.013.004 COSED ON SPIT3 - ASBEJTU Smn Spit)

	Buc	ket Count			
Spit	Depth (cm)	Α	В	С	D
1	6-50mm	2	2	2	2
2	30 - 100 mm	5	3	2	2
3			-	-	2
4		7			
5	74				
6					
7					
8					
9					
10	91				
11					
12					
13	,				
14			-		
15					

								it Nm							Red Orange Brown Yellow Grey Dark Grey Pale MOISTURE						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15							
															Red						
												-			Orange						
~	V														Brown						
					+							25	10.00		Yellow						
		1													Grey						
		-													 Dark Grey 						
															Pale						
							Sn	it Nm							MOISTURE						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	WOISTORE						
V	1		<u> </u>	Ė	<u> </u>	<u> </u>	-			 	12	10	17	15	Dny						
	-			-		_					-			 	Moderately moist						
														-	Moist						
														-	Wet						
			1												Wet						
							Sp	it Nm							ROOT ABUNDANCE						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm²)						
									1 %						No roots (0)						
-	V														Few (1-10)						
															Common (11-25)						
											1				Many (26-99)						
~															Abundant (>100)						
							Sp	it Nm							ROOT SIZE						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)						
	1				01										Fine (1-2 mm)						
	V														Medium (2-5 mm)						
1									17						Coarse (>5 mm)						
							Sp	it Nm						-	HORIZON BOUNDARY						
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15							
															Sharp (<0.5 cm)						
															Abrupt (0.5-2 cm)						
	1		200												Clear (2-5 cm)						
															Gradual (5-10 cm)						
												_			Diffuse (>10 cm)						

		-								- I					
SOIL COMPOSITION	4						it Nm				_				
idea (15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Sand							-	- 1							
Loamy sand								1.							
Sandy loam															
Sandy clay loam												-25			
Sandy clay				1					9 '-				1,000		
Loam												- 4			
Clay loam															
Silty clay loam							10		1						
Silt loam							V								
Silt															
Silty clay														1	~
Clay															-
	-	1								1111					
INCLUSION TYPE							it Nm			-	-				_
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Ironstone															
Manganese						17			1 1						
Charcoal															
Burnt clay															
Shale Sandstone														~	~
		-		-;									8 8 3		
INCLUSION ABUNDANCE							it Nm	- 9							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
None		1724								1.11			N 11.1		
Very Few (<2%)															
Few (<2-10%)															
Common (10-20%)															1
Many (20-50%)															
Abundant (50-90%)		- 5													
Very abundant (>90)					7.00										
1.0								_							
INCLUSION ABUNDANCE	4F	4.4	13	12	11	10	it Nm	8 8	7	6	5	4	3	2	1
F: 1/0.0	15	14	13	12	11	10	9	0	-	0	J	-	-		
Fine gravel (2-6 mm)				-		-							_	. /	
Medium gravel (7-20 mm)										-				1	
Coarse gravel (21-60 mm)										44				-	
Cobbles (61-200 mm)		12													_
Stones (201-600 mm)															_
Boulders (601-2000 mm)												A			
DISTURBANCE							it Nm	Spi							
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
Bioturbation														V	/
Ploughing		5.5					\neg								
Grazing								\neg							
Erosion							\rightarrow								
OTHER MATERIALS							\dashv				-		- 44		
Glass							\rightarrow	-+			-	-		V	
							-+	-+	-		15			v	-
Ceramic							-+	-	-						\dashv
Brick		-				-		-			-			-	-
Concrete							\rightarrow					_		-	-
Plastic													_		-
Metal															-
Other (Specify)									Ä.						

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Site Name/TS No:

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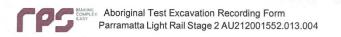
RLs:

pH:

Scale:

Date:

62 500 40



PAD/Site Name: PAD 1 Dimington local Date: 13/12/2022

Excavator/s: 18, 1890) (1860)

	Buc	ket Count			
Spit	Depth (cm)	A	В	С	D
1	10-5 cm.	·5(10cm)	2	2.	4
2	5-10		71	19	1 2
3	10-15-00	4		9	1
4		7		•	
5					
6					
7					
8					
9					
10					
11	. 00				
. 12				-	
13					
14					
15				•	

							Sp	it Nm							COLOUR
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Red
															Orange
/	V														Brown
															Yellow
															Grey
															Dark Grey
			1.81												Pale
							Sp	it Nm							MOISTURE
	2	_ 3	4	5	6	7	8	9	10	11	12	13	14	15	
/	V														Dry
		10.4						- 1							Moderately moist
			1.0												Moist
															Wet
							Sp	it Nm							ROOT ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(number per 10 cm ²)
															No roots (0)
	1														Few (1-10)
1															Common (11-25)
															Many (26-99)
															Abundant (>100)
							Sp	it Nm							ROOT SIZE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	(diameter)
															Fine (1-2 mm)
	1														Medium (2-5 mm)
1	V														Coarse (>5 mm)
_								it Nm					-		HORIZON BOUNDARY
	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
															Sharp (<0.5 cm)
															Abrupt (0.5-2 cm)
															Clear (2-5 cm)
															Gradual (5-10 cm)
	V	}													Diffuse (>10 cm)

							Sp	it Nm	1						SOIL COMPOSITION
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
											1				Sand
															Loamy sand
															Sandy loam
															Sandy clay loam
															Sandy clay
															Loam
	_														Clay loam
V	V			_	_						-				Silty clay loam
_				_							_				Silt loam
_			-	-	-	-					-				Silt
-											-				Silty clay
-				_	-						-		-	-	Clay
															Clay
								it Nm							INCLUSION TYPE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
V															Ironstone
															Manganese
															Charcoal
															Burnt clay
V															Sandstone
							Sp	it Nm							INCLUSION ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	7
															None
															Very Few (<2%)
											-				Few (<2-10%)
						_	_								Common (10-20%)
1/	V	-	-												Many (20-50%)
-	-							-			-			-	Abundant (50-90%)
-						-					-		-	-	Very abundant (>90)
				l			Sn	it Nm					I		INCLUSION ABUNDANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	INCESSION ABONDANCE
Ì			<u> </u>	_	-	ŀ.	-	-	-10				1.7		Fine gravel (2-6 mm)
		-				-									Medium gravel (7-20 mm)
1	•	_	_			-	_				-				Coarse gravel (21-60 mm)
V	-	_	_	_	_										Cobbles (61-200 mm)
-				_		_							_		Stones (201-600 mm)
-													_		
															Boulders (601-2000 mm)
							Sp	it Nm							DISTURBANCE
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	8.50
															Bioturbation
															Ploughing
															Grazing
															Erosion
															OTHER MATERIALS
/															Glass
															Ceramic
V	V														Brick
-															Concrete
1				_							-			-	Plastic
V															Metal
-				-											
				L											Other (Specify)

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Site Name/TS No:

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Appendix G **Cultural Values Assessment (Artefact, 2023)**



Anthropological Assessment

Final Report

Transport for New South Wales

May 2023



@ artefact

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Document history and status

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		Bonshek			

Last saved: 5 May, 2023

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Author: Elizabeth Bonshek
Project manager: Elizabeth Bonshek

Project number: 230655

Name of organisation: Artefact Heritage

Document version:

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Project name:

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EXECUTIVE SUMMARY

Artefact Heritage Services Pty Ltd (Artefact Heritage) have been engaged by Transport for NSW to prepare a Cultural Values Assessment Report for the Parramatta Light Rail Stage 2 project. This report will form an appendix to the Aboriginal Cultural Heritage Assessment Report (ACHAR) which has been prepared for the project and has been commissioned to explore the Aboriginal cultural values as they pertain to the project. The project area covers the development of light rail between Parramatta CBD to Stage 1 Camellia, Rydalmere, Ermington, Melrose Park, Wentworth Point, Sydney Olympic Park and the Carter Street precinct.

This report presents the results of a site visit and three interviews undertaken with three Registered Aboriginal Parties (RAPs) and participants on the project. Transcripts of the interviews have formed the basis of this report, and quotations from the interviews are included. This report provides a description of cultural values from an anthropological framework, and as such it presents a description based on the site visit and the interviews of how cultural values are constituted for the interviewees. As an anthropological report, it does not present an assessment or ranking of cultural values in a manner that is associated with Significance Assessment. The latter is perceived to rest in the domain of the ACHAR proper.

This report has been prepared by Dr Elizabeth Bonshek (Senior Heritage Consultant, Artefact Heritage) and Dr Stephan Gapps (Historian, Artefact Heritage) with review provided by Dr Sandra Wallace (Managing Director, Artefact Heritage).

The report identified a number of overlapping themes that constitute contemporary cultural values from the perspective of the three participants. For the purposes of this report these themes have been arranged under seven headings (see below). However, it is important to realise that the headings and their content have overlapping elements and therefore elements may reoccur under more than one heading. The divisions suggested below are to provide greater facility with which to move through the interview material which contains elements that are in reality tightly interwoven. For the interviewees these constituent elements are inseparable.

Themes of importance in the cultural values of the interviewees.

- Country and connection to Country
- Water ways provide food and resources
- Travel and communication
- Histories of disruption and disconnection
- Environmental decay / Urban development
- Difficulty with archaeology failure to embrace cultural values
- People of note in the area.

Based on the information provided by the participants during the site visit and the interviews and the themes that arose during these engagements, the following presents both broader considerations and project specific recommendations:

Broader considerations

- Consultation with Aboriginal communities concerning their cultural heritage should be undertaken as early
 as possible in the development process and allow for genuine input.
- Future projects should have broad scope which supports sustainable development strategies and practice, including environmental regeneration and revitalisation to restore and maintain Aboriginal cultural values.
 Broad scope is understood to include the surrounding areas in which the designated study area is located.

Parramatta Light Rail Stage 2 Cultural Values Assessment Final

- Future developments should consider having a regional, or areal, perspective, not one based only on the location of AHIMS sites and archaeological definitions of Aboriginal heritage values.
- New developments should be sustainable and not cause further damage to the environment.
- New development should avoid the river banks as these areas were used formerly as burial grounds.
- View lines (or lines of sight) along the light rail route should kept open.
- Support should be provided for Darug language programs, especially located within schools, which can provide guidance for revitalisation of the Country.

Project specific considerations

- The findings of this report should be considered and feed into the design process led Bangawarra.
- The findings of this report should be considered and feed into all Aboriginal Heritage Interpretation strategies.
- Awareness of Aboriginal histories of the area should be promoted to non-indigenous people. This could be
 done through interpretation undertaken along the route and at light rail stops, including integrating language
 names and acknowledgment of Country in various forms at light rail stop.
- Important Aboriginal people and events in the area should be celebrated, including role models such as Cathy Freeman and Maria Lock.
- Regeneration and revitalisation of the Parramatta River and river banks should be undertaken.
 Regeneration is understood to be necessary for healing Country and the resources of the area restored.
- The art installation created by Joe Hurst, which is located in Grand Avenue, should be refreshed and any works undertaken in consultation with Boomali Arts and Joe Hurst's descendants.

CONTENTS

1.0	Inti	roduction	1
1.1	F	Parramatta Light Rail	1
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GLOSSARY AND ACRONYMS

Aboriginal cultural heritage: The material (objects) and intangible traditions and practices (mythological places, dreaming stories etc) associated with past and present-day Aboriginal communities.

Aboriginal object: Any deposit, object or material evidence (not being a handicraft made for sale), including Aboriginal remains, relating to the Aboriginal habitation of NSW.

Aboriginal place: Any place declared to be an Aboriginal place under s.94 of the *National Parks and Wildlife Act 1974*.

AHIMS: Acronym for 'Aboriginal heritage information management system'. AHIMS is a register that contains information about NSW Aboriginal heritage, and it is maintained by DECCW.

Archaeological object: any object that was made, affected, used, or modified in some way by humans in the past and has been discarded.

Archaeology: The scientific study of human history, with focus on material remains and ethnographic evidence.

Artefact: An item of cultural material created by humans.

Core: A stone piece from which a flake has been removed by percussion (striking it) or by pressure. It is identified by the presence of flake scars showing the negative attributes of flakes, from where flakes have been removed.

Flake: A stone piece removed from a core by percussion (striking it) or by pressure. It is identified by the presence of a striking platform and bulb of percussion, not usually found on a naturally shattered stone.

Layer: In stratigraphy, it is used to describe a horizon (soil, rock, charcoal) that is distinct from its surrounds.

Midden: The term midden is a Danish word meaning a mound of kitchen refuse. In archaeological terms, a midden refers to an accumulation of shell deposited after people had collected and eaten shellfish. These could contain estuarine and freshwater shellfish species in addition to faunal remains, stone artefacts and charcoal from cooking fires. In northern NSW in many areas, burials have been recorded in direct association with midden deposits.

Potential Archaeological Deposit (PAD): A PAD is a location that is considered to have a potential for subsurface cultural material. This is determined from a visual inspection of the site, background research of the area and the landform's cultural importance.

Project site: Refers to the area that would be directly disturbed by construction of the project (for example, as a result of ground disturbance and the construction of foundations for structures). It includes the location of construction activities, compounds and work sites, and the location of permanent infrastructure.

Resource zone: An area of the landscape or part of the environment that provides a resource (be it food or material items such as a source of stone for making artefacts) for Aboriginal people. Swamps are good examples of rich resource zones.

Sand: A material composed of small grains (0.625-2.0 mm) (Keary 2001, p. 233). Sand is formed from a variety of minerals and rocks, but commonly contains silica, such as quartz.

Sandstone: Is a sedimentary rock formed from sand-sized grains.

Scarred trees: Trees that feature Aboriginal derived scars are distinct due to the scar's oval or symmetrical shape and the occasional use of steel, or more rarely, stone axe marks on the scar's surface. Scarred trees are identified by the purposeful removal of bark for use in the manufacture of artefacts such as containers, shields and canoes. The bark was also used for the construction of shelters. Other types of scarring include toeholds cut in the trunks or branches of trees for climbing purposes and the removal of bark to indicate the presence of burials in the area.

Stratigraphy: The study of soil stratification (layers) and deposition.

Study area: The study area comprises the eight precincts identified in the Technical Paper 1 (Design, Place and Movement) prepared by Aspect and Bangawarra (2022).

Survey: In archaeological terms, this refers to walking over a surface while studying the location of artefacts and landmarks. These are then recorded and photographed.

ACRONYMS

ACHAR: Aboriginal Cultural Heritage Assessment Report

CBD: Central Business District

EIS: Environmental impact statement

FPIC: Free, Prior and Informed Consent,

GPOP: The Greater Parramatta and the Olympic Peninsula area

SEARs: Secretary's environmental assessment requirements

1.0 INTRODUCTION

1.1 Parramatta Light Rail¹

The NSW Government's Greater Sydney Region Plan *A Metropolis of Three Cities* (Greater Sydney Commission, 2018) outlines a vision for a three-city metropolis. The Central River City covers the four local government areas of the City of Parramatta, Blacktown City, Cumberland City and The Hills Shire. *A Metropolis of Three Cities* highlights Greater Parramatta as the focal point for the Central River City, with employment growth and public transport being of key importance.

The Greater Parramatta and the Olympic Peninsula area (GPOP), which extends from Westmead and Parramatta in the west to Sydney Olympic Park to the east, is fast emerging as the heart of Sydney's Central River City and is set to grow and change significantly over the next 20 years. Forecasts predict that GPOP will accommodate almost 170,000 new residents by 2041. Employment opportunities will also grow, with an additional 100,000 jobs predicted by 2041 (SGS, 2017).

Parramatta Light Rail will deliver an integrated light rail service that supports the population and employment growth expected throughout GPOP. It will integrate with existing and future modes of transport, including buses, trains, ferries and active transport (pedestrian and cycle networks), as well as Sydney Metro West services and the existing road network.

Parramatta Light Rail will be delivered in stages to keep pace with development:

- Stage 1 will connect Westmead to Carlingford via the Parramatta central business district (CBD) and Camellia. The construction and operation of Parramatta Light Rail Stage 1 was approved by the NSW Minister for Planning in May 2018. Major construction is underway, with the track installation complete and light rail stop construction in progress. Stage 1 is expected to start operating in 2024. Further information on Stage 1 is provided at Parramatta Light Rail
- Transport for NSW is now proposing to construct and operate Stage 2 of Parramatta Light Rail ('the
 project'). Stage 2 would connect the Parramatta CBD and Stage 1 to Camellia, Rydalmere, Ermington,
 Melrose Park, Wentworth Point and Sydney Olympic Park.

Figure 1 provides an overview of the Parramatta Light Rail network showing both stages.

¹ The Introduction has been provided by Transport for New South Wales (Transport for NSW).

LEGEND
Parramatta Light Rail Stage 1 alignment
Parramatta Light Rail Stage 2 alignment
Shared infrastructure

Figure 1. Parramatta Light Rail network

1.2 Approval and assessment requirements

1.2.1 Approval requirements

The project is critical State significant infrastructure and is subject to approval by the NSW Minister for Planning under Part 5, Division 5.2 of the *Environmental Planning and Assessment Act 1979* (NSW) (EP&A Act).

The project is also determined to be a controlled action under the *Environment Protection and Biodiversity Conservation Act* 1999 (Cth) (EPBC Act) and requires approval from the Australian Minister for the Environment and Water.

An environmental impact statement (EIS) was prepared to assess the potential impacts of the project, and to identify the management measures to address those impacts. The EIS was exhibited by the NSW Department of Planning and Environment from 9 November 2022 to 16 December 2022. The EIS was also prepared to support Transport for NSW's application for approval of the project under the EPBC Act.

The EIS was supported by a range of technical papers, which provided detailed assessments of the potential impacts of the project as they relate to the key environmental issues defined by the Secretary's environmental assessment requirements (SEARs). This included Technical Paper 4 (Preliminary Aboriginal Cultural Heritage Assessment Report) that recommended the preparation of a cultural values assessment.

1.2.2 Responding to submissions and proposed amendments

During the exhibition period, stakeholders and members of the community were able to review the EIS, participate in consultation and engagement activities, and make a written submission to the Department of Planning and Environment for consideration in its assessment of the project.

Transport for NSW has prepared a submissions report to address the Planning Secretary's request to submit a response to the issues raised in submissions to the EIS during public exhibition and DPE's State Significant Infrastructure and State Significant Project Guidelines.

During and following public exhibition of the EIS, Transport for NSW has undertaken further investigations and is proposing a number of design amendments to the project. The aim of these amendments is to address issues raised during consultation and in submissions, and to minimise the potential impacts of the project.

A summary of the proposed amendments is provided in Table 1. Further information is provided in the Amendment Report.

Table 1. Summary of amendments

Proposed amendment	Overview
	As described in section 5.4.2 and Appendix D of the EIS, investigation of an alternative alignment between Camellia and Rydalmere (the 'Camellia foreshore to Rydalmere option') was ongoing in parallel with development of the EIS. It is now proposed to amend the project to incorporate this alternative alignment of the light rail track, active transport link and bridge over the Parramatta River.
Camellia foreshore to Rydalmere alignment and bridge	The new alignment extends along the Sandown Line corridor in Camellia; however, instead of crossing south over to Grand Avenue, it continues along the Parramatta River foreshore in Camellia before extending across a new bridge structure and along the boundary of Eric Primrose Reserve in Rydalmere.
	The bridge design has been amended and includes different pier arrangements in the river. It is also proposed to locate the light rail stop at John Street closer to Rydalmere Wharf.
Melrose Park to Wentworth Point alignment and bridge	The project as described in the EIS included a bridge located between the southern end of Wharf Road in Melrose Park and the northern end of Wentworth Point. It is proposed to amend the alignment and locate the bridge further to the west to avoid direct impacts to residential properties. The works would also include removing the high voltage transmission tower at Melrose Park and relocating the wires to three new poles located to the west of the original tower.
	The project as described in the EIS included retaining the Hill Road bridge in Sydney Olympic Park and providing a new bridge for light rail vehicles on the western side of the existing bridge.
Bridge at Hill Road	It is now proposed to remove the existing bridge at Hill Road and construct a new bridge, which would accommodate road traffic and light rail vehicles in an on-road (segregated) running corridor to reduce impacts on Narawang Wetland.

In addition, refinements are proposed to the location of the traction power substation near Atkins Road, and the cut and fill volumes generated during earthworks.

1.3 Project overview

The project comprises two main elements:

- construction of about 10 kilometres of light rail infrastructure between Camellia and the Carter Street precinct adjacent to Sydney Olympic Park
- operation of about 13 kilometres of light rail alignment between the Parramatta CBD and the Carter Street precinct, including a section of infrastructure constructed by Parramatta Light Rail Stage 1 between Camellia and the Parramatta CBD.

Further information on the location of the project, and a description of the project site for the purposes of this document, is provided in the Amendment Report.

1.3.1 Key features

The key features of the project (as amended), which are shown on Figure 2. Key features of the project, include:

Light rail track and bridges

- new 10 kilometre long dual light rail track, with 14 stops, between the Parramatta Light Rail Stage 1 line in Camellia and the Carter Street precinct adjacent to Sydney Olympic Park
- two bridges over the Parramatta River between Camellia and Rydalmere, and between Melrose Park and Wentworth Point
- a bridge over Silverwater Road between Rydalmere and Ermington
- other bridge works in Ken Newman Park and Sydney Olympic Park.

Active and public transport integration

The project would also deliver:

- about 9.5 kilometres of new active transport links between Camellia and the Carter Street precinct, which
 would connect with the existing cycling and pedestrian network
- interchanges with other forms of public transport, including trains, ferries, buses and Sydney Metro West, with the main interchanges located in the Parramatta CBD, Rydalmere and Sydney Olympic Park
- a light rail and pedestrian zone (no through vehicle access) within Sydney Olympic Park along Dawn Fraser Avenue between Australia Avenue and Olympic Boulevard
- bus access over the proposed bridge between Melrose Park and Wentworth Point.

Other works

Works proposed to support the project's operation:

- turnback facilities, including along part of Macquarie Street in the Parramatta CBD
- adjustments to the Parramatta Light Rail stabling and maintenance facility at Camellia
- five new traction power substations to convert electricity to a form suitable for use by light rail vehicles
- new and improved open spaces and recreation facilities at Eric Primrose Reserve, Ken Newman Park and the Atkins Road stop.

Further information on the project's features is provided in the updated project description chapters in Appendix A of the Amendment Report.

Figure 2. Key features of the project **Oatlands** THE PROJECT 3 **Dundas** West Ryde Ermington 4 Rydalmere Substation Melrose Park Camellia Wentworth Rosehill Bridge between Melrose Park and Wentworth Point Point Adjustments to the Parramatta Light Rail stabling and maintenance facility Bridge works Silverwater Substation Newington Bridge works Sydney Olympic Auburn M4 Light rail and pedestrian zon Lidcombe

Parramatta Light Rail Stage 1 alignment

Parramatta Light Rail Stage 1 stops

Parramatta CBD

Proposed project alignment

Proposed project stops

LEGEND

1km

1.3.2 Operation

The project would operate between the Parramatta CBD and the Carter Street precinct, using a section of the Parramatta Light Rail Stage 1 alignment and the alignment constructed as part of the project.

Between the Parramatta CBD and Camellia, the project would operate along about three kilometres of the Parramatta Light Rail Stage 1 alignment. Parramatta Light Rail Stage 2 services would terminate at the Stage 1 Parramatta Square stop to allow customers direct and convenient access to Parramatta's CBD, and interchange with Parramatta Stage 1 light rail services, trains, buses and Sydney Metro West.

From Camellia, the project would operate along the light rail infrastructure proposed as part of Stage 2, terminating at the proposed Carter Street stop.

The project would operate as a turn-up-and-go light rail service from 5am to 1am, seven days a week, in line with Parramatta Light Rail Stage 1. The project would have travel times of around 29 minutes from the Carter Street stop in Lidcombe to the proposed Sandown Boulevard stop in Camellia, and a further seven minutes to the Parramatta Square stop in the Parramatta CBD.

Further information on the project's operation is provided in the Amendment Report.

1.3.3 Timing

It is anticipated that construction would start in 2025, subject to obtaining all necessary approvals, and the first passenger services are proposed to start from 2030/2031.

An indicative construction methodology is provided in the Amendment Report.

1.4 Purpose and scope of this report

The purpose of this report is to provide a cultural values assessment conducted by an anthropologist for inclusion in the Aboriginal Cultural Heritage Assessment Report (ACHAR) currently being undertaken by Transport for NSW.

The methodology for the assessment is described in Section 2.0

This report, in particular sections 5 and 6, also address the following SEAR:

 6. Heritage – Aboriginal 5: The identification of cultural heritage values must be conducted in accordance with the Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010) (the Code), and be guided by the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011)

This report forms an appendix to the Aboriginal Cultural Heritage Assessment Report.

2.0 METHODOLOGY

The following methodology was undertaken as part of the cultural values assessment:

- all existing RAPs were invited to participate in the cultural values assessment
- traditional knowledge holders who were not RAPs were also invited to participate
- potential participants were made aware of the purpose of the project and how their information will be used to ensure Free, Prior and Informed Consent
- desktop research was undertaken to establish the historical and anthropological background and to inform the development of interview questions
- a site visit was undertaken which provided both an opportunity to connect with Country and to establish subjects or locations of interest
- a set of interview questions was developed through the background research and through engagement with the participants on the site visit
- in-depth interviews were conducted in person and through Microsoft Teams as was convenient for each participant
- interviews were transcribed and a copy provided to each participant for review and approval
- a draft of the report was provided to the participants for their review and approval
- data collected during the literature review and interviews was collated into a report and specific sites - where mentioned - were included.

2.1 Limitations

Due to the time constraints the project drew upon the participants established for Technical Paper 4 (Preliminary Aboriginal Cultural Heritage Assessment Report) (RPS October 2022) as well as traditional knowledge holders known to Transport for NSW.

Participants who were also RAPs on the project had previously received information about the project during the consultation stages of the ACHAR. However, prior to the interview the three participants were provided with the links to the full ACHAR report.²

Transport for NSW undertook all liaison with the participants to establish attendance for the site visit and interviews. Once individuals had agreed to participate, Elizabeth Bonshek and Kelly Barton also arranged interview times directly. It should be noted that the short lead up time for the assessment may have resulted fewer participants than would otherwise been the case.

https://www.planningportal.nsw.gov.au/major-projects/projects/parramatta-light-rail-stage-2

Link - EIS Chapter 11 - Aboriginal Heritage

Web address

 $\frac{https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-10035\%2120221104T043401.280\%20GMT$

Link – <u>Technical Paper 4 – Preliminary Aboriginal Cultural Heritage Assessment Report</u> Web address:

https://majorprojects.planningportal.nsw.gov.au/prweb/PRRestService/mp/01/getContent?AttachRef=SSI-10035%2120221104T043342.861%20GMT



² Link - Parramatta Light Rail Stage 2 Major Projects page Web address

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Once the participant group was established an invitation to attend a site visit was extended. Only one participant was able to attend the site visit. The attending participant was invited to nominate what parts of the project route should be visited. A number of broad questions were compiled based on the discussion during the site visit and these were circulated to each participants prior to the interviews.

The interviews were conducted on Microsoft Teams as the participants were unable to attend in person due to work commitments, and also two lived outside of the Sydney area. Artefact's Aboriginal Cultural Heritage Officer attended the interviews which were subsequently transcribed. The transcriptions were issued to each participant for their approval, editing and sign off.

The transcripts and site visit were used to prepare this Cultural Values Assessment.

The Cultural Values Assessment was circulated to the three participants for their review and feedback, prior to release of the final version. One participant requested that their name not be included in the report.

2.2 Authorship and acknowledgements

This report was authored by Dr Elizabeth Bonshek (Anthropologist, Artefact), Dr Stephen Gapps (Historian, Artefact). Kelly Barton (Aboriginal Cultural Heritage Officer, Artefact) attended the site visit and interviews. James Allsop and Noni Ross (both representing Transport for NSW) attended the site visit.

3.0 CULTURAL VALUES

3.1 Introduction to cultural values

The study was based on Artefact's understanding of cultural landscapes and the approach to consultation to understand relationship with Country.

The World Heritage Convention of United Nations Educational, Scientific and Cultural Organisation (UNESCO) defines a cultural landscape as one which has 'powerful religious, artistic or cultural associations of the natural element rather than material cultural evidence, which may be insignificant or even absent' (UNESCO and Intergovernmental Committee for the Protection of the World 2015). The relationship between Aboriginal Australians and the land is conceived in spiritual terms rather than primarily in material terms (Andrews et al. 2006). Aboriginal cultural knowledge has been defined as:

Accumulated knowledge which encompasses spiritual relationships, relationships with the natural environment and the sustainable use of natural resources, and relationships between people, which are reflected in language, narratives, social organisation, values, beliefs and cultural laws and custom (Andrews, G., C. Daylight, and J. Hunt 2006 Aboriginal cultural heritage landscape mapping of coastal NSW).

Aboriginal cultural knowledge was traditionally bequeathed through oral traditions from generation to generation. Within all Aboriginal communities there was a time of dislocation and upheaval associated with the arrival of colonial settlers. This widespread disruption resulted in much of the detailed knowledge and understanding of many of the elements of the cultural landscape being lost from the Aboriginal community, nonetheless many Aboriginal people maintain a strong connection to the land of their ancestors and collectively possess a wealth of knowledge passed down through the generations.

3.2 Previous consultation work for the study area

Bangawarra provided Designing with Country input to Technical Paper 1 (Design, Place and Movement) which placed consultation centrally in their spatial design practice. In this process Bangawarra (2022), established three parallel themes to guide their planning which included: Gathering space; Diverse blending or ecologies and water systems; and lastly Reading Country. These themes are described below, and are followed by a more extensive tabulation of the cultural values that Bangawarra identify as being present within each of the eight precincts of the study area – these cultural values inform Bangawarra's proposed designs. While the Bangawarra report covers a larger remit within its scope, it is the cultural values that they identify which are pertinent to this report.

The three themes identified by Bangawarra to inform their proposed design plans are:

Ngalawallah / a gathering space

The word "Ngalawallah" translates as "come and sit next to me". This word was chosen for a
theme by Bangawarra to reflect upon how the project would bring people and communities
together through Country. Bangawarra also state that the word Ngalawallah is shared by many of
the local Sydney languages, including the D'harawal eora language of Sydney.

Tucoerah / diverse blending of ecologies and water systems

 'Tucoerah" is presented as a common language word describing places where two waters and many different ecologies meet and was chosen to celebrate the unique environments through which the project travels. As with Ngalawallah, Bangawarra state that Tucoerah is a word which has common use amongst the local languages in Sydney.

Wingara / Reading Country

Wingara is a cultural value which "describes how we read Country not as an artefact in the pages
of history, but a living, breathing entity". Again, the word Wingara is shared across the local
languages of Sydney.

The three themes above were interwoven into the proposed design and applied to the eight precincts of the study area (Figure 3) which are:

- Parramatta CBD
- Camellia
- Rydalmere East
- Ermington
- Melrose Park
- Wentworth Point (including the Millennium Parklands)
- Sydney Olympic Park
- Carter Street precinct.

A number of sub-themes were identified under the three general design themes for each precinct (see Table 2).

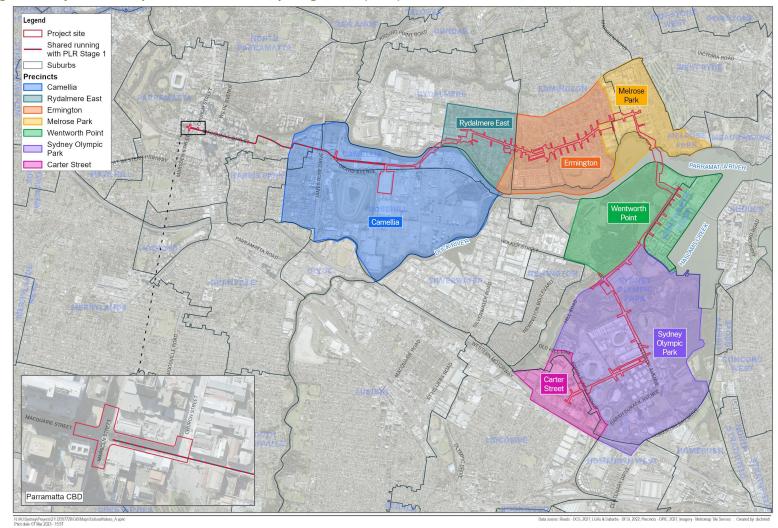


Figure 3. Project site and precincts referred to by Bangawarra (2022)

Table 2. Summary table of Bangawarra's sub-themes for their proposed design process

Precinct number	Ngalawallah / a gathering space	Tucoerah / diverse blending of ecologies and water systems	Wingara / Reading Country	Referred to in section of (Bangawarra (2022)
1 Parramatta CBD	Increasing physical accessibility along Macquarie Street towards Parramatta Park	The area has been vastly modified through the introduction of the Charles Street Weir in 1855 which transformed Country into nattaigalo (D'harawal eora: freshwater). The site exists within a complex, resilient and changed urban ecology.	Should represent Parra (also Burra) /, the short finned eel. The eel is a significant cultural animal across this part of Country (rivers and water systems of the area)	5.2
2 Camellia	The Camellia precinct offers the opportunity for "unforgetting" the knowledges and stories that have been silenced and, sometimes, erased from our lives. Unforgetting Country, the precinct would be activated through local stories of ecology, water and sky. Supporting remaining urban ecologies while always echoing the enduring songs and knowledge of those lost.	Today the Camellia precinct is an urban floodplain of significantly altered ecologies. Concrete, steel, and asphalt now lay on top of these fertile soils and seawalls restrain tidal water flows concealing these ecologically and culturally rich environments. Through public domain design and public art the rich ecological and cultural diversity that should exist across this place would be brought to the fore for the Camellia precinct.	Recognise the importance of Currujin, an important cultural resource for many local Aboriginal peoples. With a vibrant canopy full of red flowers during the season of Parra'dowee (D'harawal eora: eel creator spirit). Currujin is a ceremonial indicator, guiding people through the landscape and along Songlines. And also provide essential resources. Currujin should be the unifying element - celebrating how local Aboriginal people have always moved through and sustainably cared for Country, guided by sacred seasonal and ceremonial indicators. Currujin's presence utilised through landscaping strategies, but can inform every element of the design and place strategies.	6.1.2

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Precinct number	Ngalawallah / a gathering space	Tucoerah / diverse blending of ecologies and water systems	Wingara / Reading Country	Referred to in section of (Bangawarra (2022)
3 Rydalmere East	Through the introduction of a new bridge over the Parramatta. River connecting communities north and south.	North of the Parramatta River steep ridges and rocky outcrops of sandstone define Country. As the light rail corridor travels north across the river it sits along the footholds of the first minor ridge in this vast interconnected system. Moving between Low Country, floodplains and High Country sandstone coastal forests, these two interconnected but distinct areas are sacred to understanding and protecting Country.	Along the shoreline of Rydalmere, Country is known as Wulumay (Common Sydney Language: snapper), a place where you can fish for snapper. The snapper is a sacred animal for local peoples, and parts of this Country have been named for its cultural importance. We remember the life-sustaining resources this Country provides and make a commitment to honouring local culture and stories.	

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Precinct number	Ngalawallah / a gathering space	Tucoerah / diverse blending of ecologies and water systems	Wingara / Reading Country	Referred to in section of (Bangawarra (2022)
4 Ermington	Protected from uninitiated onlookers, this High Country provides vital spatial resources to protect and pass on the most sacred and important knowledges. Across the extensive network of ridges north of the Parramatta River, senior Elders and Kordji (healers) used this Country to enact their ceremonies. Respecting and celebrating this connection to High Country, the Ermington precinct is an important place to care for Country and ceremony. Protecting visual connections to northern High Country and creating places to gather would strengthen connections to significant surroundings.	The precinct has a diverse number of ecologies and floral/fauna communities throughout the area. Designing for these complete ecologies across the Ermington precinct would ensure that the project helps to protect and sustain Country.	On this Country women have always protected freshwater lore and raised future generations amongst Dahl'wah (D'harawal eora: casuarina) groves. As we listen to the wind rustling through leaves we remember and hear the old women, freshwater streams flow down the escarpment to meet the saline ecologies below, we celebrate the healing freshwater and connected to and accountable to all aspects of Country, both living and nonliving. By celebrating and protecting freshwater across the Ermington precinct we can create vital connections to Country for local communities.	

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Precinct number	Ngalawallah / a gathering space	Tucoerah / diverse blending of ecologies and water systems	Wingara / Reading Country	Referred to in section of (Bangawarra (2022)
5 Melrose Park	Integrating, and returning to the public realm, the Bulla Cream Dairy (Willowmere) property. Prioritising Country within the restoration and reclamation of this artefact of colonial heritage. Create community-focused spaces where all people can come together and share in the diverse and complicated histories of Country. Positioned on an elevated position overlooking the Paramatta River – can allow for community gathering celebrating the connection to High and Low country.	Located on the interstitial plain between High Country ridges north and the saline waters south As the freshwaters run off the major sandstone ridge from the sites north across Ryde, they meet the tidal flows of Parramatta River, again creating the rich and diverse Tucoerah environment. Connected to culturally and ecologically rich environments of High and Low Country, Melrose Park is another transition point Precinct can play a vital role in ensuring that when the two water systems meet there is a buffer between dense urban environments and the protected natural environments.	Enduring spirit of this Country celebrates the White-bellied Sea eagle. Integrating sensitive design and engineering that protects the mangroves of Parramatta, the Melrose Park precinct can also create spatial connections to Sky Country through the travel route of the light rail and the public domain.	

Precinct number	Ngalawallah / a gathering space	Tucoerah / diverse blending of ecologies and water systems	Wingara / Reading Country	Referred to in section of (Bangawarra (2022)
6 Wentworth Point (Including Millennium Parklands)	Is one part of a vast ceremonial ground shared by many nations. For thousands of years people from all over Sydney and surrounding areas would travel to this area for lore ceremonies, following cyclical ecological and cultural indicators. Project can honour this story and protect this significant ceremonial gathering site, as well as the cultural, spiritual, and visual connections to High Country.	Wentworth Point is one of the most significant surviving Tucoerah environments along the light rail alignment. Young life is nurtured and supported as the foundation for a sustainable future with Country. Primary goal of the project in this precinct would be to buffer and protect this ecology. Creating sensitive and responsive human and public domain interfaces with this wetland, the precinct would be designed as a hub of incidental education for users and the community,	Before colonisation, Wentworth Point was an island known as Arrownally. Arrownally was a vital resource for ecology and people alike. At the head of the bay, the island helped to connect people living along Haslams Creek north to Parramatta River. As a buffer to tidal inundations, the island allowed women in Wulban (D'harawa eora bark canoes designed to carry fire) and Nuwi (D'harawal eora and Common Sydney Language: bark cones) to travel through the water and connect to the vital food and cultural resources Eventually the island was reclaimed through expansion of industrial and maritime activities of 1890s. Remembering Arrownally history allows the project to re-read Country and assert the stories of this place, lost through colonisation and poorly considered urban development.	10.2

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Precinct number	Ngalawallah / a gathering space	Tucoerah / diverse blending of ecologies and water systems	Wingara / Reading Country	Referred to in section of (Bangawarra (2022)
7 Sydney Olympic Park	Areas around Sydney Olympic Park are ceremonial grounds (past, present and future). Spatially activated by the ancient stories and ceremonies of Country, the Sydney Olympic Park precinct can provide community spaces that add to a diversity of operations, helping to re-define this precinct as a diverse and multimodal destination.	The Sydney Olympic Park precinct sits 500 metres southwest from the largest remaining mangrove forest along the Parramatta River. Opportunity to physically, culturally and spiritually experience the Tucoerah. Blending of fresh and saltwater environments Formally, operationally and materially connecting to the mangroves, the Sydney Olympic Park precinct can celebrate and support the ongoing protection of these significant ecologies.	The mangroves provide opportunities to read Country. Holding contemporary and Ancestral stories, the mangrove ecologies of Sydney Olympic Park protect plants that have grown here since before colonisation. With thick mud that holds and stores decades of colonial pollution, these ecologies also teach us of resilience and continuation. Surviving colonial impacts.	11.2

Precinct number	Ngalawallah / a gathering space	Tucoerah / diverse blending of ecologies and water systems	Wingara / Reading Country	Referred to in section of (Bangawarra (2022)
8 Carter Street Precinct	As a significant node for the project, offers the opportunity to connect with Country at the site while also fostering broader connections through the diverse and protected ecologies beyond.	None	Celebrate Maramara (mullet). A significant animal guiding ceremonial obligations. The largest and most significant lore ceremonies were to take place across the Low Country of Homebush and Sydney Olympic Park. Low Country and High Country. Hosting peoples from the entire kinship system, the significant blooms of mullet also enabled surrounding nations to visit and carry out their caretaking obligations sustainably. Maramara signifies both the beginning and end—of seasonal cycles and of ceremony—enabling people to read and understand the cultural needs of Country. Connection between the mullets running through waters as the light rail traverses over its urban habitat - we recognise the knowledge Maramara provides, enabling us to move through Country sustainably.	12.2

Due to the project amendments identified in Table 1, a Supplementary Design, Place and Movement report has been prepared, however there are no changes to the Designing with Country commentary previously provided in Technical Paper 1 (Design, Place and Movement) as a result of the amended project.

3.3 Summary of cultural values identified by Bangawarra

The themes and elements that Bangawarra identified have been used to develop their design process and ideas. If these cultural values (or elements) are detached from their precincts for the purposes of this analysis, we can see the following elements run through the report:

- High (sandstone and fresh water) and Low (salt water) Country. Fresh water flows down from High sandstone and into the saltwater environment of the river
- connections between the two engagement between High and Low Country
- certain animals and flora are noted as important cultural resources and life sustaining: namely,
 eel, mullet, snapper, the eagle and the red tree, representing sky, land and water
- places along the river were ceremonial places prior to colonisation
- the landscape is now transformed, built over and covered by industrial buildings
- the concept of "unforgetting" is introduced the importance of not forgetting and uncovering and revealing what once was
- · cultural values still continue, although covered
- High Country is the land of healing (seniors and elders have knowledge)
- sounds are important
- survival is important
- Country should be prioritised in restoration of the area
- land strategies should be implemented
- there should be strategies to connect people and maintain connections.

As will be seen below, many of these elements and themes reappear in the interviews undertaken with the three participants.

4.0 HISTORICAL BACKGROUND

4.1 Sydney Region

Many Aboriginal people, like other Indigenous or First Nations people around the world, say they have been living on Country for 'time immemorial' - that they have always been here and their origins lie in the creation of the land and animals. Over the last few decades, archaeologists' knowledge of deep human time in Australia has expanded from just a few thousand years in the 1950s, to 25,000 years in the 1960s, then 40,000 years, to now around 60,000 years or more.3

Archaeological evidence of Aboriginal people living in the Sydney region from Shaw's Creek west of the Dyarubbin (Nepean) River is dated at around 14,000 years ago and numerous other sites in the area have been dated at around 15,000 ago. While Cranebrook Terrace, near Penrith in Western Sydney, has been dated to 41,700 years and a site near Parramatta at 30,000 years old, there is growing consensus among archaeologists and historians that people have lived across the Sydney region from around 50,000 years ago.4

More ancient sites may lie off the coast and in drowned river valleys, now deep under water. Before the major sea level rise event at the end of the last ice age around 17,000 years ago, Aboriginal people living along the Parramatta River could have walked downstream along the riverbanks to the sea about 30 kilometres beyond the current day coastline. Over generations they would have watched and told stories about the gradual change as the sea rose to fill the 'drowned river valley' of what is now Sydney Harbour until it reached present levels around 6,000 years ago.5

⁴ Attenbrow, Sydney's Aboriginal Past, 2010, pp 18-20; Nanson et al., 'Chronology and Palaeoenvironment of the Cranebrook Terrace' 1987, p. 77; Williams et al., 'The Cranebrook Terrace Revisited', 2017, pp 100-109; McDonald, 'Heritage Conservation Strategy', Report, 2005, pp. 4, 87-94. Val Attenbrow notes questions have been raised about the 40,000 years BP radiocarbon age for stone artefacts from the Cranebrook Terrace and the date of 30,000 years BP at Parramatta. Attenbrow, 'Archaeological evidence of Aboriginal life in Sydney', 2012'. See Williams et al., 'A terminal Pleistocene open site on the Hawkesbury River' 2012 for comparison of site ages along the river. Karskens et al., are confident that 'Aboriginal people were living on Dyarubbin/the Nepean River as long as 50,000 years ago'. Karskens et al., 'Traces in a lost landscape', 2017, p. 4. ⁵ There are now at least 21 identified oral stories around Australia that describe ancient sea-level rise. See Nunn and Reid, 'Aboriginal Memories of Inundation of the Australian Coast dating from more than 7000 years ago', 2016, p.11. Attenbrow, Sydney's Aboriginal Past, 2010, pp. 154-155; Birch, 'A Short Geological and Environmental History of the Sydney Estuary', 2007, pp217-219.



³ Belshaw, Nickel & Horton, 2020; Griffith, 2018: 112; Karskens, 2009: 25. As Elder Aunty Jenny Munro expresses in Currie 2008: 4, "...from time immemorial, we believe as Aboriginal people, Australia has been here from the first sunrise, our people have been here along with the continent, with the first sunrise. We know our land was given to us by Baiami, we have a sacred duty to protect that land."

Given the devastating impact of violent dispossession and disease upon Aboriginal people in the Sydney region during colonisation, the precise identification of language groups and historical traditional lands or Country for a given area is often difficult today. Early colonial observer Watkin Tench believed there was at the least coastal and inland dialects of the same language and, while this is challenged by some historians who prefer less distinction between what were all 'canoe cultures' around Sydney's coast and water ways, there seems to have been an alignment with inland economies of the rivers, creeks and open forests of the Cumberland Plain, and coastal 'saltwater' focused groups.⁶

Prior to colonisation, Aboriginal people in the relatively resource rich Sydney region lived in extended family groups estimated at around 30 to 50 people. These groups were associated with certain territories or places that gave clan members particular social and economic rights and obligations. Each of the estimated 30 clans in the Sydney region had a name often associated with a place or resource such as the Cabro (Gabra) gal (people) at modern day Cabramatta. Clan groups moved around a defined area in response to changing seasons and the availability of food and other resources. European observers mistakenly took this as a nomadic lifestyle, when in fact they moved around a 'limited and deeply known' area. There were also forms of more sedentary agriculture and aquaculture, and villages such as those described by early colonial diarists at Kamay-Botany Bay and later accounts of '70 huts' at Bent's Basin on the Nepean River west of Sydney.⁷

Some areas, particularly resource rich ones, had shared boundaries or reciprocal rights with bordering and neighbouring groups. With appropriate permission and protocols, people could travel through and hunt on other groups' lands. On special occasions such as feasts associated with the beaching of a whale; a kangaroo hunt on the open forests of southwestern Sydney; trading or exchanging stone, tools and other items, as well as ceremonial occasions, people would often travel long distances around and from outside the Sydney region.⁸

With several rivers and estuarine coastal areas, the Sydney region sustained a comparatively large population, unlike more arid inland areas. Fish and shellfish were a major part of Saltwater peoples' diets. The nawi (tied-bark canoe) was a common sight both day and night in rivers and creeks and was even dexterously paddled off the coast. There are many accounts by early colonists of Aboriginal people in canoes fishing and cooking their catch on small fires on hearth stones within the vessels. Women were the primary fishers from nawi (men usually fished with spears). Women were highly skilled with shell hooks and twine fishing lines and thus played an important economic role in

⁶ A frequently used indication of Country is language identity, however, far more complex factors are known to

⁷ Gapps, Cabrogal to Fairfield, 2010, pp. 26-60; Attenbrow, Sydney's Aboriginal Past, 2010, p. 78; Karskens, The Colony, 36. See Gammage, The Biggest Estate on Earth, esp. 'Farms without fences', pp. 281-304

⁸ See Gammage, The Biggest Estate on Earth, 2011.



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have often taken precedence over language in determining Aboriginal people's definition of Country. For an excellent overview of one area of Sydney see 'Filling a void: History of the word Guringai', Aboriginal Heritage Office, https://www.aboriginalheritage.org/history/filling-a-void-history-of-word-guringai/ See also Stanner,'Aboriginal Territorial Organization: Estate, Range, Domain and Regime', 1965, pp 1-26. There is debate on the extent and name for the language itself, some preferring to use 'The Sydney Language'. The main language spoken across what is now the Greater Sydney Region has been known as Darug (with various alternative historical spellings Dharruk/Dharug/Dharook) after it was first used in written records in 1900 by

Matthews & Everitt in 'The Organisation, Language and Initiation Ceremonies of the Aborigines of the South East Coast of N.S.W.', p. 265. Attenbrow believes the Darug language extended from Appin in the south to the Dyarubbin-Hawkesbury River in the north, west of the Georges River, to Parramatta and the Lane Cove River however others have taken it further, following the whole Cumberland Plain region. This historical overview does not seek to contest traditional or current definitions of affiliation with Country and acknowledges that multiple interpretations of such identity may exist. Tench observed that though the coastal and inland men he met conversed and understood each other, many words for common things bore no similarity while other words were only slightly different. Troy, The Sydney Language, 1994; Brook and Kohen, The Parramatta Native Institution, 1991, p. 3; Attenbrow Sydney's Aboriginal Past, 2010, p. 34; Tench, A complete account of the settlement at Port Jackson, 1793, p. 122. See for example Goodall and Cadzow, 'Rivers and Resilience' for discussion of 'canoe cultures'.esp., pp. 38-39.

Sydney. They were noted as cradling their children while fishing, as their songs floated across the waters of Sydney Harbour.⁹

People living inland across the Cumberland Plain focused on hunting small animals, gathering plants and catching freshwater fish and eels. Banksia flowers, wild honey, varieties of yam and burrawang nuts (macrozamia - a cycad palm with poisonous seeds that require processing to remove toxins) were recorded as important food sources. Xanthorrhoea, also known as the grass tree, had many uses - the nectar was eaten, the stalk used as a spear and the resin as a glue. Small animals such as bandicoots and wallabies were hunted with traps and snares. Watkin Tench noted the skill in cutting toeholds in trees to swiftly climb to hunt possums.¹⁰

The landscape and environment before non-Aboriginal people arrived was a finely managed one. In 1790, John Hunter observed people 'burning the grass on the north shore opposite to Sydney, in order to catch rats and other animals'. In 1804, Henry Waterhouse described the land in the area known then as the Cowpastures as 'a beautiful park, totally divested of underwood, interspersed with rich, luxuriant grass ... except where recently burnt'. These forests that had been managed by many generations of Aboriginal people through such methods as what is known as 'firestick farming'. Fire was an important tool and also used to open up tracks, to 'clean Country', drive animals into the paths of hunters, cooking, warmth, treating wood, cracking open stones and for a place to gather, dance and share stories and knowledge.¹¹

The Sydney region was a landscape rich with the imprints of activity, art and culture such as rock engravings and paintings, scarred and carved trees, ceremonial rock and mound structures, cooking ovens, villages of bark huts, stone tool quarries, grinding grooves and tool-making sites, burial and other shell middens, and other artefacts. All this activity had a lasting impact on the landscape, and many elements such as rock engravings in particular survive, or have been kept intact or cared for by community members. Over time, many Aboriginal pathways were taken up by the colonists and made into roads, some still on the same routes today. 'Kangaroo grounds' became colonial estates, fishing creeks became drains, hills and peaks used for communication became signalling stations and lookouts, and shell middens became the limestone for the bricks and mortar of early colonial buildings.¹²

The large swathes of Hawkesbury sandstone across the Sydney region were the canvas for what has been likened to an enormous open air art gallery – engravings of the outlines of spirit creatures, marsupials, birds, fish, weapons, footprints and even European boats alongside people, showing a continuity that carried on beyond the arrival of British colonisers in 1788. This Sydney art tradition was distinctive from other regions such as inland New South Wales where carved trees were more prominent, or further south where painting dominates. There are more than 4,000 known rock art sites and more than 3,000 rock shelters with pigment or painted art, often featuring hand stencils.

¹² Griffith, Deep Time Dreaming, 2018, p, 241; Gammage, The Biggest Estate on Earth, p. xix; Attenbrow, 'Archaeological evidence of Aboriginal life in Sydney', 2012.



⁹ Banks, Endeavour Journal, 1770, p. 55; Collins, An Account of the English Colony, 1, 1798, p. 557. Estimates of the population of the Sydney region as a whole vary between 3,000 and 20,000. Attenbrow, Sydney's Aboriginal Past, 2010, p.38. It is unclear exactly how many clan groups lived across the entire Sydney Basin, though several have survived the impact and devastation of colonisation. As Paul Irish notes, these groups continued to survive. See Irish, Hidden in Plain View, 2017, esp. pp. 12-31 Traditional boundaries have primarily been reconstructed based on surviving linguistic evidence and are therefore only approximations: it is difficult to describe social interaction, tribal boundaries and linguistic evidence in any simple way, and boundaries and interaction across them varied over time.

¹⁰ Tench, A Complete Account, 1793, pp. 82, 230; Kohen, 'An archaeological study', 1986, p. 77; Kohen Aborigines in the west, 1985, p.9; Brook and Kohen, The Parramatta Native Institution, 1991, p. 3; Attenbrow, Sydney's Aboriginal Past, 2010, p. 41.

¹¹ White, Journal, 1790, p. 163; Henry Waterhouse, 12 March 1804, HRNSW, Volume 5, p. 359; Gammage, The Biggest Estate on Earth, 2011, esp. pp. 163-185; Griffith, Deep Time Dreaming, p. 240.

The Sydney Basin has been compared to Kakadu National Park in terms of the vast numbers of Aboriginal sites that remain today. 13

The first encounters between the British colonists and the Sydney people were initially based in curiosity, with both sides attempting to comprehend each other. However, misunderstandings or transgressions of Aboriginal law and protocol soon escalated into violence and retribution. Unarmed convicts outside the encampment at Sydney Cove were increasingly targeted during 1788. However in April 1789, what Sydney Aboriginal people called galgala or smallpox broke out and more than half - possibly even 80 percent - of the population around Sydney Harbour were dead within a month. Captain John Hunter wrote that 'it was truly shocking to go round the coves of this harbour [seeing] men, women and children, lying dead'. David Collins wrote that those who witnessed the Sydney man Arabanoo's grief and agony could never forget either - on being taken on a boat around the harbour Arabanoo 'lifted up his hands and eyes in silent agony [and exclaimed] "All dead! All dead!".14

Despite such massive death and disruption to Aboriginal lives across Sydney, in 1794 resistance warfare against the colonisers began in earnest along the new settlements on the Dyarubbin (Hawkesbury) River and was to carry on through the 1790s, largely under the leadership of the famous warrior Pemulwuy. This 'constant sort of war' as one colonist described it, continued until Governor Macquarie ordered the now infamous military campaign across the Sydney region that ended in the Appin Massacre of 17th April 1816.15

Sydney Aboriginal society was not static and did not cease after contact with Europeans. Both material and cultural traditions of Aboriginal Sydney continued after the devastation to Aboriginal society, sometimes for example, by incorporating non-Aboriginal materials in traditional elements such as using glass and ceramics to make spear points and other tools. Twenty-nine engraved and pigment art sites have been dated to the period after European arrival. Some creation and other stories told to R. H. Mathews by Gundungurra (Gandangarra) people in 1901 were carried on for generations and survive today. 16

As the Cumberland Plain became more closely settled during the 1800s, Aboriginal people continued to live close to their traditional Country where they could. Some managed to live in the centre of the growing city of Sydney such as groups of families who caught and sold fish at Circular Quay and others at Rose Bay, while other families continued to live on the outskirts of populated areas such as at La Perouse and at Salt Pan Creek on the Georges River. From the 1880s, others moved to ,or were forced onto, reserves such at Sackville in the northwest. Families such as the Locks, who were descendants of Maria Lock, continued to live near Blacktown; and descendants of Lucy Leane continued to live at Liverpool. All carried knowledge of their ancestors and their Country down to this day. During the 1800s, many Aboriginal women married European men. Some families knew of their

¹⁶ Irish and Gowan, 'Where's the evidence?', p. 61; Artefact Heritage, 2022, Aspect Industrial Estate, Aboriginal Cultural Heritage Report to Penrith City Council, p. 18. See also Goward, 'Aboriginal glass artefacts of the Sydney region', 2011; Mathews, Some Mythology and Folklore of the Gundungurra Tribe, 1901 (2003) Meredith, The Last Kooradgie, 1989, and Smith and Jennings, 'The petroglyphs of Gundungurra Country', p. 241.



¹³ Karskens, The Colony, p. 32; Griffith, Deep Time Dreaming, 2018, p, 188; Mulvaney and Kamminga, Prehistory of Australia, 1999, p. 284, pp. 376-381. See McDonald, Dreamtime Superhighway. An analysis of the Sydney basin rock art, 2007.

¹⁴ Gapps, 'They have attack'd almost every person who has met with them', *The Sydney Wars* blogpost 2019, https://thesydneywars.com/; 'Karskens The Colony, 2009, p. 50. Evidence of smallpox including dead and sick was also found well away from Sydney. Gapps, *The Sydney Wars*, 2018, pp. 55-56.

¹⁵ See Gapps, The Sydney Wars, 2018, esp. pp. 125-155, 226-255.

heritage but often kept it hidden. Others only found out much later through family history work from the 1980s.¹⁷

While much language spoken across the Sydney region was stolen - particularly when Aboriginal people were forced not to speak traditional languages at home or school as their children could be taken away - a number of early colonial word lists such as those given by Sydney woman Patyegarang to William Dawes, form the basis of language revival today. Some Sydney words became widespread across Australia such as corroboree, dingo, cooee, waratah and woomera. In many suburbs across Sydney, Aboriginal placenames were incorporated into suburbs or street names such as Maroubra, Bondi, Turramurra, Cabramatta and Bunnerong to name a few.¹⁸

4.2 Parramatta

Parramatta is one of several current day Sydney locations based on a traditional Aboriginal word or placename, generally understood to be from the Darug word Burramatta, which is broken down to mean, Burra = eel, matta = place. The suffix gal = the people of, would be added to describe the Burramattagal who lived there. European attempts to transcribe Aboriginal words were often poor, and the early colonists transcribed the place of eels as 'Parramatta'.¹⁹

Parramatta is in the centre of traditional Darug Country in what in 1788 Governor Arthur Phillip called the County of Cumberland. The Cumberland Plain is a biological and geological (biogeographic) feature of the Sydney Basin, the major geological basin extending from the elevated coastal sandstone formations at the Sydney coast in the east, to the Dyarubbin or Hawkesbury-Nepean River in the west and south. The mildly undulating plains consist of soils that have formed through millennia of alluvial deposition are punctuated with occasional rocky outcrops such as at Prospect Hill. Over the entire plain there are over 100 creeks and nine rivers, of which the Parramatta River rises in predominantly grassy or open woodlands to the west.²⁰

The river was navigable by boats to a point at modern day Parramatta where it narrows and becomes rocky. As Surgeon John White described in April 1788; 'here the tide ceased to flow and all further progress for boats was stopped by a flat space of large broad stones over which a fresh water stream ran'. Here was the centre of the Burramattagal eel fishing and trapping activities. David Collins described how burra were harvested by placing hollow logs in the water and then drawing them up with the burra inside. At the confluence of brackish tidal waters and freshwater, the Burramattagal could catch flathead and mullet fish, tortoises, mussels, oysters, crabs, prawns, mussels, freshwater crayfish and other fish. On the riverbanks, as John Hunter noted, Aboriginal people 'live chiefly on the roots they dig from the ground ... the wild yam.' Governor Phillip soon declared Burramattagal land to be 'good country' for farming and 'to be settled' as soon as the colonists were able to.²¹

Parramatta, accessible by boat, with fresh water and surrounded by open woodlands, was of strategic military importance to the colony as well. The first structure was a redoubt or small fort and

²¹ White, Journal of a Voyage, p. 128; Collins, An Account, 1798, p. 462; Hunter, An Historical Journal, 1790, p. 61; Phillip to Sydney, 15 May 1788, HRNSW, 1, 2, p. 133



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¹⁷ See for example Johnson, Aunty Joan Cooper, 2003; Kohen, Daruganora, Part 2, Darug Genealogy, 2009. As Goodall and Cadzow note, more recent movement of Aboriginal people from outside Sydney into the area has had little attention, particularly investigation of how they may have related to the Sydney Country and to the people who had traditionally lived there. Goodall and Cadzow, Rivers and Resilience, 2009, p. 41

¹⁸ Dawes, Notebooks, pp. v-vii; Troy, The Sydney Language, 1992; Karskens, The Colony, 2009, p. 33

¹⁹ Christian, 'The eel as a totem, 2021; Kass & Liston, Parramatta: A Past Revealed, 1996, pp.4-7; Tench, An Account, 1793, p. 230; Kohen, 'An Archaeological study', 1986, p. 77; Brook & Kohen, The Parramatta Native Institution, 1991, p. 3.

²⁰ Birch, 'A Short Geological and Environmental History of the Sydney Estuary', 2007, pp217-219.

the location chosen as the second seat of government. As historian Grace Karskens notes, Governor Phillip's attitude towards the Darug people at Parramatta was strikingly different to his attempts to gain the confidence of people such as Bennelong around Sydney Cove - 'there were no meetings, no dancing, no gifts or high hopes of "living in amity" ...the settlement of Parramatta was a true invasion, with well-organised military defences.'22

The colonists were correct in their fears of conflict and the threat Aboriginal warriors posed to their precious stock and maize crops that were spreading out into other small settlements at Prospect Hill and 'The Ponds', two miles northwest of Parramatta. In mid-1791, the small group of farms at the foot of Prospect Hill came under attack from 'more than one hundred' warriors in one raid, and were attacked several times over the next months, requiring soldiers to be sent out from Parramatta. Between 1791 and 1794, several colonists in the districts around Parramatta were attacked and some were killed by warriors. David Collins noted their attacks and raids had become 'frequent and extensive' and in April 1794, one raid on the Government Farm at Toongabbie turned into a battle between constables and warriors.23

Ongoing resistance warfare came to a head in 1797 when Pemulwuy led a large force of warriors into the township of Parramatta itself. In what has become known as the Battle of Parramatta, at least five warriors were killed and Pemulwuy and others wounded. As Pemulwuy had received 'seven buck shot in his head and other parts of his body', yet soon escaped captivity, it was rumoured by both colonists and Aboriginal people alike that he 'could not be killed' by firearms. Pemulwuy's resistance continued, with several escaped convicts apparently joining forces with his guerrilla warband. By 1801, Governor King had had enough and issued orders to the settlers to 'drive back the hordes of natives' around Parramatta, the Georges River and Prospect Hill. In November, rewards were offered including free pardons for convicts. Pemulwuy, wanted 'dead or alive', was shot and killed in June 1802 and his head cut off and sent to England. To this day it has not been returned to his Country.24

Even after the death of Pemulwuy, conflict and resistance continued across the Sydney region. Another Government Order banning all Aboriginal people from entering the 'Grounds of Dwellings of any Settler' was issued in 1805. While some Aboriginal people attempted to negotiate their safety and continued access to the settlements and a 'Conference' was arranged at 'the brush between Prospect and George's River', Pemulwuy's son Tedbury had united a band that continued to harass travellers, kill stock and raid farms, until Tedbury was shot in 1810. By 1814, drought conditions and expanding settlement to the south led to more conflict, culminating in the Appin Massacre in April 1816 which effectively ended resistance warfare in the region.²⁵

Government policies of removing Aboriginal children from their parents in order to assimilate them into white society effectively began in 1814. William Shelley, a former missionary from London, proposed to Governor Macquarie a plan for the education of Aboriginal people in 'useful skills', including religion and morals, and domestic duties for women and girls in preparation for marriage. Macquarie enthusiastically agreed and established the 'Black Native Institution of NSW' at Parramatta, installing Shelley as the manager. Some children were 'selected', others coerced and others sent by their families - until they realised they could only visit them once a year at the Annual

²⁵ Gapps, Cabrogal to Fairfield, 2010, p. 100-101; Karskens The Colony, 2010, p. 225



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²² Karskens 2017; Philip, *Journal*, 1793, p. 299. For an overview of the military occupation of Parramatta see Gapps, The Sydney Wars, 2018, pp. 46-48

²³ Gapps, The Sydney Wars, 2018, pp. 96-7, 104-5. Collins, An Account, Vol 1, 1798, pp. 304-5
²⁴ Collins, *An Account*, 1798, p. 305; Smith, 'Pemulwuy', 2020, Pemulwuy's head was sent by Governor King to Sir Joseph Banks but has not been identified among the thousands of Aboriginal remains being repatriated.

Feast. Macquarie even ordered that any children captured or orphaned during his 1816 military campaign were to be brought to the school.²⁶

Maria Lock, a child of Yarramundi who was reported as 'Chief of the Richmond Tribe' and younger sister of Colebe (who was granted land at Blacktown) was one student who excelled. In the 1819 school examinations she took out the major award, competing against almost 100 of the local European children. After Governor Macquarie left the colony to return to England in 1821 the school suffered from lack of patronage and was moved to what became known as 'the Black's Town' (present day Blacktown) in 1823, but eventually closed in 1829.²⁷

Macquarie's efforts to as he called it 'civilise' Aboriginal people also centred on the Annual Feast that began in the same year as the Institution, and with the hope of attracting parents from across the Sydney region to hand their children over to the school. People were recorded having travelled from the south coast and southern highlands in 1843 to attend the feast, which proved a more enduring institution in Parramatta than the school. By the 1830s the practice of issuing blankets at the feast had turned into a kind of census of Aboriginal people.²⁸

Throughout the 19th century Aboriginal people continued to attend the feast and an Aboriginal population of considerable size remained in the surrounding locality well into the 1830s. Large gatherings of several hundred people regularly occurred to the south at The Cowpastures near Camden and at the 1833 Annual Feast at Parramatta, apparently 800 Aboriginal people attended. From 1833 it was moved from December to March in order to issue blankets and clothing to Aboriginal people before winter. People travelling to the feast from the west would apparently camp at Clay Cliff Creek, others would camp near the Toll house on the Western Road. John Taylor recalled that after the feast, hundreds of Aboriginal people would 'gather for an evening corroboree on the vacant ground on the corner of Macquarie and Marsden streets'. Even in the 1860s and 1870s ceremonial occasions still brought people together across the region. Thomas Fowlie recalled two campsites at Granville at this time where people stopped en route to receive blankets at Parramatta, and performed 'corroborees by night, until by the close of the seventies they ceased to come'. James Hassall noted a camp near Prospect, where in the 1830s traditional combats occurred prior to attending the feast.²⁹

Between 1828 and 1834 the so-called 'blanket returns' noted a 'Parramatta Tribe' with around 40 people, many from the wider districts including Duck River, Ryde and Concord, but by 1841 there were only 11 people from the Weymaly or Prospect area. By the 1840s, closer settlement around Parramatta had pushed many Aboriginal people away from their traditional lands.³⁰

By the 1880s the establishment of the Aborigines Protection Board brought new levels of control over Aboriginal lives. As Parramatta and nearby suburbs and industry expanded in the area, in order to survive in the Sydney region, Aboriginal people often kept their identity hidden. Some people managed to live in Parramatta through the 20th century such as Aunty Joan Cooper, born in 1928 and who grew up in Parramatta, recalled that as a young child at school she was 'made to feel different for being Aboriginal'. She was also aware that her parents only ever spoke their language in private at home, and that it was important for her to attend school in fear of being 'taken away' if she didn't.³¹

³¹ Cooper in Johnson, Aunty Joan Cooper, 2003, p. 60



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²⁶ Na., 'Blacktown Native Institution'

²⁷ Brook and Kohen, The Parramatta Native Institution, pp. 23, 51; The Sydney Gazette, 17 April 1819

²⁸ Hassall, In Old Australia, pp 17-20; Gapps, Cabrogal to Fairfield, 148-151.

²⁹ Fowlie, 'History of Granville', p. 14; Hassall, In Old Australia, pp 17-20

³⁰ Kass & Liston, Parramatta: A Past Revealed, p. 106

In 1891, the Central Cumberland (Parramatta and Liverpool) census recorded 15 Aboriginal people, as well as 12 identified as 'half-caste'. A number of these people were noted as 'living on a farm at Holsworthy'. However, these distinctions did not account for many other Aboriginal people who married non-Aboriginal people, or who managed to survive on the fringes of Sydney, away from the restrictions in more populated areas where racist policies were in place to take Aboriginal children away from their parents. Indeed under this system, which was attempting to rid Sydney of its Aboriginal population, some children taken from families as far away as Narrabri and Moree in western NSW were brought back to Sydney to such places as the 'Children's Home' at Liverpool. Now known as the Stolen Generations, many of these people grew up in western Sydney and many were never reunited with their parents and families.32

Today, some descendants of Burramattagal, such as Jules Christian, continue to revive cultural traditions such as the Burramattagal Eel Festival that has been held since 2016.³³

³³ Christian, 'The eel as a totem and symbol of resilience', 2021



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³² 'Welfare of Aboriginals' in *Votes & Proceedings of the Legislative Assembly NSW*, 1892-3, 8, p 1122. See also 'Aborigines Protection Board Minute Books' SRNSW 1899-1920

5.0 PRESENTATION OF PARTICIPANTS INFORMTION

A site visit was undertaken on 13 February 2023 and interviews with three RAPs were undertaken during the same week.

All three participants were interviewed and one, Jamie Eastwood (Aragung Aboriginal Cultural Heritage Site Assessments), attended the site visit. One participant did not wish to have their name included in the report and are referred to henceforth as Participant 3.

Table 3. Participants who attended the site visit and interview

Name	Organisation	Participation
Jamie Eastwood	Aragung Aboriginal Cultural Heritage Site Assessments	Attended site visit and interview
Jacinta Toben		Participated in interview
Participant 3	Requested details be withheld	Participated in interview

5.1 Results of the site visit

A site visit was carried out on 13 February 2023 attended by Jamie Eastwood (Aragung Aboriginal Cultural Heritage Site Assessments), Elizabeth Bonshek (Senior Heritage Consultant, Artefact), Stephen Gapps (Historian, Artefact), Kelly Barton (Aboriginal Heritage Officer, Artefact), and James Allsop and Noni Ross (Transport for NSW).

Following the review of the location of the sites with Jamie Eastwood, it was agreed that we would visit the following sites along the proposed project alignment route:

- 1. Ermington Wharf
- 2. Ken Newman Park
- 3. Broadoaks Park
- 4. Rydalmere
- 5. Disused rail line at Camellia (the Sandown Line)
- 6. Grand Avenue, Camellia
- 7. Wentworth Point
- 8. Sydney Olympic Park Brickworks complex.

Jamie stated that he was concerned that he was only one voice, and while in his 50s, he was still young and others have a deeper knowledge. He also said that he did not need to see the Parramatta site because he was already well acquainted with it. The discussion which took place during the walk over Country highlighted a number of relevant themes which were common to all the sites and many of these themes were raised in the interviews which followed that week. The interviews and emerging themes are presented below in section 5.2 and section 6.

Generally, the presence and importance of Songlines and sight lines emerged on the site visit, as did the central importance of the river, as both a subsistence resource and an area of great spiritual importance. The need for people to access Country, and moreover, their inability and prohibition on accessing Country, also emerged.

During the drive through Camellia we observed an art work located in the traffic island on Grand Avenue, Rosehill.

5.1.1 Art work at Grand Avenue, Rosehill created by Joe Hurst, 1999.

During the site visit on Grand Parade in Rosehill a series of Aboriginal artwork was noticed along the median strip. Some are carvings of shields and other devices on logs (that appear to be local pylons or piers perhaps sourced from Parramatta River) and others concrete painted with representations of Sydney style rock engravings.

On investigation these were found to have been installed in 1999 by Aboriginal artist Joe Hurst (deceased, 2022). Joe Hurst was a well-known artist with a career spanning more than 30 years. He was renowned for creating pieces connected with the land on which they were built.

Long-time member of Boomalli Aboriginal Artists Cooperative, Joe descended from the Johnson clan of the Murrawarri people, Northern NSW. Working across a vast array of disciplines including design, construction, sculpture, printing, painting, set design and public art, Joe completed several commissioned pieces for government bodies such as the Department of Aboriginal Affairs (NSW Government) and NSW Premiers Department.

He was involved in many exhibitions both nationally and internationally and exhibited in Budapest, Hungary and New Zealand. Two of Joe's more prominent works were a 4.5 metre high sculpture for a new Indigenous Exhibition at the Powerhouse Museum in Sydney. He also designed the Sea of Hands for both Reconciliation weekend and Olympic weekend in the Royal Botanic Gardens.

While the sculptures (and possibly associated tree plantings) are surrounded by industry, they remain a significant part of early attempts to incorporate Aboriginal art and representation in the local area and as such should be considered as an element of more contemporary cultural significance.³⁴

³⁴ 'Remembering Joe Hurst', June 23 2022, Taylor, online at; https://taylorau.com.au/remembering-joe-hurst/; 'Joe Hurst', Boomali, online; https://www.boomalli.com.au/joe-hurst/











Figure 7. Joe Hurst art installation





5.2 **Interviews**

In this section I (Elizabeth Bonshek) present a summary of the interviews with each participant. Each participant is introduced in their own words and direct quotes are utilised throughout. Where the flow of the conversation has been broken or an element extracted the following indicator is used "...". Words that appear [inside a square bracket] indicated that I have introduced a word or phrase to assist in conveying clear meaning. The themes of the three participants will be summarized in the following the section.

All language names / words were reviewed by the participants.

5.2.1 Interview 1. Jamie Eastwood, interviewed by Elizabeth Bonshek on 16 February 2023. Kelly Barton, Aboriginal Heritage Officer, Artefact also present.

Jamie Eastwood brought up a number of themes during the site visit and addressed many of these during the interview. He said that the Parramatta River was a Songline, and that there were other Songlines that were important in the area. Songlines established the resources of the river, the land and sky; they guided the movement of people into and out of the area; and they formed the overarching context of Aboriginal people's connectedness to Country in past, present and future time across land, water, air and stars. He also commented on the nature of urban development and the disturbance and disruption that this has caused. And he stressed the necessity to remember Aboriginal lifeways and to not forget. He suggested the naming of stations [light rail stops] in Darug language.

Jamie Eastwood's introduction:

Hello everyone, my name is James Eastwood, I am a traditional Gamba man from western NSW on my grandmother's side. I'm spiritually born on the Gadigal nation of Sydney. On my mother's side my relationship is with the Parramatta, I am a descendant of the Darug people.

At the moment I work in Parramatta in the lands associated with Parramatta... for 30 odd years as a cultural educator. I grew up with a lot of elders in the area. I am happy to discuss the cultural values and significance of the area that I have learnt, so thank you....

We are talking about the people of the Darug of the Parramatta area, in particular, the Burramattagal and the Wangal people of that area so I think if we are gonna talk about that part of Parra which is Country. I think we should recognise that we are talking about these people's lands....(16 February 2023)

Jamie explained that the route of the light rail touches Wangal land. The Wangal people are a part of the Parramatta River. The Wangal people extend as far as Sydney to Cockle Bay and the border the Burramattagal people to the west; the Bidjigal People to the north; and the Gadigal people to the east.

The Parramatta River is a major Songline and is a spiritual connection for people. The river was created by Garangachal, the Grey Eel. As well as providing natural resources (fish, shell fish, and the plants growing along the river) the river was also used for barter and trade as people came into the area. The river is a Songline and knowledge is passed between the clans along it and its tributaries.

...the most important parts of the cultural landscapes of the area and the light rail [route] would be the river and the tributaries that flow from the river.

Over thousands of years people from around the region gathered at Parramatta. Jamie said that not only does the archaeology of the area shows this...

There is also evidence in stories my elders have told me, they passed on to me...

People came to Parramatta from all over New South Wales, not just the Sydney Basin. Some followed the Songline from the Blue Mountains, an Aboriginal walking track which is now the Great



Western Highway. They came for feasting associated with the mass migration of the eels which, once a year, make their way down river to the sea, migrating from fresh water to salt water. At this time of the year there are many small lagoons forming along the river. So this is good for harvesting eels:

...the eels used to rest in there, it was like a ready made feast for you...

The feasting happened every year and lasted for roughly a month. For example, the coastal people came to Parramatta for bark to make canoes; and some people from the plains on the other side of the mountains needed to obtain certain stone tools. They traded and exchanged with one another and arranged marriages. People were welcomed into Parramatta; they could not simply travel in of their own wish. Jamie stated:

"This goes back to why we do a welcome to Country. We welcome people on to our Country and ensure the spiritual ancestors, of the Burramattagal people/ancestors, meant them no harm... that's why we do welcome to Country.

In addition to the eels which form the central focus of the annual festival, other river resources included shellfish, mango crab, mullet, brim, bass and snapper, the last being the totem of the Wangal. A particular type of grub that lives in rotten wood in the mangrove swamps is also edible as well as various plants growing along the river bank. Duck species living on the river were also caught for food. While larger animals such as the kangaroo were hunted during feasting time possums were a staple part of the diet. Men cut toe holds into the tree trunks so that they could climb up and catch possums or alternatively smoked them out if the tree had a hollow.

Jamie stated that for Aboriginal people there can be no separation of the elements that constitute the ground, the water, the air and sky: rather they are layers. This discussion emerged during the site visit, arising at Potential Archaeological Deposit 1 (PAD1) Ermington Boat Ramp, where we had talked about how the removal of soil from an area was constituted as an absence by archaeologists. For example, the removal of original natural soil represented disturbance and therefore the possibility of absence of archaeological value. Jamie contradicted this assertion during the site visit and returned to this matter during the interview.

Well look, wherever we go, I am coming from Gadigal land in the heart of Redfern, surrounded by bitumen and concrete and there is probably no "natural soil profile" present. In saying that I'm at a special place called the Block. It still has that Aboriginal spirituality to it: It's not what has been taken away, it's what was here and what will always be here... you can strip Country bare and build over it and do what you want to it, but what I am trying to say, it will always be Aboriginal land and always have that presence.

When we think about land, we think about it in layers... but these layers are in multidimensions - quite often you talk about the layer of a circle which is never ending. When we like to do things, we sit in circles, it is all inclusive it includes past, present and future.

Jamie also pointed out the importance of sight and hearing in thinking about these multidimensional layers. Through view lines Aboriginal people can see their Songlines and through sound they are also connected to the various animals and birds which are dreamtime beings. By looking to the "sky Country" Aboriginal people can see their "astral dreaming stories" in the stars.

As I said you can take soil away and build over the top of it and disrupt view lines or Songlines, fill the skies so we can't see our astral Dreamings, but they are always there, because they have been passed on for millennium, for many thousands of years and that story is hopefully never ending and will keep on going.

Jamie concluded this statement by adding that he hoped that his participation in the interview would be a continuation of the telling and retelling of stories which "let people whose Country we are talking about."

The proposed Parramatta light rail stops were noted by Jamie as being important because they will travel along Church Street, which was the location in which the Native Institute was established and was the organisation which took first took away Aboriginal children from their parents. This is a very important site in contemporary Aboriginal history:

This was one of the first places Aboriginal children were taken away. Its only contemporary history when you think about it. Children were taken away right up to the 70s, children are still being taken away to this day. It goes past goes close to where we had our feast, there are quite significant areas in Parramatta itself.

Contemporary history we are talking about 150 years -- it is still where it all started and eventuated where all the children were taken to the native institute and later moved to the Blacktown native institute.

Jamie stated further that information and research about this period in history should be made public:

...for everyone to see and tell our histories. It is not only Aboriginal history, its Australian history. Unfortunately lots of horrible things happened, you can't bullshit about history, it is what happened. It's a fact.

Jamie included contemporary events through which people meet and continue to strengthen and educate others about their social and cultural values and these included a number of public events, such as National Aborigines and Islander Day Observance Committee Week (NAIDOC Week) which Jamie described as a "modern day corroboree"; and the Eel Festival held in Parramatta annually. Individuals named as inspirational for Aboriginal people, especially younger generations, include Cathy Freeman who won gold at Sydney Olympic Park.

I asked Jamie whether he felt that Aboriginal people had lost parts of their culture. He responded:

When I talk about loss, I'm talking about the environment that has been removed from these areas; the natural flora and fauna.

Not only that I'm talking about the loss of sound of birds, sight lines, all that type of stuff.

In a sense of loss a lot has been destroyed but I guess it's never lost, because going back to that connection to Country and land, it always will be and always was Aboriginal land. You can take it over, you can put concrete or bitumen over it,



build on it. Aboriginal person has walked softly along that environment in the first place and their footprints are there to this day.

So while some aspects of the environment have been lost, and therefore people's connection to those elements that have been removed, the nature of Aboriginal people's connection to the land remains unchanged. But it is important to not to forget about culture.

...its vitally important to keep these links and conversations going about culture, so it isn't forgotten. A lot of our people from that area have held the stories, and being an oral culture passed from mouth to mouth and ceremonies such as at Parramatta, they haven't happened for a long time. We only have a few elders left that can tell those stories; and they haven't got all the information. They have gaps too as they have a broken culture - that is no fault of their own. It has been disrupted with children removed and families separated.

The importance of remembering culture was stressed and the importance of not forgetting. The process of maintaining memories involves tying culture to places, through naming, specifically the place names of the new stations [light rail stops]..

Why couldn't we revalue things? Why not call these stations dual names, such as this is the Homebush Park, Olympic stop we could call it the Wangal stop, revaluing things. Dual naming or outright Wangal station.

5.2.2 Interview 2. Jacinta Tobin, interviewed by Elizabeth Bonshek on 15 February 2023. Kelly Barton, Aboriginal Heritage Officer, Artefact also present.

Jacinta Tobin's statement revolved around her perception that the Country has become "sick" through overdevelopment. Furthermore, consultation concerning development was not co-ordinated, but piecemeal, and undertaken through a process in which Darug people have no power of veto to protect Country. Her interview was an emotional and heartfelt plea for the cessation of development, although at the same time she acknowledged that her plea would not be heard, and her position became one of demanding the revitalisation of the river and the restoration of Aboriginal peoples' access to the river so that they could care for it and to continue the social, cultural and spiritual practices of her ancestors.

Jacinta Tobin's introduction:

My name is Jacinta Tobin, I come from an unbroken women's line to the Prospect people. We married into the Yarramundi mob. We are from the first legal marriage of black and white in Australia and we are the Sydney "Originies [the originals]".

Overall, Jacinta Tobin's response to the route of the study area was to focus on the big picture of development in the area. She was concerned about overdevelopment in Sydney and the effects of development on the city, and in regard to the study area, the life of the river.

In the 90s we tried to work with the government agencies to understand green corridors through the city. My concerns with all the development is that we are heating up Sydney, it is becoming one of the hottest cities in the world. We are not thinking of the long-term effects on the fish life and whatever little bit of nature is left.... We've seen the big old trees come down in Sydney, the figs, for a monorail - that monorail is gone.

That's not even a branch that grew on those trees and no one has that long term thinking, and everyone is just in it for the money and the Country is sick...

There is no thought of our Songline connection to any other nations in any of this development, no thought of any of the "other than human" experience in these developments, it's all about us as human beings, so where is us, as Aboriginal people, who care for Country?

She remarked that Aboriginal people looked after the Country with a long term plan, "a seven generation plan" not a "four year turn around depending on who is in power".

There are Songlines in Parramatta:

Songlines are already there, you've got Parramatta Road, that's an old Songline. You've got Silverwater Road, I suspect there would have been a crossing path there. There were sites all along the river bank there because it was from the salt water to the fresh water, so it was very important place for those gathering area.

She felt that Aboriginal people were regarded as museum pieces, and therefore they were perceived to be a part of the past:

You know these places, that were our food bowls, called us to Country at times, Burramatta was only Burramatta when the eels were on. There would have been other food sources there at different times of the year depending on which way people came in. But we've not thought about this in any planning of the city because we are just constantly looked at as a museum piece, but we are not museum pieces we are still here, our culture is still alive...barely.

Development has completed changed the topography of the land and the river no longer flows the way it should. Darug people do not have control over development:

What concerns us is that when we do have these consultations, then our name gets put on there and generations to come will think we signed off on these things. We did not sign off on these things. These things need to be stated: that we are being talked to about cultural values after the horse is bolted. And that is really important to my family, for my family, not just my family name but the Darug name, the Darug people's name to be acknowledged that they had no control. No control over this development - but we are trying to lessen the blow.

Other Australians were not exempt from a responsibly to look out for the future:

I know, non-indigenous folk need to understand we gotta do long term planning now, you know because we have seen all the fires and the floods....

Jacinta was faced with a paradox when asked to talk about cultural values:

...right now most of the people who come to Country who have the old way food source understanding, don't eat our bush tucker, because most of our bush tucker (the liver) is really bad, you know as in the animals and that.

And so these are things that when people ask us about our cultural values, how can we have cultural values when we can't even eat from Country [because of pollution].

Located within a compromised environment, Aboriginal cultural values which are constituted through Songlines and the movement people along Songlines and the associated activities of these movements, together with debased access to contaminated resources for subsistence and ceremonial life, renders questions about cultural values meaningless to Jacinta because Aboriginal people cannot practice the ways of their ancestors because the Country has become sick. She emphasised that culture was not dead, but Country was sick.

Everybody in this Country has their church, their steeples, their gathering places. Where do my family gather? Look at us now, we've been colonised, we get colds and flus like every other bugger; we don't even eat our food, to resort to having healthy foods in our bodies. The river is toxic and that's not right. You know that is one of the main food sources in this area and yet we can't eat from that yet. You can't even swim in it at the moment.

Mum used to eat eels out of that river. She was born in 1933, she's 90 this year, she ate eels out of this river - you can't do that now.

And these are the things that are the cultural values that need to be restored and what people don't get is if we start to care for Country, we will be able to go through to the next century. But right now we are leading ourselves to a path of destruction in Country.

She added that development needed to be carried out in "smarter" ways, including "circular economies" and materials that do not generate heat in the cities. And there needs to be spaces left so that Aboriginal people can gather and hold corroborees and access the river. The river and the land needed revitalising. In some areas yams are being replanted, but more needs to be done to restore bush tucker to the area.

The trauma of historical violence experienced by Aboriginal people came to the fore during our discussion. The violent nature of historical interactions between Aboriginal people and colonial settlers and rendered futile any attempt to understand "cultural values" in a vacuum - wherein history is excluded.

Jacinta also spoke about the importance of people knowing about the truth of what had happened in the past, because with this knowledge understanding might follow.

The history and the truth telling needs to come out for people to understand our predicament as Aboriginal people here in Country as Darug people. And the history is still scarring our families and is still emotional for us, it hasn't gone away. I wasn't expecting to do this now [crying], it's hard. It's really hard. But this is where people don't cry for our Country like we cry for our Country. People don't cry for our Country...

...the reality is that people don't cry for our Country, yet they drink the water from here; they don't feel that way and we are powerless.

The unsustainable nature of contemporary development and its polluting effects on the environment recurred throughout our exchange. Threaded throughout was the indivisible nature of Aboriginal spiritual connection to Country (the land, the environment, all the animals on the land and in the water and the skies) and the well-being of people.

I'm just devasted for Country.

The generations that are gone and still sit on our shoulders and tap us on the shoulder; and come into our dreams -and we still have family who dream and go into water ways we still travel in Country - but it's just, we can't ...no one eats food from Country, we would be healthier, so much healthier if we ate from Country, but look at the pollution that comes from all those areas there and it goes into that poor old river.

If we could push for looking after the water way, I would be grateful but there is so much more that we have to care for. If we care for the river better than we are doing...that is at least one bit we are trying to look after.

Furthermore:

...we are not practicing our traditional practices to keep the land happy. That was our job. Our job was to make sure that Country was happy. Country happy, people happy. Country healthy, people healthy...

...People don't understand that you need to leave seed stock to grow another harvest, not reap all the food in one go. This kind of behaviour is making the ancestors cry and the ancestors understand that today people are powerless. We need to stand strong to make things right. Part of doing things right would be to be involved in the bigger picture, not in small consultation pieces.

She felt that other people were permitted to have heritage.

Everybody else gets to keep their little 200 years. My family has been here for six generations...they all get the land and are big money people now.

I work with descendants of Blaxland, Wentworth and Lawson, they live very different to how I live. And my family were here before they got here.

Give us the space in this area for our family to practice because those bends are important on our rivers, those bends were important and yes - good fishing. Well would be if the fish were edible.

My request is to create the waters so our food source is available again.

Which means go to the planning minister and waterway people and big picture plans, because it's the government creating this, it's the government that needs to clean it up.

She continued that Aboriginal people need to have artefacts back in their proper place; not in a museum. Things have their proper places and some should not be placed together. Aboriginal people need to look after their heritage, both tangible and intangible. Other people were allowed to care for their heritage.

In reflecting upon the route of the light rail, Jacinta remarked that Sydney Olympic Park was a place that the Dharawal would come over and games would have taken place there. She noted that there is still a bora ring in Westmead Park – "and if you take your shoes off you can feel them". Parramatta Park has them too, she said, and scar trees, which are used to mark the location of bora rings. Women used to use the mud baths there too "...which is good for skin care", but, she added, women weren't asked about this.

Jacinta added that there was still much more to know and that it was sad that today people were still discovering things because when they were growing up their Aboriginality was hidden.

There is so much more in Country...and we are still re-discovering it and this is the sad part, we weren't brought to understand this, we were told we were Spanish - that is why the cussies [cousins] were so dark, must have been some Maori somewhere, because everyone had to lay low because mum came out so fair.

So this is the hard part. We lost two thirds of the tribe within the first five years of settlement. The old ones would have been bringing up the new ones, but they died.

In closing, I asked Jacinta if she thought that things had been lost or whether there was disconnection. She replied:

Well I don't think anything is lost, I don't because the dreaming is the past the present the future, so things haven't been lost.

What I worry is that it is sick and we need to bring it back, because if we lose something then it's gone and I don't think my culture is gone and I don't think the land is gone. It never goes. It still vibrates, it's still got energy, it's still got energy in it.

What I do think is that it is sick, because it is not getting the attention from the original people from Country whose responsibility to do ceremony in certain places at certain times of the year. But we are still learning that because we were denied to even speak out language here. More than a certain amount of them

were shot, we were hung from trees, hunted, they poisoned our flour and water holes. They shot us for fun.

She continued that the Country needed repair and revitalisation and that has to be done through ceremonial practice to create health, and access to the Country was needed to allow ceremony to take place. She said that Darug have been disconnected from Country; they have been prevented from accessing the land and Songlines. Therefore, access to Country is vitally important.

We have been disconnected but we are still connected. We are disconnected from putting our feet on the Country, we are disconnected from access to site, we are disconnected with other Songlines that are part of this Country. It effects everybody's Songline, because we are not doing the job from Country which we need to do to make the planet a better place.

5.2.3 Interview 3. Participant 3, interviewed by Elizabeth Bonshek on 17 February 2023. Kelly Barton, Aboriginal Heritage Officer, Artefact also present.

While Participant 3 made an introduction for the interview, this is not included in the report. In the following section Participant 3 has been referred using the pronoun "they".

Participant 3 said that the Parramatta River is a very significant place because it is where fresh water meets salt water and therefore it is a place of "friction and flowing". They referred to a time when the river was flooded and people were scared to go near the river for fear of the spirits there.

Parramatta River is so significant, same as all of our water ways. If you [Transport for New South Wales] are having to go along a river I think you need to stick to the spaces already developed - not that it makes it any less cultural or any less values - but if you can stay away from the edges of the rivers, it is really important because our burials were along these river in the sand. They are areas we should avoid touching at all cost.

The river banks were burial sites in former times and therefore are highly significant and should not be touched. Furthermore the river itself really constitutes the last remaining green space and for this reason it should be left alone.

Early in the conversation Participant 3 expressed her view concerning Aboriginal Heritage Information Management System (AHIMS) sites. They commented that they exist only because an archaeologist has gone to a particular place and found "a tiny little object". One of the first things they wanted to address was the nature of AHIMS sites.

This is cultural Country, the whole lot of it. Whether there is an AHIMS dot anywhere, that means nothing to us. This is cultural land even though it has been built on. Our DNA is still on that land. If you go deep enough, you'll find evidence of that.

They continued saying that archaeology doesn't take enough time to look deeply enough or look at spiritual connection, nor does it take into about oral histories of the area.

So cultural heritage makes me quite ill, I just can't handle it. I can't handle those AHIMS dots - where they are the only important bits, because that's just not the way we should be looking at it.

They emphasised that it is the Country that matters: the river, and the sandstone Country to the north which has resources for women, provides shelter and filters water.

Participant 3 also rejected the idea that development had caused disturbance to the ground and that disturbance of itself negated the possibility of finding evidence of Aboriginal activity in the past.

... in archaeology, it was always like there is nothing here anymore because it has already been developed. That is such a fallacy. There is DNA in this Country and its still there under the buildings...

Searching for little objects is what they have been doing. And that's how we pin point our culture, but that's not it all, it's a lot deeper than that. I mean even the flora and fauna that have managed to survive are really important: they carry our stories. When we are out there [on Country] and when we see them do different things [observe the flora and fauna]...they [the flora and fauna] are still here. And we don't take that into consideration at all, we have all these things so that birds can't land on things because they don't want bird shit.

It's pretty sad.

Their criticism of archaeology and cultural heritage management extended to the consultation process. They argued that:

... What I can't handle is that we aren't changing our thought process about how we look at Country. We are all looking at it in the same way .. and I know development is going to happen.

We are all looking at it like there is a site here, a site here... But it is a whole area of Darug Country, along this river for thousands and thousands of years. You go there now and it is so polluted, people throw rubbish in there, there is run off going into it. Duck River is absolutely atrocious.

And then we are getting Darug mob on here to talk about this [ie consultation]. Like what do we say? Look after the water ways, include a bit of story and interps [interpretation] and names of stations and things like that. ..., its heart breaking looking at our Country especially these water ways like this.

They also thought that the Country had become sick and had become buried. It could be revitalised by bringing language back and using language on Country, and by cleaning up the water ways and caring for the flora and fauna of the Country. While Participant 3 felt that "nothing good" for Darug people could come of more development, something that could be done as the development progressed was to clean up the river and sponsor education programs for Darug people.

Education programs were suggested as a major way forward to address the need to care for Country:

There is nothing good for us that can come out of this. The only good thing that can come out, is getting some educational stuff in there, some "sign-offs" that you're impacting the river when you're going across it. Do some regeneration works across the banks.

If you are going to impact the river like that, fix it up as far along as you can ...

Like development's not a good thing for any of us even though we catch trains and stuff - but hurting Country that way, it is awful for us.

But I guess its gonna happen, we just have to try to think of stuff that benefits our mob, which is the education:... [[such as] sponsoring some language programs in local schools. None of us have money because of what's happened to our mob. We don't inherit anything, we are on the back foot the whole time. Things like that. Even a sponsorship for young people to get into apprenticeship: different things like that I think, because we are never gonna save Country but there are little things we can do.

Even some of these school in this area, if you've got the species marked out, schools can sponsor the species as part of science curriculum...and if they've got some kind of funding in place for them to do that, they might be able to look after some of the habitats along and through this area.

If you are going to have a station and sub stations and they are going to be built, they should always include something in there for local species instead of trying to move them out.

Mine's [my concern] all about trying to clean up a bit, because if you get the school adopting these areas, they take real pride in it, you'll find that the whole community gets on board.

Educational programs which include language programs are desperately needed. Also plain English booklets about the area, but these must include whose Country it is, and be written by someone whose Country it is. They added that while it would be good to revitalise language in schools along the route, there weren't enough people to teach Darug face to face:

We do [language] programs [but] we don't sit in these areas [along the proposed light rail route]. We do them here out in the Hawkesbury and we are setting up at the moment...downloadable language programs for the school because there is not enough of us to go to every school. They can download them and their language teachers can learn from one of my colleagues on how to deliver those programs.

Language has picked up massively. We have 700 people that have gone through our language course which is massive and Mum's being doing the language course for about 40yrs. My uncle is doing it and now it has really picked up.

Where I live in at the Ponds they are walking along speaking Darug, I walked into the school. They were talking to me... I was like OMG they are not just saying a

word they are asking me questions. I was blown away by it. There is an opportunity ... to actually sponsor some of these projects moving forward.

Participant 3 then suggested that audio information accessible by QR codes be provided at the stations [light rail stops] so that people could hear acknowledgements of Country and learn about whose Country they were on. While they said educational programs had been used in some areas, such as Parramatta Square, the Darug needed a broader reach, including in areas such as Rosehill.

The thing is too with this area, the Eel Festival every year we get 2000-3000 people to go there, the community is so interested in Darug culture they just don't know where to find it as it is not accessible...

Question: Is Parramatta Park the only cultural space where you can be on Country?

There are little pockets, parks and that, Parramatta Square has got the yarning circle and stuff now for the Darug circle. We have done a bit with Parramatta square. That's where Macquarie's feasts were and our kids were taken, so it's not the happiest space.

We have got a lot of education in there, I have done few public art projects and I've been able to include language usage. But it's a funny space in front of the church where those feasts happened. For other spaces? You don't want to lose a space.

They remembered that their parents went to Homebush to do ceremony there, before Sydney Olympic Park was set up.

Participant 3 was passionate about the restitution of Darug language, which was seen as a fundamental element in the process of cultural and social reproduction: speaking Darug language is core for the maintenance of cultural and social value:

My grandmother spoken Darug language fluently. When my mum walked around the corner and they were speaking, they shushed. They didn't want the kids to speak the language because they didn't want their children taken. And that's my mother, that language took a short time to be taken off us. And now we are fighting for how many lifetimes to try and get that language back, we are never going to be born into the language, we are never going to be fluent. Unless you are born into it, it's never going to be a fluent language. And what's been taken is absolutely disgusting...

The concept of cultural values was discussed again, and the limitation, from Participant 3's point of view, of the archaeological framework - and by extension by government agencies which rely upon archaeological definitions of Aboriginal evidence and potential.

We need to stop thinking that if there are no objects than there is no Cultural values...

If you look at in this way, when you go out and do this archaeology and you're looking for objects, you're going through topsoil to clay and you stop because apparently there is nothing in the clay.

When we hold ceremony, we use the clay, we don't use the top soil. We get down into the clay - we paint [with] that, we use that, that's a spiritual connection. That whole clay layer.

Then when you get down into the rock, we use the rock as well. The little top bit that has been taken away, that's not what out mob connects to anyway, we connected deeper...

It's not even connection to Country, we are connected to everything, it's a holistic thing, spiritually. Which you can't explain properly. Songlines, singing Country. If you get right into it shape shifting and going elsewhere in your mind, there is just so much more to it than that layer of objects. When you connect your feet to Country you can feel it, feel the different Countries...

My family say: 'How did you go today? Did you find some knives and forks?' That's all it is, evidence of us living there. That's not our cultural heritage. It's this whole Country, us teaching in in classrooms. People say we have to get on Country. No we don't, we are still on Country. On Country but in a building, that's hopefully air conditioned.

6.0 DISCUSSION AND SUMMARY OF RESPONSES

6.1 Introduction

The three participants raised a wide range of issues in the interviews. All of them, in differing ways and with slightly different emphases, discussed the importance and nature of Country and spiritual connection to Country. This included:

- the importance of Parramatta River as a Songline
- the importance of its tributaries which provide people with spiritual and cultural wellbeing through access to essential resources (water life, bird life and flora and fauna associated with the river and the river banks)
- the importance of connection (travel and communication) between people from different Countries.

These descriptions of how life should be led - which are a description of cultural values - were also demonstrated to be compromised. Environmental degradation in the area as a whole, stemming from over development and polluting industries located in various places, have disrupted and destroyed the ecosystem of the waterways: the Country was described as "sick". However, it was understood that the sickness could be healed if people were able to practice their cultural values.

It was indicated more than once, both verbally and through reactions during the interviews, that being asked to discuss cultural values caused affront and was frustrating because it seemingly required a description of cultural practices that today people are prevented from enacting. I was told that people have been prevented from physically accessing Country (in this instance, Parramatta River) which has resulted in disruption of their cultural practices; historical events have also resulted in the loss of cultural practices and in turn have disrupted people's ability to perform their cultural and ceremonial practices (their cultural values). People have been alienated from Country; their language lost; their children taken away - yet they are asked through the interview process to describe their cultural values, and to do so within a process which they feel will inevitably lead to further development.

In comparison with the Bangawarra report the comments of the three participants did not accord necessarily with the precincts but ranged thematically across the precincts identified in that document. The participants comments were not confined to the project route but addressed the broader region. The Bangawarra themes "Reading Country"; "Diverse Ecologies" and "Gathering Spaces" can all be read into the response of the participants during the interviews.

The following presents a summary of the themes that arose and specific comments. These themes have been arranged under seven headings; however it is important to realise that the headings and content have overlapping elements (and therefore elements may reoccur under more than one heading). The divisions suggested below are to provide the reader with better facility to move through the interview material which contains elements that are, in reality, tightly interwoven, and for the interviewees these elements are inseparable:

- Country and connection to Country
- water ways provide food and resources
- travel and communication
- · histories of disruption and disconnection
- environmental decay / urban development



- difficulty with archaeology failure to embrace cultural values
- people of note in the area.

6.1.1 Country and connection to Country

Songlines are spiritual connections to the ancestors, and knowledge comes from them. The Parramatta River is a Songline and was created in the Dreamtime by the movement of the Grey Eel. The following points present an amalgam of the points noted by the participants:

- The landscape has changed, but the land is as old as the Dreamtime, and there is a continuous connection despite the changes that have occurred, both over time and through impact by colonial settlers.
- Site line markers are important these are places from which there are view lines, for example
 offering views up or down the river.
- Travel routes are located on Songlines.
- Songlines are everywhere: there is no absence of Songlines. Songlines in the area include the Parramatta River, Duck Creek, the route inland to the west, flats, ridge lines.
- A Songline is a way of passing knowledge onto others, it is also trade line.
- Not only are the land and water important, so is the sky and the stars; hearing and seeing are important.
- Past, present and future are all connected, they are not separable.
- The spiritual connection to Country is indivisible.
- Country has energy, and this energy never goes away: it cannot be lost; people need to reconnect to Country and the energy of Country.
- The Parramatta River is significant spiritually because it is the meeting of fresh and salt water and therefore a place of "friction and flowing".
- Riverbanks were burial places. For this reason the riverbanks are areas of spiritual importance.
- Because of the practice of placing burials along the river bank, the works of the project should avoid these areas and stick to already developed areas.

6.1.2 Water ways provide food and resources

The participants noted the following elements:

- Mangrove "elbows" of younger trees were used to make boomerangs.
- The Golden Eel lives in the river and spawns at certain times; these times are feasting times.
- Mangroves provided food such as crabs, eels.
- Indigenous uses of resources was sustainable.
- Women used to place their babies on the leaves that dropped from Shea Oaks. Snakes do not like the leaves of this tree, and will not slither over them. So this is a way of protecting the babies.
- Warragul greens grow in the mangrove area and are like English Spinach. Captain Cook picked these and he and his crew ate them. Perhaps these greens saved his crew.
- The mangroves are breeding grounds for fish, birds, and they also provide materials to make fishing technology.



6.1.3 Travel and communication

The following elements were noted by the participants:

- The Parramatta River is a border between groups.
- People travelled to the area to trade for resources such fish, and to get wood for making canoes, and silcrete from the Cumberland Plain. They used shell to make barb points. Jamie noted that Uncle Greg Sims is still making these and also heating silcrete. People are also building canoes too.
- View lines, or lines of sight, are important because they provide vantage points to see Country.
 Lines of sight enabled people to see disturbances as well as smoke signals; and so they communicated and prepared to welcome people travelling into the area.
- People would ask permission to come to another territory; travel was seasonal, and therefore fixed to certain periods.
- Feasting was also seasonal and brought people together. These gatherings were also the time social arrangements were made (ie the time for arranging marriages).

6.1.4 Histories of disruption and disconnection

The following were considered important by the participants:

- Histories have been taken from Aboriginal people, including the knowledge that their elders held.
- People had to hide their identity and stopped teaching Darug language to their children because
 they were fearful of what would happen to them if their Aboriginality were known: it was likely
 their children would have been removed.
- The participants felt there was a need to tell others what has happened, and that education was important. Contemporary events (such as the Eel Festival, and NAIDOC week) are important occasions in which to educate others about what has happened to Aboriginal people
- the Parramatta city area site was important because of the "bad history" that happened there, namely the removal of children and their relocation to the Native Institution on Church Street.
 This history should be made public.
- The burial grounds along the riverbank have been violently disturbed.
- Violence occurred when babies were killed on the riverbank.
- Environment resources and ecosystems have been lost and these need to be regenerated.
- It is important to remember links and connections between people and Country and not forget.

 Knowledge of these things can be maintained by telling stories and restoring language
- Language and education is important:
 - Darug language has been lost and is being retaught. No-one has been born into the
 Darug language.



- Revitalising Darug language can make the Country heal. Language teachers and support for them is needed, as well as other educational programs or apprenticeships.
- Language "signage" including audio should be placed at light rail stops along the Parramatta River to encourage language education.
- Darug people have lost of power over land and their ability to care for Country.
- Aboriginal people have become viewed as museum objects, not people with a vibrant cultural life and ongoing connection to Country.
- Artefacts should be returned to their "proper place" and not held off Country.

6.1.5 Environmental decay / urban development

The following were considered important by the participants:

- The environment is not what it was because it has been trashed by pollution.
- The land and water has become sick through urban growth and needs to be revitalised.
- There is no long-term plan for the revitalisation of the land and water a plan that looks to the generations of the future.
- A sustainable way of living and "developing" the environment (circular economies) is needed.
- The Country is "sick" (also "unhappy") because people are not looking after it. The Country needs healing.
- The future is bleak because of overdevelopment. The most that could happen as a result of the consultation process is the revitalisation/regeneration of the river and river banks.
- Including schools in programs to clean up the river (including restore animals and bird life) would be very effective.
- Consultation was viewed as a process of ticking boxes.
- Consultation was viewed as a way that developers could obtain legitimacy for their projects because the results were already set.
- The process of consultation asked Aboriginal people to talk about cultural values when they do not have the means to carry out the practices which constitute those cultural values and which will maintain the health of the Country, which, as a result, is sick
- AHIMS sites should not be the central focus for what constitutes Aboriginal values. A broader regional view is needed.

6.1.6 Difficulty with archaeology – failure to embrace cultural values

The participants noted the following elements:

• The word midden is used by many people to refer to 'rubbish tips". Middens were made by large numbers of people and they are not "rubbish tips"; they are important places of social activity and people were also buried in middens. Middens reflect sustainable use of resources; they are the



evidence of harvesting of shell fish – caught in layers as people harvested. People harvested a particular shellfish, and then another group would come along and see the remains of that shellfish, and so harvest a different shell fish (so as to not overfish). The middens were very deep, up to nine metres high. Similarly the word" bi-product" for pieces that have been flaked off, or knapped off, but are too small to be used is misleading. These may be very small pieces but they are still artefacts, they are not discards.

- The removal of soil is not a sufficient indication that cultural values are absent. The removal of soil is meaningless in terms of indicating cultural belonging. Soil can be moved anywhere and remain connected – the soil can move, and people remain connected
- AHIMS sites and their location do not affect the nature of the land as culturally and spiritually important. Cultural values are present regardless of whether an AHIMS site is present. A plan that covers the whole area, not simply AHIMS dots located in discrete areas, is needed.
- Archaeology does not dig deep enough and does not take flora and fauna into consideration.
- Archaeology does not embrace cultural values. Archaeologists should stop associating objects
 with cultural values. Aboriginal cultural values go deeper than the topsoil, and are embedded in a
 multi-layered understanding of soil, water, sky, stars, sound and sight, which exist across past,
 present and future (manifesting the connection with Country).

6.1.7 People of note in the area

The following people were noted as important:

- In the contemporary period Cathy Freeman for her sporting achievements, and Maria Lock for educational achievements in the nineteenth century.
- Joe Hurst's art work in Grand Avenue was noted as important. Artists present one way of
 expressing cultural reproduction: by keeping connections to Country alive especially when if it
 difficult to access the land to carry out more traditional practices. Joe Hurst's artwork should be
 refreshed. This would require the permission and participation of his family and should be
 approached through Boomali Arts.

7.0 SUMMARY AND RECOMMENDATIONS

This Cultural Assessment Report presents the results of a site visit and three interviews undertaken with three Registered Aboriginal Parties on the project. Transcripts of the interviews have formed the basis of this report, and quotation from the interviews are included. This report provides a description of cultural values from an anthropological framework, and as such it presents a description based on the site visit and the interviews of how cultural values are constituted for the interviewees.

The report identified a number of overlapping themes that constitute contemporary cultural values from the perspective of the three participants. For the purposes of this report these themes have been arranged under seven headings (see below).

Themes of importance in the cultural values of the interviewees.

- Country and connection to Country
- Water ways provide food and resources
- Travel and communication
- · Histories of disruption and disconnection
- Environmental decay / urban development
- Difficulty with archaeology failure to embrace cultural values
- People of note in the area.

Based on the information provided by the participants during the site visit and the interviews and the themes that arose during these engagements, the following presents both broader considerations and project specific recommendations:

Broader considerations

- Consultation with Aboriginal communities concerning their cultural heritage should be undertaken
 as early as possible in the development process and allow for genuine input.
- Future projects should have broad scope which supports sustainable development strategies and
 practice, including environmental regeneration and revitalisation to restore and maintain
 Aboriginal cultural values. Broad scope is understood to include the surrounding areas in which
 the designated study area is located.
- Future developments should consider having a regional, or areal, perspective, not one based only on the location of AHIMS sites and archaeological definitions of Aboriginal heritage values.
- New developments should be sustainable and not cause further damage to the environment.
- New development should avoid the river banks as these areas were used formerly as burial arounds.
- View lines (or lines of sight) along the light rail route should kept open.
- Support should be provided for Darug language programs, especially located within schools,
 which can provide guidance for revitalisation of the Country.



Project specific considerations

- The findings of this report should be considered and feed into the design process led Bangawarra
- The findings of this report should be considered and feed into all Aboriginal Heritage Interpretation strategies.
- Awareness of Aboriginal histories of the area should be promoted to non-indigenous people. This
 could be done through interpretation undertaken along the route and at light rail stops, including
 integrating language names and acknowledgment of Country in various forms at light rail stop.
- Important Aboriginal people and events in the area should be celebrated, including role models such as Cathy Freeman and Maria Lock.
- Regeneration and revitalisation of the Parramatta River and river banks should be undertaken.
 Regeneration is understood to be necessary for healing Country and the resources of the area restored.
- The art installation created by Joe Hurst, which is located in Grand Avenue, should be refreshed and any works undertaken in consultation with Boomali Arts and Joe Hurst's descendants.

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