Moss Vale Plastics Recycling and Reprocessing Facility

Technical Report 8 - Aboriginal Cultural Heritage Assessment Report

Plasrefine Recycling Pty Ltd

October 2021

→ The Power of Commitment

View across PAD2 within the study area.

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT

PROPOSED PLASTICS RECYCLING CENTRE

MOSS VALE, NSW

OCTOBER 2021

Report prepared by

OzArk Environment & Heritage

for GHD

on behalf of

Plasrefine Recycling Pty Ltd

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Heritage NSW

ABORIGINAL CULTURAL HERITAGE ASSESSMENT REPORT COVER SHEET

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Ben Churcher, OzArk Environment & Heritage Principal Archaeologist

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Acknowledgement

OzArk acknowledge the traditional custodians of the area on which this assessment took place and pay respect to their beliefs, cultural heritage, and continuing connection with the land. We also acknowledge and pay respect to the post-contact experiences of Aboriginal people with attachment to the area and to the Elders, past and present, as the next generation of role models and vessels for memories, traditions, culture and hopes of local Aboriginal people.

ABBREVIATIONS AND GLOSSARY

ACHAR	Aboriginal Cultural Heritage Assessment Report. As set out in the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*, all developments where harm to Aboriginal objects is likely must be assessed in an ACHAR.
ACHCRs	*Aboriginal Cultural Heritage Consultation Requirements for Proponents.* Guidelines for conducting Aboriginal community consultation for developments where harm to Aboriginal objects is likely.
AHIMS	Aboriginal Heritage Information Management System. Administered by Department of Premier and Cabinet, AHIMS is the central register of all Aboriginal sites within NSW.
Assemblage:	All artefacts recorded at a location. In this report, assemblage refers to stone artefacts as this was the only artefact class recorded.
Code of Practice	*Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* under Part 6 NPW Act. Issued by DECCW in 2010, the Code of Practice is a set of guidelines that allows limited test excavation without the need to apply for an AHIP. The test excavation program for this assessment was conducted under the Code of Practice.
DPIE	NSW Department of Planning, Industry and Environment
EIS	Environmental Impact Statement. A required document for major projects documenting all potential impacts to the environment, including heritage, that may arise due to the development.
Heritage NSW	Government department tasked with ensuring compliance with the NPW Act. Heritage NSW is advised by the Aboriginal Cultural Heritage Advisory Committee (ACHAC).
NPW Act	*National Parks and Wildlife Act 1974*. Primary legislation governing Aboriginal cultural heritage within NSW.
PAD	Potential archaeological deposit. Indicates that a particular location has potential to contain subsurface archaeological deposits, although no Aboriginal objects are visible.
RAP	Registered Aboriginal Party. An individual or group who have indicated through the ACHCR process that they wish to be consulted regarding the project.
SEARs	Secretary's Environmental Assessment Requirements issued by DPIE.

EXECUTIVE SUMMARY

OzArk Environment & Heritage (OzArk) has been engaged by GHD (the client), on behalf of Plasrefine Recycling Pty Ltd (the proponent) to complete an *Aboriginal Cultural Heritage Assessment Report* (ACHAR) of 74-76 Beaconsfield Road, Moss Vale (Lots 10 and 11 DP1084421) which has the potential to be impacted by the proposed Moss Vale Plastics Recycling Facility (the proposal).

The archaeological investigation for the proposal was initiated by Biosis Pty Ltd which included initiating the *Aboriginal cultural heritage consultation requirements for proponents* (ACHCRs), undertaking survey of the study area following the *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW*, and preparing an Archaeological Technical Report (ATR) for the proposal (**Appendix 1**) following the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW*.

At the conclusion of the survey, Biosis identified three potential archaeological deposits (PADs), two of which were liable to be harmed by the proposal. As the ATR recommended test excavation within these PADs to better understand their archaeological nature, the proponent engaged Biosis to undertake the investigation. However, due to travel restrictions associated with the COVID-19 pandemic, Biosis was unable to provide the staff required.

The proponent then engaged OzArk to undertake the test excavation program and to prepare the ACHAR.

The test excavation program was undertaken from 3–6 August 2021 and from a total of 48 excavation squares (0.5 metres [m] x 0.5 m), nine artefacts were recorded. This equates to 0.75 artefacts per square metre; a very low artefact density and representative of a background scatter of artefacts that would be found in most comparable landscapes across the region.

As a result of the survey and test excavation, six sites were recorded in the study area. This consists of two surface isolated finds (MVRec IF1 and Beaconsfield Rd IF-1) and four sites registered with the Aboriginal Heritage Information Management System (AHIMS) register to account for the nine artefacts recovered from the test excavation program (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3). In addition, there are two isolated finds (BR IF1 and BR IF2) that have been previously recorded in the study area.

The archaeological investigation has demonstrated that the study area has a very low potential to contain significant Aboriginal objects or deposits. The sites that have been recorded are best described as representative of a low-density of displaced artefacts in landforms that have been disturbed by ploughing and other land use impacts.

An assessment of likely impact from the proposal concluded that three isolated finds (MVRec IF1, BR IF1 and BR IF2) will be harmed by the proposal.

It is also noted that Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3 will be harmed by the proposal but that these sites no longer have cultural heritage value as the artefacts have been removed from the landscape during the test excavations.

Isolated find Beaconsfield Rd IF-1 will not be harmed by the proposal and will be conserved in the landscape.

Recommendations concerning Aboriginal cultural values within the study area are as follows:

1. Following project approval, an Aboriginal Cultural Heritage Management Plan (ACHMP) will be developed to manage Aboriginal cultural heritage within the study area. The ACHMP will be developed in consultation with the RAPs.
2. To ensure that Beaconsfield Rd IF-1 is not harmed during the construction of the access road, the northern boundary of the study area adjacent to Beaconsfield Rd IF-1 should be temporarily fenced and signed (see **Figure 7-3** for the location of the site). There should be no vehicle movements or the storage of materials to the north of this fence during the construction activities. The fence may be removed at the conclusion of the construction associated with the proposal.
3. The impact footprint of the proposal should be temporarily fenced during construction to ensure that there are no inadvertent impacts to surrounding landforms. The fence may be removed at the conclusion of the construction associated with the proposal.
4. An attempt will be made to locate the isolated finds MVRec IF1, BR IF1, and BR IF2 before the start of construction. This should be undertaken with the assistance of the Aboriginal community and all visible artefacts should be collected.
5. No further archaeological investigation is required at Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3 as the test excavation program has demonstrated that the sites are now without cultural heritage value.
6. The artefacts from the sites recorded during the test excavation program should be re-buried with any other artefacts collected within the study area. The way they are reburied, and the location of the reburial will be set out in the ACHMP.
7. The ACHMP will provide policies for unexpected finds, including human skeletal material.

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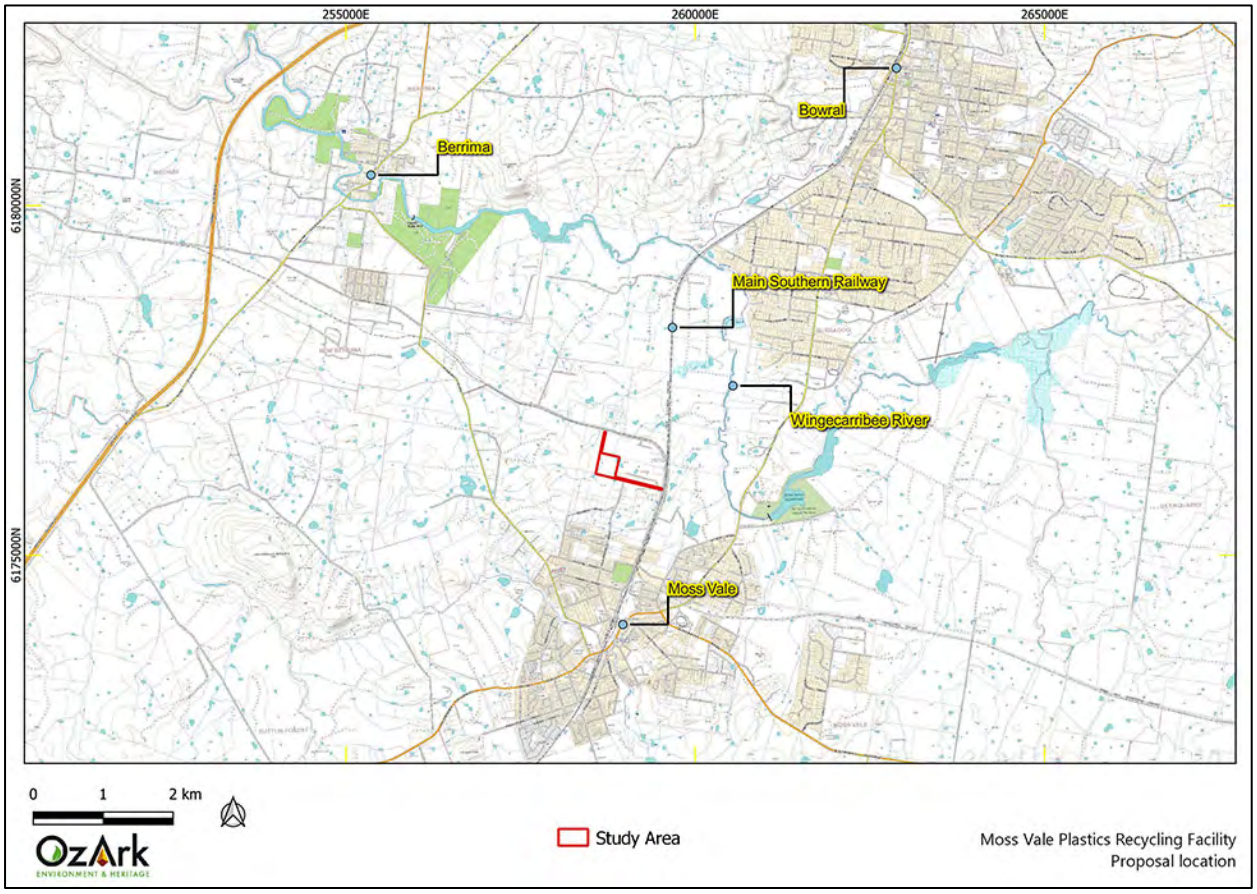
TABLES

1 INTRODUCTION

1.1 DESCRIPTION OF THE PROPOSAL

OzArk Environment & Heritage (OzArk) has been engaged by GHD (the client), on behalf of Plasrefine Recycling Pty Ltd (the proponent) to complete an *Aboriginal Cultural Heritage Assessment Report* (ACHAR) of 74-76 Beaconsfield Road, Moss Vale (Lots 10 and 11 DP1084421) which has the potential to be impacted by the proposed Moss Vale Plastics Recycling Facility (the proposal). The proposal is in the Wingecarribee Shire Local Government Area (LGA) (**Figure 1-1**).

Figure 1-1: Map showing the location of the proposal.



1.2 BACKGROUND

The archaeological investigation for the proposal was initiated by Biosis Pty Ltd. This investigation included:

- Initiating the *Aboriginal cultural heritage consultation requirements for proponents* (ACHCRs) (DECWW 2010b)
- Providing Registered Aboriginal Parties (RAPs) with project information and an assessment methodology according to Stages 2 and 3 (part) of the ACHCRs

- Undertaking survey of the study area following the *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW* (Code of Practice, DECCW 2010)
- Preparing an Archaeological Technical Report (ATR) for the proposal (**Appendix 1**) following the *Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW* (the Guide, OEH 2011.

At the conclusion of the survey, Biosis identified three potential archaeological deposits (PADs), two of which were liable to be harmed by the proposal. As the ATR recommended test excavation within these PADs to better understand their archaeological nature, the proponent engaged Biosis to undertake the investigation. However, due to travel restrictions associated with the COVID-19 pandemic, Biosis was unable to provide the staff required.

At this stage, the proponent engaged OzArk to undertake the test excavation program and to prepare the ACHAR.

As a result, the background research (environmental and archaeological context), predicative modelling, and survey results and recommendations are provided in the ATR. The ACHAR provides details on the Aboriginal community consultation undertaken, the results of the test excavation undertaken following the Code of Practice, and overall management recommendations. The ACHAR refers to the ATR for all other required aspects of the report as stipulated in the Guide.

1.3 PROPOSED WORK

The proposal would involve the construction and operation of a plastics recycling and reprocessing facility with capacity to receive up to 120,000 tonnes per year of mixed plastics. This would comprise of about 100,000 tonnes of mixed plastics and up to 20,000 tonnes of PVC (polyvinyl chloride) and plastic films. The proposal development would comprise:

- Two main buildings for mixed plastics and waste receival, recycling and reprocessing and finished product storage
- Wastewater treatment plant
- Ancillary infrastructure including an office building, workshop, truck parking, staff and visitor parking, internal roadways, weighbridges, water management, fire management, landscaping, fencing, business identification signage and utility connection.

The proposal also includes construction of part of Braddon Road (currently unformed) and construction of a new road access connection to Lackey Road (the Braddon Road east extension) (see ATR [**Appendix 1**] Figure 3).

Ancillary facilities would also be constructed including but not limited to a car park for employees and visitors, an administration/reception building, and business identification signage would also be constructed.

To facilitate the primary development proposed in the study area some civil engineering works, including earthworks, would be required for the site, to enable flat bases to be provided for the two main buildings, as well as for smaller buildings, the car park, and connecting roadways and it may also be necessary to divert a short section of the eastern drainage pathway from its existing alignment, to enable a suitable separation distance to be maintained between the pathway and from the buildings and roadways.

1.4 STUDY AREA

The study area is located approximately 2.8 kilometres (km) northwest of the Moss Vale town centre at 74–76 Beaconsfield Road, Moss Vale NSW. It is located on the either side of Beaconsfield Road, west of Lackey Road, and on the south of Douglas Road (**Figure 1-2**). It encompasses 11.4 hectares (ha) of private land.

Figure 1-2: Aerial showing the study area.

2 THE ARCHAEOLOGICAL ASSESSMENT

2.1 DATE OF ARCHAEOLOGICAL ASSESSMENT

The survey component of this assessment was undertaken by Biosis on 3 June 2021.

The test excavation component of this assessment was undertaken by OzArk from 3–6 August 2021.

2.2 OZARK INVOLVEMENT

2.2.1 Field assessment

The test excavation component of the heritage assessment was undertaken by:

- Fieldwork Director: Ben Churcher (OzArk Principal Archaeologist, BA[Hons] Dip Ed)
- Archaeologist: Brendan Fisher (OzArk Project Archaeologist)
- Archaeologist: Georgia Reed (OzArk Project Archaeologist).

2.2.2 Reporting

The reporting component of the heritage assessment was undertaken by:

- Report Author: Ben Churcher
- Contributor: Georgia Reed
- Reviewer: Dr Jodie Benton (OzArk Director).

2.3 RELEVANT LEGISLATION

Cultural heritage is managed by several state and national Acts. Baseline principles for the conservation of heritage places and relics can be found in the *Burra Charter* (Burra Charter 2013). The *Burra Charter* has become the standard of best practice in the conservation of heritage places in Australia, and heritage organisations and local government authorities have incorporated the inherent principles and logic into guidelines and other conservation planning documents. The *Burra Charter* generally advocates a cautious approach to changing places of heritage significance. This conservative notion embodies the basic premise behind legislation designed to protect our heritage, which operates primarily at a state level.

Several Acts of parliament provide for the protection of heritage at various levels of government.

2.3.1 Commonwealth legislation

Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

The EPBC Act, administered by the Commonwealth Department of Agriculture, Water and the Environment, provides a framework to protect nationally significant flora, fauna, ecological

communities, and heritage places. The EPBC Act establishes both a National Heritage List and Commonwealth Heritage List of protected places. These lists may include Aboriginal cultural sites or sites in which Aboriginal people have interests. The assessment and permitting processes of the EPBC Act are triggered when a proposed activity or development could potentially have an impact on one of the matters of national environment significance listed by the Act. Ministerial approval is required under the EPBC Act for proposals involving significant impacts to national/commonwealth heritage places.

Other

The *Aboriginal and Torres Strait Islander Heritage Protection Act 1984* is aimed at the protection from injury and desecration of areas and objects that are of significance to Aboriginal Australians. This legislation has usually been invoked in emergency and conflicted situations.

2.3.2 State legislation

Environmental Planning and Assessment Act 1979 (EP&A Act)

This Act established requirements relating to land use and planning. The main parts of the EP&A Act that relate to development assessment and approval are Part 4 (development assessment) and Part 5 (environmental assessment). The purpose of the Part 5 assessment system is to ensure public authorities fully consider environmental issues before they undertake or approve activities that do not require development consent from a council or the Minister. The Minister responsible for the Act is the Minister for Planning and Public Spaces.

The EP&A Act currently provides the primary legislative basis for planning and environmental assessment in NSW. The objects of the EP&A Act include encouragement of:

- The proper management, development, and conservation of natural resources
- The provision and coordination of the orderly and economic use and development of land
- Protection of the environment, including the protection and conservation of native animals and plants, including threatened species, populations and ecological communities, and their habitats
- Ecologically sustainable development.

The objects also provide for increased opportunity for public involvement and participation in environmental planning and assessment.

The EP&A Act includes provisions to ensure that the potential environmental impacts of a development or activity are rigorously assessed and considered in the decision-making process.

The framework governing environmental and heritage assessment in NSW is contained within the following parts of the EP&A Act:

- Part 4: Local government development assessments, including heritage. May include schedules of heritage items
    - Division 4.7: Approvals process for state significant development

National Parks and Wildlife Act 1974 (NPW Act)

The NPW Act provides for the protection of Aboriginal objects (sites, objects and cultural material) and Aboriginal places. Under the Act (Part 6), an Aboriginal object is defined as: any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises NSW, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains.

An Aboriginal place is defined under the NPW Act as an area which has been declared by the Minister administering the Act as a place of special significance for Aboriginal culture. It may or may not contain physical Aboriginal objects.

It is an offence under Section 86 of the NPW Act to 'harm or desecrate an object the person knows is an Aboriginal object'. It is also a strict liability offence to 'harm an Aboriginal object' or to 'harm or desecrate an Aboriginal place', whether knowingly or unknowingly. Section 87 of the Act provides a series of defences against the offences listed in Section 86, such as:

- The harm was authorised by and conducted in accordance with the requirements of an *Aboriginal Heritage Impact Permit* (AHIP) under Section 90 of the Act;
- The defendant exercised 'due diligence' to determine whether the action would harm an Aboriginal object; or
- The harm to the Aboriginal object occurred during the undertaking of a 'low impact activity' (as defined in the regulations).

Under Section 89A of the Act, it is a requirement to notify the Secretary of the Department of Planning, Industry and Environment (DPIE) of the location of an Aboriginal object. Identified Aboriginal items and sites are registered on Aboriginal Heritage Information Management System (AHIMS) that is administered by Heritage NSW.

2.3.2.1 Secretary's Environmental Assessment Requirements

SEARs were issued by DPIE on 15 October 2020. In relation to Aboriginal cultural heritage, the SEARs sate:

Cultural Heritage and Aboriginal Cultural Heritage – including:

- *identify and describe the Aboriginal cultural heritage values that exist across the development and document in an Aboriginal Cultural Heritage*

Assessment Report (ACHAR) which may include the need for a surface survey and test excavations

- *consultation with Aboriginal people must be undertaken and documented in ACHAR and*
- *a description of the impacts on Aboriginal cultural heritage values.*

No additional requirements from Heritage NSW are contained in the SEARs.

2.3.3 Applicability to the proposal

2.3.3.1 Commonwealth legislation

It is noted there are no Commonwealth or National heritage listed places within the study area, and as such, the heritage provisions of the EPBC Act and other Commonwealth Acts do not apply.

2.3.3.2 State legislation

The current proposal will be assessed under Division 4.7 of the EP&A Act as State Significant Development (SSD): SSD-9409987.

As the proposal is a SSD, if approved, Section 4.41 of the EP&A Act would apply and therefore an AHIP under section 90 of the NPW Act to harm Aboriginal objects would not be required. Instead, all management related to Aboriginal cultural heritage within the study area would be governed by the policies within an approved *Aboriginal Cultural Heritage Management Plan* (ACHMP).

Any Aboriginal sites within the study area are afforded legislative protection under the NPW Act.

Under Section 89A of the NPW Act, it is a requirement to notify the Secretary of DPIE of the location of an Aboriginal object. Identified Aboriginal items and sites are registered on AHIMS that is administered by Heritage NSW.

The fieldwork, consultation, and reporting as adhered to the SEARs.

2.4 ASSESSMENT APPROACH

The current assessment follows the Code of Practice. Field assessment and reporting has followed the Guide.

Aboriginal community consultation has followed the ACHCRs.

2.5 PURPOSE AND OBJECTIVES

The purpose of the current study is to identify and assess heritage constraints relevant to the proposed works.

2.5.1 Aboriginal cultural heritage assessment objectives

The current assessment will apply the Code of Practice in the completion of an Aboriginal cultural heritage assessment to meet the following objectives:

Objective One: Undertake background research on the study area to formulate a predicative model for site location within the study area

Objective Two: Identify and record Aboriginal cultural heritage values within the survey areas. This includes intangible cultural values, Aboriginal objects, and any landforms likely to contain further archaeological deposits

Objective Three: Assess the likely impacts of the proposed work to Aboriginal cultural heritage values and provide management recommendations.

2.6 REPORT COMPLIANCE WITH THE CODE OF PRACTICE

The Code of Practice establishes requirements that should be followed by all archaeological investigations where harm to Aboriginal objects may be possible. **Table 2-1** tabulates the compliance of this report with the requirements established by the Code of Practice.

Table 2-1: Report compliance with the Code of Practice.

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 1	Review previous archaeological work	*See subsections below*
Requirement 1a	Previous archaeological work	**Appendix 1**
Requirement 1b	AHIMS searches	**Appendix 1**
Requirement 2	Review the landscape context	**Appendix 1**
Requirement 3	Summarise and discuss the local and regional character of Aboriginal land use and its material traces	**Appendix 1**
Requirement 4	Predict the nature and distribution of evidence	*See subsections below*
Requirement 4a	Predictive model	**Appendix 1**
Requirement 4b	Predictive model results	**Appendix 1**
Requirement 5	Archaeological survey	*See subsections below*
Requirement 5a	Survey sampling strategy	**Appendix 1**
Requirement 5b	Survey requirements	This Requirement was fulfilled during the undertaking of the survey
Requirement 5c	Survey units	**Appendix 1**
Requirement 6	Site definition	**Appendix 1**
Requirement 7	Site recording	*See subsections below*
Requirement 7a	Information to be recorded	**Appendix 1**
Requirement 7b	Scales for photography	All artefact photographs employed a centimetre scale bar.
Requirement 8	Location information and geographic reporting	*See subsections below*
Requirement 8a	Geospatial information	All artefact locations were logged using a non-differential handheld GPS.

Code of Practice Requirement	Context of the Requirement	Concordance in this report
Requirement 8b	Datum and grid coordinates	All coordinates are provided in GDA Zone 56.
Requirement 9	Record survey coverage data	**Appendix 1**
Requirement 10	Analyse survey coverage	**Appendix 1**
Requirement 11	Archaeological Report content and format	This report adheres to this Requirement.
Requirement 12	Records	Biosis undertakes to maintain all survey records for at least five years.
Requirement 13	Notifying OEH and reporting	*See subsections below*
Requirement 13a	Notification of breaches	Not applicable
Requirement 13b	Provision of information	Not applicable
Requirement 14	Test excavation which is not excluded from the definition of harm	The test excavation did not take place in any of the landforms identified in Requirement 14.
Requirement 15	Pre-conditions to carrying out test excavation	*See subsections below*
Requirement 15a	Consultation	Consultation has included the ACHCRs, see **Section 3**.
Requirement 15b	Test excavation sampling strategy	A test excavation methodology was produced (**Appendix 3**) and issued to RAPs for their information.
Requirement 15c	Notification	Heritage NSW was provided with a copy of the test excavation methodology via the heritage mailbox on 13 July 2021.
Requirement 16	Test excavation that can be carried out in accordance with the Code of Practice	*See subsections below*
Requirement 16a	Test excavations	The test excavation program complied with this requirement; see **Section 8** and **Appendix 3**.
Requirement 16b	Objects recovered during test excavations	The test excavation methodology established that any artefacts recovered from the excavations would be held by OzArk until the long-term fate of the artefacts can be agreed to between the RAPs, Heritage NSW and the proponent.
Requirement 17	When to stop test excavations	The methodology of the test excavation adhered to this requirement; see **Appendix 3**.

3 ABORIGINAL COMMUNITY CONSULTATION

3.1 ABORIGINAL COMMUNITY CONSULTATION

The Aboriginal cultural heritage assessment of the proposal has followed the (ACHCRs) (DECCW 2010b).

Consultation undertaken to date with Aboriginal community stakeholders by both Biosis and OzArk is presented in **Appendix 2 Figure 1**.

The ACHCRs include four main stages, and these will be detailed in the following sections.

3.1.1 ACHCRs Stage 1

The aim of Stage 1 is to identify the RAPs who wish to be consulted about the proposal.

The ACHCRs were initiated by Biosis.

On 21 April 2021 a public notice was placed in the *Highland Times* inviting expressions of interest to be consulted about the proposal (**Appendix 2 Figure 2**).

In addition, the following agencies were contacted by Biosis on 13 April 2021 to determine if they were aware of any individuals or groups who may be interested in being consulted about the proposal (**Appendix 2 Figure 3**):

- Heritage NSW, Department of Premier and Cabinet
- Illawarra Local Aboriginal Land Council (LALC)
- Wingecarribee Shire Local Council
- Office of the Registrar, Aboriginal Land Rights Act 1983
- National Native Title Tribunal
- Native Title Services Corporation Limited
- South East Local Land Services.

As a result, the following individuals and groups registered to be consulted about the proposal. These individuals/groups are regarded as the RAPs for the project.

- Leanne Tungai
- Yurrandaali
- Tungai Tonghi
- Woronora Plateau Gundungara Elders Council
- Illawarra Local Aboriginal Land Council
- Duncan Falk Consultancy

- Yerramurra (Murrin Clan/Peoples) and Taste of Tradition Native Aboriginal Corporation
- Cubbitch Barta Native Title Claimants
- Wodi Wodi Traditional Owner
- Stakeholder 1 (so denoted as they have requested anonymity).

3.1.2 ACHCRs Stages 2 & 3

The aim of Stages 2 and 3 is provide information about the proposal to the RAPs and to acquire information regarding Aboriginal cultural values associated with the proposal either through consultation and/or field work. Often these two stages are run together, and the detailed project information is provided in the assessment methodology that is issued to all RAPs for their consideration.

On 4 June 2021, Biosis issued the Stage 2 and 3 Aboriginal Community Consultation document (**Appendix 2 Figure 4**) which introduced the proposal to the RAPs (Stage 2 of the ACHCRs) and outlined the forthcoming methodology for the assessment in line with Stage 3 of the ACHCRs. The closing date for comment was 2 July 2021.

Three comments were received by Biosis from the Illawarra LALC, the Woronora Plateau Gundungara Elders Council, and Stakeholder 1. The Illawarra LALC did not provide comment on the Stage 2/3 methodology document, while the other comments were:

- Requested that wet sieving be considered as an option during test excavations
- Prefer for the material to be returned to Country and reburied as they were found (i.e. not placed in plastic bags). We feel it takes away the natural connection of the cultural material to Country, and therefore request to not have the cultural material placed in plastic bags for reburial.

Both comments were considered although only one had direct bearing on the forthcoming test excavation program. The request for wet-sieving was noted, but it was decided to proceed with dry sieving as originally planned due to the logistical constraints of wet sieving in a test excavation program where a number of discrete locations were to be investigated.

The comment on the fate of any artefacts recovered was noted and will form part of the recommendations of this ACHAR to be implemented in the *Aboriginal Cultural Heritage Management Plan* (ACHMP) following project approval.

On 14 September 2021, OzArk sent all RAPs a project update letter that set out the fact that OzArk was taking over the archaeological investigation and to provide RAPs with more detailed information regarding the test excavation methodology (**Appendix 3**). OzArk requested that any comments be returned by 30 September 2021.

During this time, one comment was received from Cubbitch Barta Native Title Claimants that stated:

> *Despite what the code of practice says I believe that the material should be sieved with 3 mm for a test excavation. The ground at the moment is very wet and could be almost impossible to dry sieve. Wet sieving is the preferred option.*

OzArk considered the comment and noted that the excavations would adhere to the Code of Practice as a statutory requirement, however, there would be 3 mm sieves available if the deposits and/or finds suggested that it would be of advantage to use 3 mm sieves. The reference to wet sieving was considered, but, as has been previously noted, OzArk does not feel that wet sieving is appropriate for a test excavation program.

3.1.3 ACHCRs Stage 4

Stage 4 involves the production of a draft ACHAR that is issued to all RAPs for their consideration. The ACHAR will document the results of the assessment, outline opportunities for the conservation of Aboriginal cultural values, and suggest recommendations for the management of Aboriginal objects should impacts to these objects be unavoidable.

A draft of this ACHAR was sent to all RAPs on 29 September 2021 with a closing date of 19 October 2021 for comments. As of 25 October 2021, only one response was received from Cubbitch Barta Native Title Claimants. The response stated:

Thank you for the opportunity of participating and commenting on this proposed project. I agree with the recommendations made that a CHMP be completed in order to manage the artefacts still located on the site, and the reburial of the artefacts that were excavated as part of this project. I believe that an AHIP will still be applicable unless this is a State significant project.

In relationship to the unimpacted areas, there should be a fence, so that there are no secondary impacts to the site by stockpiling or vehicles, including bulldozers to the area. All on site inductions to workers should include a cultural induction, so that all workers are aware of the responsibility under the NPW Act.

As noted by the writer, the proposal is an SSD (SSD-9409987) and an AHIP will not be required. The writer's request regarding fencing the impact footprint so that there is not inadvertent impact to neighbouring areas is noted and this recommendation has been added to this ACHAR.

3.2 ABORIGINAL COMMUNITY INVOLVEMENT IN THE ASSESSMENT

Please see **Appendix 1** for Aboriginal community involvement in the survey.

Regarding the test excavation, there were four RAP representatives present for each of the four days of test excavation as detailed in **Table 3-1**.

Table 3-1: Aboriginal community participation in the test excavation.

	Tuesday, 3 August 2021	Wednesday, 4 August 2021	Thursday, 5 August 2021	Friday, 6 August 2021	Notes
Yurrandaali	x	x			Bo Field
Leanne Tungai					Did not reply, re-allocated
Tungai Tonghi			x	x	Kiera Cruse
Wodi Wodi Traditional Owner	x	x	x	x	Mark Dutton
Cubbitch Barta Native Title Claimants			x	x	Kiahni Chalker
Yerramurra					Didn't turn up
Duncan Falk Consultancy	x	x			Duncan Falk
Illawarra Local Aboriginal Land Council					Could not supply a field worker. Re-allocated
Woronora Plateau Gundungara Elders Council	x	x	x	x	Paul Cummins
Stakeholder 1					Could not supply a field worker. Re-allocated

4 CULTURAL HERITAGE VALUES

4.1 INTRODUCTION TO CULTURAL VALUES

No matter who you are, we all have culture. Each person's culture is important; it's part of what makes us who we are.

Many Aboriginal people in Australia have a unique view of the world that's distinct from the mainstream. Land, family, law, ceremony, and language are five key interconnected elements of Aboriginal culture. For example, families are connected to the land through the kinship system, and this connection to land comes with specific roles and responsibilities which are enshrined in the law and observed through ceremony. In this way, the five elements combine to create a way of seeing and being in the world that is distinctly Aboriginal.

Aboriginal and Torres Strait Islander peoples are connected to Country through lines of descent (paternal and maternal), as well as clan and language groups. Territory is defined by spiritual as well as physical links. Landforms have deep meaning, recorded in art, stories, songs, and dance. Songlines or Dreaming Tracks as well as kinship structures link Aboriginal peoples to the territories of other groups. In the past, these links were also used for trade.

Living on this land for more than 50,000 years, Aboriginal and Torres Strait Islanders established effective ways to use and sustain resources. One important aspect is the right of certain people to control the use of resources in a particular area, as well as cultural and spiritual values like totemism that were fundamental in resource management. There was a wide range of traditional methods for gathering food including fish traps, subsistence agriculture, hunting and harvesting a wide range of natural fruits and vegetables. Some groups of people would stay in one place, while others moved around the land according to the seasons, to ensure sustainable and rich food supplies, and to fulfil their spiritual and cultural obligations.

In much of eastern Australia, Aboriginal communities live their lives like most Australians without resorting to tribal lore. However, in certain crucial areas, particularly associated with family, leadership roles and caring for Country, Aboriginal lore continues, even in the most urbanised communities.

4.2 IDENTIFYING CULTURAL VALUES

A major aim of this assessment is to identify any cultural values within the landscape in which the proposal is located so that those values can be recognised and incorporated into the proposal's management recommendations.

4.2.1 Cultural values identified throughout the ACHCR process

No specific cultural values were identified by the RAPs regarding the study area, however, the strong cultural values of Aboriginal communities towards landscapes and cultural heritage sites are recognised.

5 LANDSCAPE CONTEXT

Please refer to the ATR in **Appendix 1** for the landscape context of the study area.

In general terms the study area consists of elevated landforms associated with seasonal watercourses. The main site area which is largely covered by PAD2 as identified by Biosis consists of a broad, gently sloping spur with a seasonal waterway on the western side and a seasonal drainage pathway on the eastern side, as well as to its north. The western waterway is a tributary to the Wingecarribee River, and the eastern drainage pathway now drains to a dam on the eastern property boundary. On **Figure 5-1** the main site area is shown looking north. In this view the broad crest can be seen with the more-incised waterway to the west and the very seasonal waterway to the east. The western waterway displays bank erosion and aggradation while the eastern waterway is substantially aggraded.

Figure 5-1: Oblique aerial of the main site area.

The access road to Lackey Road occupies a landform identified by Biosis as PAD3. In the west, this portion of the study area crosses a seasonal waterway before the landform rises to a gently sloping hill. In the east of this area, the slopes have a moderate gradient except for one isolated bench area.

Figure 5-2 shows the area of the proposed access road viewed to the west. The aerial shows the proposed road dipping into the seasonal drainage line beyond where the existing building complex can be seen. The proposed road then crosses a gentle hill slope before dropping relatively steeply towards Lackey Road out of picture.

Figure 5-2: Oblique aerial of the proposed access road.

6 ARCHAEOLOGICAL CONTEXT

Please refer to the ATR in **Appendix 1** for the archaeological context of the study area.

It is noted that there are two previously recorded sites within the study area, BR-IF1 and BR-IF2. Biosis 2021 describes the sites that were recorded by Kayandel Archaeological Services as follows:

AHIMS 52-4-0386/BR-IF1

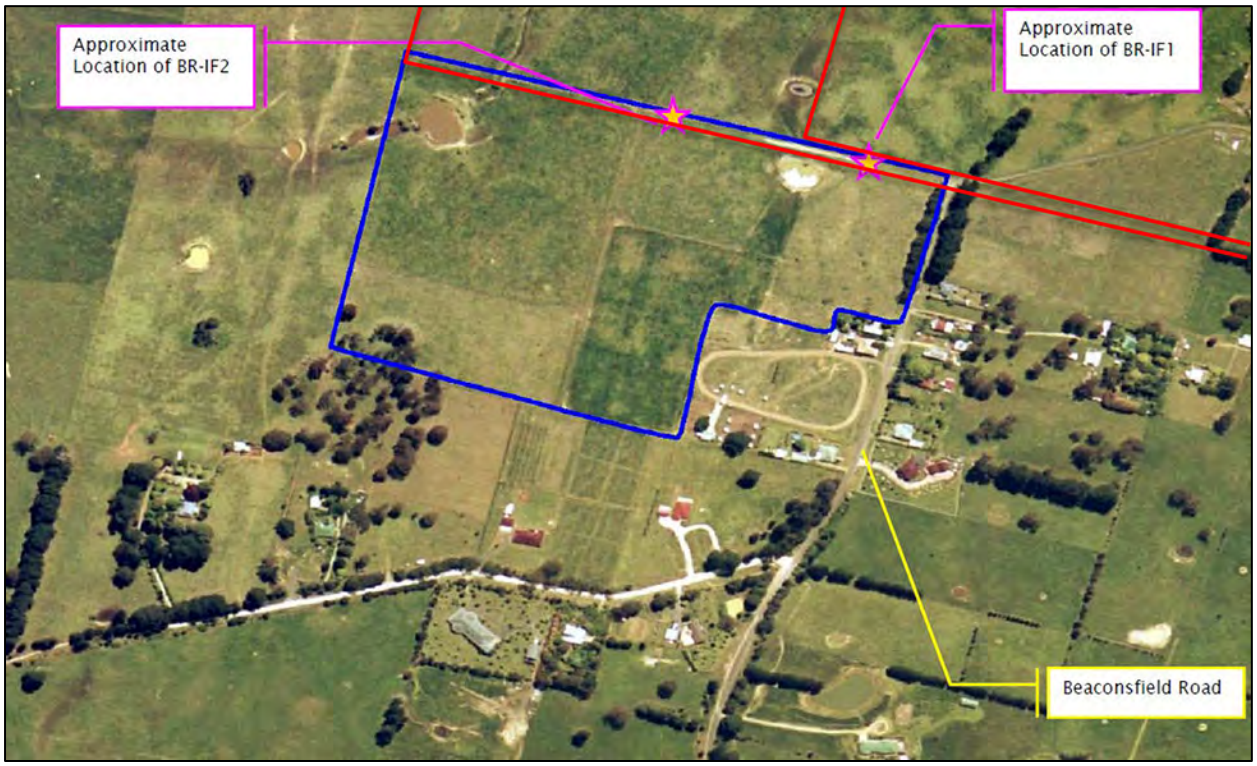
BR-IF1 was recorded in Lot 1 DP1000057 Beaconsfield Road, Moss Vale and was situated on an unformed vehicle track along the northern most boundary fence. The site consisted of an isolated artefact made up of a coarse grained grey silcrete with quartz inclusions distal flake fragment. Some edge damage to left hand ventral margin and three negative flake scars on the dorsal surface were also observed. Kayandel recorded the site's location at coordinates GDA 56 E258825 N6175904, however, based on the site description and maps provided in Kayandel (2005) this location is more than 200 m south of the correct location. The correct location of the site places it within the study area.

AHIMS 52-4-0387/BR-IF2

BR-IF2 was recorded in Lot 1 DP1000057 Beaconsfield Road, Moss Vale and was situated on an unformed vehicle track along the northern most boundary fence. The site consisted of an isolated artefact made up of a grey silcrete (or quartzite) flaked piece. Kayandel recorded the site's location at coordinates GDA 56 E258633 N6175948, however, based on the site description and maps provided in Kayandel (2005) this location is more than 200 m south of the correct location. The correct location of the site places it within the study area.

Figure 6-1 shows the correct locations of both sites within the impact area for the proposed access road. During the survey undertaken by Biosis, an unsuccessful attempt was made to locate both sites, but neither could be found. Biosis suggests that the artefacts may have been moved by water wash or had become obscured by ground vegetation.

Figure 6-1: Location of previously recorded sites from Kayandel 2005.



7 RESULTS OF ABORIGINAL ARCHAEOLOGICAL ASSESSMENT

Please refer to the ATR in **Appendix 1** for the results of the archaeological survey by Biosis.

The Biosis survey recorded one isolated find, MVRec IF1 (52-4-0712). This site consisted of an isolated quartz steep edged scraper that was located on the surface of an area of disturbance associated with the removal of a timber fence post on the spur crest.

The artefact was visible at the time of the test excavation program by OzArk (**Figure 7-1**).

Figure 7-1: View of MVRec IF1.

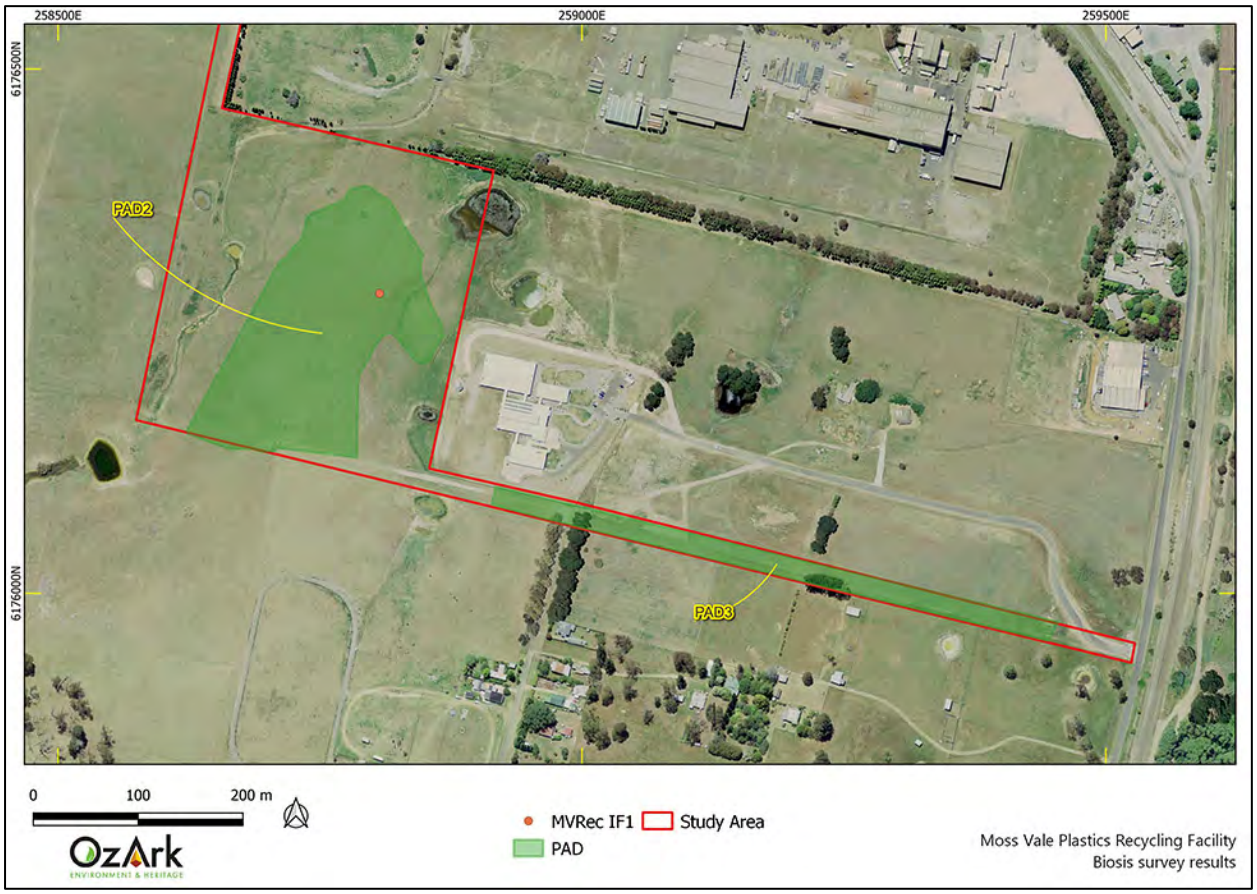
	
1. View south of the location of MVRec IF1 shown by the pin flag.	2. View of MVRec IF1.

In addition, Biosis recorded three PADs, two of which were later the focus of the test excavation program. These PADs are:

- PAD1 is located on a crest of a gentle sloping hill spur leading down to the flats surrounding a creek line. PAD1 will not be impacted by the proposal and is not discussed further
- PAD2 is located on a crest of a gentle sloping hill spur within the main site area. This spur is bounded by drainage lines to the east and west. MVRec IF1 was recorded within this PAD on the surface near of an area of disturbance associated with a fallen fence post
- PAD3 is located on the slopes of a gentle sloping hill spur leading down to the flats surrounding a creek line. This PAD is within the area of the proposed access road.

Figure 7-2 shows the location of the archaeological features recorded by Biosis.

Figure 7-2: Location of the isolated find and PADs recorded by Biosis.



7.1 ABORIGINAL SITES RECORDED

During the test excavation program, a further isolated artefact was located adjacent to PAD3 and outside of the study area.

Table 7-1 summarises the Aboriginal cultural heritage site recorded during the test excavation at the study area. Further details on the site follows.

Table 7-1: Aboriginal cultural heritage site recorded during the survey.

AHIMS ID	Site Name	Feature(s)	Location
52-4-0715	Beaconsfield Rd IF-1	Isolated distal fragment of a silcrete flake	Near PAD3

Beaconsfield Rd IF-1 (52-4-0715)

Site Type: Isolated find

GPS Coordinates: GDA Zone 56 259038E, 6176087N

Location of Site: The site is located within Lot 10 DP1084421. The site is 50 m east northeast from the northern end of Beaconsfield Road (**Figure 7-3**).

Description of Site: The site consists of a distal fragment of a silcrete flake (**Figure 7-4**). It is within a mid-slope landform distant to water. The surroundings of the site have undergone

widespread disturbances from the use of a track, earthworks, and animal grazing. The fragment measures 19 mm (length) x 20 mm (width) x 4 mm (depth). The artefact is at a tertiary stage of reduction.

Figure 7-3: Aerial showing the location of Beaconsfield Rd IF-1.

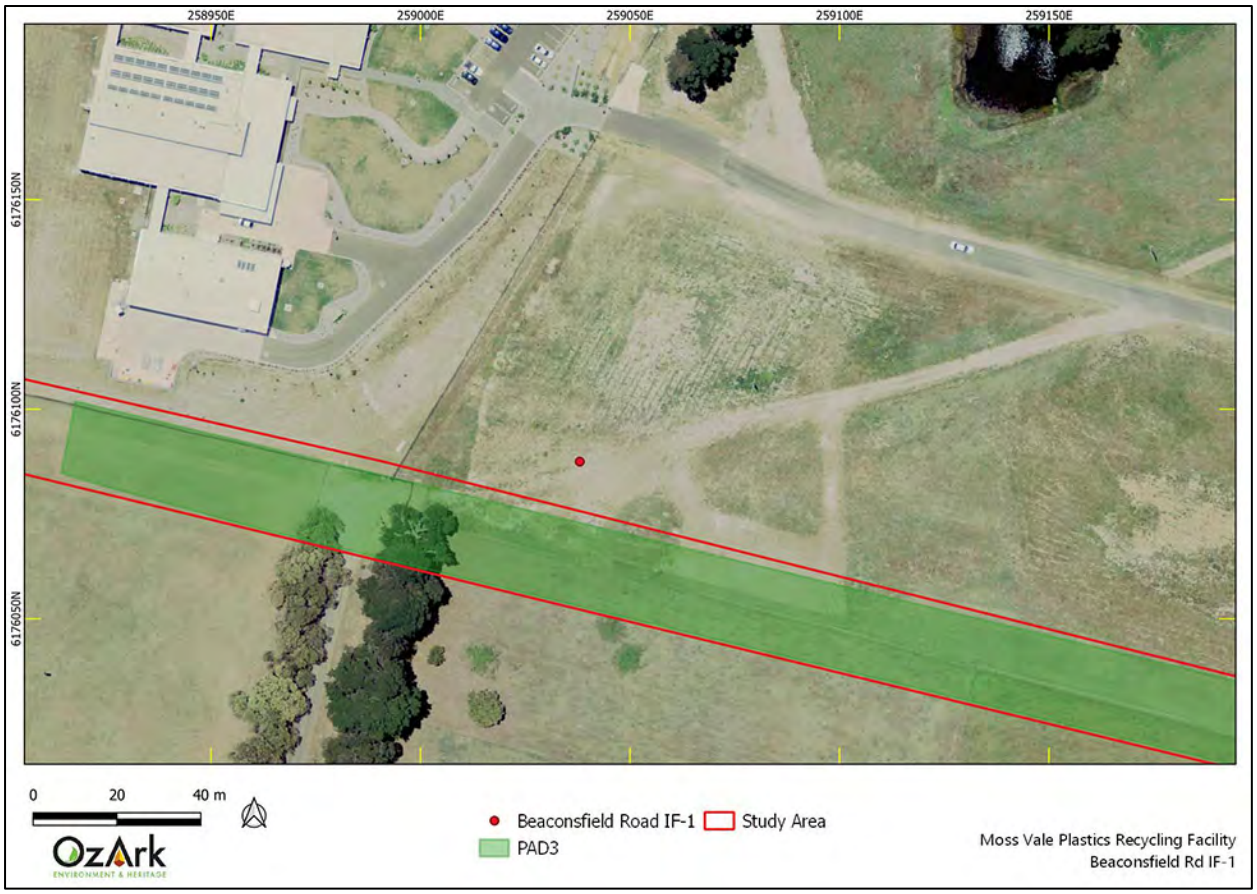


Figure 7-4: Beaconsfield Rd IF-1. View of site and the recorded artefact.

1. View west towards Beaconsfield Road of Beaconsfield Rd IF-1 shown by the pin flag in the foreground.

2. View of Beaconsfield Road IF-1.

8 TEST EXCAVATION PROGRAM

8.1 BACKGROUND TO THE TEST EXCAVATION PROGRAM

The test excavation program followed the recommendations of the Biosis 2021 archaeological survey of the study area which recorded three PADs of which PAD2 and PAD3 have been identified by the proponent as being impacted by the proposal. Due to COVID-19 restrictions, Biosis could not undertake the test excavations, therefore OzArk was engaged to undertake archaeological test excavations and prepare an ACHAR.

The results of the archaeological survey conducted by Biosis recommended that archaeological test excavations were required within the areas of PAD that are identified as being impacted by the proposal. The two PADs identified were located within hill slope and spurline landforms. PAD2 is large and within the main site area and PAD3 is on the east–west access road.

8.2 ARCHAEOLOGICAL BACKGROUND TO THE TEST EXCAVATION PROGRAM

The results of previous subsurface investigations across the region are summarised below to gain an understanding on the nature of any subsurface archaeological deposits that may be present within the study area.

8.2.1 Previous subsurface investigations within the region

To place the archaeological test excavations in a regional context, recent archaeological investigations that have included subsurface excavations will be discussed below.

8.2.1.1 Dibden 2000

Proposed subdivision of Lot 1, DP 539841, Colo Street, Mittagong, NSW Aboriginal archaeological assessment, Report to Brian Wallis Real Estate.

Dibden (2000) surveyed and subsequently completed subsurface test pitting at a 5.5 ha property in Mittagong (approximately 17 km northeast of the study area). This property abuts the upper reaches of Nattai Creek. Surveys revealed artefact scatters located on both sides of a creek or drainage line. The results of the test pitting confirmed significant disturbance attributed to European industrial activity. The artefacts recovered included lithic material of silcrete, chert, and quartz material. The assemblage was primarily debitage attributed to stone artefact manufacture as well as micro-blade technology. Overall, there was a low density of lithic material uncovered and historic European land use had severely impacted the archaeological potential of the study area.

8.2.1.2 Dibden 2005

Proposed Subdivision at Lot 1, Sackville Road, Hill Top NSW

Dibden (2000) undertook test excavations after the identification of surface artefact scatter sites. Thirty 0.25 m^2 test squares were excavated across a 500 m ridge, east of Running Water Creek and beside an open drainage depression. Only 15 artefacts were uncovered within eight of the 30 test squares and within the top 20 cm of soil. These artefacts were primarily quartz (48%), silcrete (20%), and silicified tuff (15%) and included cores, bipolar cores, as well as backed and retouched artefacts. Dibden concluded that the distribution of artefacts is likely a result of short occupation periods as the site was beside an ephemeral water source.

8.2.1.3 AMBS 2007

Renwick Sustainable Village, Mittagong Southern Highlands, NSW Test excavation, Report to ARC Corporation on behalf of Landcom.

AMBS (2007) excavated 138 test squares across a 115 ha development area at the Renwick Sustainable Village, located approximately 20 km from the study area. Test squares were placed on different landforms, including crests, terrace slopes, and creek flats. From 138 test squares, 1,786 artefacts were recovered, primarily from a depth between 19–45 cm. Artefact density was highest in alluvial deposits beside drainage lines or within terrace slopes characterised with deep sandy soil. The sites with the smallest artefact density included spur crests with shallow soil deposits. The artefacts were composed of quartz (41%), quartzite (34.4%), and silcrete (10.5%). Few bipolar cores were also identified, and the artefact assemblage suggested a date range between 5000 and 1600 years ago.

8.2.1.4 Biosis 2020

Chesley Park Brick Making Plant (Site 2) 416 Berrima Road, New Berrima NSW: Archaeological Report.

Biosis Pty Ltd was commissioned by Brickworks Ltd to survey and perform test excavations on a farmland, 2.1 km southeast of Berrima, 7.5 km southwest of Bowral, and approximately 5 km from the study area. Test excavations of 137 test squares located in areas with moderate and high archaeological potential uncovered 67 subsurface artefacts and identified a further 11 additional sites within the farmland. Majority of artefacts (55 artefacts found over 32 test squares) were uncovered on lower slope terrace landforms within clayey silt or sandy clay deposits within the first 30 cm. The raw material of the artefacts consisted of silcrete (65.67%), quartz (17.91%), quartzite (11.94%), and crystal quartz (4.48%).

8.2.2 Archaeological context summary

Salient points from the archaeological context presented above are:

- Dibden 2000, recovered lithic material from stone artefact manufacture at a low artefact density. The location abutted a creek; however, the low artefact density was attributed to disturbance caused by historic European land use.

- Dibden 2005, undertook test excavations along a ridge, east of Running Water Creek and adjacent to an open drainage depression. A low artefact density (15 artefacts from 30 test squares) was recovered, and it was concluded that the distribution of the lithic material reflected the short occupation periods of the site as it was located at an ephemeral water source.

- AMBS 2007, excavated 138 test squares at three different landforms which included crests, terrace slopes, and creek flats. A total of 1,786 artefacts were recorded from depths between 19–45 cm. This study found that artefact density was highest in alluvial deposits beside drainage lines or within terrace slopes with sandy soil.

- Biosis 2020 undertook test excavations of 137 test squares on farmland near Berrima. A total of 67 artefacts were recorded with most artefacts recorded on lower slope terrace landforms. 66% of artefacts were manufactured from silcrete sources.

8.3 METHODOLOGY

8.3.1 Purpose of the test excavation program

The purpose of the test excavation program is to understand more completely the nature of the subsurface archaeological deposits within the study site. Data obtained from the test excavation program will inform the mitigation and management options in the ACHAR.

The aims are therefore to:

1. Establish the extent and nature the of subsurface archaeological deposits at a site or landform with archaeological potential
2. Use the data gained from the test excavation program to better evaluate the archaeological significance and potential of the landforms within the study area
3. Develop, in consultation with the RAPs and the proponent, an informed strategy for the management of impacts to any Aboriginal cultural heritage likely to be impacted by the proposal.

8.3.2 Rationale of the test excavation program

The test excavation methodology is provided as **Appendix 3**. This document sets out the predictive model used to design the test exaction program.

While any test excavation program is limited in the level of research objectives it can achieve due to the restricted nature of the excavations, the test excavations attempted to answer the following research questions:

- How do the results of the test excavations reflect on the extent and nature of the previously recorded PADs?
- Are there intact stratigraphic deposits present beneath the 'plough zone' that are of conservation value?
- Are there intact subsurface deposits which indicate the original location of the identified surface artefacts?
- How has ploughing affected the integrity of the soil profile/artefacts?
- How does the artefactual material and stratigraphy identified at the site compare to other archaeological excavations undertaken in the local area and the broader region?
- Is there evidence providing insight into the tasks were Aboriginal people undertaking?
- Are intact archaeological features, such as hearths, present in the tested areas?
- Can chronological dates be obtained (i.e. from *in situ* charcoal samples) that will aid our understanding of Aboriginal occupation in the region?

8.4 THE ARTEFACT CATALOGUE

8.4.1 Analysis terminology

The abbreviations shown in **Table 8-1** have been used in the catalogue of the artefact assemblage from the test excavation program.

Table 8-1: Abbreviations used in the artefact catalogue.

Artefact Analysis Abbreviations		
Artefact Type		
F	flake	An unmodified artefact that is broader than it is long
B	blade	An unmodified artefact that is longer than it is broad (normally twice as long as it is broad). Parallel dorsal ridges
FP	flaked piece	A flake that has subsequently had other flakes removed (i.e. the flake becomes a core). Easier to determine if removal is from the ventral surface of a flake
BF	backed flake	Displays intentional retouch, not just edge wear/chattering
BB	backed blade	Displays intentional retouch, not just edge wear/chattering
M	microlith	Small backed tools of geometric form usually having a point or backed edge
ES	end scraper	Retouch to proximal or distal end only
SS	side scraper	Retouch to marginal edge, may include end/s as well
A	ground edge axe	A flake or cobble that displays evidence of being ground to form an edge
AB	ground edge axe blank	Normally a cobble that displays bifacial shaping to form an ovoid shape ready for edge grinding
C	core	Any core, including fragments
AH	anvil/hammerstone	Containing obvious crushing/pitting

Artefact Analysis Abbreviations		
O	other	Rarely recorded: artefacts such as adzes or eloueras. Glass artefacts are also recorded in this category
S	shatter	Shatter does not refer solely to heat shatter but also chips of raw material clearly the result of the knapping process
Raw Material		
MS	mudstone	
S	silcrete	
C	chert	
T	tuff	
B	basalt	
V	volcanics (other)	
PW	petrified wood	
QZ	quartzite	
Q	quartz	
O	other	
Integrity		
C	complete	
PF	proximal fragment	i.e. the distal is missing
DF	distal fragment	i.e. the proximal is missing
LB	longitudinal break	Broken down through the platform
MB	medial break	Broken across the angle of strike
Reduction		
1	Primary: greater than c. 50% cortex, dorsal surface entirely cortex	
2	Secondary: displaying cortex but either incomplete on dorsal surface or less than c. 50%	
3	Tertiary: no cortex	
Size		
Size range 1		0–10 mm
Size range 2		10–20 mm
Size range 3		20–30 mm
Size range 4		30–50 mm
Size range 5		50–100 mm
Size range 6		Over 100 mm
Rotation		
P	Previous flakes have been removed in a parallel (direct or opposed) orientation to the flake	
R	Previous flakes have been removed in a non-parallel (direct or opposed) orientation to the flake	
N	Not discernible	
Platform type		
S	Simple	Platform commonly struck from a previous flake removal presenting as an unfaceted surface
P	Point	Denotes a single point of contact often as a result of in-direct percussion
C	Cortex	Platform displaying cortex on part of the platform
CR	Crushed	A platform that is crushed, often obscuring the original form of the platform
F	Flaked	A platform displaying faceting
Platform size		
1		Point
2		Very small: up to 3mm

Artefact Analysis Abbreviations		
3		Small: up to 5mm
4		Moderate: up to 10mm
5		Large: over 10mm
Termination		
F	Feather	Termination has a smooth distal without steps or steep angles
SH	Step/Hinge	Termination that has steps or 'breaks' at the distal: often associated with flakes removed from an almost exhausted core
P	Plunge	Flakes that have a marked curvature denoting a flake removed for core rejuvenation purposes
Cores		
U	unidirectional	Core with a single platform and flakes removed with the same orientation
B	bidirectional	Core with two platforms, often opposed platforms but also where flakes are removed in two orientations from a single platform
M	multidirectional	Multiple platforms
Core features		
B	bladelet core	Parallel ridge scars on the core
R	reduced/globular	Exhausted cores, normally small, globular, multidirectional cores but also reduced bladelet cores
O	'opportunistic'	A core where two or three flakes have been removed in an opportunistic way to test a cobble. Majority of core is un-flaked
F	fragment	A broken or shattered core
Retouch		
proximal	Retouch is confined primarily to the proximal end (i.e. platform has been removed)	
distal	Retouch is confined primarily to the distal end (i.e. platform is intact)	
margin	Retouch is confined primarily to one or both margins	
steep	Retouch is closer to ninety degrees (i.e. vertical retouch)	
semi-steep	Retouch is closer to forty-five degrees (i.e. sloping retouch)	
fine	Very fine nibbling	
invasive	Retouching where retouch extends into the body of the artefact (regular retouch)	
unifacial	Retouch is on one side of an artefact only	
bifacial	Retouch is on both ventral and dorsal surfaces	

A discussion on why these attributes were analysed follows.

Artefact type

Description: Possible artefact types include flakes, blades, retouched flakes/blades, cores, scrapers, shatter/fragments and other (hammerstones, grindstones, ground-edge axes) although not all may be present at any one site.

Issues: Classing artefacts, generally, does not usually entail significant problems. A minority of artefacts are difficult to define such as ambiguities between recognising flaked pieces (flakes subsequently used as a core to source further flakes), and between cores and scrapers.

Uses: This category will be used to assess differences in provisioning strategies (e.g. core provisioning as opposed to flake provisioning), differences in site function/use

(e.g. presence/absence of grindstones), and the taphonomic effects of past land use on the site (are more broken artefacts part of the assemblage?).

Raw Material

Description: A largely self-explanatory attribute, raw materials expected to be present include silcrete, chert, mudstone, quartz, porcellanite, chalcedony, and volcanics.

Issues: This category often has problems for analysts without a geological background. Even then, without breaking an artefact, the true nature of the stone will sometimes remain uncertain.

Uses: Raw material is an important attribute, which may broadly indicate the place of origin of an artefact. The dominance of one raw material or another may also be used to group or differentiate sites. Raw material is also frequently used in concert with attributes in the creation of analytic units for more in-depth inter and intra site comparisons.

Artefact Breakage

Description: At a basic level, flakes break in three different ways. Two are transverse (at 90 degrees to the direction of percussion) – proximal and distal; one is longitudinal (along the plane of percussion).

Issues: It is occasionally difficult to be certain of the breakage on an artefact. In most cases, however, the kind of breakage can be ascertained.

Use: It is important to differentiate broken from complete flakes for the purposes of analysis, as the two are not comparable regarding several measures. The amount of artefact breakage in an assemblage also indicates the degree of fragmentation to which the assemblage has been subject. In highly fragmented assemblages, the actual number of artefacts represented may be significantly exaggerated. Quantifying breakage allows a more accurate approximation of artefact numbers to be made.

Dimensions[1]

Description: Percussive dimensions measure the maximum length of the flake in the direction of force application from the point that force was applied. In this regard it relates to the length of core face that was removed during the manufacture of the artefact.

[1] From experience OzArk does not routinely weigh artefacts as this information has been found to closely correlate either to artefact size or the raw material from which the flake has been struck. Thus, smaller artefacts are lighter than larger artefacts when made from the same material and artefacts made from denser stone (such as volcanics) are heavier than comparably sized artefacts from lighter (less-dense) stones such as mudstone. In practice, the category cataloguing the maximum size of the artefact is analogous with the artefact's weight.

Issues: There is some uncertainty as to what these attributes are measuring in terms of the flake manufacturing process.

Use: Flake dimensions are expected to correlate with differences in the provisioning and reduction strategies at different places. For example, the reduction of cores at a site will produce many moderate to small flakes and some larger flakes. As a result, a histogram of flake length will show a relatively consistent increase in number of flakes from large to small. Contrastingly, when most flakes are the result of retouching or maintenance tasks on other flakes, most of the flakes remaining should be very small, with comparably few large to moderate flakes. However, it may be the case that a few moderate to large flakes will be discarded at the site as they are exhausted through excessive/heavy retouch or simply thrown away prior to a reprovisioning event. In such a case, a histogram of artefact size should show bimodality regarding length (a small peak in the moderate range and a large peak in the small range).

Reduction

Description: This category refers to the level of reduction evident on an artefact. This is assessed by the amount of cortex remaining on the artefact. Cortex refers to the 'skin' of a rock: the surface that has been weathered to a different texture and colour by exposure to the elements over a long period. The amount of cortex as a percentage of surface area will be measured on all artefacts (in relation to flakes, cortex can only occur on the dorsal and platform surfaces). The nature of cortex—its shape and texture—will vary depending on where the raw material was sourced. This measurement will help determine if an artefact is at a primary, secondary or tertiary level of reduction.

Issues: This is a relatively unambiguous descriptive category.

Use: When a natural cobble is first selected it will usually be covered in cortex. Therefore, the first artefacts produced from it will have a complete coverage of cortex on the dorsal side (primary reduction). As the cobble is increasingly reduced the amount of cortex on each artefact will rapidly decrease (secondary reduction) until it ceases to be present on artefacts (tertiary reduction). Because of this trend, it should be possible to determine how early in the reduction sequence the artefact was produced. If large numbers of artefacts or a high proportion of the artefacts of a raw material retain cortex it may indicate that the site is near the source. Differences between the proportions of artefacts retaining cortex between different raw material indicates relative differences in distance to source. This does not necessarily mean distance in terms of measurable distance across the landscape; it may also reflect length of time since leaving the source. For example, the last campsite when a group is returning to the source of the raw material may be very close to the source in terms of distance, but distant in terms of time elapsed since the group left the source. If artefacts with cortex are occurring in sites a long distance from the place of origin of the natural cobble, then it is likely that cobbles were being transferred to the site

when still only slightly reduced. This would imply an attempt to maximise the amount of stone being provisioned with the weight of transported material being a relatively minor concern.

Rotation

Description: Describes whether a flake was struck from a core that was rarely rotated (a unidirectional or bidirectional core), or from a core that has been rotated frequently (a multidirectional core).

Issues: There is little ambiguity in assessing this category. If the orientation of previous flakes was unclear, this category is left blank.

Use: An examination of the direction in which previous flake scars on an artefact's dorsal surface have been removed, along with the orientation in which the flake itself was removed from its core, will give evidence about the core from which the flake was struck. This enables a greater sample pool to determine the types of cores used even if the original core may not have been recorded in the investigation.

Platform Surface

Description: Platform surface will be recorded as one of the following: simple, point, cortical, crushed or flaked.

Issues: This is a largely unambiguous descriptive attribute.

Use: The surface of a platform provides information about the history of the core prior to the detachment of the flake, and about methods employed to control the flaking process. 'Point' platforms often imply the use of an intermediary punch (or in-direct percussion) to remove a flake; while 'simple' platforms are often indicative of free-hand percussion. Crushing on the platform surface can imply a bipolar reduction technique where the core is first rested on an anvil prior to the flake being detached. Platforms displaying flaking have been linked to the systematic production of 'blades'. Patterns in the spatial distribution of these attributes may be used to infer differences in reduction strategies.

Platform Size

Description: Platform size will be recorded as fulfilling one of a series of size ranges.

Issues: This is a largely unambiguous descriptive attribute.

Use: Like the platform surface, platform size is illustrative in determining the type of reduction technique used to detach a flake. The smaller (finer) the platform size implies a greater likelihood that it was detached by in-direct percussion rather than direct percussion which often results in a larger platform size.

Termination

Description: Termination refers to the way in which force leaves a core during the detachment of a flake. Every complete flake has a termination. There are patterns in the forms that terminations will take, with the three major categories (those to be used here) being feather, hinge/step and plunging (outrepasse).

Issues: This is a largely unambiguous descriptive attribute although care needs to be taken to distinguish terminations on a previous flake scar from hinge/step terminations or breakages.

Use: Different terminations have different implications both for flake and core morphology. A flake with a feather termination (in which force exits the core at a low or gradual angle) will have a continuous sharp edge around the periphery beneath the platform. This has advantages in terms of the amount of the flake edge that can be used for cutting and makes the flake more amenable to subsequent retouching or resharpening activities. Detaching flakes with feather terminations also has minimal impact on the effective platform angle of the core, and so platform angle thresholds are reached relatively slowly while feather terminating flakes continue to be produced.

Hinge and step terminating flakes have none of these advantages. They result in edges that are amenable neither to cutting nor to retouching. Furthermore, hinge and step terminations lead to rapidly increasing effective platform angles, leading to a requirement for core rejuvenation and core exhaustion. For these reasons, such terminations are considered undesirable or *aberrant*. The number of aberrant flake terminations is expected to increase towards the end of a core's use-life, as reduction in core size and increase in core platform angle make it increasingly difficult to detach feather terminating flakes. In areas where aberrantly terminating flakes are relatively common it may be inferred that core potential was more thoroughly exploited. From this it may in turn be inferred that the pressure to realize core potential (e.g. a strategy of heavy raw material conservation) was greater. Increased mobility/emphasis on portability is one possible explanation of such a pattern.

Plunging or outrepasse flakes have the opposite effect on core morphology to step and hinge flakes, in that they remove the entire core face and part of the core bottom. As a result, such flakes may be used to rejuvenate cores in which core angles have become high, but which still retain useable potential (e.g. are still quite large). The presence of outrepasse flakes may be taken to indicate core rejuvenation and the requirement to increase core use-life.

8.4.2 Research considerations

Stone artefacts are probably the most resilient physical evidence of Aboriginal occupation in Australia and for many parts of the country form the most abundant archaeological evidence of Aboriginal occupation. Stone artefacts are important because they are tangible evidence of Aboriginal use of an area and can potentially contain information about lithic activities, the

organisation of stone technologies, and potentially information about larger-scale issues of settlement organisation across regions and even social change over time.

The kinds of information which can be obtained from stone artefacts may vary considerably, depending in part on:

- The numbers of artefacts which can be examined and recorded: generally, the larger the number of artefacts the more reliable will be statistical statements about them
- The presence of other assemblages with which the artefacts can be compared
- The condition of sites in which they occur: generally undisturbed sites have more information potential than disturbed sites, depending on the scale at which research is carried out
- The theory which underlies the artefact recording and analysis.

8.4.2.1 Statistically useful sample sizes

A large enough number of artefacts need to be recorded so that analyses can be based on statistically sound data (Leonard and Jones 1989). The numbers of artefacts which are needed in a sample will depend on how common or rare certain kinds of artefacts are. If a summary of most common raw material types is required, then a random sample of 20 or 30 artefacts might suffice. On the other hand, if no backed artefacts were recorded, and this type normally makes up 1% of an assemblage, then several hundred artefacts would need to be recorded to indicate whether backed artefacts are present at a site or in a certain landscape setting. Ideally, sample sizes should be large enough to be able to carry out statistical tests of significance (Clegg 1990).

8.4.2.2 Condition

As a rule, artefacts from undisturbed sites may be able to provide more information than artefacts from disturbed sites. On sites in good physical condition it may be possible to identify artefacts relating to individual lithic activities, such as knapping floors (Hiscock & Mitchell 1993). It may be possible to refit or conjoin artefacts and analyse the evidence from those activities (White 1999). On very heavily disturbed sites the artefacts themselves may be very broken, making it harder to analyse them.

8.4.2.3 Theory and recording

Stone artefacts can be recorded and analysed in different ways to give different kinds of information about different topics. The variables that are recorded and the interpretations which are made will depend in part on the theory which underlies the analysis. If someone wants to know what stone tools were used for, then artefacts should be examined under a microscope for use-wear and residues. If someone wants to know how stone was flaked and tools were made, then a technological analysis may record data on stone flaking such as patterns of scarring on

cores or flakes. If someone wants to know about how stone materials were obtained (procured), transported and discarded then recording might focus on stone raw materials; information about raw material types and where they occur naturally in the landscape will be critical, and raw material type and size of artefacts may be recorded.

Consulting projects may seek to provide a basic description of an assemblage, recording just a few variables to give information about general topics. The present analysis records provenance information (where each artefact was found) and several other variables, with some additional information for modified artefacts and cores. This level of recording should not be regarded as a definitive record of the assemblage. If artefacts are kept in a safe place, they can be reanalysed in the future to provide new information and address new questions.

8.5 SAMPLING METHODOLOGY FOR THE TEXT EXCAVATION PROGRAM

The sampling methodology was developed to investigate potential subsurface deposits at eight locations across PAD2 and PAD3 which will be impacted by the proposal (**Table 8-2**). Excavation occurred at 10 m intervals along the eight transects with six test squares excavated per transect. This resulted in a total of 48 test squares (each 0.5 m by 0.5 m) being excavated (or a total of 12 square metres [m^2]).

The first test square for each transect was excavated in 5 cm spits, with the other test squares being excavated in 10 cm spits. Excavation was continued until culturally sterile soil was reached. Culturally sterile soils were judged when no artefacts were being recorded and the soil became increasingly dominated by clay or gravels.

The location of the excavated transects is shown on **Figure 8-2** with hill slope. This figure shows that:

- Transect 1 (TR1) is within a localised bench within a sloping landform
- Tr2 is located on within a create landform just before the topography descends to the east
- Tr3 samples the elevated, level landform to the east of Beaconsfield Road
- Tr4 samples the lower elevation landform associated with a drainage line
- Tr5–Tr8 sample the gradually sloping landform between two drainage lines. Note the evidence of ploughing that can be seen in this area.

Figure 8-3 to **Figure 8-5** show aerial views of the transect locations.

Figure 8-6 to **Figure 8-12** show the location of each excavation square associated with the eight transects.

Table 8-2: Sampling methodology for the text excavation program.

	Test excavation methodology	Landform area of registered PAD	0.5% of registered PAD	Proposed excavation area	Transects
PAD2	Up to 30 squares (0.5 m x 0.5 m) were excavated across five transects within PAD2 within the proposed site of the plastic recycling facility.	34,131 m²	171 m^2	7.5 m^2	Transect 5–8
PAD3	Up to 18 squares (0.5 m x 0.5 m) were excavated across three transects within the proposed access road site for the proposed plastic recycling facility.	10,721 m²	53 m^2	4.5 m^2	Transect 1–3

Figure 8-1: Location of the transects excavated within the study area.

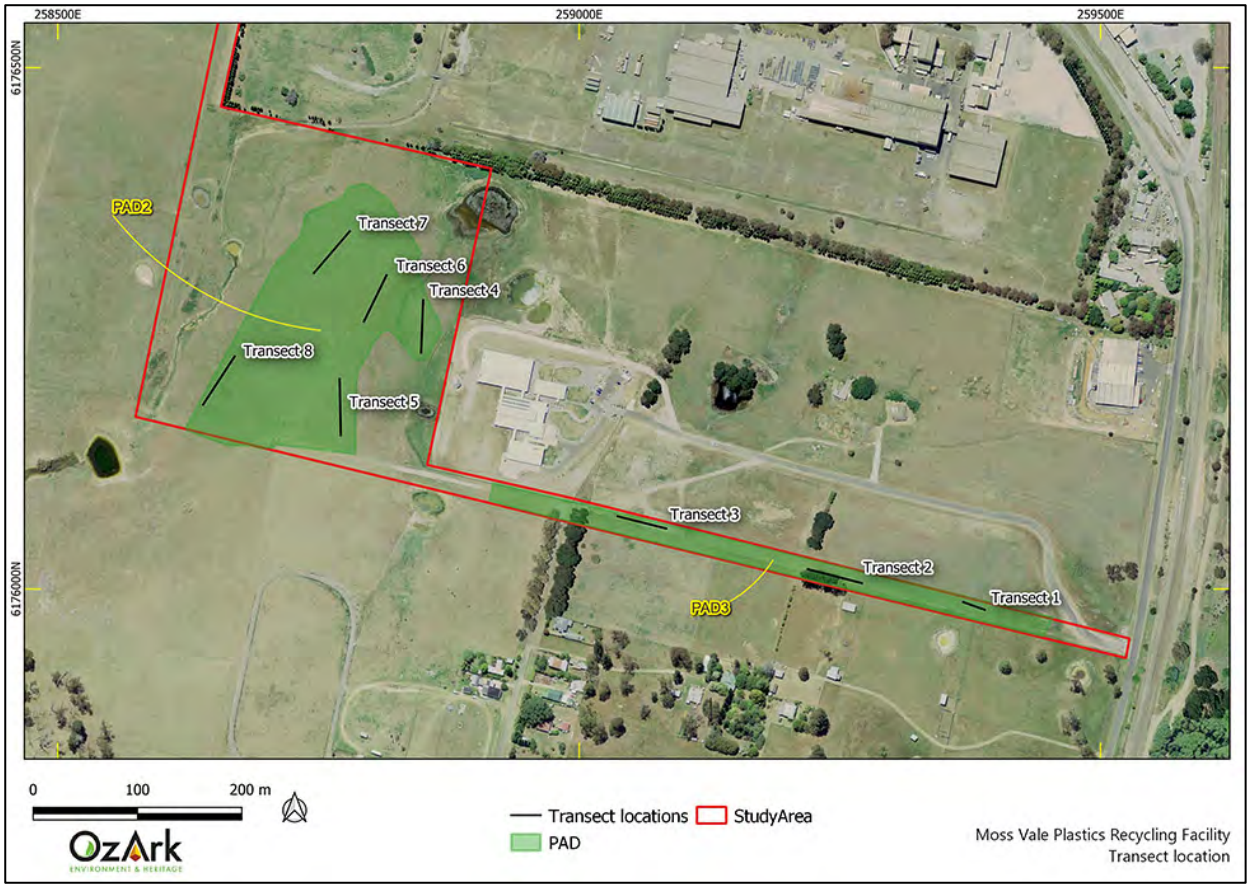


Figure 8-2: Location of transects shown with hill slope.

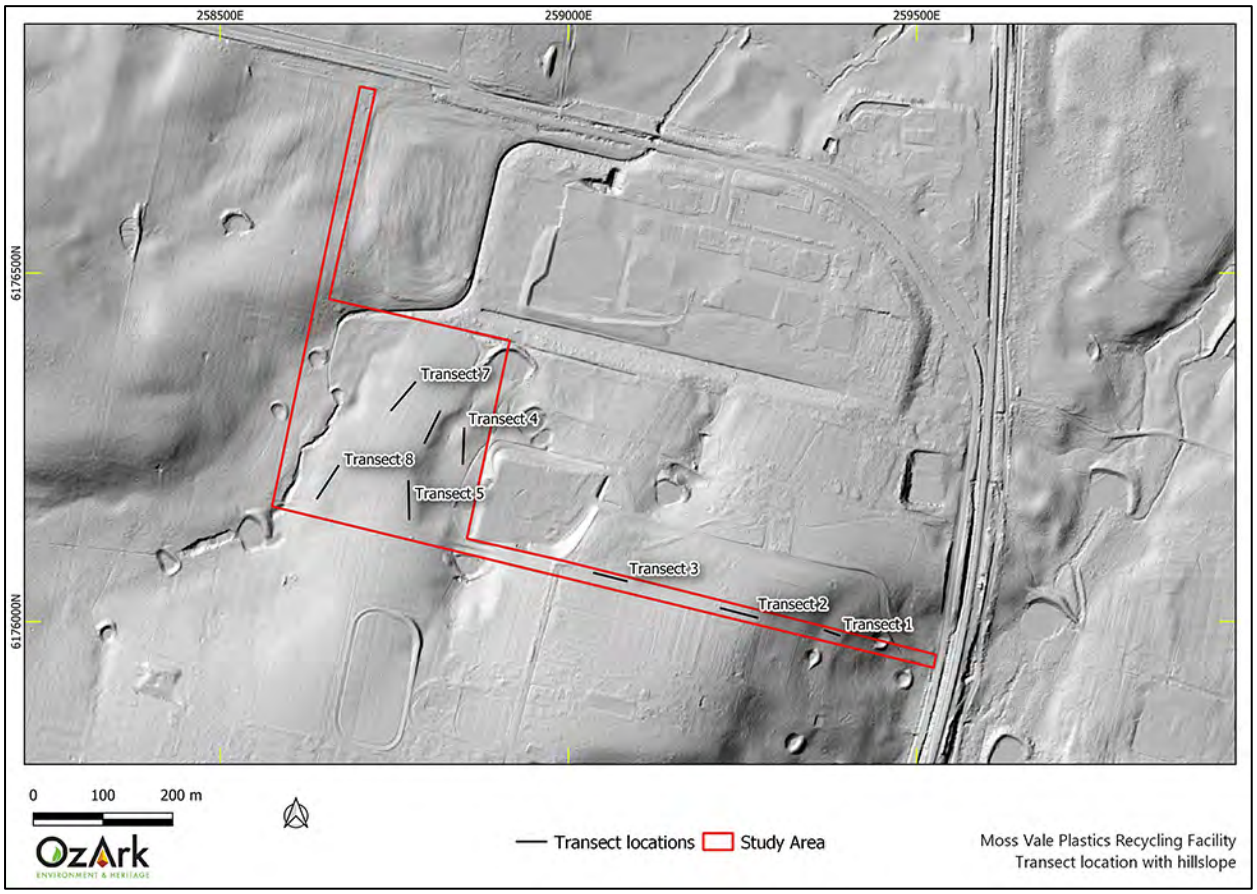


Figure 8-3: Aerial showing the location of TR1.

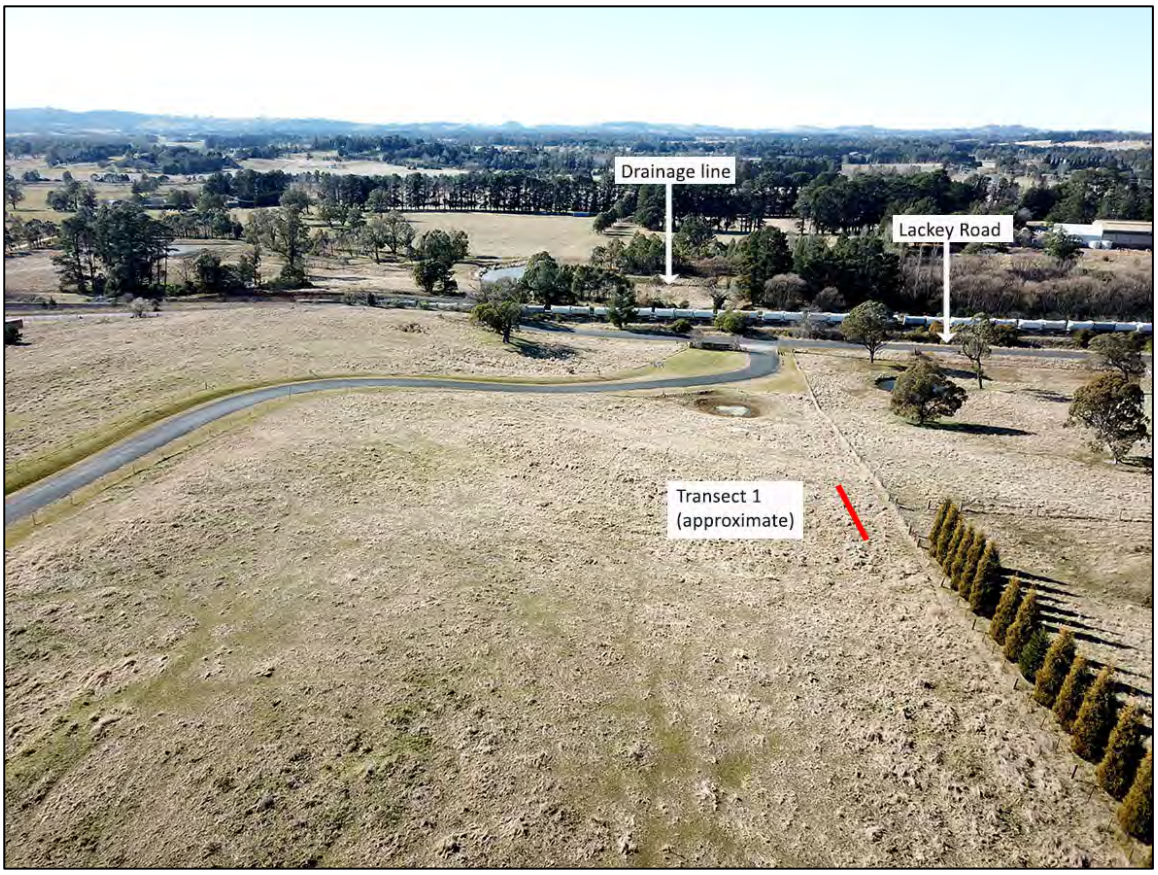


Figure 8-4: Aerial showing the location of TR2 and TR3.

Figure 8-5: Aerial showing the location of TR4 to TR8.

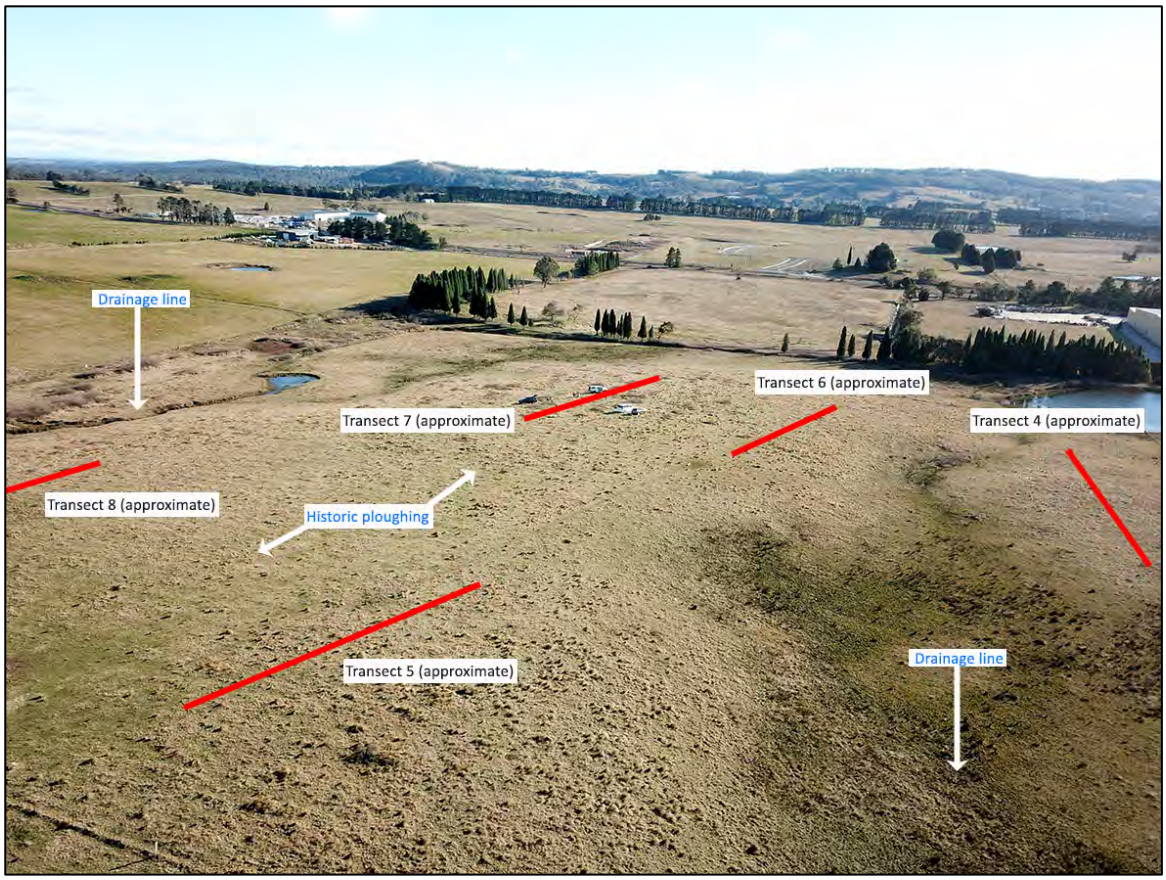


Figure 8-6: Location of the Tr1 and the associated excavation squares.

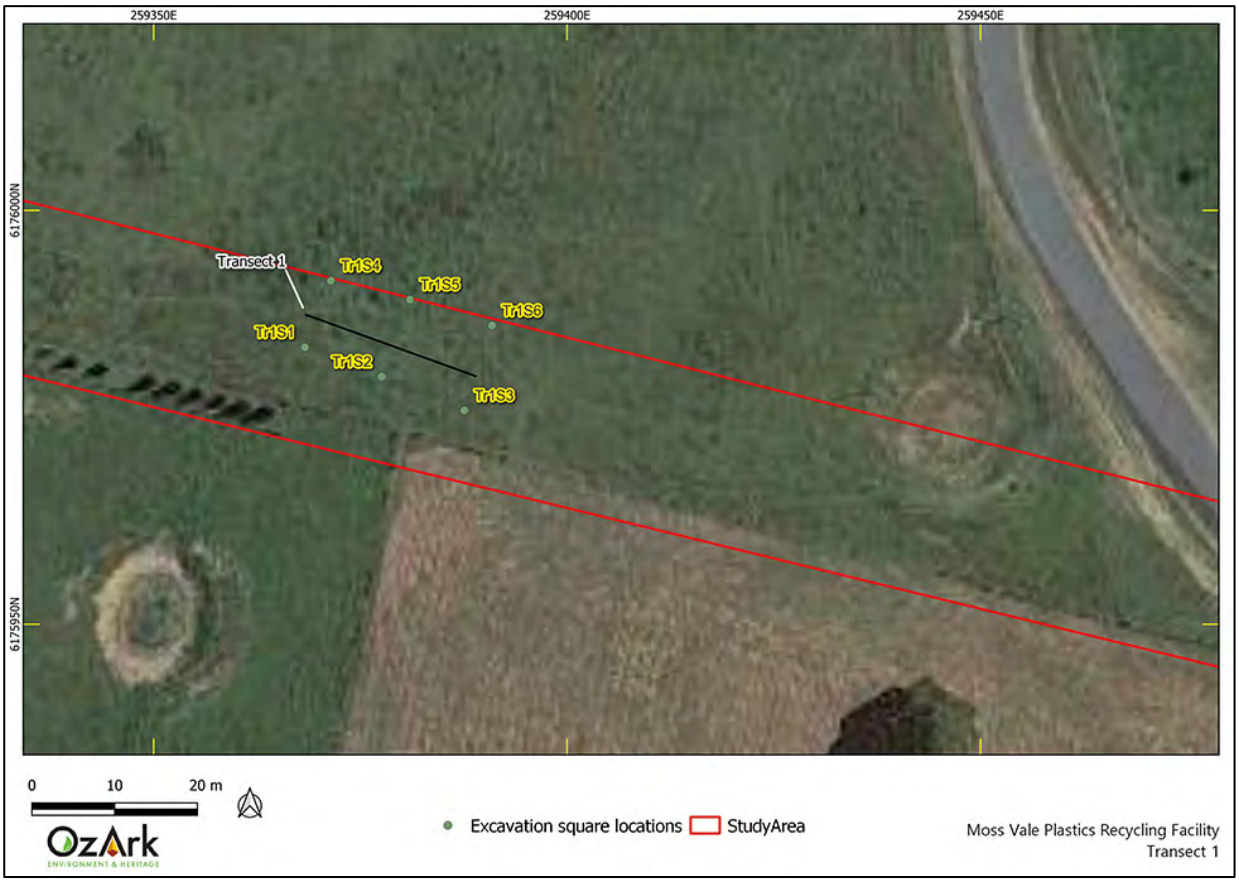


Figure 8-7: Location of the Tr2 and the associated excavation squares.

Figure 8-8: Location of the Tr3 and the associated excavation squares.

Figure 8-9: Location of the Tr4 and Tr6, and the associated excavation squares.

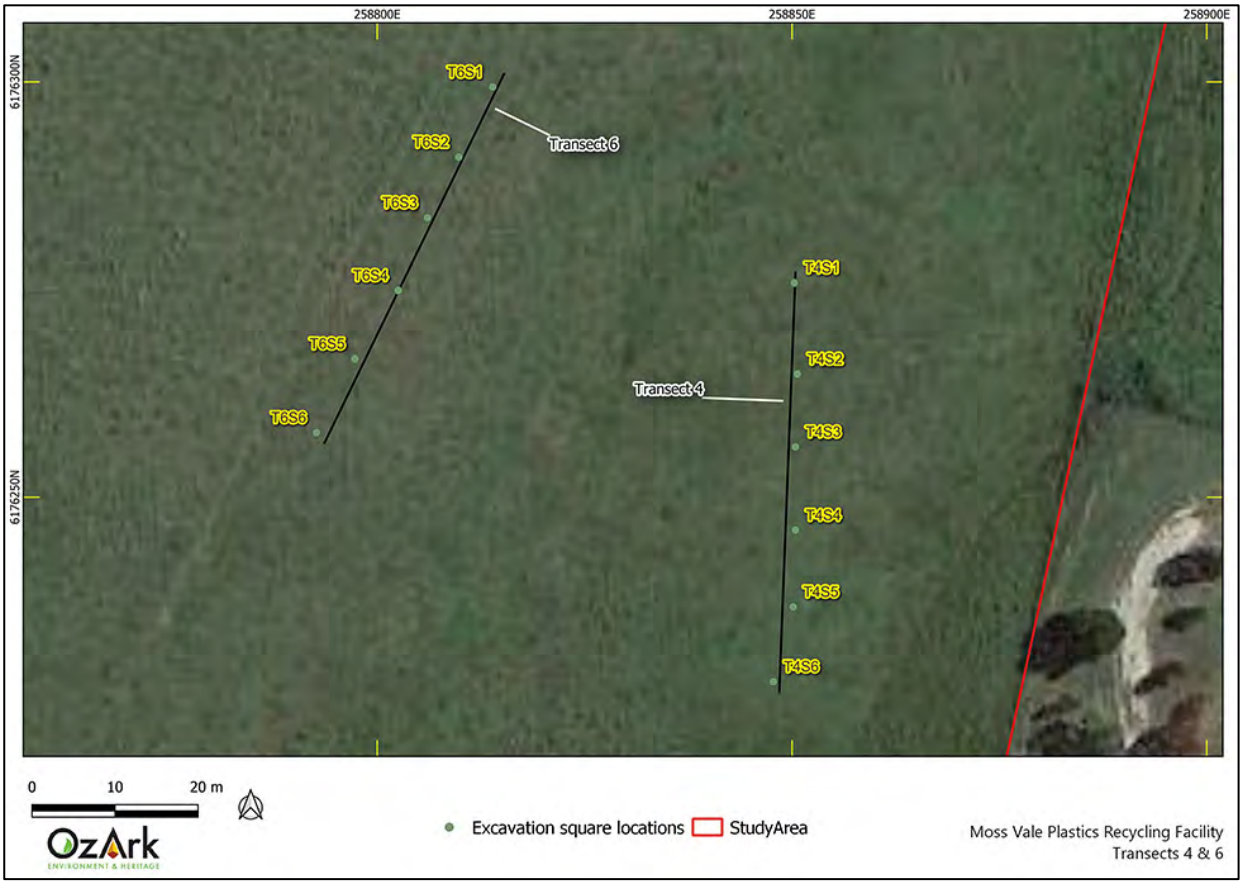


Figure 8-10: Location of the Tr5 and the associated excavation squares.

Figure 8-11: Location of the Tr7 and the associated excavation squares.

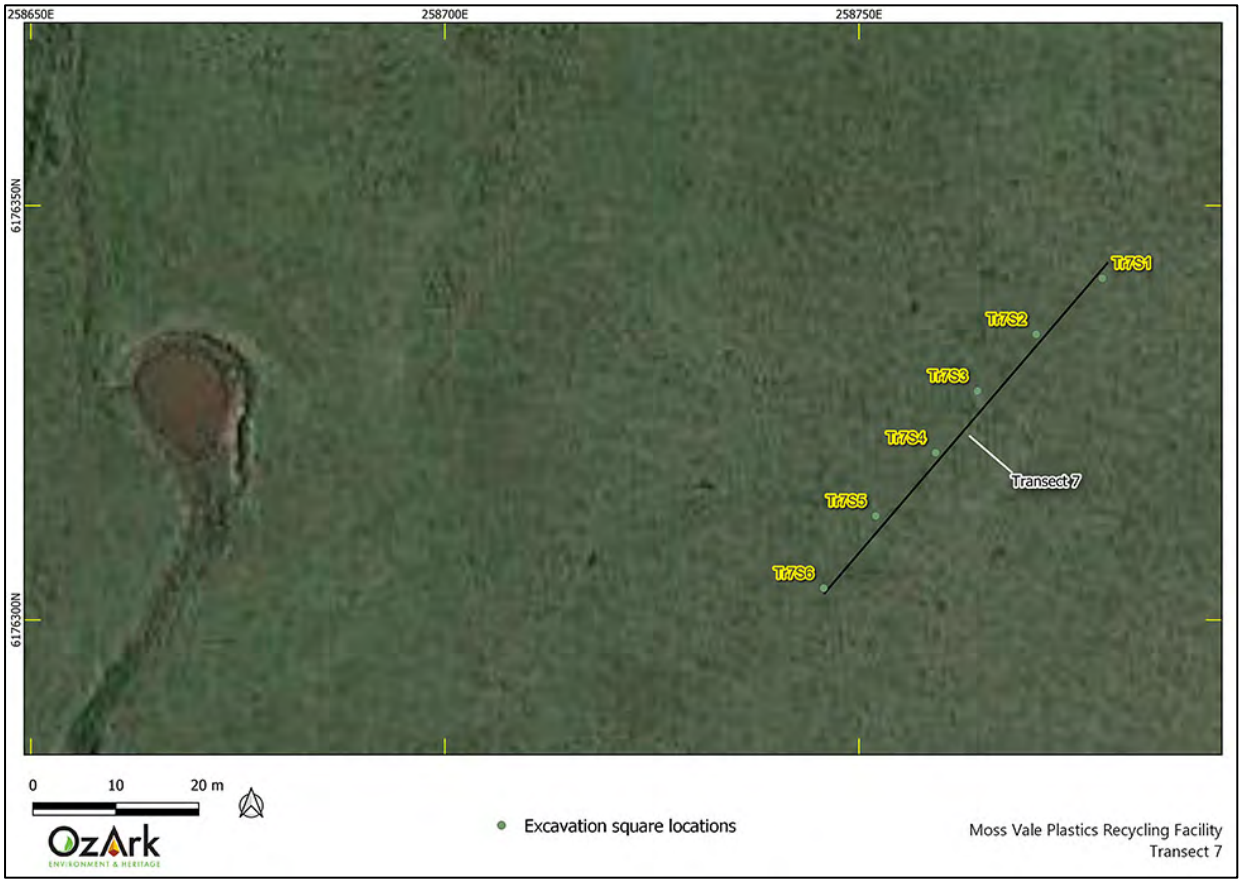
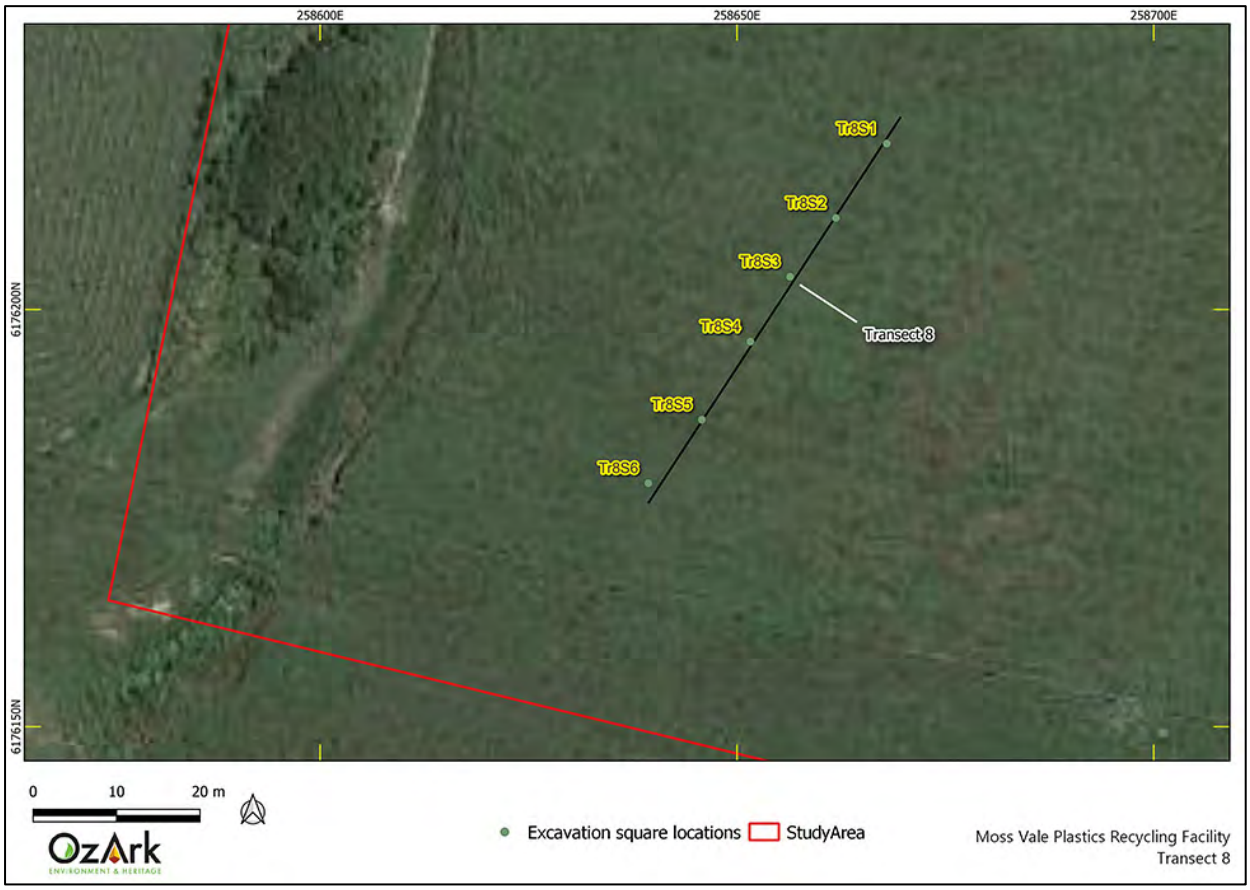


Figure 8-12: Location of the Tr8 and the associated excavation squares.



8.6 TEST EXCAVATION RESULTS

8.6.1 Preamble

The results of the test excavation program were limited. Forty-eight excavation squares (0.5 m by 0.5 m) were excavated across eight transects: a total of 12 m^2. From these eight transects, nine artefacts were recorded: an average linear artefact density of 0.75 artefacts per square metre. The artefact density for the study area is therefore low and comparable to a background scatter of artefacts that would be within most NSW landscapes.

The maximum number of artefacts recorded in a transect was four (Tr6) with two artefacts recovered from Sq2 and two artefacts from Sq6.

The results indicate an extremely low incidence of subsurface artefacts across the PADs and that historic land use, such has ploughing, has impacted the study area with intact subsurface deposits being non-existent. No nodal areas represented by clusters of artefacts were identified, and by implication, the surface artefacts that have been recorded are likewise manifestations of this background scatter of artefacts.

The low artefact totals from the test excavations reduces the capability to perform meaningful analysis and draw significant conclusions due to insufficient artefact quantities.

Table 8-3 summarises the location and results from each excavation square (locations are shown on **Figure 8-6** to **Figure 8-12**). **Table 8-3** indicates that seven excavation squares (or 14.6 per cent) recorded artefacts whilst 41 excavation squares (or 85.4 per cent) recorded no artefacts. This table illustrates that five excavation squares (or 10.4 per cent) recorded one singular artefact and that only two excavation squares (or 4.2 per cent) recorded two artefacts (Tr6 Sq2 and Tr6 Sq6).

Table 8-3. Summary of results from each excavation square.

Transect	Square	GDA Zone 55 East	GDA Zone 55 North	Artefacts (total)
TR1	1			0
TR1	2			0
TR1	3			0
TR1	4			0
TR1	5			0
TR1	6			0
TR2	1			0
TR2	2			1
TR2	3			1
TR2	4			0
TR2	5			0
TR2	6			1
TR3	1			0
TR3	2			0
TR3	3			0
TR3	4			0
TR3	5			0
TR3	6			0
TR4	1			0
TR4	2			0
TR4	3			0
TR4	4			0
TR4	5			0
TR4	6			0
TR5	1			0
TR5	2			0
TR5	3			1
TR5	4			0
TR5	5			0
TR5	6			0
TR6	1			0
TR6	2			2
TR6	3			0
TR6	4			0
TR6	5			0

Transect	Square	GDA Zone 55 East	GDA Zone 55 North	Artefacts (total)
TR6	6			2
TR7	1			0
TR7	2			0
TR7	3			0
TR7	4			0
TR7	5			0
TR7	6			1
TR8	1			0
TR8	2			0
TR8	3			0
TR8	4			0
TR8	5			0
TR8	6			0

8.6.2 Description of excavation areas

The following section will describe the landscape features of each transect.

8.6.2.1 Transect 1

Six excavation squares (0.5 m by 0.5 m) were excavated in a group rather than along a linear alignment at Tr1 (**Figure 8-6**). Tr1 was placed to investigate a bench within a generally sloping landform that descends towards Lackey Road and an unnamed drainage line to the east (**Figure 8-13**). Tr1 is within PAD3 and current land use is as a cleared, grass paddock.

Figure 8-13: View of the landform at Tr1.

3. View east of the bench landform (mid-distance) investigated by Tr1.

4. View east of the bench landform (mid-distance) investigated by Tr1.

8.6.2.2 Transect 2

Excavation of six squares (0.5 m by 0.5 m) along a 50 m east–west transect were completed at Tr2 (**Figure 8-14**). Tr2 is within PAD3 on a crest landform with gentle slopes descending to the

east where an unnamed drainage line is located. Tr2 is within a cleared grass paddock adjacent to a property fence line.

Figure 8-14: View of the landform at Tr2.

	
1. View east of the crest landform investigated by Tr2.	2. View east of the crest landform investigated by Tr2.

8.6.2.3 Transect 3

Excavation of six squares (0.5 m by 0.5 m) along a 50 m east–west transect were completed at Tr3 (**Figure 8-15**). Tr3 is within PAD3 on a mid-slope landform which descends to the northwest. TR3 is located within a cleared grass paddock parallel to a property fence.

Figure 8-15: View of the landform at Tr3.

	
1. View east of the sloping landform investigated by Tr3.	2. View west of the sloping landform investigated by Tr3 (located where the people can be seen).

8.6.2.4 Transect 4

Excavation of six squares (0.5 m by 0.5 m) along a 50 m north–south transect were completed at Tr4 (**Figure 8-16**). Tr4 is within PAD2 at the bottom of a hill spur within a drainage landform. The

location of the transect was within a slightly elevated landform with channels of the drainage line on either side. The area is cleared and grassed.

Figure 8-16: View of the landform at Tr4.

	
1. View east of the slightly elevated landform investigated by Tr4.	2. View south of the landform investigated by Tr4.

8.6.2.5 Transect 5

Excavation of six squares (0.5 m by 0.5 m) along a 50 m north–south transect, to the south of Tr6 was completed at Tr5 (**Figure 8-17**). Tr5 is within PAD2 at the break of slope from the sloping hill spur towards the drainage line to the east. Tr5 is within a cleared grass paddock.

Figure 8-17: View of the landform at Tr5.

	
1. View south of the sloping landform dropping towards the drainage line to the east investigated by Tr5.	2. View north of the landform investigated by Tr5 showing the drainage line to the east (right in this photo).

8.6.2.6 Transect 6

Excavation of six squares (0.5 m by 0.5 m) along a 50 m north–south transect were completed at Tr6 (**Figure 8-18**). Tr6 is within PAD2 at the break of slope from the sloping hill spur towards the

drainage line to the east. Tr6 is within a cleared grass paddock. Tr6 is located east of the isolated surface find originally recorded during the Biosis survey (AHIMS 52-4-0712/MVRec IF1).

Figure 8-18: View of the landform at Tr6.

	
1. View south of the sloping landform dropping towards the drainage line to the east investigated by Tr6.	2. View south of the landform investigated by Tr6 showing the drainage line to the east (right in this photo).

8.6.2.7 Transect 7

Excavation of six squares (0.5 m by 0.5 m) along a 50 m north–south transect was completed at Tr7 (**Figure 8-19**). Tr7 is in PAD2 west of a drainage line within a gentle slope. It is within a cleared grass paddock and blackberry bushes now growing.

Figure 8-19: View of the landform at Tr7.

	
1. View north of the sloping landform dropping towards the drainage line to the west investigated by Tr7.	2. View south of the landform investigated by Tr7 showing the gently sloping landform.

8.6.2.8 Transect 8

Excavation of six squares (0.5 m by 0.5 m) along a 50 m north–south transect were completed at Tr8 (**Figure 8-20**). Tr8 is in PAD2 on a slight slope that descends towards a drainage line to the west. Tr8 is in a cleared grass paddock, approximately 30 m east of the creek.

Figure 8-20: View of the landform at Tr8.

	
1. View north of the sloping landform dropping towards the drainage line to the west investigated by Tr8.	2. View south of the landform investigated by Tr8 showing the gently sloping landform and the drainage line to the west (right in this photo).

8.6.3 Stratigraphy

Archaeological stratigraphy was not present at any of the excavation squares investigated. Generally, excavation squares consisted of a thin (>10 cm) humic layer of topsoil above loam soils, sometimes with gravel inclusions. The loam soils were above culturally sterile orange clayey loam soils.

The first square of each transect was excavated manually in 5 cm spits. Once the soil profile or a lack of archaeological stratigraphy was determined, the OzArk Excavation Director determined that excavation in 10 cm spits was appropriate for the remainder of the excavation squares.

8.6.3.1 Transect 1

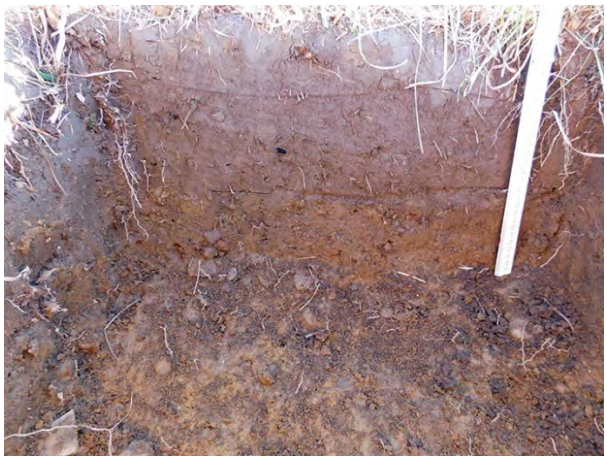
Table 8-4 provides detail on the soil profiles at Tr1 and **Figure 8-21** shows a sample of excavated soil profiles.

Soils across Tr1 consisted of a medium layer (<8 cm) of dark brown humic topsoil overlying dark brown loam which, in turn, overlies a mid-brown loam. Excavation depths were between 27 to 30 cm before reaching an orangey clay loam with gravels. Soils were very moist suggesting a high water table at this location.

Table 8-4. Tr1: Stratigraphy.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr1 Sq1	30	7 cm of dark brown humic topsoil. Dark brown loam from 7-20 cm. Mid brown loam from 20-30 cm and continues in depth.
Tr1 Sq2	27	7 cm of dark brown humic topsoil. Dark brown loam from 7-18 cm. Mid brown loam from 18-27 cm. Orangey clay with gravel at base.
Tr1 Sq3	27	10 cm of dark brown humic topsoil. Dark brown loam from 10-20 cm. Orangey clay loam with gravels from 20-27 cm.
Tr1 Sq4	30	8 cm of dark brown loam topsoil. Dark brown loam from 8-20 cm followed by mid-brown loam to 30 cm with an indistinct boundary between the dark and mid brown deposit.
Tr1 Sq5	30	7 cm of dark brown humic topsoil. Dark brown loam from 8-20 cm followed by mid-brown loam to 30 cm with an indistinct boundary between the dark and mid brown deposit. Orangey clay loam with gravel at base.
Tr1 Sq6	30	7 cm of dark brown humic topsoil. Dark brown loam from 8-20 cm followed by mid-brown loam to 30 cm with an indistinct boundary between the dark and mid brown deposit. Orangey clay loam with gravel at base.

Figure 8-21. Tr1 excavation square profiles.



1. Tr1 Sq2, north profile.

2. Tr1 Sq4, north profile.

8.6.3.2 Transect 2

Table 8-5 provides detail on the soil profiles at Tr2 and **Figure 8-22** shows a sample of excavated soil profiles.

Soils across Tr2 consisted of a thin layer (<5 cm) of dark brown humic topsoil overlaying a dark brown loam (with stones or gravel in Sq3 and Sq6). Excavation depths ranged between 25 to 40 cm before a layer of orangey clay loam with gravel was reached.

Table 8-5. Tr2 stratigraphy.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr2 Sq1	39	5 cm of dark brown humic topsoil. Dark brown loam from 5-20 cm. Orangey clay loam from 20-39 cm and continues in depth.
Tr2 Sq2	40	5 cm of dark brown humic topsoil. Dark brown loam from 5-24 cm. Orangey clay loam with gravel from 24-40 cm and continues in depth.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr2 Sq3	34	5 cm of dark brown humic topsoil. Dark brown loam with gravel from 5-21 cm. Dark orangey brown clay loam with evidence of burning from charcoal inclusions 21-34 cm.
Tr2 Sq4	25	5 cm of dark brown humic topsoil. Dark brown loam 5-25 cm. Orangey clay loam with gravel.
Tr2 Sq5	25	10 cm of dark brown humic topsoil. Dark brown loam from 10-20 cm. Orangey clay loam with gravel from 20-25 cm and continues in depth.
Tr2 Sq6	30	9 cm of dark brown humic topsoil. Dark brown loam with stones from 9-24 cm. Orangey clay loam with gravel from 24-30 cm.

Figure 8-22. Tr2 excavation square profiles.

1. Tr2 Sq2, west profile.

2. Tr2 Sq3, north profile.

8.6.3.3 Transect 3

Table 8-6 provides detail on the soil profiles at Tr3 and **Figure 8-23** shows a sample of excavated soil profiles.

Soils across Tr3 consisted of a layer (<7 cm) of dark brown humic topsoil. This is generally above a dark brown loam which sits on top of an orangey clay loam or bedrock. Excavation depths ranged between 8 to 30 cm before a very compact layer of sandstone bedrock or compacted orangey clay loam was reached.

Table 8-6. Tr3 stratigraphy.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr3 Sq1	30	5 cm of dark brown humic topsoil with a 2 cm layer of sand below the topsoil indicating landform modification. Dark brown loam from 5-17 cm. Orangey clay loam from 17-30 cm. Orangey clay loam with stones which continues in depth.
Tr3 Sq2	27	7 cm of dark brown humic topsoil. Dark brown loam from 7-15 cm with loose and isolated stones which are evidence of land use disturbance. Orangey clay loam from 15-27 cm which continues in depth.
Tr3 Sq3	37	7 cm of dark brown humic topsoil. Dark brown loam from 7-18 cm. Orangey clay loam from 18-37 cm which continues in depth.
Tr3 Sq4	8	5 cm of dark brown humic topsoil. Sandstone bedrock from 5-8 cm which continues in depth.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr3 Sq5	12	4 cm of dark brown humic topsoil. Dark brown loam from 4-12 cm. Sandstone bedrock.
Tr3 Sq6	18	5 cm of dark brown humic topsoil. Orangey sandstone bedrock from 5-18 cm which continues in depth.

Figure 8-23. Tr3 excavation square profiles.

3. Tr3 Sq3, north profile.

4. Tr3 Sq4 west profile.

8.6.3.1 Transect 4

Table 8-7 provides detail on the soil profiles at Tr4 and **Figure 8-24** shows a sample of excavated soil profiles.

Soils across Tr4 consisted of a thick layer (15> cm) of brown loam topsoil. This was followed by a mid-brown loam. Excavation depths varied between 28 to 40 cm before a culturally sterile level was reached. Soils were alluvial and very moist.

Table 8-7. Tr4 stratigraphy.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr4 Sq1	28	Dark brown leached loam or alluvial topsoil deposit to 18 cm. Light brown leached loam with gravel inclusions from 18-28 cm. Orange clay loam with gravel inclusions which continues in depth.
Tr4 Sq2	40	Mid-brown loam topsoil to 15 cm. Light brown loam from 14-40 cm and continues in depth.
Tr4 Sq3	33	Dark brown loam topsoil to 20 cm. Mid- brown loam from 20-33 cm. Light brown clay loam which continues in depth.
Tr4 Sq4	30	Dark brown loam topsoil to 25 cm. Mid- brown loam from 25-30 cm.
Tr4 Sq5	32	Dark brown loam topsoil to 15 cm. Mid- brown loam from 15-32 cm and continues in depth.
Tr3 Sq6	23	Dark brown loam topsoil to 18 cm. Mid-brown loam from 18-23 cm and continues in depth.

Figure 8-24. Tr4 excavation square profiles.

	
5. Tr4 Sq2, north profile.	6. Tr4 Sq3, south profile.

8.6.3.1 Transect 5

Table 8-8 provides detail on the soil profiles at Tr5 and **Figure 8-25** shows a sample of excavated soil profiles.

Soils across Tr5 generally consisted of a thick layer (<15 cm) of dark brown humic topsoil. Beneath the topsoil, the soil profile was variable between test squares, largely due to land use impacts, such as ploughing, disturbing the soil profile. Sq1 was characterised entirely by dark brown loam with clay chunks, indicative of ploughing activity. Below the topsoil in Sq2 and Sq4, a mid-brown loam was present. For Sq3, Sq5, and Sq6, instead of the presence of a mid-brown loam, an orangey clay loam with siltstone inclusions was present. Excavation depths were variable and ceased when culturally sterile soils were reached.

Table 8-8. Tr5 stratigraphy.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr5 Sq1	30	30 cm of dark brown loam with clay chunks. Evidence of land use disturbance from ploughing.
Tr5 Sq2	20	Dark brown loam topsoil to 12cm. Mid brown loam from 12-20 cm which continues in depth.
Tr5 Sq3	25	Dark brown loam to 15 cm. Orangey clay loam with siltstone inclusions from 15-25 cm which continues in depth.
Tr5 Sq4	25	Dark brown loam to 14 cm. Mid brown loam from 14-25 cm. Orangey clay with siltstone inclusions.
Tr5 Sq5	30	Mottled dark orange loam indicative of disturbance from ploughing to 20 cm. Orange clay loam with siltstone inclusions from 20-30 cm which continues in depth.
Tr5 Sq6	20	Dark brown loam to 12 cm. Orangey clay loam with siltstone inclusions from 12-20 cm.

Figure 8-25. Tr5 excavation square profiles.

	
7. Tr5 Sq4, south profile.	8. Tr5 Sq6, southh profile.

8.6.3.1 Transect 6

Table 8-9 provides detail on the soil profiles at Tr6 and **Figure 8-26** shows a sample of excavated soil profiles.

Soils across Tr6 consisted of a thick layer (>15 cm) of dark brown topsoil. Beneath the topsoil, Sq1, Sq2, Sq3, Sq4, and Sq5 comprised an orangey clay loam with excavation depths beginning at depths between 15 cm and 20 cm. Excavation depths were variable, with excavation ensuring that the culturally sterile orangey clay loam was reached.

Table 8-9. Tr6 stratigraphy.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr6 Sq1	40	Dark brown topsoil loam to 20 cm. Orange clay loam between a 20 cm and 40 cm depth which continues.
Tr6 Sq2	35	Dark brown topsoil loam to 15 cm. Orangey clay loam from 15 cm to 35 cm.
Tr6 Sq3	30	Dark brown topsoil loam to 15 cm. Orangey clay loam from 15 cm to 30 cm.
Tr6 Sq4	30	Dark brown topsoil loam to 15 cm. Orangey clay loam from 15 cm to 30 cm.
Tr6 Sq5	28	Dark brown topsoil loam to 15 cm. Orangey clay loam from 15 cm to 28 cm.
Tr6 Sq6	37	Dark brown topsoil loam with gravel inclusions to 20 cm. Between a 10 cm and 20 cm depth, bioturbation was present which included charcoal inclusions. Orangey clay loam with gravel inclusions from 20 cm to 37 cm.

Figure 8-26. Tr6 excavation square profiles.

1. Tr6 Sq1, north profile.

2. Tr6 Sq6, north profile.

8.6.3.1 Transect 7

Table 8-10 provides detail on the soil profiles at Tr7 and **Figure 8-27** shows a sample of excavated soil profiles.

Soils throughout Tr7 consisted of a loam topsoil layer (between 5 and 16 cm). Each test square produced a variable soil profile. Sq1, Sq2 and Sq3 had thick topsoil layers (15-16 cm). Sq1 had an orangey brown loam beneath the topsoil and orangey clay loam beneath that. Sq2 had an orangey clay loam beneath the topsoil. Sq3 has a mottled clay loam beneath the topsoil. Sq4 has a mid-brown loam followed by an orangey clay with stone inclusions and bioturbation. Sq5 and Sq6 had a mid-brown loam beneath the topsoil followed by an orangey clay loam with gravel and pebbles.

Table 8-10. Tr7 stratigraphy.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr7 Sq1	30	12 cm of dark brown loam topsoil. Orangey brown loam from 12-25 cm. Orangey clay loam from 25-30 cm and continues in depth.
Tr7 Sq2	16	16 cm of dark brown loam topsoil. Orangey clay loam from 16-29 cm which continues in depth.
Tr7 Sq3	25	16 cm of mottled dark loam topsoil. Mottled clay loam from 16-25 cm which continues in depth.
Tr7 Sq4	35	5 cm of dark brown humic topsoil. Mid-brown loam from 5-18 cm. Orangey clay with stones from 18-35 cm with bioturbation present (charcoal or a possible burrow) and continues in depth.
Tr7 Sq5	25	5 cm of dark brown humic topsoil. Mid-brown loam from 5-20 cm. Orangey clay loam with many gravels and pebbles from 20-25 cm and continues in depth.
Tr7 Sq6	20	5 cm dark brown humic topsoil. Mid-brown loam from 5-20 cm. Orangey clay loam with many pebble/gravel inclusions.

Figure 8-27. Tr7 excavation square profiles.

	
1. Tr7 Sq4, north profile.	2. Tr7 Sq5, north profile.

8.6.3.1 Transect 8

Table 8-11 provides detail on the soil profiles at Tr8 and **Figure 8-28** shows a sample of excavated soil profiles.

Soils throughout Tr8 consisted of a dark brown layer of loam topsoil (<12 cm) above variable soil profiles. In Sq1, a dark brown, mottled loam was below the topsoil which was above a mottled orange clay loam. In Sq2, a mottled mid-brown soil was beneath the topsoil. In Sq3 and Sq4 excavation ceased as the soils were extremely moist. In Sq5, orangey clay loam was below the topsoil layer, and in Sq6, a mottled clay loam was below the topsoil layer.

Table 8-11. Tr8 stratigraphy.

Transect/Square	Total depth of square (cm)	Soil profile description
Tr8 Sq1	30	7 cm of dark brown humic topsoil with roots. Dark brown mottled loam from 7-25 cm. Mottled orange clay loam from 25-30 cm and continues in depth.
Tr8 Sq2	20	12 cm of dark brown loam topsoil. Mottled mid brown loam from 12-20 cm and continues in depth.
Tr8 Sq3	10	Very dark brown loam to 10 cm. Excavation ceased due to boggy nature of the soil.
Tr8 Sq4	10	Very dark brown loam to 10 cm. Excavation ceased due to boggy nature of the soil.
Tr8 Sq5	25	12 cm of dark brown loam topsoil. Orangey clay loam from 20-25 cm.
Tr8 Sq6	20	12 cm of dark brown loam topsoil. Mottled clay loam from 12-20 cm and continues in depth.

Figure 8-28. Tr8 excavation square profiles.

	
1. Tr8 Sq1, north profile.	2. Tr8 Sq5, north profile.

8.6.3.2 Stratigraphy conclusion

Only in Tr3 was sandstone bedrock reached. At all other excavation squares, excavation ceased at a consistent orangey clay loam that had an increasing clay content with depth. Excavation at Tr1, Tr4 and Tr8 encountered moist soils suggesting that the soils were either alluvial (TR4) or were located at areas where there was a high water table (Tr1 and Tr8).

Within PAD2 the excavations recorded disturbances probably associated with ploughing. This consisted of chunks of orange clay within a mid-brown loam soil layer, or a high incidence of gravels.

Generally, except for one excavation square at Tr7, evidence of bioturbation from burrowing animals was absent. Also, except for one instance in Tr6, evidence of charcoal was absent from the excavations.

In summary, the excavations recorded reasonably consistent soil profiles across the areas investigated. While evidence of ploughing confirmed the information gained from digital elevation models (**Figure 8-2**) or aerial photographs (**Figure 8-5**), other disturbances were rarely noted. The absence of charcoal suggests that the initial clearing of the land comprising PAD2 and PAD3 was undertaken some time ago.

8.6.4 Artefact assemblage

A total of nine artefacts were recorded during the test excavation program. The raw material for five artefacts was silcrete, three artefacts were manufactured from quartz, and one was manufactured from chert. The recorded artefacts were unmodified flakes except for Tr6 Sq2 which recorded a microlith. All artefacts except two were recorded within the first 10 cm of the excavation squares (Spit 1), with the remaining two being recorded between 20–30 cm.

The number of artefacts recovered at each area is summarised in **Table 8-12**. Artefact attributes are presented in **Appendix 4**.

The artefact assemblage from the four transects where artefacts were recorded is detailed in **Table 8-12**.

Table 8-12. Artefact excavation log.

Relevant PAD	Transect	Number of artefacts
PAD3	Tr1	0
PAD3	Tr2	3
PAD3	Tr3	0
PAD2	Tr4	0
PAD2	Tr5	1
PAD2	Tr6	4
PAD2	Tr7	1
PAD2	Tr8	0

8.6.4.1 Transect 2

Three artefacts were recovered from Tr2: two silcrete flakes and a quartz flake (**Figure 8-29**).

Figure 8-29. Test excavation. Tr2 artefacts.

1. Tr2 Sq2: silcrete flake displaying evidence of bipolar reduction.

2. Tr2 Sq3: quartz flake.

3. Tr2 Sq6: silcrete flake.

8.6.4.2 Transect 5

One artefact was recovered from Tr5: a proximal fragment of a quartz flake (**Figure 8-30**).

Figure 8-30. Test excavation. Tr5 artefact.

1. Tr5 Sq3 artefact: broken quartz flake.

8.6.4.3 Transect 6

Four artefacts were recovered from Tr6: three silcrete flakes and a quartz flake fragment (**Figure 8-31**). One of these artefacts was a small microlith manufactured from silcrete (Tr6 Sq2).

Figure 8-31. Test excavation. Tr7 artefacts.

1. Tr6 Sq2: distal fragment of a quartz flake and a silcrete microlith.

2. Tr6 Sq6: silcrete flakes.

8.6.4.4 Transect 7

One artefact was recovered from Tr7: a silcrete flake (**Figure 8-32**).

Figure 8-32. Test excavation. Tr7 artefact.

1. Tr7 Sq6: distal fragment of a chert flake.

8.6.5 Conclusions

The results of the test excavation of eight transects across two PADs illustrated that there were no subsurface archaeological deposits of conservation value within the areas to be impacted by the proposal.

A total of nine artefacts were recorded during test excavation, an overall artefact density of 0.75 artefacts per square metre.

Overall, there is a low artefact density within subsurface deposits recorded by the test excavation investigations. The artefact density represents a standard ‘background’ expression of artefacts that are common in many New South Wales environments.

9 DISCUSSION

9.1 DISCUSSION OF SURVEY RESULTS

Biosis 2021 (**Appendix 1**) conclude that the survey resulted in the identification of one isolated surface artefact and three areas of PAD. The AHIMS sites recorded by Kayandel (2005) located within the study area were inspected, however they could not be relocated, likely due to low levels of ground surface visibility or natural disturbances such as erosion displacing the artefacts.

Biosis noted that these results were not surprising as the review of previous assessments completed adjacent to the study area have also indicated the presence of Aboriginal sites across the same or similar landforms.

9.2 DISCUSSION OF THE TEST EXCAVATION PROGRAM

9.3 TEST EXCAVATION SUMMARY

As highlighted in **Section 8.6.1**, 48 excavation squares (0.5 m x 0.5 m) were excavated across eight transects: a total of 12 m^2. From these eight transects, nine artefacts were recovered: an average artefact density of 0.75 artefacts per square metre.

The maximum number of artefacts recorded in a transect was four (Tr6) with two artefacts being recovered from Sq1 and two artefacts from Sq6.

The results of the test excavations have concluded that further archaeological excavation at PAD2 and PAD3 is unnecessary because of the low artefact density in subsurface deposits which have also been subject to land use disturbance.

9.4 RESEARCH CONSIDERATIONS

Section 8.4.2 provides some research considerations that should be applied to any excavation. Some concluding remarks will be made in this section about the considerations noted in **Section 8.4.2**.

Statistically useful sample size

Forty-eight 0.5 m by 0.5 m excavation squares were excavated across eight transects throughout the impact areas for the proposal: a total of 12 m^2. From these eight transects, nine artefacts were recovered: an average artefact density of 0.75 artefacts per square metre. This density of artefacts is extremely low and not robust enough for any meaningful statistical analysis.

Comparable assemblages

The artefact assemblage was not substantial enough to form adequate comparison with other sites. However, the lack of artefacts in the assemblage agrees with previous research at similar landforms to those within the study area (**Section 8.2**). Dibden (2005) attributed low artefact density to short periods of occupation at an ephemeral water source. AMBS (2007) concluded

that artefact density was highest in alluvial deposits beside drainage lines, and Biosis (2020) had higher artefact density on lower slope terrace landforms. However, Dibden (2000) found that at a site where higher artefact densities could be anticipated, that low artefact densities occur due to historic European land use.

The current investigation generally agrees with these other studies in that there is a low artefact density in landforms distant to permanent water sources. Although AMBS (2007) concluded that alluvial landforms near drainage lines was a favoured location, this cannot be equated with Tr4 which, although alluvial, is not a terrace landform but is likely to have been recently deposited following the clearing of surrounding hills. Further, both waterways associated with the proposal are highly seasonal, although a local landowner did say that there were springs in the area. Whether this was the case in antiquity is not known but the low-density distribution of subsurface artefacts could be the remains of small artefact scatters associated with use of these springs or the seasonal waterways that have been dispersed through long-term ploughing.

Condition

The condition of the deposits is poor, particularly as most artefacts were derived from the upper 10 cm of the soil profile within the 'plough zone' and because no archaeological stratigraphy or features were noted.

Any analysis of vertical or horizontal distribution of artefacts is hampered by a lack of data. In terms of vertical distribution, no excavation square displayed archaeological stratigraphy and most of the artefacts were confined to the uppermost spit (0–10 cm) (**Section 8.6.3**). This allows limited opportunities to undertake a taphonomic analysis on how material has moved within the soil profile, and limited opportunities to study change in artefact types or sizes through time. There is also no discernible patterning in the horizontal distribution of artefacts.

Theory and recording

The small size of the artefact assemblage does not allow for particularly meaningful interpretation. Therefore, only basic attributes were recorded for future research.

9.5 RESEARCH QUESTIONS

In **Section 8.3.2**, several research questions were posed for the test excavation program. These will be answered below.

- How do the results of the test excavations reflect on the extent and nature of the previously identified PADs?
    - The test excavation has confirmed that while a low-density of subsurface artefacts is present at both PADs that the artefact distribution is without any nodal points and is best described as a background scatter of artefacts, possibly dispersed from more concentrated sites in the past but now lacking any form of association with a particular location.

- Are there intact stratigraphic deposits present beneath the 'plough zone' that are of conservation value?
    - No artefact bearing deposits were identified beneath the 'plough zone'. As such, there are no deposits with conservation value.
- Are there intact subsurface deposits which indicate the original location of the identified surface artefacts?
    - No. Only seven out of the 48 excavation squares excavated contained artefacts. Subsurface artefacts were recovered from within the 'plough zone', and therefore, there is no indication of the original location of the identified surface artefacts.
- How has ploughing affected the integrity of the soil profile/artefacts?
    - Most subsurface artefacts recovered from the test excavation were recovered from the top 10 cm of the deposit and therefore are within the plough zone. As such, the integrity of the sites is regarded as being poor. Only two artefacts (Tr6, Sq6) recorded at a depth of 20–30cm, but this depth is still regarded as being within the plough zone.
- How does the artefactual material and stratigraphy identified at the site compare to other archaeological excavations undertaken in the local area and the broader region?
    - The artefact assemblage is not substantial enough to form adequate comparison with other sites in the local area or broader region, However, the materials identified during the test excavation program are consistent with those commonly found during excavations within the broader region.
    - The stratigraphy of the deposits within the excavation squares is consistent to those encountered on similar landforms within the broader region which have been impacted by long-term farming practices. The A-horizon is generally shallow (less than 20 cm) with visible disturbances from repeated ploughing.
- Is there evidence providing insight into the tasks Aboriginal people were undertaking?
    - The small sample size of the assemblage does not allow for any conclusion as to the tasks Aboriginal people were undertaking.
- Are intact archaeological features, such as hearths, present in the tested areas?
    - No archaeological stratigraphy or archaeological features such as hearths were recorded during the test excavation program.
- Can chronological dates be obtained (i.e. from *in situ* charcoal samples) that will aid our understanding of Aboriginal occupation in the region?
    - No archaeological features (i.e. hearths) with *in situ* charcoal samples were identified during the test excavation. Furthermore, most artefacts were uncovered from soils disturbed by ploughing. As such, no dating can be undertaken.

9.6 SITE RECORDINGS

As artefacts were recorded during the test excavation program, the findings are required to be recorded on the AHIMS register. Although it will be noted that the artefact/s associated with these 'sites' have been collected and that no further investigation is required, the find locations will be registered with AHIMS.

The location of the new site recordings is shown on **Figure 9-1** and **Figure 9-2**. A summary of the site information is provided in **Table 9-1** and descriptions of the sites follow.

Table 9-1: Sites recorded because of the test excavation program.

AHIMS ID	Site name	Site type	Coordinates (GDA Zone 56)
52-4-0713	Beaconsfield Rd OS-1	Artefact scatter	259253E, 6176010N (centre)
52-4-0714	Beaconsfield Rd OS-2	Artefact scatter	258802E, 6176274N (centre)
52-4-0716	Beaconsfield Rd IF-2	Isolated find	258771E, 6176178N
52-4-0717	Beaconsfield Rd IF-3	Isolated find	258745E, 6176303N

Figure 9-1: Location of sites recorded in PAD2 during the test excavation program.

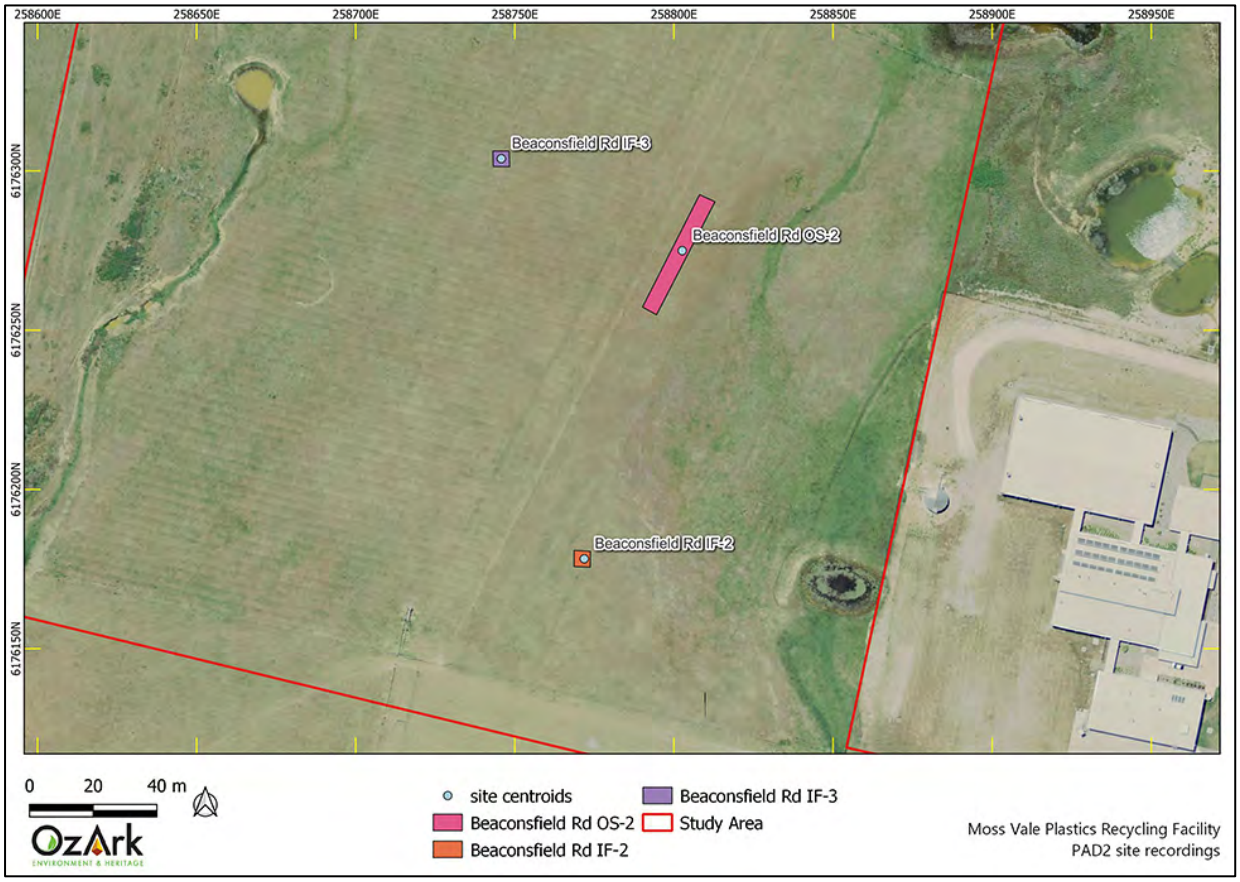


Figure 9-2: Location of sites recorded in PAD3 during the test excavation program.

Beaconsfield Rd OS-1 (52-4-0713)

Site Type: artefact scatter

GPS Coordinates: GDA Zone 56: 259253E, 6176010N (centre)

Location of Site: The site is located within Lot 10 DP1084421 just to the north of the fence separating this lot from Lot 15 DP2810 (**Figure 9-2**). The site is 276 m east of the northern end of Beaconsfield Road.

Description of Site: The site consists of three artefacts that were recorded during test excavation. The site is in a cleared paddock in a crest landform where the topography descends to the east. The artefacts consist of two silcrete flakes and a quartz flake. The artefacts have been removed from the site with the intention of reburying them nearby at a later date. It is assessed that there is a low likelihood of there being further artefacts present at the site, although the test excavation results concluded that there is a very low density of subsurface artefacts across all landforms near the site. The site extends 36 m (east–west) by 3.5 m (north–south).

Beaconsfield Rd OS-2 (52-4-0714)

Site Type: artefact scatter

GPS Coordinates: GDA Zone 56: 258802E, 6176274N (centre)

Location of Site: The site is located within Lot 11 DP1084421 (**Figure 9-1**). The site is 272 m northwest of the northern end of Beaconsfield Road.

Description of Site: The site consists of four artefacts that were recorded during test excavation. The site is in a gently sloping spur between two ephemeral drainage lines. The artefacts include a distal fragment of a quartz flake, a silcrete microlith, and two silcrete flakes. The artefacts have been removed from the site with the intention of reburying them nearby at a later date. It is assessed that there is a low likelihood of there being further artefacts present at the site, although the test excavation results concluded that there is a very low density of subsurface artefacts across all landforms near the site. The site extends 40 m (north–south) by 5 m (east–west).

Beaconsfield Rd IF-2 (52-4-0716)

Site Type: Isolated find

GPS Coordinates: GDA Zone 56: 258771E, 6176178N

Location of Site: The site is located within Lot 11 DP1084421 (**Figure 9-1**). The site is 237 m west-northwest of the northern end of Beaconsfield Road.

Description of Site: The site consists of a single proximal fragment of a quartz flake that was recorded during test excavation. The artefact has been removed from the site with the intention of reburying them nearby at a later date. It is assessed that there is a low likelihood of there being further artefacts present at the site, although the test excavation results concluded that there is a very low density of subsurface artefacts across all landforms near the site. The site is in a gently sloping spur between two ephemeral drainage lines and extends 5 m (north–south) by 5 m (east–west).

Beaconsfield Rd IF-3 (52-4-0717)

Site Type: Isolated find

GPS Coordinates: GDA Zone 56: 258745E, 6176303N

Location of Site: The site is located within Lot 11 DP1084421 (**Figure 9-1**). The site is 332 m northwest of the northern end of Beaconsfield Road.

Description of Site: The site consists of a single chert flake that was recorded during test excavation. The artefact has been removed from the site with the intention of reburying them nearby at a later date. It is assessed that there is a low likelihood of there being further artefacts present at the site, although the test excavation results concluded that there is a very low density of subsurface artefacts across all landforms near the site. The site is in a gently sloping spur between two ephemeral drainage lines and extends 5 m (north–south) by 5 m (east–west).

10 SIGNIFICANCE AND IMPACT ASSESSMENT

10.1 ASSESSMENT OF SIGNIFICANCE

10.1.1 Identifying cultural significance

The concept of cultural significance is used in Australian heritage practice and legislation to encompass all the cultural values and meanings that might be recognised in a place. The *Burra Charter*'s definition of cultural significance is broad and encompasses places that are significant to Indigenous cultures (Burra Charter 2013).

The *Burra Charter* definition of 'place' is also broad and encompasses Indigenous places of cultural significance. 'Place' includes locations that embody spiritual value (such as Dreaming places, sacred landscapes, and stone arrangements), social and historical value (such as massacre sites), as well as scientific value (such as archaeological sites). In fact, one place may be all these things or may embody all these values at the same time.

In some cases, the find-spot of a single artefact may constitute a 'place'. Equally, a suite of related locations may together comprise a single 'place', such as the many individual elements that make up a Songline. These more complex places are sometimes called a cultural landscape or cultural route.

The Guide (OEH 2011: 8–9) notes that cultural significance is comprised of an assessment of social values, scientific values, aesthetic values, and historic values. These values are described as:

Social or cultural value

Social or cultural value refers to the spiritual, traditional, historical, or contemporary associations and attachments the place or area has for Aboriginal people. Social or cultural value is how people express their connection with a place and the meaning that place has for them.

Places of social or cultural value have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods, or events. Communities can experience a sense of loss should a place of social or cultural value be damaged or destroyed.

There is not always consensus about a place's social or cultural value. Because people experience places and events differently, expressions of social or cultural value do vary and, in some instances, will be in direct conflict. When identifying values, it is not necessary to agree with or acknowledge the validity of each other's values, but it is necessary to document the range of values identified.

Social or cultural value can only be identified through consultation with Aboriginal people. This could involve a range of methodologies, such as cultural mapping, oral histories, archival

documentation, and specific information provided by Aboriginal people specifically for the investigation.

Cultural value involves both traditional links with specific areas, as well as an overall concern by Aboriginal people for their sites generally and the continued protection of these. This type of value may not be in accord with interpretations made by the archaeologist: a site may have low archaeological value but high social value, or vice versa.

Scientific (archaeological) value

This 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 (Burra Charter 2013).

Information about scientific values will be gathered through any archaeological investigation undertaken. Archaeological investigations must be carried out according to the Code of Practice (DECCW 2010).

Often scientific values are informed by social values that allow a contemporary understanding of the archaeological data to be understood.

Aesthetic value

This refers to the sensory, scenic, architectural, and creative aspects of the place. It is often closely linked with the social values. It may consider form, scale, colour, texture and material of the fabric or landscape, and the smell and sounds associated with the place and its use (Burra Charter 2013).

Historic value

Historic value refers to the associations of a place with a historically important person, event, phase, or activity in an Aboriginal community. Historic places do not always have physical evidence of their historical importance (such as structures, planted vegetation or landscape modifications). They may have 'shared' historic values with other (non-Aboriginal) communities.

10.2 ASSESSED SIGNIFICANCE OF THE RECORDED SITES

Biosis 2021 (**Appendix 1**) do not undertake an assessment of significance for the isolated find (MVRec IF1) recorded during the survey. This site will be dealt with here as OzArk was able to identify the site during the test excavation program and can make an appropriate assessment of significance.

Table 10-1 presents a summary of the significance assessment of Aboriginal cultural heritage sites recorded during this assessment. Further details of each of the assessment criteria are provided below.

Social or Cultural Value

The two recorded isolated finds (MRec IF1 and Beaconsfield Rd IF-1) have been provisionally assigned high cultural value as it is OzArk's experience that all artefacts are held in high value by the Aboriginal community as markers for past occupation of the Country and as a tangible connection to their ancestors.

The sites recorded during the test excavation program (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3) have been assigned nil significance as the artefacts have been removed from the landscape.

No further cultural values were identified by the RAPs based on their review of the draft ACHAR and nor did anyone object to the fact that these sites have been afforded nil cultural significance as their recording is an administrative action only.

Archaeological/Scientific Value

The two recorded isolated finds (MRec IF1 and Beaconsfield Rd IF-1) have been assigned low scientific value as they are displaced artefacts without associated archaeological deposits. Both artefacts are representative of artefacts that are recorded in the region, and neither will be able to meaningfully add to our knowledge concerning past Aboriginal use of the area.

The sites recorded during the test excavation program (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3) are assigned nil scientific significance as the test excavation program demonstrated that there are no associated intact archaeological deposits, and the low density of subsurface artefacts is representative of the broader landscape.

Aesthetic Value

None of the recorded sites have aesthetic values as they are difficult for the layperson to interpret, and the historic land use has removed any aesthetic features that may have once existed.

Historic Value

None of the sites have any known historic associations and all have nil historic values.

Table 10-1: Aboriginal cultural heritage: significance assessment.

Site Name	Social or Cultural Value	Archaeological / Scientific Value	Aesthetic Value	Historic Value
MVRec IF1	High	Low	Low	Nil
Beaconsfield IF-1	High	Low	Low	Nil
Beaconsfield OS-1	Nil	Nil	Nil	Nil
Beaconsfield OS-2	Nil	Nil	Nil	Nil
Beaconsfield IF-2	Nil	Nil	Nil	Nil
Beaconsfield IF-3	Nil	Nil	Nil	Nil

10.3 LIKELY IMPACTS TO ABORIGINAL HERITAGE FROM THE PROPOSAL

Table 10-2 presents a summary of potential impacts to Aboriginal cultural heritage associated with the proposal.

Regarding the sites recorded during the test excavation program (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3), all sites are within the impact footprint for the proposal. However, as was noted in **Section 9.6**, these sites have only been recorded to account for the artefacts recorded during the test excavation program and they are, because of the test program, already 'destroyed'. Therefore, while these sites will be impacted by the proposal, there will be no loss of value as the low values associated with these sites have been already impacted by the process of test excavation. While there may be further artefacts within the site extents, these artefacts are extremely unlikely to be numerous and are likely to be representative of the background expression of artefacts common to most landscapes. It is therefore concluded in **Section 10.2** that these sites are without cultural heritage values and, as such, no values will be harmed by the proposal.

In conclusion, the proposal will harm three isolated finds (MVRec IF1, BR IF1, and BR IF2) assessed as having high cultural values but low scientific values. The impact to sites Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3 will not result in any further loss of value, and the isolated find, Beaconsfield Rd IF-1, will be avoided by the proposal.

Table 10-2: Aboriginal cultural heritage: impact assessment.

AHIMS ID	Site Name	Type of Harm (Direct/Indirect / None)	Degree of Harm (Total/Partial / None)	Consequence of Harm (Total/Partial/No Loss of Value)
52-4-0712	MVRec IF1	Direct	Total	Total
52-4-0715	Beaconsfield Rd IF-1	None	None	No loss of value
52-4-0713	Beaconsfield Rd OS-1	Direct	Total	No loss of value
52-4-0714	Beaconsfield Rd OS-2	Direct	Total	No loss of value
52-4-0716	Beaconsfield Rd IF-2	Direct	Total	No loss of value
52-4-0717	Beaconsfield Rd IF-3	Direct	Total	No loss of value
52-4-0386	BR-IF1	Direct	Total	Total
52-4-0387	BR-IF2	Direct	Total	Total

10.4 AVOIDING AND MINIMISING HARM

10.4.1 Conserving significant Aboriginal cultural heritage

An object of the NPW Act is the '*conservation of objects places and features… of cultural value within the landscape, including… places, objects and features of significance to Aboriginal people*' (s.2A(1(b)(i)).

As heritage professionals, OzArk, strives for good conservation outcomes. In particular, OzArk is primarily concerned with the conservation and protection of Aboriginal cultural heritage that is of significance to Aboriginal people.

Two primary objectives when managing harm to an Aboriginal object are:

- Impacts to significant Aboriginal objects and places should always be avoided wherever possible
- Where impacts to Aboriginal objects and places cannot be avoided, proposals should be amended to reduce the extent and severity of impacts to significant Aboriginal objects and places using reasonable and feasible measures.

10.4.2 Opportunities to conserve Aboriginal cultural heritage values

10.4.2.1 Ecologically sustainable development principles

Ecologically sustainable development principles (ESD) (defined in s.6 of the *Protection of the Environment Administration Act 1991*) requires the integration of economic and environmental considerations (including cultural heritage) in the decision-making process. Regarding Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle.

10.4.2.2 Intergenerational equity

Intergenerational equity is the principle whereby the present generation should ensure the health, diversity, and productivity of the environment for the benefit of future generations.

In terms of Aboriginal heritage, intergenerational equity can be considered in terms of the cumulative impacts to Aboriginal objects and places in a region. If few Aboriginal objects and places remain in a region (for example, because of impacts under previous permits), fewer opportunities remain for future generations of Aboriginal people to enjoy the cultural benefits of those Aboriginal objects and places.

Information about the integrity, rarity or representativeness of the Aboriginal objects and places proposed to be impacted, and how they illustrate the occupation and use of land by Aboriginal people across the region, will be relevant to the consideration of intergenerational equity and the understanding of the cumulative impacts of the proposal.

Where there is uncertainty, the precautionary principle should also be followed.

10.4.2.3 The precautionary principle

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

In relation to Aboriginal cultural heritage values, the precautionary principle should be guided by:

- The proposal involves a risk of serious or irreversible damage to Aboriginal objects or places or to the value of those objects or places
- There is uncertainty about the Aboriginal cultural heritage values or scientific or archaeological values, including in relation to the integrity, rarity or representativeness of the Aboriginal objects or places proposed to be impacted.

10.4.2.4 Principle of Integration

The Plan of Implementation of the World Summit on Sustainable Development held in Johannesburg, 2002, noted the need to "*promote the integration of the three components of sustainable development- economic development, social development and environmental protection- as interdependent and mutually reinforcing pillars*".

The principle of integration ensures mutual respect and reciprocity between economic and environmental considerations:

- Environmental considerations are to be integrated into economic and other development plans, programs, and projects
- Development needs are to be considered in applying environmental objectives.

10.4.2.5 Applicability to the proposal

There is a very low impact to Aboriginal cultural heritage values as few Aboriginal sites were recorded, and no intangible heritage values have been identified within the study area. The results of the surface survey and test excavation indicate that significant Aboriginal cultural heritage values will not be harmed within the study area.

Table 10-3 examines the application of ESD principles to the proposal.

Table 10-3: Application of ESD principles to the proposal.

ESD principle	Response
Avoiding and minimising harm	**Section 11** sets out mechanisms by which to avoid and minimise harm. The undertaking of the test excavation program has indicated that significant subsurface deposits are not present at the study area.
The integration principle	The proposal presents a strong case for the broader environmental benefits arising from environmentally responsible development. The environmental consequences of the proposal have been carefully assessed.
The precautionary principle	The Aboriginal cultural heritage investigation has followed the precautionary principle though undertaking a robust Aboriginal cultural heritage assessment to ensure that harm to Aboriginal objects and values is minimised. The survey adopted a precautionary principle when it came to describing and assessing landforms within the survey areas and the test excavation program was undertaken to provide certainty that significant subsurface deposits will not be harmed.
The intergenerational equity principle	It is assessed that the proposal will not harm significant Aboriginal cultural heritage values and that there will be a manageable diminution of intergenerational equity should the sites recorded here be harmed.

11 MANAGEMENT OF ABORIGINAL CULTURAL HERITAGE SITES

11.1 GENERAL MANAGEMENT PRINCIPLES

Appropriate management of cultural heritage items is primarily determined based on their assessed significance as well as the likely impacts of the proposal. **Section 10.2** and **Section 10.3** describe, respectively, the significance / potential of the recorded sites and the likely impacts of the proposal. The following management options are general principles, in terms of best practice and desired outcomes, rather than mitigation measures against individual site disturbance.

- Avoid impact by altering the proposal to avoid impact to a recorded Aboriginal site. If this can be done, then a suitable curtilage around the site must be provided to ensure its protection both during the short-term construction phase of development and in the long-term use of the area. If plans are altered, care must be taken to ensure that impacts do not occur to areas not previously assessed.

- If impact is unavoidable then approval to disturb sites under the authority of an ACHMP must be sought from DPIE. Normally the management recommendations contained in the ACHAR become policies of the ACHMP. As the Aboriginal community have been provided the opportunity to view the draft ACHAR, the ACHAR must make it clear that a future ACHMP will manage Aboriginal cultural heritage within the study area so that the Aboriginal community can assess the management recommendations with this knowledge. The ACHMP policies will often stipulate that the Aboriginal community should be involved in any salvage activities and will dictate what the fate of any salvaged Aboriginal objects will be.

11.2 MANAGEMENT AND MITIGATION OF RECORDED ABORIGINAL SITES

11.2.1 Opportunities to conserve Aboriginal cultural heritage values

While three isolated finds will be impacted by the proposal, a further isolated find is adjacent to the study area and will not be harmed.

To ensure that Beaconsfield Rd IF-1 is not harmed during the construction of the access road, the northern boundary of the study area adjacent to Beaconsfield IF-1 should be temporarily fenced and signed (see **Figure 7-3** for the location of the site). There should be no vehicle movements or the storage of materials to the north of this fence during the construction activities. The fence may be removed at the conclusion of the construction associated with the proposal.

11.2.2 Management of potentially impacted Aboriginal sites

Following project approval, an ACHMP will be developed in consultation with the RAPs and approved by DPIE.

The ACHMP will contain policies for unexpected finds, including the unlikely event that human skeletal material is uncovered.

The following management principles should be applied to the three isolated finds (MVRec IF1, BR IF1, and BR IF2) liable to be harmed by the proposal:

- The ACHMP will advocate that an attempt is made to locate the isolated finds before the start of construction. This should be undertaken with the assistance of the Aboriginal community and all visible artefacts should be collected
- The ACHMP will recommend that the long-term management of the collected artefacts is that they are re-buried within the study area, but outside of any impacts from the proposal. It is noted that RAPs have already expressed the view that the artefacts are reburied without any plastic containers/bags and this will be set out in the ACHMP and agreed to during the ACHMP's review with RAPs.

The following management principles should be applied to the four sites recorded because of the test excavation program (Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3) that are liable to be harmed by the proposal:

- No further archaeological investigation is required at these sites as the test excavation program has demonstrated that the sites are now without cultural heritage value
- The artefacts from the sites recorded during the test excavation program should be re-buried with any other artefacts collected within the study area.

The ACHMP will state that all sites impacted by the proposal (MVRec IF1, BR IF1, BR IF2, Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3) should have an Aboriginal Site Impact Recording Form submitted to the AHIMS register to list all sites as 'destroyed' following the community collection of the isolated finds.

The re-burial location should be registered as a site with the AHIMS register and the proponent will undertake to protect that location.

12 RECOMMENDATIONS

Under Section 89A of the NPW Act it is mandatory that all newly recorded Aboriginal sites be registered with AHIMS. As a professional in the field of cultural heritage management it is the responsibility of OzArk to ensure this process is undertaken.

To this end it is noted that six Aboriginal sites were recorded during the assessment.

The following recommendations are made based on these impacts and regarding:

- Legal requirements under the terms of the NPW Act whereby it is illegal to damage, deface or destroy an Aboriginal place or object without the prior written consent of Heritage NSW or an approved ACHMP
- The findings of the current investigations undertaken within the study area
- The interests of the Aboriginal community.

Recommendations concerning Aboriginal cultural values within the study area are as follows:

1. Following project approval, an ACHMP will be developed to manage Aboriginal cultural heritage within the study area. The ACHMP will be developed in consultation with the RAPs.
2. To ensure that Beaconsfield Rd IF-1 is not harmed during the construction of the access road, the northern boundary of the study area adjacent to Beaconsfield Rd IF-1 should be temporarily fenced and signed (see **Figure 7-3** for the location of the site). There should be no vehicle movements or the storage of materials to the north of this fence during the construction activities. The fence may be removed at the conclusion of the construction associated with the proposal.
3. The impact footprint of the proposal should be temporarily fenced during construction to ensure that there are no inadvertent impacts to surrounding landforms. The fence may be removed at the conclusion of the construction associated with the proposal.
4. An attempt will be made to locate the isolated finds MVRec IF1, BR IF1, and BR IF2 before the start of construction. This should be undertaken with the assistance of the Aboriginal community and all visible artefacts should be collected.
5. No further archaeological investigation is required at Beaconsfield Rd OS-1, Beaconsfield Rd OS-2, Beaconsfield Rd IF-2, and Beaconsfield Rd IF-3 as the test excavation program has demonstrated that the sites are now without cultural heritage value.

6. The artefacts from the sites recorded during the test excavation program should be re-buried with any other artefacts collected within the study area. The way they are reburied, and the location of the reburial will be set out in the ACHMP.
7. The ACHMP will provide policies for unexpected finds, including human skeletal material.

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APPENDIX 1: ARCHAEOLOGICAL TECHNICAL REPORT

Moss Vale Plastics Recycling Facility Archaeological Survey Report

FINAL REPORT

Prepared for GHD

24 August 2021

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Contents

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Glossary

ACHA	Aboriginal Cultural Heritage Assessment
AHIMS	Aboriginal Heritage Information Management System
ASR	Archaeological Survey Report
DECCW	Department of Environment, Climate Change and Water (now Heritage NSW)
EIS	Environmental Impact Statement
DP	Deposited Plan
EP&A Act	*Environmental Planning and Assessment Act 1979*
GDA	Geocentric Datum of Australia
GPS	Global Positioning System
GSV	Ground Surface Visibility
ICOMOS	International Council on Monuments and Sites
IF	Isolated Find
LEP	Local Environmental Plan
LGA	Local Government Area
MGA	Map Grid of Australia
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NSW	New South Wales
PAD	Potential Archaeological Deposit
Study area	Defined as 74-76 Beaconsfield Road, Moss Vale, NSW
SEARs	Secretary's Environmental Assessment Requirements
the Code	*Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW*

Summary

Biosis Pty Ltd (Biosis) was commissioned by GHD to undertake an Archaeological Survey report (ASR) for the proposed development of a plastics recycling facility at 74-76 Beaconsfield Road, Moss Vale, New South Wales (NSW) (the study area). This Archaeological Survey Report (ASR) documents the findings of the archaeological investigations conducted under Section 2.3 of the *Code of Practice for Archaeological Investigation of Aboriginal Objects in NSW* (DECCW 2010a) (the Code), the ASR provides evidence about the material traces of Aboriginal land use to support further conclusions and management recommendations.

The study area is located approximately 2.8 kilometres north west of the Moss Vale town centre at 74-76 Beaconsfield Road. It is located on the western side of Beaconsfield Road and on the southern side of Douglas Road.

There are 49 Aboriginal cultural heritage sites registered with the Aboriginal Heritage Information Management System (AHIMS) register within 10 km of the study area. Two of these sites, AHIMS 52-4-0386/BR-IF1 and AHIMS 52-4-0387/BR-IF2, are located within the study area. Both of these sites were recorded as isolated artefacts.

An archaeological survey was conducted on 3 June 2021 by Biosis archaeologist Mathew Smith and Duncan Falk Consulting representative Duncan Falk. The overall effectiveness of the survey for examining the ground for Aboriginal sites was deemed low. This was attributed to vegetation cover restricting ground surface visibility (GSV) combined with a low amount of exposures; however, one isolated artefact, AHIMS 52-4-0712/MVRec IF1, was identified in an area of disturbance and suggested potential for sub-surface soils. The locations of AHIMS 52-4-0386/BR-IF1 and AHIMS 52-4-0387/BR-IF2 were also visited but neither site could be identified due to grass cover.

Based on the results of the survey and background research completed for the project, three areas of Potential Archaeological Deposit (PAD) were also identified across the study area. These PAD areas are located within hill slope and spurline landforms.

Strategies have been developed based on the archaeological significance of cultural heritage relevant to the study area. The strategies also take into consideration:

- Predicted impacts to Aboriginal cultural heritage.
- The planning approvals framework.
- Current best conservation practice, widely considered to include:
  - The ethos of the Australia International Council on Monuments and Sites (ICOMOS) Burra Charter.
  - the Code.

The recommendations that resulted from this process are provided below.

Management recommendations

Prior to any development impacts occurring within the study area, the following is recommended:

Recommendation 1: Further archaeological assessment required

It is recommended that archaeological test excavations are completed in areas of PAD that will be impacted by proposed works prior to impacts occurring, in order to characterise the archaeological significance of each

site. The results of these excavations should be included in an Aboriginal Cultural Heritage Assessment (ACHA) report and any further project recommendations should take into account these results and comments from the Aboriginal community. The ACHA and test excavations must be conducted in accordance with the Code and the *Aboriginal cultural heritage consultation requirements for proponents* (consultation requirements) (DECCW 2010b).

Recommendation 2: Discovery of Aboriginal Objects

All Aboriginal objects and Places are protected under the *National Parks and Wildlife Act 1974* (NPW Act). It is an offence to disturb an Aboriginal object without a consent permit issued by Heritage NSW, Department of Premier and Cabinet (Heritage NSW). Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the Heritage NSW and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and Heritage NSW' Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by Heritage NSW.

1 Introduction

1.1 Project background

Biosis was commissioned by GHD to undertake an ASR for the proposed development of a plastics recycling facility at 74-76 Beaconsfield Road, Moss Vale (the study area). This ASR provides evidence about the material traces of Aboriginal land use identified during a survey of the study area and will be used to support an ACHA as part of Secretary's Environmental Assessment Requirements (SEARs) for the preparation of an Environmental Impact Statement (EIS) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This investigation has been carried out under Part 6 of the NPW Act. It has been undertaken in accordance with the Code. The Code has been developed to support the process of investigating and assessing Aboriginal cultural heritage by specifying the minimum standards for archaeological investigation undertaken in NSW under the NPW Act. The archaeological investigation must be undertaken in accordance with the requirements of the Code.

1.2 Study area

The study area is located approximately 2.8 kilometres north west of the Moss Vale town centre at 74-76 Beaconsfield Road, Moss Vale NSW. It is located on the western side of Beaconsfield Road and on the southern side of Douglas Road (Figure 1 and Figure 2). It encompasses 11.4 hectares of private land.

The study area is within the:

- Wingecarribee local government area (LGA).
- Parish of Bong Bong.
- County of Camden.

1.3 Planning approvals

The proposed development will be assessed against Part 4 of the EP&A Act. Other relevant legislation and planning instruments that will inform this assessment include:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- NPW Act.
- *National Parks and Wildlife Amendment Act 2010.*
- *Infrastructure State Environmental Planning Policy 2007* (SEPP).
- *Wingecarribee Local Environmental Plan 2010* (LEP).
- *Moss Vale Enterprise Corridor Development Control Plan 2008.*

1.4 Objectives of the investigation

The objectives of the investigation can be summarised as follows:

- To conduct background research in order to recognise any identifiable trends in site distribution and location.
- To search statutory and non-statutory registers and planning instruments to identify listed Aboriginal cultural heritage sites within the study area.
- To highlight environmental information considered relevant to past Aboriginal occupation of the locality and associated land use and the identification and integrity/preservation of Aboriginal sites.
- To formulate a model to broadly predict the type and character of Aboriginal sites likely to exist throughout the study area, their location, frequency and integrity.
- To conduct an archaeological survey of the study area to locate unrecorded or previously recorded Aboriginal sites and to further assess the archaeological potential of the study area.
- To identify the impacts of the proposed development on any known or potential Aboriginal sites within the study area.
- To recommend strategies for the management of Aboriginal cultural heritage within the context of the proposed development.

1.5 Investigators and contributors

The roles, previous experience and qualifications of the Biosis project team involved in the preparation of this archaeological report are described below in Table 1.

Table 1 Investigators and contributors

Name and qualifications	Experience summary	Project role
Taryn Gooley BASc (Hons)	Taryn has over 10 years' experience in archaeological consulting and has successfully completed numerous projects throughout NSW. Taryn has extensive experience in undertaking Aboriginal archaeological assessments, archaeological surveys, and large scale archaeological testing and salvage excavation programs across NSW. Taryn has participated in and managed a number of long term archaeological programs under the NPW Act and Part 4 and Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).	• Quality assurance
Mathew Smith BA/Bsc (Hons)	Mathew is an archaeologist with over 5 years' experience in the consulting industry. Mathew specialises in Aboriginal archaeology and has successfully obtained project approvals for Aboriginal Heritage under the NPW Act, including Aboriginal Heritage Impact Permits and State Significant Development approvals. Mathew's areas of expertise include project management, archaeological excavation and survey, Aboriginal	• Field investigation • Report preparation

	community consultation, and preparation of technical reports. Mathew specialises in assessments of Western NSW and along the South Coast and has developed relationships with regulators and Aboriginal communities across these areas. Mathew also specialises in Aboriginal stone artefact identification and analysis and is a full member of the Australian Association of Consulting Archaeologists Inc.	

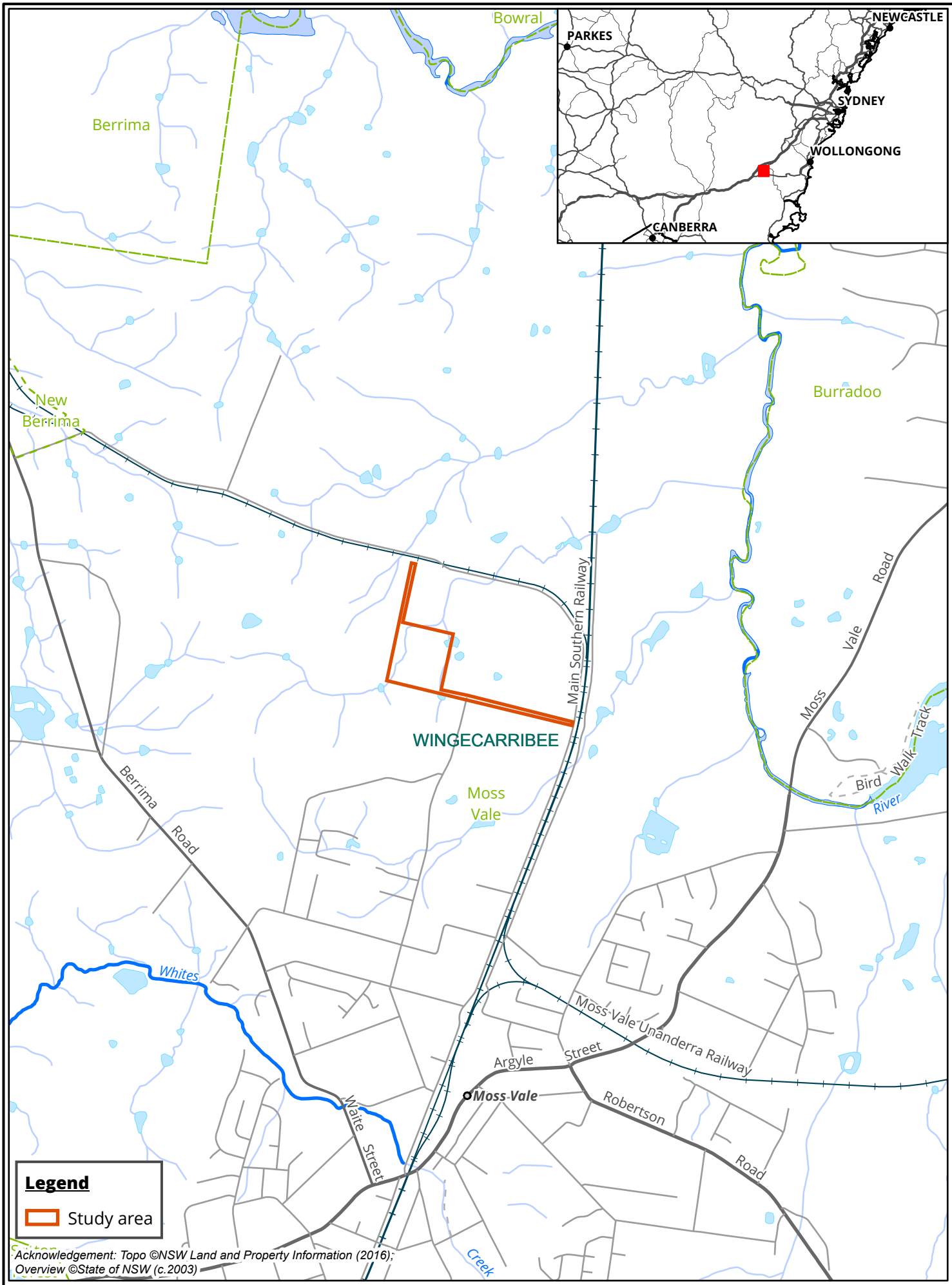

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Figure 1 Location of the study area

Matter: 34710
Date: 04 August 2021,
Drawn by: MK, Checked by: MS, Last edited by: mknudsen
Location:P:\34700s\34710\Mapping\34710_working, Layout: 34710_ACHA_F1_Locality

0 200 400 600 800 1,000
Metres
Scale 1:1:25,000@ A4, GDA 1994 MGA Zone 56

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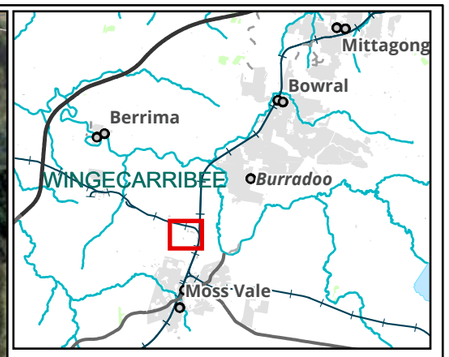

Legend

- Study area
- Lot

Figure 2 Study area detail

0 30 60 90 120 150

Metres

Scale: 1:4,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

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Matter: 34710, Date: 04 August 2021,
Drawn by: MK, Checked by: MS, Last edited by: mknudsen
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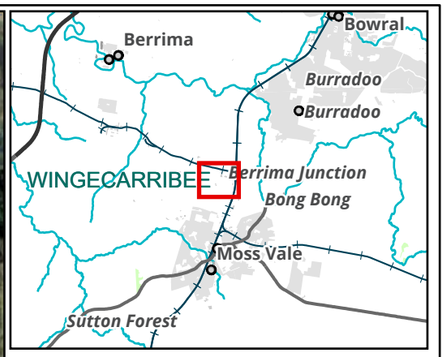
2 Proposed development

The proposal would involve the construction and operation of a plastics recycling and reprocessing facility with capacity to receive up to 120,000 tonnes per year of mixed plastics. This would comprise of about 100,000 tonnes of mixed plastics and up to 20,000 tonnes of PVC (polyvinyl chloride) and plastic films. The proposal development would comprise (Figure 3):

- Two main buildings for mixed plastics and waste receival, recycling and reprocessing and finished product storage.
- Wastewater treatment plant.
- Ancillary infrastructure including an office building, workshop, truck parking, staff and visitor parking, internal roadways, weighbridges, water management, fire management, landscaping, fencing, business identification signage and utility connection.

The proposal also includes construction of part of Braddon Road (currently unformed) and construction of a new road access connection to Lackey Road (the Braddon Road east extension).

To facilitate the primary development proposed in the study area some civil engineering works, including earthworks, would be required for the site, to enable flat bases to be provided for the two main buildings, as well as for smaller buildings, the car park, and connecting roadways and it may also be necessary to divert a short section of the western watercourse from its existing alignment, to enable suitable separation distance to be maintained between the watercourse and from the buildings and roadways.



Legend

Study area

Figure 3 Proposed works

0 30 60 90 120 150

Metres

Scale: 1:4,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

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Matter: 34710, Date: 05 August 2021,
Drawn by: MK, Checked by: MS, Last edited by: mknudsen
Location: P:\34700s\34710\Mapping\
34710_working, Layout: 34710_ACHA_F3_ProposedWorks

3 Desktop assessment

The desktop assessment involves researching and reviewing existing archaeological studies and reports relevant to the study area and surrounding region. This information is combined to develop an Aboriginal site prediction model for the study area, and to identify known Aboriginal sites and/or places recorded in the study area. This desktop assessment has been prepared in accordance with requirements 1 to 4 of the Code.

3.1 Landscape context

It is important to consider the local environment of the study area in any heritage assessment. The local environmental characteristics can influence human occupation and associated land use and consequently the distribution and character of cultural material. Environmental characteristics and geomorphological processes can affect the preservation of cultural heritage materials to varying degrees or even destroy them completely. Lastly landscape features can contribute to the cultural significance that places can have for people.

3.1.1 Topography and hydrology

The underlying geology that dictates the existing landscape is the Wianamatta Group, which is comprised of the Bringelly Shales consisting of mid grey and dark grey mudstones with interbedded lithic sandstones as well as finer grained siltstones and claystone (Figure 4). The subdued relief of the Moss Vale Tablelands is the result of the long periods during which sediments laid down in the late Palaeozoic and early Mesozoic were slowly weathered, eroded and transported away. This landscape is geologically old. The local relief of the area is less than 40 metres and the slopes range from between 10 and 20% with localised steeper slopes of between 20 and 35%. The crests are broad and convex, and the slopes are moderately inclined with concave drainage lines and minor terracing occurring on steeper slopes (*eSPADE*, 2019).

More specifically the study area is contained within the residual deposits (Q_r) unit of the Wianamatta Group consisting of mid grey and dark grey mudstones with interbedded lithic sandstones as well as finer grained siltstones and claystone.

Stream order is recognised as a factor which helps the development of predictive modelling in Aboriginal archaeology in the Southern Highlands. The stream order system used for this assessment was originally developed by Strahler (1964). It functions by adding two streams of equal order at their confluence to form a higher order stream, as shown in Figure 5. As stream order increases, so does the likelihood that the stream would be a perennial source of water.

The study area contains two first order strahler creek lines which flow north into a second order stream outside of the study area. These streams have been modified and dams have been constructed along both water lines resulting in changes to natural flow regimes; however both streams are incised around the base of a gently sloping spur and would have provided potential resources to Aboriginal people in the area.

3.1.2 Soil landscapes

Soil landscapes have distinct morphological and topological characteristics that result in specific archaeological potential. They are defined by a combination of soils, topography, vegetation and weathering conditions. Soil landscapes are essentially terrain units that provide a useful way to summarise archaeological potential and exposure.

There are two separate soil landscape systems that can be applied to the study area, the Mitchell Landscapes compiled by Dr Peter Mitchell in 2002 shown in Figure 6 and the Soil and Land Resources of the Hawkesbury-Nepean Catchment compiled in 2008 by the Department of Environment and Climate Change.

The Mitchell soil landscape places the entire study area within the Moss Vale Highlands soil landscape. This landscape consists of rolling hills and rounded peaks with deep channel incisions on horizontal Triassic aged geology alternating between quartz sandstone and shale. There are widespread yellow and grey texture-contrast soils, deep yellow earths on friable sandstone often with concretionary ironstone and accumulations of quartz sand in valleys (Mitchell 2002, pp. 117).

The Soil and Land Resources of the Hawkesbury-Nepean Catchment system places the study area within two soil landscapes, the Lower Mittagong and the Moss Vale soil landscapes (DECCW 2008).

The Lower Mittagong soil landscape is an erosional soil landscape and covers the eastern section of the study area, associated with the ridge line landform. It occurs on Wianamatta Group Shales and outcropping sandstone is typically non-existent in this soil landscape suggesting low potential that grinding groove or rock engraving sites will be present. Soils in this landscape consist of yellow, brown and red podsols, yellow earths, red and brown earths and soloths.

The Moss Vale soil landscape is an erosional landscape and is present across the ridge spur and slopes in the central and western portions of the study area. This landscape also occurs on the Wianamatta Group Shales and soils consist of yellow and red podsols and yellow earths.

The presence of erosional soil landscapes across the study area suggests there may be potential for sub-surface deposits to be preserved as deposition of soils by erosion. Erosion can result in accumulation of soils on top artefact deposits resulting in burial and preservation of these deposits until excavation.

3.1.3 Landscape resources

The Southern Highlands region provided a wide variety of resources that could have been used by Aboriginal inhabitants.

The swamp and numerous creeks in the area would have provided permanent water and food resources such as fish, snakes, eels, platypus, waterfowl and yabbies, with edible plants growing abundantly. The tall open forests would have provided areas to hunt kangaroo, possums, wallabies and birds, while closer to the escarpment, caves and over-hangs provided shelter and smaller trees, plants and bushes would have provided yet another source of food (Morton 2005). As well as being important food sources, animal products were also used for tool making and fashioning a myriad of utilitarian and ceremonial items. For example, tail sinews are known to have been used to make fastening cord, while 'bone points' would have functioned as awls or piercers. Animals such possums were highly prized for their fur, with possum skin cloaks worn fastened over one shoulder and under the other. Kangaroo teeth were incorporated into decorative items, such as head bands (Attenbrow 2002).

The study area has been extensively cleared and now consists entirely of pasture grasses. Vegetation prior to European impacts in the area is thought to have comprised of wet sclerophyll forest and woodlands. Common species would have included tall eucalypts, including peppermints and mountain grey gums. Woodlands were dominated by gums and silvertop ash, and in poorer soil areas by peppermint stringybark, swamp gum, and cabbage gum. Understorey species would have included she oak, spiky hakea, and tea tree. Large areas of wet heath comprised of prickly broom heath, coral heath, Christmas bells and button grass (Mitchell 2002, pp. 117). These plant resources would have been used in a variety of ways. Fibres from stringybark trees were twisted into string, which was used for many purposes, including the weaving of nets, baskets and fishing lines. String

was also used for personal adornment. Bark was used from Eucalypts in the provision of shelter; a large sheet of bark being propped against a stick to form a gunyah for example (Attenbrow 2002).

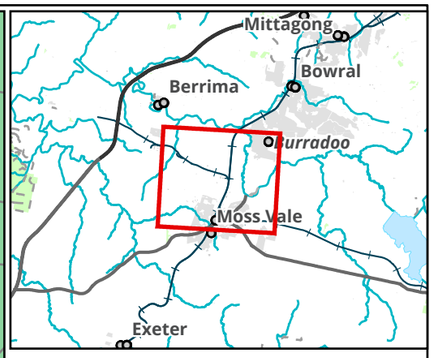
The Moss Vale region generally provided a number of lithic resources used by Aboriginal inhabitants. Lithic resources would have been accessible in the outcrops of shale and sandstone of the Wianamatta Group, while the sandstone formations also provided areas where tools might be ground and sharpened and art engraved. Alluvial deposits along the banks of the Wingecarribee and Nepean Rivers would also have provided sources of silcrete and quartzite cobbles which would have been used extensively by Aboriginal people. The local environment of the study area provided access to water, flora and fauna resources, and useful stone material. These factors would have made the area a potentially suitable place of occupation.

3.1.4 Land use history

The earliest exploration of the Southern Highlands occurred in 1798 when several explorers visited the Wingecarribee River. They were followed by Hamilton Hume and Charles Throsby in 1817 who explored the area west of Sutton Forest; and then in 1818 they explored the area between Moss Vale and Jervis Bay with James Meehan. In 1819, Thorsby was granted 1000 acres by Governor Macquarie at Bong Bong on the outskirts of Moss Vale and named the property Throsby Park. Governor Macquarie also put Throsby in charge of building the Old Argyle Road from Sydney to Goulburn (NSW Roads and Maritime Services 2013, pp. 41).

The establishment of Moss Vale as a township began with the planning of the railway station commencing in 1846. According to the writings of Joseph Lansdowne, by 1853, Moss Vale possessed only five buildings, poorly constructed of 'bricks and slabs'. Outside of these structures the land appeared to contain thick bush and fields of wheat and it appears that the development of Moss Vale was gradual until the construction and completion of this railway line and station in 1867 by engineer John Whitton. Subdivision for the town began around 1864, with developments to the Moss Vale district including the subdivision of several large estates, as well as the inclusion of a general store, postal office and hotel to service the influx of railway workers and their families (L, Emery 2001).

By 1888, further buildings had been erected throughout Moss Vale, with James Cathman constructing a church in the town centre. By 1891, Tudor House was constructed, originally designed by J. Horbury Hunt for use as a country house for Alick Osbourne. Tudor House was later remodelled to accommodate schooling facilities following its move from Sydney in 1901 (JRC Planning Services 1993).



Legend

Study area

Geological Units

- Gshb,Robertson Basalt
- Jui__b,Ungrouped Jurassic igneous rocks - basalt
- Q_a,Alluvium
- Q_af,Alluvial floodplain deposits
- Q_ct,Colluvial talus deposits
- Q_h,Anthropogenic deposits
- Q_r,Residual deposits
- Tutm,Mittagong Formation
- Twia,Ashfield Shale
- Twib,Bringelly Shale

Figure 4 Geological units in the vicinity of the study area

0 200 400 600 800 1,000 N

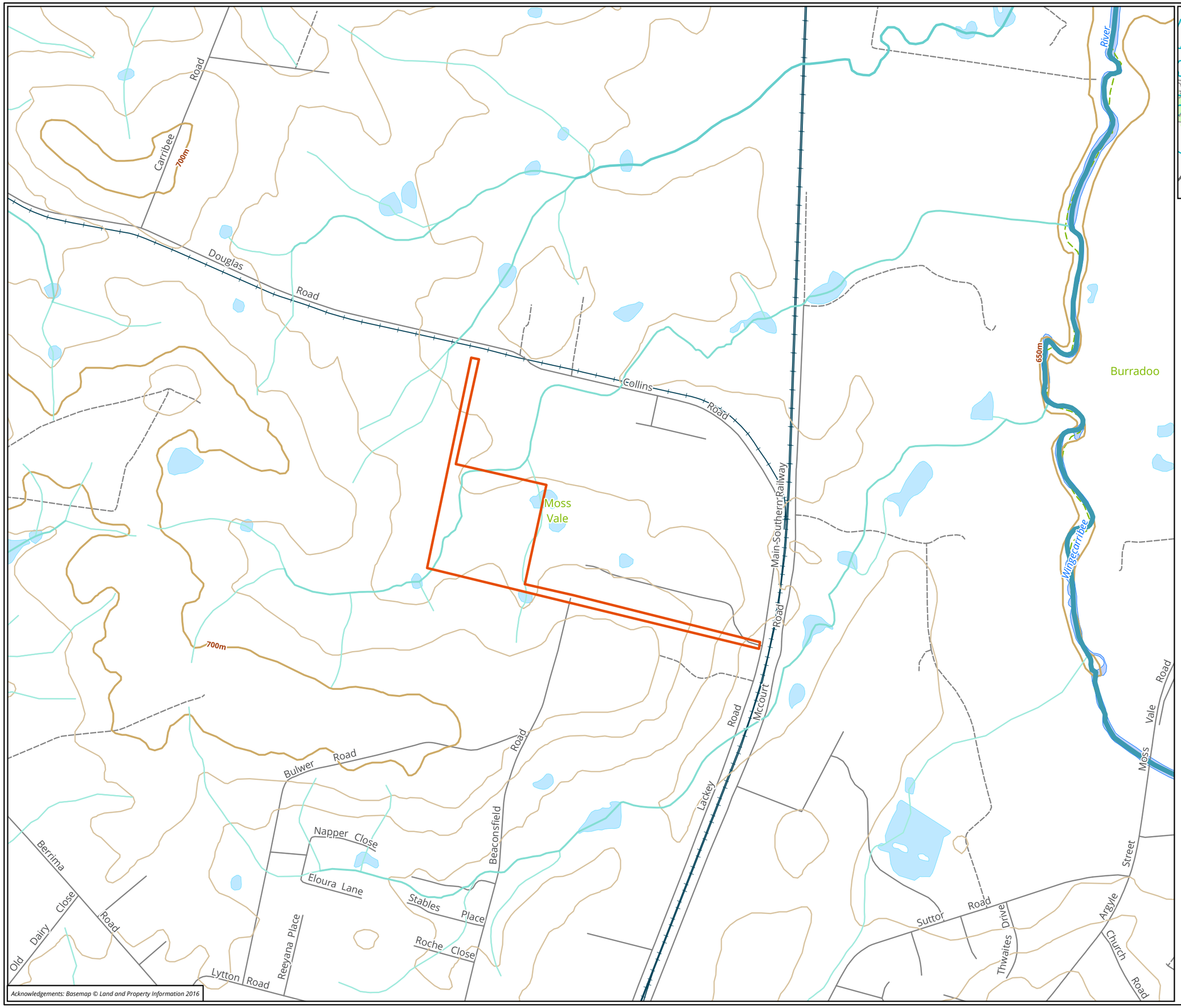
Metres

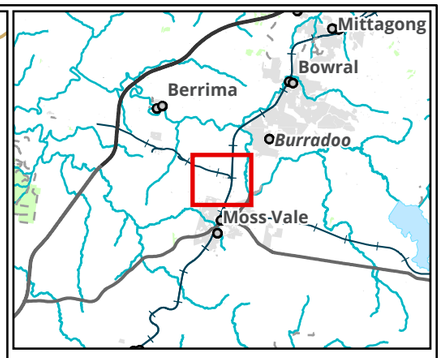
Scale: 1:20,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

biosis

Matter: 34710, Date: 04 August 2021,
Drawn by: MK, Checked by: MS, Last edited by: mknudsen
Location: P:\34700s\34710\Mapping\
34710_working, Layout: 34710_ACHA_F4_Geology





Legend

- Study area
- Contour (10m)

Strahler Order

- 1
- 2
- 3
- 5

Figure 5 Hydrology and topography in the vicinity of the study area

0 75 150 225 300 375

Metres

Scale: 1:10,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

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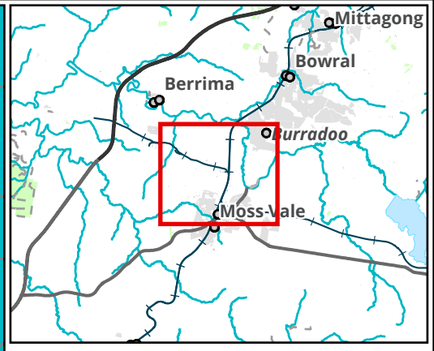


Legend

- Study area

Mitchell landscapes (1:250,000)

- Moss Vale Highlands
- Nattai Plateau
- Robertson Basalts
- Wingecarribee Swamp

Figure 6 Soil landscapes in the vicinity of the study area

0 200 400 600 800 1,000 N

Metres
Scale: 1:20,000@ A3
Coordinate System:
GDA 1994 MGA Zone 56

biosis

Matter: 34710Date: 04 August 2021,
Drawn by: MK, Checked by: MS, Last edited by: mknudsen
Location: P:\34700s\34710\Mapping\
34710_working, Layout: 34710_ACHA_F6_Soils

Acknowledgements: Basemap © Land and Property Information 2016; Soils: NSW Department of Environment and Climate Change (2008), Mitchell Landscapes (version 3)

3.2 Previous archaeological work

A large number of cultural heritage surface (surveys) and sub-surface (excavations) investigations have been conducted throughout NSW in the past 30 years. There has been an increasing focus on cultural heritage assessments in NSW due to ever increasing development, along with the legislative requirements for this work and greater cultural awareness of Aboriginal cultural heritage.

The majority of Aboriginal sites in the region date to the last 6,000 years when the sea-level stabilised following the end of the last Ice Age. Prior to this, sea levels were lower and the coast was located much further off shore, about 14 kilometres to the east of its current position. Coastal sites older than 6,000 years are rare, as most would have likely been inundated by the rising sea. Pleistocene-age Aboriginal sites on the south coast include a rock shelter at Burrill lake (located approximately 150 kilometres south of the study area) which has been dated to 20,830±810BP (ANU-138) (Lampert 1971, pp. 122) and a coastal midden at Bass Point dated to 17,010±650BP (ANU-536) (Bowdler 1970, pp. 254).

3.2.1 Regional overview

A number of Aboriginal cultural heritage investigations have been conducted for the Southern Highlands region. Models for predicting the location and type of Aboriginal sites with a general applicability to the region and thus relevant to the study area have also been formulated, some as a part of these investigations and others from cultural heritage investigations for relatively large developments.

Rich (1988) surveyed a stretch of the Wingecarribee River between Berrima and the Wingecarribee Swamp, approximately 15 kilometres south-east of the study area, which resulted in the identification of open artefact scatters, isolated finds, potential archaeological deposits (PADs) and scarred trees. Low-density artefact scatters were located predominantly within 50 metres of water. Based on the results of this study, Rich argued that site distribution in the cold upland areas may have been governed by cultural preferences. She concluded that most sites will be located along minor water courses on elevated dry flat areas and more selectively along rivers where the valley is wide, or where resource areas such as swamps occur. Isolated finds, however, will be found at a wider variety of locations.

Dibden (2000) conducted a survey of 5.5 hectare property in Mittagong (11 kilometres north of the study area) adjacent to the upper reaches of Nattai Creek, which located an artefact scatter distributed on either side of an ephemeral creek channel. Subsequent subsurface test pitting revealed that the site had been extensively disturbed by previous European industrial activity. The site was determined to be a sparse scatter of low-density lithic material comprising primarily silcrete, chert and quartz and covering an area of approximately 1.8 hectares. The assemblage contained mainly debitage resulting from stone artefact manufacture, and a micro-blade core was recovered indicated that micro-blade technology was employed on the site.

Kelton & Mills (2003) undertook a survey of the proposed expansion area of Penrose Quarry, approximately 22 kilometres south-west of the study area. A rock shelter with ochre and charcoal markings was recorded. The art was determined low scientific significance; however the shelter floor was considered to have high significance due to the depth of floor deposit. Consequently, the shelter floor was excavated within three trenches to the basal weathered sandstone. Artefacts, including backed blades and a dense charcoal deposit were found throughout the soils. A large hearth was also identified that contained stone artefacts, bone and shell. A geomorphologist confirmed the theory that there were two distinct periods of occupation within the shelter, ranging from 2,977 to 12, 829 BP.

Navin Officer Heritage Consultants Pty Ltd (2003) recorded six open artefact scatter sites during a survey conducted at Renwick, approximately 11 kilometres north of the study area, in response to a proposed residential subdivision. All sites were located within 200 to 300 metres of an ephemeral water courses on both spur crests and valley floors. Stone artefacts were made primarily on silcrete, with smaller frequencies of quartz, tuff and chert. All artefacts were flakes, cores and flaked pieces indicating general flaking activities; no formal tool types were recorded other than one backed blade. Visibility variables were extremely low during the survey and hence the opportunity to locate artefactual material was considerably hampered.

Dibden (2000), following the identification of two artefact scatter sites during a survey, conducted a surface collection and test excavations at Lot 1, Sackville Road, Hill Top NSW, approximately 22 kilometres north of the study area. Thirty 50 by 50 centimetre test pits were excavated across a broad ridge 500 metres east of Running Water Creek and adjacent to a 1st order open drainage depression. A total of 241 artefacts were recovered; however, most were collected from the ground surface. Only 15 artefacts were found within 8 of the test pits. Quartz was the most common raw material followed by silcrete and silicified tuff, while artefact types consisted of cores, bipolar cores, backed artefacts and retouched artefacts. It was concluded that the irregular distribution of artefacts suggested the site was probably occupied for short stays only.

AMBS (2007) conducted test excavations across a 115 hectare development area at the Renwick Sustainable Village, approximately 15 kilometers north-east of the study area. Two test excavation areas were excavated across three different landforms (crest, terrace slopes and creek flats) that were associated with 2nd and 3rd order streams. A total of 1786 artefacts were recovered from 138 test pits, with the majority coming from a depth of 19-45 centimetres. The highest density of artefacts were recovered from alluvial deposits adjacent to drainage lines or on terrace slopes with deep sandy deposits. Spur crests and slopes with shallow soil deposits had the least occurrence of artefacts. The dominant raw material was quartz followed by quartzite and silcrete. The small number of bipolar cores, the use of quartz and presence of back artefacts suggested a date range of 5000 to 1600 years ago.

3.2.2 Local overview

A number of Aboriginal cultural heritage investigations have been conducted within the local area (within approximately 10 kilometres of the study area). Most of these investigations were undertaken as part of development applications and included surface and sub-surface investigations. These investigations are summarised below.

Koettig (1987) conducted an archaeological assessment for the Berrima Sewerage Scheme, approximately 5 kilometres north-west of the study area. Two open artefact sites were identified during the survey: one was located within a bulldozer scour exposure on the alluvial floodplain of the Wingecarribee River, and the other site was on a spur crest 100 metres from a tributary of the Wingecarribee River. Artefacts consisted of chert, silcrete and quartz. Test excavations were conducted on a low, wide spur that had been largely cleared. Thirteen backhoe pits were excavated along with two shovel test pit transects of 19 test pits. A total of 67 artefacts were recovered from the test pits, with most being located at a depth of 10 to 20 centimetres, and consisted of quartz, silcrete, mudstone and chert. Koettig argued that due to the limited number of excavations within the region during the 1980s, the test excavations could not determine whether the recovered archaeological material was typical of sites more than 100 metres from water. She concluded that spurs and undulating ground close to minor streams were of moderate archaeological sensitivity.

Kelton (2002) surveyed the area assessed by Koettig (1987) for a series of proposed extraction panels for underground mining at the Berrima Colliery, approximately 6 kilometres north-west of the study area. The survey targeted of a number of landforms including ridge crests, low and upper-mid hill

slopes, ephemeral and spring-fed creeks, alluvial and colluvial terraces, and exposed sandstone formations. Three Aboriginal sites were recorded that comprised two rock shelters with art and deposit and one open artefact scatter.

Kayandel (2005) undertook a preliminary constraints cultural heritage assessment of Lot 1 DP 1000057, Beaconsfield Road, Moss Vale in 2005. This area was adjacent to and partially within the current study area. As part of this assessment Kayandel undertook a survey of the area. As part of this survey they identified two Aboriginal objects consisting of a grey course grained silcrete distal fragment and a grey mottled silcrete (or quartzite) flaked piece. Both artefacts were located along the northern boundary fence where a dirt track was running east to west. Both of these artefacts have been incorrectly mapped on the AHIMS register.

Following the results of the survey Kayandel assessed the area as containing moderate archaeological potential and recommended further assessment.

Total Earth Care (2006) undertook a an Aboriginal Heritage and Archaeological Assessment for the Moss Vale 'South West' project located approximately 4.5 kilometres south of the study area. This assessment included a survey of the area which identified one artefact scatter of thirteen artefacts over an area of 50 metres by 70 metres area located across a level ridgeline landform (Site MVSW1). Five associated isolated artefacts were also identified across the less level areas of the ridgeline, which are suggested to represent background scatter.

It was predicted that a subsurface assemblages are likely to be present at the MVSW1 site and as such it was recommended that the site be conserved or that further investigation is undertaken prior to any disturbance or development of the site.

Total Earth Care (2007) completed an Aboriginal cultural heritage study of the Moss Vale 'Enterprise Zone', which covered the entirety of the study area. As part of this study Total Earth Care undertook a survey of the enterprise zone targeting areas identified as sensitive during predictive modelling, these areas targeted for survey did not include the current study area. These sensitive areas consisted of raised level ridgelines and areas near water sources. In addition, Aboriginal stakeholders also targeted areas of their own choosing based on experience and inclinations. The results of the survey identified eight sites comprising a grinding groove with associated PAD and artefacts, six open camp sites and seven isolated finds. Sites MVEnt 1 to 5 were located along upper stretches of Stony creek to the north-west of the study area, MVEnt site 6 was located on a level terrace above Whites Creek, while MVEnt Site 7 was located on a level area at the bottom of a ridge.

MVEnt site 7 also included areas of high and moderate archaeological potential which extended across the ridgeline crests and slopes which the currently proposed study area extends across.

Mary Dallas Consulting Archaeologists (2011) undertook an Aboriginal heritage due diligence assessment to support a DA to subdivide two allotments at Chesley Park, approximately 2 kilometres north-west of the study area. A desktop assessment was conduction and a brief site visit to relocate previously recorded sites. The assessment found that the previously recorded Aboriginal sites within the study area would not be adversely affected by the proposed road and subdivision; however, a PAD previously identified and amended by previous studies would be directly affected and further investigations were recommended.

EMM (2017) conducted an ACHA on behalf of Hume Coal Pty Ltd for an underground coal mine and associated mine infrastructure in the Southern Coalfields of NSW, approximately 5 kilometres west of the study area. A desktop assessment was conducted of the environmental, archaeological and ethnohistoric contexts and, through consultation with the Aboriginal community, a predictive model of Aboriginal site location was able to be determined:

- Artefact scatters and isolated finds are most likely to occur as background scatter on all landforms; however, concentration of artefacts are most likely to occur on elevated landforms or raised areas of lower lying landforms adjacent to ephemeral and perennial streams, within 200 metres.
- Elevated landforms near the confluence of streams are particularly sensitive to open artefact scatters.
- Rock shelters are likely to occur along rocky scarps and cliff lines.
- Grinding grooves and engraving sites are most likely to be present on outcropping sandstone in stream beds or adjacent to streams.
- Modified trees will occur in areas that have not been cleared and are of sufficient age to bear marks of traditional Aboriginal scarring or carving.

Due to the large area of the project, the predictive model was used to target specific areas during archaeological surveys and test excavation. The survey resulted in 166 newly recorded sites within the Hume Coal Project area, 11 newly recorded sites within the Berrima Rail Project area and two previously recorded sites were relocated and re-recorded. Site types included rock shelters (some with art, artefacts and PADs), grinding grooves, open stone artefact sites, areas of PAD, and potential culturally modified trees.

Based on this survey an archaeological test excavation was conducted, which consisted of 160 test pits being excavated. 281 artefacts were recovered and consisted of cores, flakes, and flake fragments, and 11 retouched artefacts were identified. Raw material comprised of quartz, silcrete, quartzite, chert, volcanic, and petrified wood. The excavations determined that the overall average artefact density was seven artefacts per square metre with the upper soil profile bearing the majority of artefacts. The results of both the survey and test excavations confirmed that the presence of stone artefacts is linked directly to distance to streams and that the presence and frequency of surface artefacts sites is not a reliable indicator of subsurface frequencies.

Artefact (2018) was engaged by Brickworks Ltd to prepare an Aboriginal heritage assessment of the proposed development of a masonry plant and associated infrastructure on an 8 hectare portion of land at Chesley Park, approximately 2 kilometres north-west of the study area. The assessment found that a portion of AHIMS 52-4-0175/52-4-0197, including a surface artefact scatter and an associated area of archaeological sensitivity, would be impacted by the proposed Stage 1 works. This site was located on a terrace above Stoney Creek and the areas of potential extended up a hillslope and across the surrounding alluvial flats. Another portion of the same site, which included a suite of grinding groves and associated area of archaeological sensitivity, was also located 20 metres outside the proposed Stage 1 impact area. The survey also found three additional Aboriginal sites (AHIMS 52-4-0196, CPark A1 and CPark A2) located across hillslope and creek terraces and areas of archaeological sensitivity associated with the same landforms. Artefact recommended archaeological test excavations to determine the nature and extent of any potential subsurface deposits. They also recommended an exclusion zone around the grinding grooves to mitigate any direct or indirect impacts, along with a heritage management plan.

Biosis Pty Ltd (2019) was commissioned by Brickworks Ltd to undertake an ACHA for Stage 1 of the proposed development at Chesley Park, 416 Berrima Road, New Berrima NSW, approximately 2 kilometres north-west of the study area. Test excavation were undertaken across the entire Stage 1 study area which included a mid slope terrace, lower and upper slopes and crest landforms. These excavations recovered 427 artefacts from 156 test pits, with the majority of artefacts occurring on the mid slope terrace (382) followed by the lower slope landform (22), upper slope landform (21) and open depressions (2). The site was found to contain grinding grooves and a large number of artefacts

including a range of tool types such as complete flakes, cores, and flake fragments made using different raw material types and largely intact stratified deposits. A total of 13 tools were recorded from the excavation program, which included backed artefacts, Bondi points, an anvil, asymmetrical blade, dihedral burin, eloura, geometric microlith, round edge scraper, scraper, steep edge scraper and a thumbnail scraper. The majority of artefacts were found on the elevated, relatively flat mid slope terrace which was still located in close proximity to Stony Creek. Artefact numbers decreased further from the creek and on the lower lying landforms. The tools recorded in the assemblage along with the high density of artefacts also suggested that the area was likely to have been used as either a tool processing area or as an occupation area (or camp site) where tools were discarded.

3.2.3 AHIMS site analysis

A search of the AHIMS database (Client Service ID: 595862) identified 49 Aboriginal archaeological sites within a 10 by 10 kilometre search area, centred on the study area .Two of these registered sites are located within the study area, AHIMS 52-4-0386/BR-IF1 and AHIMS 52-4-0387/BR-IF2, and three are located within 100 metres (Figure 7). AHIMS search results are provided in Appendix 1. Table 2 provides the frequencies of Aboriginal site types in the vicinity of the study area. The mapping coordinates recorded for these sites were checked for consistency with their descriptions and location on maps from Aboriginal heritage reports where available. These descriptions and maps were relied where notable discrepancies occurred.

It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the list. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area. Some recorded sites consist of more than one element, for example artefacts and a modified tree, however for the purposes of this breakdown and the predictive modelling, all individual site types will be studied and compared. This explains why there are 51 results presented here, compared to the 43 sites identified in AHIMS.

Table 2 AHIMS site type frequency

Site type	Number of occurrences	Frequency (%)
Artefact	43	84.3
Modified tree	1	2.0
Grinding groove	4	7.8
Potential archaeological deposit	3	5.9
Total	51	100

A simple analysis of the Aboriginal cultural heritage sites registered within the 10 by 10 kilometre buffer of the study area indicates that the primary site types in the region are artefact sites, making up 84.3% of recorded AHIMS sites. The next most recorded site type consists of grinding grooves making up 7.8% then PAD sites making up 5.9%. One modified tree was also recorded on AHIMS making up 2% of sites.

3.2.4 AHIMS sites located within the study area

AHIMS 52-4-0386/BR-IF1

BR-IF1 was recorded in Lot 1 DP 1000057 Beaconsfield Road, Moss Vale and was situated on an unformed vehicle track along the northern most boundary fence. The site consisted of an isolated artefact made up of a coarse grained grey silcrete with quartz inclusions distal flake fragment. Some edge damage to left hand ventral margin and three negative flake scars on the dorsal surface were also observed.

Kayandel recorded the sites location at coordinates GDA 56 E258825 N6175904 however based on the site description and maps provided in Kayandel (2005) this location is more than 200 metres south of the correct location. The correct location of the site places it within the study area.

AHIMS 52-4-0387/BR-IF2

BR-IF2 was recorded in Lot 1 DP 1000057 Beaconsfield Road, Moss Vale and was situated on an unformed vehicle track along the northern most boundary fence. The site consisted of an isolated artefact made up of a grey silcrete (or quartzite) flaked piece.

Kayandel recorded the sites location at coordinates GDA 56 E258633 N6175948 however based on the site description and maps provided in Kayandel (2005) this location is more than 200 metres south of the correct location. The correct location of the site places it within the study area.

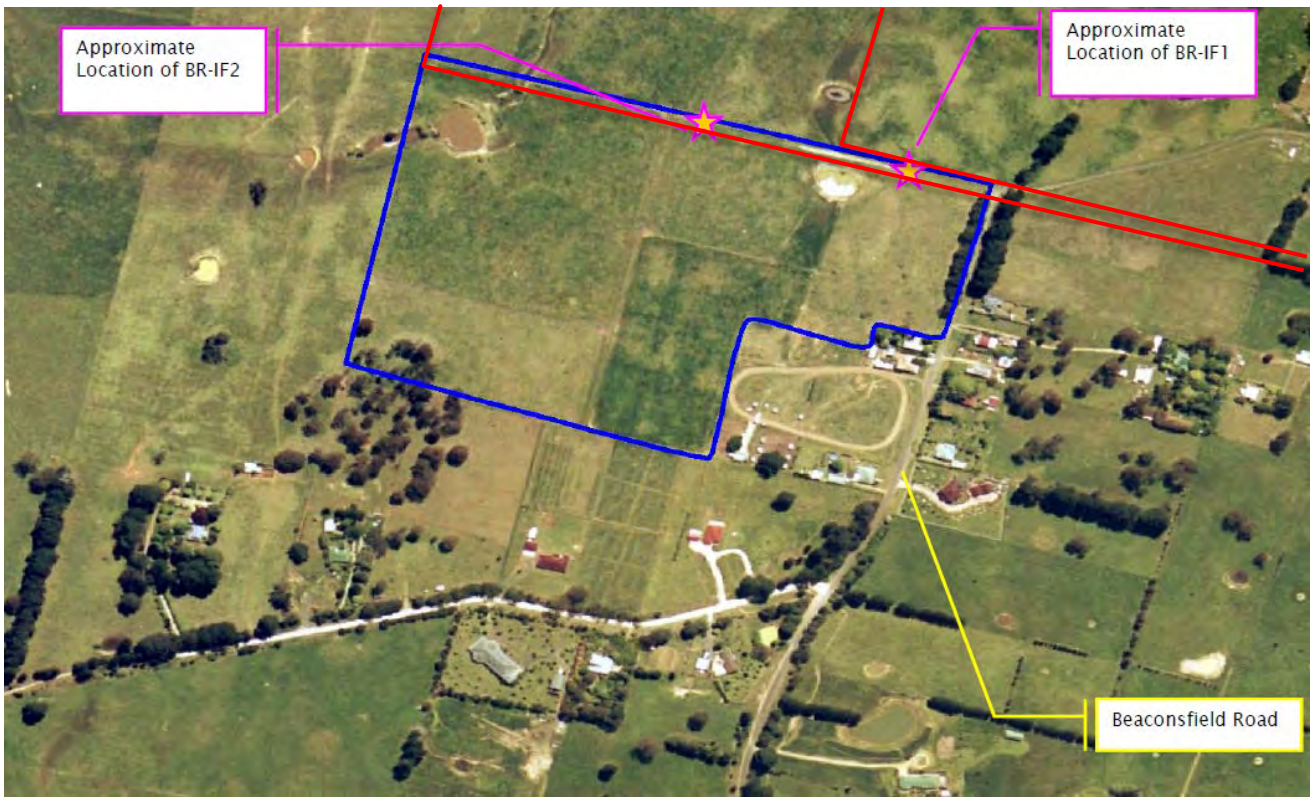


Photo 1 **Figure from Kayandel (2005, pp. 10) showing approximate locations of BR-IF1 and BR-IF2 with Kayandel study area (blue lines) and current study area (red lines) outlined**

Figure removed from public version

4 Predictive modelling

Biosis has previously prepared predictive modelling for the Moss Vale region as part of an Aboriginal Cultural Heritage Assessment located at Berrima (Biosis 2019b), which is applicable to the current study area.

The predictive model contained within this section is based upon:

- Site distribution in relation to local soil landscapes, local geology, local hydrology and local topography within the study area.
- Consideration of site type, raw material types and site densities likely to be present within the study area.
- Findings of the ethnohistorical research on the potential for material traces to present within the study area.
- Potential Aboriginal use of natural resources present or once present within the study area.
- Consideration of the temporal and spatial relationships of sites within the study area and surrounding region.

Based on this information, a predictive model was developed, indicating the site types most likely to be encountered during the survey and subsequent sub-surface investigations across the present study area.

4.1 Analysis of Aboriginal occupation

A regional AHIMS search undertaken by Biosis (2019b) approximately 1 kilometre north west of the current study area, resulted in similar site type occurrences to those from the local search discussed above in section 3.2.3. The regional search identified 103 AHIMS sites within a 10 kilometre search area and covered the current study area.The most commonly recorded site types in the Southern Highlands region was found to be artefact sites, which represented a total of 71.88% (n=74) of all sites noted (Table 3). The next most common site types were PAD sites (13.59%, n=14), followed by grinding grooves (7.77%, n=8), modified trees (5.82%, n=6) and one occurrence each of a shell site and burial site (0.92%, n=1).

In order to use this data, it is necessary to acknowledge possible biases. It should be noted that the AHIMS database reflects Aboriginal sites that have been officially recorded and included on the AHIMS register. Large areas of NSW have not been subject to systematic, archaeological survey; hence AHIMS listings may reflect previous survey patterns and should not be considered a complete list of Aboriginal sites within a given area. The AHIMS search used in this predictive model was also undertaken in 2019 suggesting there could be small differences in the results if additional sites have been recorded since then.

Despite these biases the following model is still directly applicable to the current study area and provides insight in the potential sites present in the study area.

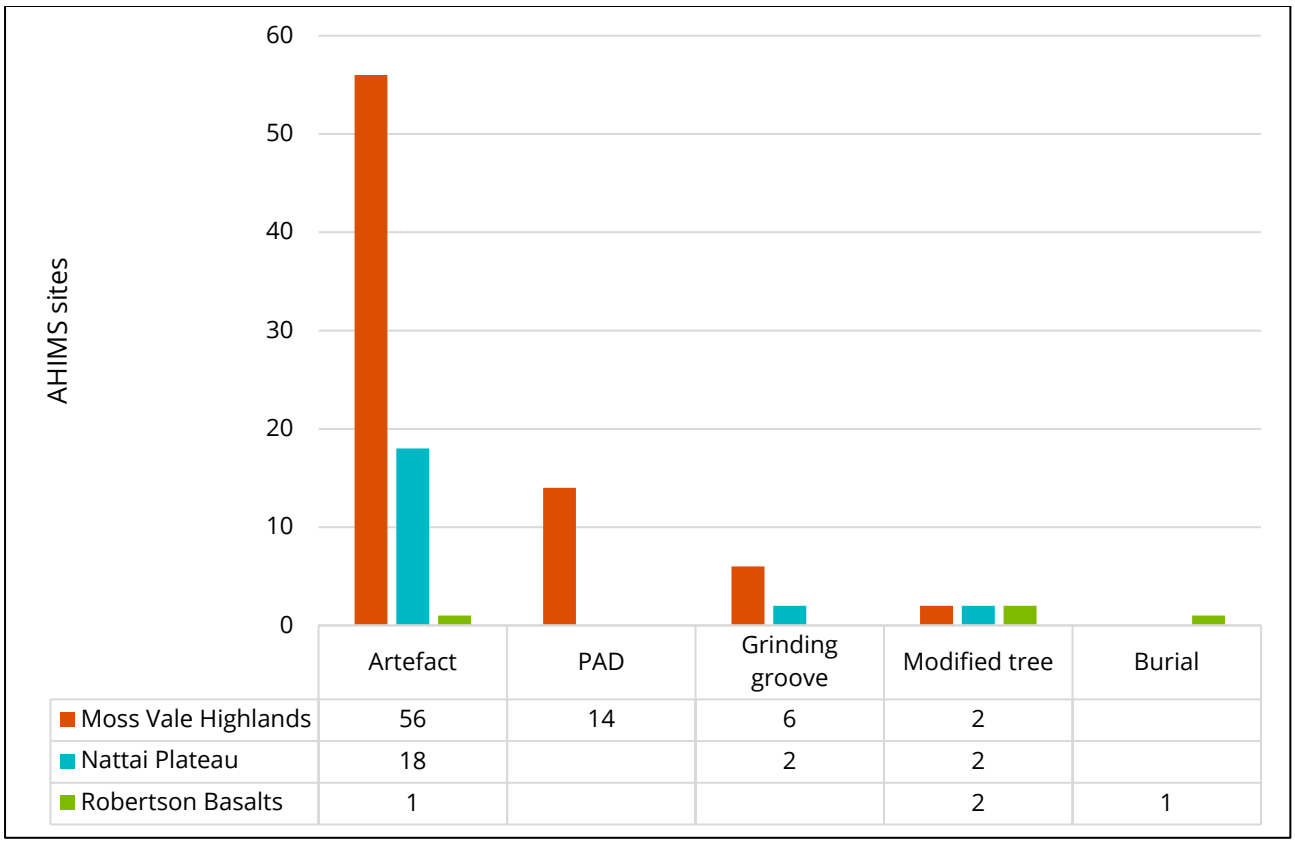
Table 3 Summary of the AHIMS site types recorded within the wider Southern Highlands region

Site type	Number of occurrences	Frequency (%)
Artefact	74	71.88
PAD	14	13.59
Grinding groove	8	7.77
Modified tree	6	5.82
Shell	1	0.97
Burial	1	0.97
Total	103	100.00

4.1.1 Local soils

An analysis of Aboriginal sites in relation to soil landscapes was completed to identify correlations, which may be caused by the environment in each landscape. Soil landscapes are characterised by distinct vegetation and landforms, both of which can influence the distribution of Aboriginal heritage sites. The Moss Vale Highlands soil landscape is one of the most dominant landscapes within the local area. This soil landscape occurs extensively within the Southern Highlands and is associated with rolling hills and rounded peaks with deep channel incisions (Mitchell 2002, pp. 106). The entire study area consists of the Moss Vale Highlands soil landscape making it directly applicable.

The greatest variety of site types and the highest number of sites were found to occur in the Moss Vale Highlands soil landscape (Graph 1). A total of 78 sites were recorded in this soil landscape, accounting for 75% of the total recorded sites identified. This landscape contained four site types including artefacts, PADs, grinding grooves, and modified trees. The Nattai Plateau soil landscape contained the second highest number of sites (n=22), which accounts for 21.2% of sites and includes 18 artefact scatters, two modified trees, and two grinding grooves.



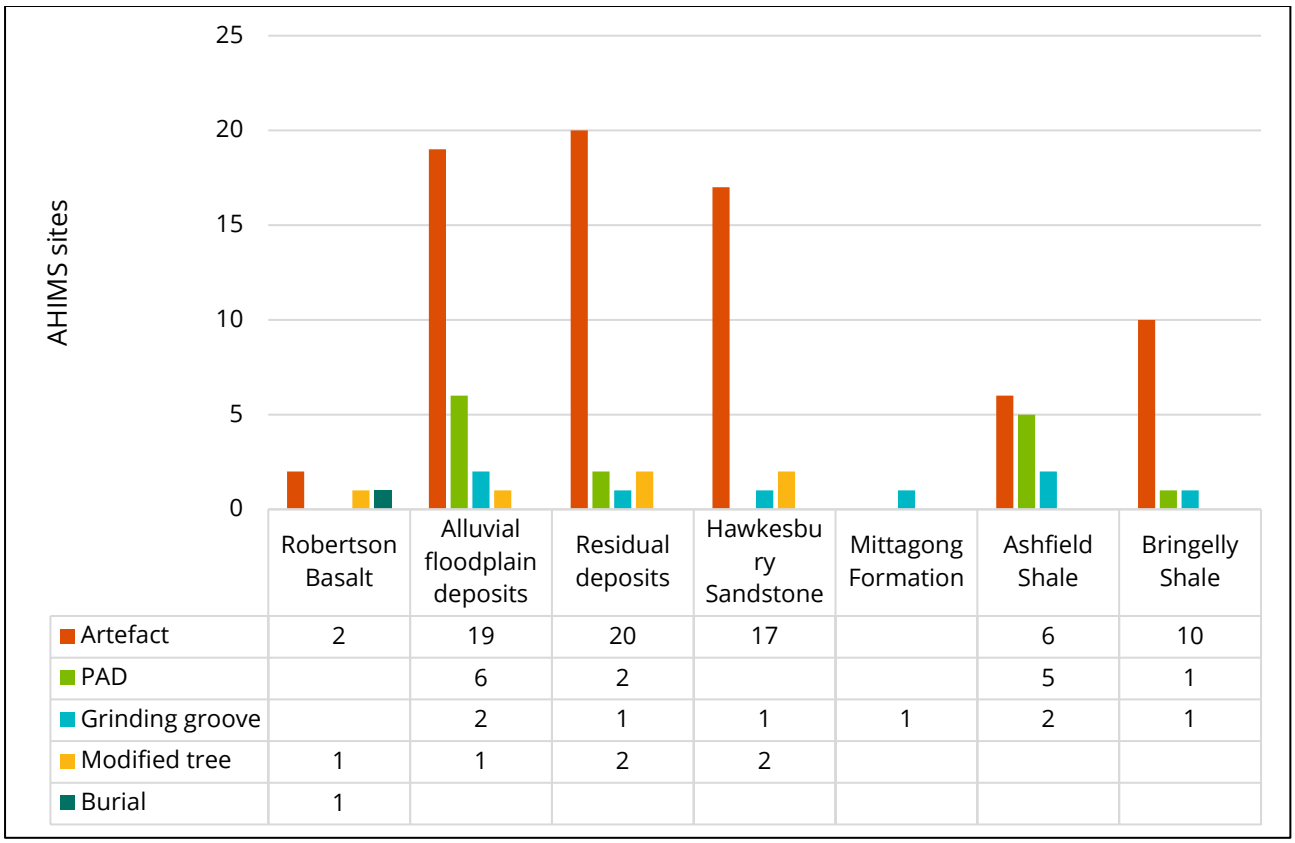
	Artefact	PAD	Grinding groove	Modified tree	Burial
Moss Vale Highlands	56	14	6	2	
Nattai Plateau	18		2	2	
Robertson Basalts	1			2	1

Graph 1 Site types and frequency of recorded AHIMS sites located within soil landscapes in the local region

4.1.2 Local geology

The underlying geology that dictates the existing landscape is the Wianamatta Group. Within this group, the residual deposits (Q_r) consists of mid grey and dark grey mudstones with interbedded lithic sandstones as well as finer grained siltstones and claystone and was the dominant geological unit present across the current study area. A total of 27% of all artefact scatters recorded in the local area have been noted within this formation. Likewise, the second most frequently occurring formation, the alluvial floodplain deposits (Q_af) contains 25.6% of all artefact scatters.

The alluvial floodplain deposits contained the most PADs (42.90%) and grinding groove (25%) sites. Subsequently, both of these formations are the most archaeologically rich in comparison to others and have recorded the highest variety of cultural material compared to others (Graph 2). The Hawkesbury Sandstone (Tuth) also recorded a relatively high number of artefacts within the region. This unit consists of medium to coarse-grained quartz sandstone with minor shale and laminite lenses. A total of 30% of all artefact scatters recorded have been noted within this formation.



	Robertson Basalt	Alluvial floodplain deposits	Residual deposits	Hawkesbury Sandstone	Mittagong Formation	Ashfield Shale	Bringelly Shale
Artefact	2	19	20	17		6	10
PAD		6	2			5	1
Grinding groove		2	1	1	1	2	1
Modified tree	1	1	2	2			
Burial	1						

Graph 2 Site types and frequency of recorded AHIMS sites located within the geological units in the local region

4.1.3 Local hydrology

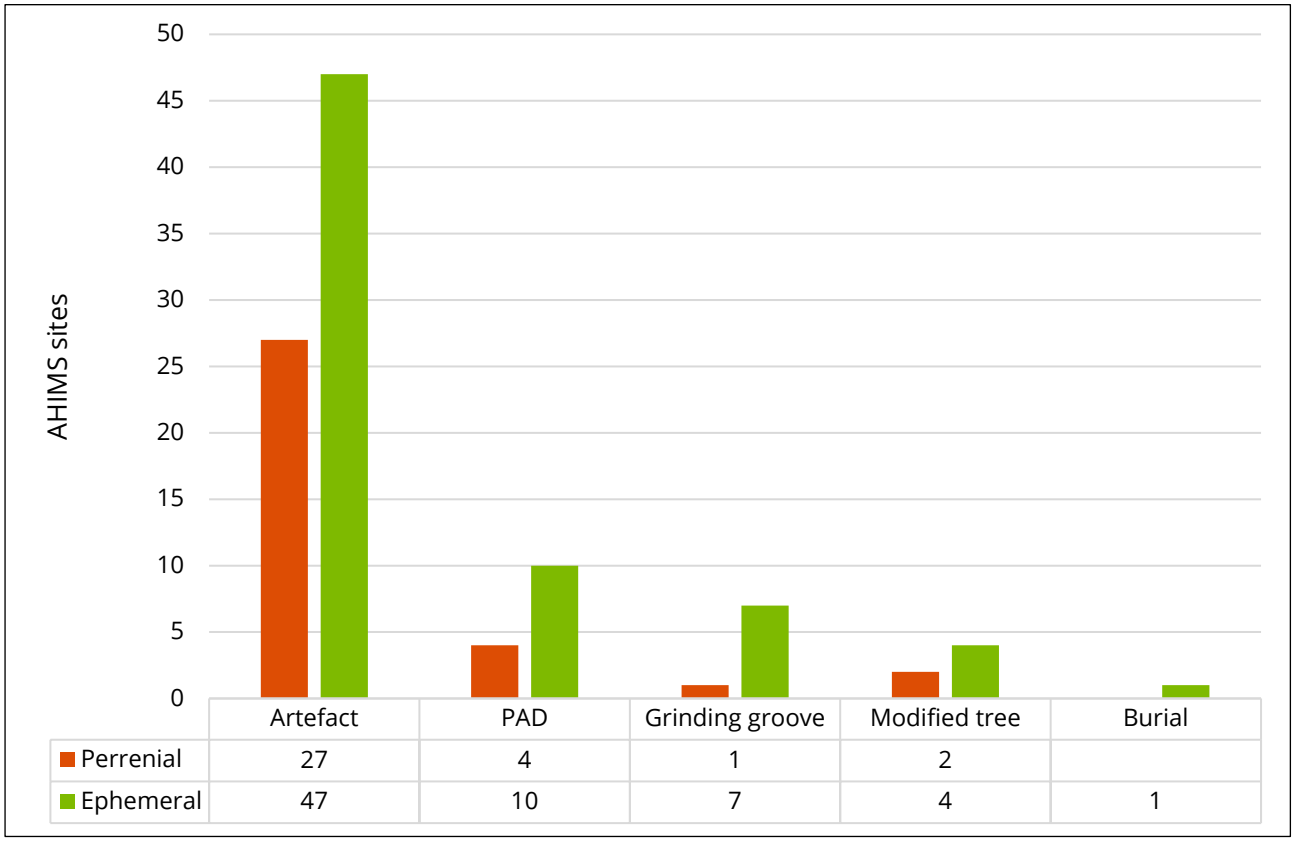
Distance to water

Distance to water is a common and important factor in the distribution of Aboriginal sites. Water is imperative to survival and areas with access to abundant water was often the preferred location for occupation. Within the local area the average distance that sites were recorded from permanent water sources was approximately 90.8 metres and 142.2 metres to ephemeral water source. A further analysis of this information illustrates the distribution of site types within the landscape and their general relationship to water sources.

The data illustrates that artefact scatters are on average closer to ephemeral water sources than permanent ones, as are PADs and grinding grooves. Modified trees are on average closer to permanent water sources than ephemeral ones. This data also shows that modified trees have the longest average distance to permanent water sources, while artefacts have the longest average distance to ephemeral water sources. As only six modified trees and eight grinding grooves were identified in the AHIMS results during the creation of this predictive model, the numbers contain some bias as the data could be affected by the possible underrepresentation of certain site types in the local area.

Table 4 Summary of the site types and their associated distances to water (metres)

Site type	Permanent water source			Ephemeral water source		
	Max	Min	Average	Max	Min	Average
Artefact/s	285.2	9.9	81.3	542.9	4.5	161.6
Modified tree	166.3	105.1	135.7	267.9	26.2	156.8
Grinding grooves	-	-	20.3	139.3	0.1	33.6
PAD	77.5	13.7	40.3	204.5	19.8	76.1
Total	-	-	90.8	-	-	142.2



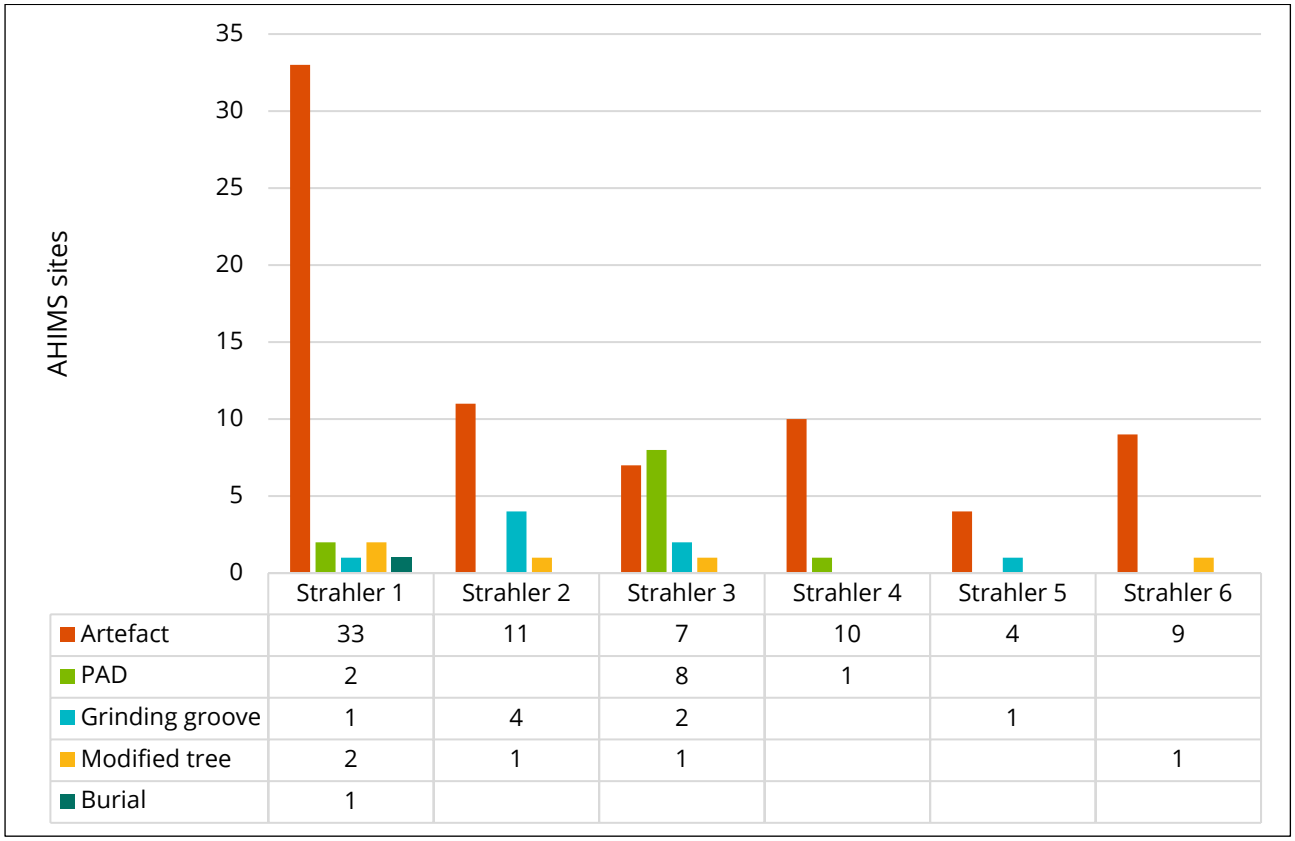
Graph 3 Site types and frequency of recorded AHIMS sites and distance to water

Stream order

In the local area, it becomes evident that 39.4% of all sites are located near a first order stream. These sites included artefacts, PADs, grinding grooves, one burial and modified trees, with artefacts representing nearly 84.6% of all sites near first order streams. The second highest number of sites, a total of 18.2%, were located near third order streams. This group of sites consisted of artefacts, PADs, modified trees and grinding grooves. A total of 16.2% sites were located near second order, 11.1% near forth order streams, 10.1% near sixth order streams, and 5.1% near fifth order streams (Graph 4).

From this analysis alone it could be suggested that a higher number of Aboriginal sites are situated around first, second and third order streams. It also suggests that PADs are likely to be located near third order streams or lower and that grinding grooves will be located near second order streams.

Overall, it could suggest a preference for this environmental zone, which helps to predict the location and complexity of other unrecorded Aboriginal sites in the landscape.



	Strahler 1	Strahler 2	Strahler 3	Strahler 4	Strahler 5	Strahler 6
Artefact	33	11	7	10	4	9
PAD	2		8	1		
Grinding groove	1	4	2		1	
Modified tree	2	1	1			1
Burial	1					

Graph 4 Site types and frequency of recorded AHIMS sites and Strahler order

4.2 Aboriginal site prediction statements

The definition of each site type is described in Table 5 firstly, followed by the predicted likelihood of this site type occurring within the study area (Table 6).

Table 5 Definitions of the predictive model

Potential rating	Description
High	The Aboriginal site types given this rating are those that have been recorded predominantly in both the local and regional area. Likewise, the landscape conditions within the focus area will also be aligned with those generally associated with this site type.
Moderate	Sites are known to occur in the regional and local landscape but not in high numbers. The landscape conditions are not precisely aligned however the site may infrequently occur in certain conditions.
Low	The site types given this rating have been recorded regionally, but not locally and not in substantial numbers. The site is generally considered unlikely to occur within the landform conditions present.

Table 6 Aboriginal site prediction statements

Site type	Site description	Potential
Flaked stone artefact scatters and isolated artefacts	Artefact scatter sites can range from high-density concentrations of flaked stone and ground stone artefacts to sparse, low-density 'background' scatters and isolated finds.	**High:** Stone artefact sites have been previously recorded in the region across a wide range of landforms including alluvial flats, and also within the study area. They have a high potential to be present in undisturbed areas within the study area.
PADs	Potential sub surface deposits of cultural material.	**High:** PADs have been previously recorded in the region across a wide range of landforms including alluvial flats. They have the potential to be present in undisturbed landforms.
Axe grinding grooves	Grooves created in stone platforms through ground stone tool manufacture.	**Low:** The geology of the study area lacks suitable horizontal sandstone rock outcrops for axe-grinding grooves. Therefore, there is low potential for axe grinding grooves to occur in the study area.
Modified trees	Trees with cultural modifications	**Low:** Due to extensive vegetation clearance there are no mature native trees within the study area; therefore, the potential for modified trees to occur is low.
Shell middens	Deposits of shells accumulated over either singular large resource gathering events or over longer periods of time.	**Low:** Shell midden sites have not been recorded within the study area and due to the distance from permanent water sources, there is low potential for shell middens to be present within the study area.

Site type	Site description	Potential
Quarries	Raw stone material procurement sites.	**Low:** There is no record of any quarries being within or in the vicinity of the study area.
Burials	Aboriginal burial sites.	**Low:** Aboriginal burial sites are generally situated within deep, soft sediments, caves or hollow trees. Areas of deep sandy deposits will have the potential for Aboriginal burials. The soil profiles associated with the study area are not commonly associated with burials.
Rock shelters with art and / or deposit	Rock shelter sites include rock overhangs, shelters or caves, and generally occur on, or next to, moderate to steeply sloping ground characterised by cliff lines and escarpments. These naturally formed features may contain rock art, stone artefacts or midden deposits and may also be associated with grinding grooves.	**Low:** The sites will only occur where suitable sandstone exposures or overhangs possessing sufficient sheltered space exist, which are not present in the study area.
Aboriginal ceremony and Dreaming Sites	Such sites are often intangible places and features and are identified through oral histories, ethnohistoric data, or Aboriginal informants.	**Low:** There are currently no recorded mythological stories for the study area.
Post-contact sites	These are sites relating to the shared history of Aboriginal and non-Aboriginal people of an area and may include places such as missions, massacre sites, post-contact camp sites and buildings associated with post-contact Aboriginal use.	**Low:** There are no post-contact sites previously recorded in the study area and historical sources do not identify one.
Aboriginal places	Aboriginal places may not contain any 'archaeological' indicators of a site, but are nonetheless important to Aboriginal people. They may be places of cultural, spiritual or historic significance. Often they are places tied to community history and may include natural features (such as swimming and fishing holes), places where Aboriginal political events commenced or particular buildings.	**Low:** There are currently no recorded Aboriginal historical associations for the study area.

5 Archaeological survey

An archaeological survey of the study area was undertaken on 3 June 2021 by Biosis archaeologist Mathew Smith and Duncan Falk Consulting representative Duncan Falk. The survey sampling strategy, methodology and a discussion of results are provided below.

5.1 Archaeological survey objectives

The objectives of the survey were to:

- Provide RAPs an opportunity to view the study area and to discuss previously identified Aboriginal object(s) and/or place(s) in or within close proximity to the study area.
- Attempt to re-identify Aboriginal archaeological sites previously identified in the study area.
- Undertake a systematic survey of the study area targeting areas with the potential for Aboriginal heritage.
- Identify and record Aboriginal archaeological sites visible on the ground surface.
- Identify and record areas of PADs.

5.2 Archaeological survey methodology

The survey methods were intended to assess and understand the landforms and to determine whether any archaeological material from Aboriginal occupation or land use exists within the study area.

5.2.1 Sampling strategy

The survey effort targeted all landforms in the study area that will be potentially be impacted by the proposed works.

5.2.2 Survey methods

The archaeological survey was conducted on foot with a field team of two members. Recording during the survey followed the archaeological survey requirements of the Code and industry best practice methodology. Information that recorded during the survey included:

- Aboriginal objects or sites present in the study area during the survey.
- Survey coverage.
- Any resources that may have potentially have been exploited by Aboriginal people.
- Landform.
- Photographs of the site indicating landform.
- Evidence of disturbance.
- Aboriginal artefacts, culturally modified trees or any other Aboriginal sites.

Where possible, identification of natural soil deposits within the study area was undertaken. Photographs and recording techniques were incorporated into the survey including representative photographs of survey units, landform, vegetation coverage, ground surface visibility (GSV) and the recording of soil information for each survey unit were possible. Any potential Aboriginal objects

observed during the survey were documented and photographed. The location of Aboriginal cultural heritage and points marking the boundary of the landform elements were recorded using a hand-held Global Positioning System (GPS) and the Map Grid of Australia (MGA) (94) coordinate system.

5.3 Archaeological survey results

A total of one meandering transect was walked across the study area with surveyors targeting all landforms in the study area and focusing on areas of exposure were possible to assess the ground for Aboriginal sites. As a result of this one new Aboriginal site and three PADs were identified in the study area. The results from the field survey have been summarised in Table 7 and Table 8 survey details are provided below.

Table 7 Survey coverage

Survey unit	Landform	Survey unit area (m²)	Visibility (%)	Exposure (%)	Effective coverage area (m²)	Effective coverage (%)
1	Undulating hill spurs	21154	10	10	212	1

Table 8 Landform summary

Landform	Landform area (m²)	Area effectively surveyed (m²)	Landform effectively surveyed (%)	No. of Aboriginal sites	No. of artefacts or features
Undulating hill spurs	114000	212	0.19	1 IF and 3 PADs	1

Generally the survey was hampered by poor GSV due to comprehensive vegetation and grass cover. Isolated areas of exposure did however allow some ground surfaces to be observed and resulted in the identification of one new Aboriginal site.

5.4 Visibility

In most archaeological reports and guidelines visibility refers to GSV, and is usually a percentage estimate of the ground surface that is visible and allowing for the detection of (usually stone) artefacts that may be present on the ground surface (DECCW 2010a). Visibility in the study area was very low with approximately 5% of the ground surface visible and allowing for the detection of artefacts. This low visibility was due to the extensive coverage of grass across the study area which obscured the ground surface. Areas of ground surface visibility were present in isolated areas where exposure or disturbance had removed grass cover.

Photo 2 Photo showing extensive grass coverage across the study area

5.5 Exposure

Exposure refers to the geomorphic conditions of the local landform being surveyed, and attempts to describe the relationship between those conditions and the likelihood the prevailing conditions provide for the exposure of (buried) archaeological materials. Whilst also usually expressed as a percentage estimate, exposure is different to visibility in that it is in part a summation of geomorphic processes, rather than a simple observation of the ground surface (Burke & Smith 2004, pp. 79, DECCW 2010a). Overall, the study area displayed areas of exposure around 2%. These areas of exposure were primarily associated with the creeklines that ran through the study area, as water erosion had exposed soil profiles in the banks of the creeks or had washed away grass cover in small areas adjacent to the creek.

Photo 3 Photo showing exposures along creek banks as a result of erosion

5.6 Disturbances

Disturbances affecting the presence of Aboriginal sites in an area can be associated with natural or human agents. Natural agents generally affect small areas and include the burrowing and scratching in soil by animals, such as wombats, foxes, rabbits and wallabies, and sometimes exposure from slumping or scouring. Disturbances associated with recent human action typically cover large sections of the land surface. These agents can include residential development such as landscaping and construction of residential buildings; farming practices, such as initial vegetation clearance for creation of paddocks, fencing and stock grazing; agricultural practices such as fruit orchards; light industrial practices such as nursery and the creation of artificial dams to name but a few.

Disturbances in the study area were primarily related to human agents but only covered a small portion of the study area. Disturbances included construction of several dams along the creeklines in the study area, construction of road surfaces in isolated areas, construction of farm infrastructure such as fencing and cattle yards, and finally the disturbances associated with cattle grazing such soil disturbances from trampling.

Photo 4 **Example of a dam that has been contructed along the western drainage line running through the study area**

Photo 5 Area of cattle trampling in foreground of photo showing distubances to surface soils

5.7 Aboriginal sites identified in the study area

One isolated artefact and 3 PAD sites were identified during the survey. Site descriptions are provided below.

5.7.1 MVRec IF1

The survey identified one new Aboriginal site in the study area. This site consisted of an isolated quartz steep edged scraper that was located on the surface of an area of disturbance associated with the removal of a timber fence post on the spur crest (Photo 6 and Photo 7). The artefacts characteristics are provided in Appendix 2.

Photo 6 Photo of MVRec IF1 artefact dorsal surface

Photo 7 **Location of MVRec IF1 in an area of disturbance from uprooted fence post, facing north**

5.7.2 PAD 1

PAD 1 was located on a crest of a gentle sloping hill spur leading down to the flats surrounding a creekline (Photo 8). Previous assessments undertaken in the local area have identified artefacts on the surface of similar landforms and there is moderate potential subsurface artefacts may be present at this location.

Photo 8 Overview of PAD 1, facing south

5.7.3 PAD 2

PAD 2 was located on a crest of a gentle sloping hill spur. This spur is bounded by drainage lines to the east and west (Photo 9). Previous assessments undertaken by Total Earth Care (2007) and have identified artefacts on the surface of similar landforms in the vicinity of the study area . The current survey identified one quartz artefact, MVRec IF1 on the surface near of an area of disturbance associated with a fallen fence post within this area of PAD. This suggests there is high potential further artefacts may be present at this location.

Photo 9 Overview of PAD 2, facing north

5.7.4 PAD 3

PAD 3 was located on the slopes of a gentle sloping hill spur leading down to the flats surrounding a creekline (Photo 10). Previous assessments undertaken by Total Earth Care (2007) have identified artefacts on the flats at the base of this landform and assessed the area with moderate to high archaeological potential. As a result this areas area has moderate potential for further artefacts to be present.

Photo 10 Overview of part of PAD 3, facing west

AHIMS 52-4-0386/BR-IF1

BR-IF1 was recorded by Kayandel (2005) in Lot 1 DP 1000057 Beaconsfield Road, Moss Vale and was situated on an unformed vehicle track along the northern most boundary fence. The site consisted of an isolated artefact made up of a coarse grained grey silcrete with quartz inclusions distal flake fragment. Some edge damage to the left hand ventral margin and three negative flake scars on the dorsal surface were also observed.

Kayandel recorded the sites location at coordinates GDA 56 E258825 N6175904 however based on the site description and maps provided in Kayandel (2005) this location is more than 200 metres south of the correct location. The correct location of the site places it within the study area.

The correct site location was visited as part of this survey however, the artefact could not be relocated likely as a result of surface erosion moving artefacts down slope or lower visibility as the unformed access track was covered with grass.

Photo 11 Approximate location of BR-IF1 according to Kayandel (2005), showing hill slope potentially subject to surface runoff artefact movement, facing west

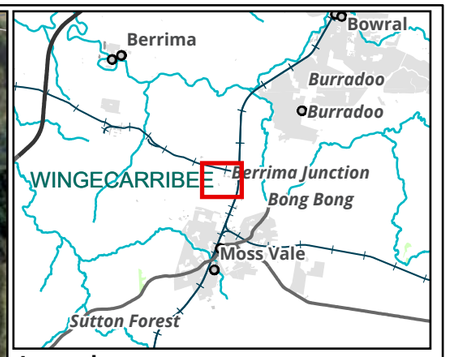
AHIMS 52-4-0387/BR-IF2

BR-IF2 was recorded by Kayandel (2005) in Lot 1 DP 1000057 Beaconsfield Road, Moss Vale and was situated on an unformed vehicle track along the northern most boundary fence. The site consisted of an isolated artefact made up of a grey silcrete (or quartzite) flaked piece.

Kayandel recorded the sites location at coordinates GDA 56 E258633 N6175948 however based on the site description and maps provided in Kayandel (2005) this location is more than 200 metres south of the correct location. The correct location of the site places it within the study area.

The correct site location was visited as part of this survey however, the artefact could not be relocated likely as a result of erosion or lower visibility as the unformed access track was covered with grass.

Photo 12 Approximate location of BR-IF2 according to Kayandel (2005) showing grass cover, facing west



Legend

- Study area
- Lot
- Potential archaeological deposit (PAD)
- Surface Artefacts

Figure 8 Survey results and coverage

0 30 60 90 120 150

Metres

Scale: 1:4,000@ A3

Coordinate System:
GDA 1994 MGA Zone 56

N

biosis

Matter: 34710, Date: 05 August 2021,
Drawn by: MK, Checked by: MS, Last edited by: mknudsen
Location: P:\34700s\34710\Mapping\
34710_working, Layout: 34710_ACHA_F8_SurveyResults

5.8 Discussion of archaeological survey results

The archaeological survey consisted of a meandering foot transect, which targeted all landform types within the study area. The results of the survey are provided in Figure 8. The survey resulted in the identification of one isolated surface artefact and three areas of PAD. The AHIMS sites recorded by Kayandel (2005) located within the study area were inspected, however they could not be relocated, likely due to low levels of GSV or natural disturbances such as erosion displacing the artefacts.

The study area is within an undulating hills landform pattern with rounded peaks and channel incisions. The study area contains a number of gently sloping spurs that gradually slope downward toward creeklines. The study area is covered by the Moss Vale Highlands Mitchell soils or the Lower Mittagong soil and Moss Vale NSW Soil and Land Information Systems soil landscapes. All of these soil landscapes are erosional in nature indicating top soils within the study area were likely formed from material being washed down the slope where they accumulated on slopes and within stream channels. This is likely to have resulted in the preservation of Aboriginal sites were soils have accumulated on top of sites as a result of erosion. Predictive modelling of Mitchell soil landscapes in the area confirms this with majority of sites located in the Moss Vale Highlands landscape.

Review of previous assessments completed adjacent to the study area by Kayandel (2005) and Total Earth Care (2007) have also indicated the presence of Aboriginal sites across the same or similar landforms. Kayandel (2005) undertook field investigation of Lot 1 DP 1000057, Beaconsfield Road and identified two isolated artefacts on the same spur that extends into the study area, Similarly Total Earth Care (2007) completed an Aboriginal cultural heritage study of the Moss Vale 'Enterprise Zone' covering the study area and identified a number of Aboriginal sites on the hill slopes and spurs as well as flats at the base of these spurs. Based on their results both Kayandel (2005) and Total Earth Care (2007) identified areas of archaeological potential in association with slopes and spurs.

The survey of the study area completed as part of this assessment also identified one artefact in an area of disturbance where an uprooted fence post had brought sub-surface soils to the surface. Based on this and the results of Kayandel (2005) and Total Earth Care (2007), three areas of PAD located across gently hillslopes and spurs have been determined to contain moderate and high potential to contain Aboriginal sites.

6 Recommendations

Strategies have been developed based on the archaeological (significance) of cultural heritage relevant to the study area and influenced by:

- Predicted impacts to Aboriginal cultural heritage.
- The planning approvals framework.
- Current best conservation practise, widely considered to include:
  - Ethos of the Australia ICOMOS Burra Charter.
  - The Code.

Prior to any impacts occurring within the study area, the following is recommended:

Recommendation 1: Further archaeological assessment required

It is recommended that archaeological test excavations are completed in areas of PAD that will be impacted by proposed works prior to impacts occurring, in order to characterise the archaeological significance of each site. The results of these excavations should be included in an ACHA report and any further project recommendations should take into account these results and comments from the Aboriginal community. The ACHA and test excavations must be conducted in accordance with the Code (DECCW 2010b).

Recommendation 2: Discovery of Aboriginal Objects

All Aboriginal objects and Places are protected under the NPW Act. It is an offence to disturb an Aboriginal object without a consent permit issued by Heritage NSW. Should any Aboriginal objects be encountered during works associated with this proposal, works must cease in the vicinity and the find should not be moved until assessed by a qualified archaeologist. If the find is determined to be an Aboriginal object the archaeologist will provide further recommendations. These may include notifying the Heritage NSW and Aboriginal stakeholders.

Recommendation 3: Discovery of Aboriginal Ancestral Remains

Aboriginal ancestral remains may be found in a variety of landscapes in NSW, including middens and sandy or soft sedimentary soils. If any suspected human remains are discovered during any activity you must:

1. Immediately cease all work at that location and not further move or disturb the remains.
2. Notify the NSW Police and Heritage NSW' Environmental Line on 131 555 as soon as practicable and provide details of the remains and their location.
3. Not recommence work at that location unless authorised in writing by Heritage NSW.

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Appendices

Appendix 1 AHIMS results

THE FOLLOWING APPENDIX IS NOT TO BE MADE PUBLIC

Appendix 2 Survey results

DSCN8498

DSCN8473

DSCN8474

DSCN8475

DSCN8476

DSCN8477

DSCN8478

DSCN8479

DSCN8480

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DSCN8490

DSCN8491

DSCN8492

DSCN8493

DSCN8494

DSCN8495

DSCN8496

DSCN8497

Artefact characteristics

SITE ID	TYPE	RAW MATERIAL	CORTEX %	PLATFORM	PLATFORM LENGTH (MM)	PLATFORM WIDTH (MM)	TERMINATION	RETOUCH	RETOUCH LOCATION	LENGTH (MM)	WIDTH (MM)	THICKNESS (MM)	FLAKE SCARS	TOOL TYPE	Zone	Eastings	Northings
MVRec IF1	Tool	Quartz	0	Flaked	12.82	9.1	Retouched	Scalar	Distal Margin	16.52	15.71	7.82	6	Scraper	56	258807	6176286

APPENDIX 2: ABORIGINAL COMMUNITY CONSULTATION

Appendix 2 Figure 1: Biosis and OzArk consultation logs.

Agencies contacted to determine if they know of any stakeholders who may wish to be consulted

Contact organisation	Person	Contacted by (Biosis)	Date	Method (Email/registered post)
Heritage NSW, Department of Premier and Cabinet		AKE	13/04/2021	Email
Illawarra Local Aboriginal Land Council	Paul Knight	AKE	13/04/2021	Email
Wingecarribee Shire Local Council	Mellisa Wiya	AKE	13/04/2021	Email
Office of the Registrar, Aboriginal Land Rights Act 1983	Stephen Wright	AKE	13/04/2021	Email
National Native Title Tribunal		AKE	13/04/2021	Email
Native Title Services Corporation Limited		AKE	13/04/2021	Email
South East Local Land Services	Jason Carson	AKE	13/04/2021	Email

Agency responses to Biosis

Contact organisation	Person	Contacted by (Biosis)	Date	Method (Email/registered post)	Notes
Biosis	AKE	Heritage NSW, Department of Premier and Cabinet	13/04/2021	Email	Automatic reply - reciept
Biosis	AKE	National Native Title Tribunal	13/04/2021	Email	Automatic reply - reciept
Biosis	MJS	National Native Title Tribunal	14/04/2021	Email	One Indigenous Land Use Agreement, Gundungurra Area Agreement
Biosis	MJS	ILALC	14/04/2021	Email	The Illawarra Aboriginal Land Council is unable to provide contact details for any Aboriginal people or organisations in relation to the study area. They would also like to register their interest
Biosis	MJS	Heritage NSW, Department of Premier and Cabinet	22/04/2021	Email	Provided list of Stakeholders

Individuals/groups contacted to determine if they wish to be consulted.

Contact organisation	Person	Contacted by	Date	Method
Cubbitch Barta	Glenda Chalker	Biosis - CAM	12/05/2021	Mail
Illawarra Local Aboriginal Land Council	Paul Knight	Biosis - CAM	12/05/2021	Mail
South West Rocks Corporation	Edward Moran	Biosis - CAM	12/05/2021	Mail
South West Rocks Corporation	William Moran	Biosis - CAM	12/05/2021	Mail
Yamanda Aboriginal Association	Aunty Annie Warren	Biosis - CAM	12/05/2021	Email
Gundungurra Aboriginal Heritage Association Inc.	Andrew White	Biosis - CAM	12/05/2021	Email
Badu (Murrin Clan/Peoples)	Karia Lea Bond	Biosis - CAM	12/05/2021	Email
Barraby Cultural Services	Lee Field	Biosis - CAM	12/05/2021	Email
Biamanga (Murrin Clan/Peoples)	Seli Storer	Biosis - CAM	12/05/2021	Email
Bilinga (Murrin Clan/Peoples)	Simalene Carriage	Biosis - CAM	12/05/2021	Email
Yerramurra (Murrin Clan/Peoples) and Taste of Tradition Native Aboriginal Corporation	Blaan Davies	Biosis - CAM	12/05/2021	Email
Gilay Consultants	Carol Slater	Biosis - CAM	12/05/2021	Email
Clive Freeman	Clive Freeman	Biosis - CAM	12/05/2021	Email
Cullendulla (Murrin Clan/Peoples)	Corey Smith	Biosis - CAM	12/05/2021	Email
Darryl Caines	Darryl Caines	Biosis - CAM	12/05/2021	Email
Dharug (Murrin Clan/Peoples)	Andrew Bond	Biosis - CAM	12/05/2021	Email
Duncan Falk Consultancy	Duncan Falk	Biosis - CAM	12/05/2021	Email
Gundungurra Tribal Council Aboriginal Corporation	Eddy Neumann	Biosis - CAM	12/05/2021	Email
Gary Caines	Gary Caines	Biosis - CAM	12/05/2021	Email
Goobah Development PTY LTD (Murrin Clan/Peoples)	Basil Smith	Biosis - CAM	12/05/2021	Email
Gadhu Dreaming	Gordon Campbell	Biosis - CAM	12/05/2021	Email
Gundungurra Tribal Technical Services	David Bell	Biosis - CAM	12/05/2021	Email
Gundungurra Tribal Technical Services	Pimmy Johnson Bell	Biosis - CAM	12/05/2021	Email
Gundungurra Tribal Technical Services	Peter Foster	Biosis - CAM	12/05/2021	Email
Gundungurra Tribal Technical Services	Teangi Mereki Foster	Biosis - CAM	12/05/2021	Email
Gundungurra Tribal Technical Services	Larry Hoskins	Biosis - CAM	12/05/2021	Email
Gundungurra Tribal Technical Services	Christopher Payne	Biosis - CAM	12/05/2021	Email
Gundungurra Tribal Technical Services	Sam Wickman	Biosis - CAM	12/05/2021	Email
Gunyuu (Murrin Clan/Peoples)	Kylie Ann Bell	Biosis - CAM	12/05/2021	Email
Jerringong (Murrin Clan/Peoples)	Jodi Anne Stewart	Biosis - CAM	12/05/2021	Email
	James Davis	Biosis - CAM	12/05/2021	Email
Karrial (Murrin Clan/Peoples)	Karrial Johnson	Biosis - CAM	12/05/2021	Email
Woronora Plateau Gundungara Elders Council	Paul and Kayla Cummins & Williamson	Biosis - CAM	12/05/2021	Email
Bellambi Indigenous Corporation Gandangara Traditional Owners	Kim Moran	Biosis - CAM	12/05/2021	Email
Three Ducks Dreaming Surveying and Consulting	Leonard Wright	Biosis - CAM	12/05/2021	Email
Leanne Tungai	Leanne Tungai	Biosis - CAM	12/05/2021	Email
Munyunga (Murrin Clan/Peoples)	Kaya Dawn Bell	Biosis - CAM	12/05/2021	Email
Mura Indigenous Corporation (icn:8991)	Phillip Carroll	Biosis - CAM	12/05/2021	Email

Contact organisation	Person	Contacted by	Date	Method
Murri Bidgee Mullangari Aboriginal Corporation	Ryan and Darleen Johnson	Biosis - CAM	12/05/2021	Email
Murramarang (Murrin Clan/Peoples)	Roxanne Smith	Biosis - CAM	12/05/2021	Email
Murrumbul (Murrin Clan/Peoples)	Mark Henry	Biosis - CAM	12/05/2021	Email
Ngunawal Heritage Aboriginal Corporation	Dean Delponte	Biosis - CAM	12/05/2021	Email
Nundagurri (Murrin Clan/Peoples)	Newton Carriage	Biosis - CAM	12/05/2021	Email
South Coast NSW Aboriginal Elders	Owen Carriage	Biosis - CAM	12/05/2021	Email
Pejar Local Aboriginal Land Council		Biosis - CAM	12/05/2021	Email
Pemulwuy (Murrin Clan/Peoples)	Pemulwuy Johnson	Biosis - CAM	12/05/2021	Email
Tharawal Local Aboriginal Land Council	Robyn Straub	Biosis - CAM	12/05/2021	Email
Thoorga Nura	John Carriage	Biosis - CAM	12/05/2021	Email
Tungai Tonghi	Troy Tungai	Biosis - CAM	12/05/2021	Email
Walbunja (Murrin Clan/Peoples)	Hika Te Kowhai	Biosis - CAM	12/05/2021	Email
Walgalu (Murrin Clan/Peoples)	Ronald Stewart	Biosis - CAM	12/05/2021	Email
Warra Bingi Nunda Gurri	Nathanial Kennedy	Biosis - CAM	12/05/2021	Email
Wingikara (Murrin Clan/Peoples)	Hayley Bell	Biosis - CAM	12/05/2021	Email
Wullung (Murrin Clan/Peoples)	Lee-Roy James Boota	Biosis - CAM	12/05/2021	Email
Yurrandaali	Bo Field	Biosis - CAM	12/05/2021	Email

Stakeholder responses to Biosis

Contact organisation	Person	Date	Method (Email/registered post)	Notes
Yurrandaali	Bo Field	13/05/2021	Email	Would like to register for the project.
Leanne Tungai	Leanne Tungai	12/05/2021	Email	Would like to register for the project.
Tungai Tonghi	Troy Tungai	15/05/2021	Email	Would like to register for the project.
Wodi Wodi Traditional Owner	James Davis	16/05/2021	Email	Would like to register for the project.
Cubbitch Barta Native Title Claimants	Glenda Chalker	24/05/2021	Email	Would like to register for the project.
Yerramurra	Blaan Davis	15/05/2021	Email	Responded but did not register - to confirm
Duncan Falk Consultancy	Duncan Falk	17/05/2021	Email	Would like to register for the project.
ILALC	Paul Knight	-	-	Would like to register for the project.
Woronora Plateau Gundungara Elders Council	Kayla Williamson	18/05/2021	Email	Would like to register for the project.
Stakeholder 1	Stakeholder 1	17/05/2021	Email	Would like to register for the project.

Responses received by Biosis to the Stage2/3 document

Contact organisation	Person	Date	Method (Email/registered post)	Notes
ILALC	Paul Knight	8/06/2021	email	Confirmed receipt and let Paul know the date to repsond. No comments were received
Woronora Plateau Gundungara Elders Council	Kayla Williamson	4/06/2021	email	Requested that wet sieving be considered as an option during test excavations
Stakeholder 1	Stakeholder 1	5/06/2021	email	Prefer for the material to be returned to Country and reburied as they were found (i.e. not placed in plastic bags). We feel it takes away the natural connection of the cultural material to Country, and therefore request to not have the cultural material placed in plastic bags for reburial

Consultation undertaken by OzArk: Stage 3

Date	Organisation	Comment	Method
14.7.21	Yurrandaali	Rebecca Hardman (RH) sent project update notification. Comments closes 30.7.21	email
14.7.21	Leanne Tungai	RH sent project update notification. Comments closes 30.7.21	email
14.7.21	Tungai Tonghi	RH sent project update notification. Comments closes 30.7.21	email
14.7.21	Wodi Wodi Traditional Owner	RH sent project update notification. Comments closes 30.7.21	email
14.7.21	Cubbitch Barta Native Title Claimants	RH sent project update notification. Comments closes 30.7.21	email
14.7.21	Yerramurra	RH sent project update notification. Comments closes 30.7.21	email
14.7.21	Duncan Falk Consultancy	RH sent project update notification. Comments closes 30.7.21	email
14.7.21	Illawarra Local Aboriginal Land Council	RH sent project update notification. Comments closes 30.7.21	email
14.7.21	Woronora Plateau Gundungara Elders Council	RH sent project update notification. Comments closes 30.7.21	email
14.7.21	Stakeholder 1	RH sent project update notification. Comments closes 30.7.21	email
15-Jul-21	Yurrandaali	RH sent invite to fieldwork. RSVP 22.7.21	email
15-Jul-21	Leanne Tungai	RH sent invite to fieldwork. RSVP 22.7.21	email
15-Jul-21	Tungai Tonghi	RH sent invite to fieldwork. RSVP 22.7.21	email
15-Jul-21	Wodi Wodi Traditional Owner	RH sent invite to fieldwork. RSVP 22.7.21	email
15-Jul-21	Cubbitch Barta Native Title Claimants	RH sent invite to fieldwork. RSVP 22.7.21	email
15-Jul-21	Yerramurra	RH sent invite to fieldwork. RSVP 22.7.21	email
15-Jul-21	Duncan Falk Consultancy	RH sent invite to fieldwork. RSVP 22.7.21	email
15-Jul-21	Illawarra Local Aboriginal Land Council	RH sent invite to fieldwork. RSVP 22.7.21	email
15-Jul-21	Woronora Plateau Gundungara Elders Council	RH sent invite to fieldwork. RSVP 22.7.21	email
15-Jul-21	Stakeholder 1	RH sent invite to fieldwork. RSVP 22.7.21	email
16-Jul-21	Yurrandaali	RH received email confirming attendance at fieldwork	email
16-Jul-21	Yurrandaali	RH responded asking for workers comp	email

Date	Organisation	Comment	Method
17-Jul-21	Stakeholder 1	RH received confirmation of attendance at fieldwork	email
18-Jul-21	Duncan Falk Consultancy	RH received confirmation of attendance at fieldwork	email
18-Jul-21	Duncan Falk Consultancy	RH received feedback on the methodology	email
19-Jul-21	Stakeholder 1	RH thanked	email
19-Jul-21	Duncan Falk Consultancy	RH thanked	email
19-Jul-21	Tungai Tonghi	RH received confirmation of attendance at fieldwork. Will send email with workers comp and site officer details	Phone
19-Jul-21	Duncan Falk Consultancy	RH thanked for feedback	email
19-Jul-21	Yurrandaali	RH received workers comp	email
20-Jul-21	Yurrandaali	RH thanked	email
20-Jul-21	Woronora Plateau Gundungara Elders Council	RH received workers comp and site officer details	email
20-Jul-21	Woronora Plateau Gundungara Elders Council	RH thanked	email
21-Jul-21	Cubbitch Barta Native Title Claimants	RH received confirmation of attendance at fieldwork	email
21-Jul-21	Cubbitch Barta Native Title Claimants	RH thanked, requested site officer details and workers comp	email
21-Jul-21	Cubbitch Barta Native Title Claimants	RH received workers comp, site officer details and feedback: *I would just like to add in regards to the proposed methodology that in my opinion should be changed. Despite what the code of practice says I believe that the material should be sieved with 3 mm for a test excavation. The ground at the moment is very wet and could be almost impossible to dry sieve. Wet sieving is the preferred option*	email
21-Jul-21	Cubbitch Barta Native Title Claimants	RH thanked	email
22-Jul-21	Wodi Wodi Traditional Owner	Ben Churcher (BC) received call confirming attendance at fieldwork. Will send insurances to RH.	email
22-Jul-21	Wodi Wodi Traditional Owner	RH received workers comp	email
26-Jul-21	Wodi Wodi Traditional Owner	RH thanked and asked for site office details	email
26-Jul-21	Tungai Tonghi	RH phoned for copy of workers comp - N/a	Phone
26-Jul-21	Tungai Tonghi	RH emailed for copy of workers comp and site officer details	email
26-Jul-21	Leanne Tungai	RH sent follow up email asking if able to attend and offering to assist with cover under a third party employer if requires insurance. RH asked for contact to be made by tomorrow at latest	email
26-Jul-21	Yerramurra	RH sent follow up email asking if able to attend and offering to assist with cover under a third party employer if requires insurance. RH asked for contact to be made by tomorrow at latest	email
26-Jul-21	Illawarra Local Aboriginal Land Council	RH received confirmation of attendance at fieldwork, workers comp and request for additional fees	email
26-Jul-21	Illawarra Local Aboriginal Land Council	RH thanked but noted unable to accept field officer from Wollongong or Shellharbour. Requested alternative site officer. Confirmed rates	email
26.7.21	Yerramurra	RH received email confirming attendance at fieldwork and noting will send other documents later today	email
26.7.21	Yerramurra	RH thanked	email
28.7.21	Yerramurra	RH emailed requesting workers comp be sent through today or unable to attend	email
28.7.21	Tungai Tonghi	RH phoned - N/A	email
28.7.21	Tungai Tonghi	RH emailed requesting workers comp be sent through today or unable to attend	email
28-Jul-21	Illawarra Local Aboriginal Land Council	RH phoned - N/a	Phone

Date	Organisation	Comment	Method
28-Jul-21	Wodi Wodi Traditional Owner	RH phoned n/a	email
28-Jul-21	Wodi Wodi Traditional Owner	RH emailed requesting site officer details	email
28-Jul-21	Leanne Tungai	RH sent email notifying position is no longer available and has been re allocated.	email
28.7.21	Yerramurra	RH received incorrect insurances	email
28.7.21	Yerramurra	RH requested workers comp	email
28.7.21	Yurrandaali	RH phoned and confirmed additional day	email
28-Jul-21	Illawarra Local Aboriginal Land Council	RH sent follow up email asking for new site officer details	email
28.7.21	Tungai Tonghi	RH received email saying already sent	email
28.7.21	Tungai Tonghi	RH requested re send as has not received	email
28.7.21	Tungai Tonghi	RH received public liability insurance	email
28.7.21	Tungai Tonghi	RH received Product insurance	email
28.7.21	Tungai Tonghi	RH requested workers comp	email
28.7.21	Tungai Tonghi	RH received workers comp	email
29.7.21	Yerramurra	RH received email noting does not have workers comp, asked for details of third party provider	email
29.7.21	Yerramurra	RH forwarded invite to fieldwork to Frank at Get Set and copied in Blann requesting workers compensation cover	email
29.7.21	Tungai Tonghi	RH thanked	email
29-Jul-21	Wodi Wodi Traditional Owner	RH received site officer contact details	email
28-Jul-21	Illawarra Local Aboriginal Land Council	RH phoned and spoke to Donna, she is waiting on call back from Paul to see if they have someone outside Wollongong and Shellharbour LGA. Donna does not this so. RH confirmed happy to put as not able to attend and will re allocate day tomorrow in case Paul comes back to her with an alternative.	email
30-Jul-21	Woronora Plateau Gundungara Elders Council	BC phoned Paul Cummins to offer Tuesday/Wednesday work as Illawarra LALC could not attend. Paul confirmed he could attend the fieldwork	email
01-Aug-21	Stakeholder 1	Sheridan Baker (SB) received email saying unable to attend fieldwork due to COVID lockdown	email
02-Aug-21	Tungai Tonghi	Taylor Foster (TF) received phone call from Troy stating he cannot attend FW but will be sending a representative in his place - Kiera Cruise	Phone
02-Aug-21	Tungai Tonghi	TF received email with name and number of site officer	Email
02-Aug-21	Tungai Tonghi	TF responded "Great thank you Troy. I have let Brendan know to expect Kiera."	Email
03.8.21	Duncan Falk Consultancy	SB received email: Informing OzArk that the RAPs doing the fieldwork came from areas (Wollongong and Shellharbour) where COVID restrictions are currently in place. The health requirements for these areas are that you may travel outside of the LGA if you have had a covid test in the last 7 days with a negative result. Ben checked with the workers and they have signed that they have complied with these conditions.	Email
23.8.21	Tungai Tonghi	Brendan Fisher (BF) received a phone call from Troy asking about the invoice he had emailed to RH and gotten no response regarding. BK directed him to send an email to SB	email
23.8.21	Tungai Tonghi	SB rang Troy and confirmed invoice paid 13 Aug 2021	email
23.8.21	Tungai Tonghi	Troy called to let Sheridan know everything is all good. BK answered	email

Appendix 2 Figure 2. Reproduction of the public notice.

southernhighlandnews.com.au Wednesday, April 21, 2021 SOUTHERN HIGHLAND NEWS 19

Connect with Classifieds

Southern HighlandNews Phone: 02 4861 2333 Email: classifieds@southernhighlandnews.com.au

Public Notices

Public Notices

Biosis is undertaking an Aboriginal Cultural Heritage Assessment for the Moss Vale Plastics Recycling Facility at 74-76 Beaconsfield Road Moss Vale, within the Wingecarribee Local Government Area on behalf of Plastefine Recycling Pty Ltd c/o GHD Pty Ltd (Lauren Xuereb, community.inputghd.com)

The project will be assessed as State Significant Infrastructure under Part 4 of the *Environmental Planning and Assessment Act 1979*.

In accordance with the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010 (DECCW 2010)*, Biosis invites Aboriginal people who hold cultural knowledge in determining the significance of Aboriginal object(s) and/ places in the vicinity of the above area to register their interest in a process of community consultation.

The purpose of Aboriginal community consultation is to provide sufficient information for the assessment of Aboriginal cultural heritage values, and to assist the Secretary of the Department of Planning, Industry and Environment in their consideration and determination of the application.

For more information or to register in writing, please contact **Mathew Smith (Email: msmith @biosis.com.au, Address: 30 Wentworth Street Port Kembla, Tel: 0409 991 176**

Please note that the name of each group that registers for consultation on this project will be provided to Heritage NSW, Department of Premier and Cabinet and the Local Aboriginal Land Council unless the group specifies that they do not want their details released.

REGISTRATIONS MUST BE RECEIVED BY 5 May 2021

Public Notices

Positions Vacant

Delivery Person
Casual position

Casual driver required Monday & Tuesday each week to deliver goods and furniture in Southern Highlands and surrounding areas.
Approximately 3 - 4 hours per day. A certain level of personal fitness necessary, suits semi/retired person.
Manual vehicle provided.
Ability to assemble chairs & flat packed furniture required

Please forward applications to:
Hi-Land Stationery Office Choice Pty Ltd
Email : ph@ hilandstationery.com.au
or ring Peter 0414 934 933

Positions Vacant

COOK/CHEF

The Hermitage is a Catholic Retreat Centre on Old South Road Mittagong. We are looking for persons to work as Cooks/Chefs. Must be willing to work flexible hours including evenings and weekends on a casual basis.
A valid & current working with children check is essential.

Resumes may be emailed to:
office@thehermitage.org.au
Applications close Thursday 22 April 2021.

MAINTENANCE/GENERAL DUTIES

The Hermitage is a Catholic Retreat Centre on Old South Road Mittagong. We are looking for persons to work casual hours on Maintenance /General Duties. Must be willing to work flexible hours. A valid & current working with children check is essential.

Resumes may be emailed to:
office@thehermitage.org.au
Applications close Thursday 22 April 2021.

Work Wanted

HARRY THE HOUSEWASHER
LP Gutters, Eaves, Walls, windows, HP Tennis Courts, Paths, Driveways
John Leah
0419 297 021

PLASTER REPAIRS
Small job specialist!!
0473-882-626

Massage

AT MITTAGONG
Remedial Massage
9 Station Street
Front and back entry
9.30-7.30pm 7 Days
0426 533 686

Massage

NEW AT BOWRAL SERENITY MASSAGE
18 Station Street Bowral, behind Cotton On, Level 1. Easy parking at Rivers or Cinema, 10am-7.30pm, 7 days. Phone 0409 130 376.

Adult Services

Australian Services
Busty, friendly.
0422 282 346

MATURE male, body rubs for mature gents & ladies. Outcalls only. Ph 0411 740 291

Appendix 2 Figure 3: Example of agency letter.

biosis

12 April 2021

Heritage NSW, Department of Premier and Cabinet
PO Box 644
Parramatta NSW 2124

Dear Sir or Madam,

RE: Moss Vale Plastics Recycling and Reprocessing Facility: Aboriginal Cultural Heritage Assessment, Notification to Agencies
Our Ref: Matter 34710

Biosis Pty Ltd (Biosis) is currently undertaking an Aboriginal Cultural Heritage Assessment (ACHA) for GHD Pty Ltd on behalf of Plasrefine Recycling Pty Ltd to inform the development of a plastics recycling facility at 74-76 Beaconsfield Road Moss Vale, New South Wales (NSW) (the project). The project is to be assessed as State Significant Development (SSD) under Part 4 of the *Environmental Planning and Assessment Act 1979 (*EP&A Act*)*.

Biosis is assisting GHD Pty Ltd with consultation with the Aboriginal community to inform the ACHA. Consultation with the Aboriginal community for this assessment will be undertaken in accordance with the Aboriginal *Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010) (consultation requirements).

The purpose of the Aboriginal community consultation is to provide sufficient information for the assessment of Aboriginal cultural heritage values to assist the Secretary of the Department of Planning, Industry and Environment in the consideration and determination of the application under the EP&A Act. The project will be undertaken in accordance with the *National Parks and Wildlife Act 1974*.

As per section 4.1 of the consultation requirements, Biosis is seeking to identify Aboriginal people who may have an interest in the study area and hold cultural knowledge relevant to determining the cultural significance of Aboriginal objects and/or places in the Wingecarribee Local Government Area. If you could please provide contact details for any such Aboriginal people or organisations by **28 April 2021** it would be greatly appreciated.

Biosis Pty Ltd
Wollongong Resource Group
30 Wentworth Street,
Port Kembla, NSW 2505
Phone: 02 4201 1090
Fax: 03 9646 9242
ACN 006 175 097
ABN 65 006 175 097
Email: wollongong@biosis.com.au
biosis.com.au

In accordance with section 4.1.3 (a) of the consultation requirements, please note that the relevant client contact for this project is:

GHD Pty Ltd
Lauren Xuereb
Community and Stakeholder Engagement Advisor
Tel: 1800 810 680
Email: community.input@ghd.com

All correspondence regarding provision of names and contact details of Aboriginal people who may hold cultural knowledge relevant to the study area should be provided in writing to:

Mathew Smith
Biosis Pty Ltd
30 Wentworth Street
Port Kembla
msmith@biosis.com.au
0409 991 176

If you have any queries regarding the project please don't hesitate to contact Mathew Smith on the details above, or alternatively the main office number on 02 4201 1090.

Yours sincerely

Mathew Smith
Consultant Archaeologist

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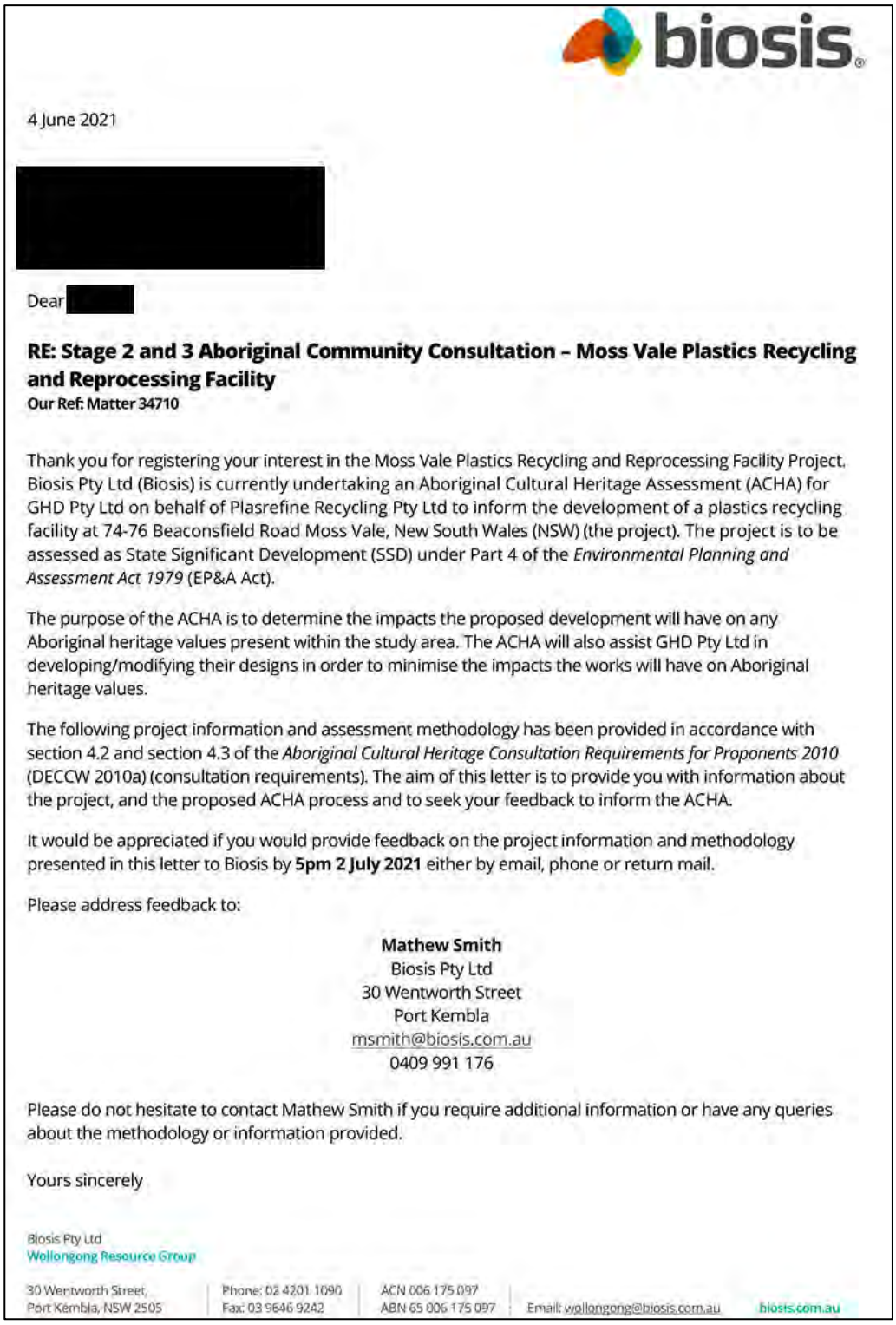
Appendix 2 Figure 4: Sample Stage 2/3 document.



biosis

4 June 2021

[redacted]

Dear [redacted]

RE: Stage 2 and 3 Aboriginal Community Consultation – Moss Vale Plastics Recycling and Reprocessing Facility
Our Ref: Matter 34710

Thank you for registering your interest in the Moss Vale Plastics Recycling and Reprocessing Facility Project. Biosis Pty Ltd (Biosis) is currently undertaking an Aboriginal Cultural Heritage Assessment (ACHA) for GHD Pty Ltd on behalf of Plasrefine Recycling Pty Ltd to inform the development of a plastics recycling facility at 74-76 Beaconsfield Road Moss Vale, New South Wales (NSW) (the project). The project is to be assessed as State Significant Development (SSD) under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

The purpose of the ACHA is to determine the impacts the proposed development will have on any Aboriginal heritage values present within the study area. The ACHA will also assist GHD Pty Ltd in developing/modifying their designs in order to minimise the impacts the works will have on Aboriginal heritage values.

The following project information and assessment methodology has been provided in accordance with section 4.2 and section 4.3 of the *Aboriginal Cultural Heritage Consultation Requirements for Proponents 2010* (DECCW 2010a) (consultation requirements). The aim of this letter is to provide you with information about the project, and the proposed ACHA process and to seek your feedback to inform the ACHA.

It would be appreciated if you would provide feedback on the project information and methodology presented in this letter to Biosis by **5pm 2 July 2021** either by email, phone or return mail.

Please address feedback to:

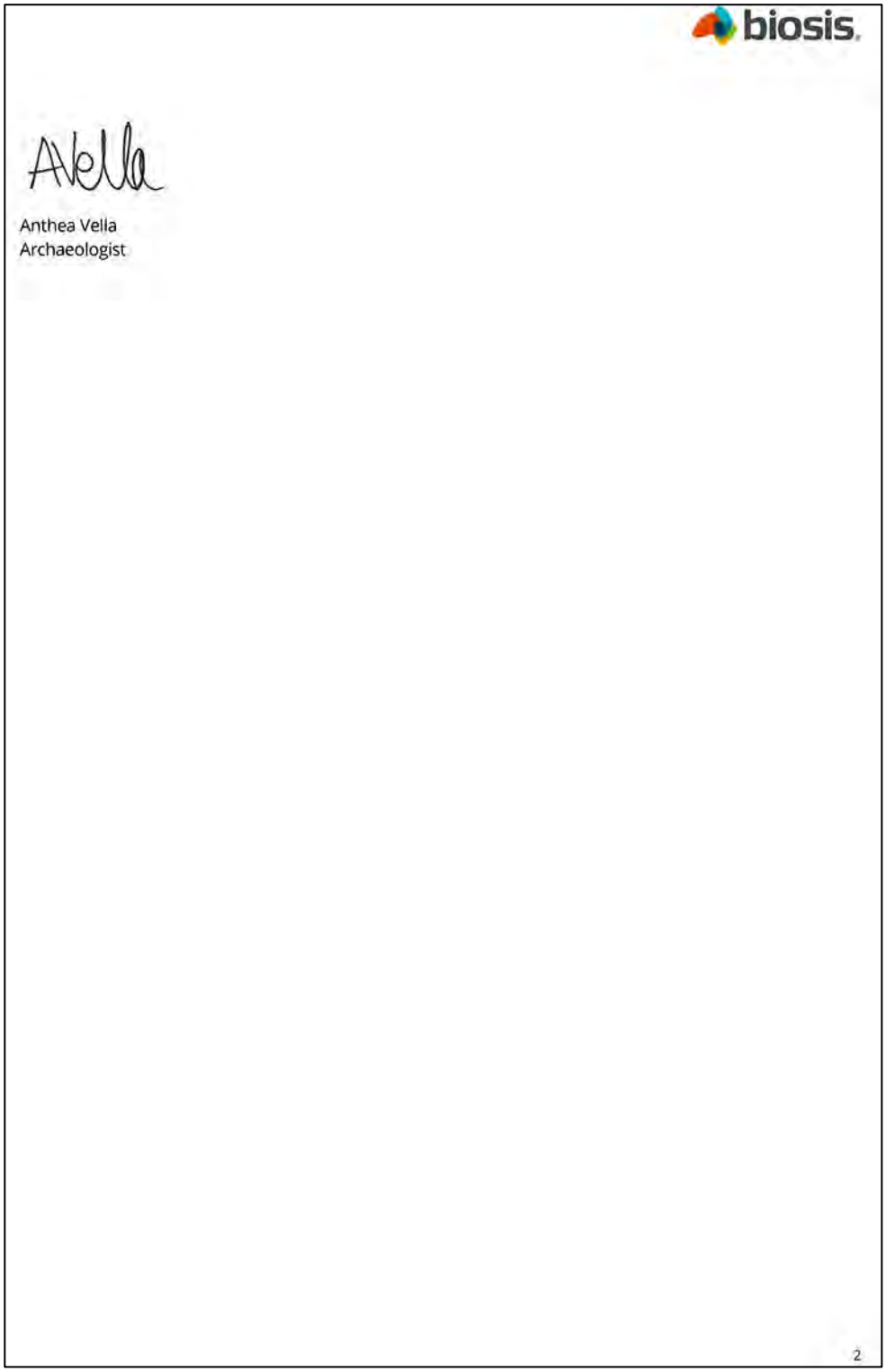
Mathew Smith
Biosis Pty Ltd
30 Wentworth Street
Port Kembla
msmith@biosis.com.au
0409 991 176

Please do not hesitate to contact Mathew Smith if you require additional information or have any queries about the methodology or information provided.

Yours sincerely

Biosis Pty Ltd
Wollongong Resource Group

30 Wentworth Street, Port Kembla, NSW 2505 | Phone: 02 4201 1090 Fax: 03 9646 9242 | ACN 006 175 097 ABN 65 006 175 097 | Email: wollongong@biosis.com.au | biosis.com.au


biosis
Anthea Vella
Archaeologist
2

biosis

Stage 2 – Project information

The aim of the stage 2 document is to provide registered Aboriginal parties (RAPs) with information about the scope of the project, and the proposed cultural heritage assessment process, and to seek their feedback on the project.

The project

GHD Pty Ltd on behalf of Plasrefine Recycling Pty is proposing to construct a new Plastics Recycling and Reprocessing Facility at 74-76 Beaconsfield Road, Moss Vale (Lot 11 DP 1084421) within the Wingecarribee Shire Local Government Area (LGA). The project involves the construction and operation of a plastics sorting and reprocessing facility with the capacity to process up to 120,000 tonnes of mixed plastic waste per annum into pellets, flakes or plastic derived products. Secretary's Environmental Assessment Requirements (SEARs) were issued for the project on 15 October 2020. The SEARs require an Aboriginal Cultural Heritage Assessment (ACHA) to be completed in order to support the environmental impact statement (EIS) for the development.

Biosis has been engaged by GHD Pty Ltd to undertake the ACHA to support the EIS and to inform the proposed works design for the study area. The ACHA will be prepared in accordance with *the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011). It includes an Archaeological Report (AR) prepared in accordance with the *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales* (DECCW 2010b) (the Code) and consultation with Aboriginal community in accordance with the consultation requirements. The ACHA will inform GHD Pty Ltd of any potential for the project to impact on or expose Aboriginal objects or sites. Biosis will provide recommendations based on the outcomes of the ACHA.

Study area

The study area encompasses 74-76 Beaconsfield Road (Lot 11 DP 1084421), Moss Vale NSW. It is within the Wingecarribee Shire LGA, and is approximately 93.7 kilometers south-west of the Wollongong central business district (Figure 1). The study area encompasses approximately 19.46 hectares of private land.

Background

Biosis has undertaken preliminary background research which included a search of the Aboriginal Heritage Information Management System (AHIMS) database (Client Service ID: 595862) identified 49 Aboriginal archaeological sites within a five by five kilometre search area, centred on the study area. Two of these sites AHIMS 52-5-0386/BR-IF1 and AHIMS 52-5-0386/BR-IF2 were located within the study area (Figure 2).

AHIMS 52-4-0386/BR-IF1 was recorded by Kayandel (2005) and consisted of a grey course grained silcrete distal flake fragment with edge damage and three negative flake scars located on an unformed vehicle track within the southern extent of the study area. The GPS coordinates provided to AHIMS by Kayandel for this site did not match up with the mapped location in the Kayandel (2005) report.

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AHIMS 52-4-0386/BR-IF1was recorded by Kayandel (2005) and consisted of a grey mottled silcrete (or quartzite) flaked piece located on an unformed vehicle track within the southern extent of the study area. The GPS coordinates provided to AHIMS by Kayandel for this site did not match up with the mapped location in the Kayandel (2005) report.

Kayandel (2005) had previously undertaken a constraints assessment of Lot 1 DP1000057 adjacent to the study area to the south. This assessment included a field survey and identified the two previously discussed AHIMS sites. Kayandel also assessed the lot as archaeologically sensitive, noting that the presence of the two isolated finds combined with the presence of water sources in the vicinity indicated at a minimum low density artefacts deposits had a moderate potential to occur.

Total Earth Care (2007) completed an Aboriginal cultural heritage study of the Moss Vale 'Enterprise Zone', which included survey in the vicinity of the study area. Seven open artefact scatters and 11 isolated finds were identified that comprised a total of 64 artefacts and seven grinding groove panels. All of the sites were located on level raised areas above the flood zone of creek lines and all of them were considered to have high levels of associated subsurface deposits. As part of this assessment Total Earth Care also identified areas of heritage constraints within the Enterprise zone including an area of slope in the eastern section of the study area that contained potential.

A field investigation consisting of a pedestrian survey of the study area was conducted on 3 June 2021 by Biosis archaeologists and Duncan Falk from the registered Aboriginal group Falk Consulting in order to relocate previously recorded Aboriginal objects, sites, or areas of potential as well as to identify any additional unrecorded Aboriginal objects, sites, or areas of potential in the study area. During the field investigation the two previously recorded AHIMS site were visited but could not be relocated. One new Aboriginal site, AHIMS Pending/MVRec IF1, was identified on the crest of a gentle spur line located between two drainage channels. This site consisted of a single quartz steep-edged scraper. In addition to this site, three areas of archaeological potential were identified on the crests and slopes of the spur lines. These sites were located in close proximity to drainage lines which would have provided valuable resources and were elevated so they would not flood during periods of increased rainfall. This likely to have made them potential areas of occupation and suggests the presence of sub-surface potential (Figure 3).

Project schedule

The proposed schedule and time allocations for the consultation stages are summarised below.

Action	Timeframe	Potential constraints and limitations
Commencement of Aboriginal community consultation – advertising of project and notification to stakeholders	Completed	Project advertised in the Southern Highland News on 21 April 2021. Notices sent to identified Aboriginal parties 12 May 2021.
Notices sent to identified Aboriginal parties	12 May 2021	N/A
Aboriginal stakeholder registration period	12 May to 23 May 2021	Registration period expired on 23 May 2021
Field investigation	Completed	Completed by Biosis archaeologist and Aboriginal representatives from Falk Consulting on the 3 June 2021

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Archaeological test excavations (if required)	TBC	TBC
Information gathering	Continuous	N/A
Review of draft report	TBC	28 days review time allowed under the consultation guidelines.
Final report	TBC	TBC

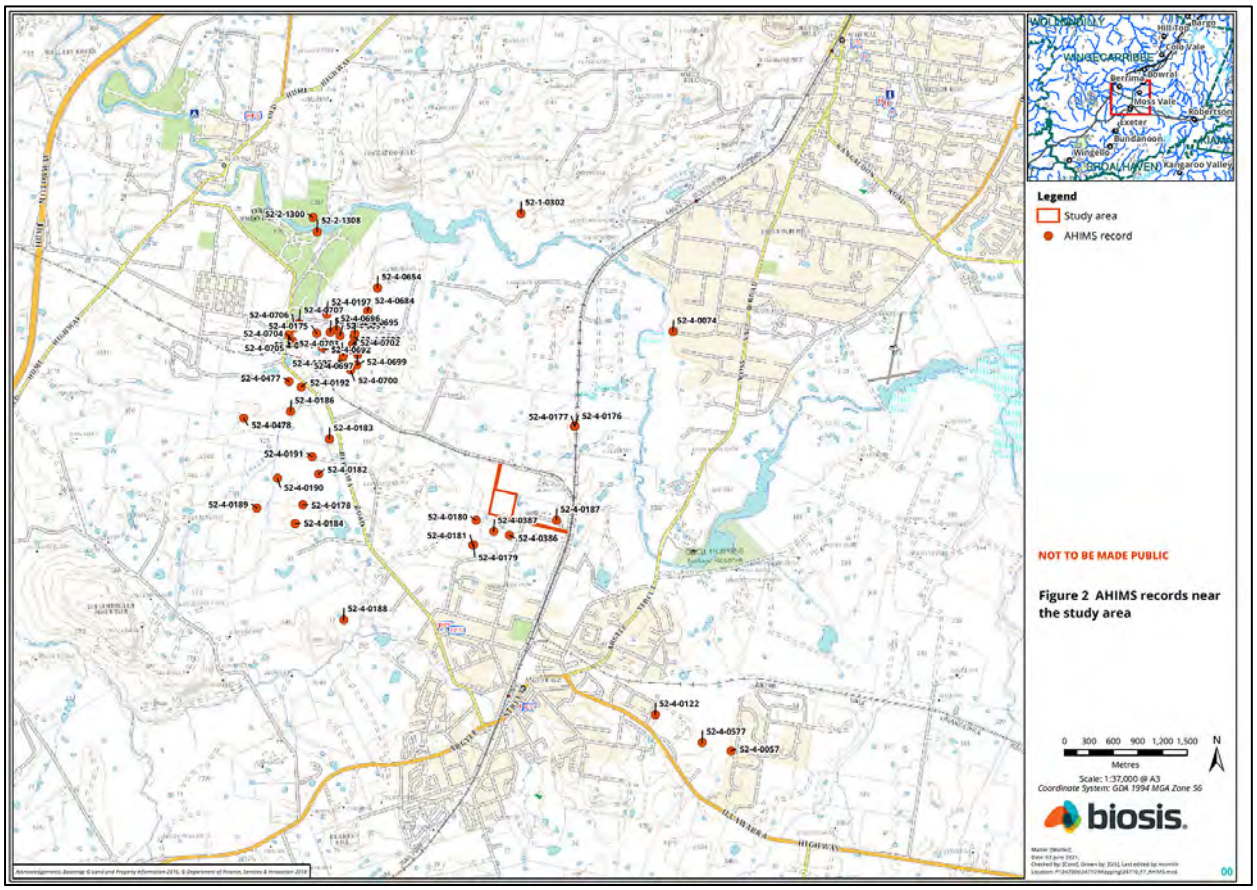
Responsibilities and roles

As part of the consultation process, RAPs are expected to respond to requests for cultural information and comment on draft reporting, as appropriate, in accordance with their role specified in section 5 of the consultation requirements. Biosis and the proponent, in accordance with their role under section 5 of the consultation requirements, will consult with the Aboriginal community by supplying suitable project information and providing the opportunity for Aboriginal stakeholders to provide input into the heritage management process.

Each section of the ACHA methodology will be undertaken in consultation with the RAPs for the project. Biosis invites RAPs to provide culturally appropriate information via mail, email or phone with regards to this project.

5


Legend
Study areas
DRAFT
Figure 1 Study area location
0 90 180 270 360 450
m
Scale: 1:9,026 @ A3
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
biosis
N


Legend
Study area
AHIMS record
NOT TO BE MADE PUBLIC
Figure 2 AHIMS records near the study area
0 300 600 900 1,200 1,500
Metres
Scale: 1:37,000 @ A3
Coordinate System: GDA 1994 MGA Zone 56
biosis
N
52-1-0302
52-2-1300
52-2-1308
52-4-0654
52-4-0684
52-4-0197
52-4-0707
52-4-0706
52-4-0175
52-4-0704
52-4-0705
52-4-0702
52-4-0692
52-4-0699
52-4-0697
52-4-0477
52-4-0192
52-4-0700
52-4-0186
52-4-0478
52-4-0183
52-4-0191
52-4-0182
52-4-0190
52-4-0189
52-4-0178
52-4-0184
52-4-0074
52-4-0177
52-4-0176
52-4-0180
52-4-0187
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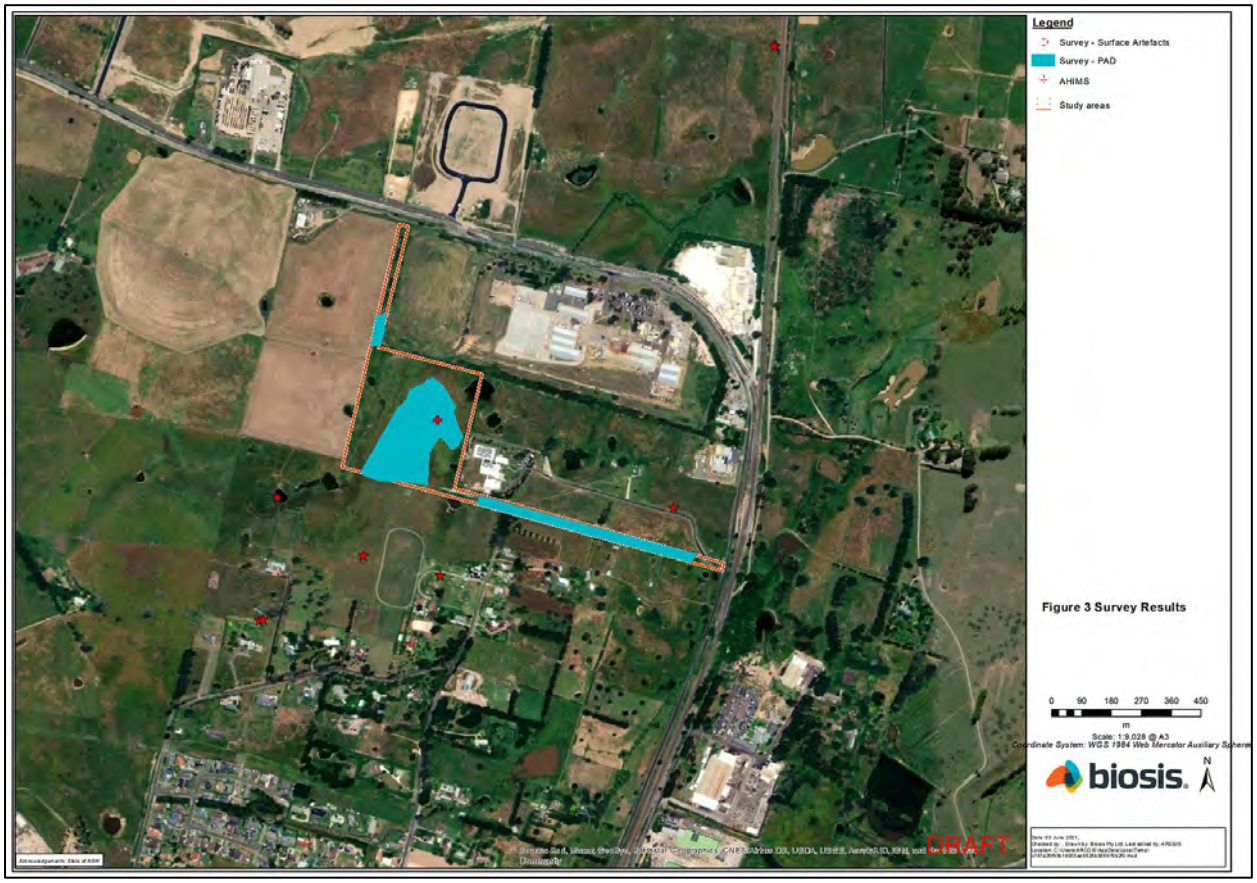
52-4-0577
52-4-0057


Legend
Survey - Surface Artefacts
Survey - PAD
AHIMS
Study areas
Figure 3 Survey Results
0 90 180 270 360 450
m
Scale: 1:9,026 @ A3
Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
biosis
N
DRAFT

biosis.

Stage 3 – Gathering information about cultural significance

The aims of stage 3 of the consultation process is to facilitate a process where RAPs for the project can:

- Contribute to culturally appropriate information gathering and the research methodology.
- Provide information that will enable the cultural significance of Aboriginal objects and/or places in the proposed study area to be determined.
- Have input into the development of any cultural heritage management options (DECCW 2010a, pp. 12).

The purpose of the stage 3 document below is to provide RAPs with information about the proposed ACHA methodology for the project, including the survey strategy and test excavation (if required) methodology and to seek feedback on the Aboriginal cultural values present within the study area.

The assessment methodology includes the following tasks:

Background research

This task will identify known Aboriginal sites, areas of potential archaeological sensitivity and previous disturbance, and inform the predictive modelling for the assessment/study area. The following steps will be undertaken:

- A search of the AHIMS database will be completed to identify registered sites in the vicinity of the assessment/study area. The results of the AHIMS search will be used to obtain relevant site cards and relevant previously completed Aboriginal cultural heritage assessments.
- A review of relevant reports identified through the AHIMS search will be undertaken.
- A review of aerial photographs and other resources to gauge the existing landscape and previous history of land disturbance will be undertaken.
- A review of the historical heritage databases will be undertaken.
- A brief summary of the historical uses of the study area will be developed.

Consultation with the Aboriginal community

This task will provide the Aboriginal community with the opportunity to participate in decisions regarding the management of their cultural heritage by providing proponents information regarding cultural significance and opportunities to input into management options.

Aboriginal community consultation will be undertaken in accordance with the consultation requirements, which includes:

- COMPLETED. Biosis ascertained the names of Aboriginal people or groups who may hold cultural knowledge relevant to determining the significance of Aboriginal objects and/ or places within the study area.

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- COMPLETED. Aboriginal stakeholders were provided with notification by letter of the project on 12 May 2021 via Biosis on behalf of GHD Pty Ltd, and given the opportunity to be involved in consultation.
- This document outlines the details of the project and proposed archaeological testing methodology. If required. The RAPs must be given an opportunity to review and provide feedback to the proponent within a minimum of 28 days of Biosis providing the methodology document.
- The DRAFT ACHA report and AR will be provided to all RAPs for comment – the proponent must allow 28 days for comment. All comments and correspondence sent and received regarding the project will be included in the final report in an appendix.

Culturally sensitive material

Biosis invites RAPs to provide culturally appropriate information via mail, email or phone with regards to this project.

Cultural information provided will be recorded in the Aboriginal consultation log and discussed in the report. If the information is regarded as too sensitive to be made public then RAPs should advise Biosis and identify the nature of the sensitivity. Biosis will then arrange for the recording of the information in accordance with its sensitivity. Documents which hold sensitive information will clearly list, on the front cover, who can have access to the document. These documents will be stored securely.

Archaeological test excavations

Any areas of Potential Archaeological Deposit (PAD) identified during the field investigation which cannot be avoided by the construction works will be subject to archaeological test excavations as outlined below.

Aims

The principle objectives of the test excavations are to identify and understand the nature, extent and significance of any areas of PAD within the study area. This will further our knowledge of Aboriginal archaeological site patterning within the study area and enable the predictive model to be further tested and refined.

The aims of the testing program are to:

- Determine the nature and extent of the sub-surface archaeological deposits in the study area.
- Identify if the archaeological material occurs in an intact, undisturbed context, by examining the soil profile and stratigraphy.
- Analyse and interpret any archaeological finds (such as stone artefacts, hearths, etc.) recovered during the testing program.
- Inform current knowledge of Aboriginal occupation and land use models of the region.
- Provide management and mitigation measures for Aboriginal archaeological objects located during the subsurface testing program.
- Test the predictive model and answer the research questions developed as part of this assessment.

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Test excavation methodology

If test excavations are required within the study area they will conform to the following methodology:

- Test excavations will be conducted in 50 by 50 centimetre units.
- The test pits will be excavated by hand (inclusive of trowels, spades and other hand tools) along transects at intervals of of 20 metres or other justifiable and regular spacing (being no smaller than five metres).
- The first test pit within a PAD area will be excavated in five centimetre spits; the subsequent test pits conducted within the site or PAD area can then be excavated in either 10 centimetre spits or stratigraphic units (whichever is smaller) to the base of Aboriginal object-bearing units being the removal of the A-horizon soil deposit down to the sterile clay or bedrock layer (B-horizon).
- If the depth of deposit prevents reaching sterile deposits within the 50 by 50 centimetre test pit, additional 50 by 50 centimetre test pits may be excavated adjacent to the original test pit (for example expanding the test pit to 50 by 100 centimetres) to reach the sterile deposits.
- Test pits may be combined and excavated as necessary in 50 by 50 centimetre units for the purposes of further understanding site characteristics. Note that under the Code, the maximum area that can be excavated in any one continuous area is three metres squared (3 m²).
- The maximum surface area of all test excavation units must be no greater than 0.5% of the PAD or area being investigated.
- All excavated soil will be sieved in 3 or 5 millimetre sieves. Dry sieving will be attempted in the first instance, however wet sieving may be used if deposits cannot be dry sieved.
- All cultural material will be collected, bagged and clearly labelled. They will be temporarily stored in the Biosis office for analysis (at 30 Wentworth Street Port Kembla NSW 2505).
- For each test pit that is excavated, the following documentation will be taken:
  - Unique test pit identification number.
  - GPS coordinate of each test pit.
  - Munsell soil colour and texture.
  - Amount and location of cultural material within the deposit.
  - Nature of disturbance where present.
  - Stratigraphy.
  - Archaeological features (if present).
  - Photographic records.
  - Spit records.
- Test excavation units will be backfilled as soon as practicable.
- An AHIMS Site Impact Recording form will be completed and submitted to the AHIMS Registrar for any sites impacted during test excavations.

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- In the event that suspected human remains are identified works will immediately cease and the NSW Police and Heritage NSW, Department of Premier and Cabinet (Heritage NSW) will be notified.
- Test excavations will cease when enough information* has been recovered to adequately characterise the objects present with regard to their nature and significance.

**Enough information is defined by Heritage NSW as meaning "the sample of excavated material clearly and self-evidently demonstrates the deposit's nature and significance. This may include things like locally or regionally high object density: presence of rare or representative objects: presence of archaeological features: or locally or regionally significant deposits stratified or not."*(DECCW 2010b, pp. 28).

Any cultural material identified during test excavations will be temporarily stored in the Biosis, Wollongong office for analysis (30 Wentworth Street Port Kembla NSW 2505)

Surface salvage

Surface salvage is recommended to be undertaken at AHIMS 52-5-0386/BR-IF1, AHIMS 52-5-0386/BR-IF2 and AHIMS pending/MVRec IF1. This will involve a program of collecting all surface artefacts by a qualified Archaeologist and a representative from a registered Aboriginal Group. Biosis proposes to undertake a surface salvage in line with the Code and this will include:

- Artefact recordings in line with requirement 18 of the Code
- GPS coordinates of each artefact.
- Photographic records of each artefacts and its surrounding context.
- All cultural material will be collected, bagged and clearly labelled. They will be temporarily stored in the Biosis office for analysis (at 30 Wentworth Street Port Kembla NSW 2505)
- Following the salvage of each Aboriginal site, an Aboriginal Site Impact Recording Form (ASIRF) will be prepared and submitted to AHIMS.

Long term management of cultural material

Once the cultural material has been analysed, the cultural material can be managed in the following manners:

- Cultural material can be held by the Aboriginal community under a care and control agreement.
- Cultural material can be returned to country and reburied as soon as practicable in a secure location in accordance with Requirements 16b and 26 of the Code.

Biosis requests any comments regarding the care and control of any cultural material be included as part of the review of this assessment methodology.

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Reporting

Biosis will prepare an ACHA and AR for the project. The ACHA will document the findings of the assessment, and detail the consultation process. The AR will be included as an appendix to the ACHA and will document the desktop assessment, field investigation, and test excavation results.

The main aim of the report is to document the assessment of potential development related impacts to Aboriginal cultural heritage and to formulate strategies to manage these impacts. Reporting will follow the guidelines of Heritage NSW, in particular the consultation requirements, the Code, and the *Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW* (OEH 2011).

The ACHA report will contain:

- Details of the Aboriginal consultation process undertaken as part of the assessment.
- A review and summary of the environmental context of the study area.
- A review and summary of the Aboriginal archaeological context of the study area.
- Archaeological test excavation results.
- Aboriginal site significance assessment.
- Impact assessment.
- Management strategies.
- Maps detailing any Aboriginal sites identified during the assessment process.

The RAPs will be provided with the draft ACHA report and AR, and their comments on the report content sought. Comments on the report's content are to be provided to Biosis by the party's respective nominated spokesperson(s). All comments not provided in writing will be recorded in an informal logbook by Biosis. These comments and responses to these comments will be documented in the final ACHA.

As part of this methodology registered Aboriginal parties will be provided with the draft report for comment and allowed **28 days** for review.

The final report will incorporate all comments and will be forwarded on to RAPs once completed.

References

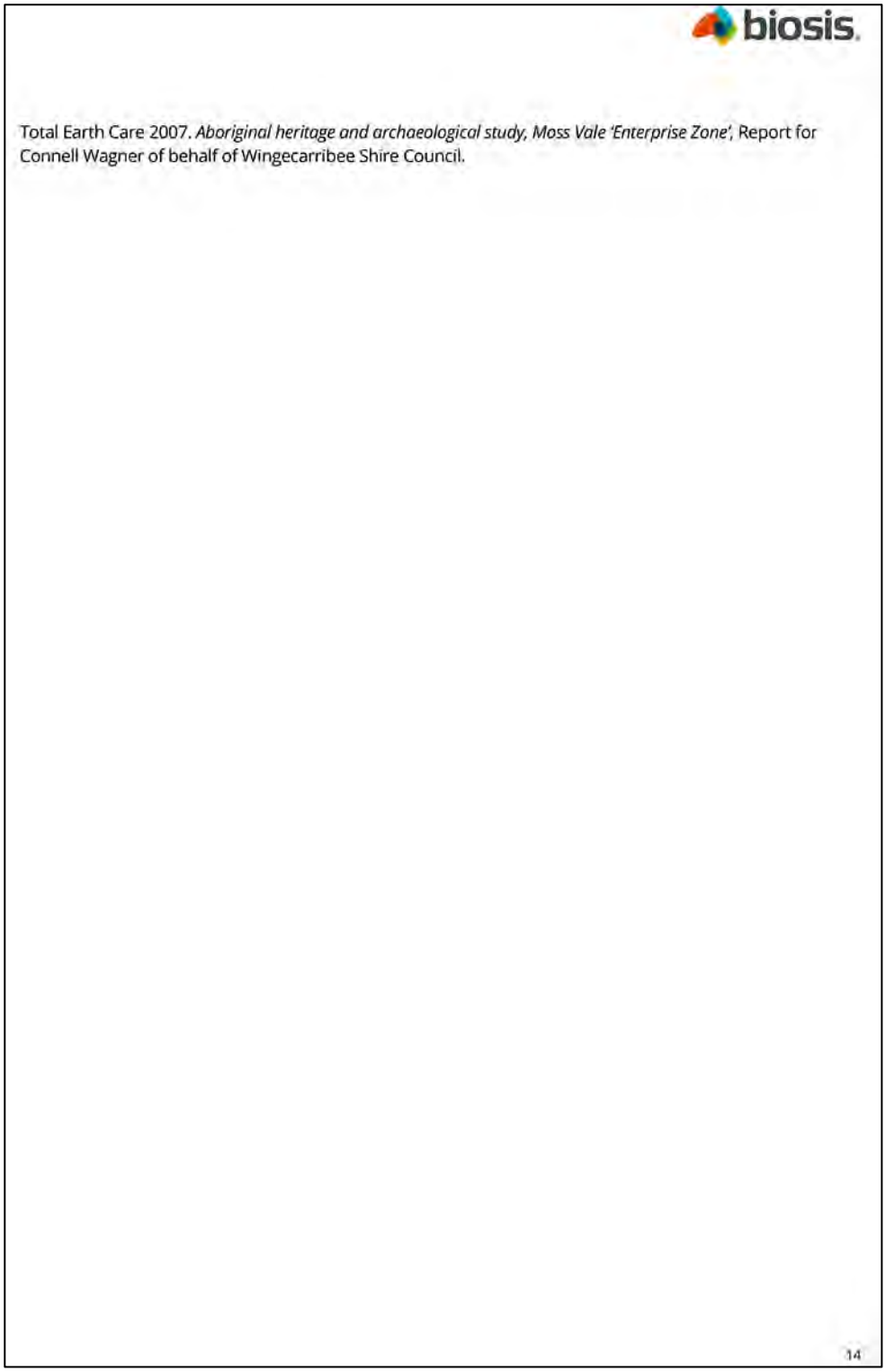
DECCW 2010a. *Aboriginal Cultural Heritage Consultation Requirements for Proponents*, New South Wales Government Department of Environment and Climate Change, Sydney NSW.

DECCW 2010b. *Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales*, Department of Environment and Climate Change, Sydney NSW.

Kayandel Archaeological Services 2005. *Lot 1 DP 1000057 Beaconsfield Road, Moss Vale, NSW. Preliminary Opportunities and Constraints Cultural Heritage Assessment. Prepared for Siteplus,*.

OEH 2011. Guide to investigating, assessing and reporting on Aboriginal cultural heritage in NSW, Office of Environment and Heritage, Department of Premier and Cabinet, Sydney NSW.

13



Total Earth Care 2007. *Aboriginal heritage and archaeological study, Moss Vale 'Enterprise Zone'*, Report for Connell Wagner of behalf of Wingecarribee Shire Council.

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APPENDIX 3: TEST EXCAVATION METHODOLOGY

OzArk Environment & Heritage ABN 59 104 582 354
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Queanbeyan enquiry@ozarkehm.com.au PO Box 2069
Newcastle www.ozarkehm.com.au DUBBO NSW 2830

13 July 2021

PROJECT UPDATE
MOSS VALE PLASTICS RECYCLING AND REPROCESSING FACILITY

As a Registered Aboriginal Party (RAP) for the Moss Vale Plastics Recycling and Reprocessing Facility project, you have recently had the opportunity to review the *Stage 2 and 3 Aboriginal Community Consultation* methodology document issued by Biosis (Biosis 2021).

In this document, Biosis set out the methodology for test excavation (page 11) as '*any areas of Potential Archaeological Deposit (PAD) identified during the field investigation which cannot be avoided by the construction works will be subject to archaeological test excavations*' (page 10).

Plasrefine Recycling Pty Ltd (the proponent) have indicated that two out of the three PADs identified by Biosis will be impacted by the project and therefore test excavation will be required.

However, due to COVID-19 restrictions, Biosis are not in a staffing position to undertake the test excavation program for some time and therefore the proponent has engaged OzArk Environment & Heritage (OzArk) to take over the heritage assessment for the project. This includes developing the *Aboriginal Cultural Heritage Assessment Report* (ACHAR) and undertaking the test excavation program.

As Biosis were not able to provide detail on where the test excavation program would take place when they issued the *Aboriginal Community Consultation* methodology document (Biosis 2021), this letter is to inform you that OzArk will now be undertaking the heritage assessment and to provide you with detail on where the test excavation is proposed.

This project update should be read in conjunction with Biosis 2021.

1 TEST EXCAVATION METHODOLOGY

The test excavation methodology will follow that set out in Biosis 2021 (pages 11 & 12). The aims of the test excavation program are as set out in Biosis 2021 (page 10).

Please note that the 'surface salvage' methodology set out in Biosis 2021 (page 12) will not take place until after project approval and will be informed by the results of the test excavation program. Any recommendations regarding post-approval salvage will be contained in the ACHAR that you will have the opportunity to review.

Similarly, recommendations for the long-term management of cultural material will also be contained in the ACHAR. However, as requested by Biosis, any comments regarding the care and control of any cultural material that you may have should be forwarded to OzArk so that they can be included in the ACHAR recommendations.

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As a State Significant Development (SSD-9409987), Aboriginal cultural heritage at the site will be managed by an *Aboriginal Cultural Heritage Management Plan* (ACHMP) that will be developed following approval and in consultation with the RAPs. The ACHMP will normally include the ACHAR recommendations in terms of post-approval salvage and/or long-term management of Aboriginal objects.

2 LOCATION OF THE TEST EXCAVATION PROGRAM

Following their survey, Biosis identified three areas of PAD (see Biosis 2021: Figure 3). These consist of a small PAD on the north–south access road, a linear PAD on the east–west access road, and a large central PAD within the main site area. The proponent has indicated that the north–south access road is no longer part of the project and that this area of PAD will not be impacted. Therefore, it has been removed from the test excavation program.

The remaining two PADs will be impacted, and the test excavation program will focus on these areas.

This will comprise 48 excavation squares:

- Three transects of 50 m each (six squares at 10 m intervals), spaced along the east–west access road. This equates to 18 squares.
- Five transects of 50 m each (six squares at 10 m intervals) for the central PAD. This equates to 30 squares.

The location of the eight transects (each containing six excavation squares) is shown on **Figure 2-1**.

The transect locations shown on a digital elevation model (DEM) (**Figure 2-2**) provide a good visual representation of the topography of the study area. The frequent striations seen in this image are the remnants of ploughing and it is obvious that a large portion of the study area has been impacted by ploughing. This has likely disturbed the topmost 20 cm of soil, but often, deeper deposits can be intact below the plough zone. However, in OzArk's experience, if there are significant deposits below the plough zone there will be a greater surface expression of visible artefacts that have been brought to the surface through ploughing. As Biosis only recorded a single artefact in the study area (Biosis 2021: page 4), the implication is that there are not extensive subsurface artefact deposits within the main project area. The aim of the test excavation program will be to confirm or refute this observation.

Figure 2-1: Indicative location of transects.

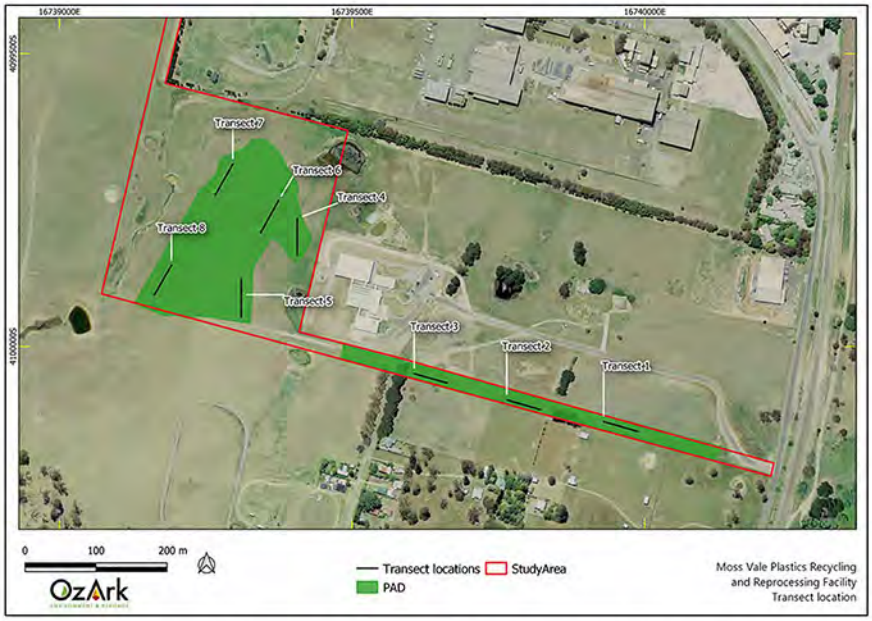
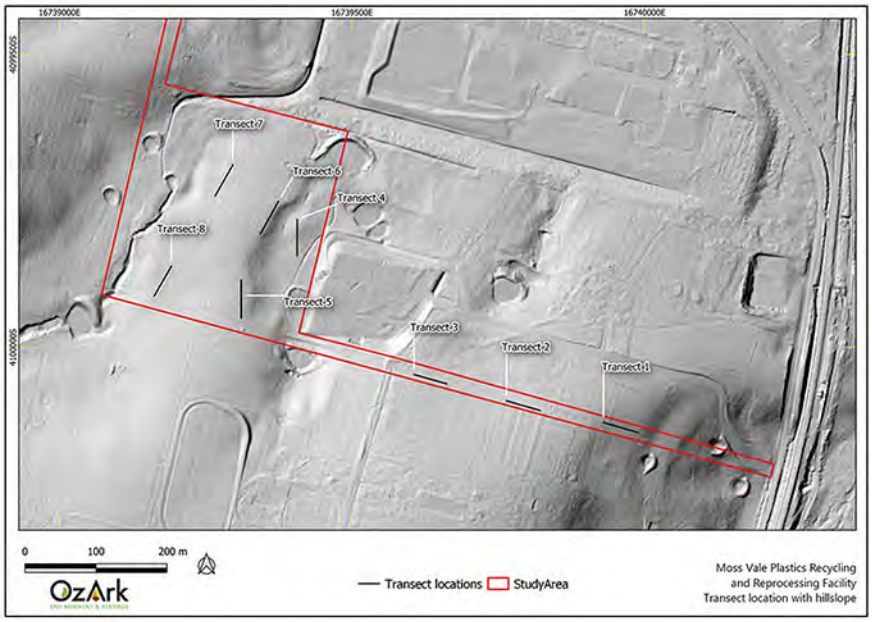


Figure 2-2: Indicative location of transects showing hillslope.



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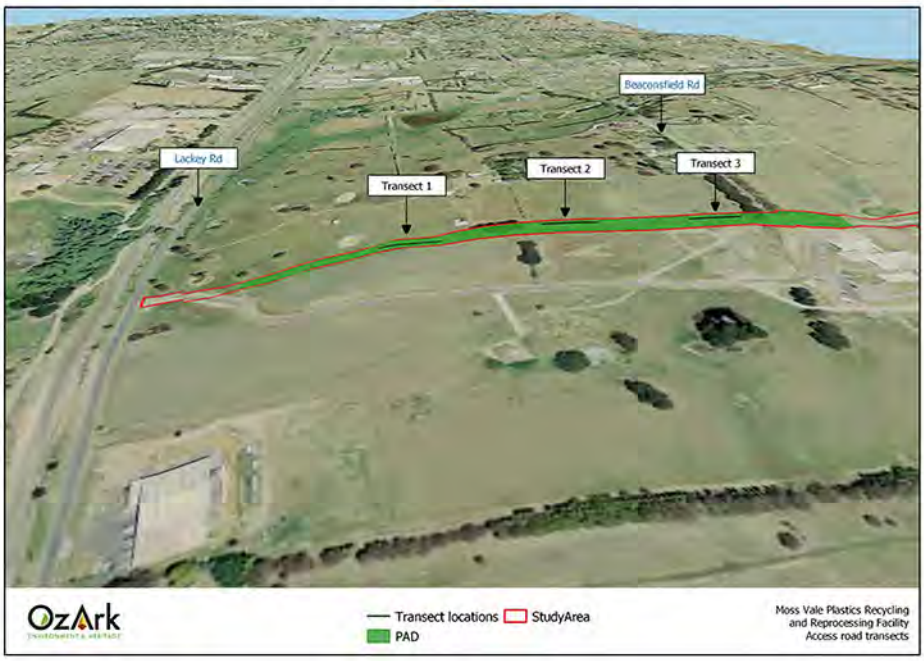
The location of the transects has been informed through reference to a DEM of the study area to indicate the best location for the transects so that the program samples the most likely landforms to contain subsurface archaeological deposits.

Specifically, regarding the east–west access road that is shown on a DEM on **Figure 2-3**:

- The landform of this PAD occupies a broad crest to the west (right in **Figure 2-3**) and slopes to the east towards Lackey Road
- Transect 1 has been placed to sample a bench landform within the slope as the slope gradient to the east and west of this location would make these landforms unsuitable for camping activities
- Transects 2 & 3 have been placed to sample the broad crest landform outside of the disturbance associated with Beaconsfield Road.

Figure 2-3: DEM of the east–west access road.



Regarding the central PAD that is shown on a DEM on **Figure 2-4**:

- The landform of this PAD occupies a broad crest that descends with a gentle gradient to the west (left in **Figure 2-4**) and a steeper gradient to the east. At the base of each slope are seasonal waterways that have been dammed
- Transect 4 has been placed in the level landform at the base of the eastern slope and near the seasonal waterway

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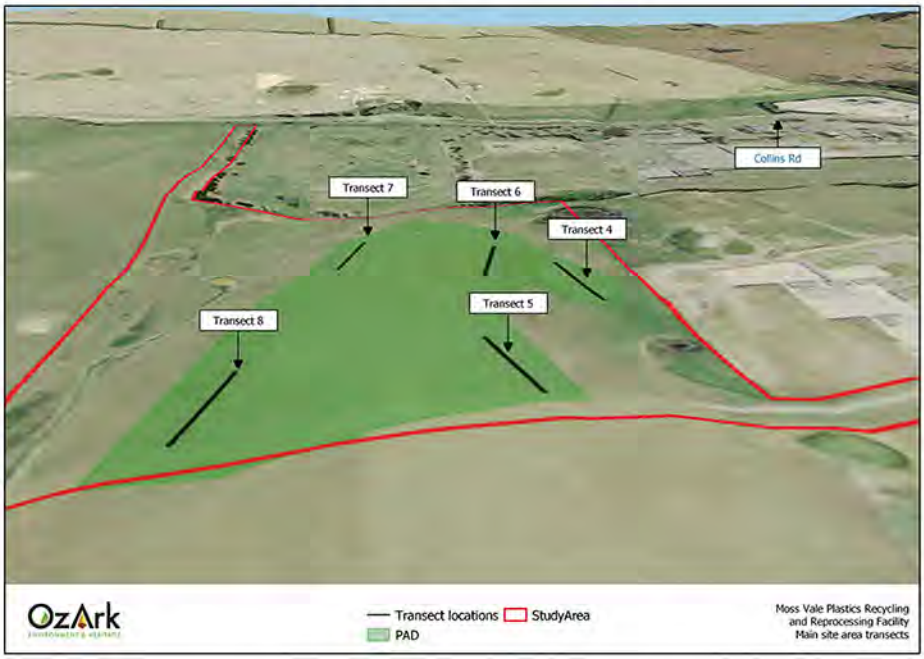
- Transects 5 & 6 have been placed along the level landforms at the top of the eastern slope as the slope itself would be unsuitable for camping activities. These locations should be outside of ploughing impacts
- Transects 7 & 8 have been placed along the level landforms at the top of the western slope. To the west, the slopes and landforms near the seasonal waterway are not included in the PAD. The locations of Transects 7 & 8 have been impacted by ploughing and are regarded as having low archaeological potential. These transects are being investigated to provide a contrast to the transects located outside the plough zone on the eastern side of the crest (Transects 5 & 6).

Figure 2-4: DEM of the central PAD area.



The test excavation will involve the excavation of squares in these prescribed transects using the specific spacing and methods as specified in the *Code of Practice for Archaeological Investigation of Aboriginal objects in NSW* (Code of Practice; DECCW 2010), to attempt to answer the aims of the excavation program set out in Biosis 2021 (page 10).

The exact location of the transects will be determined in the field so that areas of obvious disturbance can be avoided. The location of transects will, however, be as close as possible to the locations shown on **Figure 2-1** and any decision to deviate from this plan will be discussed with the RAPs who will be present for the excavation.

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3 CODE REQUIREMENTS OF THE TEST EXCAVATION PROGRAM

The test excavation program will be undertaken as per the Code of Practice (DECCW 2010).

The Code of Practice lists a number of requirements pertaining to test excavation. These requirements are detailed below and further information pertaining to these requirements follow in subsequent sections.

Requirement 14 (Test excavation which is not excluded from the definition of harm):

Sub-surface investigation will not be excluded from harm where they are carried out in the following areas:

- *in or within 50 m of an area where burial sites are known or are likely to exist*
- *in or within 50 m of a declared Aboriginal place*
- *in or within 50 m of a rock shelter, shell midden or earth mound*
- *in areas known or suspected to be Aboriginal missions or previous Aboriginal reserves or institutes*
- *in areas known or suspected to be conflict or contact sites.*

Response: The test excavation locations are not located within the vicinity of the items listed under Requirement 14 of the Code of Practice. There are no identified burials or conflict sites in or near the project area, there is a very low possibility that evidence relating to this period of conflict may be unearthed during the test excavations. If this should occur, excavation at that location will cease and advice will be sought from RAPs and Heritage NSW.

Requirement 15a (Consultation)

Consultation must be undertaken as set out in the National Parks and Wildlife Regulation 2009 (NPW Regulation).and completed to the stage described in subclause 80C(6) of the NPW Regulation):

Response: The *Aboriginal cultural heritage consultation requirements for proponents* have been initiated for the project by Biosis and have been completed to the stage described in subclause 80C (6) of the NPW Regulation (now established in Section 60 of the NPW Regulation 2019). OzArk is continuing the consultation requirements. This project update is an addendum to Biosis 2021 which as already been circulated to all RAPs for the prescribed 28 day review period.

Requirement 15b (Test excavation sampling strategy)

A sampling strategy must be developed. This strategy must do the following:

- *provide a framework for sampling all potential archaeological deposits (PAD) that are at risk of harm (within the subject area)*
- *describe the differentiation of the PAD to be test-excavated from the surrounding archaeological landscape (i.e. explain why the PAD is anticipated to be of higher significance than the continuous distribution of archaeological material in which it exists), and*
- *test those areas of PAD that have no archaeological exposure or visibility, or test the boundaries of known sites (where appropriate)*
- *confirm areas of low potential (where relevant).*

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- *comply with the methods described in this Code*
- *describe how the sampling area relates to the area that is proposed to be impacted by the proposed activity.*

Response: This project update sets out the proposed sampling strategy for the test excavation program and should be read in conjunction with Biosis 2021. The test excavation will be confined to the areas within the impact footprint of the project.

Requirement 15c (Notification)

At least 14 days before undertaking any test excavations the relevant Heritage NSW regional office must be notified, in writing, of the following:

- *the location of the proposed test excavation and the subject area*
  - This document sets out the proposed location of the test excavation program.
- the name and contact details of the legal entity with overall responsibility for the project
  - Plasrefine Recycling Pty Ltd. 74-76 Beaconsfield Road, Moss Vale.
- the name and contact details of the person who will be carrying out the test excavations where this is different to the legal entity with overall responsibility for the project
  - OzArk Environment & Heritage, 145 Wingewarra St, Dubbo NSW 2830.
- the proposed date of commencement, and estimated date of completion, of the test excavations
  - Anticipated Commencement: August 2021
  - Anticipated Completion: August 2021.

    Weather permitting, the projected period for the excavation is up to four days.
- the location of the temporary storage location for any Aboriginal objects uncovered during the test excavations
  - Aboriginal objects recovered during the excavations will be temporarily stored in a locked cupboard at 145 Wingewarra Street, Dubbo, NSW (OzArk office) for analysis. Other objects, such as faunal or charcoal samples, may be sent to third party specialists for analysis.

This test excavation methodology will be sent to Heritage NSW for their consideration at the same time as it is issued to the RAPs for their consideration and comment on 14 July 2021.

Requirement 16a (Test Excavation)

Acts occurring in the course of test excavations will be excluded from the definition of harm but only if done in order to understand the site characteristics, local and regional prehistory, and conservation requirements for the subject area).

Response: The test excavation program will adhere to Requirement 16a of the Code of Practice as set out in this document.

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Requirement 16b (Objects recovered during test excavations)

> *Any Aboriginal objects that are moved during test excavation must be reburied as soon as practicable in a secure temporary storage location in accordance with Requirement 26 pending any agreement reached as to the long-term management of the salvaged Aboriginal objects. The person carrying out the test excavation is responsible for ensuring that procedures are put in place so that Aboriginal objects that are reburied are not harmed. The location of the secure temporary storage location must be submitted to AHIMS with a site update record card for the site(s) in question).*

Response: Aboriginal objects recovered during the excavations will be analysed at 145 Wingewarra Street, Dubbo, NSW (OzArk office). When not being analysed, the objects will be temporarily stored in a locked cupboard at 145 Wingewarra Street, Dubbo, NSW. The long-term management of any recovered artefacts will be determined in consultation with the RAPs. Further detail on Requirement 16b is provided in **Section 3.1**.

Requirement 17 (When to stop test excavations)

> *Any test excavation carried out under this Requirement must cease when: suspected human remains are encountered; or enough information has been recovered to adequately characterise the objects present with regard to their nature and significance.*

Response: While there are no identified burials or conflict sites in or near the project area, OzArk shall ensure that this requirement is adhered to during the test excavation program should human remains be identified. This will include ceasing work as soon as human skeletal material is noted and immediately notifying NSW Police and Heritage NSW.

3.1 COMPLIANCE WITH THE CODE OF PRACTICE: REQUIREMENT 16A

Table 3-1 outlines the points necessary to comply with Requirement 16a of the Code of Practice and where these requirements are addressed in this document.

Table 3-1: Compliance with Requirement 16a of the Code of Practice.

Requirement 16 of Code of Practice	Where requirement is addressed
1. Test excavation units must be placed on a systematic grid appropriate to the scale of the area—either PAD or site—being investigated e.g. 10 m intervals, or other justifiable and regular spacing.	Complies. See **Section 3.3** point 1.
2. Any test excavation point must be separated by at least 5 m.	Complies. See **Section 3.3** point 1.
3. Test excavations units must be excavated using hand tools only.	Complies. See **Section 3.3** point 4.
4. Test excavations must be excavated in 0.5 m x 0.5 m units.	Complies. See **Section 3.3** point 1.
5.Test excavations units may be combined and excavated as necessary to understand the site characteristics, however: i) the maximum continuous surface area of a combination of test excavation units at any single excavation point conducted in accordance with point 1 (above) must be no greater than 3m^2. ii) The maximum surface area of all test excavation units must be no greater than 0.5% of the area—either PAD or site—being investigated.	i) Complies. See **Section 3.3** point 10. ii) Complies. The excavations include 12 m^2 in a combined PAD area of 44,854 m^2. This equates to 0.26% of the PAD area.
6. Where the 0.5 m x 0.5 m excavation unit is greater than 0.5% of the area then point 5 (ii) (above) does not apply.	Not applicable.
7. The first excavation unit must be excavated and documented in 5 cm spits at each area —either PAD or site—being investigated. Based on the evidence of the first excavation unit, 10 cm spits or sediment profile/stratigraphic excavation (whichever is smaller) may then be implemented.	Complies. See **Section 3.3** point 3.
8. All material excavated from the test excavation units must be sieved using a 5 millimetre (mm) aperture wire-mesh sieve.	Complies. See **Section 3.3** point 5.

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Requirement 16 of Code of Practice	Where requirement is addressed
9. Test excavation units must be excavated to at least the base of the identified Aboriginal object-bearing units, and must continue to confirm the soils below are culturally sterile.	Complies. See **Section 3.2**.
11. Photographic and scale-drawn records of the stratigraphy/soil profile, features and informative Aboriginal objects must be made for each single excavation point.	Complies. **Section 3.3** points 2, 7, 8, and 11.
12. Test excavations units must be backfilled as soon as practicable.	Complies. See **Section 3.3** point 6.
13. Following test excavation, if Aboriginal Cultural Heritage has been identified a site card must be completed and submitted to the AHIMS Registrar as soon as practicable. Following the submission of the site card to the AHIMS Registrar an Aboriginal Site Impact Recording form will be completed as in accordance with the requirements of the Code.	It will be the responsibility of OzArk to ensure that this requirement is met.

3.2 SAMPLING STRATEGY

The sampling strategy will involve investigating potential subsurface deposits at eight locations. **Figure 2-1**, shows the general location and placement of the transects. Please note that these are subject to change depending on the discretion of OzArk's Excavation Director and the input of Aboriginal community representatives when on site.

Excavation will occur in 10 m intervals along all eight transects. A minimum of six test squares will be excavated per transect. A minimum of 48 test squares will be excavated across the eight transects. All test squares will be 0.5 m by 0.5 m in size (0.25 m^2).

Any decision to expand an excavation square or to investigate a perpendicular transect will be done in consultation with the Aboriginal community, but the decision of whether to expand or not will ultimately rest with OzArk's Excavation Director.

The first test square of each transect will be excavated manually in 5 cm spits. If the soil profile and/or lack of archaeological stratigraphy indicates that it is warranted, test squares may then be excavated in 10 cm spits, after consultation between the OzArk Excavation Director and RAPs.

Excavation will continue in any one test square until culturally sterile soils are reached. 'Culturally sterile' does not necessarily mean the B-Horizon clays, but rather, if no artefacts have been present for 20 cm, the test square will stop being excavated. If the A-Horizon soils are continuing deeper from this point, then it is up to the discretion of the Excavation Director as to final depth of test square if no artefacts are present. If there is evidence of alluvial disturbance, i.e. gravels or rolled river pebbles, the degree of disturbance will be considered in the decision as to how deep an individual test square should be excavated. The decision to stop excavation at any test square will be done in consultation with RAPs, but the ultimate decision rests with the OzArk Excavation Director.

3.3 PERSONNEL AND METHODS

The excavation program will be undertaken by three archaeologists and four RAP representatives and will include the following aspects:

1. It is proposed that 48 excavation units (0.5 m x 0.5 m) be excavated at the indicative transects shown in this document (**Figure 2-1**). Test pits will be spaced 10 m apart
2. Prior to any excavation, the site will be recorded via digital photography
3. Initial test squares will be excavated in 5 cm spits to determine whether archaeological stratigraphy is present. If not, spit size will be increased to 10 cm. If archaeological stratigraphy is present, this will be used rather than spits, though only if equal or less than 10 cm

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4. All excavation will be done using hand tools only
5. The excavated material from all test squares will be sieved on site using dry sieving through sieves of five-millimetre mesh
6. Each excavator (by hand) will be responsible for sieving the deposit from their test square, retrieving the artefacts and, in conjunction with the supervising archaeologist, correctly recording their provenance. There could be some room for assistance with the sieving, but a self-contained approach is preferable. Deposits will be sieved onto tarpaulins and the spoil used to backfill the test square once final recording and photography has occurred
7. A standard excavation recording form will be used for each excavated test square. Details will include: date, site recorder, spit number and depth, description of finds, description of soil, sketch plan of excavation (if relevant to show structure), end of spit levels, and soil pH (when necessary or appropriate)
8. It is envisioned that the excavation crew will consist of three archaeologists and four RAP site officers over four days. The excavator of each test square, in conjunction with the supervising archaeologist, will be responsible for ensuring any forms are correctly completed. It will be the supervising archaeologist's responsibility to perform all photographic tasks, undertake any planning and section drawing if required and to ensure that a correct location of each test square is maintained
9. Given that the work will be physical, all persons participating on the test excavation program should be aware of this and be 'fit for work'
10. If intact archaeological deposits or archaeological features are encountered, then additional archaeological test squares may be excavated to ensure documentation of any features and/or retrieval of artefacts and other relevant archaeological material. A feature could include a high density of artefacts within a square, or a test square containing rare or unusual artefacts (such as artefacts constructed from a stone type rarely represented in the area or less-common tool forms), or other signs of human occupation i.e. ground ovens/hearths or charcoal concentrations. The decision of whether any expansion is warranted rests with the Excavation Director. No expansion will exceed 3 m^2
11. If warranted, photographic and scale-drawn recordings of the stratigraphic/soil profile, features and informative Aboriginal objects will be made for each single excavation point (i.e. archaeological stratigraphy is encountered). At a minimum, an indicative section of each test square will be photographed
12. Analysis of all excavated lithics will be made to determine the site's characteristics and to enable the site to be compared with other sites in the region. Analysis will also assist in determining what type of activities the Aboriginal people carried out at the site and their relationship with local resources (fauna, flora, water, and stone). All artefacts will be analysed and selectively photographed, and the more diagnostic artefacts may be drawn by a lithic specialist
13. All faunal remains, if recovered, will be analysed by a fauna specialist. Remnant shell and bone fragments may assist in determining what foods Aboriginal people may have eaten at the specific site and may elucidate possible foraging strategies. In conjunction with *in situ* stone tools, bone/shell fragments may also provide evidence of specific usage of stone tools for food processing

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14. Artefacts will remain at the OzArk office (145 Wingewarra Street, Dubbo NSW) until the analysis is complete. Once complete, the artefacts will remain at the OzArk office where whey will be kept at a locked location until point 16 below is enacted
15. Excavation results will be used to advise further courses of action in relation to the management and mitigation options for the project
16. Once all excavation activities for this project are complete, artefacts, if present, will have their ultimate fate decided in a negotiated agreement between the RAPs, the proponent and the Heritage NSW.

We welcome any comments on the information provided here. Any comments should be directed to OzArk Consultation Officer, Ms Rebecca Hardman, at rebecca@ozarkehm.com.au before Friday 30 July 2021.

Kind regards,

Ben Churcher
Principal Archaeologist
ben@ozarkehm.com.au

APPENDIX 4: EXCAVATION ARTEFACT ASSEMBLAGE

Relevant PAD	Transect	Square	Spit	Artefact Type	Raw Material	Integrity	Size (LxBxW mm)	Reduction	Rotation	Platform Type	Platform Size	Termination Type	Notes
PAD2	5	3	1	F	Q	PF	10x9x4	T	P	P	1	-	
PAD2	6	2	1	F	Q	DF	12x20x7	T	R	-	-	SH	
PAD2	6	2	1	M	S	C	8x9x2	T	R	-	-	F	Steep, unifacial retouch to margins and proximal
PAD2	6	6	3	F	S	C	34x21x7	T	R	P	1	F	
PAD2	6	6	3	F	S	DF	18x11x4	T	P	-	-	F	
PAD2	7	6	1	F	C	DF	19x10x2	T	N	-	-	F	Crushing at distal
PAD3	2	2	1	F	S	C	19x13x5	T	P	S	2	F	Bipolar reduction
PAD3	2	3	1	F	Q	C	12x23x14	T	N	S	4	F	
PAD3	2	6	1	F	S	C	218x11x4	T	P	F	3	F	