Vivacity Property

Oasis Caravan Park, Kanwal

LGA: Central Coast Council

Archaeological Due Diligence Assessment

21 August 2023

McCARDLE CULTURAL HERITAGE PTY LTD

ACN 104 590 141 • ABN 89 104 590 141

PO Box 166, Adamstown, NSW 2289
Mobile: 0412 702 396 • Email: penny@mcheritage.com.au

M

MCCARDLE

CULTURAL HERITAGE

Report No: J202355 DD	
Approved by:	Penny McCardle
Position:	Director
Signed:	
Date:	21 August 2023

This report has been prepared in accordance with the scope of services described in the contract or agreement between McCardle Cultural Heritage Pty Ltd (MCH), ACN: 104 590 141, ABN: 89 104 590 141, and the proponent. The report relies upon data, surveys, measurements and specific times and conditions specified herein. Any findings, conclusions or recommendations only apply to the aforementioned circumstances and no greater reliance should be assumed or drawn by the proponent. Furthermore, the report has been prepared solely for use by the proponent and MCH accepts no responsibility for its use by other parties.

CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

EXECUTIVE SUMMARY

McCardle Cultural Heritage Pty Ltd (MCH) has been engaged by Vivacity Property to undertake an Archaeological Due Diligence Assessment for the proposed redevelopment of the Oasis Caravan Park and associated civil infrastructure located at 205, 207-209 Wallarah Road, Kanwal NSW, consisting of Lot 1 DP518378, Lot 1223 DP 1004170 and Lots 14 and 15 DP 23235 and Lot 1 DP518378.

In terms of the environmental context, the project area is situated the in the Central Coast area on the Clifton Sub-group of the Triassic Narrabeen Group that consists of claystone, sandstone and shale. Consisting of a disturbed landform, the project area includes the Gorokan soil landscape that consist of an upper soil Horizon A and underlying B. Unit A and Unit B are interpreted as being Holocene and Pleistocene in age respectively. Within the region, sites tend to occur on or within soil Horizon A or are often present at the interface of the A and B horizons.

In terms of fresh water sources, there are no fresh water sources within approximately 450 metres of the project area. An unnamed 1st order stream is mapped within the project area and starts to the north of the project area. However, field investigations showed that no watercourse was present in the project area. Based on historic aerial photography, the project area has been subject to a range of landuses disturbances and impacts including complete clearing of vegetation, ground leveling, dam construction and the establishment of the current caravan park and the associated infrastructure.

In relation to the archaeological context, a search of the AHIMS register has identified 3 known Aboriginal sites currently recorded within two kilometre of the project area and include one shell midden, one scar tree and one PAD. There are no registered sites or Aboriginal Places within the project area. Considering the AHIMS results, local and regional archaeological investigations as well as the environmental context, given that fresh water was necessary for survival and there are no local sources of fresh water, the absence reliable of fresh water indicates the project area and immediate surrounds may have been used no more than hunting and gathering opportunities rather that large-scale long-term camping. Evidence of such past Aboriginal land uses manifest in the archaeological record as low-density artefact scatters and isolated artefacts.

The project area, consisting of a disturbed landscape, was surveyed as one survey unit. Previously cleared and levelled, a number of access roads are located throughout the project area for the existing caravan park. The caravan park itself consists of well-established mobile homes/caravans, large administration building located in the south, two swimming pools and an open area in the centre. Additionally, an open grasses/vegetated area is located in the northern portion and a number of parked vehicles along the western side of the property. Additionally, the survey did not identify any evidence of exposed sandstone that may have provided temporary water catchment locations following heavy rain. No sites or PADs were identified in the project area and as such there are no impacts on the archaeological record and the following recommendations are provided:

1) The persons responsible for the management of onsite works will ensure that all staff, contractors and others involved in construction and maintenance related activities are made aware of the statutory legislation protecting sites and places of significance. Of particular importance is the National Parks and Wildlife Regulation 2019, under the National Parks and Wildlife Act 1974;

2) An Unexpected Finds Procedure (Appendix B) will be implemented during all works, and

3) Should any Aboriginal objects be uncovered during works, all work will cease in that location immediately, the Unexpected Findsa Procedure followed and the Environmental Line contacted.

GLOSSARY

Aboriginal Place: are locations that have been recognised by the Minister (and gazetted under the *National Parks and Wildlife Act 1974*) as having special cultural significance to the Aboriginal community. An Aboriginal Place may or may not include archaeological materials.

Aboriginal Site: an Aboriginal site is the location of one or more Aboriginal archaeological objects, including flaked stone artefacts, midden shell, grinding grooves, archaeological deposits, scarred trees etc.

Artefact: any object that is physically modified by humans.

Artefact scatter: a collection of artefacts scattered across the surface of the ground (also referred to as open camp sites).

Assemblage: a collection of artefacts associated by a particular place or time, assumed generated by a single group of people, and can comprise different artefact types.

Backed artefact: a stone tool where the margin of a flake is retouched at a steep angle and that margin is opposite a sharp edge.

Background scatter: a term used to describe low density scatter of isolated finds that are distributed across the landscape without any obvious focal point.

Core: a chunk of stone from which flakes are removed and will have one or more negative flake scars but no positive flake scars. The core itself can be shaped into a tool or used as a source of flakes to be formed into tools.

Debitage: small pieces of stone debris that break off during the manufacturing of stone tools. These are usually considered waste and are the by-product of production (also referred to as flake piece).

Flake: any piece of stone struck off a core and has a number of characteristics including ring cracks showing where the hammer hit the core and a bulb of percussion. May be used as a tool with no further working, may be retouched or serve as a platform for further reduction.

Flaked piece/waste flake: an unmodified and unused flake, usually the by-product of tool manufacture or core preparation (also referred to as debitage).

Harm: is defined as an act that may destroy, deface or damage an Aboriginal object or place. In relation to an object, this means the movement or removal of an object from the land in which it has been situated

In situ: archaeological items are said to be "in situ" when they are found in the location where they were last deposited.

Retouched flake: a flake that has been flaked again in a manner that modified the edge for the purpose of resharpening that edge.

Typology: the systematic organization of artefacts into types on the basis of shared attributes.

ACRONYMS

ACHA	Aboriginal Cultural Heritage Assessment
ACHMP	Aboriginal Cultural Heritage Management Plan
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit

AHIMS SITE ACRONYMS

ACD	Aboriginal ceremonial and dreaming
AFT	Artefact (stone, bone, shell, glass, ceramic and metal)
ARG	Aboriginal resource and gathering
ART	Art (pigment or engraving)
BOM	Non-human bone and organic material
BUR	Burial
CFT	Conflict site
CMR	Ceremonial ring (stone or earth)
ETM	Earth mound
FSH	Fish trap
GDG	Grinding groove
HAB	Habitation structure
HTH	Hearth
OCQ	Ochre quarry
PAD	Potential archaeological deposit.
SHL	Shell
STA	Stone arrangement
STQ	Stone quarry
TRE	Modified tree (carved or scarred)
WTR	Water hole

1 INTRODUCTION

1.1 INTRODUCTION

McCardle Cultural Heritage Pty Ltd (MCH) has been engaged by Vivacity Property to undertake an Archaeological Due Diligence Assessment for the redevelopment of the Oasis Caravan Park and associated civil infrastructure located at 205, 207-209 Wallarah Road, Kanwal NSW, consisting of Lot 1 DP518378, Lot 1223 DP 1004170 and Lots 14 and 15 DP 23235 and Lot 1 DP518378 (the Study Area of 5.34ha).

The assessment has been undertaken to meet the Heritage NSW, Department of Premier & Cabinet Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW and the brief. The purpose of a due diligence assessment is to assist proponents to exercise due diligence when carrying out activities that may harm Aboriginal objects or Aboriginal places and to determine whether that should apply for a consent to harm Aboriginal objects or Places through an Aboriginal Heritage Impact Assessment (AHIP).

The purpose of this due diligence report is to demonstrate that all reasonable and practicable measures have been undertaken to prevent harm to any Aboriginal objects and/or place within the project area. This report has met the Heritage NSW Due Diligence requirements and considered the relevant environmental and archaeological information, the project land condition, the nature of the proposed development activity and impacts, as well as preparing appropriate recommendations.

1.2 PROPOSED DEVELOPMENT

The project will include the demolition of the current caravan park and rezoning for a mixed-use development composed of apartment buildings, supermarket and public parklands, and associated access roads and ancillary infrastructure.

Works typically associated with the development and associated infrastructure and utilities include clearing, site remediation, bulk earthworks including construction of the buildings, basements and roads, services reticulation: WW, PW, NBN, electrical and gas and landscaping.

Works are to clear the majority of vegetation within the project area. Minimal native canopy or shrub species are present within the site and have been assessed as being in a highly degraded condition (AEP 2022).

1.3 THE PROJECT AREA

The project area is located at 205, 207-209 Wallarah Road, Kanwal. Including Lot 1 DP518378, Lot 1223 DP 1004170 and Lots 14 and 15 DP 23235 and Lot 1 DP518378, the location of the project area is shown in Figures 1.1 and 1.2. The caravan park includes onsite permanent accommodation, site office, swimming pool and bathroom facilities. Lots 14 & 15 are proposed to be retained as parklands. The Study Area totals 5.34ha and comprises predominately of infrastructure relevant to the caravan park and areas of vegetation connected to the adjacent allotment of the north.

Figure 1.1 Location of the project area

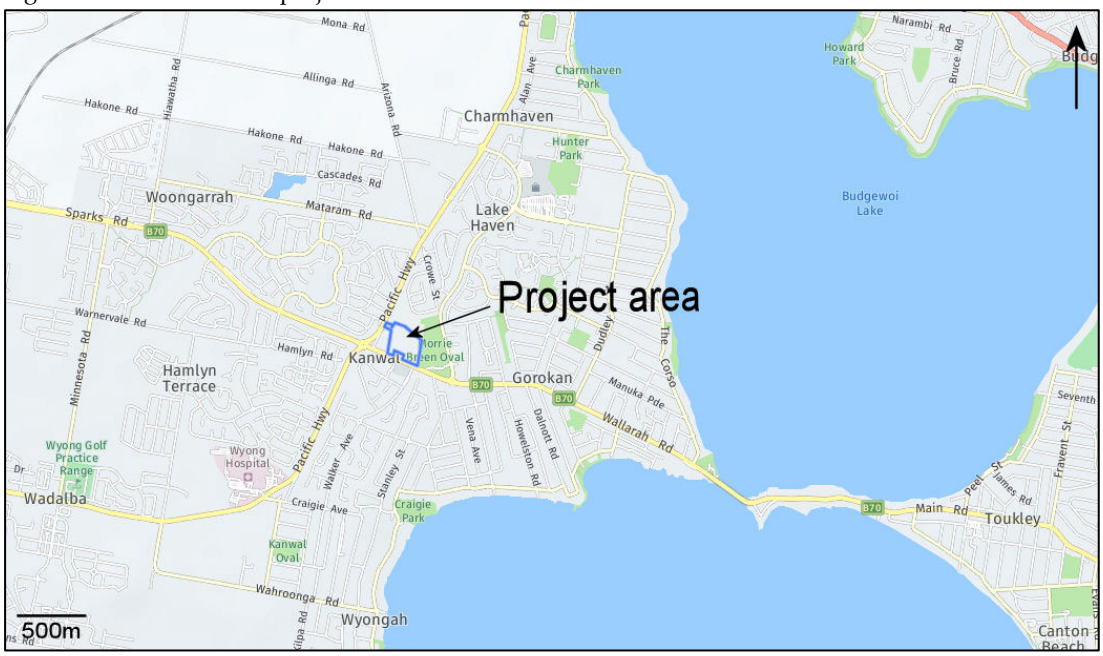


Figure 1.2 Aerial photograph of the project area (Nearmap 2023)

1.4 OBJECTIVES OF THE DUE DILIIGENCE ASSESSMENT

The objectives and primary tasks of this due diligence assessment were to:

- undertake a search of the Aboriginal Heritage Management System (AHIMS) and other relative registers;

- undertake research into the environmental and archaeological contexts of the project area;
- develop a predictive model of site location for the project area;
- undertake a field survey of the project area;
- assess the potential impacts of the proposed development on any identified Aboriginal sites or potential archaeological deposits (PADs) identified within the project area;
- assess the significance of any identified Aboriginal objects or sites identified within the project area;
- complete and submit site cards to AHIMS for any Aboriginal sites identified; and
- provide appropriate recommendations.

1.5 LEGISLATIVE CONTEXT

The following overview of the legislative framework, is provided solely for information purposes for the client, and should not be interpreted as legal advice. MCH will not be liable for any actions taken by any person, body or group as a result of this general overview and MCH recommends that specific legal advice be obtained from a qualified legal practitioner prior to any action being taken as a result of the general summary below.

Land managers are required to consider the effects of their activities or proposed development on the environment under several pieces of legislation. Although there are a number of Acts and regulations protecting Aboriginal heritage, including places, sites and objects, within NSW, the three main ones include:

- National Parks and Wildlife Act (1974, as amended)
- National Parks and Wildlife Regulation (2019)
- Environmental Planning and Assessment Act (1979)

1.5.1 NATIONAL PARKS AND WILDLIFE ACT (1974, AS AMENDED)

The National Parks and Wildlife Act (1974), Amended 2019, is the primary legislation for the protection of Aboriginal cultural heritage in New South Wales. The NPW Act protects Aboriginal heritage (places, sites and objects) within NSW and the protection of Aboriginal heritage is outlined in s86 of the Act, as follows:

- "A person must not harm or desecrate an object that the person knows is an Aboriginal object" s86(1)
- "A person must not harm an Aboriginal object" s86(2)
- "A person must not harm or desecrate an Aboriginal place" s86(4)

Penalties apply for harming an Aboriginal object, site or place. The penalty for knowingly harming an Aboriginal object (s86[1]) and/or an Aboriginal place (s86[4]) is up to $550,000 for an individual and/or imprisonment for 2 years; and in the case of a corporation the penalty is up to $1.1 million. The penalty for a strict liability offence (s86[2]) is up to $110,000 for an individual and $220,000 for a corporation.

Harm under the National Parks and Wildlife Act (1974, as amended) is defined as any act that destroys defaces or damages the object, moves the object from the land on which it has been situated,

causes or permits the object to be harmed. However, it is a defence from prosecution if the proponent can demonstrate that;

1) harm was authorised under an Aboriginal Heritage Impact Permit (AHIP) (and the permit was properly followed), or
2) the proponent exercised due diligence in respect to Aboriginal heritage.

The 'due diligence' defence (s87[2]), states that if a person or company has applied due diligence to determine that no Aboriginal object, site or place was likely to be harmed as a result of the activities proposed for the Project Area, then liability from prosecution under the NPW Act 1974 will be removed or mitigated if it later transpires that an Aboriginal object, site or place was harmed. If any Aboriginal objects are identified during the activity, then works should cease in that area and Heritage NSW, Department of Premier & Cabinet notified (DECCW 2010:13). The due diligence defence does not allow for continuing harm or as defence to s.86(1) or (4).

The archaeological due diligence assessment and report has been carried out in compliance with the Heritage NSW (DECCW 2010) Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW.

1.5.2 NATIONAL PARKS AND WILDLIFE REGULATION (2019)

The National Parks and Wildlife Regulation 2019 provides a framework for undertaking activities and exercising due diligence in respect to Aboriginal heritage. The Regulation (201909) recognises various due diligence codes of practice, including the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW, but it also outlines procedures for Aboriginal Heritage Impact Permit (AHIP) applications and Aboriginal Cultural Heritage Consultation Requirements (ACHCRs); amongst other regulatory processes.

1.5.3 ENVIRONMENTAL PLANNING & ASSESSMENT ACT 1979 (EP&A ACT)

The *Environmental Planning and Assessment Act 1979* (EP&A Act) establishes the statutory framework for planning and environmental assessment in NSW and the implementation of the EP&A Act is the responsibility of the Minister for Planning, statutory authorities and local councils. The EP&A Act sets up a planning structure that requires developers (individuals or companies) to consider the environmental impacts of new projects. Under this Act, cultural heritage is considered to be a part of the environment. It provides for the identification, protection and management of heritage items through inclusion of these items into schedules off planning instruments, such as Local Environmental Plans (LEPs) or Regional Environmental Plans (REPs). This Act requires that Aboriginal cultural heritage and the possible impacts to Aboriginal heritage that development may have, are formally considered in land-use planning and development approval processes.

This Act has three main parts of direct relevance to Aboriginal cultural heritage. Namely, Part 3 which governs the preparation of planning instruments, Part 4 which relates to development assessment provisions for local government (consent) authorities and Part 5 which relates to activity approvals by governing (determining) authorities. Planning decisions within Local Government Areas (LGAs) are guided by Local Environmental Plans (LEPs). Each LGA is required to develop and maintain an LEP that includes Aboriginal and historical heritage items which are protected under the EP&A Act and the NPW Act. The Project Area is located within the Central Coast LGA and falls under the 2022 LEP.

1.5.4 LOCAL ENVIRONMENTAL PLAN

The project area is located within the Central Coast LGA. Schedule 5 of the LEP 2020 details the heritage requirements and heritage items covered by the plan. No Aboriginal sites or places are identified within proximity to the project area.

1.6 ABORIGINAL COMMUNITY CONSULTATION

A due diligence assessment relates to the physical identification of Aboriginal objects, sites and places. Community consultation is only required once Aboriginal objects, sites or places have been identified and an Aboriginal Heritage Impact Permit (AHIP) is deemed necessary. Section 5.2 of the Heritage NSW (DECCW 2010) Due Diligence Code of Practice for the protection of Aboriginal Objects in NSW specifically states that;

> *'consultation with the Aboriginal community is not a formal requirement of the due diligence process' (2010:8).*

However, in order to consider the cultural significance of the project are, a copy of the draft report was sent to DLALC with a request for comment. DLALC responded agreeing with the draft assessment (Appendix A).

1.7 QUALIFICATIONS OF THE INVESTIGATOR

Dr. Penny McCardle: Principal Archaeologist & Forensic Anthropologist has 22 years experience in Indigenous archaeological assessments, excavation, research, reporting, analysis and consultation and 19 years in skeletal identification, biological profiling and skeletal trauma identification for NPWS, NSW Police and the NSW Department of Forensic Medicine.

- BA (Archaeology and Palaeoanthropology): Indigenous archaeology, University of New England 1999
- Hons (Archaeology and Palaeoanthropology): Physical Anthropology, University of New England 2001
- Forensic Anthropology Course, University of New England 2003
- Armed Forces Institute of Pathology Forensic Anthropology Course, Ashburn, VA 2008
- Analysis of Bone trauma and Pseudo-Trauma in Suspected Violent Death Course, Erie College, Pennsylvania, 2009
- Documenting Scenes of War and Human Rights Violations. Institute for International Criminal Investigations, 2018
- PhD, University of Newcastle, 2019

1.8 REPORT STRUCTURE

The report includes Section 1 which outlines the project, Section 2 presents the environmental and archaeological context, Section 3 provides the results and discussion and Section 4 presents the Impact Assessment, Section 5 discusses the mitigation measures and Section 6 provides the management recommendations.

2 ENVIRONMENTAL AND ARCHAEOLOGICAL CONTEXT

The archaeological due diligence process and assessment requires that the available knowledge and information in relation to the environmental and archaeological contexts is considered. The purpose of this is to assist in identifying whether Aboriginal objects, sites or places are likely to be present within the project area based on archaeological predictive modelling and in what condition they may be found in given the environmental impacts.

2.1 LOCAL ENVIRONMENT

Past site location and land use are closely linked to the environment including the landform, geology, geomorphology, soils, waterways and associated resources. The environmental context is important to identify potential factors relating to past Aboriginal land use patterns.

The project area is situated the in the Central Coast area on the Clifton Sub-group of the Triassic Narrabeen Group that consists of claystone, sandstone and shale (Sydney 1:250,000 Geological Series Sheet, 1966). Consisting of a disturbed landform, the project area includes the Gorokan soil landscape. Crests, ridges and slopes generally have up to 15 centimetres of loose dark brown sandy loam (A_1 horizon) that overlies up to 30 centimetres of yellowish-brown hard setting clayey sand (A_2 horizon) that overlays the B horizon. In exposed areas the A_1 horizon is often absent and the A_2 is exposed at the surface. The mid slopes usually include <15 centimetres of the A_1 horizon that overlays 10-15 centimetres of the A_2 that then overlies the B horizon. Lower slopes consist of 10-50 centimetres of the A_1 horizon that overlays 10-50 centimetres of the A_2 horizon that then overlays the B horizon. The drainage lines include up to 10 centimetres of the A_1 horizon overlying 30 centimetres of the A_2 horizon that then overlays a clay B/C horizon, (Murphy 1993:56-58).

The A horizon of the Gorokan Soil Landscape of the project area are generally 30cm or less in depth and soil deflation and erosion expose rather than bury former land surfaces on which stone artefacts may have been present, removing the upper part of the soil profile, usually to the exposed B horizon. The geomorphology of the Central Coast is complex and consist of an upper soil Horizon A and underlying B. Unit A and Unit B are interpreted as being Holocene and Pleistocene in age respectively. Within the region, sites tend to occur on or within soil Horizon A or are often present at the interface of the A and B horizons. Within the A horizon the lowermost (in terms of vertical positioning) artefact assemblages tend to contain artefacts that are typically attributed to the mid-Holocene, as characterised by an increase in the number of backed artefacts.

In terms of fresh water sources, there are no fresh water sources within approximately 450 metres of the project area. An unnamed 1st order stream is mapped within the Study Area and starts to the north of the Project area. However, the Riparian Assessment Report (AEP, June 2022) revealed that the field investigations showed that no watercourse was present in the project area and the area is not recognised as a wetland.

In relation to land uses and associated impacts, Heritage NSW (DECCW 2010) defines disturbed lands as land that has been the subject of human activity that has changed the lands' surface and, or subsurface, these changes being changes that remain clear and observable. This definition is based on the types of disturbances classified in The Australian Soil and Land Survey Field Handbook (CSIRO 2010) and Table 2.1 provides a scale formulated by the CSIRO of the levels of disturbances and their classification, which will assist in determining the level of disturbance across the project area and its impact on potential cultural material that may be present.

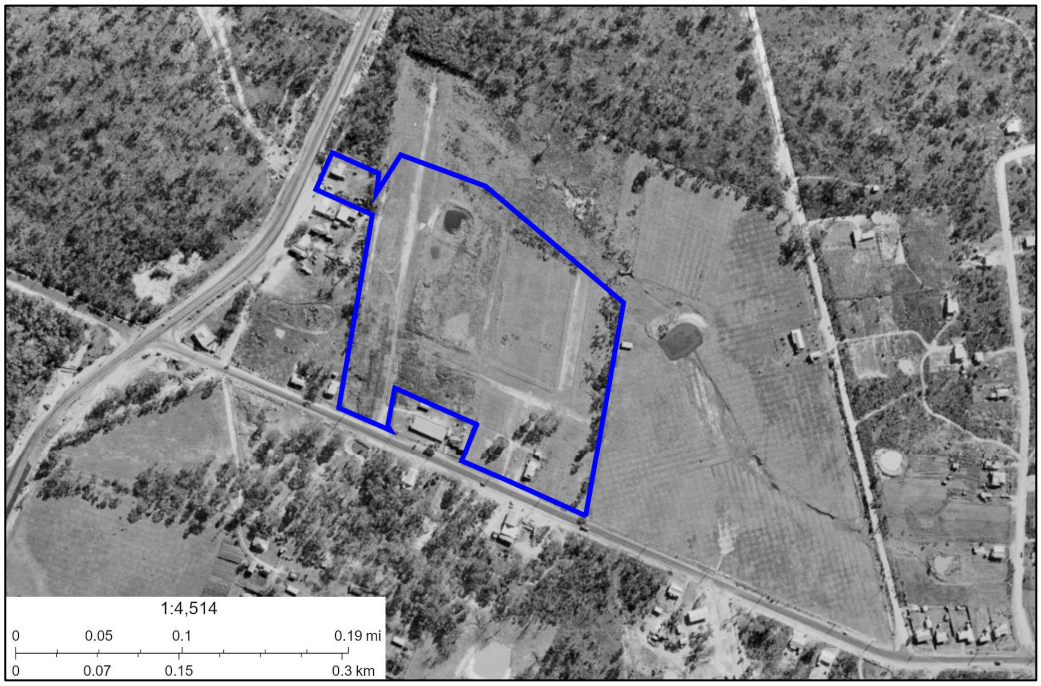
Table 2.1 Land use scale (CSIRO 2010)

Minor disturbance		Moderate disturbance		Major disturbance	
Cleared and/or grazed at some time, but apparently never ploughed		Cleared and/or grazed at some time, with ploughing also attested		Severe disturbance to natural soil profiles; complete-to-near complete topsoil loss/disturbance	
0	No effective disturbance; natural	3	Extensive clearing (e.g., poisoning and ringbarking	6	Cultivation: grain fed
1	No effective disturbance other than grazed by hoofed animals	4	Complete clearing: pasture native or improved, but never cultivated	7	Cultivation: irrigated, past and present
2	Limited clearing (e.g., selected logging)	5	Complete clearing: pasture native or improved, cultivated at some stage	8	Highly disturbed: e.g., quarry, road works, mining, landfill, urban

Regionally, following European settlement of the area in the 1820s, the regional landscape has been subjected to a range of different modifactory activities including extensive logging and clearing, agricultural cultivation (ploughing), pastoral grazing, residential developments and other construction works. The associated high degree of landscape disturbance has resulted in the alteration of large tracts of land and the cultural materials contained within these areas.

Based on historic aerial photography and Nearmap (2000 – 2023), the current project area has been subject to a range of both moderate and high landuses disturbances and impacts. As shown in the 1965 aerial photograph (Figure 2.1), the entire project area had been completely cleared and levelled, a number tracks are present and a large dam is located in the north western area. It is also likely that the project area was ploughed at least once for pasture grass and grazing.

Figure 2.1 Historic aerial photograph of the project area in 1965 (NSW Historic Imagery)



The 1971 aerial photograph (Figure 2.2) indicates no additional works or clearing has occurred, whilst the 1975 and 1976 aerial photographs (Figure 2.3 and 2.4) show additional tracks/access roads and the start of the establishment of the current caravan park.

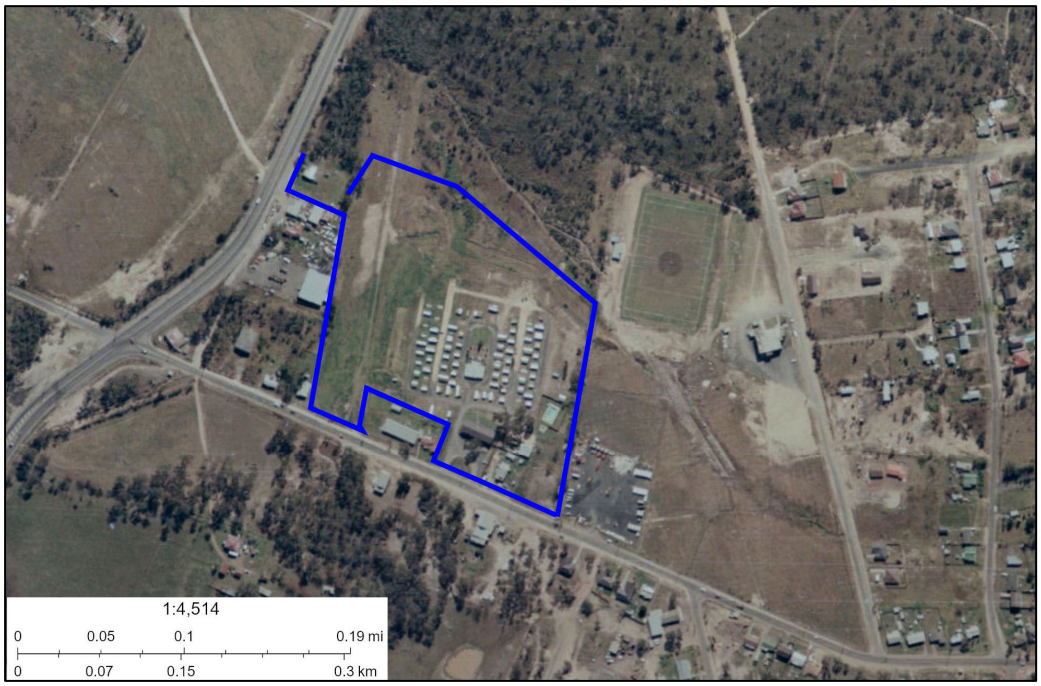
Figure 2.2 Historic aerial photograph of the project area in 1971 (NSW Historic Imagery)

Figure 2.3 Historic aerial photograph of the project area in 1975 (NSW Historic Imagery)

Figure 2.4 Historic aerial photograph of the project area in 1976 (NSW Historic Imagery)

By 1980 (Figure 2.5) the caravan park is well established with the associated infrastructure and there does not appear to be any additional major changes from then until today.

Figure 2.5 Historic aerial photograph of the project area in 1976 (NSW Historic Imagery)



The past land uses (clearing, dams, access roads, site establishment and infrastructure) and how they impact on the landscape and deposits are discussed below.

Early vegetation clearing included the uprooting of trees by chaining which disturbed or destroyed that may be present near, or underneath trees and vegetation (Wood 1982). Alternatively, timber

was harvested manually, using axes and hand saws and generally, only the trees that were wanted for timber were felled (selective logging). However, after the 1950s, there was an increase in mechanisation in the logging industry, and clear-felling became widely practised whereby the best logs were removed for processing, but nearly every other tree was bulldozed and burnt, and had increased impacts to the landscape.

Farming and agricultural activities also disturbed the landscape. Pastoralism activities result in disturbances due to vegetation clearance and the trampling and compaction of grazed areas which accelerate the natural processes of sheet and gully erosion, which in turn can cause the horizontal and lateral displacement of artefacts. Furthermore, grazing by hoofed animals can affect the archaeological record due to the displacement and breakage of artefacts resulting from trampling (Yorston et al 1990). Pastoral land uses are also closely linked to alterations in the landscape due to the construction of dams, fence lines and associated structures. As a sub-set of agricultural land use, ploughing typically disturbs the top 10-35 centimetres of topsoil (Koettig 1986, Personal obs.) depending on the method and machinery used during the process. Ploughing increases the occurrence of erosion and can also result in the direct horizontal (up to 18 metres per plough run) and vertical movement of artefacts, thus causing artificial changes in artefact densities and distributions (e.g., Roper 1976; Odell and Cowan 1987; Lewarch and O'Brien 1981). Ploughing activities are typically evidenced through 'ridges and furrows' however a lengthy cessation in ploughing activities dictates that these features may no longer be apparent on the surface.

Excavation works required for developments, including but not limited to dams, roads, business, residential, industrial, works depos and associated infrastructure and utilities, require excavation, cut and fill methods. These direct impacts to the land and associated cultural materials that may be present are easy to see and understand. Any form of construction or resource exploitation that involves the removal of, relocation of or compaction or soils sediments or minerals, requires the modification of the topography, thus displacing and/or destroying any cultural materials that may have been present (Wood 1982). Theses significant disturbances have results in none of the original topsoils remining in situ.

In terms of everyday land uses, vehicular movements on sites have been well documented and based on several experiments (DeBloois, Green and Wylie 1974, Gallagher 1978), have shown that vehicle movements over an archaeological site are extremely destructive to the site through compaction and movement, thus altering the spatial relationship and location of the artefacts. Based on general observations it is expected that the creation of dirt tracks for vehicle access would also result in the loss of vegetation and therefore will enhance erosion and the associated relocation of cultural materials.

Additional disturbances would have derived from natural processes. The patterns of deposition and erosion within a locality can influence the formation and/or destruction of archaeological sites. Within an environment where the rate of erosion is generally high, artefacts deposited in such an environment will be eroded downslope after being abandoned (Waters 2000; Waters and Kuehn 1996). If erosion occurs after cultural material is deposited, it will disturb or destroy sections, or all of, archaeological sites even if they were initially in a good state of preservation. The more frequent and severe the episodes of erosional events the more likely it is that the archaeological record in that area will be disturbed or destroyed.

Additionally, bioturbation processes such as the redistribution and mixing of cultural deposits occurs as a result of burrowing and mounding by earthworms, ants and other species of burrowing animals. Artefacts can move downwards through root holes as well as through sorting and settling due to gravity, and translocation can also occur as a result of tree falls (Balek 2002; Peacock and Fant 2002; Canti 2003; Stein 2003:). Experiments to assess the degree that bioturbation can affect material have been undertaken. In abandoned cultivated fields in South Carolina, Michie (summarised in

Balek 2002:42-43) found that over a 100-year period 35% of shell fragments that had been previously used to fertilise the fields were found between 15 and 60 centimetres below the surface, inferred to be as a result of bioturbation and gravity. The ways in which earthworms can affect cultural deposits includes: creating false artefact concentrations and stratigraphy (for example biomantles) by moving artefacts downwards through the soil; indirectly displacing larger artefacts as they burrow through the soil; burying artefacts through the deposition of faecal material on the surface; and blurring natural and cultural boundaries. They can also destroy remains of seeds and organic materials as they eat them (Fowler et al. 2004:462; Stein 1983:280-281).

The project area is located within an environment that provided very limited resources. Without a fresh water supply to enable camping, the project area may have been utilised for more transitory activities such as travel and hunting and gathering on the way to reliable water and associated subsistence resources. Such past Aboriginal land uses are manifest in the archaeological record as a background scatter of discarded artefacts (such as isolated artefacts and/or very low-density artefact scatters). In relation to modern alterations to the landscape, the previous large-scale clearing and leveling, possible ploughing and grazing, dam construction, existing caravan park and associated infrastructure can be expected to have had moderate to high impacts upon the archaeological record at those locations.

2.2 ARCHAEOLOGICAL CONTEXT

A review of the archaeological literature of the region, and more specifically the local area and the results of an AHIMS search provide essential contextual information for the current assessment.

While the Aboriginal occupation of Australia is currently accepted as beginning approximately 65,000 years ago (Clarkson et al. 2017), the Aboriginal occupation of the Hunter Valley has been dated to approximately 20,000 years (Brayshaw 1987:100). Radiocarbon dates obtained from charcoal at a site in Glennies Creek, north of Singleton, found that artefacts within the deposit dated to approximately 20,200 years before present (BP). Despite this Pleistocene period site, most of the archaeology in the Hunter region has been dated to the Holocene period.

There are many types of evidence past Aboriginal occupation across the landscape which form the archaeological record of a region. Places which show evidence of Aboriginal occupation of an area are archaeological sites. These sites contain numerous site features, and some contain more than one features. The Aboriginal heritage information management system (AHIMS) provides information of the known archaeological sites in NSW.

2.2.1 ABORIGINAL HERITAGE INFORMATION MANAGEMENT SYSTEM (AHIMS)

It must be noted that there are many limitations with an AHIMS search including incorrect site coordinates due to errors and changing of computer systems at AHIMS over the years that failed to correctly translate old coordinate systems to new systems. Secondly, AHIMS will only provide up to 110 sites per search, thus limiting the search area surrounding the project area and limiting a more comprehensive analysis and finally, few sites have been updated on the AHIMS register to notify if they have been subject to a s87 or s90 and as such what sites remain in the local area and what sites have been destroyed, to assist in determining the cumulative impacts, is unknown.

A search of the AHIMS register (Appendix B) has identified 3 known Aboriginal sites currently recorded within two kilometre of the project area and include one shell midden, one scar tree and one PAD (Figure 2.6). There are no registered sites or Aboriginal Places within the project area.

Figure 2.6 Location of AHIMS sites

2.2.2 HERITAGE REGISTER LISTINGS

The National Heritage List, the Commonwealth Heritage List, the Australian Heritage Database, Australia's National Heritage List, The National Trust Heritage Register State Heritage Inventory the and the relevant Local Environmental Plan have no Aboriginal objects, sites or places listed.

2.2.3 SUMMARY OF THE REGIONAL ARCHAEOLOGICAL CONTEXT

The majority of archaeological surveys and excavations throughout the region have been undertaken in relation to environmental assessments for developments across the Central Coast. A review of the two most relevant regional investigations (Vinnicombe 1980; Dallas *et al* 1987) illustrates consistency in site type and location across the region as well as a possible bias in the results due to a focus on specific landforms.

The corpus of recorded sites is described and assessed qualitatively in MCH (2005) who undertook a regional based desk top study of the Gosford/Wyong region. Following an AHIMS site search, 251 known Aboriginal sites were registered within a twenty-four-kilometre-wide by twenty-nine-kilometre-long search area. Following a detailed review of all assessments and site cards, MCH provide an overview of the archaeology for the wider Gosford/Wyong area and found that in the sandstone country of the Sydney Basin certain topographic zones may be more or less likely to contain certain types of archaeological evidence. For example, it is generally held that shelter sites are more likely to be located on slopes, and grinding grooves are commonly found ridge tops. Indeed, 97% of the shelter sites for which landform was recorded are situated on ridge or slope formations, a trend which is largely a reflection of the fact that sites of this type require the presence of sandstone structures which are rarely found outside these topographical contexts.

Similarly, in order to establish grinding grooves, the appropriate sandstone outcrops and water resources must be available. In relation to the high proportion of grinding grooves identified in the locality, MCH found that a relatively high proportion of these sites were recorded as part of "personal study" or "private research" and were not identified during the course of a systematic archaeological survey. It is therefore likely that although some grinding groove sites were recorded in the course of systematic surveys, they are over-represented within the sample. The over-representation of grinding grooves is apparently a manifestation of biased sampling practices and, given that grinding groove sites are generally closely linked to water supplies, it follows that proximity to water will be identified as an archaeologically important trait. However, when grinding groove sites are exempted from the analysis, it is apparent that the majority of sites are located between 51 and 100 meters from water, with sites within ten meters of water comprising approximately 18% of the total sites examined, a finding which is concurrent with the regional pattern identified by Vinnicombe (1980) and others.

A number of issues were identified in relation to the relationship between site location and water sources. First and foremost are the fact that reliable/permanent water sources may not necessarily consist of creeks or waterways. Rather, within the sandstone country sinkholes/cistern within the sandstone formations can act as water catchment locations and provide a ready supply of water. Importantly, features of this type can only be identified in the course of survey activity and will not be apparent on a topographic map. Given the ubiquity of water supplies within the area, MCH raised the question of whether it is therefore worthwhile questioning whether the location of sites in close proximity to water is reflective of the fact that water resources are a selective factor in site selection and location. However, within well-watered locations other factors may have assumed higher importance in regard to site selection. For example, within a swamp environment, water is readily available across the area, and therefore elevation assumes greater importance. "Visually impressive" sites are frequently recorded as the result of isolated recording events rather than systematic surveys. Dallas *et al* (1987:16) and Kinhill (1995:331) suggest that surveying for the purposes of identifying rock shelters and art sites dictates that less blatant archaeological evidence in the form of artefact scatters, may not be identified or recorded. This suggestion is concurrent with the apparent and somewhat surprising lack of open artefact scatters and isolated finds identified within the region. Furthermore, it is widely acknowledged that the Narrabeen geological formation and, more specifically, the valley bottom landforms within this unit have been largely ignored by systematic surveys (Vinnicombe 1980, Kinhill Engineers 1995, Silcox 1995a, 1995b, 1996, McDonald 1988; MCH 2005).

Consequently, although it is speculated that valley bottoms were utilised as routes of movement thought the sandstone country and would hence have greater concentrations of archaeological material and site types such as open camps (Attenbrow 1981, Dallas et al 1987, Vinnicombe 1980:X:13), but this is yet to be tested. The fact that the valley bottoms are an alluvial formation subject to high-rate deposition also dictates that there is a high likelihood that archaeological deposits in this landform will have been quickly buried beneath alluvium and colluvium. Yet, there has been little or no sub-surface testing within the valley bottoms and consequently it is possible that the relative lack of open campsites is representative of the biases of past sampling strategies rather than a 'true' archaeological pattern. Consequently, predictive statements and assessments of archaeological significance must be prefaced by the assertion that we are working within the confines of an unknown data set, where the parameters (and often reliability) of the "sampling universe" are rarely known and can never be assumed (Rowland 1995: 361).

Based on the data available a broad range of site types are represented including isolated artefacts, open campsites, shelters, grinding grooves, engravings and shelters with art and/or deposit. Within the areas covered by the regional studies, a range of available landforms has been sampled. In regional terms, site distribution is extremely closely linked to topography, with ridge sides, ridge

tops and valley bottoms with access to reliable water exhibiting the highest concentrations of sites. However, it must be emphasised that the vast majority of the areas assessed by the afore-mentioned regional studies are in a variety of topographic and geological contexts and some vary considerably from the specific project area.

2.2.4 SUMMARY OF THE LOCAL ARCHAEOLOGICAL CONTEXT

All archaeological surveys throughout the local area have been undertaken in relation to environmental assessments for developments. The most relevant investigations indicate differing results and observations based on surface visibility and exposure, alterations to the landscape, proximity to water sources and geomorphology.

Previous assessments of the wider local area (Appleton 2006, 2009; Dyall 1980; Heritage Concepts 2006; Therin 2001; RPS 2016, Wild Thing 2002; MCH 2020, 2021a-c, 2022a-d) have identified have identified that artefact scatters and isolated finds are the most prominent site type are the most prominent site types in the area. These assessments have also identified that both landform and distance to water were important factors in past Aboriginal land use with elevated landforms within 50 metres of reliable water to have been the most favoured. The higher the stream order (and more reliable water source) the higher the numbers of sites and site densities, and both decrease with distance from the water source, and a decrease in stream order. A number of sites were also found on slopes; however, it is likely they were eroded down slope and not found in their original location. All sites were noted to have been disturbed through past landuses including but not limited to clearing, agricultural and pastoral activities, residential developments, utilities, infrastructure and erosion. The following is a summary of the previous investigations undertaken within a similar environmental context as the current project area.

- a wide variety of site types are represented in the project area with open campsites and isolated artefacts by far the most common;
- lithic artefacts are primarily manufactured from mudstone and silcrete with a variety of other raw materials also utilised but in smaller proportions;
- sites in proximity to ephemeral water sources or located in the vicinity of headwaters of upper tributaries (1st order streams) have a sparse distribution and density and contain little more than a background scatter;
- sites located in the vicinity of the upper reaches of minor tributaries (2nd order streams) also have a relatively sparse distribution and density and may represent evidence of localised one-off behaviour;
- sites located in the vicinity of the lower reaches of tributaries (3rd order creeks) have an increased distribution and density and contain evidence that may represent repeated occupation or concentration of activity;
- sites located in the vicinity of major tributaries (4th and 5th order streams/rivers) have the highest distribution and densities. These sites tend to be extensive and complex in landscapes with permanent and reliable water and contain evidence representative of concentrated activity; and
- sites located within close vicinity at the confluence of any order stream may be a focus of activity and may contain a relatively higher artefact distribution and density.

These findings are consistent with models developed for the area.

2.3 SYNTHESIS OF ENVIRONMENTAL AND ARCHAEOLOGICAL CONTEXTS

The site types identified throughout the area appear to be either low density/small occupation activities or sites that were associated with more secular activities. The broader landform assessment also suggests that larger sites indicative of larger camping groups may be located on the valley floors mainly due to available room compared to the limited and uneven surfaces of the sandstone areas where by large scale habitation is not possible, but may have been utilised as activity areas away from the main camp. Based on information gained from previous studies, both regionally and locally, within a two-kilometre radius of our project area, it can be expected that:

- the likelihood of locating sites increases with proximity to available water; either creeks/rivers along valley floors or sinkholes/cistern within sandstone formations;
- the likelihood of finding large sites increases markedly with proximity to reliable water;
- natural landforms will be utilised in the sandstone country including rock shelters and suitable sandstone surfaces for art/engravings;
- grinding grooves will be located along or near water sources or near sinkholes/cistern within sandstone formations;
- a variety of stone artefact types will be located though the majority will be flakes, flaked pieces and debitage;
- a variety of raw materials utilised in stone tool manufacture will be represented, though the majority of sites will be predominated by mudstone and silcrete;
- the likelihood of finding scarred trees is dependent on the level of clearing in an area; and
- the majority of sites will be subject to disturbances including human and natural.

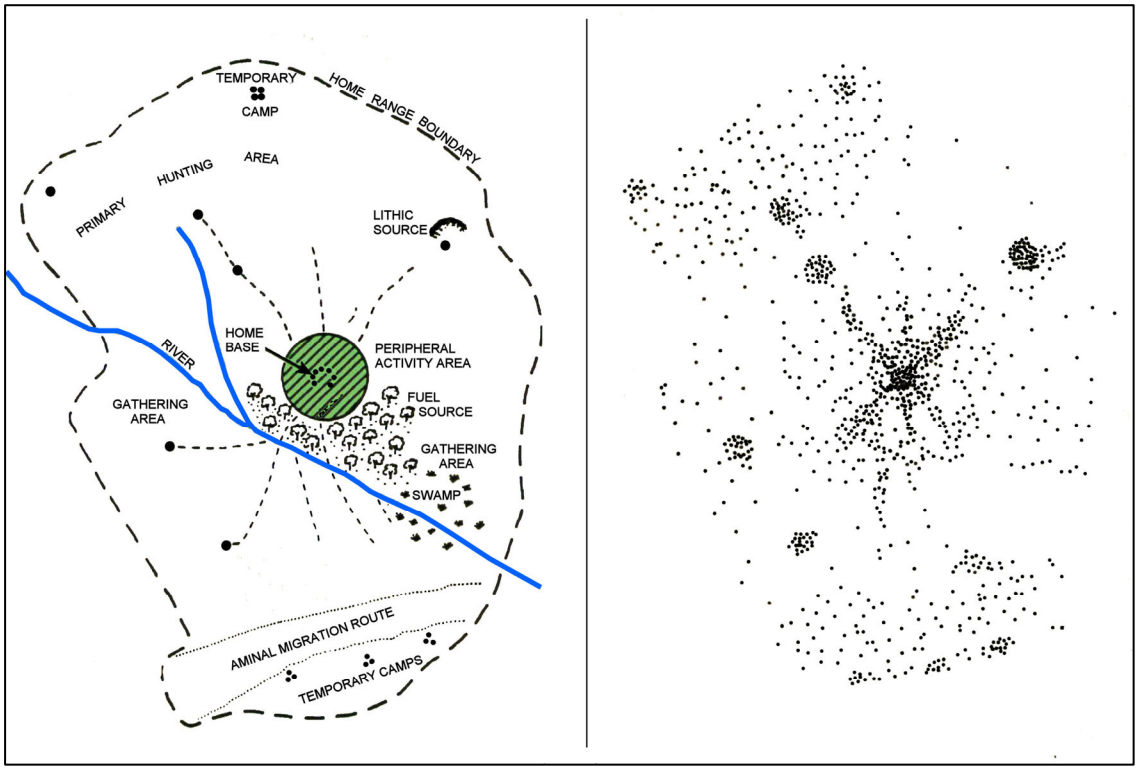
2.4 MODELS OF PAST ABORIGINAL LAND USE

The main aim of this project is to attempt to define both the nature and extent of occupation across the area. As a result, the nature of the analysis will focus on both the landform units and sites. The purpose of this strategy is to highlight any variations between sites and associated assemblages, landforms and resources across the area treating assemblages as a continuous scatter of cultural material across the landscape. In doing this, it is possible to identify variation across the landscape, landforms and assemblages that correspond with variation in the general patterns of landscape use and occupation. Thus, the nature of activities and occupation can be identified through the analysis of stone artefact distributions across a landscape. A general model of forager settlement patterning in the archaeological record has been established by Foley (1981). This model distinguishes the residential 'home base' site with peripheral "activity locations".

Basically, the home base is the focus of attention and many activities and the activity locations are situated away from the home base and are the focus of specific activities (such as tool manufacturing). This pattern is illustrated in Figure 2.7. Home base sites generally occur in areas with good access to a wide range of resources (reliable water, raw materials etc). The degree of environmental reliability, such as reliable water and subsistence resources, may influence the rate of return to sites and hence the complexity of evidence. Home base sites generally show a greater diversity of artefacts and raw material types (which represent a greater array of activities performed at the site and immediate area). Activity locations occur within the foraging radius of a home base camp (approximately 10 km); (Renfrew and Bahn 1991).

Based on the premise that these sites served as a focus of a specific activity, they will show a low diversity in artefacts and are not likely to contain features reflecting a base camp (such as hearths). However, it is also possible that the location of certain activities cannot be predicted or identified, adding to the increased dispersal of cultural material across the landscape. If people were opting to carry stone tools during hunting and gathering journeys throughout the area rather than manufacturing tools at task locations, an increased number of used tools should be recovered from low density and dispersed assemblages.

Figure 2.7 Foley's model (L) and its manifestation in the archaeological record (R), (Foley 1981).



2.5 MODEL OF OCCUPATION FOR THE LOCAL AREA

Work throughout NSW has aimed to understand the nature of Aboriginal occupation and to identify the nature of past Aboriginal land uses. This theme often aims to identify and explain archaeological patterning in site type, content and distribution. General theories have been developed outlining the relationship between land use patterns and the resulting archaeological evidence. A number of models developed for the region have been reviewed (McBryde 1976; Koettig 1994; Dean-Jones and Mitchell 1993; Rich 1995; Kuskie and Kamminga 2000; McDonald and White 2010). All models state that the primary requirements for repeated, concentrated or permanent occupation is access to reliable fresh water. Brief and possible repeated occupation may be represented in areas that have unreliable access to ephemeral water sources, however, these areas will not contain high archaeological evidence or potential (Goodwin 1999).

Kuskie and Kamminga (2000) established a general model of occupation strategies based primarily upon ethnographic research. Used as a starting point, it makes a general set of factors that are consistent with other studies (e.g., McDonald and White 2010, Nelson 1991). The model distinguishes between short-term or extended long-term occupation and makes some predictions about the likely

location of different foraging and settlement activities. Combining this information with a review of assemblage contents from a sample of excavated sites within the region, a baseline of settlement activities may be determined (Barton 2001).

The model provides a number of archaeological expectations that may be tested. For example, the presence of features requiring a considerable labour investment (e.g., stone-lined ovens or heat-treatment pits) are likely to occur at places where occupation occurred for extended periods of time. The presence of grindstones is also a reliable indicator of low mobility and extended occupation as seed grinding requires a large investment of time and effort (Cane 1989). In most ethnographic examples, seed grinding is an activity that takes place over an entire day to provide adequate energetic returns (Cane 1989; Edwards and O'Connell 1995).

Where group mobility was high and campsites frequently shifted throughout the landscape, artefact assemblages are not expected to contain elements such as grindstones, heat-treatment pits, ovens and the diversity of implements frequently discarded at places of extended residential occupation. It may also have been the case that the location of particular activities could not be predicted by tool users, adding to the increased low-density scattering of artefacts over the landscape. Also, if individuals were opting to carry a number of stone tools during hunting and gathering activities and maintaining these tools rather than manufacturing new tools at each task location, the ratio of used tools to unworn flakes in these assemblages should be high. Table 2.2 has been adapted from Kuskie and Kamminga (2000).

Table 2.2 Site descriptions (Kuskie & Kamminga 2000).

Occupation Pattern	Activity Location	Proximity to water	Proximity to food	Archaeological expectations
Transitory movement	all landscape zones	not important	not important	• assemblages of low density & diversity • evidence of tool maintenance & repair • evidence for stone knapping
Hunting &/or gathering without camping	all landscape zones	not important	near food resources	• assemblages of low density & diversity • evidence of tool maintenance & repair • evidence for stone knapping • high frequency of used tools
Camping by small groups	associated with permanent & temporary water	near (within 100m)	near food resources	• assemblages of moderate density & diversity • evidence of tool maintenance & repair • evidence for stone knapping & hearths
Nuclear family base camp	level or gently undulating ground	near reliable source (within 50m)	near food resources	• assemblages of high density &diversity • evidence of tool maintenance, repair, casual knapping • evidence for stone knapping • heat treatment pits, stone lined ovens • grindstones
Community base camp	level or gently undulating ground	near reliable source (within 50m)	near food resources	• assemblages of high density & diversity • evidence of tool maintenance, repair, casual knapping • evidence for stone knapping • heat treatment pits, stone lined ovens • grindstones & ochre • large area >100sqm with isolated camp sites

To identify the specific activity areas through analysis of the composition of patterning of lithic assemblages, is utilised. However, this is applied to excavated materials as they provide more realistic data due to the lesser degree of disturbances, removal and breakages.

2.6 PREDICTIVE MODEL FOR THE PROJECT AREA

An archaeological predictive model is established to identify areas of archaeological sensitivity so it can be used as a basis for the planning and management of Aboriginal heritage. It involves reviewing existing literature to identify basic site distribution patters. These patterns are then modified according to the specific environment of the project area to form a predictive model for site location within the current project area. A sampling strategy is then used to test the model and the results of the survey used to confirm, refute or modify the model.

Land-systems and environmental factors are commonly used factors in predictive modelling based on the assumption that they provide distinctive sets of constraints and opportunities that influenced past Aboriginal land use patterns. As land use patterns may differ between zones (due to different environmental conditions), this may result in the physical manifestation of different spatial distributions and forms of archaeological evidence. The predictive model presented here is based on landform units, previous archaeological assessments conducted within the region, distribution of known sites and site densities and traditional Aboriginal land use patterns. Also taken into consideration are land use impacts (both natural and anthropomorphic) that may have resulted in a disturbed landscape and associated archaeological record.

Considering the AHIMS results, local and regional archaeological investigations as well as the environmental context, given that fresh water was necessary for survival and there are no local sources of fresh water, the absence reliable of fresh water indicates the project area and immediate surrounds may have been used no more than hunting and gathering opportunities rather that large-scale long-term camping. Evidence of such past Aboriginal land uses manifest in the archaeological record as low-density artefact scatters and isolated artefacts.

Non-indigenous settlement and land uses have significantly impacted the investigation area, most noticeably from clearing activities and excavation works associated with the levelling out of the project area and establishment of the current caravan park. These land uses would have impacted on the archaeological record by re-distributing and/or removing any cultural materials that may have been present in the project area.

The presence of past Aboriginal people and their use of the landscape are undeniable and evidence is seen in the cultural materials that have survived both natural and human landuses since colonisation of the area in the 1800's. Whilst it is clear Aboriginal people lived across the landscape, the evidence will have been impacted and/or destroyed through such land uses. Brief descriptions of the site types that may occur in the project area are presented below.

- **Artefact scatters**

Also described as open campsites, artefact scatters and open sites, these deposits have been defined at two or more stone artefacts within 50 metres of each other and will include archaeological remains such as stone artefacts and may be found in association with camping where other evidence may be present such as shell, hearths, stone lined fire places and/or heat treatment pits. These sites are usually identified as surface scatters of artefacts in areas where ground surface visibility is increased due to lack of vegetation. Erosion, agricultural activities (such as ploughing, grazing) and access ways can also expose surface campsites. Artefact scatters may represent evidence of;

- Large camp sites, where everyday activities such as habitation, maintenance of stone or wooden tools, manufacturing of such tools, management of raw materials, preparation and consumption of food and storage of tools has occurred;
- Medium/small camp sites, where activities such as minimal tool manufacturing occurred;
- Hunting and/or gathering events;

- Other events spatially separated from a camp site, or
- Transitory movement through the landscape.

Artefact scatters are a common site type in the locality and the broader region. There is potential for very low-density artefact scatters to occur within the project area. However, there is also the potential for such sites to be impacted on through past land uses.

- **Isolated finds**

Isolated artefacts are usually identified in areas where ground surface visibility is increased due to lack of vegetation. Erosion, agricultural activities (such as ploughing) and access ways can also expose surface artefacts. Isolated finds may represent evidence of;

- Hunting and/or gathering events; or
- Transitory movement through the landscape.

Isolated finds are a common site type in the locality and the broarder region. There is potential for isolated artefacts to occur across the project area and across all landforms. There is also the potential for such sites to be impacted on through past land uses.

3 RESULTS AND DISCUSSION

To comply with the due diligence requirement that a visual inspection of the project area be undertaken, an archaeological survey across the project area was undertaken by MCH archaeologist Dr. Penny McCardle on 8th August 2023. The survey focused on areas of high ground surface visibility and exposures (erosional features, tracks, cleared areas).

3.1 SURVEY UNITS

The project area, consisting of a disturbed landscape, was surveyed as one survey unit. Previously cleared and levelled, a number of access roads are located throughout the project area for the existing caravan park. The caravan park itself consists of well-established mobile homes/caravans, large administration building located in the south, two swimming pools and an open area in the centre. Additionally, an open grasses/vegetated area is located in the northern portion and a number of parked vehicles along the western side of the property. The project area is identified as a highly disturbed landform with very little, if any, of the original top soils remaining due to previous works across the project area. Additionally, the survey did not identify any evidence of exposed sandstone that may have provided temporary water catchment locations following heavy rain. Examples of the project area are provided in Figures 3.1 to 3.4.

Figure 3.1 North western area facing south

Figure 3.2 Far western parcel of land (facing west)

Figure 3.3 Northern open area (facing east)

Figure 3.4 Example of the established section of the project area

The effectiveness of the survey for both obtrusive and unobtrusive archaeological sites, is determined though ground surface visibility and exposures across the project area. Ground surface visibility is used to define the degree to which the surface of the ground can be observed and can be influenced by natural processes, such as the nature and type of vegetation cover, erosion, or land use practices (e.g., ploughing or grading). Existing exposures (visible at the time of the survey) are described in terms of the natural erosion processes responsible for its creation and any other contributing or primary processes (e.g., ploughing, stocking, machinery cutting, vehicle tracks, any ground disturbances). As shown in Table 3.1 the total effective coverage for the project area is 1,202m², or 2.25% reflecting the low surface visibility due to vegetation cover, structures and roads. However, previous exposures through large scale clearing and leveling out of the project area would have resulted in 100% exposures that would have re-distributed or destroyed any archaeological sites.

Table 3.1 Effective coverage for the investigation area

SU	Landform	Area (m2)	Vis. %	Exp. %	Exposure type	Previous disturbances	Present disturbances	Limiting visibility factors	Effective coverage (m2)
1	disturbed	53,400	15%	15%	erosion, vehicle tracks	clearing, leveling, caravan park	erosion, caravan park	vegetation, structures	1,202
Totals		**53,400**							**1,202**
								Effective coverage %	**2.25%**

The level and nature of the effective survey coverage is considered satisfactory to provide an effective assessment of the project area. The coverage was comprehensive for obtrusive site types (e.g., grinding grooves and scarred trees) but somewhat limited for the less obtrusive surface stone artefact sites by surface visibility constraints that included vegetation cover and minimal exposures.

In relation to land uses and the associated impacts on the landscape and any cultural materials that may have been present, the project area has been subject to complete clearing of vegetation, ground leveling, dam construction and the establishment of the current caravan park and the associated infrastructure, and as indicated in Table 3.2, these disturbances range from moderate to high.

Table 3.2 Land use scale (CSIRO 2010) and land uses in the project area

Minor disturbance		Project area	Moderate disturbance		Project area	Major disturbance		Project area
0	No effective disturbance; natural		3	Extensive clearing (e.g., poisoning and ringbarking		6	Cultivation: grain fed	
1	No effective disturbance other than grazed by hoofed animals		4	Complete clearing: pasture native or improved, but never cultivated	yes	7	Cultivation: irrigated, past and present	
2	Limited clearing (e.g., selected logging)		5	Complete clearing: pasture native or improved, cultivated at some stage		8	Highly disturbed: e.g., quarry, road works, mining, landfill, urban	yes

3.2 ARCHAEOLOGICAL SITES AND ARCHAEOLOGICAL SENSITIVITY

No sites or areas of potential archaeological sensitivity were identified in the project areas during the survey and this is due to the significantly high impacts from previous land uses across the project area (clearing of vegetation, ground leveling, dam construction and the establishment of the current caravan park and the associated infrastructure). Additionally, the absence of reliable fresh water, indicates the project area may have been utilised for more transitory activities rather than camping. Evidence of such past Aboriginal land uses manifests in the archaeological record as a background scatter of discarded artefacts, which would have been disturbed/destroyed through past land uses.

In view of the predictive modelling and the results obtained from the effective coverage and disturbance rating, it is concluded that the survey provides a valid basis for determining the probable impacts of the proposal and formulating recommendations for the project. The survey results demonstrate the absence of Aboriginal objects within the project area. The results are consistent with those obtained from other studies in the local area within a similar environmental context. The results indicate a number of possible past Aboriginal land use within the project area;

- No Aboriginal occupation
- Ground disturbances having disturbed or removed evidence

Considering general models of occupation for the locality, the results of this and local investigations, the locality may have been utilised by Aboriginal people. As there are no fresh water resources in the project area or immediate surrounds, the project area is unlikely to have been utilised more than a low intensity usage such as transitory movement or hunting/gathering activities.

3.3 CONCLUSION

It is well established that proximity to water was an important factor in past occupation of the area, which is not surprising as fresh water is necessary for survival. As there are no fresh water sources in the project area or the immediate surrounds, and there is no evidence of exposed sandstone that may have provided temporary water catchment locations following heavy rain, the project area was unsuitable for camping but may have been utilised for transitory movement or hunting/gathering activities only.

In relation to modern alterations to the landscape, previous clearing of vegetation, ground leveling, dam construction and the establishment of the current caravan park and the associated infrastructure can be expected to have had high impacts upon the archaeological record. Natural factors such as erosion would also have impacted on the archaeological record, all of which would have displaced cultural materials and the likelihood of in situ cultural materials is very low to nil.

4 ASSESSMENT OF IMPACTS

The archaeological record is a non-renewable resource that is affected by many processes and activities. As outlined in Section 2 and Section 3, the various natural processes and human activities have impacted on archaeological deposits through both site formation and taphonomic processes.

4.1 IMPACTS

The Heritage NSW Code of Practice for the Archaeological Investigation of Aboriginal Objects in New South Wales (2010:21) describes impacts to be rated as follows:

1) Type of harm: is either direct, indirect or none
2) Degree of harm is defined as either total, partial or none
3) Consequence of harm is defined as either total loss, partial loss, or no loss of value

As no sites or PADs were identified, there are no impacts on the archaeological record.

5 MITIGATION AND MANAGEMENT STRATEGIES

Specific strategies, as outlined through the Heritage NSW Code of Practice for Archaeological Investigation of Aboriginal Objects in New South Wales (DECCW 2010b), the Guide to Investigating, Assessing and Reporting on Aboriginal Cultural Heritage in NSW (OEH 2011), and the Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW (DECCW 2010c), are considered below for the management of the identified site(s) within the project area.

5.1 CONSERVATION/PROTECTION

Conservation is the first avenue and is suitable for all sites, especially those considered high archaeological significance and/or cultural significance. Conservation includes the processes of looking after an indigenous site or place so as to retain its significance and managed in a way that is consistent with the nature of peoples' attachment to them.

As no sites or PADs were identified conservation/protection is not required.

5.2 FURTHER INVESTIGATION

An Aboriginal Heritage Impact Permit (AHIP) is no longer required to undertake test excavations (providing the excavations are in accordance with the Code of Practice for Archaeological Investigations in NSW). Subsurface testing is appropriate when a PAD has been identified, and it can be demonstrated that sub-surface Aboriginal objects with potential conservation value have a high probability of being present, and that the area cannot be substantially avoided by the proposed activity.

As no sites or PADs were identified further investigations are not justified.

5.3 AHIP

If harm will occur to an Aboriginal object or Place, then an AHIP should be sought from Heritage NSW, Department of Premier & Cabinet as a defence to that harm. If a systematic excavation of the known site could provide benefits and information for the Aboriginal community and/or archaeological study of past Aboriginal occupation, a salvage program, and, or community collection, may be an appropriate strategy to enable the salvage of cultural objects.

As no sites or PADs were identified an AHIP is not required.

6 RECOMMENDATIONS

6.1 GENERAL

1) The persons responsible for the management of onsite works will ensure that all staff, contractors and others involved in construction and maintenance related activities are made aware of the statutory legislation protecting sites and places of significance. Of particular importance is the National Parks and Wildlife Regulation 2019, under the National Parks and Wildlife Act 1974;

2) An Unexpected Finds Procedure (Appendix C) will be implemented during all works, and

3) Should any Aboriginal objects be uncovered during works, all work will cease in that location immediately, the Unexpected Findsa Procedure followed and the Environmental Line contacted.

REFERENCES

Andrews, N. 1992, Archaeological survey for an Environmental Study Enterprise Drive; Wyong, Unpublished report to the Wyong Shire.

Appleton, J. 2006. The archaeological investigation for sites of indigenous cultural significance on Part Lot 62 & Lot 64, DP 755245 (additional land to Wyong Employment Zone – WEZ) Sparks Road, Warnervale, Central Coast, NSW. Report to Wyong Shire Council.

Appleton, J. 2009. The archaeological investigation for sites of Indigenous cultural significance in Precinct 7A, Warnervale, Central Coast, NSW. Report prepared for Wyong Shire Council.

Attenbrow, V. 1981. Mangrove Creek Dam Salvage Excavation Project; Two Volumes, Unpublished Report to the National Parks and Wildlife Service on behalf of the NSW Department of Public Works.

Attenbrow, V. 1987. The Upper Mangrove Creek Catchment: A Study of Quantitative Changes in the Archaeological Record. Unpublished PhDThesis, University of Sydney

Archaeological and Heritage Management Solutions Pty Ltd (AHMS). 2009. Bluetongue Brewery Excavation Report. Pacific Beverages Pty Ltd.

Branagan, David F., and Gordon H. Packham, *Field Geology of New South Wales*, Third Edition, Department of Mineral Resources New South Wales, Sydney.

Dallas, M. 1981. An Archaeological Survey at Kariong, NSW. Report to Douglas Sanger Pty Ltd.

Dallas, M., and Gojak. D. 1981. The Gosford Regional Sewerage Scheme: Investigation of Aboriginal Middens at the Broadwater.

Dallas, M. 1986. Archaeological Survey along Hue Hue Road Wyong, NSW. Report to Wyong Shire Council.

Dean-Jones, P. and P.B.Mitchell. 1993. Hunter Valley Aboriginal sites assessment project. Environmental modelling for archaeological site potential in the Central Lowlands of the Hunter Valley. Report to NSW National Parks and Wildlife Service.

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

Department of Environment, Climate Change and Water (DECCW). 2010c. *Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW*. Department of Environment, Climate Change and Water NSW, Sydney.

Drew, J. 1994. Archaeological Assessment of the Emergency operations Centre, Woy Woy Road, Kariong. Report to Mark Lawer Architects.

Du Cros, H., and Rich. E. 1986. Proposed Industrial Development of Crown Land, DP 42612, at Mt Penang, Near Gosford: Archaeological Survey for Aboriginal Sites. Report to NSW Department of Lands.

Dyall, L. 1980. Report on Aboriginal Relics at proposed site for Power Station at Chittaway Point, *NSW*. Report to Electricity Commission.

Dyall, L. 1981. A Preliminary Assessment of Aboriginal Relics on Power Station Site at Olney. Report to the Electricity Commission of New South Wales.

Heritage Concepts. 2006. Aboriginal Archaeological Assessment & Statement of Heritage Impact. Proposed Gas Pipeline Project Munmorah Power Station. Report to Parsons Brinckerhoff on behalf of Delta Electricity.

Hughes, P. J. and Sullivan, M. 1984. Environmental Approaches to the Assessment of Archaeological Significance. In S. Sullivan and S. Bowdler (eds) *Site Surveys and Significance Assessments in Australian Archaeology. Pp: 34-47.*

Hunter, John. 1793, *An historical journal of the transactions at Port Jackson and Norfolk Island.,* London: Stockdale.

Insite Heritage Pty Ltd. 2010. Aboriginal and European Heritage Assessment Wyee – Local Environmental Study. Report to Conics Pty Ltd.

Kinhill Engineers Pty Ltd, 1995a, An Archaeological Survey and Assessment of Compartments 182, 183 and 184, McPherson Sate Forest, NSW, Unpublished report to State Forests NSW, Morisset District

Kinhill Engineers Pty Ltd, 1995b, Morisset Forestry District EIS, An Archaeological Assessment of Aboriginal Archaeological Sites, Unpublished report to State Forests NSW, Morisset District

Koettig, M. and J. McDonald, 1983. Report on a Survey for Archaeological Sites in the Mt Penang Area, Somersby. Report for to Lester Firth Associates Pty Ltd.

Koettig, M. 1986a. Test Excavations at Six Locations along the Proposed Pipeline Route between Glennies Creek Dam, Hunter Valley Region, NSW. A report to the Public Works Department, NSW.

Koettig, M. 1986b. Assessment of Archaeological Sites along the Proposed Singleton to Glennies Creek Water Pipeline Route and the Reservoir Site at Apex Lookout, Hunter Valley, New South Wales. Unpublished report for The Public Works Department.

Kuskie, P.J. 2000. An Aboriginal archaeological assessment of the proposed Mount Arthur North Coal mine, near Muswellbrook, Hunter Valley, New South Wales. Report to Dames and Moore.

Kuskie, P.J., and J. Kamminga. 2000. Salvage of Aboriginal archaeological sites in relation to the F3 Freeway near Lenaghans Drive, Black Hill, New South Wales. Report to Roads and traffic Authority New South Wales.

McDonald, J. 1984, Archaeological Survey of Pacific Highway: Proposed Northbound Carriageway Between Gosford and Kariong, NSW. Report to the Department of Main Roads.

McDonald, J. 1985, Sydney Basin Aboriginal Heritage Study: Rock Engravings and Shelter Art Sites. Stage 1, Unpublished report to the NSW NPWS; Sydney

McDonald, J. 1986, Sydney Basin Aboriginal Heritage Study: Shelter Art Sites. Stage 2, Volume 1, Unpublished report to the NSW NPWS; Sydney

McDonald, J. 1988, The Proposed Warre Warren Aboriginal Place: McPherson State Forest Archaeological Investigation, Report to the Forestry Commission of NSW.

McDonald, J. 1990, Sydney Basin Aboriginal Heritage Study: Engravings and Shelter Art Sites, Stage Three, Volume 1, report to the National Parks and Wildlife Service.

McDonald, J. and A. Ross. 1990, Helping the police with their inquiries: archaeology and politics at Angophora Reserve rockshelter, N.S.W., *Archaeology in Oceania*, 1990; v. 25 no. 3, p. 114-121

McDonald, R.C., Isbell, R.F., Speight, J.G., Walker, J. and Hopkins, M.S. 1998. *Australian Soil and Land Survey Field Handbook, Second Edition*. Inkata Press, Australia.

McCardle Cultural Heritage (MCH). 2005. Wyong Regional Archaeological Report: Archaeological Desk Top Review. Report to Sydney Gas Pty Ltd and DEC.

McCardle Cultural Heritage (MCH). 2020. Johns Rd, Wadalba. Archaeological due diligence assessment. Report to Tocae Group Pty Ltd.

McCardle Cultural Heritage (MCH). 2021a. 110 Jenson Rd, Wadalba. Archaeological due diligence assessment. Report to Jenson Developments Pty Ltd.

McCardle Cultural Heritage (MCH). 2021b. 213 Jenson Rd, Wadalba. Archaeological due diligence assessment. Report to Jenson Developments Pty Ltd.

McCardle Cultural Heritage (MCH). 2021c. 90-100 Jenson Rd, Wadalba. Archaeological due diligence assessment. Report to Fortis Properties Australia Pty Ltd.

McCardle Cultural Heritage (MCH). 2022a. 135 Jenson Rd, Wadalba. Archaeological due diligence assessment. Report to ADW Johnson.

McCardle Cultural Heritage (MCH). 2022b. 30 Jenson Rd, Wadalba. Archaeological due diligence assessment. Report to MKY Enterprises Pty Ltd.

McCardle Cultural Heritage (MCH). 2022c. 40 Jenson Rd, Wadalba. Archaeological due diligence assessment. Report to Interface Planning.

McCardle Cultural Heritage (MCH). 2022d. 130-140 Johns Road, Wadalba. Archaeological due diligence assessment. Report to Interface Planning.

Murphy, C.L. 1993, *Soil Landscapes of the Gosford-Lake Macquarie 1:100 Sheet (Redhead, Wyong, Gosford, Spencer, Laguna)*, Department of Conservation and Land Management Soil Landscape Series: Sydney.

Office of Environment and Heritage (OEH), 2011. *Guide to Investigating, Assessing and reporting on Aboriginal Cultural Heritage in NSW*. Department of Environment, Climate Change and Water NSW, Sydney.

Peacock, E. and D. Fant. 2002. Biomantle Formation and Artifact Transolcation in Upland Sandy Soils: An Example from the Holly Springs National Forest, North-Central Mississippi, U.S.A. In *Geoarchaeology* 17(1):91-114.

Rowland, Mike. 1995, 'Aboriginal prehistoric sites: identifying and assessing significance', In Sharon Sullivan (ed) *Cultural Conservation – towards a national approach,* Australian Government Publishing Service, Canberra, pp. 357-367).

Scott, Anthony. 1998. *The Ecology of the Tuggerah Lakes: An Oral History.* Report by Sainty & Associates and CSIRO Land and Water for Wyongy Shire Council, CSIRO Canberra, Technical Report 40/90

Silcox, R. 1989, Survey for Aboriginal Sites on Lot 3, Somersby Industrial Estate, Near Gosford, NSW. Report to Ashton Scholastic Pty Ltd NSW.

Silcox, R. 1995a, Archaeological Survey and Assessment of the Remainder of Compartments 182, 183 and 184, McPherson State Forest, Kulnura, NSW, Unpublished report to State Forests NSW, Morisset District.

Silcox, R. 1995b, Archaeological Survey and Assessment of Compartment 66, Olney State Forest, NSW, Unpublished report to State Forests NSW, Morisset District.

Silcox, R. 1996, Archaeological survey and assessment of Compartment 128, Ourimbah State Forest, Mangrove Mountain, NSW, Unpublished report to State Forests of NSW, Morisset.

Vinnicombe 1980, Prediction and Predilection: A Study of Aboriginal Sites in the Gosford-Wyong Region, Unpublished report to the NSW NPWS, Hurstville.

Vinnicombe, P. 1984, Single sites or site complexes? A case study from the north of the Hawkesbury River, NSW, pp. 108-117 in S. Sullivan and S. Bowdler (eds), *Sites surveys and significance assessment in Australian Archaeology;* proceedings of the 1981 Springwood Conference on Australian Prehistory, Australian National University, Research School of Pacific Studies, Department of Prehistory, Canberra

Waters, M. 2000. Alluvial Stratigraphy and Geoarchaeology in the American Southwest. *Geoarchaeology: An International Journal* 15(6):537-557.

Waters, M. and D. Kuehn. 1996. The Geoarchaeology of Place: The Effect of Geological Processes on the Preservation and Interpretation of the Archaeological Record. *American Antiquity* 61(3):483-496.

Wild Thing. 2002. Archaeological Heritage Assessment for a proposed pipeline associated with the Integrated Tourist Facility Magenta Shores Wilfred Barrett Drive, The Entrance North, NSW. Report prepared for Mirvac Projects Pty Limited.

Wood, S. 1982. Mechanical treatment impacts to cultural resources in Central Arizona: The marden brush cutter. *Presented at the Symposium on Dynamics and Management of Mediterranean-Type Ecosystems,* June 22-26, 1981, San Diego, California.

Yorston, R.M., Gaffney, V.L. and Reynolds, P.J. 1990. Simulation of artefact movement due to cultivation. *Journal of Archaeological Science,* 17:67-83.

APPENDIX A

DLALC response

Local Aboriginal Land Council
DARKINJUNG

168 Pacific Highway Watanobbi NSW 2259
PO Box 41 Wyong NSW 2259
Phone (02) 4351 2930
ABN 99 583 297 167
Email darkinjung@dlalc.org.au

17 August 2023

By email: tom@vivacityproperty.com.au

Dear Mr Copping,

Re: Oasis Caravan Park – ACHA DD Report

I write to you on behalf of Darkinjung Local Aboriginal Land Council (Darkinjung).

I write in response to your email dated 8 August 2023, wherein you requested Darkinjung's comments on ACHA DD Report for Oasis Caravan Park, Kanwal.

I understand that you have made this request in recognition of Darkinjung's role as cultural authority under the *Aboriginal Land Rights Act 1983* (NSW) on all matters of Aboriginal Cultural Heritage on the Central Coast.

I understand that the Proponent is seeking the following changes to the planning controls affecting Oasis Caravan Park, Kanwal

- Redevelopment of the Oasis Caravan Park, Kanwal.

Darkinjung's comments and recommendations on the report are provided in **Attachment A.**

If you require any further information regarding this matter, please contact me on 0488 706 309 or via email at Jacob.cain@dlalc.org.au

Yours Sincerely,

Jcain

Jacob Cain
Senior Culture & Heritage Officer

Attachment A

Darkinjung's comments and recommendations

ACHA DD Report – Oasis Caravan Park.

• Agree that would have been possibly used more so for hunting or gathering, leaving the chances of finding something still possible but highly unlikely given the past disturbance of construction, vehicle usage, etc. Which would of most likely damaged and/or destroyed any remaining Aboriginal Heritage.

• Nearest Registered Site according to AHIMS is approximately 1.07kms away, ruling out registered sites close enough to consider potential application for an AHIP.

• Highly recommend a procedure be put in place if any unregistered findings were to come up during construction, which would include ceasing work for a limited time, identification of items and a possible application for AHIP to continue works after further investigation.

• Unlikely chance for marked trees due to the area not being close to water, not fully ruling it out if there are still older trees remaining. Some trees have been used to give directions to other sites or give some sort of message to Aboriginal People.

• Agree with the unlikelihood for grinding grooves given how far from water the area lies in.

• Overall happy and can agree with the report and feel the correct due diligence has been undertaken, the area as stated in the report has been very much so disturbed over the past years due to construction, making it much easier to believe that the chances of sites to appear very unlikely but keeping in mind possible, nonetheless. Given the findings of no fresh water nearby increases the likelihood of not finding sites.

Also note that DLALC hasn't been involved in the fieldwork for the project area and am relying on the findings in the survey & report undertaken.

APPENDIX B

AHIMS Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : Oasis Caravan Park

Client Service ID : 806842

Penny Mccardle

Po Box 166

Adamstown New South Wales 2289

Attention: Penny Mccardle

Email: penny@mcheritage.com.au

Date: 06 August 2023

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -33.2701, 151.4623 - Lat, Long To : -33.2342, 151.5241, conducted by Penny Mccardle on 06 August 2023.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.

A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (https://www.legislation.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Heritage NSW upon request

Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Heritage NSW and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date. Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

Level 6, 10 Valentine Ave, Parramatta 2150
Locked Bag 5020 Parramatta NSW 2124
Tel: (02) 9585 6345

ABN 34 945 244 274
Email: ahims@environment.nsw.gov.au
Web: www.heritage.nsw.gov.au

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : Oasis Caravan Park

Client Service ID : 806842

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-7-0359	Lett Street Midden	GDA	56	361044	6318864	Open site	Valid	Shell : 100		
	Contact Darkinjung LALC - Watanobbi	**Recorders**	Mr.Lee Davison					**Permits**		
45-3-4474	Craigie Park	GDA	56	359447	6318631	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	Contact	**Recorders**	Guringai Tribal Link Aboriginal Corporation,Mrs.Tracey Howie					**Permits**		
45-7-0417	Athol Street scar tree	GDA	56	362248	6318748	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Guringai Tribal Link Aboriginal Corporation,Mrs.Tracey Howie					**Permits**		

**** Site Status**

Valid - The site has been recorded and accepted onto the system as valid

Destroyed - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

Partially Destroyed - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

Not a site - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 06/08/2023 for Penny Mccardle for the following area at Lat, Long From : -33.2701, 151.4623 - Lat, Long To : -33.2342, 151.5241. Number of Aboriginal sites and Aboriginal objects found is 3

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

APPENDIX C

Unexpected finds procedure

Unexpected finds procedures

Unexpected find protocols have been developed to provide procedures for unexpected finds including Aboriginal objects and the discovery of human remains. These protocols must be followed throughout all stages of the development.

Unexpected Aboriginal objects

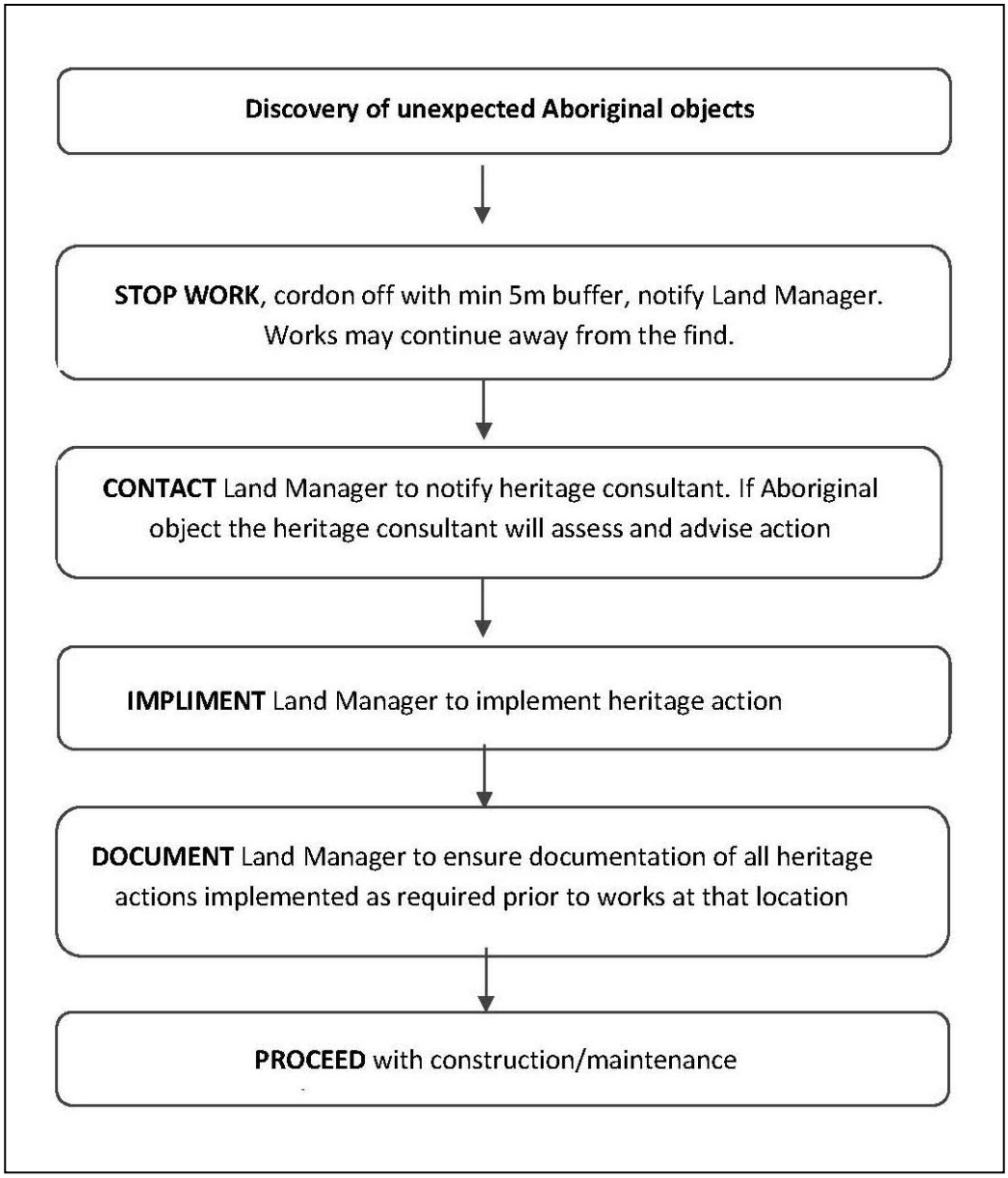
Should unexpected Aboriginal objects be uncovered during any stage of the development, Figure 1 illustrates the protocols. Unexpected Aboriginal objects may include, but not limited to, isolated artefacts, artefact scatters, scarred trees, hearths and shell middens (descriptions of such objects are provided).

Work must stop immediately in that location, the objects cordoned off with at least a 5m perimeter surrounding the object(s) with high visibility fencing/barrier and the Land Manager notified immediately. The Land Manager will then contact the heritage consultant who will assess the object(s) and recommend appropriate mitigation measures, inlcuding contacting the Environmental Line if required. The Land Manager is to implement all reasonable mitigation measures recommended by the heritage consultant and in accordance with Heritage NSW regulations and the NSW NPW Act.

If additional works are required, such as an Aboriginal Cultural Heritage Assessment (ACHA) with or without est excavations) or an Aboriginal Heritage Impact Permit (AHIP) (with collection or salvage excavations), the Land Manager is to arrange for the heritage consultant to undertake those works in accordance with all Heritage NSW requirements, procedures and Code of Practice. The methodology for undertaking additional works will be dependant on a number of factors including, but not limited to, site/object type and disturbances. Due to the unknown nature of unexpected objects, methodologies for furthe investigatiosn (if required) of unexpected Aboriginal objects will be determined during consultation with Heritage NSW.

Provided these heritage unexpected finds protocols have been followed, construction/maintenance works in that location may proceed.

Figure 1. Unexpected finds protocol flow chart



Discovery of human remains

Human skeletal remains are of the highest significance and importance to Aboriginal people, and all care, respect and dignity will be extended by all parties should human remains be uncovered.

If human remains or unidentified bone are uncovered during any stage of the development and maintenance activities, the appropriate State legislation will be followed. All human remains fall under the *Coroners Act 2009* in the first instance. If they are identified as Aboriginal and older than 100 years old, they will fall under the *NSW NPWS Act 1974* (as amended). If they are identified as Aboriginal and 100 years or less, they will remain under Police derestriction under the *Coroners Act 2009*. Figure 2 outlines the required protocols should human remains be uncovered.

Should any human remains or unidentifiable bone be found, work is to stop in that area immediately and an area of 15m cordoned off surrounding the remains/bone in high visibility fencing. The Land Manager is to be notified immediately.

The Land Manager will contact the heritage consultant and local NSW Police immediately, who will then contact the NSW Forensic Services who will determine if they are:

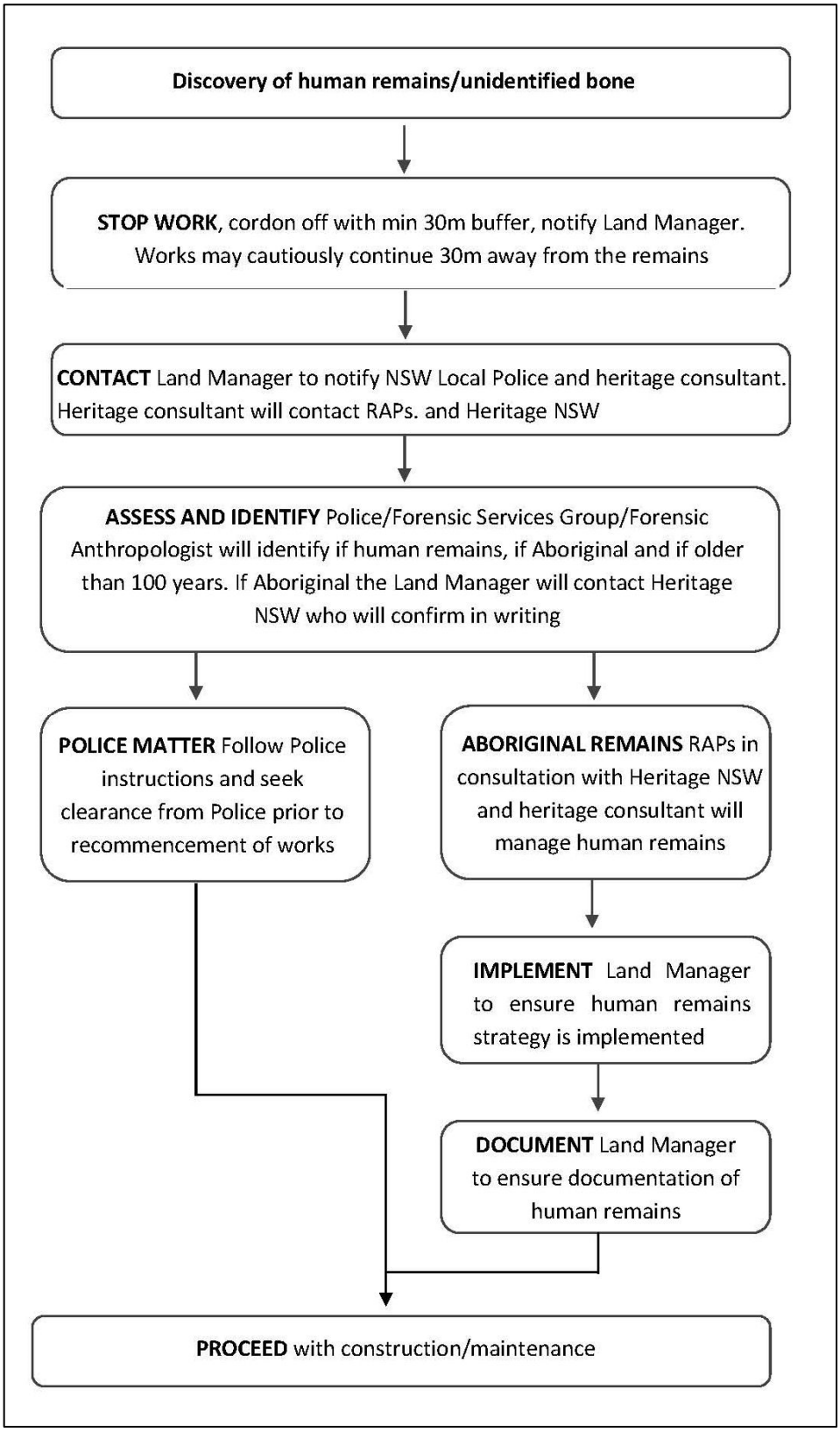
1) Human;
2) Aboriginal or non-Aboriginal;
3) If Aboriginal, determine antiquity (older or younger than 100 years)

If it is determined the remains are Aboriginal and older than 100 years old, the Police will notify the Land Manager who must contact the Environmnetal Line and Heritage NSW immediately. Heritage NSW, in consultation with the relevant Aboriginal community and the heritage consultant will develop a human remains management strategy and the Land Manager is to ensure this strategy is implemented. The Land Manager must also document the human remains management strategy and the heritage consultant will provide a letter of clearance prior to any works recommencing at that location.

If the remains are determined to be a Police matter, Police instructions will be followed and clearance to recommence works should be sought from the Police.

Provided the human skeletal protocols have been followed and documented, and a clearance letter from the heritage consultant has been obtained, construction/maintenance works may proceed in that location.

Figure 2 Human remains protocol flow chart



Verification of all Aboriginal objects (sites)

All potential Aboriginal sites will be verified by the heritage consultant in the first instance, and Heritage NSW if required.

The purpose of the verification process is to determine whether or not the objects in question are in fact Aboriginal objects to ensure appropriate management measures be implemented.

The verification process will include the following provisions:

1. A heritage consultant may assess the scientific status of the Aboriginal object (site) and provide evidence and justification for significance;
2. If it is an Aboriginal object the Environmental Line will be contacted and the site reported;
3. An AHIMS site card will be completed for each Aboriginal object (site); and
4. Management recommendations specific to each Aboriginal object (site), will be determined by Heritage NSW.

Surface Artefact scatters

Also described as open campsites, artefact scatters and open sites, these deposits have been defined at two or more stone artefacts within 50 or 200 metres of each other and may include archaeological remains such as stone artefacts, shell, and sometimes hearths, stone lined fire places and heat treatment pits. These sites are usually identified as surface scatters of artefacts in areas where ground surface visibility is increased due to lack of vegetation. Erosion, agricultural activities (such as ploughing) and access ways can also expose surface campsites. Artefact scatters may represent evidence of;

- Camp sites, where everyday activities such as habitation, maintenance of stone or wooden tools, manufacturing of such tools, management of raw materials, preparation and consumption of food and storage of tools has occurred;
- Hunting and/or gathering events;
- Other events spatially separated from a camp site, or
- Transitory movement through the landscape.

If a potential artefact scatter has been identified, the Unexpected Finds Protocol must be followed immediately.

Examples of artefact scatters (MCH)

Surface Isolated finds

Isolated artefacts are usually identified in areas where ground surface visibility is increased due to lack of vegetation. Erosion, agricultural activities (such as ploughing) and access ways can also expose surface artefacts. Isolated finds may represent evidence of;

- Hunting and/or gathering events; or
- Transitory movement through the landscape.

If a potential isolated find has been identified, the Unexpected Finds Protocol must be followed immediately.

Examples of isolated artefacts (MCH)