



Archaeological Assessment for the Proposed Rezoning of Warriewood Valley: Sector 3

August 2004

Chris Lewczak

**Draft Report for
Mirvac Homes Pty. Ltd.**

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for the Proposed Rezoning of
Warriewood Valley: Sector 3**

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ABBREVIATIONS

AHC	Australian Heritage Commission
AHIMS	Aboriginal Heritage Information Management System
AMG	Australian Map Grid
ATSIC	Aboriginal and Torres Strait Islander Commission
BP	Before Present
DEC	Department of Environment and Conservation
DIPNR	Department of Infrastructure, Planning and Natural Resources
DEH	Department of Environment and Heritage
ICOMOS	International Council on Monuments and Sites
LEP	Local Environmental Plan
NPWS	National Parks and Wildlife Service (now part of DEC)
REP	Regional Environmental Plan
RNE	Register of the National Estate

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1.0 SUMMARY

Biosis Research Pty. Ltd. was commissioned by **Mirvac Homes Pty. Ltd.** on 30 June 2004 to carry out an **indigenous and non-indigenous** archaeological assessment of **Sector 3, Warriewood Valley**, for a proposed rezoning of the land from light industrial to residential.

A site inspection was carried out on 30 July 2004. The site inspection noted there had been high levels of land modification and disturbance that has occurred throughout the European settlement of the area. The land has previously been used for cattle grazing and, from the 1930s, for market gardening. Current use of the land has also added to the modification of the site. Land levelling through cuttings and benching has removed large amounts of the natural topsoil. The remainder of the area has had disturbances through landscaping and from construction of modern buildings.

During the survey there were no Aboriginal or historical archaeological remains located. From the high level of disturbance, it was identified that there is a low potential for both Aboriginal and historical archaeological remains to have survived within the archaeological record.

It has been recommended that:

- *There are no Aboriginal or historical archaeological constraints to the proposed rezoning of Warriewood Sector 3;*
- *No further Aboriginal archaeological work is recommended;*
- *No further Historical archaeological work is recommended; and*
- *In the unlikely event that Aboriginal objects are located during the course of development all work should cease and the Metropolitan LALC and NSW National Parks and Wildlife Service should be contacted to assess the significance of the finds and recommend an appropriate course of action.*

Archaeological reports and the management recommendations contained therein will be independently reviewed by the Cultural Heritage Services Division of the NSW Department of Environment and Conservation (DEC), the relevant Aboriginal community and the NSW Heritage Office.

Although the findings of a consultant's report will be taken into consideration, recommendations in relation to managing heritage place should not be taken to imply automatic approval of those actions by the DEC, the Aboriginal community or the NSW Heritage Office.

2.0 INTRODUCTION

Cultural heritage legislation protecting Aboriginal and non-Aboriginal heritage places applies in New South Wales. These places are an important part of our heritage. They are evidence of more than 40,000 years of occupation of New South Wales by Aboriginal people, and of the more recent period of settlement by non-Aboriginal people.

Heritage places can provide us with important information about past lifestyles and cultural change. Preserving and enhancing these important and non-renewable resources is encouraged.

It is an offence under sections of legislation to damage or destroy heritage sites without a permit or consent from the appropriate body (see Appendix 2 & 3 for a complete discussion of relevant heritage legislation and constraints).

When a project or new development is proposed, it must be established if any cultural heritage places are in the area and how they might be affected by the project. Often it is possible to minimise the impact of development or find an alternative to damaging or destroying a heritage place. Therefore, preliminary research and survey to identify heritage places is a fundamental part of the background study for most developments.

The first stage of a study usually incorporates background research to collect information about the land relevant to the proposed development project (the study area). A second stage often involves a field inspection of this area.

Possibly the most important part of the study involves assessing the cultural heritage significance of heritage places in the study area. Understanding the significance of a heritage place is essential for formulating management recommendations and making decisions.

2.1 Project Background

Biosis Research Pty. Ltd. was commissioned by **Mirvac Homes Pty. Ltd.** on 30 June 2004 to carry out an **indigenous and non-indigenous** archaeological assessment of **Sector 3, Warriewood Valley**, for a proposed rezoning of the land from light industrial to residential.

This report details the aboriginal and historic archaeological potential that exists for Sector 3 and the potential impacts that the rezoning may have on the potential archaeological sites. The study area is up to the southern section of Narrabeen Creek, however, it has been stated that future development will not include the creek as it has been deemed in the Pittwater Development Control Plan

(Warriewood Valley Urban Land Release Development Control Plan No. 29; pp.12).

2.2 Aims

The aims of this study were to:

- Review relevant environmental and archaeological background information available for the area
- Consult with Metropolitan Local Aboriginal Land Council about the proposed rezoning project;
- Search and review all relevant heritage databases for potential heritage sites listed within the study area;
- Revisit previously recorded Indigenous and non-Indigenous archaeological sites and record any new archaeological sites; and;
- Create management recommendations and mitigation strategies for the site.

2.3 Consultation with the Aboriginal Community

The Metropolitan Local Aboriginal Land Council (MLALC) is the relevant Aboriginal community organisation for the study area. Mr Allen Madden from MLALC was contacted at the outset of this project. Mr Adam Madden from the MLALC accompanied the archaeologist in the field. A copy of the draft report was sent for comment to the MLALC. After several attempts to receive letters from MLALC regarding the recommendations made in this report, no correspondence has been received by Biosis Research regarding the project.

3.0 BACKGROUND INFORMATION

3.1 Environmental Background

The environmental background to the study area is provided in order to give a context to the archaeological assessment. The environmental aspects of an area will influence the type of archaeological remains that are likely to be present.

Firstly the environmental conditions of the study area may have influenced the land use by people in the past and secondly conditions will also affect the processes by which sites are preserved. Environmental values of an area can also contribute to the cultural significance and attachments people have to a place.

The following background is a brief summary of information relevant to the current assessment of archaeological values of the study area. The study area is located between Warriewood Road and MacPherson Street approximately 28km north of Sydney (Figure 1). The study area was comprised of four allotments on the northern side of MacPherson Street. They were;

- Number 20, Lot 1 DP 592091;
- Number 18, Lot 1 DP 604035;
- Number 16, Lot 4 DP 553816; and
- Number 14, Lot A DP 358765.

The northern boundary of the study area was the southern side of Narrabeen Creek (Figure 1).

3.1.1 Geology & Landforms

The geology for the area is described as Holocene silty to peaty quartz sand; and medium to fine marine sand with podzols. The study area is situated within the Warriewood Soil Landscape, which is characterised as a swamp landscape (Chapman & Murphy, 1989: 126). The Warriewood landscape consists of level to gentle undulating swales, depressions and in filled lagoons on quaternary sands. Local relief in this area is generally less than 10m and there is a gentle slope gradients of less than 5% (Chapman & Murphy 1989, 126).

3.1.2 Climate

The general Australian climate has changed during the time since Aboriginal people have lived in Australia. During the height of the last glaciation, approximately 17,000/18,000 BP, ice covered parts of the southern

highlands and the general temperatures were 6 to 10 degrees cooler than they are today (Bowler *et al* 1976 in Brayshaw 2003: 3). It has been argued that during this time the effect on coastal areas was a decrease in rainfall, until 15,000 BP, when the arid nature of the environment improved with increased rainfall and average temperatures at around 8,000-5,000 BP (McDonald 1994: 28). After this time the general climate again contracted to become slightly colder and drier than it is today (Brayshaw 2003: 3).

Sea level change 17,000-18,000 BP meant the coastline was somewhere between 15 kilometres east of its current location. Present day bays and lagoons would have formed after the gradual climate change, around 5,000 BP and the water level rose to its current location (Brayshaw 2003: 3-4).

The Sydney climate today is generally warmer with winter temperatures ranging from 8°C in winter to an average summer temperature of 26°C.

3.1.3 Flora

The vegetation in the area has been extensively cleared. There are very few pockets of native vegetation along creek lines, these are used as buffers between the housing developments and the main roads. The remaining native vegetation includes broad-leaved paper bark, *Melaleuca quinquenervia*, swamp oak, *Casuarina glauca* and swamp mahogany, *Eucalyptus robusta*. Remnant scrub and understorey vegetation in this area consists of coastal tea tree *Leptospermum laevigatum*, spike rushes, *Eleocharis* spp., and tall swamp sedge *Gahnia sieberiana* (Chapman & Murphy, 1989: 126),

3.2 Aboriginal History

3.2.1 Ethnohistory & Contact History

It is generally accepted that people have inhabited the Australian landmass for at least 40,000 years. Dates of the earliest occupation of the continent by Aboriginal people are subject to continued revision as more research is undertaken. The timing for the human occupation of the Sydney Basin is still uncertain. The earliest undisputed radiocarbon date from the region comes from a rock shelter site on the western side of the Nepean known as Shaws Creek K2 which has been dated to 14,700 years before present (BP) (Attenbrow 2002: 20). This site is over 50 km north from the study area along the Nepean River. To the south along the coast just north of Shell Harbour the site of Bass Point has been dated at 17,101 +/- 750 BP (Flood 1999).

Our knowledge of the social organisation of Aboriginal people prior to European contact is, to a large extent, reliant on documents written by European people. Such documents are necessarily affected by the inherent bias of the class and cultures of these authors. They can, however, be used in conjunction with archaeological information in order to gain a picture of Aboriginal life in the region.

At the time of arrival of Europeans at Port Jackson in 1788, the tribal group *Kuringgai* occupied an area from the northern side of Port Jackson and east of Lane Cove River, and extending along the coast north past Broken Bay (Kohen, 1989: 3).

3.2.2 Previous Archaeological Work

Three archaeological surveys have been conducted in the immediately area around the current study area, by McDonald & Benton (1999), Godden Mackay Logan (2002), and Helen Brayshaw Heritage Consultants (2003).

McDonald carried out an Aboriginal archaeological survey of Warriewood Valley Sector 12 in June 1999 for proposed rezoning of the land (McDonald, 1999, pp.1). This survey was conducted South southwest of the current study area. The survey and assessment concluded that there were “no prehistoric Aboriginal relics or sites” (McDonald & Benton, 1999: 1). The survey concluded that Sector 12 was heavily disturbed and there was a low potential for aboriginal archaeological sites and recommended that no sub-surface archaeological testing should take place (McDonald & Benton, 1999: 12-13).

In January 2002 Godden Mackay Logan surveyed Warriewood Valley Sector 8, which is located west of the current study area for its archaeological and heritage potential. The survey found no Aboriginal archaeological sites or any areas of potential. This was attributed to the extensive disturbance by previous European land use practices and development that has seen 90 percent of the allotments subjected to major surface and sub-surface disturbances (Godden Mackay Logan, 2002: 69).

The third Warriewood survey was of the Sewer Treatment Plant Buffer Sector conducted by Helen Brayshaw Heritage Consultants (HBHC) in March 2003. This survey was located immediately to the east of the current study area. Part of the survey area included Number 14 MacPherson Street (Lot A, DP 358765), which is the eastern most allotment of the current (Sector 3) study area. The survey and report found that there were no Aboriginal archaeological sites within the study area. This was attributed again to the major European land use that

includes benching of the land for levelling (Helen Brayshaw Heritage Consultants, 2003: 1).

3.2.3 Previously Recorded Sites

A 6.5km square search area around the study area was searched on the NSW Aboriginal Heritage Information Management System. This database is managed by the NSW National Parks and Wildlife Service and contains a listing of all recorded Aboriginal archaeological sites within the State. Four sites had been previously recorded and are listed in Table 1 (Figure 2).

DEC ABORIGINAL SITES REGISTER NO.	Site Type	Location (AMG 66)
45-6-0136	Art	E340900 N6271930
45-6-1616	Art	E340200 N6271650
45-6-2590	Artefact	E340680 N6271900
45-6-2592	Art	E340500 N6271950

Table 1: Previously recorded Aboriginal archaeological sites within or near the study area.

Of the four sites listed above, none occur within the current study area.

3.3 Post-Contact History

Governor Phillip explored the Pittwater and Manly areas in 1788. However it was not until 1792 when William Dawes walked from Manly to Barrenjoey and mapped the agricultural potential of the area with annotations that the region was opened up (Topman and Topman, 1993: 8). While this map pointed out good grazing area north of Careel Bay, the distance this land was from the main settlements of Sydney kept people out of the region for a further 20 years (Godden Mackey Logan, 2002: 7).

First European settlement in the area was concentrated north of the Barrenjoey peninsula, and spread out further south towards the study area. By 1830 much of the farming land around the present day Warriewood had already been granted. An undated parish map, possibly dated to 1825, shows James Jenkins, a major land holder in the Pittwater area, was granted 250 acres, which is the first land grant that includes the current study area (Plate 1).

An 1905 Narrabeen Parish map of the area shows that most of the valley as Narrabeen swampland, and the large land grant to James Jenkins, which

incorporates Sector 3, in north of the swamp (Plate 2). An account of the Jenkins property in 1829 noted there were 440 horned cattle and 40 horses grazing (Topman and Topman, 1993: 8).

The first subdivision that occurred in the Warriewood Valley area occurred in 1906 when the “Great Warriewood Estate” land sale, consisting of 500 acres in all took place. Henry F Halloran and Co., an Auctioneer firm from Sydney bought the land and partitioned the land into three major allotments, 133 township allotments, 83 hill sites and 66 farming blocks (Henry F Halloran & Co. 1906: 4) (Plate 2 & 3). Sector 3 is located in amongst the farming blocks. The accompanying brochure published prior to the land sale stated the farming land for the area “...contain soil of extremely high quality, suitable for the most approved and successful schemes of intense [horti]culture.”(Henry F Halloran & Co. 1906: 14).

The size of the farming blocks for sale encouraged the setting up of market gardeners in the area. By the 1920s many of the market gardens were established by Yugoslav families who grew tomatoes (Godden Mackey Logan, 2002: 9). A large number of glasshouses were built in a short amount of time, and by the 1930s there were so many that the area earned the nickname ‘glass city’ (Tropman & Tropman, 1993: 11).

Between the 1930s and 1960s Warriewood became one of the States most important market gardens. By the mid 1960s, however, local government began to rezone much of the land from rural to residential, taking away farming land and placing urban pressure on the established market gardeners. The rezoning continued through the 1970s and 1980s when selected areas were rezoned to light industrial areas.

In 1990 the Department of Planning included a rural standard of a minimum sewerage and water supply to be built. With these basic amenities in place the encouragement was there to develop the land further. In 1991 the then minister for planning announced that Warriewood would be a part of the State Government’s Urban Development Program. The current Warriewood Estate rezoning plan is a continuation of this program, and has already seen sectors surrounding the current study area developed into residential areas.

3.3.1 Land-use History

Historically the study area was a part of a large land grant in 1825 to James Jenkins, where the primary land use was for farming/grazing land. Reference to Jenkins having 440 horned cattle and 40 horses in 1829 on the land grant

suggests that most of the land clearing, for grazing, would have occurred between these four years.

Land formation and use of the land around the study area would have occurred after the 1905 subdivision for the “Great Warriewood Estate”, when the blocks of land that make up the study area were sold off individually and were used/developed. Market gardens were built and established. These gardens were the first individual intensive disturbance to the land. The disturbances would have likely included ploughing and levelling of the land, in a way to allow the successful use growing and harvesting of crops, and the irrigation purposes.

The market gardens gave way to the current use of these properties.

Current land use and formation

The current buildings and use of the properties in the study area directly relate to the 1980s rezoning of the area to light industrial. The current buildings and uses have again directly intensely modified and disturbed the land. There were many instances observed from the site inspection where the land has been benched to level the front ends of the blocks to create a more level area, based in the low level of the land around the creek. This area around the creek, however, has also been modified on three properties.

The current use of each of the properties is presented below with a description of current buildings and topography.

Allotment 20 (Lot 1; DP 592091)

This allotment is one of two large blocks and contains one of the two garden nurseries located within the study area. The topography of this allotment slopes down and away from the south western corner of the site, down towards the back of the allotment and the creek, and from the south west corner towards allotment 18, to the east. There has been a clear 15 – 25cm bench cut front of the main building and in front of the small car park on the eastern side of the allotment, presumably for the creation of a level building area for the main nursery centre.

There is a car park located on the MacPherson boundary of the site. The far south-western area contains an open garden display that comes around to near the centre of the property, where a large gazebo has been constructed. The allotment is divided down the centre by a large bitumen driveway that goes the whole length of the allotment to the creek.

The main building is located near the middle of the allotment on the western side and extends all the way back towards the northern end of the property near the creek. This structure appears to be a floating slab foundation structure and is situated in a benched level area created for the construction of the building.

On the eastern side of the property there are a number of green houses and nursery constructed all the way along. These structures are partially open buildings, constructed from wooden pillars and rafter structures partially enclosed with glass panels and wooden slates.

Allotment 18 (Lot 1; DP 604035)

The second nursery located in the study area is located on this allotment. From the fence line from MacPherson Street onto the property there is a 20-30cm cut bench. The lay of the land continues to slope down into a dip in the centre of the allotment where a house is situated. There is another bench into the ground for the levelling of the land house for its construction. The back half of the property rises slightly from the bench for the house to a relatively flat area towards the creek. Close to the creek the ground slopes gently down and to the north east of the property.

Other than the house built slightly to the south east of the centre mark of the allotment, the other structures and uses on the site are large open garden beds at the front of the property, and a series of greenhouses. These are located along the western section from the front through to the back; another two rows of approximately seven large green houses at the back. The final row, located closest to the creek are in a severely dilapidated state.

There are a number of driveways on this property. The main entrance to the property is down a concreted driveway that ends at the side of the house. There is also an older driveway situated on the western boundary of the site. This is a graded earthen path that leads to the back of the property to the creek, as well as in front and between the two rows of green houses.

There is an old weather board house located on the far south-western corner of the building. The house has been built on brick supports, however, the land underneath the house has been cut and levelled 10 - 20cm. There is a former driveway on the western side of the house, and a small backyard immediately behind it. The garden and greenhouse areas have encroached upon the house.

Allotment 16 (Lot 4; DP 553816)

Allotment 16 contains a brick house located at the front (MacPherson Street) of the property. This allotment is divided in two by a gravel graded path down the middle beginning from behind the house down towards the creek, and eventually winding towards the north eastern corner of the block. A tennis court has been constructed behind the house on the western side. There are three individual garden areas located near the middle of the property, two on the western side of the graded path, and one on the eastern side. There are also four garden shelter/sheds located on the property. The rear of the property appears to be an open benched and level area.

Allotment 14A [Brands Lane] (Lot 1; DP 331864)

Brands Lane is located between allotments 16 and 14 within the study area. This land leads down to the creek and is the side entrance to the two adjoining allotments. This lane, at present, does not cross the creek itself. The lane surface comprises of mottled clayey sand with inclusions of road base and slopes down from the road (south) towards the creek (north). The surface material appears to be a combination of a natural deep level B-horizon with inclusions of road base, or similar to prevent erosion.

Allotment 14 (Lot A; DP 358765)

Allotment 14 contains a house in the south western corner of the property along MacPherson Street. The land where the house is situated has been cut into to create a flat plateau for the house, which is held up on brick pillar support. The remainder of the property contains a number of enclosed sheds north of the house in the middle section of the property. There is a graded earthen driveway along the western boundary of the property from the front of the allotment to a large open level space. The Driveway slopes down from the road to the lower level backyard/working area. This open area is considerably lower than the front of the property leading to the notion that this area has been levelled in recent years to create a flat working area.

3.3.2 Previous Archaeological Work

The Warringah Shire Council commissioned a heritage study to be conducted to identify places, areas and heritage landscapes zones in the Pittwater area. The zoning and management plans that were created focused on both the known and potential Aboriginal and the known historical archaeological resource

(McDonald McPhee: 1). There were no archaeological, historic or landscape items identified within the study area.

Godden Mackey Logan conducted an archaeological assessment of Sector 8 in the Warriewood Valley, located south west of the current study area. Part of this report included the historical archaeology assessment. The assessment consisted of 10 allotments, and detailed the level of disturbances that have occurred to them since the time of the market gardens, and the construction of previous features.

The report stated the structures on the site were of low significance as they related to the final occupation of the site, that is the market gardening era. The expectation of remains of former structures/dwellings/auxiliary buildings to be present on the site was again considered low as the level of land clearing and levelling that has taken place has potentially removed any evidence of them (Godden Mackey Logan, 2002: 72).

3.4 Discussion

There have been three distinct uses for the land since European settlement. The first was the clearing of the land for dairy cattle grazing from mid 1820s onwards. The impact to the site during this time would have been from the land clearing itself, creating open paddocks. The potential for structures to be present out in the fields can be considered quite low as main structures are more likely to have been built closer to the main homestead or in one designated area close by.

The next major use of the land was from after the land subdivision for the “Great Warriewood Estate” lands sale. Accounts suggest the farming land allotments, which the current study area sectors would have been apart of, were sold off quickly due to the lure of the potential for smaller farming land sales. The allotment size and the influx of Yugoslav immigrants created a market garden centre. The activity of market gardening would have involved the sites second major land modification. It is possible during this time that some levelling that is present on the site today took place between 1906 and the 1970s. The continued cultivation of the soil during this period would have disturbed much of the topsoils in the area, and possibly any former structures or their remains.

The third use of the land that has created the highest impact to the study area has been during the time of rezoning from rural to light industrial, and the new industries that followed; namely the garden centre nurseries. During this time there have been several new buildings constructed, namely the main buildings on all of the allotments, as well as the green house and garden beds. Allotments 18 and 20 both have a series of cut benches into the land, creating flat

construction and working areas. Large open working areas on allotment 14, near the rear of the property, have also undergone a benching into the soil, down through the topsoils into what has been characterised as the B-Horizon.

During this process of land levelling and benching, it appears that a large amount of soil has been taken off the site. There are areas on these properties where the current surface level is 15-30cm below the perceived original land level. This process has greatly reduced the potential for any historic, and indeed Aboriginal remains, if any, to be present on the site.

The low potential for relics to be located within the study area had also been identified in the three previous aboriginal archaeological assessments conducted in the immediate vicinity of the study area. The three reports pointed to the effects of European modification and disturbance of the land, which has led to the low potential for Aboriginal relics to be present within the area (McDonald & Benton, 1999: 12-13; Godden Mackay Logan, 2002: 69-70; Helen Brayshaw Heritage Consultants, 2003: 11).

4.0 ABORIGINAL SITES

4.1 Archaeological Survey – Methods

An archaeological survey was conducted on Wednesday 21 July 2004. The survey was carried out by Chris Lewczak (Archaeologist, Biosis Research), Mr Adam Madden (MLALC), Terri English, Emma Gorrod and Nathan Smith (Biosis Research). The weather conditions of the day were fine and clear.

The survey was conducted on foot and concentrated on three specific areas. These were along the creek; immediately to south of the creek between the creek and the buildings; and in between the built structures where it appeared there had been generally less disturbances to the ground and a greater potential for intact soil profiles.

4.2 Archaeological Survey – Results

The survey along Narrabeen Creek was difficult due to the over grown nature of the weeds and the minimal ground visibility (Plate 4). Most of the sections along the creek had a ground visibility of less than 10 percent. The survey took place on the southern edge of the creekline from Brands land towards the eastern end of Allotment 14, and back along to the western end of Allotment 20. Seventy five percent of the creekline, between the water and the boundary fence line was surveyed.

There were several areas where the creek banks had been disturbed and modified. There were also large dumps of concrete masses in and along the creek line. Due to the extent of modifications that have been done to the creek line in historic times and the poor visibility, no Aboriginal relics were located.

The survey immediately south of Narrabeen Creek, up on the top of the banks between the creek and the northern most built structures discovered that much of the topsoil had been removed. The land slopes down towards the creek and to the northeast (Plate 5). A soil verge has been created along the backs of most of the properties along the creekline. The soil that was used appears to be the same as the current surface material and may actually be soil from here pushed up to create a verge. There were no Aboriginal relics observed in this area.

The third part of the survey concentrated between the built structures on each of the properties. It was clear early on there was a level of disturbance across the whole site. There were no areas between the buildings where the natural

topsoil was present. Many areas between the built structures are a combination of introduced sandy clay with gravel inclusions and the clayey loam that is consistent with the natural B-Horizon (Plate 6, 7 & 8). There were no Aboriginal relics located during this survey.

4.3 Archaeological Survey – Interpretation and Discussion

The field survey yielded no Aboriginal relics located on the surface of the site. This is largely due to the large amount of land modification and disturbance that has occurred during the European phase of settlement in the area. The European land use has resulted in the removal of between 15 to 30cm of the topsoil from much of the site. There were also localised areas where the cuts and benches went deeper, mainly around buildings and other structures. The remaining soil deposit has been further disturbed from the cultivation of sections of the ground for the garden nurseries.

Narrabeen creek has been heavily modified and disturbed during historic times. The disturbance that has occurred can be considered as significant as much of the natural intact soil profiles has been removed and muddled.

The impacts that have occurred across the site have resulted in a low potential for sub-surface archaeological deposits to remain. During the survey no areas were considered as having Potential Archaeological Deposits.

4.4 Statutory Regulations

The following discussion summarises legislation that applies to Aboriginal sites. The statutory regulations that affect the heritage places is detailed in Appendix 2 & 3. Please consult this appendix for a comprehensive discussion about relevant regulations.

4.4.1 New South Wales Aboriginal Cultural Heritage Legislation

Aboriginal heritage management in NSW is provided for by two pieces of legislation: the *National Parks and Wildlife Act 1974* and the *Environmental Planning and Assessment Act 1979*. These acts provide protection for all material relating to the past Aboriginal occupation of Australia. This includes individual artefacts, scatters of stone artefacts, rock art sites, ancient camp sites, human burials, scarred trees, ruins and archaeological deposits associated

with Aboriginal missions or reserves. The *National Parks and Wildlife Act* also establishes administrative procedures for archaeological investigations and the mandatory reporting of the discovery of Aboriginal sites. The NSW Department of Environment and Conservation administers the *National Parks and Wildlife Act*. The *Environmental Planning and Assessment Act* is administered by The Department of Infrastructure, Planning and Natural Resources (formerly Planning NSW).

The NSW Department of Environment and Conservation also provides guidelines for archaeological survey and reporting (NSW NPWS 1997) which this assessment follows.

Any queries or applications to excavate or disturb an Aboriginal archaeological site for purposes of archaeological fieldwork should be made in to the Cultural Heritage Unit Manager at the relevant DEC Aboriginal Heritage Division regional office. The contact details for the regional office responsible for the area covered by this survey are:

Central Cultural Heritage Unit
Aboriginal Heritage Division
NSW Department of Environment and Conservation
Level 6 / 43 Bridge St
HURSTVILLE NSW 2220

Ph: (02) 9585 6690
Fax: (02) 9585 6325

4.4.2 Commonwealth Aboriginal Cultural Heritage Legislation

The Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984 provides protection for Aboriginal cultural property.

Whereas the State Act provides legal protection for all the physical evidence of past Aboriginal occupation, the Commonwealth Act deals with Aboriginal cultural property in a broader sense. This cultural property includes any places, objects and folklore that ‘are of particular significance to Aboriginals in accordance with Aboriginal tradition’. There is no cut-off date and the Act may apply to contemporary Aboriginal cultural property as well as older sites.

5.0 NON-ABORIGINAL HISTORICAL ARCHAEOLOGICAL SITES

5.1 Archaeological Survey – Methods

The NSW *Heritage Act* 1977 protects all non-Aboriginal archaeological sites in NSW 50 years or older. A wide range of archaeological site types are protected by this Act, including below-ground features (such as building foundations, wells and artefacts) and above-ground features (such as the standing remains of buildings, machinery, fence posts and exotic vegetation). These may be single sites or complexes made up of several related parts.

The survey for historical archaeological sites within the study area was conducted at the same time as the Aboriginal archaeological survey. The survey was conducted by Chris Lewczak (Archaeologist, Biosis Research), Mr Adam Madden, (MLALC), Terri English, Emma Gorrod and Nathan Smith (Biosis Research). The weather conditions of the day were fine and clear.

5.2 Archaeological Survey – Results

There were indications from the areas surveyed that a high degree of land modification and disturbance has occurred to the study area. From the current southern boundary (MacPherson Street) fence line there is a clear benching that has occurred along the front of the properties all the way along to the back, down to a depth of 15-25cm (Plate 9, 10).

Other individual areas have also received further modification. This has been in association with many of the more recent buildings and structures. Localised benching, to a depth between 15-25cm below the current surface level, has occurred around the main buildings on all four allotments (Plate 11).

The areas that were surveyed around the current buildings on the allotments showed little signs of remaining historic structural remains. The level of disturbance, from land grading and constant present day use has removed much of the potential that may exist for these remains to still be present.

Along the area between the creekline and the closest buildings, the land has been both levelled and scraped to allow water to run off away from the main buildings, and to create a sand verge along the creek. This verge was likely created in recent times to stop waste and other material from the properties from

entering the creek itself.

5.3 Archaeological Survey – Interpretation and Discussion

It is clear the land modification and disturbances have taken place in recent times, possibly as recent as the 1980s when areas along MacPherson Street were rezoned to light industrial and many of the buildings that are now standing on the site were constructed. The levelling of the land from MacPherson Street towards the creek may have occurred sometime between the 1906 and the 1970s when the market gardens were present on the site. Since this time, however, there has been continued intensive and significant modifications and disturbances to the land within the study area.

No remains of historic relics or structures were observed during the survey. Any remains that may exist within the sub-surface deposits on the site are likely to relate to the rural use of the site from 1906 onwards; that is the market garden era. If remains do exist they are likely to be either individual relics, such as farming tools or equipment; or structures with deep foundation/use, such as wells and cesspits. The deep sub-surface structures would have intact basal sections.

It is likely that remains of former structures built within the study area would have been removed or severally disturbed during the benching and soil removal that has occurred. The potential for historic relics and remains to exist can be considered quite low.

No historic remains or areas for potential historical archaeological remains were located during the site inspection, and it was clear from this work that the likelihood for any significant historic relics to remain would be low.

5.4 Statutory Regulations

The following discussion is a summary of the legislation that applies to historical archaeological sites.

Heritage Act 1977

The NSW *Heritage Act 1977* details the statutory requirements for protecting historic buildings and places, historical archaeological sites, and historic

shipwrecks. The Act is administered by the NSW Heritage Council, through the NSW Heritage Office.

The *Heritage Act* protects all historical archaeological sites, places and relics in NSW older than 50 years, regardless of their level of cultural heritage significance.

An excavation permit is required for any works, excavations or activities, associated with an archaeological site. Excavation permits are issued by the Heritage Council of New South Wales in accordance with sections 60 or 140 of the *Heritage Act*. It is an offence to disturb or excavate land to discover, expose or move a relic without obtaining a permit. Excavation permits are usually issued subject to a range of conditions. These conditions will relate to matters such as reporting requirements and artefact cataloguing, storage and curation.

The State Heritage Register is a list of places and items with State heritage significance endorsed by the Heritage Council and the Minister. The Register came into effect on 2 April 1999. The Register was established under the *Heritage Amendment Act* 1998. It replaces the earlier system of Permanent Conservation Orders as a means for protecting items with State significance. The processes of listing and monitoring the conservation and protection of items are essentially the same.

A permit may be required from the Heritage Council of NSW for works or activities associated with a registered place or object.

General queries about site issues and permit applications can be made to the archaeological officers at the Heritage Office. The contact details are:

NSW Heritage Office
3 Marist Place
Parramatta NSW 2150

Ph: (02) 9873 8500
Fax: (02) 9873 8599

Consultation and discussion with the NSW Heritage Office should begin well before lodging an application for a Permit to disturb or destroy a historical archaeological site.

6.0 MANAGEMENT ISSUES AND RECOMMENDATIONS

6.1 Introduction

Cultural heritage places provide us with evidence of past human activity. Heritage places may be confined to a small area, or represented by a complex of features, including a cultural landscape. Places of human activity in the past are affected by the actions of the present, particularly urban expansion and agricultural processes. This means cultural heritage places are a diminishing resource.

Cultural heritage places are valuable, not only for the scientific records of the past they provide, but also for their social significance. Many Aboriginal places, for example, have a special significance to Aboriginal communities as places where traditional life has continued and places that may have sacred or symbolic significance.

Many heritage places may also be outstanding examples of artistic and creative achievement. Heritage places are valuable to Australians — and the rest of the world — as they not only provide a link with a culturally rich past, but they can contribute to recreational and community life.

Heritage places may also have economic potential (Pearson & Sullivan 1995: 15). These values should, where possible, be protected and handed on to future generations. We all have some degree of social, spiritual, ethical — and legal — obligation to see that this happens.

6.2 Aboriginal Sites

6.2.1 Potential Impacts

There were no potential impacts identified during the site survey or highlighted during review for this report

6.2.1.1 Archaeological Sites

There were no previously recorded aboriginal relics or sites located within or near the study area. There were no new Aboriginal relics or sites located during the site inspection.

6.2.1.2 Areas of Potential Archaeological Sensitivity

From the observation of the degree of land modification and soil removal that has occurred on the site during historic times, Potential Archaeological Deposits (PAD) that may have been located in the area have largely been removed. The continued disturbance from farming, market gardens and nurseries has continued to remove this potential.

There were no areas observed during the site inspection where PADs may still exist.

6.3 Non-Aboriginal Archaeological Sites

6.3.1 Potential Impacts

No significant potential impacts on any historical archaeological relics or remains were identified during the conduct of this report.

Potential impacts that do exist would be individual artefacts associated with the land use of the site from the last century, that is, associated with the farming and market gardening era. Potential relics could include, but not be limited to, farming tools, farming equipment and /or remains of plough marks (furrows)

If these relics or others do remain, they would have a low significance value.

6.3.1.1 Archaeological Sites

There were no historical archaeological sites located during the site inspection.

6.4 Management Recommendations

6.4.1 Aboriginal Archaeological Recommendations

Based on the background research, site inspection, input from the Metropolitan LALC and the legislative framework, the following is recommended for the proposed development:

- *There are no Aboriginal archaeological constraints to the proposed rezoning of Warriewood Sector 3;*
- *No further archaeological assessment is recommended; and;*
- *In the unlikely event that Aboriginal objects are located in the course of the road widening all work should cease and the Metropolitan LALC and NSW National Parks and Wildlife Service should be contacted to assess the*

significance of the finds and recommend an appropriate course of action

6.4.2 Non-Aboriginal Archaeological Recommendations

Based on the historic research, land use patterns and the review of other historical archaeological reports that have been conducted for the study area, it is recommended that:

- *There are no non-Aboriginal archaeological constraints to the proposed rezoning of Warriewood Sector 3; and;*
- *No further historical archaeological work is required within the study area as there is a low possibility for historic remains of significant value to have survived on the site.*

Metropolitan Local Aboriginal Land Council have been contacted several times since the draft report was completed in August 2004. Three attempts were made via post and e-mail over a two-month period to ascertain the MALC's recommendations and/or support for the recommendations made in this report. Despite several attempts to contact the land council, no correspondence has been received.

6.5 Report Lodgement

This report has been distributed to:

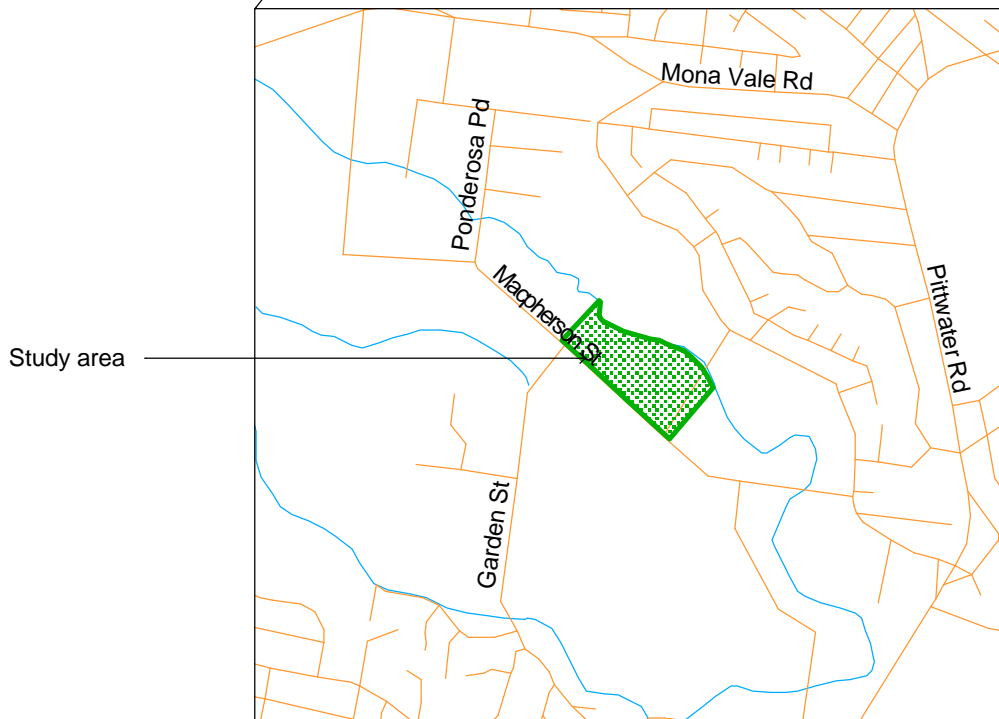
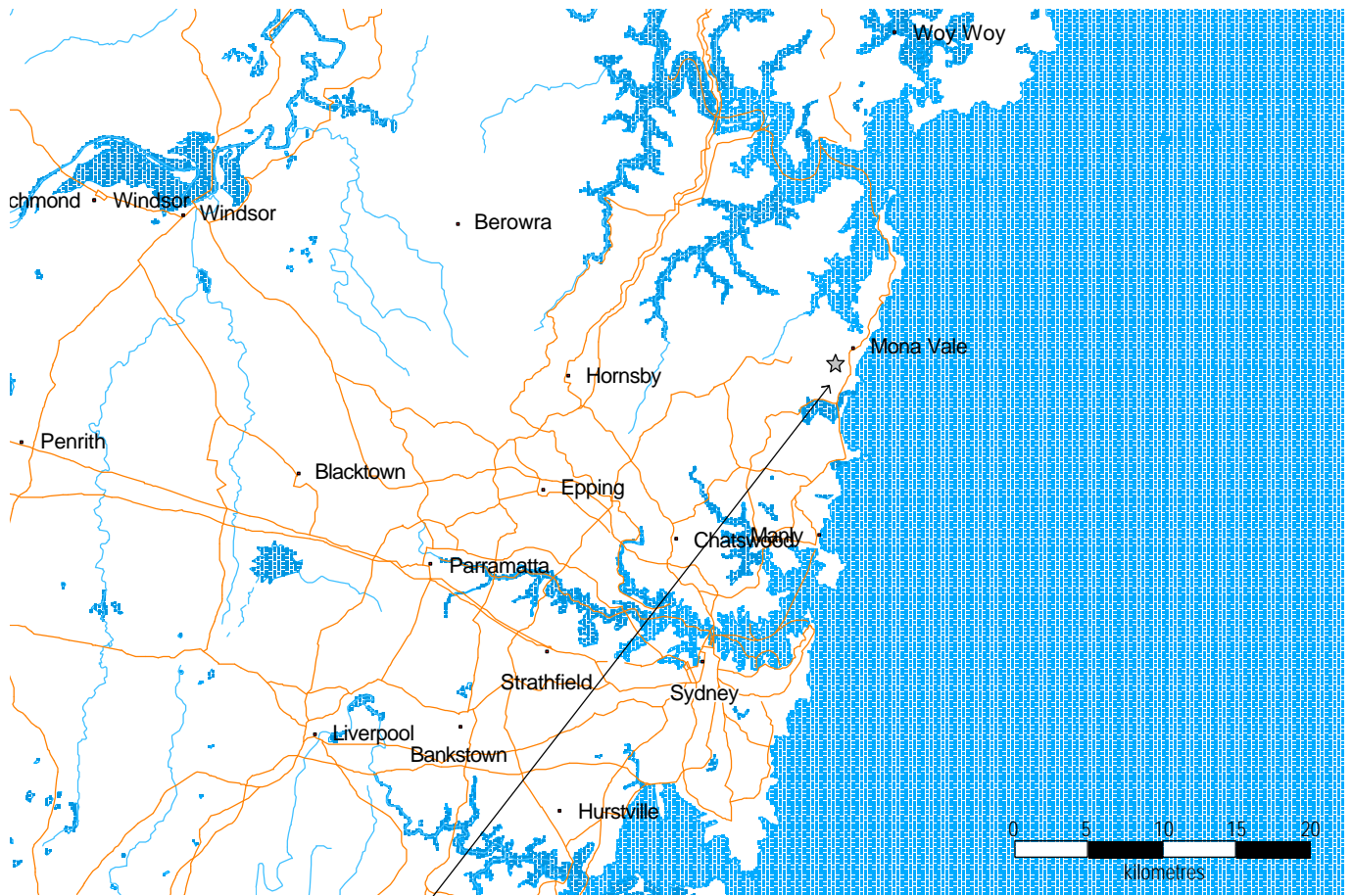
- Mr Allen Madden, Metropolitan Local Aboriginal Land Council.
- Mr Chris Duggan, Mirvac Homes Pty. Ltd.

6.6 Independent Review of Reports

Archaeological reports and the management recommendations contained therein will be independently reviewed by the Cultural Heritage Services Division of the NSW Department of Environment and Conservation, the relevant Aboriginal community and the NSW Heritage Office.

Although the findings of a consultant's report will be taken into consideration, recommendations in relation to managing a heritage place should not be taken to imply automatic approval of those actions by the Department of Environment and Conservation, the Aboriginal community or the Heritage Office.

FIGURES



Acknowledgement: Geoscience Australia
(1:250000 - Newcastle, Singleton and Sydney)

Figure 1: Location of the study area in a regional context.



BIOSIS RESEARCH Pty Ltd

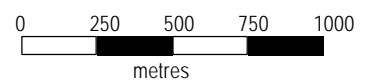
10 Bartley Street
Chippendale
NEW SOUTH WALES 2008

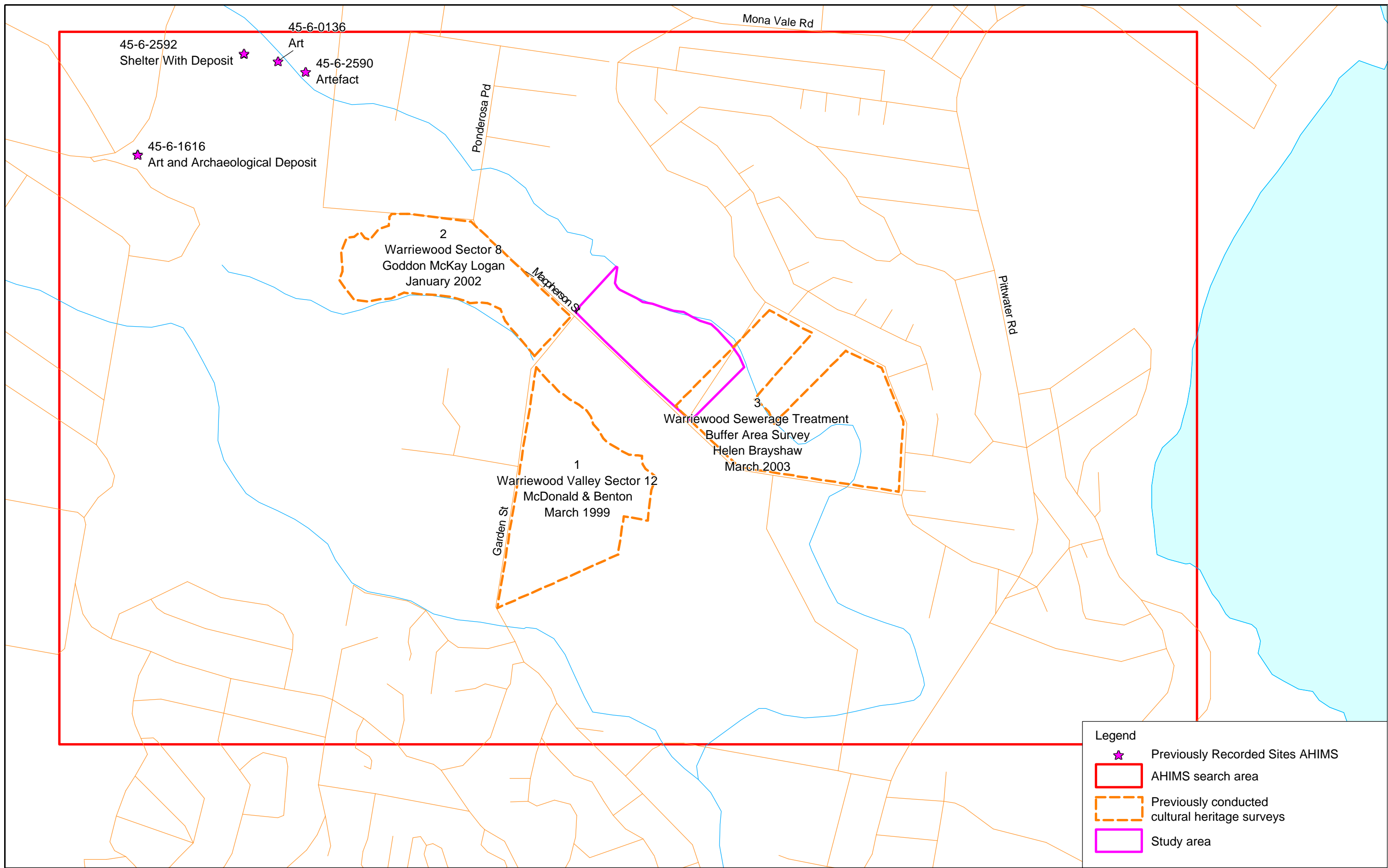
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Scale:





Legend

- ★ Previously Recorded Sites AHIMS
- ▭ AHIMS search area
- ▭ Previously conducted cultural heritage surveys
- ▭ Study area

Figure 2: Previously recorded surveys and archaeological sites.

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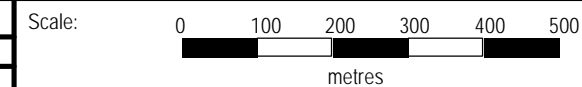


Figure 3: Previously recorded surveys and archaeological sites.

PLATES

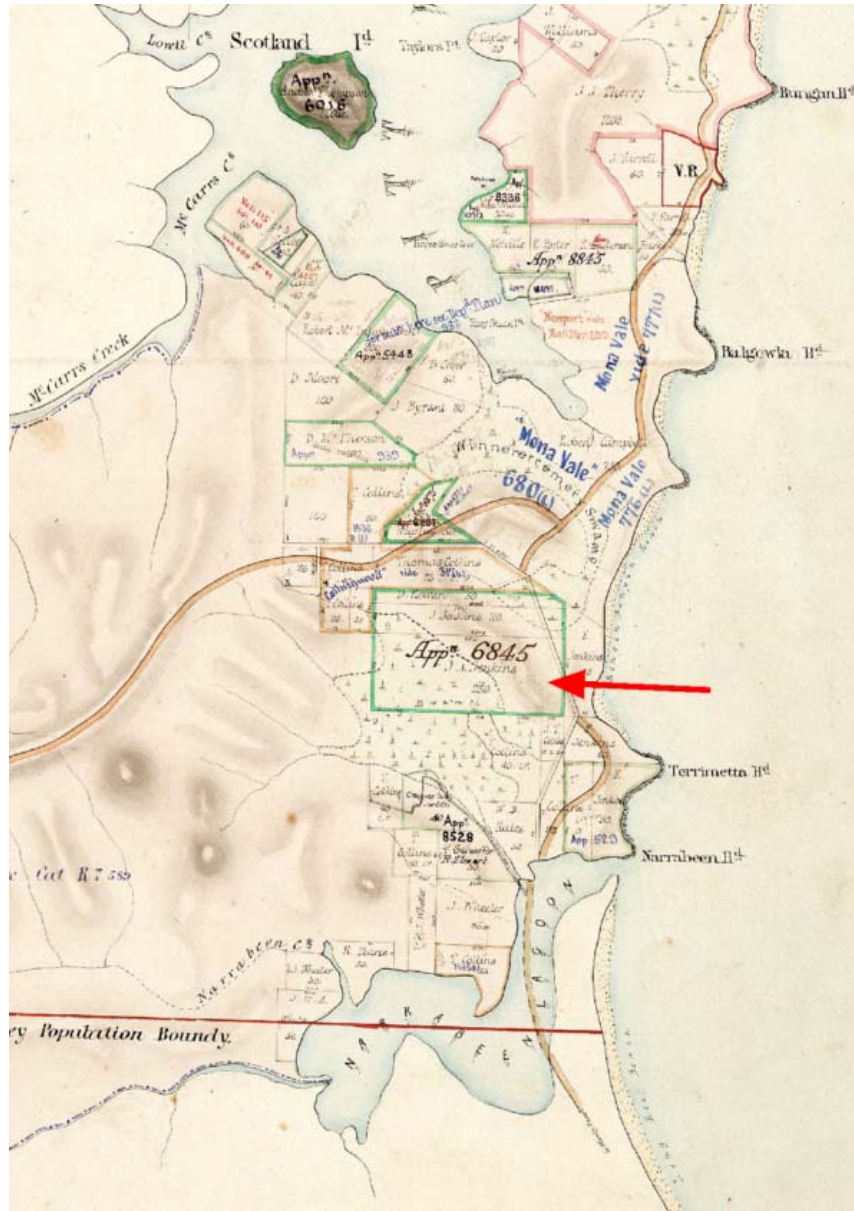


Plate 1: Parish Map of Narrabeen showing the location of the study area. Date Unknown. (New South Wales Government (2 August 1999) County of Cumberland / Parish of Rooty Hill to County of Hunter / Parish of Narrabeen. New South Wales Crown Land Administrative Maps. Parish Maps. Metropolitan Office Set. CD 5 of 6 CDs. Volume Map MN05. Version 2.1.0.)

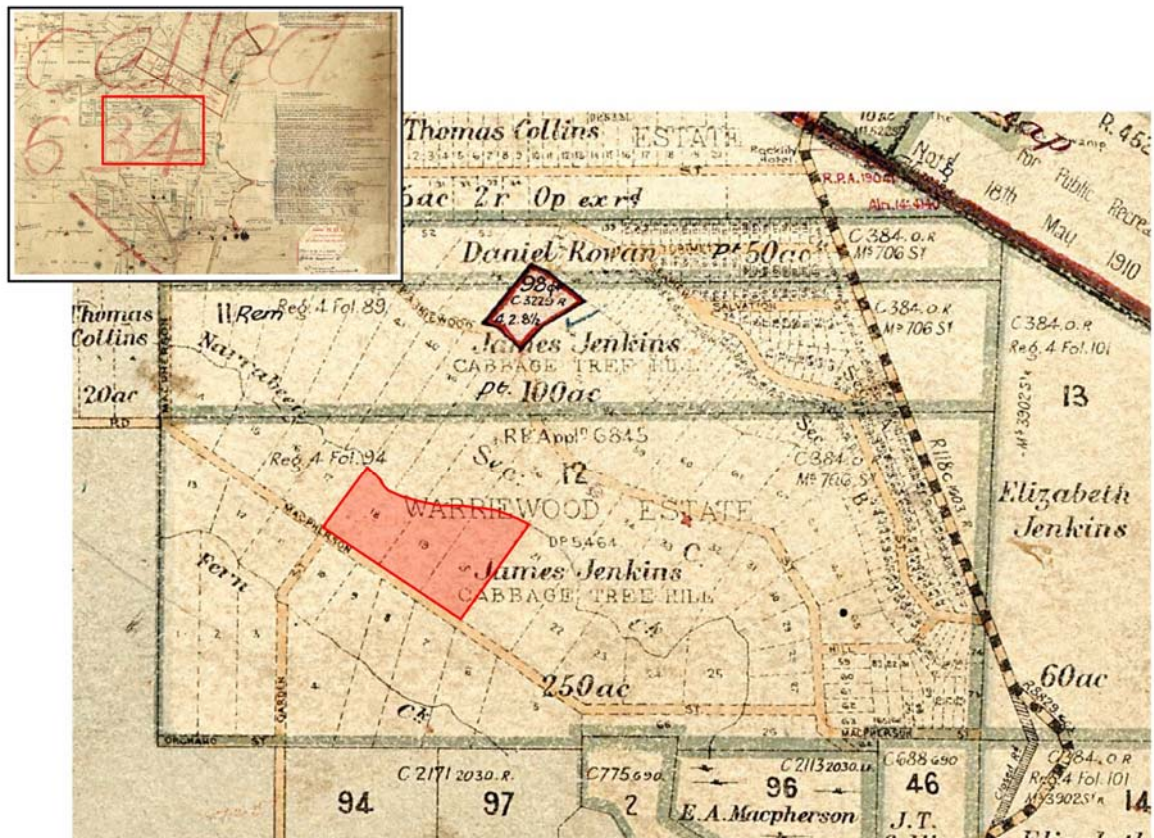


Plate 2: 1905 Narrabeen Parish Map, showing the land belonging to J. Jenkins and the planned subdivision of the “Great Warriewood Estate. (New South Wales Government (2 August 1999) County of Cumberland / Parish of Rooty Hill to County of Hunter / Parish of Narrabeen. New South Wales Crown Land Administrative Maps. Parish Maps. Metropolitan Office Set. CD 5 of 6 CDs. Volume Map MN05. Version 2.1.0.)

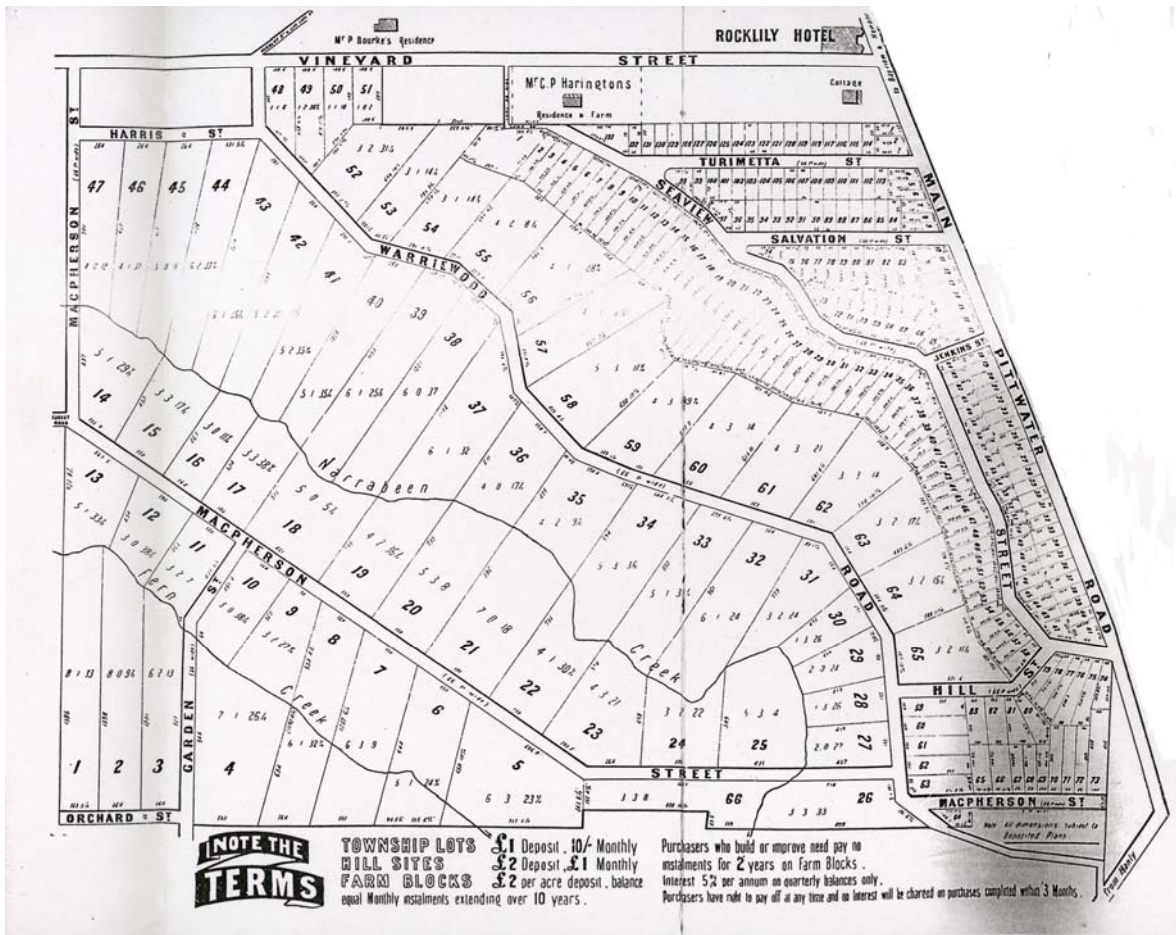


Plate 3: The “Great Warriewood Estate” subdivision plan (1906). (Henry F Halloran & Co. 1906: 23)



Plate 4: Narrabeen Creek showing the condition extent of the overgrown vegetation.



Plate 5: Photograph showing the level of disturbance between the creek and the closest buildings.



Plate 6: Example of the graded driveways/through affairs and levelled working areas within the study area.



Plate 7: Example of the graded driveways/through affairs and levelled working areas within the study area.



Plate 8: Example of the graded driveways/through affairs and levelled working areas within the study area.



Plate 9. Example of the general benching that has occurred in the study area



Plate 10. Example of the general benching that has occurred in the study area



Plate 11: Example of cut benches that have been dug to create level construction platforms for the buildings.

APPENDICES

APPENDIX 1

Indigenous community comment

APPENDIX 2

A2. Statutory regulations

A2.1 Aboriginal Sites

i) NSW Aboriginal cultural heritage legislation

The State *National Parks and Wildlife Act* 1974 provides protection for material and places relating to the past Aboriginal occupation of Australia, both before and after European occupation. This includes individual artefacts, scatters of stone artefacts, rock art sites, ancient camp sites, human burials, scarred trees, and ruins and archaeological deposits associated with Aboriginal missions or reserves. Aboriginal Objects (any material evidence of the indigenous occupation of NSW) are protected under Section 90 of the Act. Aboriginal places (areas of cultural significance to the Aboriginal Community declared by the Minister) are protected under Section 84 of the Act. The Act also establishes administrative procedures for archaeological investigations and the mandatory reporting of the discovery of Aboriginal sites. The NSW Department of Environment and Conservation administers *the National Parks and Wildlife Act*.

The NSW Department of Environment and Conservation also provides guidelines for standard archaeological reporting and assessment (NSW NPWS 1997). These guidelines are currently being updated and are in draft form (NSW NPWS n.d.)

The *National Parks and Wildlife Act* requires that a permit from the Director General be obtained before archaeological fieldwork involving disturbance to an Aboriginal site is carried out.

ii) Commonwealth Aboriginal cultural heritage legislation

The Commonwealth *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984 provides protection for Aboriginal cultural property. Certain powers and responsibilities are managed by the NSW Department of Environment and Conservation. Whereas the

State Act provides legal protection for all the physical evidence of past Aboriginal occupation, the Commonwealth Act deals with Aboriginal cultural property in a wider sense. Such cultural property includes any places, objects and folklore that ‘are of particular significance to Aboriginals in accordance with Aboriginal tradition’. There is no cut-off date and the Act may apply to contemporary Aboriginal cultural property as well as ancient sites. The Commonwealth Act takes precedence over State cultural heritage legislation when there is conflict.

Queries and applications to excavate or disturb an Aboriginal archaeological site for purposes of archaeological fieldwork, should be directed to Cultural Heritage Unit Manager at the relevant DEC Aboriginal Heritage Division regional Office:

A2.2 Non-Aboriginal Sites

i) NSW cultural heritage legislation

The *Heritage Act* 1977 details statutory responsibilities for historic buildings and gardens, historic places and objects, historical archaeological sites, and historic shipwrecks. The Act is administered by the Heritage Council of New South Wales, through the NSW Heritage Office.

The *Heritage Act* protects all historical archaeological sites, places and relics in NSW older than 50 years, regardless of their level of cultural heritage significance.

An excavation permit is required for any works, excavations or activities, associated with an archaeological site. Excavation permits are issued by the Heritage Council of New South Wales in accordance with sections 60 or 140 of the *Heritage Act*. It is an offence to disturb or excavate land to discover, expose or move a relic without obtaining a permit from the NSW Heritage Council. Excavation permits are usually issued subject to a range of

conditions that will relate to matters such as reporting requirements and artefact cataloguing, storage and curation.

The State Heritage Register is a list of places and items with State heritage significance endorsed by the Heritage Council and the Minister that came into effect on 2 April 1999. The register was established under the *Heritage Amendment Act 1998*. It replaces the earlier system of Permanent Conservation Orders as a means for protecting items with State significance. The processes of listing and monitoring the conservation and protection of items are essentially the same.

Items are added to the register by the Minister on the recommendation of the Heritage Council, following an assessment of their significance and consultation with owners and the broader community. The Heritage Council has established the State Heritage Register Committee to recommend items to the Minister for inclusion in the register.

A permit may be required from the Heritage Council of NSW for works or activities associated with a registered place or object.

General queries about site issues and permit applications can be made to the archaeological officers at the Heritage Office. The contact details are:

NSW Heritage Office
3 Marist Place
PARRAMATTA NSW 2150
Ph: (02) 9873 8500
Fax: (03) 9873 8599

Consultation and discussion with the NSW Heritage Office should begin well before lodging an application for a permit to disturb or destroy a historical archaeological site.

A2.3 Additional Legislation

Australian Heritage Commission Act 1975

The Commonwealth *Australian Heritage Commission Act* established the Australian Heritage Commission and provides protection for Aboriginal and historic cultural sites, and natural sites of significance to Australians. The Australian Heritage Commission maintains the Register of the

National Estate (RNE), which lists significant sites of the natural and cultural environments, including heritage places important to Aboriginal, European and Asian cultures in Australia.

Any place that has been nominated and assessed as having cultural heritage significance at a national level can be added to the RNE. Places are assessed against formal criteria included in the Act in 1990. The general purpose of the register is to 'alert and educate all Australians to the existence of places of National Estate significance, and to provide an essential reference and a working tool for balancing conservation and development decisions' (Pearson & Sullivan 1995: 48-9). Protection under the *Australian Heritage Commission Act* is only enforceable, however, when the place in question is on Commonwealth property or affected by actions of the Australian government. Listing on the RNE has no direct legal constraint on owners of private property, or on state or local governments.

Environmental Planning and Assessment Act 1979

The *NSW Environmental Planning and Assessment Act* may have relevance for certain projects because it requires that environmental impacts are considered in land-use planning and decision making. The definition of 'environment impacts' includes impacts on the cultural heritage of the project area. The Act has three relevant parts: Part III, which governs the preparation of planning instruments; Part IV, which relates to development where consent is required under an environmental planning instrument (EPI); and Part V, which relates to activity where development consent is not required but some other government approval assessments are needed.

Under the Act, local government authorities and The Department of Infrastructure, Planning and Natural Resources (formerly Planning NSW) prepare local and regional environmental planning instruments (LEPs and REPs) to give statutory force to planning controls. These may incorporate specific provisions for conserving and managing archaeological sites.

Integrated Development Assessment (IDA) was introduced under the *Environmental Planning and Assessment Act* so that all matters affecting a development application would be considered by the consent authority in an integrated way.

Integrated Development is one which requires development consent as well as one or more approvals from different government agencies. Such agencies may include NSW DEC or the NSW Heritage Council. If a development is likely to impact a heritage item, the consent authority must refer it, to NSW DEC (for Indigenous objects) or the NSW Heritage Council (for sites listed on the State Heritage Register) prior to approval determination.

The Local Government Act 1993

Under the State Local Government Act, councils can prepare local approvals policies that set out specific matters for consideration in relation to applications to demolish, build or undertake works. Archaeological sites could be considerations under such policies.

Environment Protection and Biodiversity Conservation Act 1999

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) an action requires approval from the Federal Environment Minister if the action will, or is likely to, have a significant impact on a matter of national environmental significance. Matters of national environmental significance are:

- World Heritage properties,
- Ramsar wetlands,
- nationally listed threatened species and communities,
- migratory species listed under international agreements,
- nuclear actions, and

- the Commonwealth marine environment.

The listing and further information about the EPBC Act can be found at the Department of Environment and Heritage website: www.ea.gov.au/epbc. Actions that are likely to have a significant impact on the environment of Commonwealth land (even if taken outside Commonwealth land), and actions taken by the Commonwealth that are likely to have a significant impact on the environment anywhere in the world, may also require approval under the EPBC Act.

APPENDIX 3

A3. Advice about the discovery of human remains

Both the NSW Heritage Office and the Department of Environment and Conservation have produced publications relevant to human remains. These are respectively: *Skeletal Remains: Guidelines for the Management of Human Skeletal Remains under the Heritage Act 1977* (1998) and *The Skeleton Manual: A Handbook for Identification of Aboriginal Skeletal Remains* (Thorne & Ross 1986).

These publications contain comprehensive details and should be consulted. The following discussion summarises relevant legislation and recommended actions.

If suspected human remains are discovered during any excavation or development work, the works must stop and a determination made as to whether the remains are human or not.

The State *Coroner's Act* 1980 gives the State Coroner jurisdiction over deaths which have occurred in NSW in the last 100 years. Anyone who discovers the remains of a 'person whose identity is unknown' should report the discovery directly to the State Coroner's Office or to the NSW Police. The Coroner's Act does not differentiate between treatment of Aboriginal and non-Aboriginal remains. The majority of burials found during development work are, therefore, likely to be subject to this reporting requirement.

Part IIA of the *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984 requires anyone who discovers suspected Aboriginal remains in NSW to report the discovery to the responsible Minister.

It should be noted that the *Aboriginal and Torres Strait Islander Heritage Protection Act* 1984 is subordinate to the *Coroner's Act* regarding the discovery of human remains. Therefore, the location at which the remains are found should be first treated as a possible crime scene, and the developer and/or contractor should not make any assumptions about the age or ethnicity of the burial.

The *National Parks and Wildlife Act* 1974 (as amended in 1989) is applicable when the skeletal remains are Aboriginal and are either per-contact in date or do not occur within cemeteries also used by Europeans (that is, historical cemeteries).

Police Commissioner's Instruction (120.08) states:

If any material is suspected of being of Aboriginal origin and there are no suspicious circumstances, then the site must be secured and a National Parks and Wildlife Officer contacted to identify the remains. Police are also asked to contact the nearest Aboriginal Community Liaison Officer.

Where it is believed the remains are Aboriginal, the police will usually invite representatives of the local Aboriginal community to be present when the remains are assessed. This is because Aboriginal people usually have particular concerns about the treatment of Aboriginal burials and associated materials.

If the skeletal remains are non-Aboriginal and more than 50 years old, the *Heritage Act* 1977 is relevant. Previous decisions and interpretations and decisions of the Heritage Council suggest that any feature or physical object from any NSW cemetery 50 or more years old may be a relic. Such objects may include buried human remains.

GLOSSARY & REFERENCES

GLOSSARY

Introduction & terminology

The following list provides definitions of various terms used in this report. Many of the terms have been referenced and the sources included in the reference list at the end of this report.

There is often a degree of confusion about the use of terms such as *heritage place*, *historical site*, *archaeological site* and so on. The definitions of these terms, as used in this report, have been included in the glossary and their relationship outlined in **Figure 1** below. The term used most consistently is *heritage place* and this is defined as follows:

Heritage place: A place that has aesthetic, historic, scientific or social values for past, present or future generations – ‘... this definition encompasses all cultural places with any potential present or future value as defined above’ (Pearson & Sullivan 1995: 7).

For the purpose of discussion in this document ‘heritage place’ can be sub-divided into **Aboriginal place** and **historic place** (i.e. a historic place refers more particularly to non-Aboriginal sites).

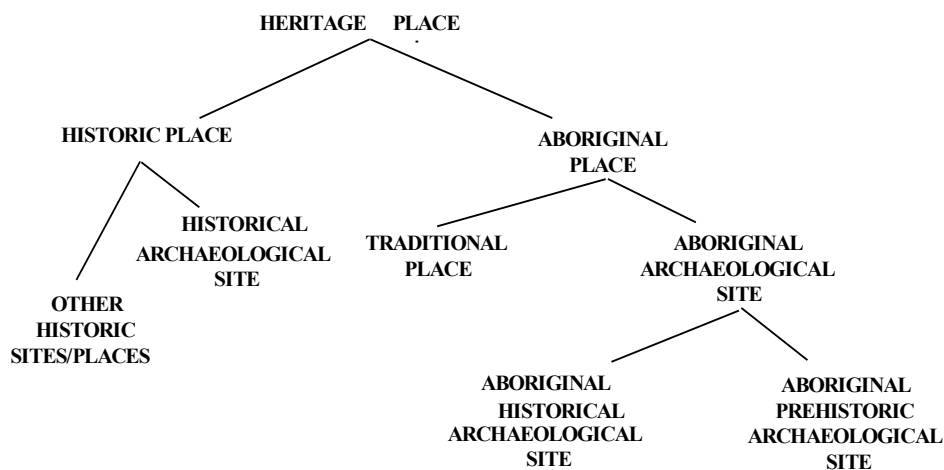


Figure G1: Terminology used for categories of heritage places.

Archaeological site types

The archaeological site types encountered in Australia can be divided into three main groups:

Historical archaeological site: an archaeological site formed since non-Aboriginal settlement that contains physical evidence of past human activity (for example a structure, landscape or artefact scatter).

Aboriginal historical archaeological site (or contact site): a site with a historical context such as an Aboriginal mission station or provisioning point; or a site that shows evidence of Aboriginal use of non-Aboriginal materials and ideas (for example: artefact scatter sites that have artefacts made from glass, metal or ceramics).

Aboriginal prehistoric archaeological site: a site that contains physical evidence of past Aboriginal activity, formed or used by Aboriginal people either before, or not long after, European settlement. These sites are commonly grouped as follows (further definition of each is contained in the glossary list):

- artefact scatter
- mound
- structures
- burial
- quarry
- rock art
- hearth
- scarred tree
- rock shelter
- isolated artefact
- shell midden
- rock well

One of the most common artefact types that provides evidence of Aboriginal people are those made from stone. Types and categories are outlined below in **Figure 2**, with further definition of each in the glossary list.

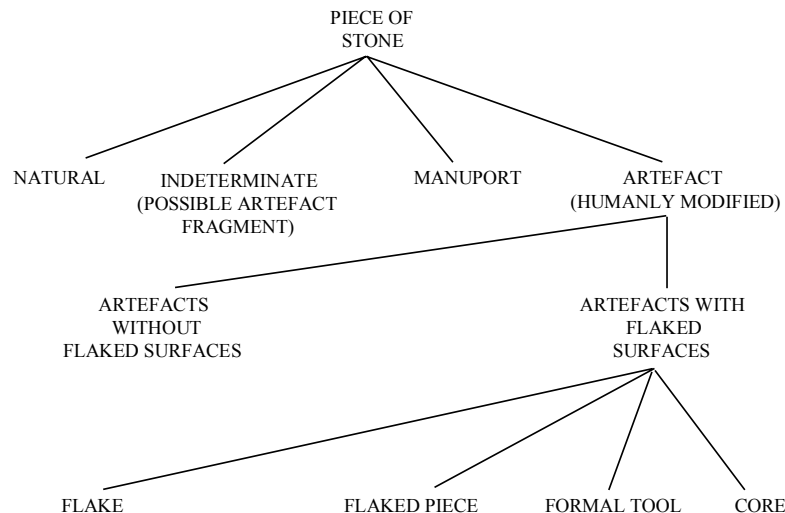


Figure G2: Stone artefact types/categories.

List of definitions

Aboriginal historical archaeological site (or contact site): either a site with an historic context such as an Aboriginal mission station or provisioning point; or a site that shows evidence of Aboriginal use of European/non-Aboriginal materials and ideas (e.g. artefact scatter sites that contain artefacts made from glass, metal or ceramics).

Aboriginal prehistoric archaeological site: a site that contains physical evidence of past Aboriginal use, formed or used by Aboriginal people either before, or not long after, European settlement.

Alluvial terrace: a platform created from deposits of alluvial material along river banks.

Anvil: a portable flat stone, usually a river pebble, used as a base for working stone. Anvils used frequently have a small

circular depression in the centre where cores were held while being struck. An anvil is often a multi-functional tool also used as a grindstone and hammerstone.

Archaeology: the study of the remains of past human activity.

Artefact scatter: a surface scatter of cultural material. Artefact scatters are often the only physical remains of places where people have lived camped, prepared and eaten meals and worked.

Backed piece: a flake or blade that has been abruptly retouched along one or more margins opposite an acute (sharp) edge. Backed pieces include backed blades and geometric microliths. They are thought to have been hafted onto wooden handles to produce composite cutting tools. Backed pieces are a feature of the 'Australian small tool tradition', dating from

between 5000 and 1000 years ago in southern Australia (Mulvaney 1975).

Bipolar working: technique used for the reduction of stone, in particular quartz, by placing a core on an anvil and ‘smashing’ with a hammerstone.

Blade: a flake at least twice as long as it is wide.

Burial site: usually a sub-surface pit containing human remains and sometimes associated artefacts.

Burin: a stone implement roughly rectangular-shaped with a corner flaked to act as point for piercing holes in animal skins. The distinguishing feature is a narrow spall, usually struck from the distal end down the lateral margin of a blade, but sometimes across the end of a flake (McCarthy 1976: 38).

Contact site: see ‘Aboriginal historical archaeological site’.

Core: an artefact from which flakes have been detached using a hammerstone. Core types include single platform, multi-platform and bipolar forms.

Cortex: original or natural (unflaked) surface of a stone.

Edge-ground implement: a tool, such as an axe or adze, which has usually been flaked to a rough shape and then ground against another stone to produce a sharp edge.

Edge modification: irregular small flake scarring along one or more margins of a flake, flaked piece or core, which is the result of utilisation/retouch or natural edge damage.

Flake: a stone piece removed from a core by percussion (striking it) or pressure. It is identified by the presence of a striking platform and bulb of percussion, not usually found on a naturally shattered stone.

Flaked piece: a piece of stone with definite flake surfaces, which cannot be classified as a flake or core.

Formal tool: an artefact that has been shaped by flaking, including retouch, or grinding to a predetermined form for use

as a tool. Formal tools include scrapers, backed pieces and axes.

Gilgai soils: soils with an undulating surface, presenting as a pattern of mounds and depressions. A possible cause is the alternation of swelling and cracking of clay during periods of wet and dry conditions.

Grindstones: upper (handstone) and lower (basal) stones used to grind plants for food and medicine and/or ochre for painting. A handstone sometimes doubles as a hammerstone and/or anvil.

Hammerstone: a piece of stone, often a creek/river pebble/cobble, which has been used to detach flakes from a core by percussion. During flaking, the edges of the hammerstone become ‘bruised’ or crushed by impact with the core.

Hearth: usually a sub-surface feature found eroding from a river or creek bank or a sand dune - it indicates a place where Aboriginal people cooked food. The remains of a hearth are usually identifiable by the presence of charcoal and sometimes clay balls (like brick fragments) and hearth stones. Remains of burnt bone or shell are sometimes preserved within a hearth.

Heat treatment: the thermal alteration of stone (including silcrete) by stone workers to improve its flaking qualities (see Flenniken & White 1983).

Heritage Place: A place with aesthetic, historic, scientific or social values for past, present or future generations – ‘... this definition encompasses all cultural places with any *potential* present or future value as defined above’ (Pearson & Sullivan 1995).

Historic place: a place that has some significance or noted association in history.

Historical archaeological site: an archaeological site formed since non-Aboriginal settlement that contains physical evidence of past human activity (for example a structure, landscape or artefact scatter).

Isolated artefact: the occurrence of one (or a small number as defined by the

survey methodology) of artefacts within a given area. It/they can be evidence of a short-lived (or one-off) activity location, the result of an artefact being lost or discarded during travel, or evidence of an artefact scatter that is otherwise obscured by poor ground visibility.

Manuport: foreign fragment, chunk or lump of stone that shows no clear signs of flaking but is out of geological context and must have been transported to the site by people.

Mound: these sites, often appearing as raised areas of darker soil, are found most commonly in volcanic plains or on higher ground near bodies of water. The majority were probably formed by a slow build-up of debris resulting from earth-oven cooking; although some may have been formed by the collapse of sod or turf structures. It has also been suggested some were deliberately constructed as hut foundations (Bird & Frankel 1991: 7-8).

Obtrusiveness: how visible a site is within a particular landscape. Some site types are more conspicuous than others. A surface stone artefact scatter is generally not obtrusive, but a scarred tree will be (Bird 1992).

Pebble/cobble: natural stone fragments of any shape. Pebbles are 2–60 mm in size and cobbles are 60–200 mm in size (McDonald et al. 1984: 78).

Percussion: the act of hitting a core with a hammerstone to strike off flakes.

Platform preparation: removal of small flake scars on the dorsal edge of a flake, opposite the bulb of percussion. These overhang removal scars are produced to prevent a platform from shattering (Hiscock 1986: 49).

Pre-contact: before contact with non-Aboriginal people.

Post-contact: after contact with non-Aboriginal people.

Quarry (stone/ochre source): a place where stone or ochre is exposed and has been extracted by Aboriginal people. The rock types most commonly quarried for artefact manufacture include silcrete,

quartz, quartzite, chert and fine-grained volcanics such as greenstone.

Retouch: a flake, flaked piece or core with intentional secondary flaking along one or more edges.

Rock art: ‘paintings, engravings and shallow relief work on natural rock surfaces’ (Rosenfeld 1988: 1). Paintings were often produced by mineral pigments, such as ochre, combined with clay and usually mixed with water to form a paste or liquid that was applied to an unprepared rock surface. Rock engravings were made by incising, pounding, pecking or chiselling a design into a rock surface. Rare examples of carved trees occasionally survive.

Rock shelter: may contain the physical remains of camping places where people prepared meals, flaked stone, etc. They are often classed as a different type of site due to their fixed boundaries and greater likelihood of containing sub-surface deposits. Rockshelters may also contain rock art.

Rock-well: a natural or modified depression within a stone outcrop, which collects water. The most identifiable of these sites have been modified by Aboriginal people, either by deepening or enlarging.

Scarred tree: scars on trees may be the result of removal of strips of bark by Aboriginal People e.g. for the manufacture of utensils, canoes or for shelter; or resulting from small notches chopped into the bark to provide hand and toe holds for hunting possums and koalas. Some scars may be the result of non-Aboriginal activity, such as surveyors marks.

Scraper: a flake, flaked piece or core with systematic retouch on one or more margins. Scraper types follow Jones (1971).

Shell midden: a surface scatter and/or deposit comprised mainly of shell, sometimes containing stone artefacts, charcoal, bone and manuports. These site types are normally found in association with coastlines, rivers, creeks and swamps – wherever coastal, riverine or estuarine

shellfish resources were accessed and exploited.

Significance: the importance of a heritage place or site for aesthetic, historic, scientific or social values for past, present or future generations.

Striking platform: the surface of a core, which is struck by a hammerstone to remove flakes.

Structures (Aboriginal): can refer to a number of different site types, grouped here only because of their relative rarity and their status as built structures. Most structures tend to be made of locally available rock, such as rock arrangements (ceremonial and domestic), fishtraps, dams and cairns, or of earth, such as mounds or some fishtraps.

Stratified deposit: material that has been laid down, over time, in distinguishable layers.

Utilised artefact: a flake, flaked piece or core that has irregular small flake scarring along one or more margins that does not represent platform preparation.

Visibility: the degree to which the surface of the ground can be seen. This may be influenced by natural processes such as wind erosion or the character of the native vegetation, and by land-use practices, such as ploughing or grading. Visibility is generally expressed in terms of the percentage of the ground surface visible for an observer on foot (Bird 1992).

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