Aboriginal Archaeological Assessment
&
Statement of Heritage Impact

Macquarie Shores Cycleway
Koona Bay Foreshore, Albion Park Rail, NSW

DRAFT REPORT

Prepared by
Heritage Concepts

for

Shellharbour City Council

May 2005
Executive Summary

Introduction
Heritage Concepts has been commissioned by Shellharbour City Council (SCC) to conduct an Aboriginal archaeological assessment and Statement of Heritage Impact for an area of land along the Koonia Bay foreshore. SCC is proposing to extend the existing Macquarie Shores Cycleway along the Koonia Bay foreshore between Wooroo Street in the south and Shearwater Boulevard in the north (a distance of approximately 1.4 km). In addition, paths will be constructed to link the new cycleway to Koonia Street via existing side streets. These connections will be along Wooroo Street (100 m long), Karoo and Werrang Streets (60 m long each) and Windang and Kanahooka Streets (80 m long each).

The proposal to extend the cycleway was identified in the Shellharbour Bike Plan 2003. The cycleway will be constructed in foreshore public reserve, situated between the Koonia Bay shoreline and residential properties in Koonia Street (zoned 6A Open Space Zone in Shellharbour City Council Local Environment Plan 2000), and wetlands (zoned 7a Environmental Protection (Wetlands) Zone), situated north of Albion Creek. Two construction methods are proposed; a fill option and a boardwalk option. The construction method selected will be based on an assessment of design requirements with regards to flooding and relative impacts to Aboriginal heritage within the study area.

Study Area
The study area is within the Shellharbour Local Government Area (LGA) on the foreshore of Koonia Bay, Albion Park Rail. Situated on the south western shore of Lake Illawarra, Koonia Bay is approximately 100 km south of Sydney.

Project Objectives
The key objectives of this project in accordance with the brief are as follows;
- Identification of statutory requirements to be met by this study;
- Review of relevant State & Federal heritage registers and listings, the AHC Register of the National Estate (RNE), National Heritage List (NHL) and Commonwealth Heritage List (CHL) and the Department of Environment and Conservation (DEC) / National Parks & Wildlife Service (NPWS) Aboriginal Heritage Information Management System (AHIMS);
- Review of Local and Regional Environmental Plans;
- Identification of, and consultation with, local Aboriginal stakeholders, including Local Aboriginal Land Council, Native Title Claimants and Tribal Elders Corporations;
- Identification of, and consultation with, any Aboriginal people who register as stakeholders with an interest in the project;
- Review of existing documents including previous archaeological reports, heritage studies, and conservation plans;
- Review and assessment of past environmental factors that may influence the condition and integrity of archaeological sites being present within or near the study area;
- Site survey and inspection in order to;
  - Assess the condition of the land surfaces within the study area;
  - Clarify inconsistencies presented in the Aboriginal Sites register card for site 52-5-0190;
  - Identify and record any Aboriginal archaeological sites or cultural heritage items within the study area;
  - Assess the archaeological potential and heritage significance of any identified Aboriginal cultural heritage sites or items within the study area;
Aboriginal Archaeological Assessment & Statement of Heritage Impact: Macquarie Shores Cycleway, Koona Bay Foreshore, Albion Park Rail, NSW

Assessment of the potential for undetected surface or subsurface Aboriginal archaeological sites or items to occur within the study area, and;

Identify areas of Aboriginal archaeological sensitivity.

Assessment of the potential impact of future development on the identified Aboriginal cultural heritage values of the study area;

Identification of a preferred construction method in consultation with Aboriginal stakeholders; and

Development of management guidelines regarding identified Aboriginal cultural heritage sites, items and areas of Aboriginal archaeological sensitivity in light of statutory heritage requirements and “best practice” heritage principles.

Aboriginal Stakeholder Consultation

Aboriginal consultation for the current project was initially undertaken by Shellharbour City Council. The study area falls within the boundaries of the Illawarra Local Aboriginal Land Council (ILALC) and the areas of three Aboriginal stakeholder groups including the Wodi Wodi Elders Corporation (WWEC), the Wadi Wadi Coomaditchie Aboriginal Corporation (WWCAC), and the Korewal Elouera Jerrungarugh Tribal Elders Aboriginal Corporation (KEJ). A search lodged with the National Native Title Tribunal by Heritage Concepts on the 21st March 2005 indicated that there are no registered Native Title claims in the Shellharbour Local Government Area.

Ms. Debbie Holloway, Aboriginal Community Liaison Officer, Shellharbour City Council, informed Heritage Concepts that preliminary verbal communication with each of the four Aboriginal stakeholder groups within the area had been undertaken by Council. Heritage Concepts followed this with a formal letter to each of the groups outlining the development proposal (including site location maps) and inviting stakeholder participation in the assessment of Aboriginal heritage values within the study area.

Given the presence of a registered site within the study area, it was determined to approach the project as if an approval under Part 6 of the NSW National Parks and Wildlife Act 1974 would be required. Part 6 approvals (covering all S87 Preliminary Research Permit and S90 Consent applications) are now governed by the DEC Interim Community Consultation Requirements. While it was unclear if there would be impacts to the registered Aboriginal site within the study area, time constraints associated with the project suggested that it would be prudent to undertake full consultation with all stakeholders in this stage of the project in order to facilitate later stages of the project should a S87 or S90 be required. Consequently an advertisement seeking registration of interest by Aboriginal people, as required under Section 1(b) of the guidelines, was placed in the local newspapers and on the Council web site. The advertisement appeared in the Illawarra Mercury on Saturday, 12/03/05, and The Advertiser and Lake Times on Wednesday, 16/03/05.

Illawarra Local Aboriginal Land Council (ILALC), the Wodi Wodi Elders Corporation (WWEC) and the Wadi Wadi Coomaditchie Aboriginal Corporation (WWCAC) expressed their interest in being involved in the current project. No response was received from the Korewal Elouera Jerrungarugh Tribal Elders Aboriginal Corporation.

Mr Shaun Suddery, Sites Officer, Wodi Wodi Elders Corporation, registered an interest in the project on 22nd March 2005. Mr Suddery indicated he would be interested in participating in any field inspection associated with the project and providing advice on the management of Aboriginal cultural heritage within the study area on behalf of WWEC.

Mr Allan Carriage, Chairperson, Wadi Wadi Coomaditchie Aboriginal Corporation registered interest in the project on 23rd March 2005. Mr Carriage indicated he would be interested in participating in any field inspection associated with the project and providing advice on the management of Aboriginal cultural heritage within the study area on behalf of WWCAC.

Heritage Concepts contacted the ILALC on the 29th March, 2004 and was informed by Mr. Basil Smith, ILALC Co-ordinator, that Wodi Wodi Elders Corporation Sites Officers also represented ILALC during site inspections. Mr Jim Davis, Wodi Wodi Elders Corporation (WWEC) was contacted and indicated that the Sites Officer would represent the interests of both and WWEC.
Mr Allan Carriage, WWCAC conducted a site inspection of the study area with Sam Moody and Bernadette McCall (Heritage Concepts) on the 13th April, 2005. Mr Suddery was unable to attend the site inspection, consequently Mr. James Davis, WWEC Sites Officer and representative of the ILALC participated in a field inspection, also on the 13th April 2005.

Mr Carriage provided a verbal statement that WWCAC was not opposed to the construction of a bike path along the Koona Bay foreshore as long as the impacts to areas of Aboriginal heritage significance were minimised. Mr Carriage also expressed concern that important bird habitats be preserved and that the foreshore access be wheelchair accessible.

Mr Davis indicated that ILALC and WWEC shared concerns that Aboriginal cultural heritage sites be recognised within the area and that impacts to these sites be minimised during the design phase of the project. Mr Davis indicated that the project needs to be discussed among the Elders. A response from WWEC and ILALC is expected shortly.

Subsequent to the site inspection, clarification was received regarding construction methods of the boardwalk and bridge abutments. The survey participants were contacted by phone to discuss the changed plans. A formal letter to each of the four groups outlining the results of the survey and the proposed construction methods was sent to all Aboriginal stakeholder groups on 27th April 2005.

Site Inspections – findings

The presence of an Aboriginal midden (site 52-5-0190) within the study area was known prior to the site inspection. Site card inconsistencies resulted in confusion as to the exact location of the registered midden. One aim of the survey was to identify and define the midden within the study area and clarify the location of the site. Two Aboriginal sites were identified during the site inspection; Koona Bay One – Wilsons Memorial Park (midden, artefact and Potential Archaeological Deposit) and Koona Bay Two - Wooroo St (midden and Potential Archaeological Deposit). It is thought that Koona Bay 1 is a southern extension of registered site 52-5-0190.

No additional areas of Aboriginal archaeological potential or sensitivity were identified during the site inspection. The foreshore area includes natural and modified land surfaces, and both middens are visible in areas of high disturbance. Each of the sites includes an area of PAD, however the extent and integrity of potential midden deposits is unclear.

Excluding sites KB 1 and KB 2, the remainder of the surveyed study area is assessed to be of nil-low Aboriginal archaeological potential or sensitivity.

- No sandstone exposures suitable for either shelter, axe/hatchet maintenance or engraving were identified;
- No mature native timber which may exhibit evidence for scarification remained within the study area.

Assessment of Cultural Heritage Values & Significance

Two midden sites, KB 1 and KB 2, were identified within the current study area. Site KB 1 is thought to correlate to registered Aboriginal site 52-5-0190. These sites are part of a larger Aboriginal cultural heritage landscape associated with the Lake Illawarra foreshore and surrounds and are important indicators of a sustained Aboriginal presence within the area.

Both of the identified Aboriginal cultural heritage items within the study area possess scientific value through their ability to provide information regarding shellfish procurement strategies, food processing techniques, patterns of land use, occupation and subsistence strategies. The associated lithic material at site KB 1 may also provide additional information on lithic technologies and raw material sources. The visible, surface areas of the two middens are of limited archaeological value due to the heavy disturbance of the archaeological deposits.
However, any intact, subsurface midden deposits associated with the two sites will further increase understanding of Aboriginal occupation of the Lake Illawarra foreshore, and are considered to be of scientific significance.

It is not the place of the consultant to provide information regarding the social, historic or aesthetic value of the Aboriginal cultural objects and places within the study area. Such information can only be provided by the local Aboriginal communities – any information regarding these issues presented by the Aboriginal stakeholder groups will be incorporated into the final report.

No additional Aboriginal cultural places, objects or areas of potential sensitivity within the study area were identified in the relevant literature or databases, or located during the site inspections conducted for this project. Preliminary Aboriginal community consultations also indicated that the study area does not contain any specific social or historical value, although foreshore areas are generally regarded as significant as “feeding places” (Allan Carriage, pers comm. 13/4/05).

**Statement of Heritage Impact**

Within the study area two Aboriginal sites have been identified. Site KB 1 and the registered location of site 52-5-0190 are within the impact area of the proposal. The proposal has been modified to avoid the location of site KB 2.

Impacts to Site KB 1 and PAD are predicted to occur as a result of the proposed construction of a cycleway along the Koona Bay foreshore. These impacts include disturbance of Aboriginal cultural heritage material during grubbing and excavation activities associated with the fill option construction method and limited disturbance of Aboriginal cultural heritage material during the pile driving associated with placement of uprights during construction of the boardwalk option construction method. At the registered location of site 52-5-0190 there will be no impacts associated with the fill options as this construction method impacts only on the fill unit overlying the archaeological deposit. The boardwalk option in this area would result in limited impacts to archaeological material at depth below the existing ground surface.

**Options Analysis**

* Fill option

The fill option requires the clearing and excavation of the existing ground surface in order to place a stable construction base on which the cycleway may be built. Site KB 1 is visible in an exposure only slightly lower than the ground surface within the impact corridor. It is anticipated that stratigraphically intact archaeological deposit associated with site KB 1 may be encountered within the initial ground grubbing activities within this area. Direct impacts to Site KB 1 and PAD may be expected should ground clearance take place in this area. These impacts will be at least 3.5 m wide and up to 50 cm in depth. The fill option is predicted to have extensive impact to site KB 1 and PAD.

Although the registered location of site 52-5-0190 shows no evidence of midden material, the site must be considered as a registered Aboriginal site. The site card notes that (in this location) the site already has fill placed over it. Geotechnical investigations along the Koona Bay Foreshore indicate that to the south of the registered location there is no fill above the natural soil units. To the north of the registered area there is at least 20 cm of fill above 1 m of sandy clay before encountering “abundant shells” (Douglas Partners 2003:Boreholes 5 & 6). The fill construction option is not predicted to impact on the fabric of registered site 52-5-0190 should it be present within the registered location.

Site KB 2 and PAD is outside the impact area of the proposed development. As such, the fill option has no impacts to site KB 2 and PAD.

* Boardwalk Option
Site KB 1 and PAD is not within the original boardwalk area as defined by SCC. During the field investigations it became clear that the impacts to site KB 1 and PAD associated with land grubbing would directly impact any archaeological material within the area. Representatives of the Illawarra Local Aboriginal Land Council, the Wodi Wodi Elders Corporation and the Wadi Wadi Comaditchie Aboriginal Corporation identified that the construction of a boardwalk in the area would be their preferred construction method.

Boardwalk construction represents limited vertical disturbance of the overall midden deposit. Disturbance associated with the construction of a boardwalk in the vicinity of site KB 1 will be associated with the immediate areas in which the upright supports of the boardwalk are placed. The uprights will be driven into place where possible, although in areas of refusal the posts will be placed in holes excavated by an auger or a small machine bucket.

The smaller span boardwalk construction method (cantilever) allows for the pile driver to be raised above the immediate ground surface of the midden, the machinery being supported by the boardwalk as it is constructed. This limits impacts to the larger midden area as the potential for shell compaction from the weight of the machinery is removed, however, this is mitigated by the extra piles required due to the shorter span of each boardwalk section.

The larger span boardwalk construction method (conventional) will require less piles as each boardwalk section is up to 12 m in length. This would result in less piles within the extent of Site KB 1 and PAD, however, the construction method would potentially require machinery tracking along the exposed surface of the site. This is considered unacceptable. Mitigation measures should be introduced if conventional piling is required to construct the boardwalk. These may include an exclusion zone around the exposed site (existing fill will protect the PAD areas), and the use of rubber pads beneath the piling rig caterpillars to evenly distribute the weight of the machinery and minimise impacts to soil profiles within the PAD area. The machine used for augering should be comparatively small and lightweight, such as a bobcat.

The area of registered site 52-5-0190 is capped by an existing layer of fill. Placement of piles in this location may impact on limited areas of archaeological material, depending on the depth of fill placed above the midden. Conventional piling represents the better boardwalk option within this area as it requires fewer upright posts and therefore fewer areas of potential impact. The operation of machinery within this area does no pose any threat to the integrity of archaeological material given the capping (or protective) layer of fill which has been noted in this area. Impacts to archaeological material would only be evident in this area if, during the driving of piles, areas of refusal are encountered and auger holes or excavated holes are required for the installation of upright posts.

Site KB 2 and PAD is outside the impact area of the proposed development. As such, the boardwalk option has no impacts to site KB 2 and PAD.

7.3.3 Bridge construction

Both construction methods require excavation for the piling works and abutments, the major difference between the two options being the size of the crane required to install the superstructure. There was no Aboriginal cultural heritage material identified within this area during the field inspection, and there are no identified heritage constraints to the excavation and construction of a bridge in this area.

Recommendations

There are two Aboriginal sites within the study area; both are protected under the NSW National Parks and Wildlife Act 1974. The following recommendations are made in light of the proposed development, statutory regulations and best practice cultural heritage management. It is recommended that the construction of the cycleway may proceed with the following limitations:
Recommendation 1 - Registration of Aboriginal sites KB 1 and KB 2

All Aboriginal sites are protected under the NSW National Parks and Wildlife Act 1974. Site KB 1 correlates to registered Aboriginal site 52-5-0190. A new site card with details of Site KB 1 should be submitted to the Aboriginal Heritage Information Management System, managed by the Department of Environment and Conservation (formerly National Parks and Wildlife Service) with updated information and site description. Site KB 2 should be registered on the Aboriginal Heritage Information Management System managed by the Department of Environment and Conservation.

Recommendation 2 - Minimisation of impacts to Aboriginal heritage

Impacts to Aboriginal cultural heritage should be minimised wherever possible. Recommendations have been designed in order to minimise impacts to Aboriginal heritage and should be adopted as part of the Construction Environmental Management Plan during works along the study areas foreshore.

Recommendation 3 - Permit application process for Site KB 1 / Site 52-5-0190

Site KB 1 (the southern part of site 52-5-01900) will be impacted by both proposed construction methods. Impacts to sites KB 1 will include destruction of PAD material in the areas of land grubbing or where upright posts are driven.

- Fill Option
  Should the fill option be the chosen method of construction, a S87 Preliminary Research Permit will be required from the DEC prior to works commencing in the area. The S87 permit will be required as horizontal impacts to the site present research opportunities. The S87 permit will need to be accompanied by a research design written by a qualified archaeologist in conjunction with input from Aboriginal stakeholder groups. Once approved, an archaeological program will be conducted in accordance with the methodology outlined in the approved S87 permit. No ground disturbance at site KB 1 may occur until the S87 permit is issued.

  Following the conclusion of the preliminary investigations, a S90 Consent permit will be required from DEC. The S90 Consent permit must be written by a qualified archaeologist and may need to be accompanied by a research design (with input from the identified Aboriginal stakeholder groups) if archaeological salvage is required within the area. The S90 Consent application must clearly state that only a small proportion of the overall site area will be impacted by the proposed works. Site KB 1 (52-5-0190) will remain listed on the AHIMS database as registered and protected Aboriginal site with limited areas having been destroyed. The consent will be obtained only for areas where land grubbing occurs. The consent will not allow any impacts to, or blanket destruction of, the remainder of the site.

- Boardwalk Option
  Should the boardwalk option be the preferred construction method, a S90 Consent permit will be required from the DEC prior to works commencing within the area. Given the limited vertical impacts to archaeological material and the construction plan to drive the piles there is no research potential associated with the construction of a boardwalk in this area, consequently a S87 is not required in this instance. The S90 Consent permit must be written by a qualified archaeologist and supported by the Aboriginal stakeholders. The S90 permit must clearly state that the proposed works will result in limited destruction of site KB 1 (52-5-0190). Site KB 1 (52-5-0190) will remain listed on the AHIMS database as registered and protected Aboriginal site with limited areas having been destroyed. The consent will be obtained only for areas where the upright posts will be placed. The consent will not allow any impacts to, or blanket destruction of, the remainder of the site.
The location of site 52-5-0190 will be impacted by both proposed construction methods. However the fill option is not predicted to impact on archaeological material in this location as the impacts are confined to the fill unit overlying the archaeological material. The boardwalk option will impact archaeological material as the impacts extend deeper as a result of the pile driving in the area.

- **Fill Option**
  As there are no predicted impacts to archaeological material at site 52-5-0190 there is no requirement for a S87 Preliminary Research Permit or S90 Consent permit from NSW Department of Environment and Conservation.

- **Boardwalk Option**
  Should the boardwalk option be the preferred construction method, a S90 Consent permit will be required from the DEC prior to works commencing within the area. Given the limited vertical impacts to archaeological material and the construction plan to drive the piles there is no research potential associated with the construction of a boardwalk in this area. The S90 Consent permit must be written by a qualified archaeologist and supported by the Aboriginal stakeholders. The S90 permit must clearly state that the proposed works will result in limited destruction of site 52-5-0190. The site will remain listed on the AHIMS database as registered and protected Aboriginal site with limited areas having been destroyed. The consent will be obtained only for areas where the upright posts will be placed. The consent will not allow any impacts to, or blanket destruction of, the remainder of the site.

### Recommendation 4 – Preferred construction method Site KB 1 / 52-5-0190

The preferred construction method at Site KB 1 is a boardwalk as it results in limited vertical impacts to site KB 1. There is no preference between boardwalk construction methods with the understanding that:

- Cantilever boardwalk construction method will result in more piles driven into the midden material (= more impact).
- Conventional boardwalk construction method will result in fewer piles driven into the midden material. However, machinery will have to track across the site. Should this construction method be selected, machinery impacts must be mitigated via an exclusion zone (refer to Recommendation 8 below) and the utilisation of rubber pads below caterpillar treads.
- Contingency measure: Although the upright supports are predicted to be driven into the ground, should any areas of refusal be encountered auguring or excavation of the new hole may not occur without the presence of Aboriginal stakeholders who have expressed an interest to be present at such times.

The preferred construction method at the registered location of site 52-5-0190 is the fill option as it is predicted to avoid impacts to archaeological material, all impacts being confined to the fill unit overlying the archaeological site.

### Recommendation 5 – Permit application Site KB 2

As there are no predicted impacts to Site KB 2 there is no requirement for a S87 Preliminary Research permit or S90 Consent Permit from NSW Department of Environment and Conservation.

### Recommendation 6 – Preferred construction method Site KB 2

As site KB 2 is not within the impact area of the current proposal, there is no preferred construction method.
Recommendation 7 – Bridge construction
The preferred option for a bridge across Albion Creek is a prefabricated composite single span bridge as it requires a smaller crane to install the superstructure.

Recommendation 8 – Exclusion areas
Aboriginal sites and areas of PAD not within the immediate construction footprint should be fenced prior to any works commencing. The fencing should be of a self-supporting barrier type (ie not star pickets etc) and should be positioned on site under the supervision of an archaeologist and representatives of the Illawarra Local Aboriginal Land Council, the Wodi Wodi Elders Corporation, the Wadi Wadi Coomaditchie Aboriginal Corporation and Korewal Eouera Jerrungarugh Tribal Elders Aboriginal Corporation (should they wish to be present). These sites should be considered exclusion zones for the duration of the works. No materials may be stockpiled within these areas nor may machinery track across these areas.

Recommendation 9 – Works areas
Machinery may operate within the remainder of the study area with the following caveats:
1) At site KB 1, all heavy machinery should be operated from the southwestern (turfed) area of PAD. Machinery cannot be driven across the exposed area of midden in this location.
2) Within the operations area of site KB 1 and site 52-5-0190, rubber pads must be placed under the caterpillar tracks in order to evenly distribute the weight of the machine to avoid compaction of the fill unit overlying midden material.

Recommendation 10 – Aboriginal watching brief
Preliminary discussions with Aboriginal stakeholders have indicated that the Lake Illawarra foreshore area is of high cultural significance to Aboriginal people. A watching brief will be initiated with interested Aboriginal stakeholders able to attend the site works to watch for any unanticipated archaeological material within the works area. Any S87 or S90 Permits required for the works will also specify a level of Aboriginal involvement. Aboriginal participation has also been requested in order to ensure that the exclusion areas are observed. The level of Aboriginal presence on site will be determined once a preferred construction method is selected and in consultation with the interested Aboriginal stakeholders.

Recommendation 11 – Site induction
Prior to commencement of works within the study area, all workers and contractors involved with the project should be inducted as to the Aboriginal heritage significance of the Lake Illawarra foreshore, particularly the study area, and the measures which have been instigated in order to protect and preserve heritage items. This induction shall be conducted by an archaeologist or an employee of Shellharbour City Council familiar with this report. The induction will also outline the procedures to be followed should unanticipated Aboriginal material be encountered during construction.

Recommendation 12 – Future works
The S90 consent permit, if granted, is applicable to ONLY the works described within this assessment and included in the permit. Any future works not discussed in this assessment, which may impact the fabric of sites KB 1 and KB 2 must be assessed and relevant recommendations provided. This recommendation is particularly pertinent should a southern extension to the current proposal ever be considered.
Recommendation 13 – Stop work provision
As required by the NSW National Parks and Wildlife Services Act 1974 in the event that Aboriginal cultural fabric or deposits, not covered by the approved S90 consent permit are encountered, works must cease immediately to allow an archaeologist to make an assessment of the find. The archaeologist will need to consult with the NSW Department of Environment and Conservation and the relevant local Aboriginal stakeholder groups regarding any Aboriginal cultural material identified.

Recommendation 14 – Communication of Aboriginal use of Koona Bay
The presence of two midden sites along the Koona Bay foreshore is indicative of Aboriginal use of the area for shellfish procurement and consumption. In addition, Lake Illawarra holds significance to Aboriginal people for environmental reasons. Provision should be made along the cycleway for the placement of interpretive signage which communicates the Aboriginal significance and importance of the Koona Bay area to users of the cycleway. Information contained in such signage must be general to the area and any text presented should be written in conjunction with, and approved by, the Aboriginal stakeholders of the area.

Recommendation 15 – Provision of draft report for comment
A copy of the draft report shall be forwarded to the Illawarra Local Aboriginal Land Council, the Wodi Wodi Elders Corporation, the Wadi Wadi Coomaditchie Aboriginal Corporation and the Korewal Elouera Jerrungarugh Tribal Elders Aboriginal Corporation. Any comments and recommendations made by the Aboriginal community shall be incorporated into the final report.
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1 Introduction

1.1 Project Background

Heritage Concepts has been commissioned by Shellharbour City Council (SCC) to conduct an Aboriginal archaeological assessment and Statement of Heritage Impact for an area of land along the Koona Bay foreshore. SCC is proposing to extend the existing Macquarie Shores Cycleway along the Koona Bay foreshore between Wooroo Street in the south and Shearwater Boulevard in the north (a distance of approximately 1.4 km). In addition, paths will be constructed to link the new cycleway to Koona Street via existing side streets. These connections will be along Wooroo Street (100 m long), Karoo and Werrang Streets (60 m long each) and Windang and Kanahooka Streets (80 m long each).

The proposal to extend the cycleway was identified in the Shellharbour Bike Plan 2003. The cycleway will be constructed in foreshore public reserve, situated between the Koona Bay shoreline and residential properties in Koona Street (zoned 6A Open Space Zone in Shellharbour City Council Local Environment Plan 2000), and wetlands (zoned 7a Environmental Protection (Wetlands) Zone), situated north of Albion Creek. Two construction methods are proposed; a fill option and a boardwalk option. The construction method selected will be based on an assessment of design requirements with regards to flooding and relative impacts to Aboriginal heritage within the study area.

Preliminary investigations by Shellharbour Council included a search of registered Aboriginal sites within the area. A review of the Aboriginal Heritage Information Management System (AHIMS) managed by the Department of Environment and Conservation (DEC, formerly the NSW National Parks and Wildlife Service) identified a registered site (site 52-5-0190 midden) within the study area. DEC recommended that a survey and subsequent assessment should be undertaken in order to determine the potential impact of the development on existing Aboriginal heritage within the area.

Aboriginal midden 52-5-0190 is registered on AHIMS, however the site card presents inconsistent location details of the site. AMG co-ordinates on the site card are given as E 298 500 N 6173 200 (placing the site on the foreshore near Wooroo Street). The map on the site card shows the site at AMG E 298 120 N 6173 335 (placing the site on the foreshore near Werrang Street / Wilson Memorial Park). One objective of the project is the clarification of the location of site 52-5-0190.

1.2 The Study Area

The study area is within the Shellharbour Local Government Area (LGA) on the foreshore of Koona Bay, Albion Park Rail (refer to Figures 1.1 and 1.2). Situated on the south western shore of Lake Illawarra, Koona Bay is approximately 100 km south of Sydney.

The proposed cycleway will be constructed over two low lying areas and a small creekline (Albion Creek). Lowland 1 is located on the Koona Bay foreshore between Wooroo and Karoo Streets. Lowland 2 is located south and north of Albion Creek. Both low laying areas are characterised by low ground levels (generally equal to or lower than Mean High Water Level – MHWL) and muddy conditions.

In the 1980s, Sydney Water Corporation installed a sewer main along the Koona Bay foreshore. As part of this work, associated infrastructure including a number of pits, ventilation pipes and a sewer pump station in Windang Street (opposite 57 Koona Street) were also constructed. The sewer main runs along the lake shoreline within the public reserve from Wooroo Street in the south-east to the sewer pumping station in Windang Street and further to Kanahooka Street. From this pumping station, part of the main runs north along Kanahooka and Koona Streets to the second pumping station located at Shearwater Boulevard (SCC 2005).
Figure 1.1: General location of study area (NSW Road Directory 1998 Land Information Centre, Surveyor General’s Department NSW: 161).
Figure 1.2: Location of study area (Albion Park 9028-1-N Topographic Map 1:25,000, Central Mapping Authority NSW).
1.3 Project Objectives

The key objectives of this project in accordance with the brief are as follows;

▪ Identification of statutory requirements to be met by this study;

▪ Review of relevant State & Federal heritage registers and listings: the AHC Register of the National Estate (RNE), National Heritage List (NHL) and Commonwealth Heritage List (CHL) and the Department of Environment and Conservation (DEC) / National Parks & Wildlife Service (NPWS) Aboriginal Heritage Information Management System (AHIMS);

▪ Review of Local and Regional Environmental Plans;

▪ Identification of, and consultation with, local Aboriginal stakeholders, including Local Aboriginal Land Council, Native Title Claimants and Tribal Elders Corporations;

▪ Identification of, and consultation with, any Aboriginal people who register as stakeholders with an interest in the project;

▪ Review of existing documents including previous archaeological reports, heritage studies, and conservation plans;

▪ Review and assessment of past environmental factors that may influence the condition and integrity of archaeological sites being present within or near the study area;

▪ Site survey and inspection in order to;
  ▪ Assess the condition of the land surfaces within the study area;
  ▪ Clarify inconsistencies presented in the Aboriginal Sites register card for site 52-5-0190;
  ▪ Identify and record any Aboriginal archaeological sites or cultural heritage items within the study area;
  ▪ Assess the archaeological potential and heritage significance of any identified Aboriginal cultural heritage sites or items within the study area;
  ▪ Assess the potential for undetected surface or subsurface Aboriginal archaeological sites or items to occur within the study area, and;
  ▪ Identify areas of Aboriginal archaeological sensitivity.

▪ Assessment of the potential impact of future development on the identified Aboriginal cultural heritage values of the study area;

▪ Identification of a preferred construction method in consultation with Aboriginal stakeholders; and

▪ Development of management guidelines regarding identified Aboriginal cultural heritage sites, items and areas of Aboriginal archaeological sensitivity in light of statutory heritage requirements and “best practice” heritage principles.

1.4 Aboriginal Stakeholder Consultation

Aboriginal consultation for the current project was initially undertaken by Shellharbour City Council. The study area falls within the boundaries of the Illawarra Local Aboriginal Land Council (ILALC) and the areas of three Aboriginal stakeholder groups including the Wodi Wodi Elders Corporation (WWEC), the Wadi Wadi Coomaditchie Aboriginal Corporation (WWCAC), and the Korewal Elouera Jerrungarugh Tribal Elders Aboriginal Corporation (KEJ). A search lodged with the National Native Title Tribunal by Heritage Concepts on the 21st March 2005 indicated that there are no registered Native Title claims in the Shellharbour Local Government Area.

Ms. Debbie Holloway, Aboriginal Community Liaison Officer, Shellharbour City Council, informed Heritage Concepts that preliminary verbal communication with each of the four Aboriginal stakeholder groups within the area had been undertaken by Council. Heritage Concepts followed this with a formal letter to each of the groups outlining the development
Given the presence of a registered site within the study area, it was determined to approach the project as if an approval under Part 6 of the NSW National Parks and Wildlife Act 1974 would be required. Part 6 approvals (covering all S87 Preliminary Research Permit and S90 Consent applications) are now governed by the DEC Interim Community Consultation Requirements. While it was unclear if there would be impacts to the registered Aboriginal site within the study area, time constraints associated with the project suggested that it would be prudent to undertake full consultation with all stakeholders in this stage of the project in order to facilitate later stages of the project should a S87 or S90 be required. Consequently an advertisement seeking registration of interest by Aboriginal people, as required under Section 1(b) of the guidelines, was placed in the local newspapers and on the Council web site. The advertisement appeared in the Illawarra Mercury on Saturday, 12/03/05, and The Advertiser and Lake Times on Wednesday, 16/03/05. A copy of this advertisement is reproduced below.

![Advertisement](image)

**Figure 1.3:** Advertisement seeking Aboriginal stakeholders as placed in local newspapers

Illawarra Local Aboriginal Land Council (ILALC), the Wodi Wodi Elders Corporation (WWEC) and the Wadi Wadi Coomaditchie Aboriginal Corporation (WWCAC) expressed their interest in being involved in the current project. No response was received from the Korewal Elouera Jerrungarugh Tribal Elders Aboriginal Corporation.

Mr Shaun Suddery, Sites Officer, Wodi Wodi Elders Corporation, registered an interest in the project on 22nd March 2005. Mr Suddery indicated he would be interested in participating in any field inspection associated with the project and providing advice on the management of Aboriginal cultural heritage within the study area on behalf of WWEC.

Mr Allan Carriage, Chairperson, Wadi Wadi Coomaditchie Aboriginal Corporation registered interest in the project on 23rd March 2005. Mr Carriage indicated he would be interested in
participating in any field inspection associated with the project and providing advice on the management of Aboriginal cultural heritage within the study area on behalf of WWCAC.

Heritage Concepts contacted the ILALC on the 29th March, 2004 and was informed by Mr. Basil Smith, ILALC Co-ordinator, that Wodi Wodi Elders Corporation Sites Officers also represented ILALC during site inspections. Mr Jim Davis, Wodi Wodi Elders Corporation (WWEC) was contacted and indicated that the Sites Officer would represent the interests of both and WWEC.

Mr Allan Carriage, WWAC conducted a site inspection of the study area with Sam Moody and Bernadette McCall (Heritage Concepts) on the 13th April, 2005. Mr Suddery was unable to attend the site inspection, consequently Mr. James Davis, WWEC Sites Officer and representative of the ILALC participated in a field inspection, also on the 13th April 2005.

Mr Carriage provided a verbal statement that WWAC was not opposed to the construction of a bike path along the Koona Bay foreshore as long as the impacts to areas of Aboriginal heritage significance were minimised. Mr Carriage also expressed concern that important bird habitats be preserved and that the foreshore access be wheelchair accessible.

Mr Davis indicated that ILALC and WWEC shared concerns that Aboriginal cultural heritage sites be recognised within the area and that impacts to these sites be minimised during the design phase of the project. Mr Davis indicated that the project needs to be discussed among the Elders. A response from WWEC and ILALC is expected shortly.

Subsequent to the site inspection, clarification was received regarding construction methods of the boardwalk and bridge abutments. The survey participants were contacted by phone to discuss the changed plans. A formal letter to each of the four groups outlining the results of the survey and the proposed construction methods was sent to all Aboriginal stakeholder groups on 27th April 2005.

1.5 Authorship

The main body of the report was produced by Caroline Wilby and Sam Moody and reviewed by Lori Sciusco of Heritage Concepts. The site inspection was carried out by Sam Moody and Bernadette McCall (Heritage Concepts) accompanied by Mr Allan Carriage Wadi Wadi Coomaditchie Aboriginal Corporation representative on 13th April, 2005. Mr James Davis, Sites Officer, Wodi Wodi Elders Corporation and Illawarra Local Aboriginal Land Council participated in a separate field inspection on 13th April 2005 also accompanied by Sam Moody and Bernadette McCall.

1.6 Acknowledgements

The input and participation of the following people are gratefully acknowledged

- Allan Carridge, Wadi Wadi Coomaditchie Aboriginal Corporation
- Jim Davis, Wodi Wodi Elders Corporation
- James Davis, Wodi Wodi Elders Corporation
- Predrag Draca, Design Engineer, Shellharbour City Council
- Debbie Holloway, Aboriginal Community Liaison Officer, Shellharbour City Council
- Lisa McFarlane, GIS Officer, Shellharbour City Council
- Kellyanne Sheargold, Aboriginal Cultural Heritage Unit, Department of Environment & Conservation
- Basil Smith, Illawarra Local Aboriginal Land Council
- Shaun Suddery, Wodi Wodi Elders Corporation
1.7 Abbreviations Used

The following abbreviations have been used throughout this document.

AHC Australian Heritage Council
AHIMS Aboriginal Heritage Information Management System
CHL Commonwealth Heritage List
DEC Department of Environment & Conservation (formerly NPWS)
ILALC Illawarra Local Aboriginal Land Council
IREP Illawarra Regional Environmental Plan
KEJ Korewal Elouera Jerrungarugh Tribal Elders Aboriginal Corporation
LEP Local Environmental Plan
LGA Local Government Area
MHWL Mean High Water Level
NHL National Heritage List
NPWS National Parks & Wildlife Service (NSW)
RNE Register of the National Estate
SOHI Statement of Heritage Impact
WWCAC Wadi Wadi Coomaditchie Aboriginal Corporation
WWEC Wodi Wodi Elders Corporation
2 Legislative Framework

2.1 Introduction
Aboriginal cultural heritage in Australia is protected and managed under a variety of legislation. The following section provides a brief summary of the Acts which are relevant to the management of cultural heritage in NSW. It is important to note that these are not presented as legal interpretations of the legislation by the consultant.

2.2 Commonwealth Legislation

2.2.1 Environment Protection & Biodiversity Conservation Act 1999 (EPBC Act)

Under Part 9 of the EPBC Act, any action that has, or is likely to have, a significant impact on a matter of National Environmental Significance (known as a controlled action under the Act), may only progress with the approval of the Commonwealth Minister for the Environment. An action is defined as a project, development, undertaking, activity (or series of activities), or alteration to any of these. Where an exception applies, an action will also require approval if it:

1. It is undertaken on Commonwealth land and will have or is likely to have a significant impact;
2. Is undertaken outside Commonwealth land and will have or is likely to have a significant impact on the environment on Commonwealth land; and
3. Is undertaken by the Commonwealth and will have or is likely to have a significant impact.

Under Section 28 subsection (1) “The Commonwealth or Commonwealth Agency must not take inside or outside Australian jurisdiction an action that has, will have, or is likely to have a significant impact on the environment inside or outside Australian jurisdiction”. The EPBC Act defines ‘environment’ as both natural and cultural environments and therefore Aboriginal and historic cultural heritage items included on the Register of the National Estate are regarded as part of the cultural environment.

Recently, Australia has changed the legislation that protects its national heritage places. Three new laws came into effect on January 2004 and are essentially a combination of the previous heritage system with a number of changes which include the establishment of a National Heritage List and a Commonwealth Heritage List.

The National Heritage List records places with outstanding natural and cultural heritage values that contribute to Australia’s National identity. The Commonwealth Heritage List will comprise natural, Aboriginal and historic places owned or managed by the Commonwealth. The new laws provide changes that offer greater legal protection under the existing Environment Conservation and Biodiversity Conservation Act 1999 (EPBC Act). Under the new system, National Heritage will join six other important ‘matters of national environmental significance’ (NES matters) already protected by the EPBC Act.

The three new Acts are;

- The Environment and Heritage Legislation Amendment Act (no.1) 2003
- The Australian Heritage Council Act 2003
- The Australian Heritage Council (Consequential and Transitional Provisions) Act 2003

Approval under the EPBC Act is required if you are proposing to take an action that will have, or is likely to have, a significant impact on the National Heritage values of a National Heritage place and/or any other NES matter. This action must be referred to the Australian Government.
Minister for the Environment and Heritage. The Minister will decide whether an action will, or is likely to, have a significant impact on a matter of national environmental significance.

The heritage provisions of the EPBC Act allow for a transition period whilst the National and Commonwealth Heritage Lists are finalised. During this transition period the Register of the National Estate acts in conjunction with the formative National and Commonwealth lists to provide full coverage for items already identified as having cultural heritage significance.

### Application to the study area - Commonwealth Listings

No items within the study area are listed on the Register of the National Estate, the National Heritage List or the Commonwealth Heritage List.

#### 2.2.2 Aboriginal and Torres Strait Islander Heritage Protection Amendment Act 1987

The Aboriginal and Torres Strait Islander Heritage Protection Amendment Act of 1987 is a Federal act administered by the Aboriginal and Torres Strait Islander Commission, and provides protection for Aboriginal heritage in circumstances where such protection is not available at a state level. This Act comes under Commonwealth jurisdiction which means that it can override state and territory provisions.

#### 2.3 State Legislation

##### 2.3.1 National Parks and Wildlife Act 1974

The National Parks and Wildlife Act 1974 provides for the protection of Aboriginal objects (sites, relics and cultural material) and Aboriginal places. Under the Act (S. 5), an Aboriginal object is defined as;

> any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains.

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

Under Section 90 of the Act, it is an offence to knowingly destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of, an Aboriginal object or Aboriginal place, without the prior written consent from the Director-General of the NSW Department of Environment and Conservation. In order to obtain such consent, a Section 90 Consent Application must be submitted and approved by the DEC Director-General. In considering whether to issue a S. 90 Consent, DEC will take into account:

- The significance of the Aboriginal object(s) or place(s) subject to the proposed impacts;
- The effect of the proposed impacts and the mitigation measures proposed;
- The alternatives to the proposed impacts;
- The conservation outcomes that will be achieved if impact is permitted; and
- The outcomes of the Aboriginal community consultation regarding the proposed impact and conservation outcomes.

It is also an offence, Under Section 86 of the Act, to disturb or excavate land for the purpose of discovering an Aboriginal object, or disturb or move an Aboriginal object on any land, without first obtaining a permit (Preliminary Research Permit, Excavation Permit, Collection Permit or Rock Art Recording Permit) under Section 87 of the Act. In issuing a Section 87 Permit, DEC will take into account;
• The views of the Aboriginal community about the proposed activity;
• The objectives and justifications for the proposed activity;
• The appropriateness of the methodology to achieve the objectives of the proposed activity; and
• The knowledge, skills, and experience of the nominated person (s) to adequately undertake the proposed activity.

Under Section 91 of the Act, it is a requirement to notify the DEC Director-General of the location of an Aboriginal object. Identified Aboriginal items and sites are registered with the NSW DEC on the Aboriginal Heritage Information Management System (AHIMS).

### Application to the study area – NSW DEC AHIMS Listings:

There are forty four (44) Aboriginal objects and Aboriginal places registered with the NSW Department of Environment and Conservation within a 10 km x 8 km search area centred on the study area. Site 52-50190 falls within the boundaries of the study area.

#### 2.3.2 The Heritage Act 1997 (NSW) (amended 1999)

The Heritage Act 1977 is the primary piece of State legislation affording protection to all items of environmental heritage (natural and cultural) in New South Wales. "Items of environmental heritage" include places, buildings, works, relics, moveable objects and precincts identified as significant based on historical, scientific, cultural, social, archaeological, architectural, natural or aesthetic values.

The Heritage Act 1977 established the Heritage Council of NSW which provides advice and recommendations to the Minister for Urban Affairs and Planning relating to the conservation and management of items of environmental heritage. The Heritage Council is also required to maintain a database of items of State heritage significance; the State Heritage Register, and a database of items of both State and local heritage significance; the State Heritage Inventory.

If the Heritage Council believes that a heritage item or place needs to be conserved, it can make a recommendation to the Minister, who decides whether to place protection on that item. There are two types of protection available: interim heritage orders; and listing on the State Heritage Register. These forms of protection are 'binding directions', which means that the heritage item which is protected in one of these ways cannot be demolished, redeveloped or altered without permission from the Heritage Council.

The Heritage Act 1977 does not apply to Aboriginal "relics" (any deposit, object or material evidence), which are protected under the National Parks and Wildlife Act 1974, however, some aspects of Aboriginal cultural heritage management and protection are covered by the provisions of the Heritage Act 1977.

The Director-General of the Department of Environment and Conservation can recommend that the Minister of Urban Affairs and Planning make Interim Protection Orders (IPOs) to preserve areas of land that have natural, scientific or cultural significance which can include land with Aboriginal places or relics on it.

Particular Aboriginal places and items that the community has formally recognised as being of high cultural value can also be listed on the State Heritage Register. This provides an extra level of protection in addition to that provided by the National Parks and Wildlife Act 1974.

### Application to the study area – NSW State Heritage Register listings

There are no heritage items within the study area listed on the NSW State Heritage Register.
2.3.3 Environmental Planning and Assessment Act 1979

The Environmental Planning and Assessment Act 1979 requires that environmental impacts are considered prior to land development. This includes impacts on Aboriginal and non-Aboriginal cultural heritage items and places. The Act also requires that Local Governments prepare Local Environmental Plans (LEP) in accordance with the Act to provide guidance on the level of environmental assessment required. Shellharbour LEP 2000 includes provisions to control development in the vicinity of heritage items to conserve and promote heritage values.

The consent authority must take into consideration the likely effect of the proposed development on the heritage significance of a heritage item or heritage conservation area, and on its setting, when determining an application for consent to carry out development on land in its vicinity.

Schedules 2 and 3 of Shellharbour LEP identify conservation areas and heritage items.

Application to the study area - Shellharbour Local Environment Plan 2000

The study area contains no items of heritage significance listed under the Shellharbour LEP 2000.

Under the EP&A Act, broad scale regional plans have also been developed which address cultural heritage resources which may extend beyond the geographic limit of one Local Government Area. The Illawarra Regional Environmental Plan (1986) No 1 applies to the Wollongong, Shellharbour, Kiama, Shoalhaven and Wingeecarribee local government areas and provides a planning and decision making framework for how to best use land resources, improve quality of life and protect regional interests and investment. The IREP identifies the Illawarra region as possessing unique characteristics worth preserving and distinguishes items of cultural heritage associated with the escarpment and its environs.

Application to the study area - Illawarra Regional Environmental Plan (1986) No. 1:

The study area contains no items of heritage significance listed under the Illawarra Regional Environmental Plan No. 1.

2.4 Summary of Cultural Heritage Listings within the Study Area

- Australian Heritage Database; RNE, CHL and NHL
  
  No cultural heritage places listed on the Australian Heritage Database are within the boundaries of the study area.

- NSW Department of Environment & Conservation Aboriginal Heritage Information Management System
  
  There are forty four (44) Aboriginal objects and Aboriginal places registered with the NSW Department of Environment and Conservation within a 10 km x 8 km search area centred on the study area. Site 52-50190 falls within the boundaries of the study area.

- NSW State Heritage Register
  
  There are no cultural heritage items within the study area listed on the NSW State Heritage Register.

- Shellharbour Local Environmental Plan (2000)
  
  There are no cultural heritage items within the study area listed on the Shellharbour LEP 2000.

- Illawarra Regional Environmental Plan (1986) No. 1
  
  The study area contains no items of heritage significance listed under the IREP (1986) No. 1.
3 Environmental Context

3.1 Topography & Landform

There are three broad physiographic units in the Illawarra region; (1) the Plateau (tableland) including the Woronora Plateau (Hazelton & Tille 1990) and the Moss Vale Tableland (Hazelton 1992) with sub-units of the Barren Grounds and Budderoo Plateaus (Fuller & Mills 1985); (2) the Illawarra Escarpment and Slopes, running in a north-south direction and ranging in altitude from c. 300 metres ASL in the north to c. 600 metres ASL in the south; and (3) the Coastal Plain, formed mainly by the western recession of the Plateau in central Illawarra (Bowman 1971). The Coastal Plain is widest at the points where Macquarie Rivulet has entrenched into the Plateau at Macquarie Pass and where other catchments of Lake Illawarra, such as Duck and Mullet Creeks, have carved into the Escarpment (Bowman 1971). The study area is situated within the Coastal Plain physiographic unit, which may be described as a mosaic of foothills, ridges, spurs, hillocks and floodplains with slopes varying from very gently inclined to steep with the occasional low cliff. The immediate environment of the study area is characterised by low, level relief of less than 5 metres (Bowman 1971, Hazelton 1992:2).

3.2 Geological Context

The Illawarra region forms part of the Sydney Basin; a geological basin filled with near horizontal sandstones and shales of Permian to Triassic age overlying older basement rocks of the Lachlan Fold Belt. The Illawarra subregion of the Sydney Basin is characterised by Permian siltstones, shale, sandstones and interbedded volcanics on and below the coastal escarpment.

The geology of the Albion Park Rail area is predominantly Quaternary Alluvium sediments and Permian aged sediments. The study area is situated within Quaternary Alluviums, comprising alluviums, gravels, swamp deposits and sand dunes. Surrounding this is the Permian aged Shoalhaven Group, including Berry Siltstone Budgong Sandstone and Lattites (Gerringong volcanics). Berry Siltstone is located to the south of the study area, being composed of siltstone, shale, sandstone and tuffaceous sandstone. Recent Alluviums are situated approximately below 10 metres AHD, with areas of higher relief consist of Berry Siltstone (Rose 1966).

3.3 Soil Landscapes

Soil landscapes in the Illawarra region are diverse and heterogeneous. The study area is situated primarily in the Albion Park (ap) soil landscape as described below. A small portion of the northern study area is categorised as disturbed terrain (xx). This occurs within other soil landscapes and consists of soils disturbed by human activity to a depth of at least 100 cm, with the original soil being removed, greatly disturbed or buried, often in the process of levelling the natural slope to <5%(Hazelton 1992: 107).

* Albion Park (ap)

Albion Park is an erosional soil landscape present on the Berry Formation of the Coastal Plain. Generally, the topography of the Albion Park soil landscape is characterised by short steep upper slopes grading into long gentle footslopes. Relief is generally 60 – 100 m (although the study area continues to sea level). Upperslopes are at 15 – 50% while footslopes are at 5 – 15% Given these inclines, drainages lines are incised on upper slopes and grade into broad drainage plains on lower slopes. Albion Park soils consist of moderately deep (50 – 100 cm) Brown Podzolic Soils on crests. Yellow podsolic Soils occur on midslopes and Soloths occur on footslopes and drainage lines. Waterlogging, seasonally high watertable, shrink-swell, hardsetting (topsoil) sodicity, low wet bearing strength (subsoil) and high available water-holding capacity (topsoil and subsoil) are all characteristic of the Albion Park soil landscape (Hazelton 1992: 40).
3.4 Hydrology

The study area lies between Lake Illawarra to the immediate east and swamp areas associated with Macquarie Rivulet and Frazers Creek to the west. Situated along Koona Bay, between Haywards Bay (to the north) and Burroo Bay (to the east), the study area is on the foreshore of Lake Illawarra. Lake Illawarra is classified as an early Intermediate Barrier Estuary or an estuarine lagoon. Barrier estuaries are characterised by “narrow elongated entrance channels with broad tidal and back barrier sand flats.” Lake Illawarra is the largest estuarine lagoon on the south coast of NSW, covering an area of 33 square kilometres and extending over nine kilometres in length and five kilometres in width. It receives salt water from the Pacific Ocean and fresh water from the Illawarra Escarpment (Roy 1984).

Macquarie Rivulet and Frazers Creek are permanent north flowing creeks located to the west of the study area. Both creeks have low water velocities and meander through the landscape, flowing into Lake Illawarra at Creole Point. The topography, combined with the available surface water and a high water table, has created a swamp environment. Streams on the gently sloping coastal plains are unconfined by topography and have extensive floodplains. A series of small billabongs are located in the western portion of the Albion Park Aerodrome. In the northern portion of the study area a small order creek (Albion Creek) flows east to Lake Illawarra.

3.5 Vegetal Resources

The Illawarra region is characterised by mixed warm temperate and subtropical rainforest complexes on rich shale soils and alluvium under the escarpment. Detailed regional ecological assessments by Mills (1988, 1989) and Mills & Jakeman (1995) identifies three major contiguous areas of rainforest in the Illawarra region, including Yarrawa Brush on the Moss Vale Tableland and Budderoo Plateau; Berkeley Brush north of Lake Illawarra on the Berkeley Hills; and Illawarra Brush in the central Illawarra between Gerroa, Jamberoo and Shellharbour. The Illawarra Brush occurred primarily on the coastal Permian volcanics, but also occurred on a range of geological substrates, mainly between Albion Park and Gerringong.

The Coastal Plain landscape within which the study area is situated would have originally consisted of large areas of the Illawarra Brush or sub-tropical rainforest (incorporating both moist and dry subtropical rainforest communities) on the deeper rich volcanic soils.

Characteristic tree species in the Illawarra subtropical rainforest complexes include Adiantum formosum (Black Stem Maidenhair), Allocorynus subcinereus (Bird’s Eye), Alphitonia excelsa (Red Ash), Balogia inophylla (Brush Bloodwood), Brachychiton acerifolius (Illawarra Flame Tree), Cassine australis (Red Olive Plum), Cayratia clematidea (Slender Grape), Celastrus australis (Australian Staff Vine), Chysocoma antarctica (Kangaroo Vine), Citrobothus pauciflorus (Orange Thorn), Dendrocnide excelsa (Giant Stinging Tree), Diospyros pentamera (Myrtle Ebony), Diplodispora australis (Native Tamarind), Doodia aspera (Prickly Rasp Fern), Eupomatia acuminata (Koda Tree), Guioa semiglauca (Wild Quince), Hibiscus heterophyllus (Native Rosella), Legnephora moorei (Round Leaf Vine), Maclura cochinchinensis (Cockscomb Thorn), Malaisia scandens (Burney Vine), Pennantia cunninghamii (Brown Beech), Piper novaehollandiae (Pepper Vine), Planchonella australis (Black Apple), Podocarpus elatus (Plum Pine), Scoporia brownii (Brown Birch), Streblus brunonianus (Whalebone Tree), Toona ciliata (Australian Red Cedar) and Wilkiea huegliana (Veiny Wilkiea).

The subtropical rainforest of the Illawarra Coastal Plain would also have been associated with patches of sclerophyll forest and woodland. The drier areas of the Albion Park Rail district would have been dominated by extensive stands of melaleucas, including Melaleuca decora (White Honeymyrtle), Melaleuca styphelioides (Prickly-leaved Paperbark) and Eucalyptus longifolia (Woolly Butt). Open forest communities within the wider Macquarie Rivulet valley include Thin Leaved Stringybark Eucalyptus eugenioides, Forest Red Gum E. turticorns, Scribbly Gum E. haemastoma, Bloodwood E. gummifera, Black Ash E. siberi and Rough Barked Apple Angophora floribunda species (Fuller and Mills 1985:49, Robinson 1988: 5).
The study area would also have been situated adjacent to both estuarine and swamp environments and vegetation communities. The Frazer's Creek Wetland largely contains dense reedlands. Indigenous vegetation of this ecotone includes Black Wattle (Acacia mearnsii), Curly Pondweed (Potamogeton crispus), Blunt Pondweed (Potamogeton ochreatus), Dusky Coral Pea (Kennedia rubicunda), Common Reed Phragmites australis, Lesser Joyweed Alternanthera denticulata, Common Rush (Juncus usitatus), Tall Spike-rush (Eleocharis spicata), Cumbungi (Typha orientalis), River Club-rush (Schoenoplectus validus), Spiny-headed Mat-rush (Lomandra longifolia), Water Plantain (Alisma plantago-acquatica), Swamp Dock (Rumex brownii), Water Ribbons (Triglochin procerum) and Swamp Oak (Casuarina glauca) (Chafer 1997:74).

The estuarine environments around Lake Illawarra are characterised by swamp she-oaks (Casuarina glauca), mangroves (Avicennia marina) and limited saltmarsh species such as (Sarcocornia quinqueflora), saltwater couch (Sporobolus virginicus), sea rush (Juncus kraussii) and sedge (Cyperus laevigatus) and saltgrasses such as Eelgrass (Zostracorniculata), Sea tassel (Ruppia megacarpa) and Paddle weed (Halophila ovalis) (Chafer 1997:44).

3.6 Faunal Resources

In addition to the rich resources provided by vegetal communities, faunal resources would have contributed to the diet and tool kit of Aborigines. Several species of animal were utilised including molluscs, fish, birds and terrestrial animals.

- Estuarine:

Birds of several species have been identified in the Macquarie Rivulet Delta. These include Brown Quail, Australian Shelduck, Great Crested Grebe, Great Cormorant, Great Egret, Black Bittern, Purple Swamp Hen, Curlew Sandpiper, Sacred Kingfisher, Fairy Martin, King Quail, Australian Pelican, Intermediate Egret, Black-necked Stork, Dusky Moorhen, Whimbrel, Pied Oystercatcher, Caspian Tern, Plumed Whistling-Duck, Pacific Black Duck, Whistling Kite, Red-kneed Dotterel, Crested Tern, Musk Duck, White-fronted Chat, Little Egret, Striated Heron, Straw-necked Ibis, White-bellied Sea-eagle, Common Greenshank, Masked Lapwing, Little Tern, Black Swan, Grey Teal, Pacific Heron, Royal Spoonbill and Kelp Gull (reference should be made to Chafer 1997:77 for a full list of birds within the Macquarie Rivulet Delta).

Mammals within the estuarine environment of the Macquarie Rivulet delta and the foreshores of Lake Illawarra include water rats (Hydromys chrysogaster) the ringtail possum (Trichosurus vulpecula), the bush rat (Rattus fuscipes) and the short-beaked echidna (Tachyglossus aculeatus).

Reptiles found locally within estuarine environments include Eastern Water Skink, Pale Sunskink, Dark Sunskink, Weasel Skink, She-oak Skink, Common Blue Tongue, Red-bellied Black Snake and Black-bellied Swamp Snake.

Amphibians including the Common Eastern Froglet, Brown-striped Frog, Bleating Tree Frog and Peron's Tree Frog are found in estuarine environments.

Fishes found within Lake Illawarra include Yellowfin Bream, Black Bream, Blue Groper, Short-finned Eel, Long-finned Eel, Long-snouted Flounder, Mulloway, Australian Salmon, Silver trevally, Snapper, Stinkfish, Anchovy, Smooth Flutemouth, Whitebait, Sea Garfish, River Garfish, Flat-tail Mullet, Australian Bass, Estuary Perch, Yellow-finned Leatherjacket, Sea Mullet, Sand Mullet, Trumpeter Whiting, Large-toothed Flounder, Small-toothed Flounder, Blue Mackerel, Sand Whiting, Black Sole, Yellowtail and Red Mullet (Chafer 1997:43, reference should be made to this work for a more complete list of fish species found within Lake Illawarra).

Molluscs found locally include Anadara trapezia, Batiillaria australis, Bedeva paivae, Hydrobia buccinoides, Irus crenatus, Laterula tasmanical, Lilia hordeacea, Macona deltoidalis, Nassarius burchardi, Pyrazus ebeninus, Salinatator fragilis and Spisula Trigonella.
### Swamp

Birds identified within the Frazers Creek Wetlands include Brown quail, Australian wood Duck, Chestnut Teal, Australian Pelican, Purple Swamphen, and Musk Duck. Mallard, Pink-eared Duck, white-faced heron, Australian White Ibis, Whiskered Tern, Freckled Duck, Pacific Black Duck, Hardhead, Eurasian Coot, Straw-necked Ibis, Black Swan, Australasian Shoveler, Great Egret, Latham’s Snipe, Australian Shelduck, Grey Teal, Swamp Harrier and Clamorous Reed-warbler (Chafer 1997:75). A more complete list of birds identified from Frazers Creek Wetlands is contained in Chafer 1997.

No specific information relating to other faunal species of the Frazers Creek Wetlands was identified during research for this project. As a general rule, a freshwater swamp environment would host a variety of frog species and snake species.

### Open Forest

Mammals found within open forest communities include swamp wallaby (*Wallabia bicolor*), long-nosed bandicoot (*Perameles nasuta*), eastern pygmy possum (*Cercartetus nanus*), sugar glider (*Petaurus breviceps*), common ringtail possum (*Pseudocheirus peregrinus*), Mountain brush-tailed possum (*Trichosurus cunninghamii*), common wombat (*Vombatus ursinus*), brown antechinus (*Antechinus stuartii*), bush rat (*Rattus fuscipes*) and grey-headed flying fox (*Pteropus poliocephalus*).

### 3.7 Resources available to Aboriginal Populations

The Coastal Plain of the Illawarra region generally provides a number of resources used by Aboriginal inhabitants. Outcrops of siltstone, shale and tuffaceous sandstones of the Berry Siltstone formation would have provided stone resources, while coastal rock platforms provided areas where tools might be ground and sharpened and art might be engraved.

A number of edible plant species would have been available within the Albion Park area. The topography of the general area includes several distinct ecotones including, estuarine lagoon, alluvial swamp, open forest and rainforest communities. Each ecotone would have hosted different floral and faunal resources, all of which would have been utilised according to seasonal availability. Aboriginal inhabitants of the Albion Park area would have had access to a wide range of avian, terrestrial and marine fauna and repeated firing of the vegetation would have opened up the foliage allowing ease of access through and between different resource zones.

Both floral and faunal species would have provided many resources in addition to food. Animals such as Brush-tailed Possums were highly prized for their fur, with possum skin cloaks recorded by the first settlers in the area. The cloaks were worn fastened over one shoulder and under the other. Kangaroo teeth were incorporated into decorative items such as head bands and beads were made from reeds and teeth. Plant resources were used in a variety of ways. Fibres were twisted into string which was used for a many purposes including the weaving of nets, baskets and fishing lines. String was also used for personal adornment. Barks were used in the provision of shelter, a large sheet of bark being propped against a stick to form a gunyah. Beaten and tied bark was also used to make torches for use at night.

Rainforests provided a rich and varied source of plant and animal resources, however, the extent to which these were utilised by Aboriginal peoples is not yet fully understood. As Mills and Jakeman note:

> The rainforest, with its abundance of fleshy-fruiting plants and its many animals, would have been an attractive site for collecting food. However, the notion that the rainforest contained an abundance of food resources should be tempered by the fact that the rainforest can be a wet and cold place, and that hunting in the dense canopy and...
undergrowth would be very difficult. Perhaps the edges of the rainforest provided a more pleasant and rewarding location for the hunting and gathering of food and other resources.

(Mills & Jakeman 1995:23)

It is worth noting that rainforest species collected by Aboriginal populations (refer to Figure 3.1) were probably used in areas outside the rainforest where conditions were more conducive to enjoyment. Given this, it is likely that the interface of ecotones were desirable places to collect resources as they provided a richer variety and better range of conditions. Places where the vegetation was easier to move through would appear to be desirable locations for the preparation and processing of resources.

Resources within the rainforests used by Illawarra Aboriginal populations included:

<table>
<thead>
<tr>
<th>Plant Species</th>
<th>Part Used</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ironwood (Acacia excelsa)</td>
<td>Wood</td>
<td>Making boomerangs</td>
</tr>
<tr>
<td>Red Ash (Alphitonia whiteii)</td>
<td>Leaves</td>
<td>Used to stupefy fish in pools</td>
</tr>
<tr>
<td>Slender Grape (Cayratia clematidea)</td>
<td>Roots &amp; berries</td>
<td>Eaten after preparation</td>
</tr>
<tr>
<td>Tree Ferns (Cyathea sp.)</td>
<td>New shoots, trunk</td>
<td>Roasted and eaten</td>
</tr>
<tr>
<td>Settlers’ Flax (Gymnostachyus anceps Araceae)</td>
<td>Leaves</td>
<td>Stripped and used for string</td>
</tr>
<tr>
<td>Cabbage Palm (Livistona australis)</td>
<td>Young leaves, trunk, heart, gum</td>
<td>Eaten</td>
</tr>
<tr>
<td>Snake Vine (Hibbertia scandens)</td>
<td>Stems and leaves</td>
<td>Fish poison</td>
</tr>
<tr>
<td>Water Vine (Cissus sp.)</td>
<td>Stems, Berries</td>
<td>Contain water, Eaten raw</td>
</tr>
<tr>
<td>Plum Pine (Podocarpus elatus)</td>
<td>Seeds &amp; fleshy stems / stalks</td>
<td>Eaten</td>
</tr>
<tr>
<td>Orange Thorn (Citriobatus pauciflorus)</td>
<td>Fruit</td>
<td>Eaten raw</td>
</tr>
<tr>
<td>Bolwarra (Eupomatia laurina)</td>
<td>Fruit</td>
<td>Eaten raw</td>
</tr>
</tbody>
</table>

Table 3.1: Rainforest resources utilised by Aboriginals (Source: Mills and Jakeman 1995:24)

Lake Illawarra also provided a rich source of resources. Allan Cunningham, Government Botanist, wrote in 1818:

...we came out upon the margin of the Lake, which is extensive, but very shoaly on its expanded surface. Pelicans, ducks and teal and some other aquatic birds were swimming, and in detached parties I observed natives of the Lake…..in canoes, spearing fish, which is said to be abundant.

Ethnographic accounts of Aboriginal subsistence patterns noted that men hunted and fished with spears, while women gathered, collected shellfish and fished with lines and hooks.
4 Archaeological Context

4.1 Prehistory of the Illawarra Region

Aboriginal populations are known to have inhabited the Illawarra region for at least 20,000 years. The earliest dated sites include Pleistocene occupation identified at a rock shelter at Burrill Lake, dated to approximately 20,000 years BP (Lampert 1971), and an open shell midden site at Bass Point, dated to approximately 17,000 years ago (Bowdler 1980). At the time of these periods of occupation, both sites would have been situated within hinterland areas located some distance away from the sea. In the case of Burrill Lake, it appears that the sea would have been located up to fifteen kilometres further east than its present level (McDonald 1992). With the melting of the continental ice sheets during the Post Glacial Marine Transgression, a rise in sea level occurred over several thousand years. The sea reached its present level approximately 6,000 to 7,000 years ago and has not fluctuated more than approximately one metre since the Holocene still stand (Thom & Roy 1983). The evolution of Lake Illawarra is attributable to these fluctuations in sea level and stream processes. Lake Illawarra filled approximately 6,000 years BP and has retained relatively the same form since then. As a consequence, the majority of sites situated around Lake Illawarra, like most Aboriginal sites on the south east coast of Australia, date to within this time period. It is likely that a considerable number of Pleistocene coastal sites once existed within the region but have been submerged and/or destroyed by sea-level changes that occurred during the Pleistocene-Holocene transition.

The Bass Point and Burrill Lake sites appear to have been continuously occupied since the Pleistocene and have thus provided valuable information regarding technological and economical change in the Aboriginal archaeological record. Changes in stone tool technology are reflected in changes in raw materials preferred and in the types of artefacts manufactured. McCarthy’s (1976) Eastern Australian stone tool sequence appears to be present throughout the Bass Point and Burrill Lake assemblages (Bowdler 1970). In the earliest phase of both sites, the lithic assemblages consist of large flakes and pebble tools, cores and coarse scrapers. From c. 4-5,000 years BP, these tool types were gradually replaced by finely modified backed blades, thumbnail scrapers, eloueras and fabricators. However, by c. 2-1,000 years BP, there is a gradual decline and disappearance of backed blades and an increase in the frequency of eloueras, fabricators and the use of quartz materials. Many of the sites on the south coast of New South Wales with evidence of shell fish exploitation have artefacts of this latter phase of the sequence.

In addition to the technological change, marked changes in the Aboriginal economy of the people occupying Bass Point have been identified, including the appearance and changeover to edible mussel (*Mytilus planulatus*) in the shellfish remains. Although this change is not synchronous for the south coast, *Mytilus planulatus* generally does not occur in sites before 1000 years BP. This change also appears to coincide with the appearance of shell fish hooks and Bowdler (1970) has suggested the change in shellfish exploitation is associated with the introduction of line fishing.

Historic accounts of Lake Illawarra and its hinterland which specifically reference the Aboriginal inhabitants are scarce, however, some early ethnographic accounts (e.g. research compiled by Organ 1990) suggest that at the time of European occupation, a highly mobile, largely dispersed population, with slightly higher populations near Lake Illawarra, occupied the region. The population density for the NSW coastal belt at the time of European settlement has been estimated at 1.5 people per 2km² which was a relatively high population density for a hunter-gatherer society and certainly much higher than the population density for the uplands (Sefton 1985). Based on the varied environmental zones along the south coast, however, it is unlikely that large scale movement from east to west was prevalent.

The first European explorers in the area were Bass and Flinders when they travelled to Port Kembla in 1796. Flinders wrote about “Canoe River” in his journal, making reference to the Lake Illawarra entrance. By 1816-1817, free-settlers started arriving in the area. The first land grants in the region were marked out by Surveyor General John Oxley and significant land...
clearing was soon undertaken. Clashes between cedar-getters and local Aboriginal populations have been documented in ethnographic reports (Organ 1990). Early European land use predominantly comprised cedar-getting, agriculture and dairying. By the 1850s, a township had been developed around the port of Shellharbour and the lake catchment had been transformed from forest into grassland and Aboriginal populations had been largely disseminated and dispersed.

Numerous Aboriginal archaeological surveys have been undertaken in the Illawarra region, falling broadly into three categories; large projects carried out within a research orientated framework and broad management context (Bowdler 1970, Dallas & Sullivan 1995, Navin 1987, Sefton 1985 & 1992), archaeological surveys conducted by interested amateurs (particularly the Illawarra Prehistory Group), and archaeological investigations carried out within a commercial contracting framework, dealing with specific localities subject to development and redevelopment (Dallas & Navin 1987, Navin 1989, 1990, Navin Officer 1997, 2002, Sefton 1985, Steele 2000).

A variety of Aboriginal sites have been identified during the course of archaeological investigations along the coastal plains, foreshores, foothills and escarpments surrounding Lake Illawarra including coastal, intermediate and estuarine middens, artefact scatters, isolated finds, scarred trees, ceremonial sites and burial sites.

4.2 The Illawarra Region – Patterns Identified in the Aboriginal Archaeological Record

Several regional patterns have been identified in the Aboriginal archaeological record in the Illawarra region. Navin (1987, 2002) has noted that the majority of Aboriginal sites recorded along the Illawarra coast and immediate hinterland occur at, or close to, ecotones – the boundaries of several ecological zones – thus providing optimum access to a broad range of ecological resources. The concentration of sites in areas of high economic diversity indicates that settlement around Lake Illawarra may have been fairly permanent. Access to fresh water also appears to be an important site location criterion, as many sites in the Illawarra region are situated adjacent to creeks. It should be noted, however, that such proximity to water courses may be an artificial or over emphasised association due to the high density of creeks and minor water courses around Lake Illawarra.

Available evidence also points to a definite preference for relatively flat, locally elevated and thus well-drained ground. Very few Aboriginal sites have been identified on recent alluvial deposits around Lake Illawarra; the majority of recorded sites are located on older, higher sedimentary units. This may indicate that many lowland sites have been destroyed by erosion or buried by sediment deposition. Such a large proportion of sites occurring on old sediments does, however, seem to reflect a cultural preference for areas away from low-lying probably flood prone zones (Navin 1987, Sefton 1985).

More specific patterns regarding Aboriginal site type and location have also been identified;

- Middens

Middens primarily contain waste materials resulting from meals of coastal resources, such as shellfish and bones and are thus found in close proximity to sea coasts, estuaries and beside rivers and inland lakes. Middens are one of the most common site type identified in the Illawarra region and range from shallow or surface scatters to deep, well consolidated deposits.

Estuarine middens have been identified on the foreshore or primary benches and bluffs around Lake Illawarra, headlands and old levee banks. Most of the lakeshore middens are made up of a limited range of estuarine shellfish species; Anadara trapezia (Sydney Cockle or Ark Cockle), Pyrazus ebeninus (Ebony Swamp Cerith or Sydney Mud Whelk) and Ostrea angasi (Flat Oyster) (Dallas & Navin 1987, Navin 1990).

Coastal middens are frequently identified on or near rocky headlands or rock platforms, adjacent to a creek mouth, or near hind-dune water sources. Smaller and lower density middens comprising sandy-shore shell species are frequently exposed in hind dune swales.
Middens along the coast near Lake Illawarra contain a much wider range of species, reflecting molluscan extraction from both sandy beach and rock platform resource zones.

Middens containing both estuarine and coastal species (intermediate middens) have also been identified near the entrance to Lake Illawarra (Navin 2002).

There is also an identified pattern on the New South Wales south coast of shell middens being associated with artefact scatters that diminish in density with distance from the midden. Sites containing both midden shell and lithic material are likely to occur on elevated ground adjacent to wetlands such as low gradient basal colluvial slopes, terminal spur line crests and alluvial terraces, or valley floor drainage corridors and sand bodies.

- **Open campsites / stone artefact scatters**

Open campsites comprise scatters of artefacts located either on the surface and/or in subsurface contexts. They may constitute the remains of hunting and gathering activities, domestic camps, or the manufacture and maintenance of stone tools. The density of artefacts may vary considerably between and across individual sites.

Open campsites represent the most prevalent site type located within the hinterland areas surrounding Albion Park Rail and the south western foreshore of Lake Illawarra. Artefact scatters have been identified mainly along ridgelines, river terraces, relic dunal features and higher areas on minor creek banks.

The majority of stone artefact assemblages identified in the Illawarra region are typical of the Late Phase of McCarthy's Eastern Australian stone tool sequence; i.e. are microlithic in character and include various flake products and knapping debris, microliths, blades and bondi points. The basic flaking methods represent are microblade knapping and bipolar flaking; typical for the Late Phase in the region as a whole. The predominant raw materials identified in Illawarra assemblages include petrified / silicified wood, quartz, chert, silcrete and indurated mudstone (Navin 1990, 2002).

- **Isolated Finds**

Isolated finds are artefacts which occur without any associated evidence for prehistoric activity or occupation. They are generally defined as single artefacts located more than a certain distance from any other artefact. Frequently used distances are 30, 60, or 100m. The distance used depends on variables such as “background” artefact densities, land use disturbance, geomorphic processes, and research design objectives. Isolated finds can generally occur anywhere in the landscape and may represent the random loss or deliberate discard of artefacts, or the remains of dispersed artefact scatters.

Isolated finds are known to occur in almost every landscape within the Illawarra region.

- **Scarred trees**

Scarred trees result when bark has been removed from a tree as a direct or indirect result of the manufacture of various goods and implements or the result of making foot holes in a tree to collect food or to facilitate the removal of bark.

Scarred trees would originally have occurred in all topographies where suitable trees occurred within the region’s extensive prehistoric forests, however, the greatest density of scarred tree sites tend to occur within close proximity to known occupation areas generally associated with significant water sources.

Nevertheless, these cultural sites represent a small proportion of the Aboriginal site types identified in the Illawarra region. This relative paucity of scarred trees is largely due to European land clearance that has occurred across the Illawarra. Surviving examples of scarred trees have generally been identified in the only remaining substantial stand of natural vegetation on the whole Lake Illawarra shoreline – on the backshore of Duck Creek.

Scarred trees identified in the Illawarra region are predominantly stringy bark (Eucalyptus eugenioides), and yellow box (Eucalyptus melliodora). (Navin 1990)
Ceremonial grounds

Stone arrangements on the south coast of New South Wales typically consist of stone cairns or alignments of single or grouped stones. Most stone arrangements are considered to have a sacred and ceremonial significance. However, traces of these types of sites would be unlikely to survive in an area which has been subject to extensive disturbance, such as is evident for the entire Lake Illawarra region. Only one possible stone arrangement has been recorded; situated on a steep south-west facing slope at Minnamurra. (Navin 1990)

Burial sites

Aboriginal burial sites in the Illawarra region are generally situated within deep, soft sediments such as aeolian sand or alluvial silts. Several burials have been identified around Lake Illawarra in midden deposits on the northern foreshore / lake entrance area and Wondang peninsula. They have generally only been visible where there has been some disturbance of sub-surface sediments or where they have been exposed by erosion processes.

Rock Shelters, Rock Engravings and Axe / Hatchet Grinding Grooves

Rock shelters with art and / or deposit, rock engravings and axe/hatchet grinding grooves are the most infrequently recorded site types within the Illawarra region. These sites generally occur within specific geological and topographical landscapes comprising sandstone exposures, shelving and overhangs. Few suitable sandstone exposures or overhangs and cavities possessing sufficient sheltered space to contain potential archaeological deposit / art have been documented in the foreshore and immediate hinterland areas of Lake Illawarra.

These sites generally occur on, or next to, sloping ground as characterised by the steep cliff lines bordering the foothills in the west, and large open and relatively flat areas of sandstone shelving and outcrops in close proximity to water.

4.3 Aboriginal Sites Recorded in the Local Context

A search of the Department of Environment and Conservation Aboriginal Heritage Information Management System (AHIMS) indicated that within a 10 km x 8 km area centred on the study area (Albion Park 1:25,000 AMG: Zone 56, Eastings 294000-304000, Northings 6171000-6179000), forty-four (44) Aboriginal sites had been identified and registered by March, 2005 (refer to Table 4.1). The majority of the Aboriginal sites recorded within the study region are middens (46%) and open campsites / artefact scatters (36%). The remainder of sites in the area are comprised of scarred trees (7%), isolated finds (7%), burials (2%) and Potential Archaeological Deposits (2%). Figure 4.1 shows the approximate location of the Aboriginal sites registered on the DEC AHIMS. Information regarding specific AMG co-ordinate locations is considered to be sensitive information and has thus not been provided.

It should be noted that the absence or paucity of records on the AHIMS database does not necessarily mean that Aboriginal sites, or particular site types, are not present within a given area. The DEC database contains only formally recorded sites and large areas of New South Wales have not been the subject of systematic survey or the recording of Aboriginal history. These areas may contain sites and places which are not currently listed on the AHIMS.

Table 4.1: DEC AHIMS Site Search Results for Albion Park Rail (AMG Search co-ordinates: 56, Eastings 294000-304000, Northings 6171000-6179000).

<p>| Site ID Number | Site Name     | Site Type                                      | Site Location                                                   | Recording &amp; Reports |
|----------------|---------------|-----------------------------------------------|                                                                |                    |
| 52-2-1158      | Logbridge Farm| Open camp site (stone artefact scatter)        | Exposed on farmland on top of a dam across creek.              | A Anderson         |
| 52-2-1159      | Karro Bay     | Midden (including pippis, oysters and mussels) | Located on beach at waters edge (&lt;2 metres from water).        | A Anderson         |</p>
<table>
<thead>
<tr>
<th>Site ID Number</th>
<th>Site Name</th>
<th>Site Type</th>
<th>Site Location</th>
<th>Recording &amp; Reports</th>
</tr>
</thead>
<tbody>
<tr>
<td>52-2-1802</td>
<td>Wollingurry Creek 3</td>
<td>Isolated find (stone artefact - unifacially flaked fine grained igneous pebble chopper)</td>
<td>Exposed by drainage works in swamp / floodplain environment; c. 15 metres from creek.</td>
<td>C Sefton</td>
</tr>
<tr>
<td>52-2-1803</td>
<td>Haywards Bay 2</td>
<td>Midden (Anadara trapezia - Sydney Cockle – and stone artefacts of jasper, quartzite, fossilised wood, silcrete and chert).</td>
<td>Located in sand layer on a 1 metre high mound c. 50-100 metres from estuary.</td>
<td>C Sefton</td>
</tr>
<tr>
<td>52-5-1804</td>
<td>OTC 1</td>
<td>Midden (Anadara trapezia, Turbo torquate, Pyrazius evenius, Austrococchla obtusa, and Conuber sp present)</td>
<td>Identified in post holes, situated on lake beach ridge, 75 m from lake shore, 3 m asl.</td>
<td>C Sefton</td>
</tr>
<tr>
<td>52-2-1809</td>
<td>Wollingurry Creek 2</td>
<td>Isolated find (stone artefact - grey silcrete flake)</td>
<td>Located in swamp / estuarine environment adjacent to creek.</td>
<td>C Sefton</td>
</tr>
<tr>
<td>52-2-1810</td>
<td>Wollingurry Creek 1</td>
<td>Open camp site (stone artefact scatter including brown chert core, fossilised wood, chert and fine grained silcrete flakes).</td>
<td>Located on lower spur line of gradual slope in woodland / swamp / estuarine environment c. 250 metres from creek.</td>
<td>C Sefton</td>
</tr>
<tr>
<td>52-5-0001</td>
<td>Duck Creek 2</td>
<td>Open camp site (stone artefact scatter, including grey chert and siliceous stone flakes).</td>
<td>Located on hillslope c. 40-50 metres from creek.</td>
<td>S McIntyre</td>
</tr>
<tr>
<td>52-5-0056</td>
<td>Duck Creek 3</td>
<td>Scarred trees – one stringy bark with toe holes, and a box eucalypt. Two open camp site (stone artefact scatters).</td>
<td>Two scarred trees and artefact scatter all located within open woodland / forest environment, c. 30-35 metres from creek tributary.</td>
<td>S McIntyre</td>
</tr>
<tr>
<td>52-5-0062</td>
<td>Yallah</td>
<td>Scarred trees</td>
<td>Located on hillslope c. 200 metres from creek.</td>
<td>A Anderson</td>
</tr>
<tr>
<td>52-5-0070</td>
<td>Tallawarra</td>
<td>Midden, consisting almost entirely of Anadara trapezia (Sydney Cockle) and some small mudwhelk.</td>
<td>Located c. 5 metres above and c. 20-30 metres away from tidemark on hillside above lake shore.</td>
<td>I George</td>
</tr>
<tr>
<td>52-5-0073</td>
<td>Warilla</td>
<td>Burial with associated stone tools including agate, jasper and quartz raw material worked into points, scrapers and cores.</td>
<td>Located in Warilla soccer field (now housing).</td>
<td>N/A</td>
</tr>
<tr>
<td>52-5-0119</td>
<td>Bevans Island Picnic island</td>
<td>Midden and associated open campsite. Predominant shell species include Anadara trapezia, Ostrea angasi and Pyrazus ebeninus. Artefacts made of basalt and flakes and cores with a silcrete flake.</td>
<td>Situated on Picnic Island foreshore. Site is less than 1 km to drinking water. Midden visible for over 55 m on north facing bank</td>
<td>M Dallas</td>
</tr>
<tr>
<td>52-5-0122</td>
<td>Yallah Site 2</td>
<td>Open camp site (stone artefact scatter including dark grey chert point and thumbnail scraper, rhyolite and jasper cores and flakes).</td>
<td>Located on a gradual slope above Lake Illawarra. Adjacent to two fresh water creeks and 300 metres from permanent fresh water at Yallah Creek.</td>
<td>ASRSYS</td>
</tr>
<tr>
<td>52-5-0123</td>
<td>Yallah Site 1</td>
<td>Open camp site (stone artefact scatter including fossilised wood flakes).</td>
<td>Located on the northern bank of a creek tributary.</td>
<td>C Sefton</td>
</tr>
<tr>
<td>Site ID Number</td>
<td>Site Name</td>
<td>Site Type</td>
<td>Site Location</td>
<td>Recording &amp; Reports</td>
</tr>
<tr>
<td>----------------</td>
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<td>---------------</td>
<td>---------------------</td>
</tr>
<tr>
<td>52-5-0134</td>
<td>Whyjuck Bay</td>
<td>Midden, species include pipes, oysters and mussels.</td>
<td>Situated on a beach at the foreshore of Whyjuck Bay. Site aspect is NNE</td>
<td>A Anderson</td>
</tr>
<tr>
<td>52-5-0137</td>
<td>Yallah</td>
<td>Scarred trees (Eucalyptus eugenioides – Thin-leaved Stringybark).</td>
<td>Located on a hillslope c. 75 metres from small creek.</td>
<td>C Sefton</td>
</tr>
<tr>
<td>52-5-0147</td>
<td>Duck Creek 1</td>
<td>Open camp site (stone artefact scatter including chert, quartz and silcrete cores and flakes)</td>
<td>Located on the banks of a small creek / seasonal tributary.</td>
<td>S McIntyre</td>
</tr>
<tr>
<td>52-5-0190</td>
<td>Koon Bay 1</td>
<td>Midden</td>
<td>Located on beach, c. 10 metres from unidentified creek. Site has been filled.</td>
<td>A Anderson</td>
</tr>
<tr>
<td>52-5-0194</td>
<td>Whyjuck Bay Lake Illawarra</td>
<td>Midden site, no further information contained on site card</td>
<td>Located on the foreshore of Lake Illawarra, site aspect is NNE.</td>
<td>A Anderson</td>
</tr>
<tr>
<td>52-5-0208</td>
<td>Bevans Island Midden 1</td>
<td>Midden: shell species are 80% Anadara trapezia, also present are Pyrazus ebeninus and Ostrea angasi. 1 flake of milk quartz also identified.</td>
<td>Condition of site is fair, 50 x 60 m over an elevated sandy ridge, 1.5 m above surrounding land surface.</td>
<td>M Dallas</td>
</tr>
<tr>
<td>52-5-0209</td>
<td>Bevans Island Midden 2</td>
<td>Midden and associated lithics: shell species are 90% Anadara trapezia, also present are Pyrazus ebeninus and Ostrea angasi.</td>
<td>Site extends for 10 x 10 m over a low sandy ridge. Condition is poor due to animal disturbance.</td>
<td>M Dallas</td>
</tr>
<tr>
<td>52-5-0210</td>
<td>Bevans Island Midden 4</td>
<td>Midden: shell species present include Anadara trapezia and Pyrazus ebeninus.</td>
<td>Site is heavily disturbed, midden visible in burrow spoil and for 10 m along bank (less than 10 cm in depth). Aspect is east.</td>
<td>M Dallas</td>
</tr>
<tr>
<td>52-5-0211</td>
<td>Bevans Island Midden 3</td>
<td>Midden: dominant shell species present include Anadara trapezia and Pyrazus ebeninus.</td>
<td>Identified in E facing bank for 67 m. Situated 2 m above water level. Site aspect is E and site has been damaged by wave erosion.</td>
<td>M Dallas</td>
</tr>
<tr>
<td>52-5-0212</td>
<td>Bevans Island Midden 5</td>
<td>Midden: dominant shell species present include Anadara trapezia and Pyrazus ebeninus in similar proportions.</td>
<td>Site has been mostly destroyed. Site aspect is East and extends for 3 m in visible section. 3 m from shoreline.</td>
<td>M Dallas</td>
</tr>
<tr>
<td>52-5-0220</td>
<td>Boonerah Pt 2</td>
<td>Open camp site consisting of 2 flakes, a grey/pink silcrete blade and a large flaked river pebble piece.</td>
<td>Situated on a level, landscaped area above Lake Illawarra.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0221</td>
<td>Kurrura Point</td>
<td>Midden (comprised entirely of Anadara trapezia – Sydney Cockle).</td>
<td>Located on ridge top / hill slope above shore of Lake Illawarra.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0222</td>
<td>Mogurah Point</td>
<td>Midden (including Anadara trapezia – Sydney Cockle, and Ostrea angasi – Flat Oyster, and some chert flakes and cores).</td>
<td>Located on ridge top / hill slope above shore of Lake Illawarra.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0223</td>
<td>Boomberry Pt 1</td>
<td>Midden consisting primarily of Anadara trapezia. Potential for other in situ material.</td>
<td>Site is a dispersed shell scatter on a hillslope 3 m SSE of a small creek.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0224</td>
<td>Boomberry pt 2</td>
<td>Midden consisting primarily of Anadara trapezia. Potential for other in situ material.</td>
<td>Site is a dispersed shell scatter on a hillslope situated between 2 small creeks.</td>
<td>K Navin</td>
</tr>
<tr>
<td>Site ID Number</td>
<td>Site Name</td>
<td>Site Type</td>
<td>Site Location</td>
<td>Recording &amp; Reports</td>
</tr>
<tr>
<td>----------------</td>
<td>-------------------------</td>
<td>---------------------------------------------------------------------------</td>
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<td>---------------------</td>
</tr>
<tr>
<td>52-5-0225</td>
<td>Elizabeth Point</td>
<td>Isolated find, a single grey chert flake.</td>
<td>Situated on level land above Lake Illawarra. Aspect is open</td>
<td></td>
</tr>
<tr>
<td>52-5-0227</td>
<td>Macquarie Rivulet 1</td>
<td>Open camp site (stone artefact scatter including chert, silcrete, fossilised wood and mudstone flakes).</td>
<td>Located on hill slope, c. 20 metres from rivulet.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0229</td>
<td>Macquarie Rivulet 3</td>
<td>Open camp site (stone artefact scatter).</td>
<td>Located on hill slope, c. 20 metres from rivulet.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0230</td>
<td>Macquarie Rivulet 4</td>
<td>Open camp site (stone artefact scatter including chert and mudstone flakes).</td>
<td>Located on ridge top / hill slope, c. 25 metres from rivulet.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0231</td>
<td>Haywards Bay</td>
<td>Midden (comprised on Anadara trapezia – Sydney Cockle – and some chert flakes and fragments).</td>
<td>Located on old levee c. 30 metres from bank of rivulet.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0237</td>
<td>Wollingurry Point</td>
<td>Midden (including Anadara trapezia – Sydney Cockle, Ostrea Angasi – Flat Oyster, Velacumantis australis – Australian mud whelk and Pyrazus ebinus – Hercules club whelk, and some chert, quartz and fossilised wood flakes and fragments).</td>
<td>Located on slight slope c. 20 metres away from creek.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0246</td>
<td>Yallah Gully 3</td>
<td>Midden (estuarine species) &amp; open camp site (stone artefact scatter including silcrete, quartz, chert, chalcedony and indurate mudstone flakes and flaked pieces).</td>
<td>Located on flat land, c. 100 metres from creek.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0247</td>
<td>Yallah Gully 2</td>
<td>Open camp site (stone artefact scatter including chalcedony, silcrete and fossilised wood flakes and fragments).</td>
<td>Located on a floodway / drainage channel c. 15 metres from creek.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0248</td>
<td>Yallah Gully 1</td>
<td>Open camp site (stone artefact scatter including fossilised wood, chalcedony, quartzite and silcrete flakes and fragments).</td>
<td>Located on hillslope c. 15 metres from creek (scattered from the top terrace to the lower levels).</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0249</td>
<td>Ash Pond 1</td>
<td>Open camp site (stone artefact scatter including quartz and silcrete flakes and fragments).</td>
<td>Located on flat land, c. 200 metres from creek.</td>
<td>K Navin</td>
</tr>
<tr>
<td>52-5-0398</td>
<td>Test Pitting Area 19</td>
<td>Stone artefact scatter &amp; PAD (Potential Archaeological Deposit)</td>
<td>SITE CARD MISSING</td>
<td>S Huys</td>
</tr>
<tr>
<td>52-5-0409</td>
<td>Test Pitting Area 20</td>
<td>Stone artefact scatter &amp; PAD (Potential Archaeological Deposit)</td>
<td>Located on spur of raised banks of the creek, c. 20-30 metres from creek.</td>
<td>S Huys</td>
</tr>
<tr>
<td>52-5-0412</td>
<td>Test Pitting Area 19</td>
<td>Stone artefact scatter &amp; PAD (Potential Archaeological Deposit)</td>
<td>Located on spur line c. 40-50 metres from creek.</td>
<td>S Huys</td>
</tr>
<tr>
<td>52-5-0431</td>
<td>Tullimbar Village PAD 3</td>
<td>Potential Archaeological Deposit</td>
<td>SITE CARD MISSING</td>
<td>Navin Officer</td>
</tr>
</tbody>
</table>

Table 4.1: DEC AHIMS Site Search Results for Albion Park Rail (AMG Search co-ordinates: 56, Eastings 294000-304000, Northings 6171000-6179000).
Figure 4.1: Approximate location of Aboriginal sites recorded on the DEC AHIMS within the broad study region: AMG co-ordinates: Zone 56, Eastings 294000-304000, Northings 6171000-6179000 (base map: Albion Park 9028-1-N Topographic Map 1:25,000, Central Mapping Authority NSW).

NB: Not all the search area is displayed on the map above.
4.4 Archaeological Sensitivity & Site Prediction – the study area

Based on information compiled within the Department of Environment and Conservation Aboriginal Heritage Information Management System in conjunction with the results of Aboriginal archaeological investigations conducted within the broader study region, a broad predictive model for the foreshore – hinterland region surrounding Lake Illawarra can be provided;

- Open campsites (artefact scatters) and shell middens are likely to be the most common site types;
- Artefact scatters are most likely to occur on level, well-drained ground adjacent to sources of freshwater and wetlands;
- Isolated finds are likely to occur anywhere in the landscape
- Estuarine middens are likely to occur on elevated ground close to estuarine environments and coastal middens are likely to occur on rocky headlands or rock platforms or near hind-dune water sources;
- Sites containing both midden shell and lithic material are likely to occur on elevated ground adjacent to wetlands or valley floor drainage corridors;
- Scarred trees are likely to occur in all topographies where old growth trees survive, either as isolated trees or as part of remnant or continuous forest;
- Burial sites are likely to occur in landforms characterised by relatively deep profile of soft sediments such as sand and alluvium and are likely to be found in occupation sites such as middens.

However, the fact that the study area falls on foreshore land adjacent to an urban landscape, characterised by varied residential development, needs to be taken into account. The installation of a sewer mains in the study area is also likely to impact the integrity of sites. The following predictive model is therefore provided for the current study area;

- Open campsites, artefact scatters and isolated finds

These sites represent the most prevalent site type identified in the Illawarra region, especially on level, well-drained land topographies and are thus the most likely site expected to occur within the current study area. However, due to the predicted levels of site disturbance through European occupation, settlement and development, the probability of such sites surviving is low.

- Middens

Middens are also amongst the most common Aboriginal sites identified in the Illawarra coastal plains region, with the majority of middens identified in the region situated along the foreshores of Lake Illawarra. The study area is situated directly within the littoral zone with at least one recorded midden registered within the study area. Given this the likely occurrence of middens is considered to be high. Sites containing both midden shell and lithic material have been known to occur on elevated ground adjacent to wetlands such as low gradient basal colluvial slopes, terminal spur line crests and alluvial terraces, or valley floor drainage corridors and sand bodies.

- Scarred Trees

Scarred trees can be expected to occur in all landscapes where remnant old growth timbers remain. However, extensive land clearance across the Illawarra region has occurred since European occupation and settlement in the early 19th century. Very few remnant stands of native vegetation exist around Lake Illawarra and these are generally situated north-west of the study area along Duck Creek. The likelihood of mature Eucalyptus exhibiting any evidence of scarification remaining in the study area is consequently considered to be low.
Burial sites

Aboriginal burial sites in the Illawarra region are generally situated within deep, soft sediments such as aeolian sand or alluvial silts. Several burials have been identified around Lake Illawarra in midden deposits on the northern foreshore / lake entrance area and Windang peninsula. It should be noted that most middens within that area do not have associated burials. The study area is situated directly within the littoral zone and associated low gradient sedimentary landscape of Lake Illawarra and a midden has been identified within the immediate study area, however, the area is not known for the presence of burials. Consequently the likely occurrence of burial sites is considered to be low – moderate.

Ceremonial sites

Ceremonial sites are amongst the most infrequently recorded sites in the Illawarra region and traces of these types of sites would be unlikely to survive in areas subjected to significant disturbance through European settlement and development. The likelihood of such sites occurring within the study area is thus considered to be nil-low.

Rock Shelters, Rock Engravings and Axe / Hatchet Grinding Grooves

Rock shelters with art and / or deposit, rock engravings and axe/hatchet grinding grooves are the most infrequently recorded site types within the Illawarra region. These sites generally occur within specific geological and topographical landscapes comprising sandstone exposures, shelving and overhangs. As the study area is not expected to contain such lithologies, the likelihood of these sites occurring is considered to be nil.
5 Site Inspection

5.1 Introduction

The archaeological site inspection of the study area was conducted by Sam Moody and Bernadette McCall (Heritage Concepts) and Allan Carriage, Sites Officer, Wadi Wadi Coomaditchie Aboriginal Corporation on 13th April, 2005. A separate field inspection was also carried out that day with the participation of James Davis, Sites Officer, Wodi Wodi Elders Corporation and representative of Illawarra Local Aboriginal Land Council, and Heritage Concepts staff.

5.2 Existing Condition of the Study Area

The study area is a corridor of land, approximately 1.4 km in length, situated along the foreshore of Koona Bay, Lake Illawarra (refer to Photographs 5.1 and 5.2). At the time of inspection the foreshore varied in width between approximately 20 m and 3 m. Tidal variation will further reduce / increase the width of the foreshore, however, the surface survey was primarily concerned with areas above the high tide mark. In addition to the foreshore, several side-street access roads fall within the study area. Generally, these are unsealed and grassed with drainage ditches adjacent to the property boundaries (refer to Photographs 5.3 and 5.4). The area can be characterised as a low-lying, level landscape.

Koona Street runs parallel to the study area with residential houses situated between the street and the foreshore. North of Albion Creek (Photograph 5.5) is an area with artificially created retention ponds. Wilsons Memorial Park is situated between Werrang and Karoo Streets. The Park is grassed with several mature Eucalypt sp. The park includes playground equipment and public toilets (refer to Photograph 5.6).

The study area displays evidence of several episodes of disturbance. Many of the Koona Street residents use the foreshore land as "rear lane access" to their properties, in some areas fill material such as road base has been deposited to improve access conditions. Anecdotal evidence from residents also suggests that trail bike and buggys are not uncommon in the area. There was evidence of tyre tracks in muddy areas that should be inaccessible in a conventional car. Stockpiling of rubbish is evident within discreet areas.

In other cases, the foreshore is used as an extension to the property, and areas have been heavily filled and landscaped (refer to Photograph 5.7). A healthy respect of flooding within the area may have also contributed to the placement of fill along sections of the foreshore in order to restrict water ingress to properties. The northern portion of the study area presents as wetland with abundant bird and arachnid life; this area was inundated with approximately 5 cm of water at the time of survey.

Vegetation within the study area varies; low laying wetlands occur in the northern section (refer to Photographs 5.8 and 5.9) and a smaller low laying wetland area is encountered at the very southern end of the study area (refer to Photograph 5.10). Exotic landscaping species, weeds and areas of turf are found in the intermediate areas (refer to Photograph 5.11). Localised stands of Casuarina sp are present, but these appear to be regenerating, rather than old growth, specimens (refer to Photograph 5.12).

A sewer line runs on the northern side of Kanahooka Street to the foreshore, and along the foreshore in a southerly direction for the remainder of the study area. A sewer pumping station is located at the terminus of Windang Street (refer to Photograph 5.13). Within the foreshore reserve area, the sewer is evidence by sewerage access points set in concrete pads and ventilation stacks. It would appear that the sewer was constructed into an open cut trench and the area backfilled. The levels of disturbance associated with the construction of the sewer are considered to be extremely high to the depth of excavation.

The area was inspected by foot, however, poor ground surface visibility due to thick vegetation cover defined an extremely low effective survey coverage. Areas of higher visibility were associated with erosion scars and vehicle access tracks. The area north of Albion Creek...
was not inspected as we could not cross the creek with a boat and the northern access point on Shearwater Boulevard was gated and locked.

In summary, the northern potion of the study area appears to be less disturbed, while the southern sections have been impacted by various episodes of alteration and disturbance associated with the adjacent residential settlement including land clearing, deposition of fill, landscaping and installation of services including access driveways and a sewer line and pumping station.
Photograph 5.7: Landscaping with filled area to left foreground

Photograph 5.8: Wetlands in the northern section of the study area (south of Albion Creek).

Photograph 5.9: Wetlands in the northern section of the study area (north of Albion Creek).

Photograph 5.10: Wetlands in the southern portion of the study area.

Photograph 5.11: Exotic weeds within the study area.

Photograph 5.12: Casuarina sp within the study area.
5.3 Survey Results

5.3.1 Identified Aboriginal Archaeological Sites

The presence of an Aboriginal midden within the study area was known prior to the site inspection. Site card inconsistencies resulted in confusion as to the exact location of the registered midden. One aim of the survey was to identify and define the midden within the study area and clarify the location of the site. Two Aboriginal sites were identified during the site inspection; Koona Bay One - Wilsons Memorial Park (midden, artefact and Potential Archaeological Deposit) and Koona Bay Two - Wooroo St (midden and Potential Archaeological Deposit). It is thought that Koona Bay 1 equates to registered site 52-5-0190.

* Koona Bay 1 - Wilsons Memorial Park (KB 1) extension of site 52-5-0190

<table>
<thead>
<tr>
<th></th>
<th>AMG</th>
<th>MGA</th>
<th>ISG</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>298 260 E</td>
<td>6173 260 N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>298 364 E</td>
<td>6173 400 N</td>
<td></td>
</tr>
<tr>
<td></td>
<td>281 741 E</td>
<td>1174 138 N</td>
<td></td>
</tr>
</tbody>
</table>

midden, artefact and PAD

KB 1 is a midden with one identified artefact visible in a deflating area associated with an exposure and vehicle track in the southern corner of Wilsons Memorial Park and south of Karoo Street. Shell density is greatest in the foreshore area behind 81 and 83 Koona Street while shell within the Wilsons Memorial Park exposure is quite sparse. Visible areas of the midden are deflating and the integrity of the exposed area is considered low. Wave action has further disturbed the site with many shell fragments eroding into Lake Illawarra.

The site is visible for an area of 45 m in length and at least 15 m in width. It is likely that the site extends inland and will be present under the turfed foreshore area behind 81 and 83 Koona Street and possibly within the southern corner of Wilsons Memorial Park. Given the relative shallow nature of the exposure, it is probable that the site will be encountered close to the current ground surface in these areas. There is not predicted to be any PAD within the area of the dirt road as the road level is already below the anticipated depth of midden. The potential thickness of the midden deposit cannot be estimated from the visible exposure.

Anadara trapezia (Trapezoid Mud Ark) dominate the site, accounting for approximately 95% of shell material identified. The remaining 5% of shell is comprised of Velacumantus australis (Southern Mud Creeper) and Ostrea angasi (Southern Flat Oyster). A banded chert flaked piece was also identified within the shell material.

Site Koona Bay 1 - Wilsons Memorial Park and site 52-5-0190 may be the same site. Although 52-5-0190 is identified as being at the northern edge of the Park on the site card, there was no evidence of midden material in this location at the time of site inspection. Survey conditions
may have influenced this result as ground surface visibility in this area was nil due to extensive grass coverage.

Figure 5.1: Location of Site KB 1 and PAD
Photograph 5.14: Site KB 1, area behind 81 Koona Street, view to SE.

Photograph 5.15: Site KB 1, area behind 81 Koona Street, view to E.

Photograph 5.16: Midden deposit dispersed by wave action, view to SE.

Photograph 5.17: Karoo Street, limited midden material visible in exposure, possibly due to high disturbance in this area, view to SW.

Photograph 5.18: Shell material identified in site KB 1.

Photograph 5.19: Detail of shell material identified in site KB 1.
Koono Bay 2 - Wooroo St (KB 2)

AMG 298 510 E 6173 210 N
MGA 298 614 E 6173 400 N
ISG 281 990 e 1174 083 N

Site KB 2 - Wooroo Street is located at the very southern end of the study area, south of Wooroo Street, approximately 250 m from site KB 1. The site is on the foreshore behind 40 Wooroo Street. KB 2 is comprised of shell material which appears to have been dislodged during the construction of a sewer ventilation tower in the immediate area. This shell material does not represent an intact midden, however, does indicate the presence of an obscured midden within the vicinity. The extent of PAD at site KB 2 has been estimated from surface inspection only. For the purposes of this report, a buffer area around the ventilation shaft has been designated as PAD in order to identify heritage constraints and minimise impacts to potential midden material.

Species identified in the shell material include Anadara trapezia (Trapezoid Mud Ark), Turbo torquatus (Heavy Turban), Pyrazus ebeninus (Hercules Club), Turbo undulates (Wavy Turban) and species which is yet to be confirmed as Thais Orbita (Dog Winkle).

Photograph 5.20: Site KB 2, shell material in disturbed area.
Photograph 5.21: Site KB 2, shell material in disturbed area.
Photograph 5.22: Detail of shells identified at site KB 2.
Figure 5.2: Location of Site KB 2 and PAD
5.3.2 Identified Areas of Aboriginal Archaeological Potential

No additional areas of Aboriginal archaeological potential or sensitivity were identified during the site inspection. The foreshore area includes natural and modified land surfaces, and both middens are visible in areas of high disturbance. Each of the sites includes an area of PAD, however the extent and integrity of potential midden deposits is unclear.

Open space within the study area has generally been cleared, landscaped, levelled and in certain circumstances significant subsurface excavation has been conducted. The subsurface integrity of the study area is therefore likely to be extremely limited as a consequence of this accumulated impact.

Excluding sites KB 1 and KB 2, the remainder of the surveyed study area is assessed to be of nil-low Aboriginal archaeological potential or sensitivity.

- No sandstone exposures suitable for either shelter, axe/hatchet maintenance or engraving were identified;
- No mature native timber which may exhibit evidence for scarification remained within the study area.

5.4 Discussion

Two Aboriginal cultural sites were identified within the study area, Koona Bay 1 – Wilsons Memorial Park, and Koona Bay 2 – Wooroo Street.

KB 1 appears to correlate to registered Aboriginal site 52-5-0190, although the location of the shell material identified in the field survey is at the opposite corner of the Park to that identified on the site card. There was no visible evidence of midden material within the area nominated on the site card as the location of site 52-5-0190, however the site card notes that fill had been placed above the midden material in this location. Surface visibility in the listed location area was extremely low. Two possibilities present themselves, either that the recorded location of the midden has been incorrectly marked on the site card, and that midden 52-5-0190 is located in the southern, rather than northern, corner of Wilsons Memorial Park, or that site KB 1 is an extension of the registered midden. Regardless of the presence or absence of midden material at the northern corner of Wilsons Memorial park, the area has been considered as an Aboriginal site as it is registered on the AHIMS database as such.

Both KB 1 and KB 2 display evidence of disturbance associated with the current use of foreshore land for vehicle and pedestrian access, while Site KB 1 is at further risk of erosion by wave action.

It is assumed that any midden material within the footprint of the existing foreshore sewer pipeline has been heavily disturbed, with little - no archaeological integrity.
6 Assessment of Cultural Values & Significance

6.1 Introduction to the assessment process

An assessment of significance seeks to understand and establish the importance or value that a place, site, or item may have to the community at large. The concept of cultural significance is intrinsically connected to the physical fabric of the item or place, its location, setting and relationship with other items in its surrounds. The assessment of cultural significance is ideally a holistic approach that draws upon the response these factors evoke from the community. The criteria of evaluating cultural heritage value are generally applied to sites, places or items that have tangible historic structures or relics visible at the site, or where there is general understanding of the extent of the historic resources.

Archaeological sites require a different method of evaluation because of the nature of the heritage resource and because the degree to which it can contribute to our understanding of history cannot be fully comprehended at the outset. Therefore, what is subject to evaluation is the significance of the ‘potential’ of the site to reveal information about the past that needs to be assessed when determining the cultural significance of archaeological resource. Archaeological deposits can also offer different types of information that is not always available through any other source and the contribution it can make to our understanding of a place of past human activities may also be of cultural heritage significance. Despite these differences the same general set of criteria are used to assess cultural heritage value of different types of heritage resources.

The Australia ICOMOS Charter for the conservation of places of cultural significance (the Burra Charter) was formulated in 1979 and most recently revised in 1999, and is the standard adopted by most heritage practitioners in Australia. The Burra Charter divides significance into various groups or categories for the purpose of assessment. They are: Aesthetic, Historical, Scientific/Technical, Social, and Other.

6.2 Criteria for the assessment of Aboriginal cultural heritage

The following assessment criteria are based on the Australia ICOMOS Charter for the conservation of places of cultural significance (the Burra Charter). These criteria have been adapted by the NSW DEC to address Aboriginal archaeological & cultural heritage values. It is important to note, however, that the determination of Aboriginal cultural heritage values can not adequately be conducted without the input of the relevant Aboriginal community groups.

### Aboriginal Cultural Heritage Values:

<table>
<thead>
<tr>
<th>Social value (sometimes termed Aboriginal value) refers to the spiritual, traditional, historical or contemporary associations and attachments which the place or area has for the present-day Aboriginal community. Places of social significance have associations with contemporary community identity. These places can have associations with tragic or warmly remembered experiences, periods, or events. Communities can experience a sense of loss should a place of social significance be damaged or destroyed. These aspects of heritage significance can only be determined through consultative processes with one or more Aboriginal communities.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Historic value refers to the associations of a place with a person, event, phase, or activity of importance to the history of an Aboriginal community. Historic places may or may not have physical evidence of their historical importance (such as structures, planted vegetation or landscape modifications). Gaining a sufficient understanding of this aspect of significance will often require the collection of oral histories and archival or documentary research, as well as field documentation. These places may have ‘shared’ historic values with other (non-Aboriginal) communities. Places of post-contact Aboriginal history have generally been poorly recognised in investigations of Aboriginal heritage, and the Aboriginal involvement and contribution to important regional historical themes is often missing from accepted historical narratives.</td>
</tr>
</tbody>
</table>
Scientific value refers to the importance of a landscape, area, place, or object because of its archaeological and/or other technical aspects. Assessment of scientific value is often based on the likely research potential of the area, place, or object and will consider the importance of the data involved, its rarity, quality or representativeness, and the degree to which it may contribute further substantial information.

Aesthetic value refers to the sensory, scenic, architectural, and creative aspects of the place. It is often closely linked with social values and may include consideration of form, scale, colour, texture, and material of the fabric or landscape, and the smell and sounds associated with the place and its use.

Figure 6.1: Criteria for the assessment of Aboriginal cultural heritage

These aspects of the heritage significance of a place or object are commonly inter-related. Because all assessments of heritage values occur within a social and historical context, all potential heritage values will have a social or Aboriginal community heritage component.

6.3 Aboriginal Cultural Heritage Values of the Study Area

Two midden sites, KB 1 and KB 2, were identified within the current study area. Site KB 1 is thought to correlate to registered Aboriginal site 52-5-0190. These sites are part of a larger Aboriginal cultural heritage landscape associated with the Lake Illawarra foreshore and surrounds and are important indicators of a sustained Aboriginal presence within the area.

Both of the identified Aboriginal cultural heritage items within the study area possess scientific value through their ability to provide information regarding shellfish procurement strategies, food processing techniques, patterns of land use, occupation and subsistence strategies. The associated lithic material at site KB 1 may also provide additional information on lithic technologies and raw material sources. The visible, surface areas of the two middens are of limited archaeological value due to the heavy disturbance of the archaeological deposits. However, any intact, subsurface midden deposits associated with the two sites will further increase understanding of Aboriginal occupation of the Lake Illawarra foreshore, and are considered to be of scientific significance.

It is not the place of the consultant to provide information regarding the social, historic or aesthetic value of the Aboriginal cultural objects and places within the study area. Such information can only be provided by the local Aboriginal communities – any information regarding these issues presented by the Aboriginal stakeholder groups will be incorporated into the final report.

No additional Aboriginal cultural places, objects or areas of potential sensitivity within the study area were identified in the relevant literature or databases, or located during the site inspections conducted for this project. Preliminary Aboriginal community consultations also indicated that the study area does not contain any specific social or historical value, although foreshore areas are generally regarded as significant as “feeding places” (Allan Carriage, pers comm. 13/4/05).
7 Statement of Heritage Impact

7.1 Requirements of a Statement of Heritage Impact

The objective of a Statement of Heritage Impact (SoHI) is to evaluate and explain how the proposed development, rehabilitation or land use change will affect the identified Aboriginal cultural heritage objects, sites and values of the affected landscape. A Statement of Heritage Impact should also address how the heritage value of the item/place can be conserved or maintained, or preferably enhanced by the proposed works.

7.2 Proposed works / land use changes

Shellharbour City Council is proposing to extend the existing Macquarie Shores Cycleway along the Koona Bay foreshore between Wooroo Street in the south and Shearwater Boulevard in the north (a distance of approximately 1.4 km). In addition, paths will be constructed to link the new cycleway to Koona Street via existing side streets. These connections will be along Wooroo Street (100 m long), Karoo and Werrang Streets (60 m long each) and Windang and Kanahooka Streets (80 m long each).

The cycleway will require the construction of a hard surface path along the foreshore area and side streets. As discussed in previous sections of this report, the study area is characterised by varied topographies. Some areas such as the two wetland areas are of low relief, being below the Mean High Water Level. Other sections have been extensively filled and are raised above the tidal zone. Existing topography, combined with significant and protected vegetation communities has resulted in two construction methods being proposed (refer to Figures 7.1 and 7.2). These are outlined below.

* Fill Option

This option proposes to construct the cycleway directly onto an earthen surface (refer to Figure 7.1). The construction surface will be obtained via land modifications including the cutting away of some raised areas and the introduction of fill to low lying areas. The crossing of Albion Creek will be achieved with the installation of a 15 m, single span pre-fabricated bridge.

Preliminary design plans show that cut and fill construction methods will take place between the northern portion of the study area, from the commencement of the retention ponds to the rear of 23 / 25 Koona Street (refer to Figures 7.3 - 7.5). Between the rear of 27 Koona Street and Kanahooka Street the surface will be prepared by grubbing and placement of a construction base material. Fill will be required between Kanahooka and Windang Streets, with a small section of clearing and grubbing between Windang Street and the rear of 63 Koona Street. More fill will be introduced between 65 Koona Street and Werrang Street (refer to Figure 7.6). The northern portion of Wilsons Memorial Park will be constructed into the existing ground surface. Further fill will be introduced between the southern portion of the Memorial Park and the southern extent of the study area (refer to Figure 7.6); a small area to the rear of 83 Koona Street will not require fill.

* Boardwalk Option

The boardwalk option will utilise a combination of direct surface (fill option) and boardwalk construction (refer to Figure 7.2), with the cycleway situated on raised boardwalks within the two low lying areas at either end of the study area (refer to Figure 7.7).

Plans presented to the consultant show an area of boardwalk within the northern wetlands adjacent to the retention ponds, to the rear of 11 Koona Street, a distance of approximately 215 m. A 15 m, single span pre-fabricated bridge will cross Albion Creek. A second section of boardwalk will be constructed at the southern low lying area, between the rear of 85 Koona Street and Wooroo Street, a distance of 210 m. Intermediate areas will be constructed in the same cut and fill manner identified above.
Figure 7.1: Fill option with Aboriginal sites shown (source: Shellharbour City Council)
Figure 7.2: Boardwalk option with Aboriginal sites shown (source: Shellharbour City Council)
**Figure 7.3**: Typical cut and fill cross section north of Albion Creek *(source: Shellharbour City Council)*
Excavation 250-400mm deep

Existing Ground Surface

Runoff

Imported topsoil 100m thick

2.5%

Adjacent Residential Property

Existing Fence (Property Boundary)

4:1

Cycleway Base
Compacted Granular Fill (DGB20 or Similar)

Concrete Pathway 2.5m Wide

Layer of Geotextics

Cycleway Subgrade
Compacted Granular Fill (DGG40 or Similar)

RL 0.85

2.5%

RL - 0.25

Dish Drain

Excavation 250-400mm deep

Figure 7.4: Typical cut and fill cross section south of Albion Creek, rear of houses 1 to 5 Koona Street (source: Shellharbour City Council)
Figure 7.5: Typical cut and fill cross section south of Albion Creek, rear of houses 5 to 23 Koona Street (source: Shellharbour City Council)
Figure 7.6: Typical cut and fill cross section between Windang & Werrang Streets and Karoo & Wooroo Streets (source: Shellharbour City Council)
Figure 7.6: Typical boardwalk cross section (source: Shellharbour City Council)
Discussion with the Design Engineer at SCC has clarified that there are two construction methods being considered for the construction of the boardwalk.

1) Support piles will be driven into the existing ground surface every 12 m, resulting in boardwalk sections with a span of 12 m, i.e. every boardwalk span would essentially be a small bridge. This method of construction will require a piling rig to move on an area of land adjacent to the boardwalk area.

2) Support piles will be driven into the existing ground surface every 3 – 4 m, resulting in boardwalk sections with a span of 3 – 4 m. This construction method will require a cantilever piling rig which would be supported on the sections of boardwalk already constructed (Predrag Draca, pers comm).

Both of these options are predicated on the ability to drive the piles directly into the ground. Should the piles reach refusal before the design depth is required there may be some requirement to excavate with an auger or machine bucket. Tree roots, compaction of top soil strata, fill placed by local residents and construction of the sewer line are several reasons that could cause refusal. Should a pile encounter an obstruction during construction, the pile may need to be set into a hole excavated by an auger or by a small machine bucket. The Geo-technical investigations carried out on the study area indicate that the likelihood of encountering material to give rise to refusal is low, however the possibility that limited areas of excavation may be required should be considered.

* Bridge Construction

Albion Creek, in the north of the study area, will be crossed by a single span bridge. The cycleway bridge will be located near the point where Albion Creek discharges into Lake Illawarra. There are two methods of bridge construction proposed under the current proposal.

1) A prefabricated composite (steel & timber) single span bridge manufactured by Landmark. This option includes piling works and some minor excavation (utilisation of a small excavator). The bridge superstructure shall be erected by 16t crane.

2) A precast concrete bridge structure ("T" girder) supported on precast concrete abutments. Both T girder and abutments are manufactured by SCI (Structural Concrete Industry). This option includes piling works and some minor excavation (utilisation of a small excavator). Given the extra weight of the superstructure (concrete) the bridge superstructure shall be erected by 20 – 25t crane.

7.3 Predicted Impact

Some portions of the study area have been subjected to significant episodes of site disturbance and varied continuous impacts resulting from the existing European settlement and development in the area. Other sections, such as the low lying wetland areas, retain land surfaces which appear to be original and predominantly intact.

Within the study area two Aboriginal sites have been identified. Site KB 1 and PAD is located within the direct impact area of the proposed cycleway. Site KB 2 and PAD is to the south of the direct impact area of the proposal. Modifications to the initial design plans resulted in the relocation the cycleway link along Wooroo Street northwards in order to avoid all areas of PAD associated with Site KB 2.

Impacts to Aboriginal sites within the study area are discussed and assessed below.

7.3.1 Fill option

The fill option requires the clearing and excavation of the existing ground surface in order to place a stable construction base on which the cycleway may be built. Site KB 1 is visible in an exposure only slightly lower than the ground surface within the impact corridor. It is anticipated that stratigraphically intact archaeological deposit associated with site KB 1 may be
encountered within the initial ground grubbing activities within this area. Direct impacts to Site KB 1 and PAD may be expected should ground clearance take place in this area. These impacts will be at least 3.5 m wide and up to 50 cm in depth. The fill option is predicted to have extensive impact to site KB 1 and PAD.

Although the registered location of site 52-5-0190 shows no evidence of midden material, the site must be considered as a registered Aboriginal site. The site card notes that (in this location) the site already has fill placed over it. Geotechnical investigations along the Koona Bay Foreshore indicate that to the south of the registered location there is no fill above the natural soil units. To the north of the registered area there is at least 20 cm of fill above 1 m of sandy clay before encountering “abundant shells” (Douglas Partners 2003:Boreholes 5 & 6). The fill construction option is not predicted to impact on the fabric of registered site 52-5-0190 should it be present within the registered location.

Site KB 2 and PAD is outside the impact area of the proposed development. As such, the fill option has no impacts to site KB 2 and PAD.

### 7.3.2 Boardwalk Option

Site KB 1 and PAD is not within the original boardwalk area as defined by SCC. During the field investigations it became clear that the impacts to site KB 1 and PAD associated with land grubbing would directly impact any archaeological material within the area. Representatives of the Illawarra Local Aboriginal Land Council, the Wodi Wodi Elders Corporation and the Wadi Wadi Coomaditchie Aboriginal Corporation identified that the construction of a boardwalk in the area would be their preferred construction method.

Boardwalk construction represents limited vertical disturbance of the overall midden deposit. Disturbance associated with the construction of a boardwalk in the vicinity of site KB 1 will be associated with the immediate areas in which the upright supports of the boardwalk are placed. The uprights will driven into place where possible, although in areas of refusal the posts will be placed in holes excavated by an auger or a small machine bucket.

The smaller span boardwalk construction method (cantilever) allows for the pile driver to be raised above the immediate ground surface of the midden, the machinery being supported by the boardwalk as it is constructed. This limits impacts to the larger midden area as the potential for shell compaction from the weight of the machinery is removed, however, this is mitigated by the extra piles required due to the shorter span of each boardwalk section.

The larger span boardwalk construction method (conventional) will require less piles as each boardwalk section is up to 12 m in length. This would result in less piles within the extent of Site KB 1 and PAD, however, the construction method would potentially require machinery tracking along the exposed surface of the site. This is considered unacceptable. Mitigation measures should be introduced if conventional piling is required to construct the boardwalk. These may include an exclusion zone around the exposed site (existing fill will protect the PAD areas), and the use of rubber pads beneath the piling rig caterpillars to evenly distribute the weight of the machinery and minimise impacts to soil profiles within the PAD area. The machine used for augering should be comparatively small and lightweight, such as a bobcat.

The area of registered site 52-5-0190 is capped by an existing layer of fill. Placement of piles in this location may impact on limited areas of archaeological material, depending on the depth of fill placed above the midden. Conventional piling represents the better boardwalk option within this area as it requires fewer upright posts and therefore fewer areas of potential impact. The operation of machinery within this area does no pose any threat to the integrity of archaeological material given the capping (or protective) layer of fill which has been noted in this area. Impacts to archaeological material would only be evident in this area if, during the driving of piles, areas of refusal are encountered and auger holes or excavated holes are required for the installation of upright posts.

Site KB 2 and PAD is outside the impact area of the proposed development. As such, the boardwalk option has no impacts to site KB 2 and PAD.
7.3.3 Bridge construction

Both construction methods require excavation for the piling works and abutments, the major difference between the two options being the size of the crane required to install the superstructure. There was no Aboriginal cultural heritage material identified along Albion Creek during the field inspection, and there are no identified heritage constraints to the excavation and construction of a bridge in this area.
8 Cultural Heritage Management Recommendations

8.1 Introduction

The archaeological assessment of the study area has been based on a review of relevant documentation and site inspection. It has been determined that there are 2 midden sites with PAD located within the study area. The study area consists of intact land surfaces, such as those encountered in the two lowland areas, interspersed with areas of high disturbance associated with adjacent residential development. Installation of services such as sewerage and the recreational use of the foreshore have also resulted in areas of high ground disturbance.

Both Aboriginal sites within the study area were identified in areas of disturbance, KB 1 in an erosion scar and KB 2 within a backfilled soil horizon. Within these areas of high disturbance Aboriginal archaeological material is contained in mixed stratigraphic contexts and is of low archaeological integrity. However, the PAD areas associated with both these sites is likely to be identifiable in less disturbed and possibly intact stratigraphic contexts. Aboriginal archaeological sensitivity and cultural heritage values of the study area are limited to the two identified sites and PAD area.

The construction of a cycleway along the Koona Bay foreshore has been assessed to impact two Aboriginal sites. The level of impact has been assessed in each of the construction methods proposed with the result that the construction of a boardwalk is viewed as being of lower impact to the fabric of the sites.

8.2 Recommendations

There are two Aboriginal sites within the study area; both are protected under the NSW National Parks and Wildlife Act 1974. The following recommendations are made in light of the proposed development, statutory regulations and best practice cultural heritage management. It is recommended that the construction of the cycleway may proceed with the following limitations:

- Recommendation 1 – Registration of Aboriginal sites KB 1 and KB 2
  All Aboriginal sites are protected under the NSW National Parks and Wildlife Act 1974. Site KB 1 correlates to registered Aboriginal site 52-5-0190. A new site card with details of Site KB 1 should be submitted to the Aboriginal Heritage Information Management System, managed by the Department of Environment and Conservation (formerly National Parks and Wildlife Service) with updated information and site description. Site KB 2 should be registered on the Aboriginal Heritage Information Management System managed by the Department of Environment and Conservation.

- Recommendation 2 – Minimisation of impacts to Aboriginal heritage
  Impacts to Aboriginal cultural heritage should be minimised wherever possible. Recommendations have been designed in order to minimise impacts to Aboriginal heritage and should be adopted as part of the Construction Environmental Management Plan during works along the study areas foreshore.

- Recommendation 3 – Permit application process for Site KB 1 / Site 52-5-0190
  Site KB 1 (the southern part of site 52-5-01900) will be impacted by both proposed construction methods. Impacts to sites KB 1 will include destruction of PAD material in the areas of land grubbing or where upright posts are driven.
  - Fill Option
Should the fill option be the chosen method of construction, a S87 Preliminary Research Permit will be required from the DEC prior to works commencing in the area. The S87 permit will be required as horizontal impacts to the site present research opportunities. The S87 permit will need to be accompanied by a research design written by a qualified archaeologist in conjunction with input from Aboriginal stakeholder groups. Once approved, an archaeological program will be conducted in accordance with the methodology outlined in the approved S87 permit. No ground disturbance at site KB 1 may occur until the S87 permit is issued.

Following the conclusion of the preliminary investigations, a S90 Consent permit will be required from DEC. The S90 Consent permit must be written by a qualified archaeologist and may need to be accompanied by a research design (with input from the identified Aboriginal stakeholder groups) if archaeological salvage is required within the area. The S90 Consent application must clearly state that only a small proportion of the overall site area will be impacted by the proposed works. Site KB 1 (52-5-0190) will remain listed on the AHIMS database as registered and protected Aboriginal site with limited areas having been destroyed. The consent will be obtained only for areas where land grubbing occurs. The consent will not allow any impacts to, or blanket destruction of, the remainder of the site.

❖ Boardwalk Option

Should the boardwalk option be the preferred construction method, a S90 Consent permit will be required from the DEC prior to works commencing within the area. Given the limited vertical impacts to archaeological material and the construction plan to drive the piles there is no research potential associated with the construction of a boardwalk in this area, consequently a S87 is not required in this instance. The S90 Consent permit must be written by a qualified archaeologist and supported by the Aboriginal stakeholders. The S90 permit must clearly state that the proposed works will result in limited destruction of site KB 1 (52-5-0190). Site KB 1 (52-5-0190) will remain listed on the AHIMS database as registered and protected Aboriginal site with limited areas having been destroyed. The consent will be obtained only for areas where the upright posts will be placed. The consent will not allow any impacts to, or blanket destruction of, the remainder of the site.

The location of site 52-5-0190 will be impacted by both proposed construction methods. However the fill option is not predicted to impact on archaeological material in this location as the impacts are confined to the fill unit overlying the archaeological material. The boardwalk option will impact archaeological material as the impacts extend deeper as a result of the pile driving in the area.

❖ Fill Option

As there are no predicted impacts to archaeological material at site 52-5-0190 there is no requirement for a S87 Preliminary Research Permit or S90 Consent permit from NSW Department of Environment and Conservation.

❖ Boardwalk Option

Should the boardwalk option be the preferred construction method, a S90 Consent permit will be required from the DEC prior to works commencing within the area. Given the limited vertical impacts to archaeological material and the construction plan to drive the piles there is no research potential associated with the construction of a boardwalk in this area. The S90 Consent permit must be written by a qualified archaeologist and supported by the Aboriginal stakeholders. The S90 permit must clearly state that the proposed works will result in limited destruction of site 52-5-0190. The site will remain listed on the AHIMS database as registered and protected Aboriginal site with limited areas having been destroyed. The consent will be obtained only for areas where the upright posts will be placed. The consent will not allow any impacts to, or blanket destruction of, the remainder of the site.
Recommendation 4 – Preferred construction method Site KB 1 / 52-5-0190

The preferred construction method at Site KB 1 is a boardwalk as it results in limited vertical impacts to site KB 1. There is no preference between boardwalk construction methods with the understanding that:

- Cantilever boardwalk construction method will result in more piles driven into the midden material (= more impact).
- Conventional boardwalk construction method will result in fewer piles driven into the midden material. However, machinery will have to track across the site. Should this construction method be selected, machinery impacts must be mitigated via an exclusion zone (refer to Recommendation 8 below) and the utilisation of rubber pads below caterpillar treads.
- Contingency measure: Although the upright supports are predicted to be driven into the ground, should any areas of refusal be encountered auguring or excavation of the new hole may not occur without the presence of Aboriginal stakeholders who have expressed an interest to be present at such times.

The preferred construction method at the registered location of site 52-5-0190 is the fill option as it is predicted to avoid impacts to archaeological material, all impacts being confined to the fill unit overlying the archaeological site.

Recommendation 5 – Permit application Site KB 2

As there are no predicted impacts to Site KB 2 there is no requirement for a S87 Preliminary Research permit or S90 Consent Permit from NSW Department of Environment and Conservation.

Recommendation 6 – Preferred construction method Site KB 2

As site KB 2 is not within the impact area of the current proposal, there is no preferred construction method.

Recommendation 7 – Bridge construction

The preferred option for a bridge across Albion Creek is a prefabricated composite single span bridge as it requires a smaller crane to install the superstructure.

Recommendation 8 – Exclusion areas

Aboriginal sites and areas of PAD not within the immediate construction footprint should be fenced prior to any works commencing. The fencing should be of a self-supporting barrier type (ie not star pickets etc) and should be positioned on site under the supervision of an archaeologist and representatives of the Illawarra Local Aboriginal Land Council, the Wodi Wodi Elders Corporation, the Wadi Wadi Coomaditchie Aboriginal Corporation and Korewal Elouera Jerrungarugh Tribal Elders Aboriginal Corporation (should they wish to be present). These sites should be considered exclusion zones for the duration of the works. No materials may be stockpiled within these areas nor may machinery track across these areas.

Recommendation 9 – Works areas

Machinery may operate within the remainder of the study area with the following caveats:

1) At site KB 1, all heavy machinery should be operated from the southwestern (turfed) area of PAD. Machinery cannot be driven across the exposed area of midden in this location.

2) Within the operations area of site KB 1 and site 52-5-0190, rubber pads must be placed under the caterpillar tracks in order to evenly distribute the weight of the machine to avoid compaction of the fill unit overlying midden material.
Recommendation 10 – Aboriginal watching brief

Preliminary discussions with Aboriginal stakeholders have indicated that the Lake Illawarra foreshore area is of high cultural significance to Aboriginal people. A watching brief will be initiated with interested Aboriginal stakeholders able to attend the site works to watch for any unanticipated archaeological material within the works area. Any S87 or S90 Permits required for the works will also specify a level of Aboriginal involvement. Aboriginal participation has also been requested in order to ensure that the exclusion areas are observed. The level of Aboriginal presence on site will be determined once a preferred construction method is selected and in consultation with the interested Aboriginal stakeholders.

Recommendation 11 – Site induction

Prior to commencement of works within the study area, all workers and contractors involved with the project should be inducted as to the Aboriginal heritage significance of the Lake Illawarra foreshore, particularly the study area, and the measures which have been instigated in order to protect and preserve heritage items. This induction shall be conducted by an archaeologist or an employee of Shellharbour City Council familiar with this report. The induction will also outline the procedures to be followed should unanticipated Aboriginal material be encountered during construction.

Recommendation 12 – Future works

The S90 consent permit, if granted, is applicable to ONLY the works described within this assessment and included in the permit. Any future works not discussed in this assessment, which may impact the fabric of sites KB 1 and KB 2 must be assessed and relevant recommendations provided. This recommendation is particularly pertinent should a southern extension to the current proposal ever be considered.

Recommendation 13 – Stop work provision

As required by the NSW National Parks and Wildlife Services Act 1974 in the event that Aboriginal cultural fabric or deposits, not covered by the approved S90 consent permit are encountered, works must cease immediately to allow an archaeologist to make an assessment of the find. The archaeologist will need to consult with the NSW Department of Environment and Conservation and the relevant local Aboriginal stakeholder groups regarding any Aboriginal cultural material identified.

Recommendation 14 – Communication of Aboriginal use of Koona Bay

The presence of two midden sites along the Koona Bay foreshore is indicative of Aboriginal use of the area for shellfish procurement and consumption. In addition, Lake Illawarra holds significance to Aboriginal people for environmental reasons. Provision should be made along the cycleway for the placement of interpretive signage which communicates the Aboriginal significance and importance of the Koona Bay area to users of the cycleway. Information contained in such signage must be general to the area and any text presented should be written in conjunction with, and approved by, the Aboriginal stakeholders of the area.

Recommendation 15 – Provision of draft report for comment

A copy of the draft report shall be forwarded to the Illawarra Local Aboriginal Land Council, the Wodi Wodi Elders Corporation, the Wadi Wadi Coomaditchie Aboriginal Corporation and the Korewal Elooua Jerrungarugh Tribal Elders Aboriginal Corporation. Any comments and recommendations made by the Aboriginal community shall be incorporated into the final report.
9 References


Appendix A

Correspondence received from Aboriginal Stakeholders
16 April 2005

General Manager
Shellharbour City Council
P O Box 155
Shellharbour Square
Shellharbour City Centre
NSW 2529

Dear Sir/Madam

Re: Report on Aboriginal Heritage survey of Koona Bay foreshore re proposed Macquarie Shores Cycleway

I think that our Shellharbour Council knows that they are very significant areas all around Illawarra Lake. The survey I done at Koona Bay is no different. It is full of middens. I am not against the cycleway around that area but I would like the cycleway to be built off the ground with a boardwalk in certain areas so it would not harm the wetlands, because of all the bird life there and the middens. I do like the idea of the archaeologist, I know her as Sam, her idea of laying top surfaces over parts of that land, but not to be dug underneath the surface any more. I don't want it dug into the surface any more where there are middens. Post-holes are alright. If this is possible I would appreciate it very much, therefore I would like to see some monitors there while this cycleway is being built.

Would you please provide a copy of this to Sam, the archaeologist, as I do not have her address.

Would you also please forward all correspondence on this matter to me at NIAC at 2/3 Birch Crescent, East Corrimal, NSW 2518.

Yours sincerely,

Allan R Carriage
President, Wadi Wadi Coomaditchie Aboriginal Corporation
Vice-President, Northern Illawarra Aboriginal Collective (NIAC)
30 April 2005

Sam Moody
Heritage Concepts
PO Box 1075
Leichhardt
NSW 2040.

Fax: 02 9660 6137

Dear Sam,

Thankyou for your letter about the plans for Macquarie Shores Cycleway. I am happy for the Council to use the method you described to put the posts in the holes. But we still need the monitors.

I have written to Shellharbour Council on the significance of Lake Illawarra foreshores. I told them in the letter I sent them that they know that Illawarra Foreshores are rich with Aboriginal heritage and significant areas. The reason I want to put monitors there is because the wetlands along there, where they are going through, is overgrowth which could be covering middens too – and maybe bodies. The wetlands are significant to our wildlife too. We would like to put a couple of monitors out there. If this is possible we'd be very happy. We are not against the walkway to be put in but we need our monitors.

Thank you

Allan R Carriage