



# Lower Hunter Lands Development Heritage Impact Assessment

Nords Wharf Estate

for Coal & Allied

October 2010

0111477  
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Heritage Impact Assessment

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Environmental Resources Management Australia Pty Ltd Quality System



0111477\_NordsWharf\_Heritage

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Coal & Allied

Lower Hunter Lands  
Development  
*Heritage Impact Assessment*  
*Nords Wharf*  
*Final*

October 2010

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## EXECUTIVE SUMMARY

Environmental Resources Management Australia (ERM) was commissioned by Catylis Pty Ltd on behalf of Coal & Allied Industries Limited (Coal & Allied) to prepare a Heritage Impact Assessment (HIA) for lands at Nords Wharf, which are subject to proposed development under Part 3A of the NSW *Environmental Planning and Assessment Act* (EP&A Act) 1979. The HIA considers the Aboriginal heritage and archaeology, historical archaeology and built heritage of the lands, the potential heritage impacts of the proposed development and identifies a heritage impact mitigation strategy.

The overall aim of this HIA was to identify any heritage values at the Nords Wharf Site that may be affected by the proposed development, and provide, if required, relevant mitigation measures for impacts to any heritage values during any future development.

One Aboriginal shell midden had been previously recorded within the Nords Wharf Site. Archaeological survey has confirmed the extent and integrity of this midden site. The assessment of significance indicates that the site has high social value to the Aboriginal community, high/moderate archaeological potential and high scientific value. For the purposes of appropriately managing Aboriginal heritage the Nords Wharf Site has been divided into three archaeological zones (see *Figure 5.2*).

Archaeological Zone 3 (area of low archaeological potential) is unlikely to be impacted and thus unlikely to impact Aboriginal heritage sites. This report recommends that all development impacts within Archaeological Zone 1 (high archaeological potential) and Archaeological Zone 2 (moderate archaeological potential) be mitigated prior to ground breaking or site construction works. Specific mitigation measures are recommended for each zone. In addition, general Aboriginal heritage mitigation measures are proposed for unexpected finds, which should be provided in a simple 'Aboriginal Heritage Plan of Management' (PoM) for the development. It is also recommended that Aboriginal heritage interpretation options be explored and implemented by Coal & Allied and the detailed midden protection guidance (see *Annex C*) be followed.

Provided mitigation is followed, the potential impacts of the proposed development on Aboriginal heritage can be satisfactorily avoided or managed.

This report has also found that no previously recorded historical heritage sites exist within the Nords Wharf Site. The development will not impact any historical heritage values of the Nords Wharf Site or the local region.

## ***ABBREVIATIONS***

AHIMS	Aboriginal Heritage Information Management System
ADTOAC	Awabakal Descendants Traditional Owners Aboriginal Corporation
ATOAC	Awabakal Traditional Owners Aboriginal Corporation
AZP	Archaeological Zoning Plan
BLALC	Bahtabah Local Aboriginal Land Council
Burra Charter	Australian best heritage practice reference that provides guidance for the conservation and management of places of cultural significance (cultural heritage places).
Coal & Allied	Coal & Allied Industries Limited
DECCW	Department of Environment, Climate Change and Water
DGEARs	Director General Environmental Assessment Requirements
ERM	Environmental Resources Management
ESD	Ecologically Sustainable Development
LHRS	Lower Hunter Regional Strategy
GTLAC	Guringai Tribal Link Aboriginal Corporation
PAD	Potential Archaeological Deposit
PoM	Plan of Management
SHI	State Heritage Inventory
SHR	State Heritage Register
SOHI	Statement of Heritage Impact
RNE	Register of the National Estate

Environmental Resources Management Australia (ERM) was commissioned by Catylis Pty Ltd on behalf of Coal & Allied Industries Limited (Coal & Allied) to prepare a Heritage Impact Assessment (HIA) for land at Nords Wharf, which is subject to proposed development under Part 3A of the NSW *Environmental Planning and Assessment Act* (EP&A Act) 1979. The HIA considers the Aboriginal heritage and archaeology, historical archaeology and built heritage of the lands, the potential impacts of the proposed development and identifies an impact mitigation strategy.

This report builds upon a preliminary desktop review undertaken for the Nords Wharf Site in January 2007 (ERM 2007). A draft of this report (following site investigations) was used during a stakeholder meeting for the Southern Estates. The community output (in terms of heritage considerations) from that process has been used to finalise this report.

This report provides the results of a detailed site survey, comprehensive heritage values assessments, heritage impact analysis and Aboriginal consultation undertaken during June to September 2007, for the Nords Wharf Nords Wharf Site (see *Figure 1.1* and *Figure 1.2*).

**1.1****PROJECT AND PLANNING CONTEXT**

It is proposed that the entire Coal & Allied owned Nords Wharf site be rezoned/listed as a 'State Significant Site' (SSS) in Schedule 3 of State Environmental Planning Policy (Major Development). A draft Schedule 3 listing will be prepared with the Concept Plan Application.

The Concept Plan for a residential subdivision and conservation land transfer of the Nords Wharf site applies to the entire 127ha Nords Wharf site. The key parameters for the proposed development of the site are as follows:

- dedication of 116.6ha of conservation land to the New South Wales Government (NSWG) that is identified in the Lower Hunter Regional Strategy and Lower Hunter Regional Conservation Plan, comprising approximately 92% of the Nords Wharf site.
- Maximum dwelling yield of 90 dwellings over 10.18ha.
- Indicative development staging. Depending on market forces, it may be decided to release the lots in 3-4 stages of 25-30 lots each.
- The provision of associated infrastructure.

- Torrens title subdivision and boundary realignment of the Nords Wharf site. The Torrens title subdivision and boundary realignment of Coal & Allied land will enable land 116.6ha in area that is owned by Coal & Allied to be excised and dedicated to NSWG for conservation purposes.

Approval has not been sought under the Concept Plan for a specific lot or road layout. An indicative lot layout will indicate how the maximum dwelling yield of 90 dwellings could be achieved on the site.

Similarly, approval has not been sought under the Concept Plan for individual lot subdivision or construction of individual houses. However, the desired future character of the proposed concept plan will be included in Urban Design Guidelines. Urban Design Guidelines will be prepared to inform the Concept Plan in respect of urban form, built form, open space and landscape, access and movement and visual impact for the site.

It is proposed to dedicate land for conservation purposes as part of the Major Project Application via a Voluntary Planning Agreement (VPA) between Coal & Allied and the NSWG in accordance with s.93F of the EP&A Act.

The proposed Concept Plan and a Plan showing the proposed development areas and conservation areas is included in the PEA prepared by Urbis.

In August 2010, the Director General Environmental Assessment Requirements (DGEARs) were issued for the site. The requirements for heritage are:

*"Heritage*

*(1) Provide an archaeological assessment and heritage impact statement in accordance with NSW Heritage Office guidelines. The statement should assess the impacts of the application on the area and any significant components of the site, including indigenous heritage.*

*(2) Provide an assessment in accordance with the draft Guidelines for Aboriginal Cultural Heritage Impact Assessment and Community Consultation (DEC 2005)."*

## 1.2

### THE STUDY AREA

This report focuses on the Nords Wharf site. The location of the study area is provided at *Figure 1.1* and the Nords Wharf site is shown in *Figure 1.2*.

The overall aim of this assessment was to ascertain whether there are any heritage values at the Nords Wharf site that might be affected by the proposed development and provide relevant mitigation measures for impacts to these heritage values during any future development. To achieve these aims the following objectives were established:

- to undertake a preliminary background desk based review of potential heritage items within and adjacent to the Nords Wharf Site (ERM 2010);
- to identify and record all heritage objects and places within the Nords Wharf Site through field survey;
- to consult with the local Aboriginal community regarding the specific Aboriginal social value of the land and the Aboriginal heritage recommendations;
- to assess the significance of all heritage objects, sites, relics and places within the Nords Wharf Site in accordance with relevant NSW heritage guidelines;
- to assess the archaeological potential of the Nords Wharf Site to contain further heritage sites;
- to assess the impact of the proposed development on heritage values through a Statement of Heritage Impact (SoHI); and
- to prepare recommendations on the management and mitigation of potential impacts caused by development to any heritage values associated with the Nords Wharf Site.

ERM's approach to the preparation of the detailed site assessment was based on the following current best practice guidelines:

- NSW Heritage Office *Assessing Significance* Guideline;
- NSW Heritage Office *Statements of Heritage Impact* Guideline;
- Department of the Environment, Climate Change and Water (DECCW) *Draft Guideline for Aboriginal Cultural Heritage Impact Assessment and Community Consultation*;
- The *Australia ICOMOS Burra Charter 1999* (Burra Charter);
- *Rio Tinto Cultural Heritage Management Guidelines for Australian Businesses*; and
- *Rio Tinto Cultural Heritage Management System Guidance for Australian Businesses*.

#### **1.4** *EXISTING HERITAGE STATUS*

The preliminary background heritage assessment (ERM 2010) found that one Aboriginal shell midden had been previously recorded under the NSW Department of Environment and Climate Change (DECCW) Aboriginal Heritage Information Management System (AHIMS) database within the Nords Wharf Site. The Nords Wharf Site also held a level of archaeological potential for further Aboriginal sites.

The preliminary background investigation included a search of the NSW Heritage Office State Heritage Register (SHR) and Inventory (SHI), the Lake Macquarie Local Environmental Plan (LEP), the Register of the National Estate (RNE) and the National Trust Register. It was found that no previously recorded historical heritage sites existed within the Nords Wharf Site.

#### **1.5** *REPORT LIMITATIONS*

This report has not been limited in terms of research into and access to the Nords Wharf Site. The survey of the Nords Wharf Site was limited due to thick vegetation across a proportion of the Nords Wharf Site. However, it is considered that a sufficient representative sample of the Nords Wharf Site was surveyed to provide evidence of landforms, historical impacts, heritage sites and archaeological potential.

#### **1.6** *REPORT STRUCTURE*

This report is structured as follows:

*Chapter 2* outlines the Aboriginal community consultation undertaken for the Nords Wharf Site;

*Chapter 3* provides the environmental and archaeological context of the Nords Wharf Site, including known and potential heritage sites within the Nords Wharf Site;

*Chapter 4* provides an overview of the history of the study area;

*Chapter 5* outlines the methodology and results of the field survey;

*Chapter 6* assesses the significance of heritage sites located in the Nords Wharf Site;

*Chapter 7* provides the proposed development structure plans;



*Chapter 8* provides an overview of Environmental Sustainable Development and the conservation and impacts to heritage items in the project application area;

*Chapter 9* outlines the legislative framework and statutory requirements;

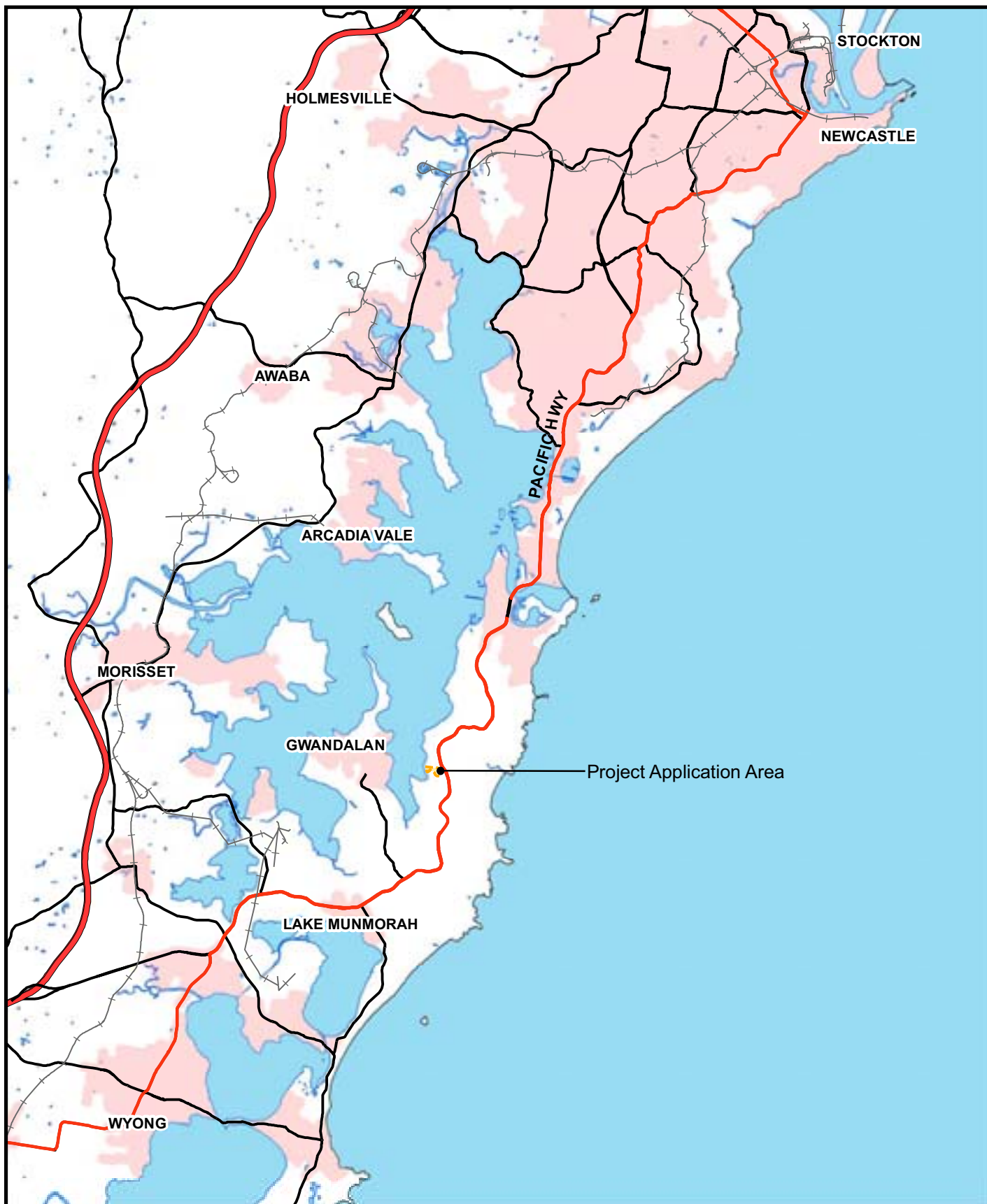
*Chapter 10* provides heritage impact mitigation recommendations; and

*Chapter 11* provides a brief conclusion outlining the findings of the HIA.

## **1.7**

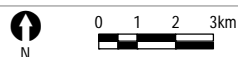
### ***AUTHORSHIP***

Dr Tim Owen (ERM Archaeologist) conducted the historical heritage field survey. Jenna Lamb (ERM Archaeologist) conducted the Aboriginal heritage field survey. Louise Doherty (ERM Built Heritage Consultant) conducted the built heritage field survey. Tim Owen, Jenna Lamb and Louise Doherty authored this report. Shelley James (ERM Heritage Consultant) undertook technical review of this report. Dr Diana Neuweger (ERM Heritage Consultant) undertook the 2010 update of this report. Steve Laister (ERM Partner) undertook Quality Assurance review of this document.



Legend  
 Nords Wharf Site

Client:	Catylis		
Project:	Lower Hunter Land Development - Nords Wharf		
Drawing No:	0111477s_NW_GIS001_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		



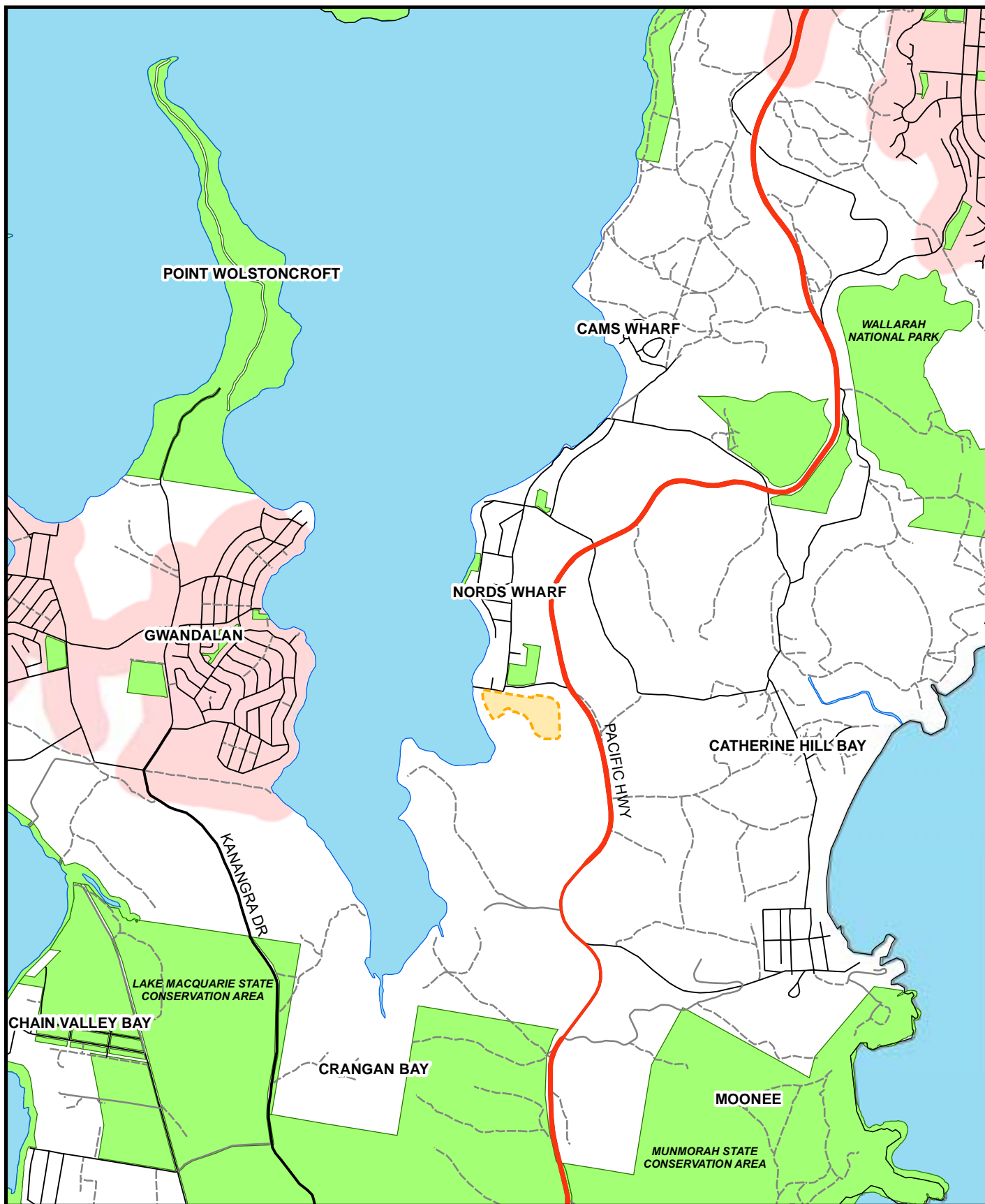
Maps and figures contained within this document may be based on third party data, may not be to scale and is intended for use as a guide only. ERM does not warrant the accuracy of any such maps or figures.

**Figure 1.1**  
**Nords Wharf Site in its Regional Setting**

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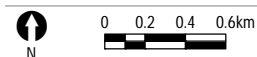
Brisbane, Canberra, Hunter Valley, Melbourne, Perth,  
 Port Macquarie, Sydney





Legend  
 Nords Wharf Site

Client:	Catylis
Project:	Lower Hunter Land Development - Nords Wharf
Drawing No:	0111477s_NW_GIS002_R0.mxd
Date:	18/02/2010
Drawn by:	JF
Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56
Scale:	Refer to Scale Bar



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**Figure 1.2**  
**Nords Wharf Site in its Local Setting**

Environmental Resources Management Australia Pty Ltd

Brisbane, Canberra, Hunter Valley, Melbourne, Perth,  
 Port Macquarie, Sydney



## 2.1 BACKGROUND – ABORIGINAL CONSULTATION

Aboriginal consultation is required for any assessment of Aboriginal heritage. The Department of Environment, Climate Change and Water (DECCW) has released the 'Interim Community Consultation Requirements Guideline' (2004) for Aboriginal consultation in relation to any study that might eventually be used to support an application under Part 6 of the *National Parks and Wildlife Act 1974*.

The interim guideline sets out a process for inviting Aboriginal groups to register interest as a party to consultation (including local press advertisement), seeking responses on proposed assessment methodology, and seeking comment on proposed assessments and recommendations. The interim guideline requires proponents to allow 10 working days for Aboriginal groups to respond to invitations to register, and then 21 days for registered Aboriginal parties to respond to a proposed assessment methodology. An additional ten days are allowed for groups to review a draft report and comment on the results and management recommendations made.

The Aboriginal community consultation for the project has been carried out in light of the DECCW guideline, taking into account the Part 3A requirements of the project. The final Director General's Requirements (DGRs) for the proposed development stated that the DECCW's guidelines should be adhered to and the consultation with the Local Aboriginal Land Council should be undertaken.

## 2.2 ABORIGINAL GROUPS CONSULTED

Letters requesting advice on Aboriginal organisations to consult, and any known heritage issues to be taken into consideration in the area, were emailed on 28 June 2007 to:

- the NSW DECCW;
- Registrar, *Aboriginal Land Rights Act 1983* (NSW);
- Lake Macquarie City Council (LMCC); and
- Bahtabah Local Aboriginal Land Council (BLALC).

In addition, a number of other Aboriginal stakeholder groups were already known by ERM for this area, and were also contacted on 28 June 2007:

- Guringai Tribal Link Aboriginal Corporation (GTLAC);
- Awabakal Traditional Owners Aboriginal Corporation (ATOAC); and
- Awabakal Descendants Traditional Owners Aboriginal Corporation (ADTOAC).

A local press advertisement requesting Aboriginal individuals and groups interested in being consulted on this project to write to ERM, was run in the Lake Macquarie News on 5 July 2007. No responses to this advertisement were received.

DECCW identified three Aboriginal parties to be contacted:

- GTLAC;
- Mur-Roo-Ma Inc.; and
- Arthur C. Fletcher.

LMCC identified one Aboriginal party to be contacted:

- BLALC.

These parties were therefore contacted by ERM to establish whether they wished to be consulted on this project. In addition, each party was asked to identify any further individuals or groups who would be interested in being consulted regarding this project. Four responses were initially received, from GTLAC, ATOAC, ADTOAC and BLALC. These parties were provided with a proposed assessment methodology (an example can be found in *Annex A*). Responses to this methodology were received from all parties, and each indicated their agreement with this methodology.

Further consultation was undertaken following the advice of DECCW on Aboriginal parties that may be interested in being contacted regarding the assessment (see above). A response was received from Arthur C. Fletcher (Wonnarua Sites Officer). Mr Fletcher indicated that he is of Wonnarua descent and requested to be involved in the project. Consultation with all of the other registered Aboriginal stakeholders and Coal & Allied resulted in a decision to invite Mr Fletcher to comment on the draft Aboriginal heritage assessment report but not to involve him in the fieldwork because the Nords Wharf Site was not within his cultural boundary, on the basis that other stakeholders advised that the Wonnarua area does not cover the current Nords Wharf Site.

A search of the National Native Title Tribunal website undertaken on 28 June 2007 revealed no active claimant applications in the Lake Macquarie LGA. Native Title is extinguished in all land that is freehold or was freehold in the past. Therefore, all freehold land in NSW cannot be claimed by Native Title applicants. As the Nords Wharf Site is freehold land, Native Title is extinguished, but such claims in the area are useful for identifying Traditional Owner groups, regardless of land tenure.

Fieldwork for the assessment was undertaken on 11 July 2007 and included a total of six local Aboriginal community representatives: Tracey Howie from GTLAC; Kerrie Brauer and Jon Hawken from ATOAC; Shane Frost and James Frost from ADTOAC; and Noel Drake from BLALC. These representatives were invited to comment on Aboriginal heritage issues in the field.

No further Aboriginal parties have so far been identified through the consultation process, further details of the Aboriginal consultation undertaken for the Nords Wharf Site are provided in *Annex A*.

### 2.3 *COMMUNITY MEETING*

On 30 August 2007 a meeting was held for the purpose of community comment in relation to the proposed development. All Aboriginal stakeholder groups were represented at the meeting. This meeting was also used to provide the results of reporting to the Aboriginal groups and fine tune possible statements of commitment, with regard to Aboriginal heritage. During the meeting a process for the long term conservation of Aboriginal middens was devised between ERM and the Aboriginal stakeholder groups. This process is detailed in *Annex C*.

### 2.4 *REQUIREMENTS FOR FUTURE ABORIGINAL CONSULTATION*

It is recommended, as per the DECCW Community Consultation Guidelines that copies of the draft final report are sent to the five registered Aboriginal parties, so that they may comment on its content and recommendations.

The comments of these parties should be appended to this report when received. Without this opportunity for comment this assessment remains incomplete. Although constraints are identified, the management options cannot be finalised without concluding consultation.

Any future work relating to the Aboriginal archaeological mitigation, as stipulated in this report, should include consultation with the relevant Aboriginal stakeholders.



### 3.1 ENVIRONMENTAL CONTEXT

#### 3.1.1 *Physical Description*

The Nords Wharf Site is located at the southern end of the Nords Wharf Township, which is situated on the eastern shore of Crangan Bay of Lake Macquarie. The Nords Wharf Site is well vegetated with trees growing up to the foreshore. The understorey is dense across the Nords Wharf Site, with the exception of the Scout Camp area, where it has been generally cleared.

‘Camp Kanangra’ is located at the north-western end of the Nords Wharf Site and comprises several structures including a hall, office, carpark and equipment sheds. These structures are all functional in design, and several are demountables.

#### 3.1.2 *Geology*

Lake Macquarie is situated on the north-eastern edge of the Sydney Basin, which extends over central-eastern NSW. Lake Macquarie’s geology mainly consists of Triassic age Munmorah Conglomerates (Triassic Narrabeen Sandstones) in the south and west, and Permian Newcastle Coal Measures in the north. As the only region where these geological features interface, Lake Macquarie has an unusual and complex mix of soil types (NPWS 2005:7).

The Nords Wharf Site is composed of the Triassic Clifton Sub-group comprising Munmorah conglomerates (Nelson 1995:19-21). The Narrabeen Formation dominates the southern area of Lake Macquarie, particularly the south western, southern and south eastern shores of Lake Macquarie (Haglund 1986:5). The Nords Wharf Site is located on Wyong (an alluvial soil type) and Doyalson soil types.

#### 3.1.3 *Topography and Landform*

The Nords Wharf Site is located in the southern part of Lake Macquarie, the largest tidal Lake in Australia. Prior to 10,000 years ago, Lake Macquarie existed only as a broad, shallow embayment. However, following the increase in sea levels in the early-mid Holocene, a marine sand barrier had been created at the Lake entrance by approximately 6,000 years ago, causing the formation of Lake Macquarie as a barrier estuary (NPWS 2005).

Speight (1990) describes categories of landform divisions, including ten morphological types of landform element units. For archaeological investigations the landscape is divided into standardised elements that can be used for comparative purposes and predictive modelling. Based on a preliminary survey of the Nords Wharf Site, a number of landform units were identified within the Nords Wharf Site, being slopes, ridges, crests, flats, dunes and gullies/creeks.

The Nords Wharf Site is located on a gently sloping ridge that levels out to a flat along the lake edge. The original landform comprises predominantly sloping landform elements with minor first order drainage depressions.

#### **3.1.4**      *Drainage*

The Nords Wharf Site generally slopes down to the south and drains into Lake Macquarie. A small creek tributary (first order – Strahler model) exists within the Nords Wharf Site. It should be noted that the Nords Wharf Site is located within the ‘Swansea-North Entrance Mine Subsidence District’. The surface typology and hydrology of the study area may have been affected by subsidence caused by historical mining activities (Navin Officer 1995:5-6). It is therefore possible that the current drainage pattern differs from the original Holocene pattern.

#### **3.1.5**      *Flora And Fauna*

RPS undertook vegetation mapping in 2005 and more extensive mapping in 2007. It was found that the vegetation occurring at Nords Wharf generally comprised Swamp Mahogany Paperbark Swamp Forest, Swamp Oak Rushland Forest and Coastal Foothills Spotted Gum Ironbark Forest.

Vegetation in the Nords Wharf Site is predominantly comprised of medium density Swamp Oak and Spotted Gum, with the understorey cleared in areas for the Scout Camp structures. Some parts of the Nords Wharf Site contain mature (old) trees.

RPS (2005) also notes a range of fauna species present or likely to be present in the Nords Wharf Site, which are predominantly comprised of birds, small mammals, frogs and reptiles. Reference should be made to RPS (2007) for the current full vegetation mapping of the Nords Wharf Site.

*Regional Aboriginal Heritage*

Prior to European settlement of the region, the Lake Macquarie area was inhabited by the Guringai and Awabakal people. Although information about the Aboriginal occupation of the Nords Wharf area is somewhat limited, the abundance of food resources (particularly around the lake's foreshore) indicates that this region would have been 'attractive' to the groups living in the area (EJE 2005:15). By the start of the twentieth century only a small number of Aboriginal people remained in the area living on the outskirts of settlements including Cams Wharf. However, the community remained in the region and has since grown to be one of the most dynamic and largest in NSW (Turner and Blyton 1995:51-52).

A brief literature review of the NSW DECCW library was made (July 2007) to understand archaeological sites in the broader region. This review was targeted to those reports relevant to the Nords Wharf Site. Key word searches were used to find reports for the locality in the Aboriginal Heritage Information Management System (AHIMS) Aboriginal Sites Database. *Table 3.1* lists reports which were reviewed and the locality with which they were concerned.

The general patterning of Aboriginal sites in the local area show a strong association with the lake edges, and little recorded in the immediate hinterland. This reflects Aboriginal focus on lake resources, predominantly shellfish.

It is noted that the 2003 Lake Macquarie Aboriginal Heritage Study Stage 1B Survey report, prepared by Umwelt for Lake Macquarie City Council (LMCC), includes the Nords Wharf Site but is yet to be finalised. It is currently not available for release to the public.

**Table 3.1 Literature Review of Relevant Archaeological Reports from the AHIMS Database**

Author & Date	Distance from Nords Wharf Site	Type of development/ report	Locality	Aboriginal Sites Recorded
Haglund (1986)	Includes the present Nords Wharf Site	Assessment report to LMCC	Lake Macquarie LGA	Discusses predictive model for likely site types and locations in Lake Macquarie area
Nelson (1995)	Includes the present Nords Wharf Site	Thesis for Master of letters University of New England	Lake Macquarie LGA	Discusses predictive model for midden sites in Lake Macquarie area
Haglund (1985)	Approx. 2.5 km south east	Aboriginal archaeological survey for proposed coal reject emplacement and associated conveyor belts	Wallerah Colliery, Catherine Hill Bay	None
Griffiths (1992)	Approx 2 km west	Aboriginal archaeological survey for proposed water sports club and holiday cabins	West side of Kanangra Drive, Gwandalan	Shell midden comprising cockle ( <i>A. trapezia</i> ) shell found on Lake foreshore
Haglund (1987)	Approx. 2 km south east	Aboriginal archaeological survey for proposed coal reject emplacement and coal handling developments	Wallerah Colliery, between Pacific High-way and township of Catherine Hill Bay	None
Brayshaw (1989)	Approx. 3.5 km west	Aboriginal archaeological survey for proposed tourist resort	Area on fore-shore of Lake Macquarie, at Summer-land Point	Shell midden comprising <i>A. trapezia</i> , whelk ( <i>Pyrazus ebeninus</i> ) and abalone ( <i>Haliotis ruber</i> ) found on western bank of Bonny Boy Gully near Lake foreshore
Dallas (1986)	Includes sewage treatment works site approx. 3 km west	Aboriginal archaeological survey of proposed pipe-line	Between sewage treatment works sites at Gwandalan and Mannering Park	Shell midden comprising <i>A. trapezia</i> found in roadway

Author & Date	Distance from Nords Wharf Site	Type of development/report	Locality	Aboriginal Sites Recorded
Dallas <i>et al</i> (1993)	Approx. 5 km north west	Aboriginal heritage assessment of proposed Morisset Peninsula Sewerage Scheme	Morisset peninsula, Lake Macquarie	12 shell middens comprising mainly <i>A. trapezia</i> , with some mud oyster ( <i>O. angasi</i> ), <i>P. ebeninus</i> , peri-winkle ( <i>Bembicium sp.</i> ), mud creeper ( <i>Velacumantus australis</i> ), scallop ( <i>Notovola sp.</i> ) and <i>Bittium sp.</i> found on foreshore flats, beaches, toes of hills, and hillslopes, with more concentrated middens adjacent to permanent creeks and where small freshwater creeks enter Lake. Chert artefact at one midden
Brayshaw (1988)	Approx. 3.5 km north east	Aboriginal archaeological survey for proposed Caves Beach Resort development	Caves Beach, Lake Macquarie	One midden, one shelter with PAD and one midden and burial site (relocated). Midden and burial site located on creek estuary and beach with associated rock platforms, included turban ( <i>Ninella torquata</i> ), <i>H. ruber</i> , <i>A. trapezia</i> , limpet ( <i>Cellana tramoserica</i> ), ducks-bill ( <i>Scutus antipodes</i> ), rock oyster ( <i>Saccostrea commercialis</i> ) and sea urchin ( <i>Heliocidaris erythrogramma</i> ), stone artefacts (including some backed artefacts) of chert, petrified wood, quartzite and basalt, and a fish hook file. Midden on Lakeshore included <i>A. trapezia</i> , <i>O. angasi</i> , <i>P. ebeninus</i> , <i>S. commercialis</i> and scallop, and stone artefacts of quartzite, chert and volcanic rock. Shelter with PAD consisted of conglomerate bedrock outcropping near creek
Dean-Jones (1988)	Approx. 4 km north	Aboriginal archaeological survey	Lot 37 Lambton Parade, Swansea Heads	Shell midden material found on property comprising <i>A. trapezia</i> , <i>P. ebeninus</i> , mussel and oyster shells, and stone artefacts made from Nobby's tuff
Dyall (1975)	Approx. 3.5 km north	Aboriginal archaeological excavation	Swansea Heads, Lake Macquarie	Midden material including <i>A. trapezia</i> , <i>O. angasi</i> , <i>P. ebeninus</i> , <i>Nerita sp.</i> , fish bone, bone points, stone cobbles used for tools (including ground-edge axes and anvils), and human burials
Donlon (1991)	Approx. 3.5 km north	Skeletal remains identification of remains from the Swansea Channel burial ground	Swansea Heads, Lake Macquarie	Remains found indicated 21 individuals recovered, including 4 cremations, on beach in midden at Lake entrance
Resource Planning (1992)	Approx. 6 km west	Aboriginal archaeological survey for dredging and stabilisation of Windermere Creek	Windermere Creek, Lake Macquarie	Isolated tuff stone artefact found on cleared land. Small midden comprising <i>A. trapezia</i> found on swampy foreshore on bank of (eroding into) Windermere Creek near its junction with Lake Petite

The environmental context outlined above has implications for Aboriginal heritage and archaeological deposits in the Nords Wharf Site. The basic geology of the Nords Wharf Site (the Narrabeen Formation) indicates that significant stratified archaeological deposits are not likely to be present. Further, no outcrops of suitable raw materials for Aboriginal stone artefact manufacture were evident within the Nords Wharf Site, therefore stone quarry sites are not expected to occur. The lack of suitable stone outcrops also indicates that shelter sites, stone engraving/art sites and axe grinding grooves will not occur.

Soils across the Nords Wharf Site (Wyong and Doyalson soil types) have been associated with a high tendency for the occurrence of shell middens (Nelson 1995). These sites are likely to be found near to water sources such as creeks, the lake and swamp/marsh features. There is some potential for scarred or carved trees to occur in the Nords Wharf Site due to the maturity of the vegetation in some portions.

It can be stated that in general a pattern exists within the temperate zones of NSW where Aboriginal stone artefact sites are concentrated along watercourses. The watercourse flowing through the southern part of the Nords Wharf Site has some potential for associated artefacts, although there is an absence of recorded sites in comparable regional contexts. This may reflect a lack of archaeological survey, rather than a lack of Aboriginal sites.

#### *AHIMS Search*

A search of the AHIMS Aboriginal Sites Database at DECCW within a 13 km x 14 km area centred around the Gwandalan, Nords Wharf and Catherine Hill Bay (CHB) Nords Wharf Sites was undertaken in July 2007.

The extended search area provided additional context with regard to the location of known Aboriginal sites and provided further clarification as to previous archaeological work on a regional basis. It was also used for base line data for the concurrent ERM studies at CHB and Gwandalan.

The search identified a total of 94 recorded Aboriginal sites – although some are noted as duplicate recordings (see *Figure 3.1*). The results comprise of 67 middens (two associated with quarries, two associated with stone artefact scatters and one associated with burials [at Swansea]), 14 stone artefact sites (13 stone artefact scatters and one isolated find), four scarred trees and three Potential Archaeological Deposits (PADs). Pulbah Island is identified as an Aboriginal place.



The AHIMS search across the south of Lake Macquarie shows that middens are the main Aboriginal site type recorded in the area. Estuarine middens comprising mostly cockle shells with some oyster and whelk are found in many parts of the Lake Macquarie shore.

Three midden sites were identified from the AHIMS search, two close to the study area and one within the Nords Wharf Site. This site is located approximately 1 km north of the Nords Wharf Site. Site 45-7-0180 is also a midden, recorded at Cams Wharf, approximately 2 km north of the Nords Wharf Site. Another midden site, 45-7-0201, has been recorded along the foreshore off Marine Parade at Nords Wharf in the recreation reserve. The 2003 update to this site card record notes that the site maintains a poor degree of archaeological integrity and interest.

A midden site has been recorded along the foreshore at Camp Kanangra Scout Camp (45-7-0177). The site card for this midden indicates that it is quite extensive, with material located over at least 400 m along the foreshore and likely further. The site card also notes that while it is considered likely that more artefacts are located in the surrounding area (including the grassed areas), the level of disturbance suggests that there is a reduced likelihood of intact archaeological deposits. As this midden site has been recorded in close proximity to the proposed development area, a survey was required to confirm the location and extent of the midden to determine if it may be affected by the proposed development.<sup>1</sup>

### 3.2.3

#### *Discussion Relating To Aboriginal Midden Sites*

Given the propensity of shell material associated with Lake Macquarie it is very important to be able to differentiate between natural shell beds and shell deposits created by Aboriginal people. Discussion on the nature of undisturbed cultural shell deposits as opposed to natural shell deposits have been provided by Bowdler 1983; Coutts 1966; Gill 1951; Hughes and Sullivan 1974. A summary of this work suggests that:

- Aboriginal middens contain shells that are of edible species and sizes, whereas natural shell deposits contain shells of both edible and non-edible species and sizes;
- Aboriginal middens contain charcoal/burnt wood, blackened/burnt shells, bones from mammals used for food, and artefacts (including flaked stone, hearth stones, bone points or shell or bone fish hooks) in addition to shells, whereas natural shell deposits do not;

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<sup>1</sup> The extent of the midden within the study area was defined during the survey. Its extent is displayed in *Figure 5.2*.

- Aboriginal middens do not contain marine lifeforms not used by Aboriginal people (eg. corals and tube worms), whereas natural shell deposits do;
- Aboriginal middens are unstratified or roughly stratified, whereas natural shell deposits are usually well stratified with sedimentary features of water laid deposits; and
- Aboriginal middens do not contain shell that has been worn during transport in the offshore/beach zone (or shell grit or rounded pebbles), whereas natural shell deposits do.

While there has been some misidentification of naturally occurring or dredge waste shell as midden in comparable contexts, many reliable midden records reflect the sensitivity of the Lake Macquarie shore for midden material.

#### 3.2.4 *Predictive Aboriginal Heritage Statement*

Based upon the environmental, regional and local archaeological patterns it is possible to provide a predictive statement for the occurrence of Aboriginal sites within the Nords Wharf Site.

Due to the undeveloped nature of the Nords Wharf Site, and general occurrence of Aboriginal sites across the region, intact Aboriginal sites could occur at any location within the Nords Wharf Site. However, there is a higher probability that Aboriginal sites were created near to the Lake foreshore and on the lower lying portions of the Nords Wharf Site, associated with an accumulation of water, i.e. the creek or temporary swamps/marshes. Sites most likely to be found are midden sites and stone artefact scatters, although a range of site types are possible – see *Table 3.2*. These sites could be extensive covering several hundred metres, as they could represent long term Aboriginal subsistence adjacent to the lake's edge.

**Table 3.2**      *Aboriginal Archaeological Site Types (in order of likely occurrence)*

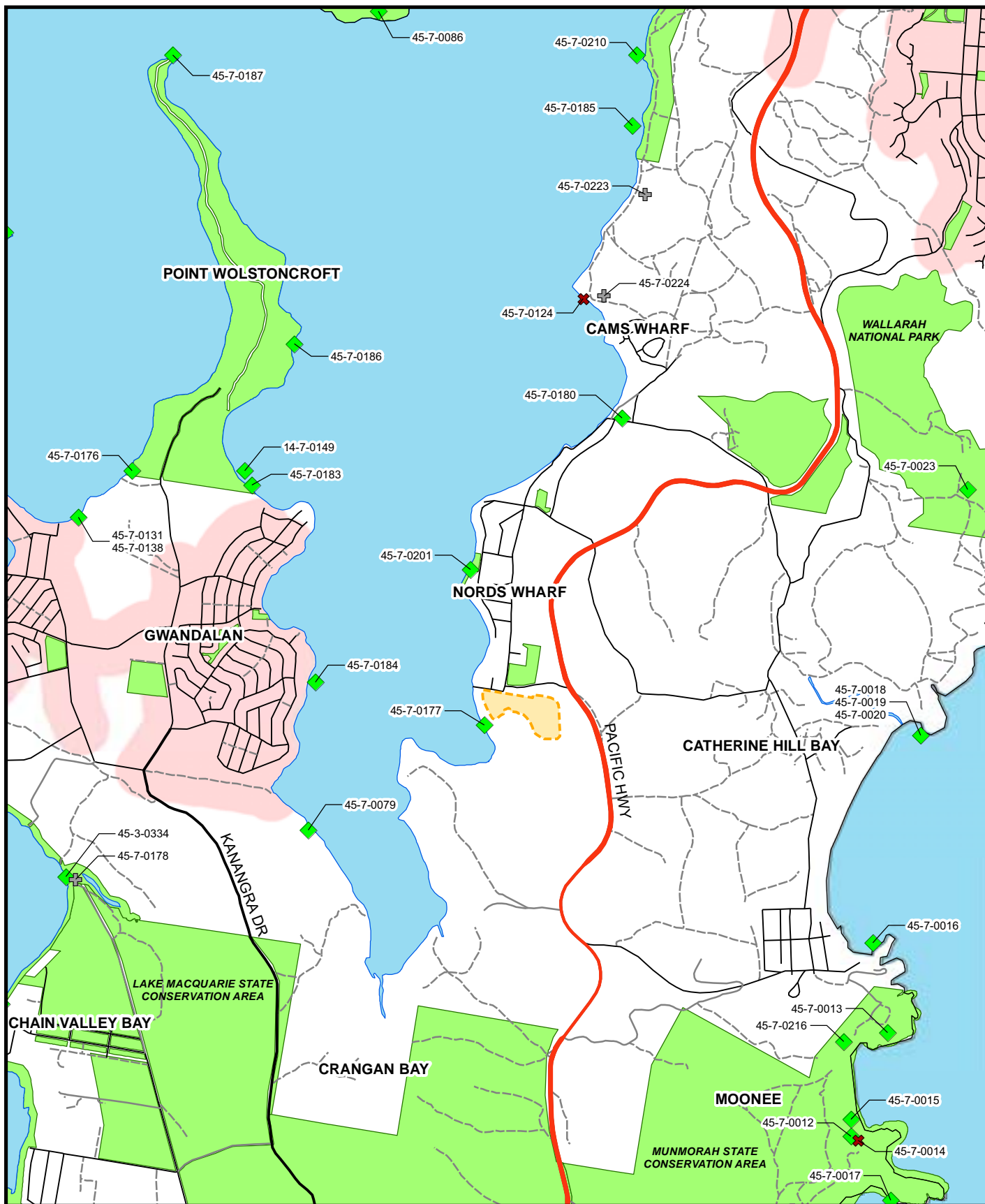
Site types	Definition
Middens	Middens consist of accumulations of shell that represent the exploitation and consumption of shellfish by Aboriginal people. Shell species may be marine, estuarine or freshwater depending on the environmental context and middens may also include other faunal remains, stone artefacts, hearths and charcoal.
Open sites [stone artefact scatters]	Open sites, also known as open campsites, are usually indicated by surface scatters of stone artefacts and sometimes fire blackened stones and charcoal. Where such sites are buried by sediment they may not be noticeable unless exposed by erosion or disturbed by modern activities. The term campsite is used as a convenient label which, in the case of open sites, does not necessarily imply that Aboriginal people actually camped on the sites; rather it indicates only that some type of activity was carried out there.
Scarred trees	Scarred trees bear the marks of bark and wood removal for utilisation as canoes, shields, boomerangs or containers. It is commonly very difficult to confidently distinguish between Aboriginal scars and natural scars or those made by Europeans.
Grinding grooves	Grooves resulting from the grinding of stone axes or other implements are found on flat areas of suitable sandstone. They are often located near waterholes or creek beds as water is necessary in the sharpening process. In areas where suitable outcrops of rock were not available, transportable pieces of sandstone were used.
Shelter sites	Sandstone shelters and overhangs were used by Aboriginal people to provide campsites sheltered from the rain and sun. The deposits in such sites are commonly very important because they often contain clearly stratified material in a good state of preservation.
Burial sites	Burials may be of isolated individuals, or they may form complex burial grounds.
Quarries	These are areas where stone was obtained for flaked artefacts or ground-edge artefacts, or where ochre was obtained for rock paintings, body decoration or decorating wooden artefacts.
Art sites	Aboriginal paintings, drawings and stencils are commonly to be found where suitable surfaces occur in sandstone shelters and overhangs. These sites are often referred to as rock shelters with painted art. Rock engravings, carvings or pecking are also to be found on sandstone surfaces both in the open and in shelters. These are referred to as rock engraving sites.
Stone arrangements, carved trees and ceremonial grounds	These site types are often interrelated. Stone arrangements range from simple cairns or piles of rocks to more elaborate arrangements; patterns of stone laid out to form circles and other designs, or standing slabs of rock held upright by stones around the base. Carved trees are trees with intricate geometric or linear patterns or representations of animals carved into their trunks. Ceremonial grounds and graves were often marked by such trees. Bora grounds are a common type of ceremonial site and they are generally associated with initiation ceremonies. They comprise two circles, generally edged with low banks of earth but sometimes of stone, a short distance apart and connected by a path.

The background assessment of the Nords Wharf Site shows that the foreshore zone contains a previously recorded Aboriginal shell midden. This site is known to extend along the flat adjacent to Lake Macquarie, but there is a significant chance that it continues into the hinterland behind the foreshore.

It is predicted that shell middens and stone artefact sites (scatters and isolated finds) are the Aboriginal site types most likely to be found in the Nords Wharf Site. Stone artefacts are considered most likely to be found on ridges and flats adjacent to the small creeks, while middens are most likely close to the foreshore. Scarred or carved trees may occur within the Nords Wharf Site.

The location of the Scout Camp, on the slope adjacent to the foreshore, is limited in size and extent and does not appear to have significantly impacted the Nords Wharf Site in terms of modification to soil profiles. The Scout Camp has been located within the Nords Wharf Site since the mid to late 1970s and therefore has no physical items (i.e. archaeology or relics) that have statutory protection under the *NSW Heritage Act*.

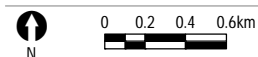
It does not appear that the Nords Wharf Site has been associated with any other historical activities and there is a low chance that any historical heritage or archaeology items will be discovered within its boundaries.



#### Legend

- Nords Wharf Site
- ✕ Stone Artefact Scatter
- + Scarred Tree
- Potential Archaeological Deposit
- ◆ Midden

Client:	Catylis		
Project:	Lower Hunter Land Development - Nords Wharf		
Drawing No:	0111477s_NW_GIS003_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		



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**Figure 3.1**  
**AHIMS Sites within the Locality of**  
**Nords Wharf Site**

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Port Macquarie, Sydney



## 4.1

## EARLY REGIONAL SETTLEMENT

The establishment and growth of European settlement in the Hunter region is directly linked to the presence of coal. An 'abundance of coal' in the Lake Macquarie area was recorded in 1800 following Captain William Reid's journey to Newcastle to collect a small cargo of coal, where he mistakenly stopped at what is now known as Moon Island rather than Nobbys Island to collect the cargo (Barney 1999:1).

The earliest white settlers in the region were missionaries, led by Rev. Lancelot Threlkeld in the 1820s to the area named in honour of former NSW Governor Lachlan Macquarie. Threlkeld established several mission stations in the region along with the first coal mine, Ebenezer Colliery, at Coal Point on land granted in 1829 (Barney 1999:1).

The Hunter Valley was opened up to free settlement in 1820 following John Howe's discovery of an inland route from the Hawkesbury River to Patrick Plains. Extensive land grants were made along watercourses and farming for sheep and cattle commenced soon after (ERM 2006:5).

## 4.2

## HISTORICAL OVERVIEW OF THE STUDY AREA

Nords Wharf takes its name from an early landowner, William James Nord, whose family owned a farm and orchard in the area. The land in the Nords Wharf Site is associated with the development of the Nords Wharf township immediately to the north and the mining operations that commenced at Catherine Hill Bay in the late 19<sup>th</sup> century.

The Parish Maps of Wallarah for 1914, 1920, 1925 and 1932 all indicate that the Nords Wharf Site is located on land originally owned by John Pope and George Hardie through these periods. The narrow foreshore area along the eastern edge of Crangan Bay is annotated as being reserved for "Public Purposes" (see *Figure 4.1*).

Of local historical interest are the school and activities associated with coal miners. The Wallarah Public School was built in 1919 and later was renamed Nords Wharf Public School. The site of the school is to the north of the Nords Wharf Site. Historical information associated with records for Catherine Hill Bay indicates that the Nords Wharf Public School served the local surrounding community.

Many miners who worked at Catherine Hill Bay lived in Nords Wharf. These men travelled by ferry to Catherine Hill Bay from the local wharf owned by William Nord (Lake Macquarie City Council website).



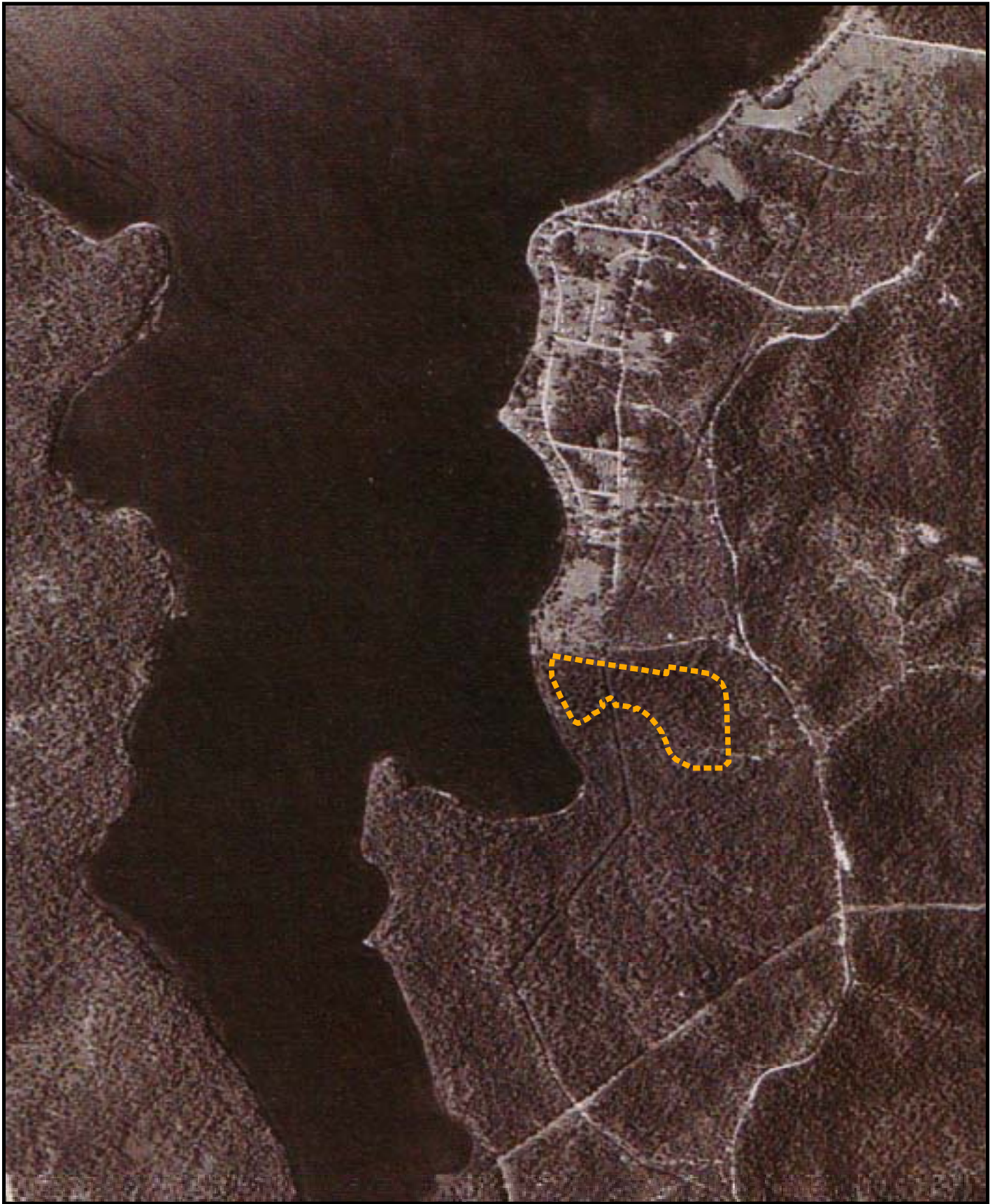


**Figure 4.1** 1914 Wallarah Parish Maps. Image Source: Department of Lands, Parish Maps Preservation project, Image ID 10870001.



A review of historical aerial photographs from 1954 and 1975, with comparison against the 2006 aerial, provides an indication of historical activities within the Nords Wharf Site.

The 1954 aerial (Figure 4.2) clearly shows that the Nords Wharf Site is covered with dense vegetation across its extent. The access road, northern boundary, is visible as is the stripped area (to the north), where houses have later been constructed. The foreshore within the study area appears to have a lower vegetation cover, presumably a factor of foreshore use and differing soil conditions preventing dense vegetation growth. No structures, buildings, roads or other development appears to be present within the Nords Wharf Site. This suggests that as of 1954 the Nords Wharf Site had been subject to very little disturbance.

The 1975 aerial (Figure 4.3) shows that Nords Wharf has become significantly more developed. The road and housing to the north of the Nords Wharf Site are clearly visible. However, the Nords Wharf Site does not appear to have been impacted by any development activities. A small area in the NW corner appears to have been subject to vegetation clearing or removal. This could be associated with the commencement of Scouting activities in the area, but no tracks or buildings appear to have been constructed. Today a portion to the north-west of the Nords Wharf Site contains the Scout's 'Camp Kanangra'. Some of the camp's buildings are visible on the current (2006) aerial photograph, as are the walking tracks through the forest.



Legend  
 Project Application Area

Client:	Catylis		
Project:	Lower Hunter Land Development - Nords Wharf		
Drawing No:	0111477s_NW_GIS004_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		
 N	0 0.09 0.18 0.27km 		

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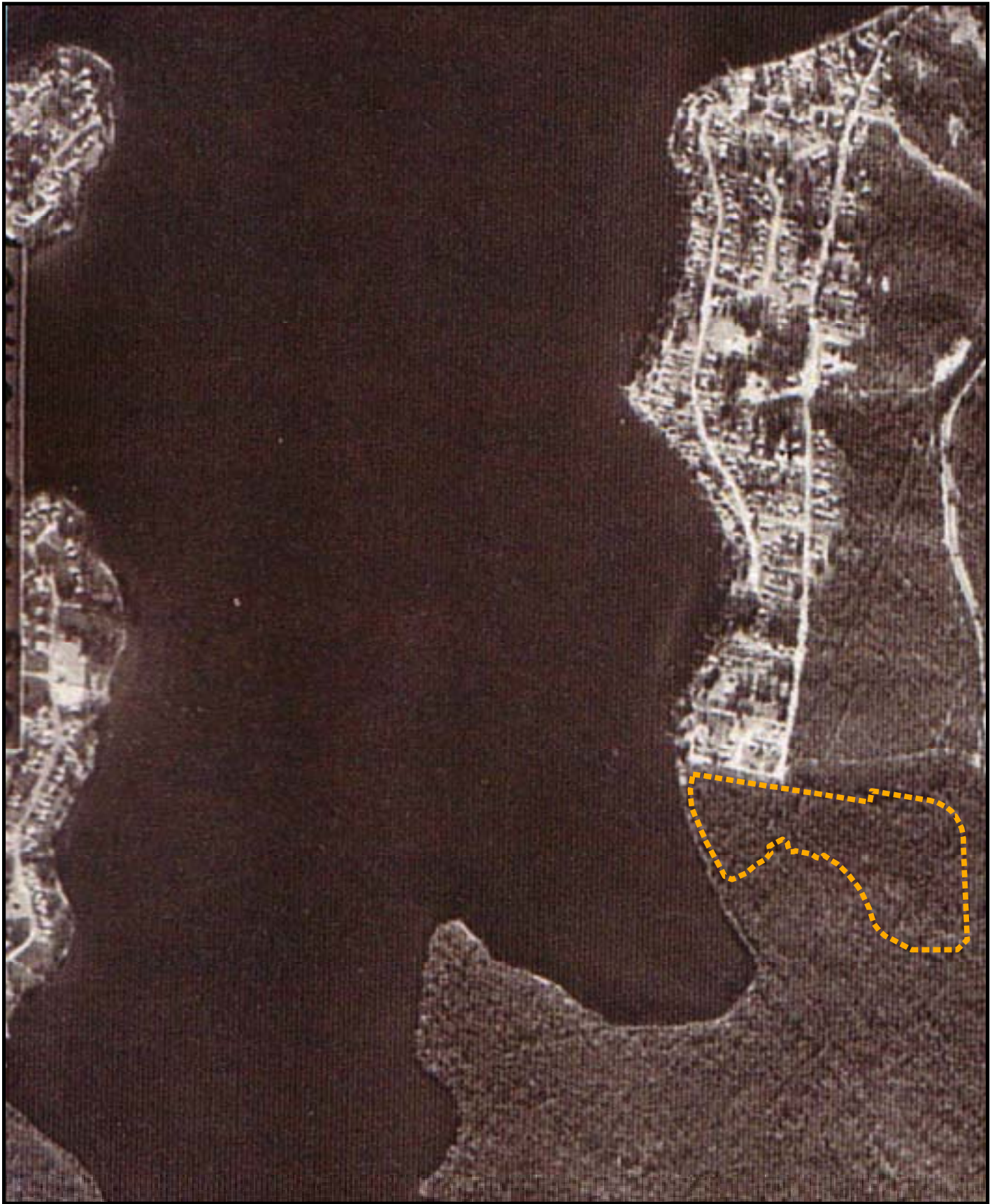
Figure 4.2  
 1954 Aerial Photograph of Nords Wharf

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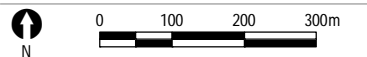






Legend  
 Project Application Area

Client:	Catylis		
Project:	Lower Hunter Land Development - Nords Wharf		
Drawing No:	0111477s_NW_GIS005_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
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Scale:	Refer to Scale Bar		



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**Figure 4.3**  
**1975 Aerial Photograph of Nords Wharf**

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 Port Macquarie, Sydney



Overall, it can be stated that the Nords Wharf Site has not been subject to historical development activities across most of its extent. The creation of a Scout camp, in the NW corner, appears to have resulted in the construction of limited numbers of buildings. Walking tracks have also recently appeared within the Nords Wharf Site. The review of historical evidence suggests that no buildings were erected within the Nords Wharf Site until the mid-1970s. The construction of these buildings is limited in extent and is unlikely to have had significant impacts to soil profiles within the Nords Wharf Site.



*Photograph 4.1 Canoe practice at Camp Kanangra, Nords Wharf 1975*

Source: Lake Macquarie Council Library

## 5.1 SURVEY METHODOLOGY

The Nords Wharf Site was surveyed on foot by the study team and Aboriginal representatives on 11 July 2007. The survey aimed to inspect all zones within the Nords Wharf Site that contained tracks and paths, areas with soil exposures and zones with low vegetation. Transects were also walked through the dense bush around and through the centre of the Nords Wharf Site (see *Figure 5.1*).

The study team inspected all zones within the Nords Wharf Site that were readily accessible and a representative sample of zones with dense vegetation. When heritage sites were identified they were recorded by the survey team for content, GPS location and digitally photographed. Notes were made of soil conditions, evidence of disturbance and possible extent of sites. Specific methodologies are described below.

### 5.1.1 *Built Heritage*

All built structures on site were inspected to determine their age and possible heritage values. The nature of construction for each structure was noted, along with possible disturbances to local soil profiles, resulting from foundation construction.

The results of this inspection were used to determine the disturbances resulting from approximately 25 years of Scout activity in the area.

### 5.1.2 *Historical Archaeology*

The Nords Wharf Site was surveyed for historical archaeological sites concurrently with the Aboriginal survey. An inspection of all visible soil profiles was made, as well as an inspection of the landscape for former sites, such as house sites, evidence of landscape modification (associated with cultivation) and material culture, such as rubbish dumps.

### 5.1.3 *Aboriginal Heritage*

The ERM field survey team was accompanied by six Aboriginal representatives (Tracey Howie from GTLAC, Kerrie Brauer and Jon Hawken from ATOAC, Shane Frost and James Frost from ADTOAC, and Noel Drake from BLALC).

The survey was conducted according to the proposed draft methodology (see *Annex A*), as specified during the Aboriginal consultation. This focused on the identification of Aboriginal heritage values relating to archaeological sites. Field survey methods were adopted to pursue the discovery of new archaeological sites, ensure their accurate recording and provide sufficient background information to provide an assessment of cultural significance to the extent that surface survey allows. The field survey also aimed to determine the extent and intactness of the known midden site (45-7-0177) and to determine if it may be impacted by the proposed development.

As such each of the different landforms identified in the Nords Wharf Site were surveyed, namely slopes, ridges, crests, flats, dunes and gullies/creeks. Creek lines, mature trees, erosion scours and vehicle access tracks were all inspected. In order to ensure the highest likelihood of finding sites if present, survey focussed particularly on areas of visibility, water courses and trees.

#### 5.1.4 *Fieldwork Constraints And Opportunities*

The survey was limited by the vegetation cover that was present over most of the Nords Wharf Site. Ground visibility was in general low, and it is estimated that less than 2% of the Nords Wharf Site was sampled during the survey (see *Annex B* for Effective Coverage Table). Erosion occurred predominantly because of vehicle and walking tracks along with occasional patches of exposed ground resulting from water erosion. The Scout Camp zone (the area with the highest Aboriginal archaeological potential) was generally de-vegetated of its understorey. This provided good opportunities to inspect the soil through the low grass covering.

In light of these constraints, the survey focused particularly on areas of visible ground; however a sample of each of the landforms identified was surveyed (see below, and *Annex B*) to ensure that the full range of potential site locations was inspected.

#### 5.2 *SURVEY TRANSECTS*

The survey of the Nords Wharf Site initially focused upon the tracks and paths within the main body of the Nords Wharf Site. This surveyed all possible paths with erosion and visibility. Next a representative sample of the densely vegetated zone was surveyed. Finally the Scout Camp area was surveyed. These survey areas took in a number of landforms which defined the survey transect inspected. The transects and landforms are identified in *Table 5.1* and *Figure 5.1*, further details are provided in *Annex B*.



**Table 5.1**      *Description of Transects Surveyed*

Transect	Landforms	Description
T1	Slope	Slope up from foreshore commencing at the western boundary of the Nords Wharf Site.
T2	Slope	Forest track along the northern boundary of the Nords Wharf Site.
T3	Slope	Forest tracks through the centre of Nords Wharf Site.
T4	Flat	Open sandy forest track through the south and east of Nords Wharf Site.
T5	Slope	Forested area along the southern, western and central north of Nords Wharf Site.
T6	Slope	Slope occupied by the Scout Camp.



- Legend**
- Project Application Area
- Transects**
- 
- 
- Landform**
- Flat
- Slope

Client:	Catylis		
Project:	Lower Hunter Land Development - Nords Wharf		
Drawing No:	0111477s_NW_GIS006_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		

Maps and figures contained within this document may be based on third party data, may not be to scale and is intended for use as a guide only. ERM does not warrant the accuracy of any such maps or figures.

**Figure 5.1**  
Survey Transects and Landforms

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Brisbane, Canberra, Hunter Valley, Melbourne, Perth,  
Port Macquarie, Sydney





### 5.3 *FIELD SURVEY RESULTS*

#### 5.3.1 *Built Heritage*

The area inspected at Nords Wharf is currently used as a Scout Camp known as Camp Kanangra. A number of buildings have been constructed as part of the Scout Camp all of which are consistent with being built within the last thirty years.

The structures on site include:

- the timber “Camp Kanangra” entry sign (*Photograph 5.1*);
- the wardens office and associated out buildings (*Photograph 5.2*);
- camp kitchen and facilities (*Photograph 5.3*);
- camp accommodation (*Photograph 5.4*); and
- galvanised iron kitchen and bathroom facility buildings (*photograph 5.5*).



*Photograph 5.1 Main Entry to Camp Kanangra*



*Photograph 5.2 Wardens Office*



*Photograph 5.3 Camp Kitchen and facilities*



*Photograph 5.4 Accommodation*



*Photograph 5.5 Camp facilities*

The construction of these buildings is likely to have removed original topsoil (A1 and A2 horizons) beneath the foot print of each building. Construction is unlikely to have disturbed intact soil horizons surrounding the buildings. Overall the construction of the Scout Camp buildings has not greatly impacted the archaeological resource of the Scout Camp area.

### **5.3.2 *Historical Archaeology***

The survey of the Nords Wharf Site did not reveal any evidence for any items of historical archaeological heritage. In general the Nords Wharf Site appears not to have been previously impacted by historical activities which could have created an archaeological record.

### **5.3.3 *Aboriginal Heritage***

Initial consultation with the local Aboriginal community indicated that Aboriginal heritage issues were associated with the potential for Aboriginal archaeological sites across the Nords Wharf Site. These sites included middens and stone artefact scatters.

The result of the survey confirmed that numerous exposures of Aboriginal shell midden were identified within the Nords Wharf Site (see *Figure 5.2*). These were primarily associated with the area within the Scout Camp, but extended up onto the slopes behind the Scout Camp and through the forested area associated with contemporary landforms.

The extent of the exposures and their location indicate that rather than separate Aboriginal midden sites, the material visible in exposures forms a component of one large extensive midden complex. This complex extends down to the foreshore and the previously recorded Aboriginal site 45-7-0177. This site is therefore described further for clarification and archaeological purposes.

*History of Recordings of this Midden Site*

One of the aims of the field survey was to determine the extent and intactness of the known midden site 45-7-0177 and ascertain whether the proposed development was likely to impact the site. The site had previously been recorded adjacent to the Lake foreshore, extending up into the Scout Camp area.

This midden site was initially recorded in 1992 by the NPWS. The recording was updated in 2003 by Umwelt (the report for this study being unavailable for release to the public at this stage).

The 1992 recording describes the midden site as having been partly disturbed by clearing and grounds maintenance activities. The 2003 recording stated that further damage has occurred through the activities of the Scout Camp, including track construction, other earthmoving activities and camping activities such as campfires. The site is noted to be located on basal conglomerate, up to 400 m from drinking water, with the surrounding vegetation comprising *Casuarina glauca* (swamp oak), *Eucalyptus robusta* (swamp mahogany), *Melaleuca quinquinervia* (swamp paperbark), *M. styphelioides* (prickly paperbark) and *Angophora costata* (Sydney red gum). The current field survey confirmed that this vegetation does not appear to have substantially changed in the intervening years (i.e. since 1992).

The midden itself was noted to comprise of a 'black deposit' in coarse gravely sands (the 1992 record suggesting that the depth was to 100 mm), comprising *Anadara trapezia* (cockle shell). The 2003 update noted that this shell was fragmented and that many fragments were burnt from Scout campfires. Stone artefacts were noted throughout the exposed midden deposit, comprising flaked tuff, silcrete and chert. The 1992 record also identified scrapers, a microlithic tool type dating to within the last several thousand years (i.e. a late Holocene technology). The 1992 record included a rough sketch map identifying shell extending less than 100 m from the Lake shore, beginning c.100 m south of the Nords Wharf boat ramp and extending south for approximately 500m. However, the 2003 update did not include a map, only noting that the exposure extended for approximately 400 m.

## *2007 Survey Results*

The current field survey confirmed shell exposures extending throughout the open area of the Scout Camp. Exposures were also noted eroding from the tracks, closest to the foreshore, and through the forested area behind (to the east of) the Scout Camp. *Figure 5.2* provides a reference to the locations where midden and stone material were observed. As a result of the field survey it can be stated that the midden extends across a portion of the proposed development area.

Soil exposures on the track comprised a low density of shell (limited to small fragments) and stone artefacts. Instances of stone artefacts were noted without associated shell material. However, given the landform (a slope) and erosion activity (water run off) it is suggested that it is possible the small stone artefacts observed had been moved from their original location down the walking tracks. All exposures observed within the eastern portion of the forested area (i.e. outside of the Scout Camp zone, but in close association to the landform where the midden material was originally observed in 1992) were recorded as part of known midden 45-7-0177. This association was drawn because all evidence for the midden was located on the same west-facing slope extending up from the foreshore.

The Aboriginal evidence observed thus represents a 'complex' of midden material resulting from long term (probably several thousand years) occupation and use of the area. The long term occupation comprises a pattern of subsistence activities and artefact manufacture on this part of the Lake. Discussion with the Aboriginal representatives provided evidence for long term use of this area. It was suggested that the nearby Pulbah Island was used for male initiation ceremonies. People not involved in these activities would have waited in this area (i.e. where the midden is now observed) for the return of males from Pulbah Island. Celebrations would then have been held in this area on the return of the newly initiated young males. Such activities could account for the extensive accumulation of midden material observed.

## *Midden Composition*

Shell material in this midden comprised predominantly *A. trapezia* with occasional fragments of *Saccostrea glomerata* (oyster). This is consistent with other recorded Lake Macquarie middens. Some small charcoal fragments were seen amongst the shell in the Scout Camp area, however it is uncertain whether these originated from the midden deposit or from recent Scout campfires. An examination of exposures containing midden indicated that the midden material occurred in varying densities throughout the Scout Camp and track area.

Flaked, retouched and heated stone artefacts of chert, quartz and silcrete (< 2 cm in dimension) were noted throughout these midden exposures. Of special note was a retouched, broken (proximal) chert flake (2 cm x 0.5 cm) found in the central area of exposure on the eroded track, which was identified as a backed artefact (another microlithic tool type dating to the Holocene). The end of this artefact had been snapped off, which seems to have resulted in the manufacturer abandoning completion of the backing.

The midden deposit was seen in a dark sandy soil overlying brown clay. The profile of the soil was examined in the road margin at the northern boundary of the Nords Wharf Site. Here the A1/A2 soil horizons appeared to be around 400 mm deep, sharply abutting the B1 clay.

Exposures on tracks in the centre and north of the Nords Wharf Site, associated with the midden but outside of the Scout Camp area, had a similar topsoil depth of 300-400 mm (comprising A1 organic matter and A2 soils abutting a mixture of B1 clays and bedrock). Exposures on tracks in the south of the Nords Wharf Site (flat landform) consisted of organic matter (A1) and a white sandy soil (A2) with a maximum depth of 100 mm, overlying a white B1 clay.

The A1 soil layers observed across the Nords Wharf Site represents the recent breakdown of organic matter. This soil horizon contained evidence of recent rubbish dumping, from small items such as fragments of plastic, glass and ceramic, to campfires and larger dumped rubbish such as burnt car bodies. The A2 soil horizons, which contain the bulk of the Aboriginal material observed, represent the long term accumulation of organic material and the breakdown for B1 clays. All B1 clays appear to be the breakdown product of the underlying bedrock.

### 5.3.5 *Discussion - Archaeological Potential And Archaeological Zoning*

It is necessary to determine whether the Nords Wharf Site has further archaeological potential. Archaeological potential means the possibility of discovering further archaeological material and the likelihood that this material has not been disturbed. Definitions of archaeological potential are provided in *Table 5.2*.

**Table 5.2** *Definitions of archaeological potential*

Rank	Definition	Example
No potential	Artefacts cannot occur in situ.	Reconstructed landscapes, hazardous landscape, developed areas.
Low potential	Artefacts are not normally found in comparable contexts but could occur in low densities making detection unlikely.	Landforms with no specific focus for use, i.e. with water sources or undifferentiated slopes.
Moderate potential	Artefacts are known to occur in comparable landforms in detectable densities (~1artefact/m <sup>2</sup> ) and there is an unknown possibility for detection.	Landforms with an environmental focus which may have seen seasonal visitation.
High potential	Artefacts are consistently found in comparable landforms or similar environmental contexts and thus will certainly be found in any ground breaking works.	Landforms with known environmental focus encouraging repeat visitation to specific locale, i.e. margins of Lakes or near high order creeks.

Site 45-7-0177 is an extensive midden that has been previously recorded outside the Nords Wharf Site (along the foreshore) and within the Nords Wharf Site (across the Scout Camp area). The site has been confirmed to extend eastwards from the foreshore, upslope to a vehicle track, to the east of the Scout Camp). Shell was seen in varying densities across this area – see *Figure 5.2*. This variable density of shell can be related to a number of factors:

1. the extent of current exposures providing a view of the midden material;
2. the variability in original accumulation of midden material, i.e. some zones within the site have more accumulated material; and
3. impacts caused by the Scout's activities in their camp ground.

In areas of obvious erosion i.e. near campfires, buildings and vehicle tracks, the midden appeared more fragmented and dispersed. In less disturbed areas, such as near groups of trees or the perimeter of the Scout Camp, midden was more intact and more densely distributed.

It can be stated that activities associated with the Scout Camp have disturbed portions of the midden to varying degrees. However, this disturbance is mainly to the upper surface of the midden. Given that the midden is probably contained with 400 mm of A2 soils, the Scout's activities may have impacted on average the upper 100 mm. The area containing the midden is therefore considered to have high archaeological potential to contain further intact and undisturbed archaeological deposits – see *Figure 5.2*. The area containing the midden has been divided into Archaeological Zones (AZ) 1 and 2 (*Figure 5.2*).

It is recommended that a portion of midden within Archaeological Zone 1 should be avoided during development, if possible. Any impacted sections of midden in AZ 1 will need to be mitigated. The portion of midden within Archaeological Zone 2 should be subject to appropriate mitigation prior to development. These mitigation measures are provided in *Chapter 10*.

Detailed survey across the remainder of the Nords Wharf Site, Archaeological Zone 3, was more limited because of dense vegetation cover. AZ 3 remains generally undisturbed and thus any Aboriginal sites located within the zone are unlikely to have been significantly impacted over the past 200 years. However, no Aboriginal sites were recorded within this zone.

It is assumed that, given the proximity to the foreshore and thus the midden, AZ 3 would have been used for more sporadic Aboriginal occupation – possibly an inverse correlation with distance from the foreshore. It is therefore possible that Aboriginal sites could be located within this area. However, if compared to the recorded site in AZ 1 and 2, any sites in AZ 3 are likely to be small in size and extent. As such AZ 3 is considered to have a low archaeological potential.

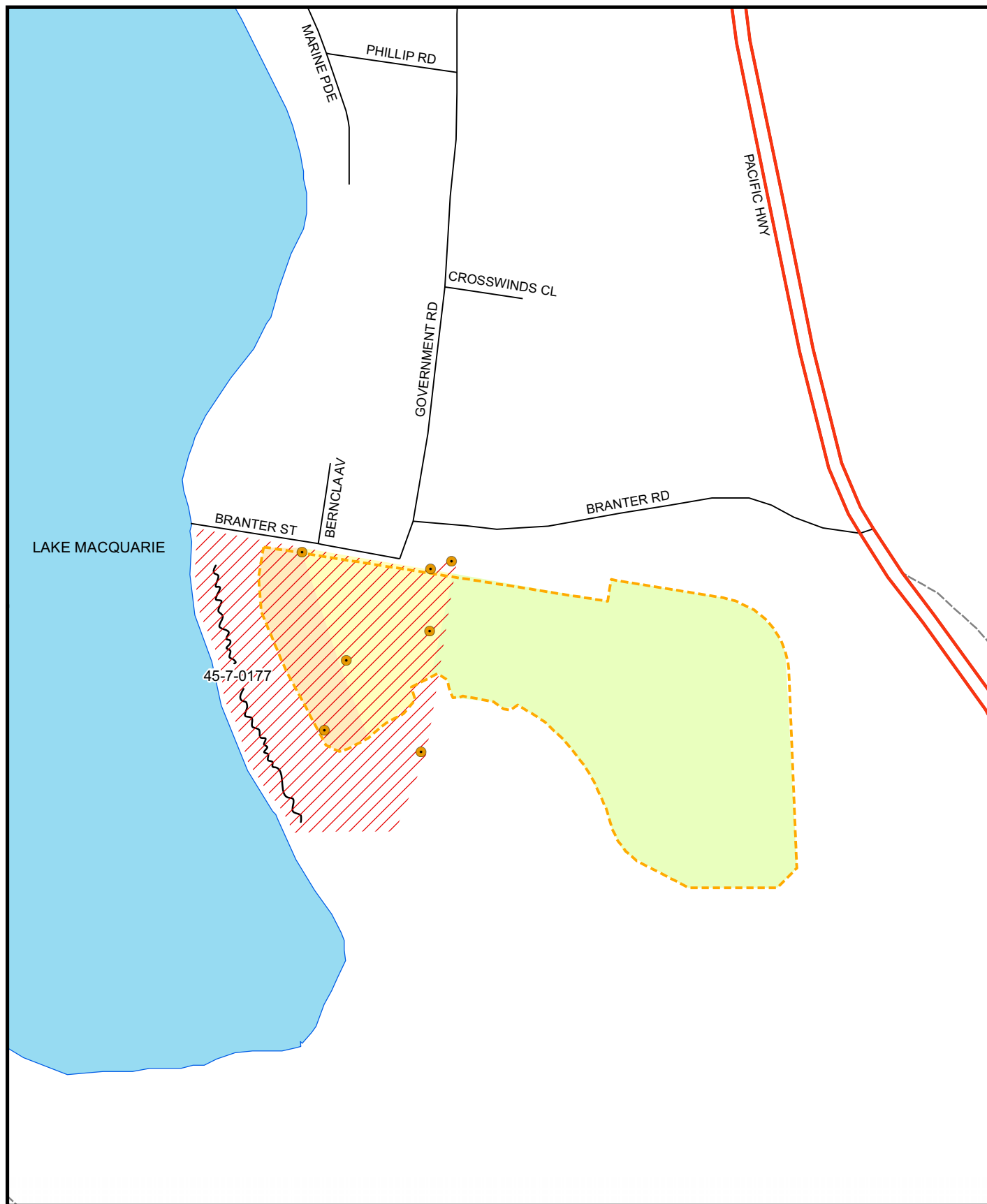
#### 5.4 SYNOPSIS OF FIELD SURVEY RESULTS

The field survey found that the Nords Wharf Site contains no items of historical heritage significance. The survey confirmed the presence of Aboriginal midden site 45-7-0177 and defined its extent within the Nords Wharf Site. The Nords Wharf Site has been divided into three zones:

- AZ 1 – this contains the midden and has a high archaeological potential. All impacts arising from development should be mitigated within this zone;
- AZ 2 – this contains the midden and has a moderate archaeological potential. Impacts arising from development should be mitigated within this zone; and
- AZ 3 – this zone covers the central and eastern portions of the Nords Wharf Site. This area does not contain any known Aboriginal sites and has a low archaeological potential.

In summary, the Nords Wharf Site provides evidence for the pattern of Aboriginal occupation around the shores of Lake Macquarie, with more frequent evidence of occupation adjacent to the foreshore and more sporadic occupation as distance from the Lake increased.





#### Legend

- Project Application Area
- Midden Observed
- ~~~~~ Original Midden Recording
- /// High Arch Potential Area
- Archaeological Zone 1
- Archaeological Zone 2
- Archaeological Zone 3

Client:	Catylis		
Project:	Lower Hunter Land Development - Nords Wharf		
Drawing No:	0111477s_NW_GIS007_R0.mxd		
Date:	18/02/2010	Drawing size:	A4
Drawn by:	JF	Reviewed by:	DN
Projection:	GDA 1994 MGA Zone 56		
Scale:	Refer to Scale Bar		



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**Figure 5.2**

#### Observed Location of Midden 45-7-0177 and Archaeological Zoning Plan

Environmental Resources Management Australia Pty Ltd

Brisbane, Canberra, Hunter Valley, Melbourne, Perth,  
Port Macquarie, Sydney



## 6.1 HISTORICAL HERITAGE ASSESSMENT

### 6.1.1 Historical Assessment Criteria

The Burra Charter (*The Australia ICOMOS Charter for Places of Cultural Significance*) has set a standard for assessing heritage significance based on the aesthetic, historic, scientific and social values embodied in an item or place. In New South Wales the *Heritage Act 1977* has established seven criteria for the identification and assessment of heritage values. The NSW Heritage Office, Department of Planning, has developed a guideline to assessing heritage significance against the seven criteria in their publication *Assessing Heritage Significance*. These criteria are as follows:

- criterion (a) – an item is important in the course, or pattern, of NSW’s cultural or natural history (or the cultural or natural history of the local area);
- criterion (b) – an item has strong or special association with the life or works of a person, or group of persons, of importance in NSW’s cultural or natural history (or the cultural or natural history of the local area);
- criterion (c) – an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the local area);
- criterion (d) – an item has strong or special association with a particular community or cultural group in NSW (or the local area) for social, cultural or spiritual reasons;
- criterion (e) – an item has potential to yield information that will contribute to an understanding of NSW’s cultural or natural history (or the cultural or natural history of the local area);
- criterion (f) – an item possesses uncommon, rare or endangered aspects of NSW’s cultural or natural history (or the cultural or natural history of the local area);
- criterion (g) – an item is important in demonstrating the principal characteristics of a class of NSW’s:
  - cultural or natural places; and/or
  - cultural or natural environments.

### 6.1.2 *Nords Wharf Concept Plan Area*

Camp Kanangra has an association with the Australia Scout movement in NSW, which has been using this area as a camp since the mid 1970s. However, this area is not used exclusively and continuously by one Scout troop, and is unlikely to have social significance as defined under the NSW assessment criteria.

The historical background and Nords Wharf Site investigation have revealed that it has no historical heritage items or value at a local or State level, including historical archaeological potential. The Nords Wharf Site does not meet any of the above criteria at a State or local level.

## 6.2 *ABORIGINAL HERITAGE ASSESSMENT*

### 6.2.1 *Aboriginal Assessment Approach*

Aboriginal heritage sites, objects and places hold value for communities in many different ways. The nature of those heritage values is an important consideration when deciding how to manage a heritage site, object or place and balance competing land-use options. The many heritage values are summed up in an assessment of “Cultural Significance”.

The primary guide to management of heritage places is the Australia ICOMOS Burra Charter 1999. The Burra Charter defines cultural significance as:

*Cultural significance* means aesthetic, historic, scientific, social or spiritual value for past, present or future generations.

Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects.

Places may have a range of values for different individuals or groups.

This assessment has sought to identify Aboriginal heritage objects and sites within the Nords Wharf Site and obtain enough information to allow the values of those objects and sites to be determined.

Research and consultation with the Aboriginal community has also been conducted to determine whether any heritage value relates specifically to the Nords Wharf Site regardless of the archaeological evidence. While it is accepted that Aboriginal sites within the local Lake Macquarie region are of significance to Aboriginal people, this study sought to identify whether the Nords Wharf Site itself held specific values either in itself, or as part of a specific local area of particular significance.

Aboriginal heritage sites with archaeological evidence are of value to the Aboriginal community through the tangible connection that it represents with pre-European Aboriginal land use.

Scientific value is assessed according to the research potential of a site. Rarity and representativeness are also related concepts taken into account. Research potential or demonstrated research importance is considered according to the contribution that a heritage site can make to present understanding of human society and the human past. Those heritage site, objects or places of high scientific significance are those which provide an uncommon opportunity to inform us about the specific age of people in an area, or provide a rare glimpse of artistic endeavour or provide a rare chronological record of changing life through deep archaeological stratigraphy.

The comparative rarity of a site is a consideration in assessing scientific significance. A certain site type may be “one of a kind” in one region, but very common in another. Artefacts of a particular type may be common in one region, but outside the known distribution in another.

The integrity of a site is also a consideration in determining scientific significance. While disturbance of a topsoil deposit with artefacts does not entirely diminish research value, it may limit the types of questions that may be addressed. For example a heavily cultivated paddock may be unsuited to addressing research questions of small-scale site structure, but it may still be suitable for answering more general questions of implement distribution in a region and raw material logistics.

### *Research Questions*

The capacity of an Aboriginal midden site to address local and regional scientific research questions is predicated on a definition of what the key research issues are for a region. In the area of Lake Macquarie, the main archaeological research questions centre around the antiquity and content of middens, and to a lesser extent on stone artefact manufacturing technology and raw material sources.

The background literature review has shown that relatively few archaeological investigations have been conducted within the local and regional area. Most of the studies have been field surveys, such as this report, where no consequential analysis or sub-surface investigation of Aboriginal sites has occurred. Some sites have been archaeologically investigated, but these have predominantly been related to Aboriginal burials.

The general absence of focused research in the Lake Macquarie area means that fundamental questions addressing Aboriginal land use, the chronology of the region, subsistence patterns and mechanisms for trade and exchange have not been explored. Archaeological questions should be asked on a local and regional basis.

The following section contains research questions that can be used to underpin any future archaeological work at the Nords Wharf site, if development were to proceed under Part 3A development consent. Suitable archaeological research questions focusing on local Aboriginal archaeology, which could be addressed through future investigations of the midden site within the Nords Wharf Site, include:

- What dates can be attributed to the use of the midden site? This can be determined through radio carbon dating of undisturbed deposits and by artefact typologies.
- What is the content of the midden? What species are represented? How do these change through time? Does any change represent a long term change in climate and thus subsistence base?
- What is the subsistence base of the region? Are shellfish sourced seasonally or year round? (It is possible to determine through oxygen 18 analysis of shell). Do land based animal remains feature in midden content? What does this tell us about subsistence strategies in the region?
- What are the stone technologies present in the midden deposit? Do these extend back before the mid-late Holocene? Do they provide evidence for trade and exchange of resources?

Regional research questions include:

- How does this site compare to middens in and along other Lakes or the coast?
- What information does the midden provide in terms of Aboriginal demographic and economic values? How do these fit in with a regional framework? Is it possible to see patterns relating to shifting demographics or alterations to trade networks, such as the 'opening' or 'closure' of social structures?
- Does the intensive use of the site provide evidence for an increase in late Holocene population numbers as elsewhere in NSW?

The site's exposures located within the Nords Wharf Site conform to the pattern of occupation expected in the Lake Macquarie area. This pattern displays more frequent occupation in close proximity to the Lake, seen in the Nords Wharf Site as extensive shell midden material from subsistence activity located within 100 m of the Lake, on a slope extending down to the foreshore. More sporadic occupation with increasing distance from the Lake was anticipated, and identified with sparse shell midden material identified further up the slope from the foreshore, within the forested area.

The midden site would appear to be representative within the local region. However, despite numerous midden sites being previously identified, it appears that a few have been archaeologically investigated, and none have been dated through scientific means, such as radio carbon dating. Therefore the extensive midden within the Nords Wharf Site can be said to have a high scientific value because of the opportunities the site presents to further our understanding of Aboriginal culture, subsistence, economy, demography and society in the region. The integrity of the site has been diminished by the presence of the Scout Camp. However these activities are most likely not to have impacted sub-surface deposits, especially those deposits outside the main camp area.

Consultation with the Aboriginal representatives was undertaken to understand the significance of this site to them. ERM obtained permission to quote Tracey Howie (TH) and Shane Frost's (SF) assessment of the site. Some of their views are presented below:

TH: "We want to get the messages left for us before the land is destroyed... Whether they are small or big [Aboriginal artefacts] these things were left by our families".

SF: "Some people think that its just a bunch of shell, but to us it means that we are touching the shells our ancestors threw into the fire".

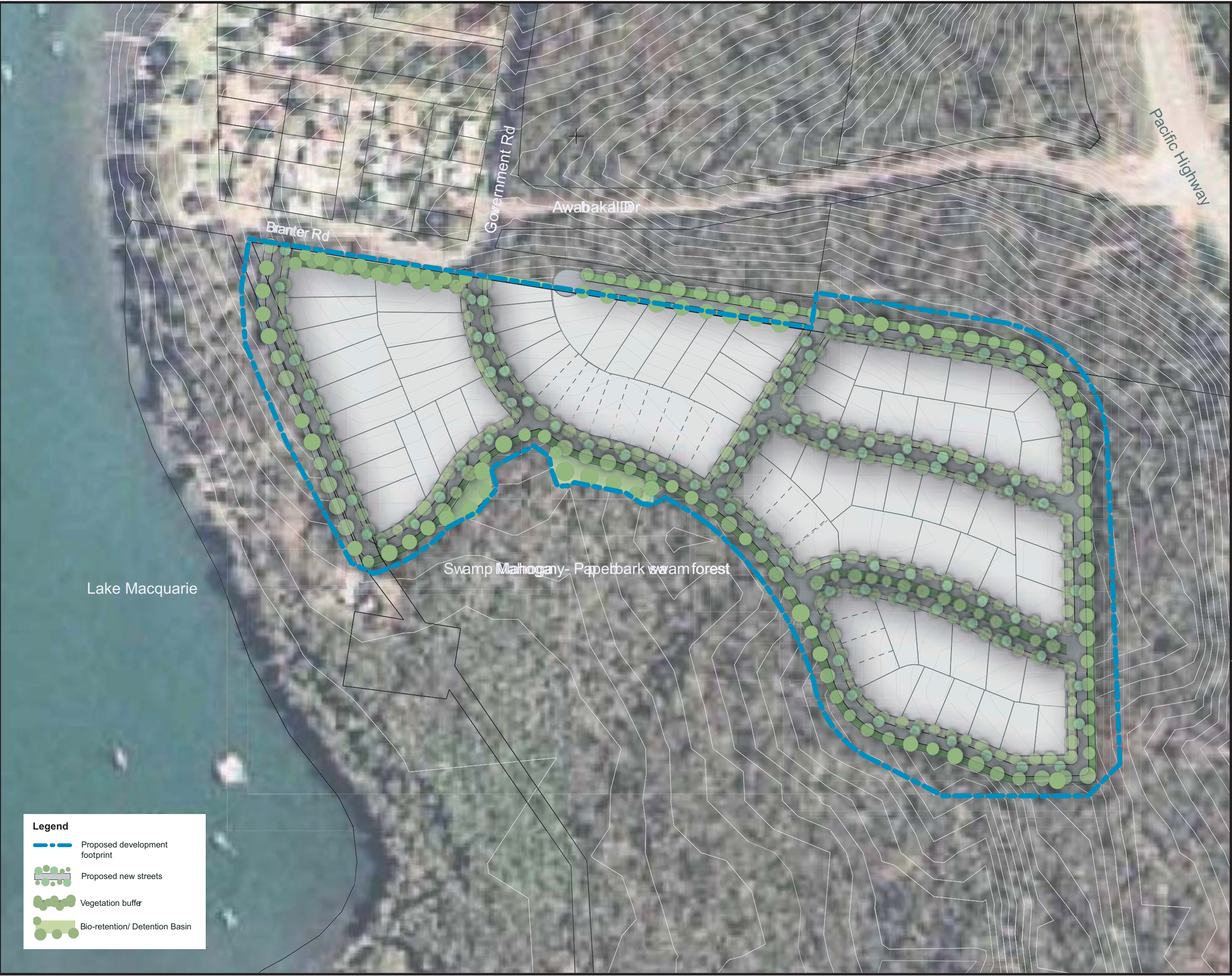
Overall, this site can be said to have high archaeological significance and high archaeological potential. It also has a high level of significance to the Aboriginal community.

The concept plan for Nords Wharf is shown in *Figure 7.1*. If this is compared against *Figure 5.2*, it can be seen that the proposed development impacts part of the Aboriginal midden site near the foreshore.

The Concept Plan includes provision for public open space as well as roads and individual residential lots. It is suggested that some of the public open space could be used as further conservation zones for Aboriginal heritage sites.







**Figure 7.1**  
**Nords Wharf - Concept Plan**

Client: Catylis  
Project: Lower Hunter Land Development - Nords Wharf

Drawing No: 0111477s\_NW\_01\_R0  
Date: 22/02/2010 Drawing size: A3  
Drawn by: GC Reviewed by: DN  
Scale: Refer to Scale Bar

0 25 50 75m

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## 8.1 PREAMBLE TO ESD

An objective of the NPW Act (1974) is the “*conservation of objects places and features ... of cultural value within the landscape, including ... places, objects and features of significance to Aboriginal people ...*” (s.2A(1)(b)(i)).

The DECCW’s publication, *Operational Policy: Protecting Aboriginal Cultural Heritage* (2009), provides guidance to proponents with guidance in term of ESD. The following discussion provides an overview of ESD and its application to the current project.

### 8.1.1 *Avoiding Or Reducing Impact To Aboriginal Sites*

“DECCW needs to balance the sometimes competing tensions between development activities and environment protection when we make decisions. Although the NPW Act gives a high level of protection to known Aboriginal objects, recent court decisions have reinforced that Part 6 gives the Director General (DG) express powers to consent to the damage, destruction or defacement of Aboriginal objects by development activities. The powers in Part 6 are not inconsistent with the objects of the Act or a requirement to give effect to ESD.” (DECCW 2009: Section 3.8)

The DECCW has three policies that provide guidance with respect to avoiding or reducing impact to Aboriginal sites:

#### Policy 20

Impacts to significant Aboriginal objects and places should always be avoided wherever possible. We [the DECCW] will promote the development (or amendment) of proposals to avoid impacts and therefore avoid the need for s.90 AHIPs.

#### Policy 21

Where impacts to Aboriginal objects and places cannot be avoided, we will require the proponent or AHIP applicant to develop (or amend) proposals so as to reduce the extent and severity of impacts to significant Aboriginal objects and places through the use of reasonable and feasible measures. Any measures proposed should be negotiated between the proponent or AHIP applicant and the Aboriginal community.

#### Policy 22

Once all avoidance, minimisation and mitigation options have been adequately explored, we may also consider the appropriateness of any proposed actions having potential Aboriginal cultural heritage benefit. Any actions proposed should be negotiated between the proponent or AHIP applicant and the Aboriginal community.

ESD has been defined in s.6 of the *Protection of the Environment Administration Act 1991*. This requires the integration of *economic* and *environmental* considerations (including cultural heritage) in the decision-making process. In regard to Aboriginal cultural heritage, ESD can be achieved by applying the principle of intergenerational equity and the precautionary principle. (DECCW 2009: 26)

#### *Intergenerational Equity*

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

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

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

Where there is uncertainty, the precautionary principle should also be followed.” (DECCW 2009:26)

#### *The precautionary principle*

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

In applying the precautionary principle, decisions should be guided by:

- a careful evaluation to avoid, wherever practicable, serious or irreversible damage to the environment
- an assessment of the risk-weighted consequences of various options.

The precautionary principle is relevant to DECCW's consideration of potential impacts to Aboriginal cultural heritage where:

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

Where this is the case, a precautionary approach should be taken and all cost-effective measures implemented to prevent or reduce damage to the objects/place." (DECCW 2009:26)

With respect to the above DECCW policy (Policy 20-22) and ESD the following sections detail specifications for conservation, potential impact, and possible reductions to impact on the identified Aboriginal sites and values.

## 8.2

### *PROPOSED CONSERVATION (AVOIDANCE) OF HERITAGE SITES*

While a portion of the midden site at Nords Wharf might be impacted, the cumulative effect of the Coal & Allied proposed conservation zones means that the majority of the midden (where it has been identified with high archaeological potential) will be conserved for perpetuity. The effect of the conservation zone is such that it will prevent future development which would impact further middens and Aboriginal sites along and adjacent to the coast.

If the regional impacts of the proposed conservation zones versus development are considered, the limited impacts to parts of one midden (with the conservation of most of that midden) are considered to be more than offset by the guaranteed conservation and preservation of other Aboriginal sites (known and unknown) within the Coal & Allied conservation lands. The cumulative conservation benefit resulting from the proposed conservation lands are considered to be of holistic long term benefit to the Aboriginal heritage values of the region.

## 8.3

### *PROPOSED IMPACTS TO HERITAGE SITES*

This analysis of potential heritage impacts has been prepared following the guidelines provided by the NSW Heritage Office and DECCW. It has also considered the requirements of the Coastal Design Guidelines for NSW in regard to heritage, which require the recognition and incorporation, or avoidance, of possible impacts on Aboriginal and European heritage sites and areas in planning and designing new development.

The implications and impact of development will not impact any historical heritage values of the Nords Wharf Site or the local region. Therefore it is not necessary to prepare a Statement of Heritage Impact (with regard historical heritage) for the proposed development.

As presented in *Chapter 7* (and *Figures 5.2, 7.1 and 7.2*) the proposed development is located across a portion of the Aboriginal midden site 45-7-0177. Archaeological survey has confirmed the extent and integrity of this midden site. The assessment of significance indicates that the site has high social value to the Aboriginal community, high/moderate archaeological potential and high scientific value. The site has been partially disturbed by recent activities in the area; however it is believed that a large proportion site remains fundamentally intact below the surface within the A2 soil horizon.

While a portion of the midden site will be impacted, the cumulative effect of the Coal & Allied proposed conservation zones means that the majority of this midden will be conserved in perpetuity. Further, the effect of the conservation zone is that it will prevent future development which would impact additional middens and Aboriginal sites along and adjacent to the coast.

If the regional impacts of the preposed conservation zones versus development are considered, the limited impacts to parts of one midden (with the conservation of most of that midden) are considered to be more than offset by the guaranteed conservation and preservation of countless other Aboriginal sites (known and unknown) within the Coal & Allied conservation lands. The cumulative conservation benefits resulting from the proposed conservation areas is of holistic long term benefit to the Aboriginal heritage values of the region.

#### *Development Impacts to Aboriginal Midden Site 45-7-0177*

For the purposes of managing Aboriginal heritage the Nords Wharf Site has been divided into three archaeological zones (*Figure 5.2*).

The Concept Plan (*Figure 7.1*) shows a series of primary and local roads, a drainage swale and housing subdivision will cover most of the Nords Wharf Site. However, a conservation zone is included in the SW corner. This zone covers the flat land area which has a high to moderate level of archaeological potential.

A portion of the Scout Camp area and the forested zone to the immediate east of the Scout Camp will be impacted by development. This area has been defined within Archaeological Zones 1 and 2 (*Figure 5.2*). These zones have a high/moderate level of archaeological potential, respectively.

Any works that result in ground breaking or disturbance within Archaeological Zones 1 and 2 are likely to impact and disturb the Aboriginal midden site. This includes undertaking removal of the Scout Camp buildings and any soil testing or sampling, such as geo-technical work. Top soil stripping prior to development would completely remove all deposits associated with the midden site.

Therefore all development impacts within Archaeological Zones 1 and 2 should be archaeologically mitigated prior to ground breaking or site construction works.

Site works within Archaeological Zones 3 are unlikely to impact Aboriginal heritage sites. This Archaeological Zone requires less stringent mitigation measures than Zones 1 and 2. The suggested heritage mitigation measures for AZ 1, 2 and 3 are presented in Chapter 10.

## 8.6 SUMMARY OF HERITAGE IMPACTS

A summary of the potential impacts on the heritage values of the Nords Wharf Site is provided in *Table 8.1* below. Mitigation requirements are presented in *Chapter 10*.

**Table 8.1** *Summary of impacts to Aboriginal heritage resulting from the proposed development*

Area	Archaeological Potential	Archaeological Significance	Aboriginal Significance	Potential Impacts	Mitigation Required
Historical Heritage	None	None	N/A	None	No
Overall - Aboriginal Heritage	High	High	High	Disturbance to midden site	Yes
Archaeological Zone 1	High	High	High	Disturbance to midden site	Yes
Archaeological Zone 2	Moderate	High	High	Disturbance to midden site	Yes
Archaeological Zone 3	Low	Low	High	Unlikely and limited	Limited
Conservation Zone	High/Moderate	High	High	None - if treated as a zero impact conservation zone to protect Aboriginal heritage	Limited

This project is to be assessed and approved under Part 3A of the *Environmental Planning & Assessment Act 1979*. In summary Part 3A can provide developers with 'comprehensive' approval for development, without the need for obtaining further approvals under different State Acts. The Part 3A approval process involves strict requirements established by the Director General of NSW Planning to ensure all environmental factors are adequately considered and addressed.

Until the development is granted Part 3A approval the Nords Wharf Site and its heritage values remain protected and under the statutory control of the relevant State Acts.

Aboriginal cultural heritage in NSW is protected by the *National Parks and Wildlife Act 1974*. Historical heritage in NSW is protected under the *Heritage Act 1977*. These acts and their obligations are provided below. The obligations under these various acts have been used to devise relevant mitigation measures for the Nords Wharf Site, which are presented in *Section 10*.

## 9.1 NSW LEGISLATION

### 9.1.1 *Environmental Planning And Assessment Act 1979 (NSW)*

The *Environmental Planning and Assessment Act 1979* (EP&A Act) requires that environmental impacts are considered in land-use planning, including impacts on Aboriginal and historical heritage. Various planning instruments prepared under the Act identify permissible land use and development constraints.

The DECCW provides guidelines for Aboriginal heritage assessment, including those conducted under the EP&A Act 1979. Where Aboriginal heritage assessment is conducted under the Integrated Development Approval process, a more detailed set of NPWS guidelines applies.

Where a development is approved under Part 3A of the Act, further approvals under the National Parks & Wildlife Act 1974 are not required. In those instances management of heritage sites must follow the statement of commitments included in the Part 3A development approval.

The statement of commitments defines the environmental management and mitigation measures the proponent is prepared to make for the proposed project. The statement of commitments is made in accordance with *EP&A Act 1979*: Part 3A Division 2 Section 75F[6].



### 9.1.2 *National Parks And Wildlife Act 1974 (Nsw)*

All Aboriginal objects within the state of NSW are protected under section 90 of the *National Parks and Wildlife Act 1974* (NPW Act).

Under section 5 of the Act, “Aboriginal Object” means any deposit, object or material evidence (not being a handicraft made for sale) relating to the Aboriginal habitation of the area that comprises NSW, being habitation before or concurrent with (or both) the occupation of that area by persons of non-Aboriginal extraction, and includes Aboriginal remains.

Sites of traditional significance that do not necessarily contain archaeological materials may be gazetted as “Aboriginal places” and are protected under Section 84 of the Act. This protection applies to all sites, regardless of their significance or land tenure. Under section 90, a person who, without first obtaining the consent of the Director-General, knowingly destroys, defaces or damages, or knowingly causes or permits the destruction or defacement of or damage to, an Aboriginal object or Aboriginal place is guilty of an offence.

Amendments introduced by the *National Parks & Wildlife Amendment Act 2001* which strengthen the provisions of section 90 have yet to commence.

The DECCW is the statutory authority for the protection of Aboriginal objects and places within NSW, with the Director-General of that department the consent authority. Approvals under the NPW Act are not required where a development is approved under Part 3A of the *Environmental Planning and Assessment Act*.

### 9.1.3 *Heritage Act 1977 (NSW)*

The *Heritage Act 1977* protects the natural and cultural history of NSW with emphasis on non-Aboriginal cultural heritage. It provides automatic statutory protection to ‘relics’. The Act defines a ‘relic’ as:

*Any deposit or material evidence relating to the settlement of the area that comprises NSW, not being an Aboriginal settlement, which is 50 or more years old.*

Sections 139-145 of the Act prevent the excavation or disturbance of land known or likely to contain ‘relics’, except in accordance with an excavation permit issued by the Heritage Council of NSW (or in accordance with a gazetted exception under Section 139(4) of the Act).

While Aboriginal heritage sites and objects (“relics”) are protected principally by the *National Parks & Wildlife Act 1974*, if an Aboriginal site, object or place is of great significance it can be protected by a heritage order issued by the Minister on the advice of the Heritage Council.

Approvals under the Heritage Act are not required where a development is approved under Part 3A of the *Environmental Planning and Assessment Act*.

## 9.2

### NSW PLANNING CONTROLS AND GUIDELINES

There are a range of planning controls and guidelines that outline issues to be considered in the management and protection of heritage at Nords Wharf. These include:

- Hunter Regional Environmental Plan (REP) 1989 - Heritage;
- Lake Macquarie Local Environmental Plan (LEP) 2004; and
- Coastal Design Guidelines for NSW 2003.

The Hunter REP Heritage aims to conserve the environmental heritage of the Hunter Region. It lists 1300 heritage items that are divided in a number of categories; State, regional, local, areas requiring archaeological investigation, and heritage precincts or conservation areas. The Hunter REP Heritage also provides a framework for local government councils to develop, along with the assistance of the Department of Planning, appropriate means for conserving the heritage of their area.

The Lake Macquarie LEP 2004 includes a range of heritage protection provisions addressing both Aboriginal and European heritage sites, items and areas. The heritage objective of the LEP is to protect and conserve archaeological sites and places of Aboriginal, natural or European cultural significance. The LEP includes provisions that conserve the remaining fabric, relics, settings and views, and evidence of the cultural significance of heritage items and the environment of heritage conservation areas.

The Coastal Design Guidelines for NSW 2003 provide a suite of guidelines aimed at shaping and enhancing the character of settlements along the coast of NSW. They focus primarily on the desirable urban design concepts for the coast including workable open space networks, integration within the existing environment, retention of key views and vistas and the scale, type and density of new development. In relation to heritage, the Guidelines promote the recognition, retention, integration and avoidance of impacts on Aboriginal and European heritage.

This section contains provisions for the mitigation of impacts resulting from the proposed development on the heritage values of the Nords Wharf Site. Mitigation measures have been informed by consideration of the NSW Heritage Office and DECCW guidelines for historic and Aboriginal heritage impact assessments. It has also been informed by reference to the Coastal Design Guidelines as they relate to heritage.

The mitigation measures presented will be used to form the basis of a 'Statement of Commitments' as defined under the *EP&A Act 1979*: Part 3A Division 2 Section 75F[6].

**10.1*****HISTORICAL HERITAGE MITIGATION MEASURES***

The Nords Wharf Site does not have inherent heritage value nor does it contain items of historical heritage. The proposed development will not impact any known heritage items. Therefore the proponent is not required to undertake mitigation measures in relation to historical heritage before, during or after the proposed development.

**10.2*****ABORIGINAL HERITAGE MITIGATION MEASURES***

Recommendations for Aboriginal heritage mitigation are based upon the Archaeological Zoning Plan, see *Figure 5.2*. These recommendations are based upon the archaeological significance and archaeological potential of the zones as defined in *Table 8.1*.

**10.2.1*****General Aboriginal Heritage Mitigations***

The following general Aboriginal heritage mitigation measures are proposed. They should be set out in a basic 'Aboriginal Heritage Plan of Management' (PoM) for the development. This PoM should be developed between Coal & Allied and the Aboriginal stakeholders and agreed upon before any site works commence. The PoM can cover these general points and make provision for other specific points below.

These measures are the responsibility of Coal & Allied (as Stage 1 subdivision developers):

- ensure that the location of all new infrastructure services avoids and protects areas of high Aboriginal significance;
- ensure appropriate stop work procedures are in place particularly for the excavation phase of works and all site contractors undergo a site induction that includes information about Aboriginal sites;
- in the unlikely event of discovery of skeletal material all works should cease, the police, relevant local Aboriginal community groups and a suitably experienced archaeologist or physical anthropologist should be contacted to assess the material before determining the correct management action; and
- ensure that on-site information about the heritage requirements is in place for the construction phase for the construction team.

### **10.2.2** *Aboriginal Heritage Interpretation*

Aboriginal heritage interpretation should to be considered for the site. This interpretation could be developed in a number of ways, from signage, brochures, community involvement in the archaeological process and local schools education, through to on-going Aboriginal community education programs. Interpretation can also be considered in the context of the three southern sites (Gwandalan, Catherine Hill Bay and Nords Wharf).

The scope for interpretation should explain local types of Aboriginal sites and their importance to local Aboriginal groups. All interpretation should be subject to involvement and agreement with the relevant local Aboriginal community groups (also see 10.2.5 below).

Interpretation of Aboriginal heritage is the responsibility of Coal & Allied.

### **10.2.3** *Required Future Aboriginal Archaeological Works*

Archaeological excavation of the identified midden site will be required for AZ 1 and AZ 2. A research design should be written prior to archaeological excavation. This research design should follow from the sampling strategy, defined below, and addresses the research questions which were posed in the Aboriginal heritage assessment (*Section 6.2* of this report). The research design is to address potential archaeological works in all three archaeological zones.

### *Archaeological Zone 1*

The zone runs NW to SE and measures approximately 20 m in width. AZ 1 contains the midden (45-7-0177) which is associated with the landform rising and falling away from the foreshore. AZ 1 extends into the assigned conservation zone in the SW corner of the Nords Wharf Site.

Ideally AZ 1 should be avoided during development. The concept plan provides protection for a portion of this zone – in the SW corner. Development across the central and northern section of AZ 1 includes roads and some subdivision. Impacts to AZ 1 should be mitigated as per the requirements for AZ 2.

### *Archaeological Zone 2*

This zone occupies the central western portion of the Nords Wharf Site. AZ 2 contains the eastern half of the recorded midden (45-7-0177). Development impacts to AZ 2 include road construction and subdivision, which will result in soil clearance which will impact the integrity of the midden.

It is recommended that the following archaeological measures are taken within AZ 2 to mitigate the impacts of development:

1. determine the extent, depth, integrity and composition of the midden through the instigation of a series of augur holes. Augur holes should ideally be approximately 100 mm in diameter, spaced 10 m apart across AZ 1 (where impacted) and AZ 2. Sampling could be undertaken in AZ 3, this would be up to 5 augur holes, to confirm an absence of Aboriginal cultural material;
2. based on the results of auguring (which will give an indication of the density and content of midden) hand excavation of a sample of approximately 15-20, 1 m<sup>2</sup> pits within Archaeological Zones 1 and 2. If archaeological deposits are found to be concentrated and intact then a representative sample of the original excavation pits will be extended to 4 m<sup>2</sup> (expansion of 1-2 pits is recommended to obtain a representative sample);
3. analysis and interpretation of all excavated material should be undertaken. Analysis should aim to include radio-carbon dating of a suitable sample(s) to determine a relative chronology for the midden (and thus the local area). Reporting on the excavation could include Aboriginal community members input into the social assessment of material. In addition to a technical report, a plain English report should be produced. This could be developed in the form of an educational document that can be used as part of site interpretation; and

4. comparison with concurrent archaeological work at Gwandalan is recommended. All archaeological site works would necessitate the involvement of Aboriginal community stakeholders. Copies of all excavation works should be submitted to the local Aboriginal stakeholder groups for comment. Final reports should be lodged with the relevant DECCW office.

#### *Archaeological Zone 3*

This zone occupies the eastern half of the Nords Wharf Site. It has low archaeological significance and low archaeological potential. Therefore no further archaeological work is required within this zone.

It is recommended that the Aboriginal stakeholders be invited to monitor topsoil stripping for the purposes of recovering cultural heritage material from this zone. This work would not require the presence of an archaeologist although a database classifying material recovered will be established.

#### *Repository for Cultural Material*

The Aboriginal heritage PoM outlined above should also include management recommendations for the storage and conservation of all Aboriginal materials excavated from the site. Measures should be agreed with the Aboriginal community prior to any site works. Storage solutions could include reburial at a nearby location, use of the material as a teaching collection or standard artefact repository with the Australian Museum.

### **10.2.4      *Conservation Zone Within The Development Footprint***

The Conservation Zone, defined as per *Figure 7.1*, is located within Archaeological Zones 1 and 2. In order to avoid impacts to the archaeological deposits in this area, a series of mitigation measures will be developed.

This zone will be managed and treated as an “Aboriginal heritage conservation area” (conserving intact midden deposits for future generations). All infrastructure and works planned for this zone have the potential to directly impact the midden deposit. In order to allow appropriate works the conservation area the following recommendations should be followed:

- no topsoil stripping be allowed;
- the existing topsoil be built up to create a protective layer above the midden. This layer of new topsoil can be landscaped and developed as required;

- if areas that cannot be built up with new topsoil require the installation of equipment etc then this equipment should not impact soil horizons i.e. it should be designed to sit on top of the current surface level;
- Aboriginal heritage interpretation (possibly information signs) should be installed within the area to inform locals and visitors about the significance and use of the local area to Aboriginal people. The interpretation should be written in collaboration with Aboriginal stakeholders and include details relating to any archaeological investigations undertaken within the Nords Wharf Site.

#### 10.2.5

#### *Protection Of The Conserved Aboriginal Midden Site*

Aboriginal midden material contained within the Nords Wharf Site, and also in the foreshore zones, which will revert to the NSW Government should be conserved with the aim of zero impact. Consultation with all Aboriginal stakeholders during a community meeting devised a draft paper for the conservation of middens. This paper is presented in *Annex C*.

Every effort should be made to follow the objectives and mitigation measures stipulated in this HIA including *Annex C*.

## CONCLUSION

This HIA has determined that the proposed development at Nords Wharf has the potential to have some impact on the Aboriginal heritage values of the foreshore area. No impact on historic heritage values will occur.

Provided the mitigation measures outlined in this HIA are implemented by Coal & Allied, the potential impacts will be avoided or managed to an acceptable level.

In addition, the cumulative effect of the Coal & Allied proposed conservation zones means that the majority of the Aboriginal midden at Nords Wharf will be conserved in perpetuity. The effect of the conservation zone is that it will prevent future development which also contributes to the protection of Aboriginal sites along and adjacent to the coast in the local area.



## REFERENCES

- Barney N (1999) **From Mistake to Millennium: A Pictorial history of Lake Macquarie over 200 years** LMCC.
- Bowdler S (1983) "Sieving seashells: midden analysis in Australian archaeology" In Connah G (ed) **Australian Field Archaeology: A Guide to Techniques** pp135-144.
- Brayshaw H (1988) **Caves Beach Resort Development Archaeological Survey** Consultancy report to Gordon Pacific Ltd.
- Brayshaw H (1989) **Archaeological Survey of Proposed Tourist Resort at Summerland Point, Lake Macquarie, NSW** Consultancy report to Bexford Pty Ltd.
- Coutts P (1966) Features of prehistoric campsites in Australia **Mankind** 6:338-346.
- Dallas M (1986) **Appendix C: Pipeline route between Gwandalan and Mannering Park Sewage Treatment Works** Consultancy report to Public Works Department.
- Dallas M, Navin K and McConchie D (1993) **Archaeological Investigation of the Morisset Peninsula Sewerage Scheme** Consultancy report to Public Works Department.
- Dean-Jones P (1988) **Archaeological Survey of Lot 37 (No. 29) Lambton Parade, Swansea Heads LMCC DP Number 240868** Consultancy report to Mr David Jamcotchian.
- Donlon D (1991) **Skeletal Remains from the Swansea Channel Burial Ground, NSW: Description and Analysis** Consultancy report to the Australian Institute of Aboriginal and Torres Strait Islander Studies.
- Dyall L (1975) **Archaeological Excavation at Swansea (Permit A 3570)** Consultancy report to NPWS.
- EJE Heritage (2005) **Conservation Management Plan – Wallarah and Moonee Collieries, Catherine Hill Bay NSW** Consultancy report to Rosecorp Pty Ltd.
- Environmental Resources Management (ERM) (2004) **Gap Analysis – Archaeology, History and Landscape: Upper Hunter Valley Aboriginal Heritage Baseline Study** Consultancy report to the Upper Hunter Aboriginal Heritage Trust.
- ERM (2006) **RTCA Heritage Register Update Summary Report** Consultancy report to Rio Tinto Coal Australia.

ERM (2007) **Lower Hunter Lands Development Stage 1 Preliminary Heritage Constraints Analysis – Nords Wharf** Consultancy report to Catylis and Coal & Allied.

Gill E (1951) Aboriginal kitchen middens and marine shell beds  
**Mankind** 4:249-254.

Griffiths T (1992) **Inspection for Aboriginal Sites and Relics of Proposed Water Sports Club and Holiday Cabins, Kanangra Drive, Gwandalan, NSW** Consultancy report to Dalkene Pty Ltd.

RPS (October 2005) **Phase One Vegetation Assessment report Over various holdings in the Lower Hunter/Central Coast, NSW** Consultancy report to Rio Tinto Coal Australia Pty Ltd.

Haglund L (1985) **Archaeological Survey at Wallarah Colliery, Catherine Hill Bay, NSW** Consultancy report to Longworth & McKenzie.

Haglund L (1986) **Assessment of the Prehistoric Heritage in the Lake Macquarie Area** Consultancy report to LMCC.

Haglund L (1987) "Archaeological Survey of Areas Proposed for Coal Reject Emplacement and Coal Handling Developments at Catherine Hill Bay, NSW" Appendix E in **Environmental Impact Statement: Expansion of the Catherine Hill Bay Coal Preparation Plant** Consultancy report to Johnstone Environmental Technology and Longworth & McKenzie.

Hughes P J and Sullivan M E (1974) The redeposition of midden material by storm waves **Journal and Proceedings of the Royal Society of NSW** 107:6-10.

Hunter Regional Environmental Plan 1989

Lake Macquarie City Council website, available at  
[www.lakemac.infohunt.nsw.gov.au](http://www.lakemac.infohunt.nsw.gov.au), accessed 19/1/07.

Lake Macquarie Local Environmental Plan 2004

Navin Officer (1995) **Walarah Peninsula Strategic Issues Study Aboriginal Archaeology** Consultancy report to GHD on behalf of LMCC.

Nelson L (1995) **Shell Middens on Lake Macquarie** Unpublished Thesis, University of New England, Department of Archaeology and Paleoanthropology.

New South Wales National Parks and Wildlife Service (NPWS) (2005) **Lake Macquarie State Conservation Area Pulbah Island Nature Reserve and Moon Island Nature Reserve: Plan of Management** Consultancy report to NSW NPWS.

NSW Department of Lands **Wallerah Parish Maps for 1914, 1920, 1925 and 1932**, available from  
[http://www.lands.nsw.gov.au/survey\\_mapping/parish\\_maps](http://www.lands.nsw.gov.au/survey_mapping/parish_maps)

NSW Department of Planning 2003 **Coastal Design Guidelines for NSW**

Resource Planning (1992) **Report of an Archaeological Survey at Windermere Creek, Lake Macquarie** Consultancy report to LMCC.

Speight J G (1990) "Landform" In McDonald R C, Isbell R F, Speight J G, Walker J, and Hopkins M S (eds) **Australian Soil and Land Survey Field Handbook, Second Edition** Inkata Press, Australia.

Turner J and Blyton G (1995) **The Aboriginals of Lake Macquarie - A Brief History** The History of Lake Macquarie Series, LMCC.



Annex A

## Aboriginal Consultation Log



**Table A.1 Consultation Stage 1: Advisory Requests**

Date	Organisation/group/individual	Contact Name	Details
28-Jun-07	Lake Macquarie News newspaper	N/A	Ad to appear on Thursday 5 July 2007, given response date of 19 July 2007 Search of NNTT website of Lake Macquarie LGA shows 7 claimant applications, none of which are active. Three of these were for Wonnarua Tribal Council and were discontinued, one was for the Boongary Clan of the Taurai People which was discontinued, one was for Jamie Roy Denniss which was discontinued, one was for Mimaga Wajaar Traditional Custodians Wanuruah Claim and was dismissed, and one was for the Wonnarua People and was discontinued.
28-Jun-07	Native Title Services	N/A	Email requesting groups to consult. Letter received 4/07/07 identifying three Aboriginal parties who may be interested in being consulted: Guringai Tribal Link Aboriginal Corporation (who we're already consulting), Mur-Roo-Ma Inc. and Arthur C. Fletcher.
28-Jun-07	DECCW	Brendan Diacono	Email requesting groups to consult. Email received 29/06/07 specifying that no Aboriginal owners are known for the area.
28-Jun-07	Registrar of Aboriginal Owners	Megan Mebberson	Email requesting groups to consult. Resent on 25/07/07 as no response had been received. Email received 8/08/07 saying to contact Bahtabah LALC.
28-Jun-07	Lake Maquarie City Council	Mary Loder	Phone call discussing project and checking whether a representative would be available for survey on 11 July. Email to this effect giving details, map and requesting groups to consult.
28-Jun-07	Bahtabah LALC	Michael Green	Phone call regarding project; left message. Email discussing project, giving map and asking whether a representative would be available for survey on 11 July; also requesting groups to consult.
28-Jun-07	Guringai Tribal Link Aboriginal Corporation	Tracey-lee Howie	Phone call regarding project; confirmed that they would be available for survey on 11 July. Email giving proposed survey details, map and requesting groups to consult.
28-Jun-07	Awabakal Traditional Owners Aboriginal Corporation	Kerrie Brauer	Email discussing project, giving map and asking whether a representative would be available for survey on 11 July; also requesting groups to consult.
28-Jun-07	Awabakal Descendents Traditional Owners Aboriginal Corporation	Shane Frost	Email discussing project, giving map and asking whether the Nords Wharf Site are within their area of interest; also requesting groups to consult.
05-Jul-07	Mur-Roo-Ma Inc.	Anthony Anderson	Email discussing project, giving map and asking whether the Nords Wharf Site are within his area of interest; also requesting groups to consult.
05-Jul-07	Wonn1 Contracting	Arthur C. Fletcher	

**Table A.2 Consultation Stage 1: Aboriginal Group Registrations Received**

Date	Organisation/group/individual	Contact Name	Details
28-Jun-07	Bahtabah LALC Awabakal Traditional Owners	Michael Green	Phone call discussing project and checking whether a representative would be available for survey on 11 July. Email to this effect giving details, map and requesting groups to consult.
28-Jun-07	Aboriginal Corporation Guringai Tribal Link Aboriginal	Kerrie Brauer	Phone call, registering interest in being consulted.
28-Jun-07	Corporation Awabakal Descendents Traditional	Tracey-lee Howie	Phone call registering interest.
29-Jun-07	Owners Aboriginal Corporation	Shane Frost	Phone call and email registering interest.
16-Jul-07	Wonn1 Sites Officer	Arthur C. Fletcher	Fax registering interest.

**Table A.3 Consultation Stage 2: Briefing and Methodology Advice Sent**

Date	Organisation/group/individual	Contact Name	Details
29-Jun-07	Bahtabah LALC Awabakal Traditional Owners	Michael Green	Email of methodology and invitation to participate in fieldwork; survey date of 11 July 2007.
29-Jun-07	Aboriginal Corporation Guringai Tribal Link Aboriginal	Kerrie Brauer	Email of methodology and invitation to participate in fieldwork; survey date of 11 July 2007.
29-Jun-07	Corporation Awabakal Descendents Traditional	Tracey-lee Howie	Email of methodology and invitation to participate in fieldwork; survey date of 11 July 2007.
29-Jun-07	Owners Aboriginal Corporation	Shane Frost	Email of methodology and invitation to participate in fieldwork; survey date of 11 July 2007.



**Table A.4** *Consultation Stage 2: Aboriginal Comments Received*

Date	Organisation/group/individual	Contact Name	Details
01-Jul-07	Awabakal Descendents Traditional Owners Aboriginal Corporation	Shane Frost	Email providing agreement with the methodology, offering fieldwork services and providing copies of insurance certificates.
02-Jul-07	Guringai Tribal Link Aboriginal Corporation	Tracey-lee Howie	Email and fax providing agreement with the methodology, offering fieldwork services and providing copies of insurance certificates.
02-Jul-07	Awabakal Traditional Owners Aboriginal Corporation	Kerrie Brauer	Email of letter providing agreement with the methodology, offering fieldwork services and providing copies of insurance certificates.
06-Jul-07	Bahtabah LALC	Michael Green	Email of letter indicating agreement with the methodology and offering fieldwork services.



Jenna Lamb/ERMAU/ERM

29/06/2007 04:11 PM

To Tracey Howie <guringai@kooe.com.au>

cc Tim Owen/ERMAU/ERM@ERM, Shelley  
James/ERMAU/ERM@ERM

bcc

Subject Aboriginal Heritage Assessment: "Catylis" at Nords Wharf,  
Gwandalan & Catherine Hill Bay

Dear Tracey-lee,

As we indicated in our email of 28 June 2007, Environmental Resources Management Australia (ERM) is undertaking an Aboriginal heritage assessment of three areas proposed for future development, at Gwandalan, Nords Wharf and Catherine Hill Bay (please find attached a map of the study areas). The study is being undertaken on behalf of Catylis/RTCA to assess development constraints and opportunities within the area.

This email provides Guringai Tribal Link Aboriginal Corporation with a proposed methodology for this heritage assessment. We would appreciate it if you could provide us with any written **feedback** on this methodology, by **Friday 6 July 2007** (by return email, or our fax number is 8584 8800).

We welcome your feedback on the method of assessing the Aboriginal heritage significance of the study area, and we understand that there are a number of methods that could be used in such an assessment. We would also welcome any information that you could provide us with concerning the cultural heritage values of the study area.

We propose to assess Aboriginal heritage of the study areas through archaeological **surveys** on **Monday 9 July-Friday 13 July 2007**. These surveys will aim to locate any Aboriginal heritage sites that occur within the study areas, and to assess their significance. The survey will be undertaken on foot and will cover all archaeologically sensitive landforms in the study area, focusing particularly on any soil exposures. Landform elements where we think sites may occur include:

- within 50 m of creeks;

- ridges, slopes and flats suitable for camping or travelling through the country; and

- in closest proximity to the shore of Lake Macquarie (in the Gwandalan study area).

During the heritage assessment, we propose to:

- identify and record any Aboriginal heritage sites located during the survey;

- take GPS readings and mark site locations on a map;

- estimate the effective survey coverage of the study area;

- assess the impact of the proposed development on known Aboriginal heritage values;

- assess the scientific and Aboriginal significance of sites; and

- provide recommendations on how to manage and mitigate proposed development impacts on known Aboriginal heritage values.

When these tasks have been completed, ERM will provide a copy of the draft Aboriginal

heritage assessment report to Guringai Tribal Link Aboriginal Corporation for comment.

ERM would like to invite one representative from Guringai Tribal Link Aboriginal Corporation to participate in paid fieldwork for the Aboriginal heritage assessment field survey of the Gwandalan, Nords Wharf and Catherine Hill Bay study areas on **Monday 9-Friday 13 July 2007**. Following current NSW DECC Aboriginal heritage consultation guidelines, your field representative should have skills or experience in one or more of the following

field identification or survey techniques (including confirmation of physical ability to undertake fieldwork);

cultural knowledge of the study area and surrounds; and

ability to assist in communicating the results of the survey back to the stakeholder community for the assessment of cultural values and significance, and returning advice on their response to ERM (DEC Interim Community Consultation Requirements, January 2005, page 8).

In order to participate in the survey on **Monday 9-Friday 13 July 2007**, Aboriginal representatives must be adequately insured, so please also provide your insurance status and copies of your certificate of currency for details concerning your public liability and workers compensation insurance. We would greatly appreciate it if you could respond to us in writing by Friday 6 July 2007 (by return email or by fax on 8584 8800) with this information, and also with the fieldwork rates of your representative. Our contact details are listed below in the email signature.

It is proposed that all field participants meet on **Monday 9 and Tuesday 10 July 2007 at 8:00 am** at the **Bowling Club**, on **Flowers Drive**, **Catherine Hill Bay**.

It is proposed that all field participants meet on **Wednesday 11 July 2007 at 8:00 am** at **Camp Kanangra Scout Camp**, at the **southern end of Government Road**, **Nords Wharf**.

It is proposed that all field participants meet on **Thursday 12 and Friday 13 July 2007 at 8:00 am** at the **corner of Summerland Road and Kanangra Drive**, **Gwandalan**.

Field participants should bring all food and water required for the day. Personal protective equipment required for the survey is **high visibility vests, safety shoes, long-sleeved shirt and trousers** and **sun/rain protection (hat, sunscreen and raincoat)**.

The Aboriginal heritage assessment will be conducted in collaboration with Aboriginal stakeholders over the course of the five days. The survey will target areas of land in each study area that are relatively undisturbed and where the ground surface is visible, including any mature trees, ridges, slopes, flats, and watercourses. ERM archaeologist Jenna Lamb will be undertaking the fieldwork for the Aboriginal heritage assessment with the Aboriginal stakeholders.

Payment for the participation of one representative in the fieldwork will be provided by the client, however invoices may be sent to ERM, at the following address:

Environmental Resources Management (Australia) Pty Ltd  
Cultural Heritage Services  
Attn: Jenna Lamb  
Locked Bay 24  
Broadway NSW 2007

In summary, we request, by **Friday 6 July 2007**:

Any feedback with regard to the proposed methodology

Any further knowledge with regard to Aboriginal heritage within the study area

Your representative's fieldwork rates

Certificates of currency for workers compensation and public liability insurance.

If you have any queries concerning the project, please feel free to contact me by return email or on the numbers listed below.

Many thanks,

Jenna Lamb  
Archaeologist



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Jenna Lamb  
Graduate Archaeologist  
Environmental Resources Management Australia Pty Ltd  
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Annex B

## Effective Coverage Table



Table B.1 Effective Coverage

Transect	Landform	Description	Length (m)	Width (m)	Area (m <sup>2</sup> )	Visibility	Exposure	Visible area (m <sup>2</sup> )	Area available for detection (m <sup>2</sup> )	% Effective coverage	Number of sites
1	Slope	Slope up from foreshore commencing at the western boundary of the Nords Wharf Site.	392	10	3920	80%	40%	3136	1254.4	32%	1 (45-7-0177)
	Slope	Forest track along the northern boundary of the Nords Wharf Site									1 (45-7-0177)
2	Slope	Forest tracks through the centre of the Nords Wharf Site	585	4	2340	100%	100%	2340	2340.0	100%	1 (45-7-0177)
3	Flat	Open sandy forest track through the south and east of Nords Wharf Site	153	4	612	100%	100%	612	612.0	100%	1 (45-7-0177)
4	Slope	Forested area along the southern, western and central north of Nords Wharf Site	195	4	780	100%	100%	780	780.0	100%	None
5	Slope	Slope occupied by the Scout Camp.	742	4	2968	30%	1%	890.4	8.9	0%	None
6		Approx Nords Wharf Site Size (m <sup>2</sup> )	443	10	4430	80%	40%	3544	1417.6	32%	None
		Total Area Surveyed (m <sup>2</sup> )			87500						1 (45-7-0177)
		Percentage Surveyed			15050						
			17%								





Annex C

Discussion Paper -  
Conservation of Aboriginal  
Midden Sites



## C.1

### CONSERVATION OF ABORIGINAL MIDDEN SITES

As this study has confirmed, Aboriginal midden sites are a common feature along the shore of Lake Macquarie. However, the cumulative impact caused by development and public use of the foreshore is starting to make these sites less common. Therefore proactive conservation of middens will preserve a representative sample of these fragile Aboriginal sites for future generations' education and enjoyment.

This discussion paper presents the outcomes of discussions held between the local Aboriginal stakeholders with regard to the immediate threats and possible conservation measures that can be used to preserve Aboriginal middens.

This paper can be used during the current development process, local councils or by the Aboriginal groups to address the problems concerning the conservation of Aboriginal middens.

#### C.1.1

##### *Location of Middens*

Aboriginal middens are commonly found around the margins and within the hinterlands of Lake Macquarie. They have been formed because of an accumulation of shell and other materials, including charcoal, animal bones, stone debitage and tools, in a particular location. This accumulation often occurs over a long period of time, sometimes thousands of years.

Middens are viewed as culturally significant to the Aboriginal people in this region because of the tangible link they represent to their ancestors (see the Aboriginal social assessment in *Section 6.2.2*).

Middens created by Aboriginal people must be differentiated from natural accumulations of shell or shell bedding. *Section 3.2.3* provides guidance to differentiating between the two types of shell accumulation.

#### C.1.2

##### *Statutory Protection*

In NSW Aboriginal midden are afforded statutory protection as Aboriginal objects under the *National Parks and Wildlife Act 1974*. With regard to the current proposal, the proposed dedication of Coal & Allied conservation land to the NSW Government will afford long term future protection for all Aboriginal middens on Coal & Allied lands, outside of the 20% development areas.

Dedication of these lands to National Parks should provide for long term care and conservation of Aboriginal these sites.

### **C.1.3      *Objective for Conservation Mitigation***

The objectives for conserving Aboriginal middens are:

1. Long term preservation of the middens;
2. Aboriginal social appreciation of the midden; and
3. The ability to educate Aboriginal people and the general public (when appropriate) with regard to the midden's content, purpose and significance.

### **C.1.4      *Common Impacts to Midden Sites***

Middens are generally contained within topsoil profiles, where middens have become embedded into the A1 and A2 horizons. They have acted as a collection point for soil accumulation, where soil has built up around the margins of the midden. This means that if left alone the middens are generally stable and will not disintegrate. However, any impact to the structural integrity of the midden can lead to its sudden disintegration.

Common impacts that middens suffer include:

- wash from motor boats (leading to erosion of the banks);
- coastal erosion (land falling into the water);
- sheet wash erosion (rain washing deposits into the water);
- impacts from facilities being constructed (i.e. roads, infrastructure services including sewerage and water, seating areas, bbqs, play equipment etc);
- land use, including vehicle and human traffic crossing middens;
- impacts from landscaping (including installing signs); and
- public impacts either caused deliberately (i.e. vandalism of the site) or as a consequence of interest (i.e. walking onto the site to get a better view or taking a small piece of the midden).

### C.1.5

#### *Possible Mitigation Measures*

Many of these impacts can be mitigated through public education or careful landscape modification to either move the impact or people away from the site or guide them past it appropriately. When devising mitigation measures the overall aim should be zero impact to the midden. However, this may not always be possible, and limited impacts may be acceptable if the overall aim of conservation is achieved.

Mitigation measures can include:

- zero impact walkways, which sit above the surface level;
- zero impact signage;
- placing a protective covering or layer above the midden i.e. a covering of soil, sand or a road above the midden so that impact are made to the new layer and not the midden;
- covering the upper surface in a geo-fabric to prevent impact;
- creation of a coastal barrier i.e. landscape change to prevent coastal erosion;
- screening of the midden using carefully placed vegetation or facilities to prevent the obviousness of the midden; and
- redesign of facilities around the midden, thus avoiding impacts.



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