PRELIMINARY ABORIGINAL
ARCHAEOLOGICAL SURVEY & ASSESSMENT

Proposed Upgrade of State Highway SH23,
Shortland to Sandgate
New South Wales

Prepared for the NSW Roads and Traffic Authority

December 2005
# Table of Contents

1.0 Introduction 3  
1.1 Background to the Assessment 3  
1.2 The Proposal 3  
1.3 Statutory Context and Controls 3  
1.4 Assessment Objectives & Scope of Works 5  
1.5 Aboriginal Consultation 6  
1.6 Authorship 7  
1.7 Report Outline 7  
1.8 Summary of Results 8  
1.9 Summary of Recommendations 8  

2.0 Environmental Context 11  
2.1 Site Location 11  
2.2 Topography and Hydrology 11  
2.3 Geology and Soils 11  
2.4 Vegetation 12  
2.5 Land Use History and Existing Condition of the Subject Land 13  
2.6 Implications for Aboriginal Use and Site Survival 13  

3.0 Archaeological Background 15  
3.1 Regional Prehistory – Archaeological Investigations in the Lower Hunter Valley 15  
3.2 Local Archaeological Context 17  
3.3 An Archaeological Predictive Model 23  

4.0 Site Inspection 27  
4.1 Methods 27  
4.2 Field Survey 28  
4.3 Results of the Site Inspection 30  

5.0 Heritage Impact Assessment 38  
5.1 Impact of the Proposal 38  
5.2 Evaluation 38
6.0 Recommendations

6.1 Basis for Recommendations

6.2 Recommendations

7.0 References

Appendices
Appendix 1: Report of the Awabakal Local Aboriginal Land Council

List of Figures

Figure 1. The location of the subject land (blue) (NRMA 2001). 9
Figure 2. The Proposal (Supplied by RTA). 10
Figure 3. South along end of existing SH23 from raised edge of Sandgate Road. 31
Figure 4. Entrance road to the Shortland Wetland Centre. 31
Figure 5. Drainage on the northern side of Sandgate Road. 32
Figure 6. Area of the southbound exit ramp to Sandgate Road. 32
Figure 7. Path alongside boggy ground north of Sandgate Road. 33
Figure 8. Disturbed ground and bike jumps adjacent to Shortland Wetland Centre. 33
Figure 9. Mounded earth within the Shortland Wetland Centre. 34
Figure 10. Reedy swamp east of the subject land. 34
Figure 11. Sparse shell fragments in fill along the vehicular track. 35
Figure 12. Regrowth casuarinas along the channelised creek. 35
Figure 13. Previously laid road on top of the fill mound. 36
Figure 14. View northeast from fill mound over railway and swamplands. 36
Figure 15. Track on fill between swampland and Sandgate Cemetery. 37
Figure 16. Raised (filled) ground immediately west of the Pacific Highway. 37
1.0 Introduction

1.1 Background to the Assessment

Dominic Steele Consulting Archaeology has been commissioned by the NSW Roads and Traffic Authority (RTA) to undertake a preliminary Aboriginal archaeological survey and assessment of a parcel of land in which an extension to State Highway SH23 is proposed for construction (Figure 1).

The subject land for the current study comprises the corridor for the construction of the proposed road varying from 60m to 200m in width. Located some 8-9km northwest of Newcastle CBD, the proposed road corridor extends northeast from the intersection of SH23 and Sandgate Road to The Pacific Highway between Sandgate Cemetery and St Josephs Nursing Home (Figure 2). This corridor is approximately 2km in length.

The proposed highway upgrade requires a Review of Environmental Factors (REF) to be undertaken in fulfilment of the provisions of Section III (Part 5) of the Environmental Planning an Assessment Act 1979. Part of this REF requirement is the assessment of the potential impacts of the Proposal on Aboriginal cultural heritage. The current study has been undertaken to identify any items of Aboriginal cultural heritage which may be impacted by the Proposal and to outline appropriate management strategies for them in the context of the Proposal.

1.2 The Proposal

The proposed highway upgrade works (‘The Proposal’) would involve the construction of a two-way median separated dual carriageway highway within the corridor described above (see Figure 2). The Proposal would also include the construction of several bridges, including on Sandgate Road over the extended SH23, and where the proposed SH23 extension crosses wetlands and the Main Northern Railway. Several access ramps/interchanges are also proposed for construction from existing major cross roads such as Sandgate Road and the Pacific Highway.

1.3 Statutory Context and Controls

Two principal pieces of legislation provide automatic statutory protection for Aboriginal heritage and the requirements for its management in New South Wales. These are the National Parks and Wildlife Act (1974) and the Environmental Planning and Assessment Act (1979). The implications of these statutory controls within the context of the Proposal are outlined below.

1.3.1 National Parks & Wildlife Act (1974)

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

any deposit, object or material evidence (not being a handicraft for sale) relating to indigenous and non-European habitation of the area that comprises New South Wales, being habitation both prior to and concurrent with the occupation of that area by persons of European extraction, and includes Aboriginal remains.
An Aboriginal place is defined under the \textit{NPW Act} (1974) as an area which has been declared by the Minister administering the \textit{NPW Act} (1974) as a place of special significance with respect to Aboriginal culture. It may or may not contain physical Aboriginal objects.

Under Section 90 of the \textit{NPW Act} (1974), it is an offence to knowingly destroy, deface, damage or desecrate, or cause or permit the destruction, defacement, damage or desecration of, an Aboriginal object or Aboriginal place, without the prior written consent from the Director-General of the Department of Environment and Conservation (DEC – formerly NPWS). In order to obtain such consent, a Section 90 Consent Application must be submitted and approved by the DEC Director-General. In considering whether to issue a Section 90 Consent, DEC will take into account the significance of the Aboriginal object(s) or place(s) subject to the proposed impacts; the effect of the proposed impacts and the mitigation measures proposed; the alternatives to the proposed impacts; the conservation outcomes that will be achieved if impact is permitted; and the outcomes of the Aboriginal community consultation regarding the proposed impact and conservation outcomes.

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

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

\subsection*{1.3.2 Environmental Planning and Assessment Act (1979)}

The \textit{Environmental Planning and Assessment Act} (1979) requires that environmental impacts are considered prior to any land development. This includes impacts on Aboriginal cultural heritage items and places. Part 5 of the Act outlines the environmental assessment requirements for various types of projects. Section 111 describes the responsibilities of Government Authorities, such as the RTA, to undertake environmental assessment of certain proposed activities. This includes an examination of the potential impact of the proposed activity on Aboriginal cultural heritage.

\subsection*{1.3.3 Implications}

Assessment of any potential impacts to Aboriginal heritage values is required for the proposed works. Damage, destruction or removal of any Aboriginal ‘places’ or ‘objects’ is only permitted where a Permit or Consent has been issued by the Director-General of the DEC according to Sections 87 and 90 of the \textit{NSW National Parks & Wildlife Act} (1974).
DEC Permits and Consents are only granted where sufficient information is supplied in written form to the Director-General from Aboriginal stakeholders, archaeologists and developers that demonstrate accuracy and transparency in the site assessment process and the good faith intended by each of these parties in applying for consent to either move, disturb and/or destroy statutorily protected objects. Best practice advocates that development impact to documented and/or potential sites of Aboriginal cultural heritage sensitivity be avoided where practicable and/or mitigated at the minimum, and that all decisions made for either course of action be made consequent to direct guidance provided by Aboriginal stakeholders.

1.4 Assessment Objectives & Scope of Works

The objectives of the current study have been to provide an Aboriginal archaeological survey and assessment of the subject land according to the following directives;

1.4.1 Aboriginal Stakeholder Consultation

- Initiate consultation with the Awabakal Local Aboriginal Land Council (ALALC);
- Incorporate any information, views, concerns and / or recommendations provided by the ALALC into the current assessment process.

1.4.2 Background Research

- Review relevant heritage registers and listings, including the Department of Environment and Conservation (DEC) Aboriginal Heritage Information Management System (AHIMS) and other statutory and non-statutory listings relevant to the Proposal;
- Review existing documents including previous archaeological investigations, reports and studies in order to form a dataset of the known archaeology of the local region;
- Prepare a predictive model describing the archaeological sensitivity of the subject land and to predict the potential for previously unrecorded sites to occur within the boundaries of the subject land of the Proposal.

1.4.3 Site Survey & Assessment

- Undertake an archaeological survey of the study area in partnership with the ALALC;
- Identify and record any Aboriginal sites that may be present within the subject land and assess their significance;
- Identify and record any areas of Aboriginal archaeological sensitivity or the potential for undetected archaeological evidence to occur within the locations to be impacted by the Proposal;
- Assess the potential impacts of the Proposal on the archaeological and cultural heritage values of the study area.
1.4.4 Analysis, Evaluation & Report

- Prepare a report detailing the outcomes of the consultation undertaken with the ALALC, the results of the field survey, and an Aboriginal archaeological assessment of the study area that meets the requirements of the NSW NPWS Aboriginal Cultural Heritage Standards & Guidelines Kit (DRAFT 1997);

- Formulate a set of management options and recommendations that provide an appropriate framework for the ongoing protection of any documented Aboriginal sites that may be located and to guide the management of the potential archaeological resource of the subject land that may be identified in general.

1.5 Aboriginal Consultation

Recent changes to Aboriginal cultural heritage management policies provided by the NSW Department of Environment & Conservation concerning ‘Public consultation for s87 Permits and s90 Consents under the National Parks & Wildlife Act (1974)’ bear relevance to the Proposal.

These primarily concern the outcomes of a court case that was determined in the Land and Environment Court in November 2004 (‘Williams v Director-General Department of Environment and Conservation, Country Energy and another’). The Court decided on the 5th of November 2004 that:

‘A consent and permit were invalid because Mr Williams had a legitimate expectation of being involved in the archaeological survey of the land to be affected. The decision extended the requirement to consult to the involvement of any Aboriginal people with an interest in the project in survey work and not just to considering specific proposals at completion of the survey and report development.’

A letter of advice received from the DEC (November 2004) concerning this outcome concludes that:

‘In the longer term for future projects, the Department is proposing to draft new guidelines on consultation to apply to applicants and will be seeking input from stakeholders on their content.’

At this point in time, precise direction as to which specific Aboriginal stakeholder groups would be required to be consulted with and/or involved in future Aboriginal archaeological projects in the greater Newcastle area has yet to be finalised by the DEC.

A search of the National Native Title Tribunal register of Native Title applications revealed that no current claims or agreements apply to the subject land.

For the current assessment, Dominic Steele Consulting Archaeology has consulted in good-faith with the Awabakal Local Aboriginal Land Council (ALALC). This organisation has previously been endorsed by the DEC, and has demonstrated in the past a sound commitment to the ongoing protection, conservation and management of Aboriginal cultural heritage sites in the local landscape.
As a consequence, it is considered that the liaison undertaken with the ALALC as identified in this report reflects a legitimate representation of Aboriginal interests in this assessment. Should the acquisition of a permit be required under the NPWS Act (s.87 or s.90), further Aboriginal community consultation and public notification will be required.

Upon engagement Dominic Steele Consulting Archaeology (DSCA) contacted the Awabakal Local Aboriginal Land Council (ALALC) to inform them of the Proposal and invite their participation in an Aboriginal archaeological survey of the subject land. This survey was arranged to be undertaken on Wednesday 28 September 2005 by Paul Irish (DSCA archaeologist) and Mr Robbie Olsen (ALALC Aboriginal Sites Officer).

Upon arrival at the ALALC on the agreed day Paul Irish was informed that Mr Robbie Olsen was unfortunately unavailable. Mr Olsen was contacted and it was agreed that Paul Irish would undertake an inspection of the subject land and discuss the results with Mr Olsen upon completion to decide what further action should be undertaken.

It was decided during this further discussion that Paul Irish would send a summary of the results of the site inspection to Mr Olsen for his review and to allow Mr Olsen to undertake an inspection of the subject land himself. The presence of a DSCA archaeologist was offered during this inspection but Mr Olsen indicated that this would not be necessary.

Mr Olsen inspected the subject land on Friday 7 October 2005 and produced a report based on his observations, and representing the views of the ALALC towards the Proposal. This report has been attached as Appendix A.

1.6 Authorship

This report has been prepared by Paul Irish.

1.7 Report Outline

This report presents the following –

- An introduction to the Proposal and its assessment (Section 1.0);
- A description of the environmental context of the subject land including its geology, topography, vegetation and soils (Section 2.0);
- A review of the local Aboriginal archaeological context pertinent to the subject land, and a prediction of the types of archaeological evidence that may be resident within the boundaries of the land (Section 3.0);
- Description of the procedure and results of the archaeological survey of the subject land (Section 4.0);
- A discussion of the results and conclusions that have been developed for the subject land and an evaluation of archaeological sensitivity of the site relative to the Proposal. This is presented in the form of a Statement of Heritage Impact (Section 5.0);
• The provision of management recommendations that detail advice on the nature and scope of further Aboriginal archaeological requirements that may potentially be required within the context of the Proposal (Section 6.0);

• References cited in this report and reports reviewed during the preparation of this document (Section 7.0);

• Inclusion of supporting information – correspondence with Awabakal Local Aboriginal Land Council (ALALC) (Appendices).

1.8 Summary of Results

A fully comprehensive Aboriginal archaeological field survey has been undertaken on the subject land. The survey did not result in the location of any Aboriginal archaeological sites, areas of archaeological potential or areas of Aboriginal cultural significance. Background research has demonstrated that no Aboriginal sites have previously been recorded within the subject land.

The majority of the subject land is swampland and/or highly disturbed or modified ground which possesses no potential for the survival of in situ remains of past Aboriginal use. There is therefore no requirement for further archaeological works prior to commencement of the proposed road duplication.

1.9 Summary of Recommendations

It is recommended that:

I There are no Aboriginal archaeological constraints to the Proposal proceeding and it is recommended that no further archaeological input is required prior to the commencement of site works.

II Further consultation with the Awabakal Local Aboriginal Land Council should be undertaken by the Roads and Traffic Authority prior to construction with respect to the concerns raised in the appended correspondence of the Awabakal Local Aboriginal Land Council.
Figure 1. The location of the subject land (blue) (NRMA 2001).
Key Features:

1. Continuation of existing SH23 carriageways
2. New bridge on Sandgate Road over SH23
3. Twin bridges over wetland and access road
4. Twin bridges over Main Northern Railway
5. Northbound access ramp from Sandgate Road
6. Southbound access connection to Sandgate Road
7. Half interchange access to Pacific Highway and Old Maitland Road
8. High standard ‘Directional Y’ interchange with Pacific Highway
9. Sandgate Road and Wallsend Road to benefit from significant traffic decreases.

Figure 2. The Proposal (Supplied by RTA).
Environmental Context

2.1 Site Location

The subject land is located approximately 8-9km northwest of the City of Newcastle between the suburbs of Shortland and Sandgate. It is bounded to the south by the end of the existing SH23 and in the north by the Pacific Highway immediately south of St Josephs Nursing Home at Sandgate. Moving from south to north, the route is bounded on its (north)western side by the Shortland Wetlands Centre, wetlands associated with a channelised tributary of Ironbark Creek, a golf range, a commercial subdivision, additional swamplands and the Rocla industrial site at Sandgate. To the (south)east of the route is residential housing at Shortland, swamplands, Sandgate cemetery and currently vacant cleared land between the route and the Pacific Highway.

2.2 Topography and Hydrology

The subject land is situated within and immediately adjacent to estuarine wetlands associated with the Hunter River flood plain. To the east of the wetlands, are mangroves along the Hunter River estuary. To the north, west and south are the edges of the East Maitland Hills and Awaba Hills respectively (Matthei 1995:2-3), forming the high and dry ground surrounding the swampland. These form low rounded spurs and hills with drainage depressions of low gradient. Local relief in the vicinity of the subject land varies from around sea level in the swamp to less than 10m AHD (Australian Height Datum).

Local topography has been modified at the ends of the proposed route by the construction of both Sandgate Road and the Pacific Highway, involving deposition of imported fill. The only natural rise within the proposed highway extension corridor appears to be at the southern end of the route at Sandgate Road, which is located on the edge of a low spur on which the suburb of Shortland is built.

Hexham Swamp was a mixture of estuarine and freshwater wetland, fed tidally from the Hunter River prior to the construction of floodgates at the confluence of Ironbark Creek in 1970. Freshwater was supplied into the wetlands largely by Ironbark Creek and its tributaries. The Ironbark Creek catchment covers the majority of Hexham Swamp with headwaters several kilometres to the south and west. The main arm of the creek enters Hexham Swamp west of Shortland and winds northeast (broadly parallel to and one kilometre from the proposed route) to the Hunter River. Between Shortland and Sandgate is a channelised tributary of the creek which currently runs north, meeting Shortland Creek immediately north of Shortland. Fresh water may have been available from this creek.

2.3 Geology and Soils

The underlying geology of the study region consists of the Permian Tomago Coal Measures and Mulbring Sandstone. The Tomago Coal Measures comprise shale, mudstone, sandstone, coal, tuff and clay) with Mulbring Sandstone being characterised by siltstone, claystone, thin sandstone and limestone (Matthei 1995:30). Soils around the swamp margins are residual soils of the Beresfield Soil Landscape (Matthei 1995).

Typical of many soil landscapes within the Hunter Valley, the Beresfield Soil
Landscape is a texture-contrast soil consisting of an A horizon / topsoil primarily derived from colluvial slopewash processes and considered to be Holocene in age, and a subsoil / B horizon on Pleistocene age (Hughes 1984). The dominant soil materials of the Beresfield Soil Landscape include;

be1 (topsoil / A horizon) – friable brownish black loam occurring at 0-10 centimetres in depth;

be2 – hardsetting dull yellowish brown sandy loam, typically ranging from a sandy loam through clay loam to fine sandy clay loam and occurs at 10-15 cm depth;

be3 (B2 horizon) – pedal brown plastic mottled clay, occurring at a depth between 15 and 120 cm (Matthei 1995).

The occurrence and relationship of these soil materials varies across different landforms within the Beresfield region;

- on moderately well drained crests, generally 5-15 cm be1 overlies 5-20 cm be2;
- on side-slopes, 5-10 cm be1 overlies 10-30 cm be2;
- on better-drained upper slopes, up to 10 cm be1 overlies 10-35 cm be2, and;
- on some lower slopes and more poorly drained flat low crests up to 10cm be1 overlies 10-30 cm be2 (Matthei 1995).

Hexham Swamp comprises quaternary sediments derived largely from the Hunter River catchment over several hundred thousand years. However deposition of these sediments increased rapidly with the formation of the swamp itself in the last 3-4,000 years following the formation of the Holocene sand barrier at the mouth of the Hunter River to the east.

Gravels consisting of sandstone, mudstones and minor quartz and silcrete are also present within Quaternary alluvial deposits along creeklines and in the Hexham Swamp (Engel 1966). It has also been suggested that an outcrop of tuff/silcrete exists within the Shortland Wetlands Centre immediately west of the subject land (Dean-Jones 1990:18) which may have offered a raw material for production of stone artefacts, though there is no definitive evidence that it was.

### 2.4 Vegetation

The current vegetation patterns of Hexham Swamp and surrounding areas have been drastically altered by land clearing and the construction of the Ironbark Creek floodgates, which have changed the swamp largely into a freshwater wetland. The area is currently cleared of most if not all original timber. Originally the lands to the south of the swamp are likely to have comprised a mixed eucalypt woodland with swamp species such as paperbark (Melaleuca sp.) and she-oak (Casuarina glauca) adjacent to the wetlands. The wetlands would have comprised a mixture of rushes, grasses, saltmarsh, mangrove and reeds. A variety of food and resource plants would have been available to Aboriginal people in and around Hexham Swamp (Umwelt 2002).
2.5 Land Use History and Existing Condition of the Subject Land

The subject land and surrounds has been highly affected by European land use over the past 150 years (see for example Brayshaw 1984, Hunter-Central Rivers CMA 2004). This can be summarised as follows:

- The construction of the Main Northern Railway in 1857 created localised disturbance (fill) and changed drainage patterns within the swamplands and feeder creeks.
- Land clearance and stock grazing in the 19\textsuperscript{th} and 20\textsuperscript{th} centuries have increased erosion (slopewash) of sediment from surrounding hills into the swamp.
- Laying of water pipelines in the 1930s and 1940s will have provided localised disturbance and further changes to hydrology.
- Over the last 50 years wetlands have been artificially created at Shortland (JMcD CHM 1997:6) and creeks such as that through the subject land have been channelised and additional channels excavated to drain the margins of the swamp for pastoral use.
- A floodgate was constructed at the confluence of Ironbark Creek with the Hunter River in 1970 to protect freshwater pastureland in the swamp from increasing salination from the prior dredging of the Hunter River and creation of Kooragang Island. This has resulted in the expansion of freshwater wetland areas at the expense of the original mixture of estuarine adapted flora and fauna.
- Construction of Sandgate Road and the Pacific Highway involved major earthworks and the latter has created an artificial barrier between the swamplands and Hunter River mangroves.
- Residential development at Shortland, Sandgate and other areas to the south will have resulted in disturbance and increased erosion in these areas, and consequent deposition of sediment into the wetlands.

As a result of these factors, the subject land is now a landscape highly altered from that which would have been used by Aboriginal people. Most, if not all original trees have been cleared and those currently present are likely to have been recent regrowth or replantings. Residential development and road, rail and service infrastructure and have clearly altered the local landscape, including deposition of fill changing the original topography. There do not appear to be any areas (including the swamp) which retain anything close to a pre-European form, and even the Shortland Wetland Centre appears to be have been artificially constructed.

2.6 Implications for Aboriginal Use and Site Survival

The environment within and immediately adjacent to the subject land would have provided Aboriginal people with access to freshwater and a variety of plant and animal resources, some of these are known from historical documentation to have been used (see Brayshaw 1984).

Equally relevant however is the fact that the majority of the subject land is, and was for probably several thousand years, swampland which, whilst utilised for its resources was not lived in/on by Aboriginal people. The only likely surface on which Aboriginal
people may have lived would be higher (dry) ground at the margins of the swamp. Such areas appear restricted to the southern end of the subject land and in any case may have been moderately to severely impacted by European land use.

Therefore, whilst the area is likely to have been used by Aboriginal people in the past, evidence of that use within the subject land, is likely to be scant, restricted in extent and have been damaged or destroyed.
3.0 Archaeological Background

3.1 Regional Prehistory – Archaeological Investigations in the Lower Hunter Valley

The first attempt to systematically record Aboriginal cultural heritage sites in the Hunter Valley Region was conducted by R.H. Mathews, who recorded a number of cave paintings and rock engravings in the Bulga-Milbrodale-Wollombi area in 1893. The first analytical archaeological study of Aboriginal cultural material – stone artefacts in particular – in the Hunter Valley occurred fifty years later by McCarthy and Davidson (1943) who performed detailed analysis of open artefact scatters within the Singleton region. Throughout the late 1960s and 1970s, David Moore (Australian Museum), carried out a long term research project in the Hunter Valley (Moore 1970, 1981) and expanded on the lithic analyses of McCarthy and Davidson (1943). Moore surveyed areas from Belltrees to Muswellbrook, and excavated a number of open sites near Singleton and rock shelter sites in the sandstone terrain to the west of the Hunter River. The sequences Moore obtained from the rock shelter sites enabled him to establish that occupation of the upper and middle Hunter was predominantly recent, most likely commencing approximately 3,000 years BP.

Throughout the 1970s, the pace of archaeological investigation in the Hunter Valley increased steadily as a result of Environmental Impact Studies of proposed mineral, industrial and housing developments. In contrast to previous investigations, which had concentrated on the sandstone terrain in the south-west of the region and along the coastal zone, the archaeological assessments of the 1970s were concentrated in the Central Lowlands in the heart of the industrial and residential development. By 1980, over forty consulting projects had been completed and there were over one thousand Aboriginal archaeological sites listed in the National Parks & Wildlife Service (NPWS – now Department of Environment and Conservation) sites register. A wide range of site types had been identified, including rock shelters with painted art and occupation deposits, axe grinding grooves on sandstone and vast numbers of open campsites or artefact scatters – a site type which had previously received little scientific attention. These studies had demonstrated that there were many more archaeological sites on the Hunter Valley floor and in the Goulburn River catchment than had previously been envisaged.

By the mid 1980s, 115 consulting projects had been completed and 1,650 sites had been listed on the NPWS Aboriginal sites register. Recognising the need for a regional study of the prehistory of the Hunter Valley Region, the NPWS commissioned an archaeological overview to be carried out under its overall direction. A five volume report was produced in 1984 which included a collation and examination of existing archaeological, ethnographic and environmental data (e.g. Brayshaw 1984, Hiscock 1986, Hughes 1984, Koettig 1984).

This database illustrated that eleven Aboriginal archaeological site types had been recorded in the broader Hunter Valley region, including grinding grooves, quarries or raw material resource areas, art sites (including paintings, largely in the Goulburn Valley and engravings in Hawkesbury sandstone formations), scarred trees, carved trees, stone arrangements, ceremonial grounds (such as the ceremonial rings or “Bora rings” located at Gloucester and Red Hill), burials (usually located in rockshelters,
middens) mythological sites, mission sites and occupation sites including rock shelters, open artefact scatters and shell middens. The database also demonstrated that stone artefacts vastly predominate the archaeological record and most identified assemblages in the Hunter Valley belong to the “Small Tool Tradition” which includes a wide range of specialised artefacts such as points, adze flakes, and backed blades (geometric microliths, Bondi points and eloueras). They are often also associated with tools with ground working edges, such as chisels and hafted hatchets.

The major raw materials utilised in the Central Lowlands, Central Goulburn Valley and adjacent areas were indurated mudstone and silcrete. Of the minor raw materials, the most distinctive were quartz, fossilised wood and chert, and porcellanite. Of these, indurated mudstone, silcrete, quartz and a range of volcanic rocks are locally available and can be described as follows:

**Indurated mudstone / rhyolitic tuff**: yellow, red and grey rock, very fine grained and homogeneous texture and can be flaked with precision. This material occurs extensively in the Permian Singleton Coal Measures and could be obtained from river cobbles or occasionally from outcrops.

**Silcrete**: yellow, red and grey, often banded, rock, consisting of rounded to sub-angular quartz grains set in a amorphous to cryptocrystalline matrix. The silcrete ultimately derives from silicified Tertiary fluvial sands and gravels, occurrences of which have been reported from along the Hunter River between Muswellbrook and Denman and near Jerrys Plains and Singleton. It occurs widely in the present day Hunter River gravels.

**Quartz**: vein quartz crops out widely and quartz pebbles are very common in river and creek gravels. Compared with indurated mudstone and silcrete, the presence of numerous incipient fracture planes in the quartz limits the control with which it can be flaked.

**Fossilised Wood**: Banded brown and grey rock resulting from the replacement of the original wood by silica. The ultimate source of fossilised wood is the Permian coal measures, and it is also found in river gravels.

**Chert**: Very small numbers of artefacts on a wide range of cherts occur in sites in these subregions. Most artefacts have water worn pebble cortex, but the ultimate source of the raw material is not known.

**Porcellanite**: Very small numbers of artefacts occur on this highly distinctive, smooth, dense grey rock. It is extremely isotropic and homogeneous, and made up of two very high temperature minerals; mullite, an aluminium silicate which occurs on pyrometamorphic rocks and cristobalite, a form of silica. Its likely ultimate source is from rock of the Eastern Australian Tertiary Volcanic Province which occur in the Merriwa Plateau, the Liverpool and Mount Royal Ranges and Barrington Tops.

More specific technological analyses of lithic assemblages were also conducted by Hiscock (1984) who examined collections of stone artefacts from sites along Redbank Creek in the Central Lowlands. Hiscock found that virtually all the stone working at these sites related to the production of one type of backed blade, the *Bondi* point, and that one complex pattern of manufacture was repeatedly carried out in the same fashion. He determined that complex procedures were involved in the procurement,
transportation, reduction and use of stone, and that there were variations in the Aboriginal utilisation of different raw material types. In particular, it was found that silcrete was heat-treated while all other raw materials were not.

The processes of heat-treatment or thermal alteration has been widely documented in the Hunter Valley (Baker 1992, 1996, Haglund 1992, Hiscock 1986, Koettig 1992, Kuskie 1994, Kuskie & Kamminga 2000, Rowney 1992, and Silcox & Ruig 1995), whereby controlled heating to specific temperatures and slow cooling was utilised to alter flaking qualities. If successfully completed, heat treatment dehydrates the rocks and creates microscopic flaws that facilitate fracturing. The individual mineral grains of microcrystalline quartz are held together more firmly and become more equigranular in heated specimens, which results in a more homogenous material with the ability to fracture like glass rather than like a rock aggregate. In the Hunter Valley, heat treatment is often accompanied by a change in colour of the stone to red or pink, as iron oxides are altered to haematite, and also results in a distinctive vitreous lustre (Domanski & Webb 1992, Flenniken & White 1983).

Excavations of stratified deposits within the Central Lowlands have indicated that Aboriginal occupation commenced at least 20,000 years BP. Koettig (1987) obtained a date of >20,200 BP from a hearth at Glennies Creek, 35 kilometres north of Braxton, while Kuskie (2002) also obtained a Pleistocene date of 18,000-30,000 years BP for a site on a former terrace of Wollombi Brook near Singleton. In surrounding regions, Aboriginal occupation has been dated to at least 19,000 years BP on the Liverpool Plains (Gorecki et al 1984), 11,000 years BP in the Upper Mangrove Creek catchment of the Hawkesbury River (Attenbrow 1987) and 17,000 years BP at Moffats Swamp near Raymond Terrace (Baker 1994).

The vast majority of dated archaeological sites in the Hunter Valley, however, are less than 4,000 years old with artefacts identified only within the A horizon soil unit, with dates corresponding to the late Holocene (Hughes 1984, Dean-Jones and Mitchell 1993). Three temporally discernible technological phases have generally been recognised for this period, including:

- Pre Bondaian, without backed blades (pre 1,300-1,500 years BP)
- Phase I Bondaian with numerous backed blades (transition dated at c. 1,300 years BP)
- Phase II Bondaian with few backed blades (transition dated at c. 800 years BP).

### 3.2 Local Archaeological Context

#### 3.2.1 Previous Archaeological Investigations in the Local Landscape

A number of archaeological investigations have been conducted over the last 20 years within the vicinity of the subject land of the current study. These have largely been concerned with infrastructure installation and upgrade and residential subdivision. The most pertinent of these are reviewed below.

**Sandgate Sewerage Scheme Survey (Dallas 1994)**

Dallas surveyed an area adjacent to the Pacific Highway between Sandgate and the St Josephs Nursing Home ahead of the proposed installation of sewerage infrastructure to service this northern area. This included the northernmost portion of the subject land...
of the current study. Dallas noted the complete lack of original land surfaces along this route due to the deposition of fill to raise the level of the Pacific Highway above adjacent swampland and mangroves. No Aboriginal archaeological sites were considered able to reside in this landscape and no evidence of prior Aboriginal use was recorded.


Several archaeological surveys have been undertaken for projects largely related to the upgrade of the Shortland Wastewater Treatment Works and the installation of additional rising mains and disposal pipelines connected to those works. Mills & Wilkinson (1994) surveyed the area of the treatment works (southwest of the subject land) ahead of a proposed upgrade. They found that although the area represented high ground overlooking Hexham Swamp, it had been impacted by previous land use and construction. They located several stone artefacts within this area (recorded as two open campsites) but did not regard any areas as retaining archaeological sensitivity.

They also examined an area leading east from the treatment works to the Hunter River to the south of the subject land of the current study, in which it was proposed to install a disposal pipe from the upgraded treatment works. The majority of this route was found to be totally disturbed and was not surveyed. One isolated stone artefact was recorded in a highly disturbed context between Maitland Road and the Main Northern Railway south of Shortland Road.

Jo McDonald CHM (1997) and Central West AHS (1998) both examined areas west of the treatment works to Maryland in which upgrades to existing sewerage pipelines and new sections of pipeline were to be installed. Both surveys included areas of swamp as well as high ground and noted the lack of archaeological potential within the former. Neither survey resulted in the location of evidence of past Aboriginal use or areas with the potential for such evidence, largely due to the lack of dry (high) ground within their study areas.

**Bluegum Vista Test Excavations (Umwelt 2002)**

Umwelt 2002 summarises the results of several test excavations and the original assessments of an area immediately west of Maryland (some 5km west of the subject land) proposed for residential redevelopment. These excavations represent the largest investigation of the southern margins of Hexham Swamp and are of direct relevance to the current study.

The study area was about 120 hectares in size and located on a low sloping ridge overlooking Hexham Swamp. Although the initial survey did not result in the identification of any surface evidence or areas of potential, test excavations were undertaken across a range of topographic ‘units’ defined across the study area, totalling over 300m² excavated at 20 locations.

The excavations retrieved a total of 3001 stone artefacts mostly located in areas with extensive outlook over the adjacent swamp. The artefacts were thought on the basis of typology to date to within the last 4,000 years, consistent with the development of the swamp.
Medium to high levels of historical disturbance were noted across the study area, accounting for the generally low densities of artefacts retrieved. The significance of the recovered remains derived largely from the lack of swamp margin sites which had been preserved in the region rather than the intactness of the deposit.


Throughout the 1990s and early 2000s, a series of archaeological investigations have been undertaken in association with the construction of a new section of the F3 Freeway between Minmi and John Renshaw Drive, Beresfield, west of Hexham Swamp.

The initial study commenced in 1992 with an archaeological examination of various route options for the proposed F3 connection between Minmi and Beresfield by Resource Planning (1992). The proposed routes included the “preferred option” interim connection of the F3 freeway which involved the continuation of the dual carriageway freeway from its then location approximately 1.5 km north of Minmi, north to John Renshaw Drive, west of Beresfield, running in an alignment directly to the west of Lenaghans Drive (Minmi Road). This option also involved the widening of John Renshaw Drive north-east towards Beresfield and Weakleys Drive north towards the New England Highway.

Three “alternative route options” – A01, A01 and A03, all situated north of John Renshaw Drive, were also investigated. A01 extended from John Renshaw drive in a north-easterly direction, crossing Weakleys Flat Creek and Scotch Dairy Creek, to meet with the New England Highway; A02 ran parallel with Weakleys Flat Creek between Weakleys Drive and the New England Highway; and A03 was proposed as a continuation of the New England Highway, being diverted to the west of the intersection of the highway John Renshaw Drive.

All surface exposures within all proposed route option areas were surveyed. One isolated artefact (cream fine-grained siliceous stone artefact – site MB1) and one small artefact scatter (two pieces of flaked chert – site MB2) were identified and predicted archaeologically sensitive zones were mapped— including the western fringes of Hexham Swamp in Black Hill and Woods Gully; an area on the northern fringes of Hexham Swamp, south of the New England Highway, Beresfield, adjacent to the location of MB1 and MB2; and three locations to the west of the current study area along Weakleys Creek and Scotch Dairy Creek (Resource Planning 1992). Resource Planning concluded that the identified sites had limited archaeological significance, however, due to the prediction that some areas of the landscape possess high archaeological potential, Resource Planning recommended that monitoring of initial clearing during road works be conducted.

The Roads and Traffic Authority endorsed these recommendations and Effenberger (1995) was engaged to monitor initial construction works, particularly in the archaeologically sensitive areas as determined by Resource Planning (1992). Several Aboriginal artefacts were identified, and following requests from Mindaribba Local Aboriginal Land Council and the then NPWS, subsurface testing over a five week period was undertaken at several locations in Woods Gully and Black Hill by Effenberger and Baker (1996).
Baker (1996) directed the test excavations at Black Hill (RTA Zones C3 and F4) and Woods Gully (RTA Zone F5). Artefacts occurred in both areas at low densities with marked “hot spots” where higher densities were identified.

At zones C3 and F5, artefact density averaged 20 and 23 artefacts / m² respectively, while at F5 artefact density average 5/m². At F4, high numbers of artefacts were found only on the large spur crest, with an easterly aspect overlooking the watercourse and Hexham Wetlands. At C3 there were indications of higher densities on the north facing mid-slope and lower densities on the crest. Baker concluded that the results contradict the model that archaeological sites are found only in association (typically within 30 metres) with watercourses. Baker concluded that high densities can occur by creeks where slopes are less than five degrees, but also on elevated landform units of steeper terrain. Low density “background scatter” (0-10 artefacts m²) was identified by Baker across most of the area.

The hand excavation at Woods Gully revealed the then highest documented artefact density in the Hunter Valley with 1,854 artefacts in one square metre (Baker 1996).

Silcrete was the dominant raw material and “indurated mudstone” (silicified tuff) was also common. Backed blades (Bondi points) of “indurated mudstone”, fine grained sedimentary and raw and heated silcrete occur. Microblade debitage (prepared platforms present, parallel sided thin flakes and blades or small cores with blade scars and evidence of platform preparation by asymmetrical alternating flaking patterns) occurred across all areas but at varying densities.

Baker (1996) argues that evidence for specialised strategies associated with the manufacture of backed blades and heat treatment of silcrete is present.

At Woods Gully, large-scale and intensive silcrete processing and backed blade production occurred, which differentiates this site from the others (Baker 1996). Sixty-six backed blades and manufacturing debitage was recovered from the broad area excavation of 4.25 m².

Baker (1996) concludes that at Woods Gully, camping occurred immediately adjacent to the creek, due to the lower relief and different faunal resources than at zones C3 and F4. Revisitation of the site is identified as the factor causing archaeological evidence to accumulate. Baker suggests that the evidence of intensive tool production indicates “maintenance” behaviour rather than “extractive” behaviour, thus Woods Gully represents a location where Aboriginal populations invested time and energy in preparation as well as general foraging.

A series of recommendations were provided for the Black Hill and Woods Gully sites, involving a combination of conservation and destruction. However, the Mindaribba Local Aboriginal Land Council strenuously disputed the significance assessment and recommendations of Effenberger and Baker (1996), which led the Roads and Traffic Authority to engage South East Archaeology to undertake an extensive salvage excavation of the areas within the development footprint (Kuskie & Kamminga 2000).

The fourteen week salvage program comprised a initial phase of testing whereby a total of 612 small test units were excavated (total area of 38.25m²), a second phased of broad area excavations whereby large areas (61 m² on a ridge crest at Black Hill and 87 m² adjacent to the watercourse at Woods Gully) were manually excavated, and a
third phase of mechanical surface scrapes including five transects within the proposed F3 Freeway corridor at Black Hill and Woods Gully.

In total, an area of 196.25 m² was excavated by hand and a combined area of 34,422 m² was mechanically excavated. A total of 37,585 lithic pieces were identified, including 22,921 diagnostic artefacts and 14,664 lithic fragments, potentially representing debitage / debris from stone knapping.

The mean density of artefacts per volume within the hand excavations equated to 546.2 artefacts / m³ at Black Hill and 209.5 artefacts / m³ at Woods Gully. The density of artefacts varied widely within individual excavation units, ranging from nil to 23,555 artefacts / m³.

A total of forty four categories of stone artefacts were identified in the Black Hill and Woods Gully assemblages, which indicated six basic categories of activities for the sites including non-specific stone flaking, bipolar flaking, microblade production, backing retouch of microblades, loss or intentional discard of microliths and loss or intentional discard of non-microlith tools.

The majority of the artefact assemblages comprised small items, with 89% measuring less than 20mm in maximum dimension and 64.6% less than 10mm in size. This high proportion of very small artefacts was attributed by Kuskie and Kamminga (2000) to the abundance of microblade activity and debitage and the use of “total sieve retrieval” methodology.

Several types of raw material were identified including quartz, chalcedony, chert and dacite, however, the dominant materials were indurated rhyolitic tuff / indurated mudstone (70.45%) and silcrete (20.4%). It was thus inferred that in the lower Hunter Valley region, the vast majority of stone used for knapping was probably derived from local sources.

Significant evidence of heat treatment or thermal alteration of silcrete led Kuskie and Kamminga (2000) to argue that considerable time and effort was expended on heat treating silcrete to improve knapping properties and perhaps produce symbolically significant (and aesthetically pleasing) colours.

Through an overall analysis of the physical evidence obtained from the salvage excavations (raw materials, typology, spatial analysis etc), in conjunction with ethnographic, ethnohistorical and anthropological information, models of Aboriginal occupation and land-use previously presented were reassessed by Kuskie and Kamminga (2000) and a revised model, primarily relating to the last 2,000 years after Hexham Wetlands had transformed to its present state, was presented. In summary, Kuskie and Kamminga’s (2000) model involves the following elements:

- Occupation by members of the Pambalong clan and possibly other clans of the Awabakal people;
- Occupation focused on the resource rich wetlands, swamps, lakes, estuaries and coastline, possibly more so near the junction of multiple resource zones;
- Occupation predominantly within the last 4,000 years, after climatic change and rising sea-levels transformed the environment of the region. Occupation may have
extended as far back as 30,000-40,000 years, however, few landscape contexts exist in which archaeological evidence of older occupation would be conserved;

- Occupation extending over the entire region, but at varying intensities and at different times of the year;

- Occupation reflecting a wide range of purposes, including transitory movement, hunting, gathering, procurement of stone, production and maintenance of wooden and stone tools, heat treatment of stone, food procurement and processing, camping by small parties, nuclear family base camps, ceremonial or spiritual activity and burial practices;

- Activities varied in frequency and occurrence within the landscape, possibly in relation to numerous variables such as topography, distance to resource zones and water, aspect, slope and cultural choice;

- Indurated rhyolitic tuff / indurated mudstone and silcrete were favoured for stone-working activities. Supplies of both materials were locally available and were probably obtained during the course of normal daily and seasonal movements, without the need for special purpose trips. Conservation of these stone types was not a priority;

- Minimal use was made of other stone materials – such as quartz, acidic volcanics, chalcedony and chert. These materials were probably obtained from local sources such as alluvial and terrace gravels, terrestrial outcrops and weathered conglomerate rock. However, other lithic materials such as dacite and rhyodacite, used for grindstones, may have been obtained from sources on the coast north of Newcastle by either trade or special exchange, or special purpose trips;

- Ochre was used for ceremonial purposes and may have been procured from sources near Lake Macquarie, the Hunter River or outside the region;

- Heat treatment of silcrete was undertaken to improve flaking qualities and possible to obtain desired colours. Heat treatment involved both cobbles and large primary flakes of silcrete;

- Microblade production occurred widely, with the presumed primary goal of producing microliths such as bondi points, that could be hafted onto hunting or fighting spears. As the production of microliths would have been time consuming and resulted in a considerable quantity of stone debitage, it is speculated that the end purpose must have been highly desirable and socially valuable;

- Casual and opportunistic knapping was also a widespread occurrence;

- A low frequency of items were knapped using the bipolar method;

- Small hammerstones and retouchers were curated and rarely discarded on-site, and special tools such as worimi cleavers and grindstones may have been deliberately cached at base camps;

- A range of plant resources were available in the locality and the processing and consumption of plant foods is likely to have occurred at camping places around the margins of Hexham Swamps and other swamps in the region;
Animal foods would have included both large and small game and were likely processed and consumed at temporary camps, nuclear base camps and at the site of procurement;

- Marine resources such as fish, eels and wetland birds, would also have been exploited.

### 3.2.2 DEC AHIMS – Aboriginal Archaeological Site Register Search

Searches of the Department of Environment and Conservation (DEC) Aboriginal Heritage Information Management System (AHIMS) Aboriginal Sites Register were undertaken for the current assessment. A search by the RTA\(^1\) of a 10km x 5km area returned records for 6 previously registered Aboriginal sites. A more recent search of a (smaller) 3km x 2km area surrounding the subject site was undertaken by DSCA\(^2\) and returned no registered sites. There are therefore no previously recorded sites within the subject land.

The registered sites consisted of 5 open campsites and one axe grinding groove site. In addition, several isolated stone artefact finds have been recorded but not registered at the Shortland Wastewater Treatment Works about a kilometre to the southwest of the subject land and also in a transmission easement between the Main Northern Railway and Maitland Road, south of Sandgate Road (see Mills & Wilkinson 1994).

The low number of recorded sites reflects the swampy terrain and high level of historic disturbance in the area, and is not considered to be indicative of the intensity of use of the area by Aboriginal people. In addition, the tools used by Aboriginal people to exploit the resources of the swamp are likely to have mainly been constructed from organic materials which are unlikely to have survived (see Brayshaw 1984).

### 3.3 An Archaeological Predictive Model

Predictive models of Aboriginal site type and site location attempt to identify areas of relative archaeological sensitivity (high, moderate and low etc.) as a tool that can be used for the planning and management of Aboriginal sites within redevelopment circumstances. Such models are generally based upon information sources such as the types of landscape units that may be contained within a study area, the results of previous archaeological surveys conducted within the region, the distribution of recorded sites and known site densities, traditional Aboriginal land use patterns and the known importance of any parts of a given study area to the local Aboriginal community.

Predictive models of site location within the lower Hunter Valley have varied as knowledge of the archaeology of the region has expanded. Modelling of archaeological context within this region currently suggests that stone artefact sites (open artefact scatter and isolated finds) are the most likely site type. Artefact scatters are generally predicted to occur close to watercourses, but also on elevated locations such as ridge crests and spur crests. In fact, some recent studies argue that artefacts

---

\(^1\) 11 May 2005, AGD Zone 56, Eastings 373500-383500, Northings 6357200-6362200.

\(^2\) 8 September 2005, AGD Zone 56, Eastings 377000-379000, Northings 6361000-6364000.
tend to be distributed in a virtual continuum across the landscape at relatively low mean densities ("background" scatters), with specific areas of high artefact density representing the location of focused, repeated activities and areas of knapping events. Essentially, it has been proposed that the landscape of the Lower Hunter Region should be viewed as an archaeological continuum in which sites represent points where higher frequencies of activities have occurred. Studies around the margins of wetlands, however, have also begun to reveal evidence of a trend for focused occupation on landform units such as wetland bordering simple slopes and basal slopes, rather than ridge crests as previously argued. Such patterns indicate that wetland environments represented resource rich zones and were a major focus of activity within the region.

Based upon information compiled within the DEC AHIMS and the background data for the local archaeological context reviewed above, it is predicted that the broader study region retains moderate-high Aboriginal archaeological potential and sensitivity and the types of sites which may be expected to occur within the boundaries of the subject site are outlined below. However, it should be noted that broad predictive models invariably have limitations. It is possible to identify areas of high archaeological sensitivity (such as wetland bordering slopes), however, it is not possible to identify areas of low archaeological sensitivity with the same certainty. This is compounded in areas of little ground surface visibility where the detection of open artefact scatters – the predominant site type in the Lower Hunter Valley Region – is problematic. However, as discussed above, archaeological studies within the Lower Hunter have recently proposed that the region should be viewed as an archaeological continuum with artefact scatters likely to be present on all landform units at varying densities. As a consequence, the only areas currently identifiable as possessing low archaeological sensitivity would be those locations which have already been significantly disturbed through construction and development.

**Open Campsites / Artefact Scatters & Isolated Finds**

Open campsites consist of scatters of stone artefacts located either on the surface and/or in subsurface contexts. They may constitute the remains of hunting and gathering activities, domestic camps, or the manufacture and maintenance of stone tools. The density of artefacts may vary considerably between and across individual sites. These sites are classed as “open” that is, occurring on the land surface unprotected by rock overhangs.

Isolated finds are artefacts which occur without any associated evidence for prehistoric activity or occupation. They are generally defined as single artefacts located more than about 50m from any other artefact. Isolated finds can generally occur anywhere in the landscape and may represent the random loss or deliberate discard of artefacts, or the remains of dispersed artefact scatters.

**Scarred or Carved Trees**

Scarred trees result when bark or wood has been removed to make shields, shelter, canoes, containers, and footholds for food retrieval. These sites may be expected to occur in almost any landscape where old growth vegetation remains. Carved trees
display often complex geometric designs carved into the exposed wood and are usually associated with ceremonial grounds or burials.

Culturally modified trees can be expected to occur upon all landform units within the study area where suitable old-growth native timber remains, however, the greatest density of scarred tree sites tend to occur within close proximity to known occupation areas generally associated with significant water sources.

It is considered unlikely that trees of sufficient age to bear scars of Aboriginal cultural origin are likely to have survived within the subject land.

**Axe Grinding Grooves**

These are grooves which result from the manufacture and/or maintenance of the working edge of some stone tools such as hatchets. They may be found where suitable sandstone is exposed in, or adjacent to, creeks or on elevated platforms where wet-grinding techniques are possible adjacent to natural rock holes and shallow ‘basins’.

As for rock engravings, axe/hatchet grinding grooves may occur in large ‘clusters’ that serves to facilitate their ready recognition, or may conversely comprise isolated items that are difficult to detect within certain light conditions.

These are unlikely to occur within the subject land as previous archaeological survey (Bowdler & Gollan 1982) has shown Ironbark Creek to be devoid of suitable sandstone.

**Ceremonial / Mythological Sites**

Ceremonial and mythological sites may occur in any location, however, natural landscape features commonly form the focus of such sites. It is predicted that traces of these types of sites would be unlikely to survive in areas subjected to disturbance through European settlement and development. The likelihood of such sites occurring within the study area is thus considered to be low.

**Burial sites**

Burial sites are rare and are usually only located when subsurface sediments have been exposed by erosion or disturbance. Burial practices vary through time and place. Skeletal material may be found as single individuals or in complex group burial grounds. They may be found in hollow tree stumps, but in the local region were commonly buried in soft dry sediments such as sand bodies or sandy loam. They have been generally found by accidental exposure, rather than through archaeological excavation. Aboriginal burial sites have been recorded in the Lower Hunter Region, although no sites have been recorded within the local vicinity. They are generally found as primary interments in soft sediments in middens, sand dunes and rock shelters. Due to the soil landscapes of the current study area, and the absence of rockshelters, the possibility of the occurrence of burial sites is considered low.

**3.3.1 Site Prediction for the Subject Land**

Based on the environmental, land use history and background archaeological data reviewed in the preceding sections, it is considered that the most likely evidence of Aboriginal occupation which may be present within the subject land would be surface finds of one or more stone artefacts which are unlikely to associated with extensive or intact sub-surface deposits of stone artefacts. It is unlikely that trees bearing scars of
Aboriginal cultural origin will have survived within the subject land and if they have, these are likely to be the only other evidence of Aboriginal occupation that will be present.
4.0 Site Inspection

4.1 Methods

4.1.1 Site Survey and Recording

The investigations reported here have involved a standard archaeological field survey, recording and assessment of the subject land.

All items of Aboriginal cultural heritage that may be located during the course of the field survey were to be recorded and plotted onto the pertinent 1:25,000 topographical map. Maps of differing scale have also been used to facilitate the location of pertinent field observations. Photographic records, sketch plans and diary descriptions have also been compiled as part of the field records.

Generally, reporting has been concerned with topography (whether sites, features or areas of potential archaeological sensitivity are located on slopes or flats etc), context, vegetation, ground exposures, the nature of ground visibility and the presence and extent of disturbance.

The distinction between site categories (open campsites vs isolated finds etc) and the definition of areas of potential sensitivity is determined according to the following categories:

- Isolated Finds consist of single artefacts that are located more than 50m apart.
- Sites comprise open artefact scatters that consist of two or more artefacts situated within 50m of each other.

The following attributes of each stone artefacts that may be located during these investigations are to be recorded:

- Artefact Type: This category records the presence of items such as flakes, flaked pieces and cores etc.
- Raw Material: Raw materials may include silcrete and indurated mudstone etc.
- Dimensions: Maximum length, width and thickness of finds are to be recorded.
- Other: Comments include the presence of cortex and retouch etc.

4.1.2 Assessment of Archaeological Potential

Frequently used criteria inclusive of landform, aspect, topography and subsurface integrity have been employed in this study to define areas of Potential Archaeological Deposit (PAD). Recognition, ascription and recording of scarred trees as being potentially of definite, probable, or possible Aboriginal origin is based upon the assessment criteria summarised by Navin Officer (1997).
4.2 Field Survey

The site inspection was conducted in fine weather on Wednesday 28 September 2005 by Paul Irish (DSCA archaeologist). Mr Robbie Olsen (ALALC Aboriginal Sites Officer) undertook a survey of the same site on Friday 7 October 2005. All areas within the subject land were inspected on foot with the exception of totally overgrown portions with no surface visibility. For ease of discussion the field observations relate to portions of the proposed road corridor as portrayed in Figure 2.

4.2.1 End of Existing SH23 to Sandgate Road

This section of the road is intended to extend north from the current termination of SH23 where it currently contains exit/entrance ramps to and from Sandgate Road. The extended road will extend under an overpass to be constructed on Sandgate Road. The road in this section will be constructed within an existing corridor through the centre of the site which already contains a partially formed road surface at its southern end (Figure 3). This is entirely made ground formed during the construction of the existing road and exit/entrance ramps. Where visible, the surface shows gravel and other introduced materials.

Sandgate Road is built on a natural low spur forming part of the high ground on which the suburb of Shortland is built, however the level of the current road has been achieved through the addition of at least several metres of fill above the natural topography. Similarly the entrance/exit ramps from the highway have been constructed on fill.

4.2.2 Sandgate Road to proposed bridge

In this area construction includes the laying of road surfaces along a corridor between existing residential properties to the southeast and the Shortland Wetland Centre to the northwest. It also includes the construction of a northbound access ramp and southbound exit ramp from and to Sandgate Road respectively. This section ends with the construction of a bridge over a channelised watercourse through existing swampland.

The northbound entrance ramp is proposed in an area currently used as access to the Shortland Wetland Centre. The proposed route initially follows a sealed road constructed on filled ground (Figure 4) before traversing open ground east of a patch of regrowth bushland. A number of tracks across this ground show the area to be fill with additional disturbance from the laying of water pipelines and drainage (Figure 5). The southbound exit ramp is proposed for construction through currently vacant land between existing dwellings along Sandgate Road east of the proposed highway extension corridor (Figure 6). This area is currently grassed with no surface exposure.

The route of the proposed highway extension north from Sandgate Road is initially filled ground with several drainage channels from the existing Sandgate Road (Figure 5). The route then passes between existing residential properties to the east and the boundary fence of the Shortland Wetland Centre to the west. This section, approximately 200m in length, consists of cleared, grassed, uneven and partly boggy ground with an unsealed vehicular track running along its eastern side (Figure 7). This
area contains mounded and disturbed ground, with drainage ditches currently informally used for trailbike riding (Figure 8). Exposed ground along the gravel track and drainage cuttings demonstrate the depth of fill and introduced materials in this area. Mounded earth is also visible within the Shortland Wetland Centre (Figure 9).

The proposed route continues approximately 300m from this section to its intersection with a channelised watercourse draining north into Ironbark Creek. The area east of the existing gravel track is reedy swampland and the track itself is constructed on fill to raise it above the level of the water (Figure 10). In addition a pipeline has been laid under the surface of this track and crosses the channelised water course. About 50m south of the this watercourse, sand on the track contained several fragments of rock oyster (*Saccostrea glomerata*) and isolated fragments of an unidentified small (<1.5cm diameter) bivalve (Figure 11). This is unlikely to represent midden shell and in any case is within introduced materials not from the local area.

4.2.3 Proposed bridge to Main Northern Railway intersection

Proposed construction in this area includes the bridge over the channelised creek and adjacent swampland and another bridge over the existing rail line with about a hundred metres of road in between.

The ground between the channelised watercourse and the extension to Astra St (off Sandgate Road) is grassed and partly waterlogged with a stand of regrowth casuarinas along the watercourse (Figure 12). There are no exposed surfaces in this area however the ground appears to be partially drained swampland.

The proposed route then crosses an extension of Astra St which connects Sandgate Road to a golf driving range to the north of the proposed corridor which was constructed on a former council waste disposal site. Between Astra St and the Main Northern Railway is an approximately 100m long and roughly 5m high fill mound constructed using fill from the construction of the Jesmond to Shortland dual carriageway section of SH23 in the 1990s (Andrew Grainger pers. comm.). On top of the mound a dual carriageway road has been constructed (Figure 13). The age of trees on the fill mound are therefore less than 15 years old. Although ground was exposed on top and on the sides of this mound, it is a totally artificial surface and was not further examined.

The railway line was constructed on fill raising the line above adjacent swamplands and its corridor is totally disturbed.

4.2.4 Main Northern Railway intersection to northern boundary of Sandgate Cemetery

This section of the proposed route follows an existing corridor between Sandgate Cemetery to the southeast and industrial properties on the northwestern side.

The corridor consists entirely of reedy swampland (Figure 14). The only dry ground in this area consists of unsealed vehicular tracks on either side of the corridor and a track linking the two at the northwestern corner of the Sandgate Cemetery. The cemetery and industrial properties are at least partly on filled ground as exposed track sections show (Figure 15).
4.2.5 Northern boundary of Sandgate Cemetery to the Pacific Highway

The final section of the proposed route involves the linkage of the highway extension to the existing Pacific Highway immediately south of the St Josephs Nursing Home. Consequently, this section involves construction of dual carriageway road linking the existing Pacific Highway and a series of exit and entrance ramps, including one linking the SH23 extension to St Josephs.

This entire section consists totally of filled ground on which the Pacific Highway and adjacent residential dwellings have been constructed (Figure 16). This fill raises this area above the mangroves of the Hunter River estuary to the east and the swamplands to the west. The only exception is St Josephs Nursing Home which is constructed on a natural low hill. However proposed impacts in this area are restricted to existing roads and surfaces which have already been impacted by clearing, earthworks and construction.

4.3 Results of the Site Inspection

4.3.1 Survey Outcomes

No evidence for past Aboriginal visitation or use of the study area has been located during the current study. Specifically:

- No Aboriginal stone artefacts were located on the ground surface within the subject land, nor were any areas with potential to contain sub-surface deposits located.
- No evidence for trees with scars of an Aboriginal cultural origin were noted in the entire study area. No mature trees were observed within the subject land of sufficient age to bear scars of Aboriginal cultural origin.
- No other evidence of past Aboriginal use of the area was located during the survey.

4.3.2 Evaluation of the Survey Results

The survey undertaken is considered to be fully comprehensive despite generally low surface visibility. Virtually the entire proposed impact corridor is through disturbed or made ground with no potential for the presence of intact Aboriginal archaeological remains or swamplands which would not have been lived in/on by Aboriginal people and which in any case have been disturbed through clearance and drainage works.

The southbound exit ramp at Sandgate Road represents the only potentially natural ground within the subject land. Despite a lack of surface exposure, this area will have been partially disturbed by tree clearance and adjacent construction works and is not considered to retain the potential for intact and extensive archaeological deposit.

The only evidence of Aboriginal occupation which may remain in this area are likely to be low density surface stone artefact finds representing the disturbed remnants of the past Aboriginal use of the area. These artefacts would retain no archaeological significance.
Figure 3. South along end of existing SH23 from raised edge of Sandgate Road.

Figure 4. Entrance road to the Shortland Wetland Centre.
Figure 5. Drainage on the northern side of Sandgate Road.

Figure 6. Area of the southbound exit ramp to Sandgate Road.
Figure 7. Path alongside boggy ground north of Sandgate Road.

Figure 8. Disturbed ground and bike jumps adjacent to Shortland Wetland Centre.
Figure 9. Mounded earth within the Shortland Wetland Centre.

Figure 10. Reedy swamp east of the subject land.
Figure 11. Sparse shell fragments in fill along the vehicular track.

Figure 12. Regrowth casuarinas along the channelised creek.
Figure 13. Previously laid road on top of the fill mound.

Figure 14. View northeast from fill mound over railway and swamplands.
Figure 15. Track on fill between swampland and Sandgate Cemetery.

Figure 16. Raised (filled) ground immediately west of the Pacific Highway.
5.0 Heritage Impact Assessment

5.1 Impact of the Proposal

The background Aboriginal archaeological research, site inspection, analysis and assessment of the subject land undertaken for the current study indicate that:

- No *documented* Aboriginal archaeological sites or ‘objects’ within the subject land will be affected by the Proposal.

- Any currently undetected Aboriginal archaeological sites or ‘objects’ which may occur within the subject land are likely to be restricted to low density surface stone artefact scatters or isolated stone artefacts in disturbed contexts with no associated sub-surface archaeological deposit. These have no *archaeological* value and would not require further *archaeological* investigation.

- No specific areas of *Potential Aboriginal Archaeological Sensitivity* relative to the Proposal have been identified in the course of preparing this heritage impact statement.

- No areas of Aboriginal cultural significance have been identified during the current study. Although the landscape was undoubtedly used by Aboriginal people in the past, and areas of cultural significance have previously been identified within the Hexham Swamp area, none are known to exist in the highly altered landscape comprising the subject land.

5.2 Evaluation

It is therefore concluded that the Proposal is unlikely to have an adverse impact upon the Aboriginal cultural heritage values of the place and should proceed as proposed subject to the implementation of the management recommendations that are presented in Section 6.0.
6.0 Recommendations

6.1 Basis for Recommendations

The following recommendations are based upon the legal requirements and automatic statutory protection provided to Aboriginal ‘objects’ and ‘places’ under the terms of the National Parks and Wildlife Act of 1974, where it is;

an offence to knowingly damage, deface or destroy Aboriginal sites or relics without the prior consent of the Director General of the National Parks and Wildlife Service,

in conjunction with;

the results of the archaeological investigations of the subject land which are documented in this report;

and;

the views expressed by the Awabakal Local Aboriginal Land Council as outlined within their appended correspondence.

6.2 Recommendations

It is recommended that:

I There are no Aboriginal archaeological constraints to the Proposal proceeding and it is recommended that no further archaeological input is required prior to the commencement of site works.

II Further consultation with the Awabakal Local Aboriginal Land Council should be undertaken by the Roads and Traffic Authority prior to construction with respect to the concerns raised in the appended correspondence of the Awabakal Local Aboriginal Land Council.

III A copy of this report should be forwarded to the Manager:

Cultural Heritage Division
NPWS
Locked Bag 914
COFFS HARBOUR NSW 2450

IV A copy of this report should be forwarded to:

The Chairperson
Awabakal LALC
127 Maitland Road
ISLINGTON NSW 2320
References


Dominic Steele Consulting Archaeology
33 England Avenue Marrickville NSW 2204 Phone & Fax (02) 9569 5801 Mobile 0411 88 4232
Email: dsca@bigpond.net.au


Hiscock, P. (1984). An analysis of the prehistoric stoneworking technology represented at sites 5, 12, and 13 at Redbank Creek, United Collieries’ Coal Lease, Hunter Valley, NSW. A report through Anutech to United Collieries Pty Ltd, Singleton, NSW.


Hunter-Central Rivers Catchment Management Authority 2004. *Hexham Swamp Rehabilitation Project.*


Koettig, M. (1987). *Monitoring excavations at three locations along the Singleton to Glennies Creek Pipeline Route, Hunter Valley, NSW (Report 3)*. Report to the Public Works Department, NSW.


NSW NPWS. (DRAFT 1997). *Aboriginal Cultural Heritage Standards & Guidelines Kit*.


Appendix 1

Awabakal Local Aboriginal Land Council
Cultural Heritage Statement
AWABAKAL
LOCAL ABORIGINAL LAND COUNCIL
127 MAITLAND ROAD
ISLINGTON NSW 2296
ABN: 19 759 066 759

Site Survey
Proposed Upgrade of SH23– Shortland to Sandgate

Attendance: Robbie Olsen- Site Officer

Survey Results:
The proposed area was surveyed on 7th October 2005.
The survey area was inspected on foot and visibility of the
Entrance ramp 6 area was restricted due to the heavy grass
cover. It is currently unclear whether archaeological deposits are
present in this area due to its current conditions
The investigation did not produce any culturally significance
artifacts through the area examined therefore the project will not
adversely impact upon the Aboriginal cultural heritage values of
the area.

Recommendations:
When works commence, the Awabakal Land Council is contacted
so that we can have a Site Officer on site to monitor for artifacts
that may be disturbed through the construction phase.
These artifacts, if found, shall then be salvaged from the
construction activities that are likely to impact upon the potential
archaeological resource of the site area. This will provide us with
evidence of previous studies that have identified recordings of
Aboriginal archaeological and cultural sites.
This will allow the development to proceed without further delays.
Any cost for a Site Officer being present at the site should be
borne by the developer.

We would like to take the opportunity to thank you for your
commitment to us in protecting and preserving the Awabakal
people’s culture and heritage.

Robbie Olsen
Sites Officer

AWABAKAL LOCAL ABORIGINAL LAND COUNCIL
Phone: 02 4965 4532    FAX: 02 4965 4531
PO Box 437 HAMILTON NSW 2303