

**Gales-Kingscliff Pty Ltd**

ABN: 75 093 540 080

# **Cudgen Lakes Sand Extraction Project**

## **Aboriginal Heritage Assessment**

Prepared by

**Heritage Surveys Archaeological Consultants**

**April, 2008**

**Specialist  
Consultant  
Studies  
Compendium**

**Part 10**



# Gales-Kingscliff Pty Ltd

ABN: 75 093 540 080

## Cudgen Lakes Sand Extraction Project

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## Aboriginal Heritage Assessment

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## **FOREWORD**

The information presented in this report is based upon field studies previously presented within the report titled 'An Archaeological Assessment of the Cudgen Lakes Sand Extraction Proposal at West Kingscliff N.S.W' (Piper 2005) and other assessments completed by A. Piper. The report presented forthwith has been prepared specifically for the Cudgen Lakes Sand Extraction Project which covers an area within the original Study Area of Piper 2005. Previous field work was carried out in consultation with the Tweed Byron Local Aboriginal Land Council and in accordance with all relevant guidelines issued by the, then, Department of Environment and Conservation (now Department of Environment and Climate Change). Reference has also been made to the *EIS Guidelines Extractive Industries – Dredging and Other Extraction in Riparian and Coastal Areas*. No further field studies or consultation has been deemed necessary for the preparation of this report.

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## EXECUTIVE SUMMARY

This report presents a reappraisal of the results and outcomes of an Aboriginal heritage assessment over lands associated with the Cudgen Lakes Sand Extraction Project ("the Project") at West Kingscliff, N.S.W. The Project is to be undertaken by Gales-Kingscliff Pty Ltd ("the Proponent"). The Project involves the removal of approximately 5 000 000m<sup>3</sup> of sand over a period of 15 to 20 years whilst progressively rehabilitating the site to provide a recreational lake and surrounding parklands. Sand removed as part of the Project would be used either as fill sand (for nominated fill sites) or processed for sale as construction material.

The objectives and operations of the Project have been refined since the 'broad scale' archaeological assessment over the same lands conducted by Piper (2005). This report has been prepared specifically for the Project, as currently proposed, which covers an area within the original Study Area of Piper (2005). Previous field work was carried out in consultation with the Tweed Byron Local Aboriginal Land Council (L.A.L.C) and in accordance with all relevant guidelines issued by the, then Department of Environment and Conservation.

The six land parcels assessed in this report are, for ease of description, referred to as Areas: A, B, C, D, E and F (see Section 2 and **Figure 3**). They consist mainly of elements of level low lying floodplain, low sand rises and swamp. All of the land parcels have been cleared of original vegetation in the past. The floodplain areas (Area A and B) are drained and levelled and prone to water logging. Cultivation allowed a high degree (approximately 80% to 100%) of surface visibility and a high proportion of the surface area (approximately 80%) possible to inspect. Fill site 7 (Area F) is slightly raised, with surface visibility possible to varying degrees, over approximately 75% of the total area.

A review of previous relevant studies and the AHIMS (NSW Department of Environment and Climate Change (DECC)) was undertaken (Section 3.1) as a preliminary assessment prior to field inspection. The review indicated a potential for Aboriginal sites existed within the Study Area (the Project Site and proposed fill sites). This was particularly demonstrated by the presence of a recorded site (# 4-2-109) 175m southwest of Area B. The review also found that a site listed in the AHIMS listings, indicated a midden/open campsite (# 4-1-21) in the eastern sector of Area F. A review (Section 3.3) of the site card information found the recording to be incorrect. The description of the site location, bears no relation to the current given grid reference. It is concluded in this report that site # 4-1-21 is correctly placed 1.125km northwest of Area F. It will be recommended to the DECC, AHIMS unit that the location be corrected to the western end of Wommin Bay Road at Chinderah. The following types of sites are those considered to have a low to moderate potential to occur within the Study Area - midden sites, open campsites, quarry sites and scarred tree sites.

Prior to the 2005 field inspection, the Tweed Byron L.A.L.C. (Section 4) were informed of the requirement for an Aboriginal Heritage Assessment. The Land Council appointed its Site Officer, Mr. Cyril Scott to represent the Land Council's interest and assist in the field inspection. The Land Council's views on the results and outcomes of the assessment are contained in **Appendix A**. The field inspections were carried out on the 18<sup>th</sup> of August and the 6<sup>th</sup> of September 2005.

The effectiveness of the field survey was affected by varying surface visibility conditions (Section 4.3 and 4.4). The results (Section 4.5) of the assessment were as follows.

## **Project Site**

No Aboriginal sites or relics were found as a result of the field inspection of the Project Site (Lot 22 DP 1082482 (Area A) and Lot 2 DP 216705 (Area B)).

## **Eastern Pipeline Corridor**

No Aboriginal sites or relics were found as a result of the field inspection of the section of the proposed eastern pipeline corridor within Part Lot 1 DP 828298 and Lot 3 DP 828298 (Area C and Area D). Previous assessments within Lots 26C and 26D DP 10715, Lots 11 and 12 DP 871753 and Lot 4 DP 727425 including the areas encompassing the proposed and alternative eastern pipeline corridor have also been undertaken without locating any Aboriginal sites or relics.

## **Northern Pipeline Corridor**

No Aboriginal sites or relics were found as a result of the field inspection of the proposed northern pipeline corridor between the Project Site and fill site 8 described as Lot 1 DP 1075645. The area which the northern pipeline corridor traverses is referred to as Area E.

The alternative northern pipeline corridor has not been the subject of field inspection by the consultant or Tweed Byron L.A.L.C. However, a search of the Register of National Estate indicates that the northern extent of the alternative northern pipeline corridor may cross the most southerly extent of the Cudgen Burial Ground.

## **Proposed Fill Site 7 - Area F**

No Aboriginal sites or relics were found as a result of the field inspection of the proposed fill site 7 (Area F). Furthermore, previous assessments within the remaining fill sites (see **Figure 3**) have also been undertaken without locating any Aboriginal sites or relics.

The Recommendations (Section 5) of the 2005 report are specific to each land parcel. As no Aboriginal sites or relics were found, neither a significance assessment nor specific recommendations as to site management can be made. Due to the generally good surface conditions for site detection it is possible to state that it is unlikely Aboriginal sites or cultural materials would be destroyed or destructively impacted. The following recommendations are made to cater for the prevailing conditions in 2005 and the current reappraisal of the six components of the Study Area (Areas A, B, C, D, E, F).

## **Recommendation - Area A and Area B (Lot 21 DP 1082482. Lot 2 DP 216705) – the Project Site**

Given the high degree of surface visibility (mean. approximately 90%) and the extensive area possible to inspect (approximately 80%) without locating any evidence of Aboriginal sites or relics, it is recommended that no further assessment or investigation is warranted.

There are no further archaeological or Aboriginal cultural heritage issues to be addressed in regard to Lot 21 DP 1052482 and Lot 2 DP 216705, however, the following recommendation has been provided as a precautionary measure.

It is recommended that, if in the process of works involving site establishment, construction or the extraction of sand, Aboriginal sites or relics are identified, work at and adjacent to the material must stop. The regional Archaeologist of the DECC Coffs Harbour and the Tweed Byron L.A.L.C must be contacted as soon as possible, who will advise as to the most appropriate course of action. Works must not proceed without authorisation of the DECC and Tweed Byron L.A.L.C.

**Recommendation - Area C and Area D (Part Lot 1 DP 828298, Lot 3 DP 828298)  
Eastern Pipeline Corridor.**

As the proposed eastern pipeline would be above ground and no Aboriginal sites were found, the placement of the pipeline would not damage or disturb any Aboriginal sub surface sites if they existed.

There are no further archaeological or Aboriginal cultural heritage issues to be addressed in regard to Part Lot 1 DP 828298 and Lot 3 DP 828298, Lots 26C and 26D DP 10715, Lots 11 and 12 DP 871753 or Lot 4 DP 727425, however, the following recommendation has been provided as a precautionary measure.

It is recommended that, if in the process of works involving the installation of the above ground eastern pipeline, Aboriginal sites or relics are identified, work at and adjacent to the material must stop. The regional Archaeologist of the DECC Coffs Harbour and the Tweed Byron L.A.L.C. must be contacted as soon as possible, who will advise as to the most appropriate course of action. Works must not proceed without authorisation of the DECC and Tweed Byron L.A.L.C.

**Recommendation - Area E Northern Pipeline Corridor**

As the proposed northern pipeline would be approximately 1m below ground in sand strata which has the potential to contain Aboriginal sites it is recommended that a Sites Officer of the Tweed Byron L.A.L.C. monitor the excavation and installation of the chosen route.

In consideration of the possibility that if the alternative northern pipeline corridor were required, as a precautionary measure it is recommended that an inspection of the route by a consultant and the Tweed Byron L.A.L.C. be undertaken. It is considered unlikely that any burials would be identified during a surface inspection unless already exposed from previous activities.. If the alternative corridor were required, sand would be pumped via an above ground pipeline posing no more destructive threats to possible burials than land uses already undertaken on the land.

If, in the process of monitoring works or any other works involving the excavation and installation of the below ground northern pipeline within the proposed corridor or installation of the above ground pipeline within the alternative corridor. Aboriginal sites or relics are identified, works at and adjacent to the material must stop. The regional Archaeologist of the DECC Coffs Harbour and the Tweed Byron L.A.L.C. must be contacted if a Sites Office is not present. Works must not proceed without authorisation of the DECC and Tweed Byron L.A.L.C.

There are no further archaeological or Aboriginal cultural heritage issues to be addressed in regard to the installation of the northern pipeline between Lot 21 DP 1082482, Lot 2 DP 216705 and Lot 1 DP 1075645.

### **Recommendation - Area F (Lot 10 DP 857710) - Proposed Fill Site 7**

Given the extensive area of surface visibility (approximately 75%) over the elevated sand rises west of the western drain and high degrees of visibility (approximately 70%), without locating any evidence of Aboriginal sites or relics it is recommended that no further assessment or investigation is warranted.

There are no further archaeological or Aboriginal cultural heritage issues to be addressed in regard to Lot 10 DP 857710 or the remaining fill sites, however, the following recommendation has been provided as a precautionary measure.

It is recommended that, if in the process of filling or construction works, Aboriginal sites or relics are identified, works at and adjacent to the material must stop. The regional Archaeologist of the DECC Coffs Harbour and the Tweed Byron L.A.L.C. must be contacted as soon as possible, who will advise as to the most appropriate course of action. Works must not proceed without authorisation of the DECC and Tweed Byron L.A.L.C.

These Recommendations have the written support of the Tweed Byron Local Aboriginal Land Council (**Appendix A**).

# 1 INTRODUCTION

## 1.1 Location

The following report presents the results and outcomes of a reappraisal of Aboriginal cultural heritage issues undertaken on behalf of Gales-Kingscliff Pty Ltd (the “Proponent”) for the Cudgen Lakes Sand Extraction Project (“the Project”). The Project Site and proposed fill sites (the “Study Area”) are located within the Kingscliff / Chinderah / Cudgen area and are surrounded by a range of existing and approved developments including a new waste water treatment plant, existing sand extraction operation and a bay lobster farm (see **Figures 1 and 2**).

## 1.2 The Project

The Project would involve the removal of approximately 5 000 000m<sup>3</sup> of sand over a period of 15 to 20 years. The Project Site covers a total area of 67ha which includes:

- a 37ha extraction site south of Altona Drive (‘southern extraction site’);
- a 9ha extraction site north of Altona Drive (‘northern extraction site’); and
- a processing area north of Altona Drive covering an area of 3.7ha.

Two pipeline corridors are also proposed extending north and east from the southern extraction site (see **Figure 2**). These are referred to as the “northern pipeline corridor” (0.8km in length) and the “eastern pipeline corridor” (1.5km in length). The proposed northern pipeline corridor would be located in the road reserve on the western side of Tweed Coast Road. The proposed eastern pipeline corridor would be located within the road reserve for a proposed subdivision road within land owned by the Proponent. It is acknowledged that the proposed road has not yet been approved. Therefore, an alternative eastern pipeline corridor (see **Figure 2**) has been proposed in the event that the proposed road is not approved within a suitable timeframe. An alternative northern pipeline has also been proposed in the event that suitable agreements are reached with an adjoining landholder.

The Project would involve the extraction of sand from the extraction sites for processing and production of materials, including washed sand and mortar sand, for the local and regional construction industry. Sand would also be pumped to a number of nominated fill sites via the proposed pipelines in order to raise the elevation and allow the development of the land for a range of intended land uses.

The Proponent would adopt a progressive approach to site landscaping. The construction of recreational facilities such as walking and equestrian / cycling tracks would occur following completion of sand extraction activities. The final lake created by the southern extraction pond would have a depth of up to 20m and cover an area of approximately 37ha. A full description of the Project is provided in Section 2 of the *Environmental Assessment*.



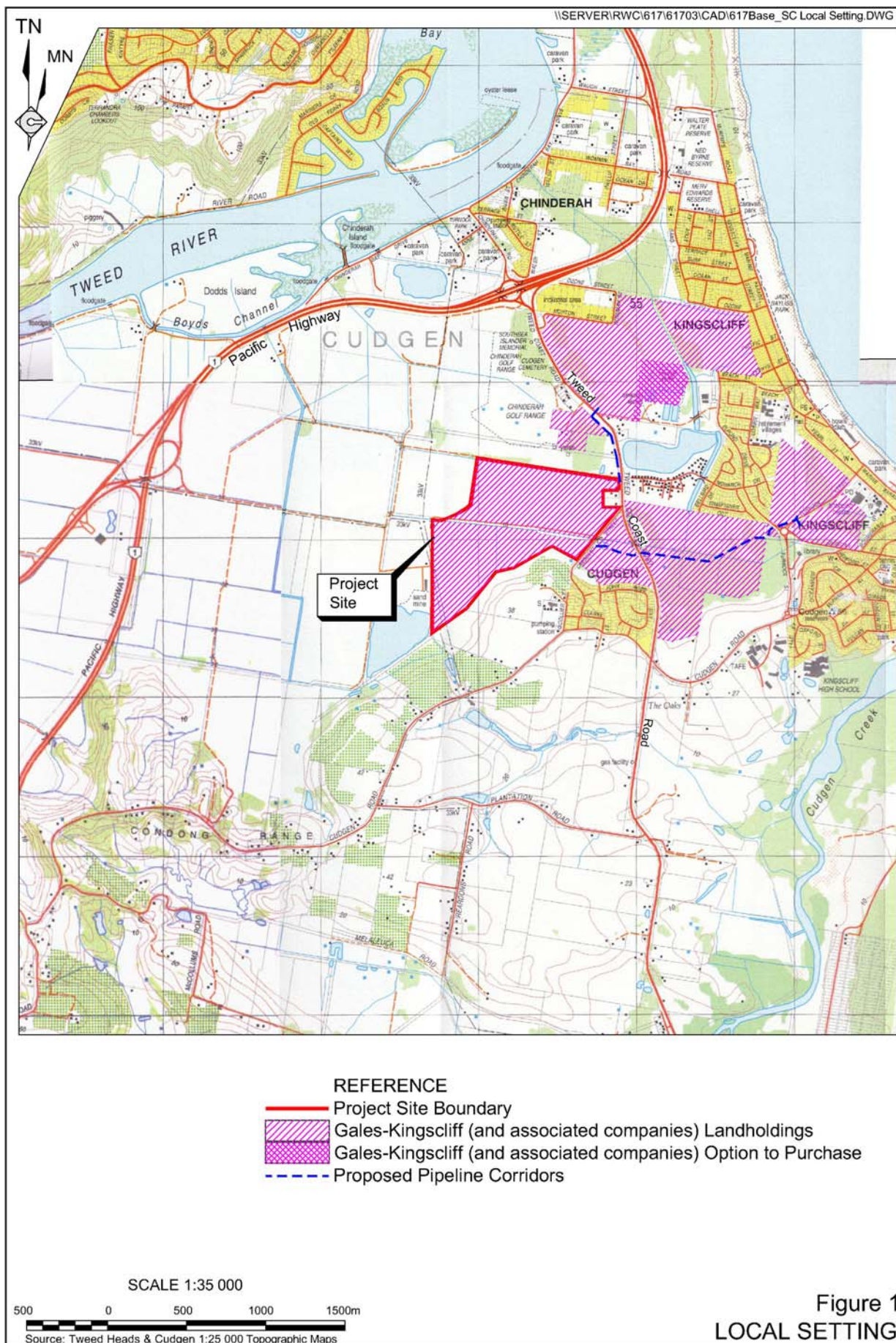
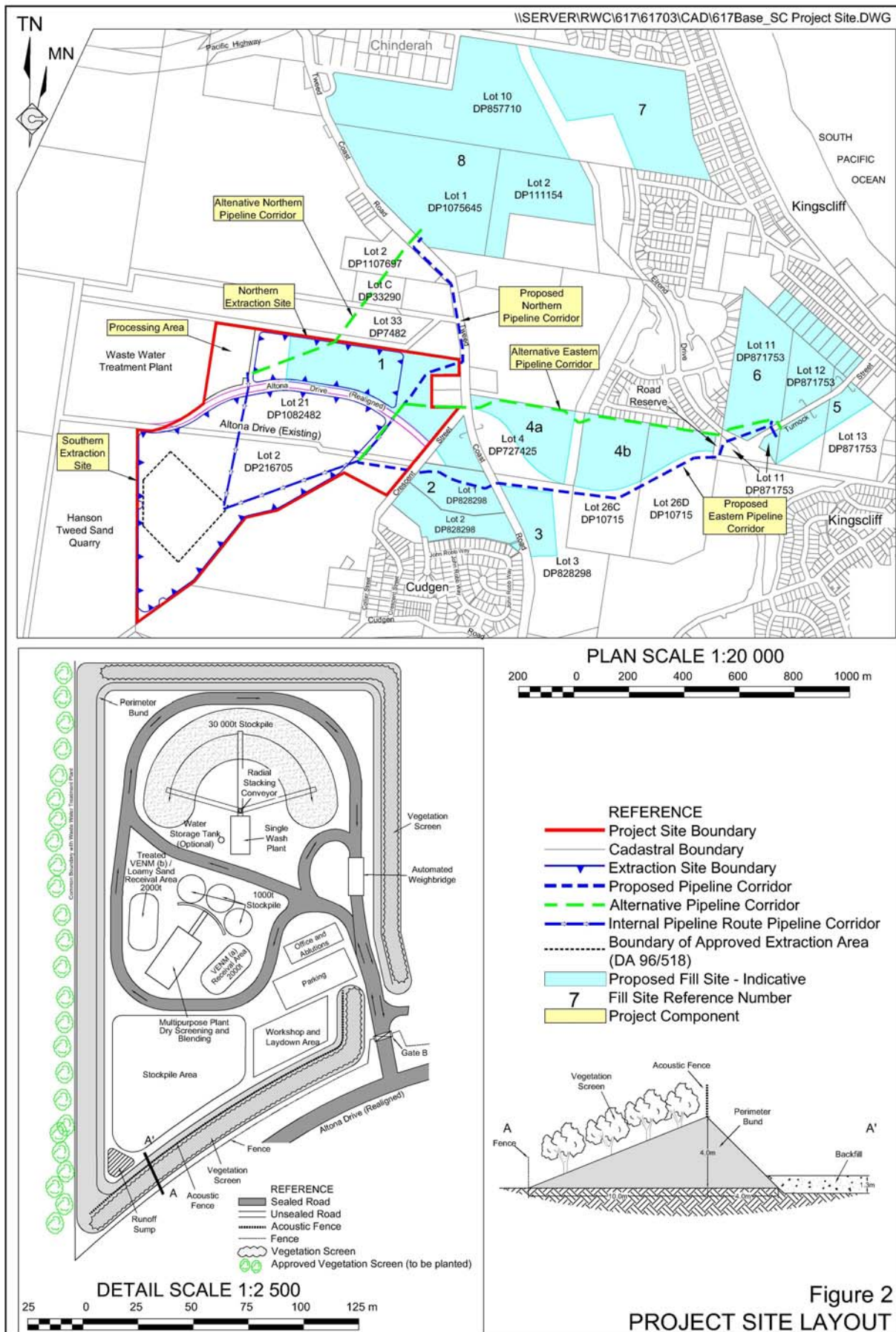


Figure 1  
LOCAL SETTING





Note: A colour version of this figure is available on the project CD

## 2 ENVIRONMENTAL FEATURES

Six areas have been defined for assessment purposes and have been referred to throughout this report as Areas A, B, C, D, E and F (see **Figure 3**) and combined are referred to as “the Study Area”. A brief description of the land parcels is provided as follows.

**Area A.** Project Site - north.

Description: Lot 21 DP 1082482

Area: 53.82ha

Features: Level floodplain, drained, levelled and cultivated, clear of trees with exception of *Casuarina glauca* on the boundary lines.

**Figure 4 - Plates 1 and 2.**

**Area B.** Project Site - south

Description: Lot 2 DP 216705

Area: 30.34ha

Features: Level floodplain, drained, levelled and cultivated, clear of trees with exception of *Casuarina glauca* on the boundary lines.

**Figure 4 - Plate 3.**

**Area C.** Section of the proposed eastern pipeline corridor.

Description: Part Lot 1 DP 828298

Area: Approximately 1.0ha

Features: Located at the intersection of Crescent Street and Chinderah Road. Low lying, prone to water logging. Carries a heavy grass/swamp cover with scattered *Melaleuca quinquinervia*.

**Figure 4 - Plate 4.**

**Area D.** Section of the proposed eastern pipeline corridor.

Description: Lot 3 DP 828298

Area: 13.07ha

Features: Located east of Tweed Coast Road. Low pasture land and swamp conditions in the alternative pipeline corridor with an upward slope to the south. The proposed pipeline corridor passes through melaleuca/swamp forest. The upward slope south carries a regrowth vegetation dominated by figs, tuckeroo, palms and exotic weed growth.

**Figure 4 - Plates 5 and 6.**

A man made embankment of basalt soil and boulders passes south to north through the southern 50% of the parcel. The remaining section of the embankment is approximately 3m to 4m in height 15m in width at the base and 3m at the crest. The purpose of the embankment was to carry a tramway from the original sugar mill at Cudgen to wharves at Chinderah on the south bank of the Tweed River.





\\SERVER\RW\61703\CAD\617Base\_AH Figure 4 1.DWG



Plate 1. Area A. View south over sand extraction area.



Plate 2. Area A. View north east from sand extraction area.



Plate 3. Area B. View south east from sand extraction area.



Plate 4. Area C. View south east. Eastern Pipeline area.



Plate 5. Area D. Northern section. Eastern Pipeline Corridor.



Plate 6. Area D. View south toward upper southern section. Eastern Pipeline Corridor.

**Figure 4**  
**ENVIRONMENTAL FEATURES**  
**PLATES 1 - 6**

Note: A colour version of this figure is available on the Project CD



\\SERVER\RW\61703\CAD\617Base\_AH Figure 4.2.DWG



Plate 7. Area E. Northern Pipeline Corridor.  
View north.



Plate 8. Area E. Northern Pipeline Corridor.  
View south.



Plate 9. Area F. Possible fill area east of the  
drain.



Plate 10. Area F. Possible fill area toward  
West Kingscliff. View south east.



Plate 11. Area F. West of the drain. Sand  
rises to the Tweed Coast Road. View west.



Plate 12. Area F. West of the drain. Open  
woodland on the sand plain.

**Figure 4**  
**ENVIRONMENTAL FEATURES**  
**PLATES 7 - 12**

Note: A colour version of this figure is available on the Project CD

**Area E.** Proposed northern pipeline corridor. Proposed corridor west of Tweed Coast Road, alternative corridor west of Tweed Coast Road.

Description: Tweed Coast Road.

Length: 0.5km

Features: A sand rise slightly elevated above the floodplain. Generally grassed with bladey grass and fern, usually slashed. Scattered regrowth eucalypt, melaleuca and swamp oak at the southern end.

**Figure 4 - Plates: 7, 8.**

**Area F.** Proposed Fill Site 7

Description: Lot 10 DP 857710

Area: 41.97ha

Features: Extends east to west from Kingscliff to the Tweed Coast Road. Bound by Morton and Ozone Streets to the north and an open block containing a Sewage Treatment Plant to the south.

**Figure 4 - Plates 10, 11, 12.**

Area F consists of two broadly distinct areas separated by a deep drain traversing Lot 10 DP 857710 from southeast to northwest. Swales and swampy conditions prevail east of the drain. Vegetation consists of extensive *Casuarina glauca* thickets, marsh grasses, reeds and fern specie.

Sand rises prevail west of the drain to elevations of only 2m to 3m AHD. Vegetation consists of open woodland with scattered regrowth eucalypt specie, *Casuarina glauca* and introduced pine. There are no trees of sufficient age to be considered original forest. Ground covers are pasture grasses, bladey grass, bracken fern, bungwahl fern and exotics.

### 3 ARCHAEOLOGICAL CONTEXT

#### 3.1 Previous European Land Use

An assessment of the type and level of disturbance through past European land use practices can be an indication of the type of Aboriginal sites that could remain. A high or low level of disturbance will help to determine the archaeological significance or scientific importance of cultural materials found.

**Area A.** The original vegetation has been totally cleared and the land drained, and levelled for agriculture (1964) and more recently cattle grazing (since 1984).

Disturbance: A high level mixing of soil and sands at the surface and sub-surface to at least 0.5m is probable. The land is presently highly disturbed through cultivation.

A high degree of lateral and vertical movement of cultural materials, if they existed, can be expected to have taken place due to mechanical processes. Only stone artefacts and shell would remain from middens or open campsites.

That Aboriginal sites can remain in heavily disturbed floodplain locations such as Area A or Area B is evidenced by the recording of a stone artefact scatter (Site No: # 4 - 2 - 109) in an adjoining property approximately 175m to the southwest (Piper. 2000).

**Area B.** Comments as per Area A.

**Area C.** A low lying marsh carrying scattered broad leafed paperbark, marsh grasses and fern. The area is often waterlogged and would appear to have had little or no commercial use. Possibly disturbed during tree clearing or excavation of a drainage channel. An unlikely location for Aboriginal sites other than isolated artefacts.

**Area D.** This area is melaleuca swamp in the proposed eastern pipeline corridor and low pasture land within the alternative eastern pipeline corridor. The southern part of Lot 3 DP 828298 is vegetated by regrowth wet sclerophyll and littoral rainforest species on higher ground.

Disturbance: The proposed pipeline corridor has possibly been cleared on occasions, at least once during the construction of the tramway embankment north and south through Area D. There is a high probability of introduced basalt stone fragments and other stone tramway bedding materials. The alternative eastern pipeline corridor has been cleared and levelled originally for sugar cane cultivation and subsequently for pasture land.

**Area E.** The route of the proposed northern pipeline corridors cross low sand rises used as a road corridor, for the most part, since the late nineteenth century. The corridor is generally grassed with some regrowth vegetation. The alternative pipeline corridor crosses low sand rises, formally grazing land, until it meets the road reserve.

Disturbance: It would be reasonable to assume that surface and sub-surface (to 0.5m) sands have been mixed during varying stages of road making and the installation of trenches carrying sewage, water, electrical and communication services. It would seem highly unlikely Aboriginal cultural materials would be undisturbed from their original contexts if they existed. A study by Davies (1992) over this road corridor found no evidence of Aboriginal cultural materials.

**Area F.** This area has been cleared of vegetation possibly several times and possibly used for cattle grazing. There is evidence of the dumping of concrete, metal and oyster shell from a processing plant once adjoining the area to the northwest.

Disturbance: A high level of disturbance to surface and sub-surface sands can be anticipated.

Area F can be described as two distinct areas defined by the deep drain which traverses Lot 10 DP 857710. East of the drain, extending towards the Kingscliff residential area, disturbances would appear to be the result of land clearing on occasions and regular slashing. The area is low lying and prone to inundation on regular occasions. Land disturbances west of the drain would appear to have been land clearing, regular slashing, an extensive network of vehicle tracks and an extensive area (approximately 2.0ha) of 'ripped' ground adjacent to Morton Street. In the sand plain conditions west of the drain Aboriginal cultural materials are highly likely to have been compressed had they existed. East of the drain the low lying conditions would be unsuitable to Aboriginal occupation sites.

### 3.2 Previous Studies

A search of the Department of Environment and Climate Change (DECC), Aboriginal Heritage Information Management System (AHIMS) was conducted as it provides a guide to recorded sites, the locations of those sites and the variety and contents of archaeological materials. From a review of the results of previous reports over lands in the vicinity of the Study Area it is possible to propose a potential model of Aboriginal site types and their distribution. Known sites are indicated in **Figure 5**.

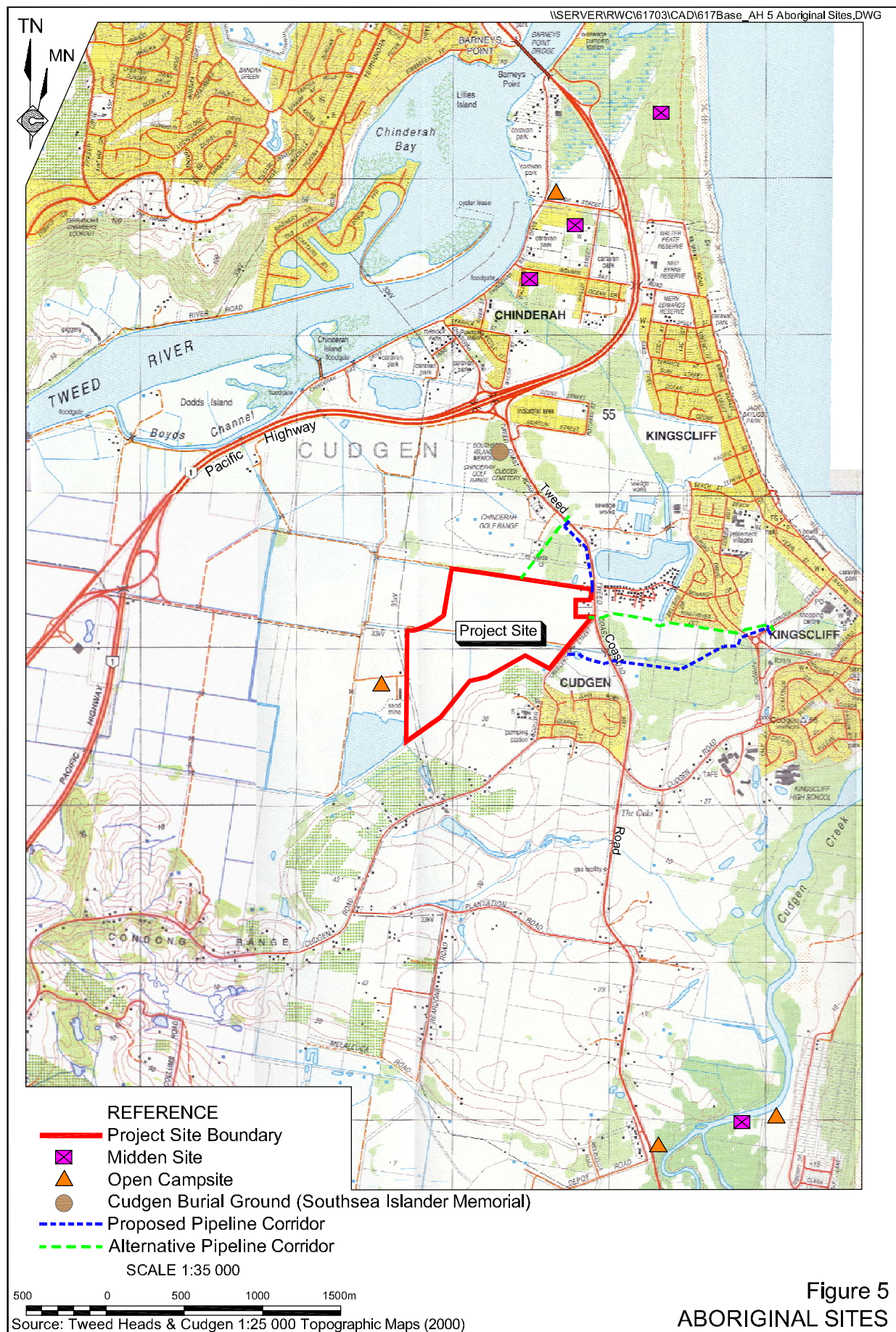
The majority of previous studies of the lower Tweed River and Tweed Coast have been in response to development proposals requiring impact assessments. The area under consideration for this assessment is taken as, between the southern Tweed River floodplain and the Tweed coastal plain extending south 8km to Bogangar. Within this general area four broad contexts can be used to identify where previous studies have been carried out. They are as follows, including relevant studies.

- The Tweed River floodplain including some dunal areas at Wommin Bay and Kingscliff. (Studies: Piper 1980, 1984, 1991, Appleton 1993, Piper 1994a, 2000, 2001b, 2003a, 2003b, 2005, Lamb 2004).
- Outer barrier dunefields of Holocene age generally sand mined with some mixing of Holocene and Pleistocene age sands at their western extent. (Studies: Collins 1993, 1996, Piper 2001, 2003a).
- Inner Barrier dunefields of Pleistocene age extending beyond coastal outer barrier sands, west to the coastal foothills. (Studies: Gollan 1989, Nicholson and Cane 1989, Davies 1991, Hall 1991, Piper 1998, 1999, 2002).
- Foothills adjacent to the Tweed River floodplain. (Studies: Piper 1994b, 1994c).

#### 3.2.1 The Southern Tweed River Floodplain (Areas: A, B, C and Part D)

This area includes the Project Site and part of the eastern pipeline corridor. Floodplain sites to date have been found to be estuarine middens or open campsites. These have been located in the area of Chinderah village. The area contains low dunes of Pleistocene and Holocene age overlapping alluvial soils at varying distances from the coastline. 2km north of Area F, between Wommin Bay and the Tweed River, Hall (1991) located a low-density midden (# 4 - 2 - 67,) which was considered to contain subsurface material over an area greater than was visibly eroding at the time. Davies (1992) in following the course of the Tweed Coast Road along the proposed course of the northern pipeline corridor did not locate any sites. Part of this route includes a 3km length of low Pleistocene sand rise, poor visibility conditions and the road itself may have hampered the effectiveness of the assessment. Studies by Piper (2001b, 2003b) have assessed all of the floodplain over which the eastern pipeline corridor is proposed without locating any evidence of Aboriginal sites.





**Figure 5**  
**ABORIGINAL SITES**

In 1994 Piper conducted an assessment of the south bank of the Tweed River at Chinderah 1.5km west of Area F as part of a study which included the banks and foreshores of the Tweed River upstream to Murwillumbah. Three middens were located on the riverbank, two of which (Cudgen 1 and Cudgen 2) were typically estuarine in character containing a predominance of oyster and lesser quantities of cockle and whelk. Each was heavily disturbed and eroding rapidly into the narrow channel on which they are located. Cudgen 1 was a low-density deposit 3m<sup>2</sup> to 4m<sup>2</sup> in area and approximately 5cm in depth. Cudgen 2 extended for approximately 25m along the inland shore of Dodds Island. The material was loosely compacted due possibly to boat wash and appeared to be mixed with a natural shell bed and sand beneath the deposit. The third midden, Chinderah 3 is a shell and artefact deposit of an unknown extent. It is located on the original riverbank some 400m east of the present river walls. An exposure of shell of approximately 40m<sup>2</sup> was visible in a vegetable garden at the corner of Waugh Street and the old Pacific Highway. The shell consisted of a mix of beach pipi and estuarine oyster, cockle and whelk. Artefactual material consisted of chert and chalcedony flaked pieces, hammer stones and a small stone piece with the appearance of grinding grooves. The site may contain undisturbed subsurface deposit and therefore may have moderate to high scientific and cultural significance (Piper 1994).

A previous study by Piper (2000) of 8.3ha of floodplain immediately southwest of the present Study Area located an open campsite (# 4 - 2 - 109). The site is 175m west of Area B. The site consisted of a low-density (3.6 artefacts/hectare) scatter of 30 stone artefacts. These consisted mainly of flaked pieces (41%), scrapers (4%), cores (8%), modified flakes (12%) and unmodified primary flakes (29%). Chert and chalcedony comprised 62% of the stone types used with 7% to 10% of agate, jasper, quartz and quartzite. The site was a ploughed paddock previously used for sugar cane and ti-tree cultivation (Piper 2000). It was considered the site did have a 'uniqueness' from the perspective that it was the only open campsite recorded on the alluvial soils of the floodplain as opposed to the slightly elevated sand rises which merge with the floodplain soils in this locality. However, the high probability that the site had been highly disturbed and therefore was of limited scientific value led to a recommendation that a Consent to Destroy be sought from the Director General N.P.W.S. A subsequent study of the adjoining parcel to the west, over 79.0ha found no further evidence of Aboriginal cultural materials (Piper. 2003).

### **3.2.2 Inner Barrier Sands (Areas: E, F)**

This area includes the western part of Lot 10 DP 857710 and the northern pipeline corridor.

Immediately south of Kingscliff studies have found the surviving archaeological resource is concentrated on old dune deposits possibly of Pleistocene age. The proposed 'Kings Forest' development area is an extensive area of sand rises and wetlands between the estuarine Cudgen Creek and the Cudgen/Duranbah hills. The area has been assessed by Golland (1989), Nicholson and Cane (1989) and Piper (1999). A quarry site (# 4 - 2 - 37) was recorded by Gollan on the northern shore of Cudgen Lake. The site is an exposure of greywacke boulders at the base of a spurline, which projects to the waters edge. An extensive amount of fractured material is evident which appears to have been reduced to 'block' form possibly for removal to other locations in the area. Some boulders show signs of heavy battering consistent with their use as anvils.

A 'preliminary' study of the 'Kings Forest' area was conducted by Nicholson and Cane (1989). The survey noted five Aboriginal sites in addition to two sites recorded by Gollan (# 2 - 3 - 37 the quarry site and # 4 - 2 - 36) an open campsite. Three open campsites containing low-density volumes of stone artefactual materials were found in elevated positions adjacent to creeks, the lake or wetlands. The artefactual materials at these sites broadly consisted of retouched and unretouched flakes, flaked pieces, cores, backed blades, scrapers and stone axes. Red ochre was evident at two locations. The source material were predominantly chert and chalcedony with a lesser amount of quartzite and quartz. Larger stone artefacts, for example axes, were produced on greywacke or basalt. The Nicholson/Cane study considered the area to have a low to moderate archaeological sensitivity (Nicholson/Cane 1989). The report made the observation that, in light of the depletion of archaeological resources in the region, the sites take on greater significance to the Aboriginal community than may normally be the case (Nicholson and Cane 1989).

A study by Piper 1998 of an inner barrier sand dune and estuarine wetland for a proposed road route (Old Bogangar Road) recorded an open campsite (# 4 - 2 - 98). Materials consisted of a stone axe, backed blade, a flaked piece of quartzite and a piece of red ochre. The site was at the north east tip of the Kings Forest Development, bisected by Old Bogangar Road. The remainder of the Kings Forest Development was reassessed by Piper (1999). This involved recording sites previously noted but not recorded, reassessing sites already recorded (Gollan # 4 - 2 - 36, 4 - 2 - 37) and searching for further sites. Three open campsites (# 4 - 2 - 103, 4 - 2 - 104, 4 - 2 - 105) one midden (# 4 - 2 - 106) and one isolated artefact (# 4 - 2 - 102) were recorded. The material at the sites consisted of chert and chalcedony cores and flakes, scrapers, stone axes on greywacke and pieces of red and yellow ochre. Kings Forest 3,5 and 6 (# 4 - 2 - 106, 4 - 2 - 105, 4 - 2 - 104) were considered to have a potential for sub-surface deposits and are considered locally potentially archaeologically significant (Piper 2000).

In 1994 Piper examined the area of a sand quarry at the eastern base of the Cudgen/Duranbah Hills. Four highly disturbed open campsites were found (# 4 - 2 - 89 to 4 - 2 - 92) on inner barrier dunes. The contents were flakes and flaked pieces of chert and chalcedony. As the material was so mixed with dredge tailings its 'in situ' context could not be confirmed. Its archaeological significance was considered low.

A study (Piper 2001) over sand rises and swamp which would include the route of the eastern pipeline corridor immediately east of Area D, found no evidence of Aboriginal cultural materials.

### **3.2.3 Outer Barrier Dune Fields (Area F)**

This area includes the eastern sector of Lot 10 DP 857710 in the vicinity Pacific Street, Kingscliff.

While the greatest proportion of the coastal foredune and hind dune deposits have been sand mined in effect destroying the archaeological resource they contained, studies east of the old Tweed Coast Road or east of the coastal streams of Cudgen, Cudgera and Mooball Creeks have recorded the surviving remnants of Aboriginal sites free of sand mining.



A study by Collins (1996) between Bogangar and Kingscliff included a strip of sand mined beach dunes between the old Tweed Coast Road and Cudgen Creek. The Collins study located two open sites (# 4 - 5 - 139, 4 - 5 - 140) on sand mined dunes between the old Tweed Coast Road and Cudgen Creek. A third site, an 'in situ' midden (# 4 - 5 - 138) was located on the eastern bank of Cudgen Creek. The artefact material at the open sites consisted of chert, chalcedony and quartz materials. The midden shell content is a low-density deposit of pipi over an area of 150m<sup>2</sup>.

Because of its apparent undisturbed context and unknown archaeological potential it was assessed to have a medium level of scientific significance. The open campsites, because of their lack of spatial or stratigraphic integrity were considered to have a low scientific significance (Collins. 1996).

A study by Piper (2001) of land adjoining the new suburb of Casuarina to the north of the Collins 1996 study assessed a 1km section of sand mined and non-mined dunes between the ocean and Cudgen Creek and an estuarine waterway linking Cudgen Lake in the south and the ocean at Kingscliff. The study found that a small area of hind dunes east of the sand mined dunes on the banks of the Cudgen Creek contained areas that had not been mined but had been impacted by land clearing.

One apparently 'in situ' pipi midden (Seaside City 1 # 4 - 2 - 111) was found to extend for approximately 120m in a band approximately 5m wide on a low dune falling to Cudgen Creek. Visible shell exposures led to an assessment that a loose sub-surface deposit up to 10cm thick or potentially greater, exists at the surface and immediate sub-surface. The site was only approximately 400m north of the 'in situ' midden (# 4 - 5 - 138) recorded by Collins (1996) in a virtually identical context.

A second site (Seaside City 2 # 4 - 2 - 112) an open campsite, was found 200m east of the midden on a mechanically formed sandbank. (approximately 1.00m elev). The material at the site consisted of a low-density scatter of shell fragments and four stone artefacts. The artefacts consisted of a greywacke stone piece bevelled on one edge, possibly the result of pounding on wood, a large beach cobble stone, almost spherical with pitting and grinding striations on one surface, a red quartzite scraper and a brown chert retouched flake (Piper 2001). The small artefact collection at the site is possibly reflective of wooden tool maintenance and the preparation of bungwahl fern rhizome, a food staple in this region.

Given the rarity of this type of site, its 'connectedness' with other sites in the vicinity and its 'in situ' position, the midden site was considered to be of a high level of archaeological and cultural significance in a regional sense. The open campsite materials were considered to have been redeposited but culturally significant to the Tweed Byron L.A.L.C., but lacking further research potential (Piper. 2001).

A study (Piper. 2003b) over 27ha of outer barrier dune and swamp on the western outskirts of Kingscliff did not locate any evidence of Aboriginal cultural materials. The Study Area was 0.5km southeast of the eastern sector of Area F in this Study Area.

### **3.2.4 Foothills to the Tweed River Floodplain (Part Area D)**

This area includes Lot 3 DP 828928 which includes both floodplain and foothill features.

The remaining group of studies were over the lower western slopes of the Cudgen/Duranbah Hills immediately adjoining the floodplain, 2km to 3km south west of the Study Area. Poor visibility hampered the effectiveness of each of these studies. Studies over clay and shale slopes at the base of the more extensive Condong Range by Piper (1994b, 1994c) failed to find any evidence of Aboriginal cultural materials.

### **3.3 A Review of the AHIMS Given Location of Site No: 04 - 1 - 0021.**

The AHIMS review indicated a site located in the eastern section of Area F approximately 225m west of houses in Pacific Street, Kingscliff. The current AMG reference is: Tweed Heads Sheet 9641 - 4 - 5. 1:25000, Easting: 5554. Northing 68750.

As the site is clearly now recorded within the eastern sector of Area F and would be impacted by any form of construction and or filling, a request for a copy of the original site card was made to verify the accuracy of the recording.

The site card contains the following information.

Recorded by I. McBryde, 1961

Map: Tweed Heads 1:250000

Reference: c 6755-4949

Site Name: Chinderah

Type: Open (sic open campsite) and midden.

Description: "¼ mile s of Chinderah beside road, 100 yards off the Pacific Highway leading to Kingscliff (to the right). It in an area said by Miss Kaye an Aboriginal from the area, to be an old feasting ground" (Site card AHIMS. Lismore District. August 1961).

It is important to note that the site card reference to "the Pacific Highway" refers to the old Pacific Highway, which in 1961 followed the Tweed River at Chinderah. The site card reference refers to the site as 100 yards (91.4m) off the Pacific Highway. The present grid reference records the site as 1.75km east of the old Pacific Highway at the closest point.

The site card describes the site as "to the right" of the road, "leading to Kingscliff". In 1961 as now, the road from the old Pacific Highway at Chinderah to Kingscliff, is Wommin Bay Road. The present grid reference for site # 04 - 1 - 0021 is not on or near a road that would have or does now lead to Kingscliff.

The site card information would place site # 04 - 1 - 0021 on the Tweed Heads Sheet, 1:25000 at Reference: Tweed Heads 9641 - 4 - 5.

1 : 25000

Easting: 554225. Northing: 6876225.

It will be recommended to the DECC, AHIMS unit that the location be corrected to the reference above.

The corrected grid reference for site # 04 - 1 -0021 is 1.6km northwest of the present AHIMS location and 1.125km northwest of Area F. The reason for the error in the current listing would appear to be in the original approximate recording on a 1:250000 map sheet and the subsequent recalibration some years later, to a metric 1:25000 AMG reference.

### 3.4 Potential Site Types in the Study Area

On the basis of the review of previous studies and AHIMS listings in the defined area ie. south of the Tweed River to Bogangar and inland to the coastal foothills, there is a potential for Aboriginal sites and or relics to exist in the Study Area. This has already been demonstrated by the presence of an open campsite (# 4 - 2 - 109) in a sand extraction area 175m southwest of the present investigation area (Piper. 2000). However, given the previous and present land use practices the range of potential sites is limited. An assessment of potential archaeological site types within the Study Area are as follows.

- There are mature trees, chiefly broad leaf paperbark, which have a potential to contain scars of Aboriginal origin. Therefore a potential exists for scarred or carved trees. This only applies to Area D.
- There are basalt rock outcrops which could provide a source of suitable stone, therefore stone quarries are possible, but only in the southern slope of Area D.
- Bora/Ceremonial areas which may have contained above ground earth or stone 'structures' have long since been cleared and levelled if they had existed.
- Burials are considered a low possibility due to the acidic nature of soils and the low-lying terrain which may have been water-logged for extended periods in the past.

Therefore the following types of sites are those considered to have a potential, be it low - moderate to exist - midden sites, open campsites, quarry sites, scarred tree sites.

#### 3.4.1 Midden Sites

Midden sites in the Tweed Valley and Tweed Coast are invariably found on elevated ground adjacent to the source of the shellfish. The sources are open beaches, rock platforms, tidal mud flats, rocks and mangrove roots. Middens in this area are mainly composed of five edible species namely pipi, cartrut, cockle, whelk and oyster. The sites may reflect only one source of gathering or a combination of sources. Middens may contain faunal remains, stone artefacts and cooking hearths. Human burials have been associated with midden sites in the Tweed River estuary and Fingal Peninsula.

The Study Area is at roughly equal distance from the open beach to the east and the Tweed River estuary to the north. It would be possible that middens could contain estuarine species - oyster, cockle and whelk or beach species - pipi and cartrut shell or combinations of both. Estuarine middens on the south banks of the Tweed River have been low density sites of oyster, cockle and whelk. They are found both on the present river bank (Cudgen 1 and Cudgen 2) and on low sand rises between the river and the Cudgen/Duranbah hills to the south. To date there have been five estuarine middens located in the Chinderah/Cudgen area.

Three sites (# 4 - 1 - 21, 4 - 2 - 66, 4 - 2 - 67) are described as low-density middens and two (# 4 - 1 - 21, 4 - 2 - 67) were considered to contain materials over a wider area. Three other estuarine middens are referred to in a previous report with N.P.W.S. site card information but do not appear in current site lists. These sites are referred to in the report as Cudgen 1, Cudgen 2 and Chinderah 3. These were recorded on the river banks of the Tweed River 4km north and northwest of the Study Area. They contain estuarine species only, oyster, cockle and whelk. Cudgen 1 and Cudgen 2 were highly disturbed through bank erosion. Chinderah 3 located on a former river terrace contained flaked pieces, hammer stones, a grinding stone and flakes in addition to the shell component. The site may well contain sub-surface deposits. The surface has been disturbed by the cultivation of a vegetable garden.

### **3.4.2 Open Campsites**

Open campsites may be found in almost any elevated position adjacent to wetlands or creeks. They will also be found on low grades or the level sections of ridge crests and spurlines, particularly where higher ground tapers toward the coastal plain. Materials at these sites is generally stone artefactual material only. A recorded site may consist of as little as two artefacts within 50m of each other or heavy concentrations of stone artefactual materials and other materials such as ochre, bone and cooking hearths. Low-density scatters of midden shell may also be present.

The review of previous studies (see Section 3.2) indicates the majority of recorded open campsites have been found in inner barrier or old dune locations adjacent to wetlands or on dune fields adjacent to estuarine streams. (Cudgen, Cudgera and Mooball Creeks). The artefactual materials at these sites includes flaked pieces, retouched pieces, retouched flakes, cores, blades, points, scrapers and stone axes. The bulk of the 'small' tool component is fabricated on chert and chalcedony.

The exception to the dunefield/wetland context is the open campsite (# 4 - 2 - 109) recorded on the floodplain only 175m southwest of the present Study Area. The low-density scatter of stone artefacts was found on a level alluvial soil plain where visibility was 100% (Piper 2000). Given that the present Study Area adjoins the location of the open campsite, there is a possibility that Aboriginal cultural materials extend into the present Study Area.

In addition it is known that a source or sources of haematite existed in the Cudgen/Duranbah Hills which was broken down to a red ochre for use on ceremonial occasions. The hills in which the material was found, slope to within 25m of the Study Area. Red ochre fragments have been identified at open campsites immediately south and east of the Cudgen/Duranbah Hills. A possibility exists for ochre to be found in the Study Area however, no ochre fragments were found in the open campsite (# 4 - 2 - 109) to the southwest of the Study Area.

### **3.4.3 Quarry Sites**

Evidence of stone quarrying of bedrock materials is recorded 7.0km south at Cudgen Lake. The quarry site (# 4 - 2 - 0037) recorded in 1989 contains large boulders of the Nerenleigh - Fernvale type (greywacke) which have evidence of fracture consistent with heavy impacts. No artefactual materials have been recorded from the site. Piper (1976) recorded two sites of quarrying in the Hastings Point area. A stone quarry is located on the northern spur of the high ground immediately west of the Cudgera Creek estuary. The site consists of large volumes of split feldspathic sandstone forming a talus slope. Large flakes are evident. A large core scraper was observed and photographed at the site (Piper. 1967). A flaking floor is evident on the eastern face of Hastings Point. The material is approximately 25cm below the surface and extends for approximately 80m north to south. The material is flaked feldspathic sandstone which may have originated from the Hastings Point quarry 1.5km to the west or from boulders at the base of the low headland (Piper. 1967).

If outcrops of greywacke exist in the assessment area a potential for quarries would exist. However the only stone in any of the land parcels is basalt boulders on the upper slope of Area D. To date no Aboriginal stone quarry has been identified in this region where the source material has been basalt. The potential for stone quarries is therefore considered low.

### **3.4.4 Scarred Tree Sites**

Scarred tree sites are rare due to the extent of tree felling and natural causes. They are the result of the removal of bark for use as covering, shields, containers, canoes and toe holds. The only recorded instances in this coastal region is a scarred tree (Site 11) recorded by Navin (1990) in the Ocean Shores development area. The tree (blackbutt) exhibits two elongated scars 2.2m and 3.0m above the ground. A study by Fox, I. 2003 refers to two scarred trees in the Billinudgel Nature Reserve "Two standing trees on the swamp edge have large elongate scars and two fallen trees also show evidence of past scarring. The site is located on a low north facing ridgeline, bounded on three sides by swampland. (Fox, I. 2003). The dimensions of the scars relationship between each of the trees and the location of the site is not recorded in the official AHIMS listings.

The only part of the Study Area which contains trees which may be of sufficient age to carry scars of Aboriginal origin is Area D where mature melaleuca trees exist.

### **3.4.5 Human Burials**

A low potential for human burials exists but would apply to Area F where only the removal of tree growth appears to have occurred. Were middens to be found, the possibility of human burials would increase. The majority of human remains found in North Coast coastal sites have been associated with midden sites.



### 3.4.6 Bora/Ceremonial

A low to nil potential exists for above ground earth embankments or stone structures which may have indicated ceremonial areas. The sand based grounds of Area A/B, Area F and the northern pipeline route Area E have long since been either completely cleared and levelled, or cleared only, which would have destroyed such features.

The remaining sectors of the Study Area (Area C and Area D) are too low lying to be considered as suitable Bora/ Ceremonial areas.

### 3.4.7 Historic sites: Cudgen Burial Ground

A search of the *Register of the National Estate* (Australian Heritage Database. AHD) indicates that cultural heritage values associated with the Cudgen Burial Ground may extend into the area of the alternative northern pipeline corridor. The Burial Ground (Place ID: 19489, Place File No: 1/01/120/0024) is historically significant for its association with the South Sea Islanders whose descendents remain in this area today. "...It is possible that Indigenous cultural values of National Estate significance may exist in this place..." (Australian Heritage Database 2008:1). The Cudgen Burial Ground is described in the AHD as approximately 300m south-southeast of the Chinderah Cemetery. It extends for approximately 480m along the western side of the Tweed Coast Road. Headstones and relics were removed from the South Sea Islander burial ground to a small area in the Chinderah Cemetery in 1968, when the dedication for the cemetery was revoked. The access road to the golf range crosses over an unknown number of graves. The Cudgen Burial Ground extended southeast of the present access road to the golf range. The land is now private property (Ibid).

The exact number and distribution of South Sea Islander grave sites and possibly Aboriginal burial sites has never been determined. The AHD report contains an error in its transcription from the 'dedication' at the Cudgen Burial Ground that states the burials were from various sites on private property 30m south-southeast not 300m as stated in the AHD report. Using the measurements from the AHD report that is approximately 480m in total from and including the present Cudgen Burial Ground the proposed alternate northern pipeline corridor would cross at the most southerly area of the suggested extent of the Cudgen Burial Ground.

## 3.5 Summary of Potential Site Types

The following types of sites have nil to moderate potential to occur within the Study Area. As there are six areas of varying land uses, topographic and environmental contexts, their potential to contain sites typical of this locality is best indicated as below in **Table 1**.

## 3.6 A Predictive Model for Site Types and Locations

- MIDDEN sites may occur on elevated sand rises or sand dunes between Kingscliff, Chinderah, Cudgen and the Tweed River. Seven midden sites are recorded in the vicinity of the Study Area. These sites contain shell species gathered from both open beach (pipi) and the Tweed River estuary (oyster,

whelk, cockle). They may also contain stone artefacts, bone of fish and terrestrial animals, ochre fragments, hearths and human burials. Human burials have been found interred within a high proportion of North Coast midden sites. Human remains have been recorded from estuarine middens on the north bank of the Tweed River (Barz. 1980).

**Table 1**  
**Site Potential**

Area	A	B	C	D	E	F
Midden Sites	L	L	L	N	M	M
Open Campsites	M	M	L	L	M	M
Quarry Sites	N	N	N	L	N	N
Scarred Tree Sites	N	N	L	L	N	N
Bora / Ceremonial Sites	N	N	N	N	N	N
Burial Sites	L	L	L	L	L/M	L/M
Historic sites:burials	L	L	L	L	L/M	L
Isolated Occurrences	M	M	M	M	M	M
Note: N = Nil L = Low M = Moderate						

Potential locations of midden sites within this Study Area are the sand rises of Area F, the northern pipeline corridor Area E, and possibly Area A and B. The remaining areas, Areas C and D, are considered too low lying to be suitable campsite locations.

- OPEN CAMPSITES have been demonstrated to occur in both floodplain and sand plain locations in the lower Tweed and Tweed coast. These sites will usually consist of stone artefact scatters with the addition of small amounts of shell and ochre fragments. Open campsite # 4 - 2 - 109 is located approximately 175m southwest of Areas A and B, in terrain which appears very similar. A low to moderate potential for open campsites is applicable to the extensive sand rises of Area F and the sand based route of the northern pipeline corridor (Area E) between Area A (north) and Area F.
- SCARRED TREES are only considered to have a low potential in Area D where mature melaleuca trees may be of sufficient age to carry Aboriginal scarring or carving.
- ISOLATED ARTEFACTS these sites consist of single artefacts, which may have been discarded during tool fabrication and maintenance. They may be found in almost any situation but are commonly found on elevated areas in sand dune or on lower slopes and ridge crests.

- QUARRY SITES OR BORA/CEREMONIAL SITES have a nil/low potential to occur as archaeological sites unless there were an oral tradition among the Aboriginal community of ceremonial sites having existed within the Study Area. Quarry sites are considered only a low possibility to occur in the slope of Area D. However only basalt occurs which to date has not been identified as a quarry material.
- HUMAN BURIAL SITES on the Tweed Coast are recorded in the former sand dunes of the Fingal Peninsula and in shell middens on the Tweed River. Burial sites to date have only been found in sand substrate contexts in the lower Tweed area. The known burials are isolated or small groups associated with middens and open campsites. Burials are usually found by accidental means, through natural erosion processes or by mechanical disturbances. The strongly acidic soils in low lying areas of the floodplain are corrosive to bone and fibres. It is unlikely that skeletal materials from a human burial would survive intact for a long period of time in wet conditions unless associated with shell midden material. It is highly unlikely that human burials would survive in Areas A, B, C and D.

A low potential for burials exists where there are sand substrates. This would apply to sections of Area E where the proposed northern pipeline corridor follows the Tweed Coast Road corridor for approximately 0.5km. As the alternate northern pipeline corridor possibly crosses at the southernmost area of the Cudgen Burial Ground there is a low to moderate potential that human burials and or human remains could be encountered if sub surface works were required to install the pipeline. However, if the northern alternate corridor were required it is proposed that the pipeline would be laid on the surface, eliminating the necessity for excavation.

A potential for burials is applicable to Area F particularly the sand rises and sand plain of the western sector. The possibility of human burials or human skeletal remains, would be enhanced, were midden or open campsites found to exist.

## **4 FIELD SURVEY**

### **4.1 Aboriginal Consultation**

The Study Area is within the area administered by the Tweed Byron LALC. It is usually practice for the Land Council to appoint its Site Officer, Mr. Cyril Scott, to represent the Land Council's interest in archaeological assessments of this kind. Prior to the Piper (2005) archaeological assessment it was agreed Mr. Scott would represent the Land Council's interests as per its usual procedures. The Land Council's views on the conduct and outcomes of that assessment are contained in **Appendix A**. The Land Council was not engaged for the purposes of this desktop reappraisal as the areas of the Project previously assessed by the consultant and the Land Councils Sites Officer are unchanged.

## 4.2 Constraints to Site Detection

The constraints to site detection are influenced by previous European land uses, the area of surface exposure, the degree of surface visibility and current conditions such as land uses, natural events such as flooding, land slippage etc. The following broadly describes the conditions for site detection in each area.

### 4.2.1 Area A (Lot 21 DP 1082482) (Figure 6 - Plates 1 and 2)

**Floodplain**, low grass cover, drained and levelled for agriculture. No tree growth. Surface exposure: 80%. Visibility: mean 90%. Type: Cultivation.

### 4.2.2 Area B (Lot 2 DP 216705) (Figure 4 - Plate 3)

**Floodplain**, low grass cover, levelled. Sparse tree growth on drainage channel. Surface exposure: 80%. Visibility: mean 90%. Type: Cultivation.

### 4.2.3 Area C (Part Lot 1 DP 828298) Triangular Section Between Crescent Street and Chinderah Road (Figure 4 - Plate 4)

**Floodplain/swamp**, melaleuca forest and heavy reed/grass cover. Surface exposure: 5%. Visibility: 10%. Type: Variable grass cover.

### 4.2.4 Area D (Lot 3 DP 828298) (Figure 4 - Plate 5 and 6)

**Toe slope**, regrowth wet sclerophyll, heavy undergrowth reeds, ferns, lilies. Surface exposure: 10%. Visibility: 20%.

**Floodplain/swamp**, melaleuca forest, heavy swamp grass. Surface exposure: approximately 5%. Visibility: 80%. Type: Vehicle track exposures.

### 4.2.5 Area E (Northern Pipeline Corridor Route from Lot 21 DP 1082482 to Lot 10 DP 857710) (Figure 4 - Plates 7 and 8)

**Low sand rises**, moderate grass cover, road corridor (Tweed Coast Road). Surface exposure: approximately 20%. Visibility: 10% - 60%. Type: Various mechanical causes. The alternative northern pipeline corridor has not been subject to field inspection as a result of its inclusion following the field inspection.

\\SERVER\RW\61703\CAD\617Base\_AH Figure 6 1.DWG



Plate 1. Area A. View north east. Extensive area of surface visibility in the cultivation. (c 80%)



Plate 2. Area A. Typical example of surface visibility. (c 90%)



Plate 3. Area F. View south over eastern section of Area F. Visibility generally nil.

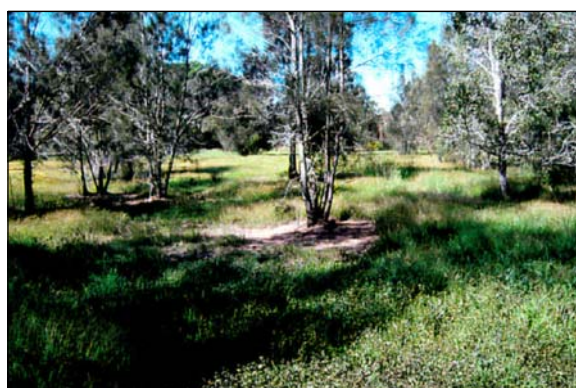


Plate 4. Area F. View south in vicinity of drain canal, eastern section of Area F. Visibility poor/ nil.



Plate 5. Area F. View east, central section, northern boundary, cable route. Visibility 50% - 100%



Plate 6. Area F. View south, central section vehicle erosion. Visibility 100%.

**Figure 6**  
**SURFACE CONDITIONS**  
**PLATES 1 - 6**

Note: A colour version of this figure is available on the Project CD



\\SERVER\IRWC\61703\CAD\617Base\_AH Figure 6 2.DWG



Plate 7. Area F. View south, central section.  
 Visibility 10% - 90%.



Plate 8. Area F. View south, central section  
 near Rotumah Street. Visibility 100%.



Plate 9. Area F. Cultivation in western section  
 (c 2 ha). Surface visibility c 70%.



Plate 10. Area F. View east, western section,  
 vehicle erosion. Visibility 100%.



Plate 11. Area F. Rubble heap containing  
 commercial oyster shell waste, 'concrete',  
 metal and plastic fittings.

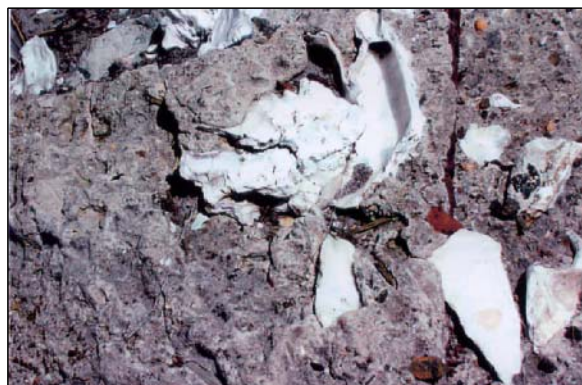


Plate 12. Area F. Rubble heap, note oyster  
 shell embedded within concrete block.

**Figure 6**  
**SURFACE CONDITIONS**  
**PLATES 7 - 12**

Note: A colour version of this figure is available on the Project CD

#### 4.2.6 Area F (Lot 10 DP 857710) (Figure 6 - Plates 3 to 12)

**Sand rises**, west of the drain, moderate fern and grass cover, a rubbish pile of concrete, metal, plastic and shell from adjacent oyster processing plant. Exposure: 75%. Visibility: average 70%. Type: Mechanical - slashing, vehicle tracks, fibre optic trenching, vehicle tracks, cultivation.

**Swale**. Immediately west of Kingscliff and east of the drain, heavy grass cover, dense *Casuarina glauca* thickets. Exposure: 10%. Visibility: 20%. Type. Mechanical spoil from drain excavation.

### 4.3 Survey Strategy - Method

Given the restrictions imposed by vegetation cover on the amount of surface area possible to inspect in each land parcel (Areas A to F) it was most practical to attempt to inspect all visible surface exposures to establish the archaeological sensitivity of the area. The inspections were carried out on foot by the Sites Officer of the Tweed Byron L.A.L.C., Mr. Cyril Scott and the Consultant.

Prior to the field inspection the Land Council was not aware of culturally significant areas or specific sites within the Study Area. However, given the close proximity of previously recorded sites to the Study Area, the Land Council is aware of the possibility of additional sites existing within the Study Area. All parts of the Study Area are accessible on foot although heavy ground cover varied surface visibility and therefore, the amount of surface area possible to inspect. Where surface exposure was extensive enough to do so, systematic transects were conducted. This was possible in Areas A, B and Area F. Where surface exposure was limited widely scattered spot checks were conducted.

Photographs were taken as a record of general features and conditions, to indicate the degree of surface visibility and the content of any sites found. Notes were made of the degree of surface visibility, the area of visibility, ground cover, land uses and any other relevant features.

### 4.4 Survey Coverage

An overview of surface conditions and site detection conditions are given in **Tables 2 to 7**.

**Table 2**  
**Area A (Lot 21 DP 1082482)**

Landform	LF Element	Area (ha)	Exposure (%)	Area of Exposure (ha)	Visibility (%)	Area for Detection (ha)	%LF For Site Detection
	Floodplain	54	80	43	90	39	72
Approximate total area available for site detection: 72%							

**Table 3**  
**Area B (Lot 2 DP 216705)**

Landform	LF Element	Area (ha)	Exposure (%)	Area of Exposure (ha)	Visibility (%)	Area for Detection (ha)	%LF For Site Detection
	Floodplain	30	80	24	90	22	72
Approximate total area available for site detection: 72%							

**Table 4**  
**Area C (Part Lot 1 DP 828298)**

Landform	LF Element	Area (ha)	Exposure (%)	Area of Exposure (ha)	Visibility (%)	Area for Detection (ha)	%LF For Site Detection
	Floodplain	1.0	5	0.05	10	0.005	1.0
Approximate total area available for site detection: 0.5%							

**Table 5**  
**Area D (Lot 3 DP 828298)**

Landform	LF Element	Area (ha)	Exposure (%)	Area of Exposure (ha)	Visibility (%)	Area for Detection (ha)	%LF For Site Detection
Hills	Top slope	2.6	10	0.26	20	0.052	2.0
	Floodplain	11.0	5	0.5	80	0.4	3.6
Approximate total area available for site detection: 5.6%							

**Table 6**  
**Area E Northern Pipeline Route**

Landform	LF Element	Area (ha)	Exposure (%)	Area of Exposure (ha)	Visibility (%)	Area for Detection (ha)	%LF For Site Detection
Sandplain	Sandrise	5	20	1	35	0.35	7
Approximate total area available for site detection: 7%							
Note: Area A section included within Table 1. Table 5 refers to the Tweed Coast Road section.							

**Table 7**  
**Area F (Lot 10 DP 857710)**

Landform	LF Element	Area (ha)	Exposure (%)	Area of Exposure (ha)	Visibility (%)	Area for Detection (ha)	%LF For Site Detection
Sandplain	Sandrisers	24	75	18	70	12.6	52
	Swale	18	10	18	20	0.36	2
Approximate total area available for site detection: 54%							

## **4.5 Results of the Assessment**

### **4.5.1 Project Site**

No Aboriginal sites or relics were found as a result of the field inspection of the Project Site (Lot 21 DP 1082482 and Lot 2 DP 216705 - referred to as Area A and Area B).



#### **4.5.2 Northern Pipeline Corridor**

No Aboriginal sites or relics were found as a result of the field inspection of the proposed northern pipeline corridor between the Project Site and the proposed fill site described as Lot 10 DP 857710 (in this report referred to as Area F).

#### **4.5.3 Eastern Pipeline Corridor**

No Aboriginal sites or relics were found as a result of the field inspection of the section of the proposed pipeline corridor within Part Lot 1 DP 828298 and Lot 3 DP 828298 (referred to as Area C and Area D). Furthermore, previous assessments (Piper 2001b, 2003a) within Lot 26C and 26D DP 10715, Lots 11 and 12 DP 871753 and Lot 4 DP 727425 also located no Aboriginal sites or relics.

#### **4.5.4 Proposed Fill Site - Area F**

No Aboriginal sites or relics were found as a result of the field inspection of proposed fill site 7 - Lot 10 DP 857710 (in this report referred to as Area F). Furthermore, previous assessments within the remaining fill sites (see **Figure 3**) have also been undertaken without locating any sites or relics.

### **4.6 Discussion of Results**

#### **4.6.1 Area A and Area B - Project Site**

The Project Site is low lying and prone to regular inundation during rain or river flooding. While the proposed extraction areas and processing area cover a total area of approximately 50ha the total area of Lot 2 DP 216705 and Lot 21 DP 1082482 (84.16ha) was considered for Aboriginal sites. Surface visibility was approximately 90% throughout, due to cultivation which allowed the surface area possible to inspect at approximately 80% of the total area.

The literature review suggested that midden sites, open campsites and isolated artefacts had a low potential to exist. Given the period of cultivation and soil spreading through levelling, it is unlikely the above sites could remain less than highly disturbed, had they existed. However, the incidence of an open campsite only 175m to the southwest, in similar terrain, increased the potential for open campsites or the scattered remains of open campsites and midden sites to remain concealed within the Project Site. The extensive area of surface visibility was adequate to conclude with a high degree of certainty that Aboriginal sites do not exist within the proposed sand extraction area. The circumstance which allowed the detection of the open campsite in the adjoining property was the total absence of ground cover and 100% of the total area possible to inspect (Piper 2000). The prevailing conditions for site detection applicable to this Study Area are similar in terms of the amount of area possible to inspect and the high degree of surface visibility.

#### **4.6.2 Area C and Area D - Eastern Pipeline Corridor**

Area C (part of the proposed eastern pipeline corridor) is a small area (approximately 1ha) of floodplain. It is low lying and often prone to inundation. Its potential for Aboriginal sites was considered nil to low. The field assessment confirmed this assessment. While the area of surface visibility was low and visibility only 10% it would appear the area would have been quite unsuitable to campsites in the past as much as the present.

The route of the proposed pipeline corridor within Area D is a continuation of the swamp conditions which prevail in Area C, although Area D contains a small area of basalt soil slope to the south. The area of surface visibility possible to inspect is small, restricted mainly to vehicle tracks in a cleared area adjacent to the Tweed Coast Road. The only type of site given a potential to occur were scarred tree sites, as the area contains a mature melaleuca forest. However no scars or carvings of Aboriginal origin were found. Quarry sites were given a low potential to occur, none were found.

The route of the alternative pipeline corridor route north of Area D is former cultivated land now pasture grassland and regrowth. This area was previously inspected and assessed by Piper (2001b). No Aboriginal sites were located and the area was not considered to have the potential to contain significant concealed sites.

#### **4.6.3 Area E - Northern Sand Pipeline Corridor**

Area E covers the route of the proposed northern pipeline corridor and includes approximately 0.5km of the Tweed Coast Road corridor, not included in Area A or Area F. The road corridor consists of a low sand rise which has been subject to a variety of mechanical disturbances which could be expected to have had a highly destructive impact upon Aboriginal sites or relics had they existed. A previous survey of this route (Davies. 1999) in relation to a telecommunications trench found no evidence of Aboriginal cultural materials. The 2005 field assessment produced a similar result.

The alternative northern pipeline corridor has not been the subject of field inspection by the consultant or Tweed Byron LALC, however, a search of the Register of the National Estate indicates that the northern extent of the alternative corridor may cross the most recent southerly extent of the Cudgen Burial Ground. It is considered unlikely that any burials would be identified during a surface inspection unless already exposed from previous activities.. If the alternative corridor were required, sand would be pumped via an above ground pipeline posing no more destructive threats to possible burials than land uses already undertaken on the land.

#### **4.6.4 Area F - Proposed Fill Site 7**

Area F contained the highest potential for Aboriginal sites and relics as it consists of an extensive area of exposed, slightly elevated (approximately 2m to 3m AHD) sand plain. There were extensive areas of surface visibility due both to the very dry conditions and extensive erosion due to vehicles and cultivation. These conditions prevail to the west of the man made canal which divides Area F. East of the canal the terrain is lower, approaching the sand dunes of the Kingscliff residential area. Surface visibility was restricted by heavy grass/fern cover and dense thickets of *Casuarina glauca* regrowth. The eastern sector of Lot 10 is prone to waterlogging and an unlikely campsite area.

The AHIMS review of recorded sites indicated an open campsite, DECC # 4 - 1 - 21, as located 225m west of the sand dunes on which residential housing and Pacific Street are located. A review (see Section 3.3) of the site card of information pertaining to the site found the description of the sites' location bore no resemblance to the given AMG 1:25000 topographic grid reference. In fact the description of the location, recorded on a 1:250000 sheet in 1961, is clearly at the western end of Wommin Bay Road approximately 91.0m east of the Tweed River and the old Pacific Highway. The corrected location of site # 4 - 1 - 21 is 1.6km northwest of its current AHIMS listing and 1.125km north west of Area F (Lot 10 DP 857710) of this Study Area. It will be recommended to the Aboriginal Heritage Unit that the grid reference be corrected.

In the process of the field assessment of the western sector of Area F, piles and scatters of oyster shell were observed adjacent to Morton Street (**Figure 6 - Plates 11 and 12**) in an area of approximately 40m<sup>2</sup>. The oyster shell was found to be embedded within concrete rubble as well as loosely packed with sand, metal, plastic and other 'introduced' material. The oyster shell is clearly not indicative of an Aboriginal midden site or open campsite. Mr. Cyril Scott, Sites Officer of the Tweed Byron L.A.L.C who was present, informed me the rubble with its 'oyster component', originated from a commercial oyster processing operation which had operated in Morton Street approximately 100m to the north. The Tweed Byron L.A.L.C. offices are approximately the same distance from the material. The mixing of shell with sand to make a form of concrete was an inexpensive method of providing strength in the absence of steel reinforcing.

## **5 RECOMMENDATIONS**

The 2005 recommendations were based upon:

- the literature review of previous relevant reports (Section 3.1);
- consultation with the Tweed Byron L.A.L.C (Section 4.1 and **Appendix A**); and
- the field inspection and its outcomes (Sections 4.5 and 4.6).

The 2007 recommendations have resulted from this desktop reappraisal in the light of the refining of the Project objectives and operations. The proposed operations and components differ from those of 2005 in that:

- alternative northern and eastern sand pipeline corridors have been introduced;
- the northern pipeline corridor is now proposed to be at approximately 1m underground instead of above ground; and
- a northern extraction area has been introduced due to the reduction in the size of the southern extraction area.

However, except for the alternative northern pipeline corridor, the areas required to be inspected for Aboriginal sites and relics are unchanged from those of the 2005 assessment. The route of the eastern pipeline corridor beyond the 2005 assessment, that is between Lot 4 DP 727425 and its termination east of Elrond Drive at Kingscliff has been assessed by Piper (2001b, 2003a) without locating any Aboriginal sites or relics. This reappraisal did not require any further field inspection. The following recommendations differ from the 2005 recommendations only in respect to the recommendations applicable to the northern pipeline corridor (see Section 5.3).

The following recommendations are specific to the designated land parcels. As no Aboriginal sites or relics were found neither a significance assessment nor specific recommendations as to site management can be made. Due to the generally good surface conditions for site detection in Areas A, B and F it is possible to state with a high degree of confidence that no Aboriginal sites or cultural materials would be destroyed or destructively impacted by the proposed sand extraction works and the use of fill and construction works in Area F. The following recommendations are made to cater for the prevailing conditions in the six (6) component areas (Areas A, B, C, D, E, F) of the Study Area.

### **5.1 Recommendation Area A and Area B (Lot 2 DP 216705, Lot 21 1082482)**

Given the high degree of surface visibility (mean approximately 90%) and the extensive area possible to inspect (approximately 80%) without locating any evidence of Aboriginal sites or relics, it is recommended that no further assessment or investigation is warranted.

There are no further archaeological or Aboriginal cultural heritage issues to be addressed in regard to Lot 2 DP 611021 and Lot 2 DP 216705, however, the following recommendation has been provided as a precautionary measure.

It is recommended that, if in the process of works involving site establishment, construction or sand extraction, Aboriginal sites or relics are identified, works at and adjacent to the material must stop. The regional Archaeologist of the DECC Coffs Harbour and the Tweed Byron L.A.L.C. must be contacted as soon as possible, who will advise as to the most appropriate course of action. Works must not proceed without authorisation of the DECC and Tweed Byron L.A.L.C.

### **5.2 Recommendation Area C and Area D (Part Lot 1 DP 828298, Lot 3 DP 828298) Eastern Pipeline Corridor**

As the eastern pipeline would be above ground and no Aboriginal sites were found, the placement of the pipeline would not damage or disturb any Aboriginal sub surface sites if they existed.

There are no further archaeological or Aboriginal cultural heritage issues to be addressed in regard to Part Lot 1 DP 828298 and Lot 3 DP 828298 or the remainder of the corridors within Lots 26C and 26D DP 10715, Lots 11 and 12 DP 871753 and Lot 4 DP 727425, however, the following recommendation has been provided as a precautionary measure.

It is recommended that, if in the process of works involving the installation of the above ground eastern pipeline, Aboriginal sites or relics are identified, works at and adjacent to the material must stop. The regional Archaeologist of the DECC Coffs Harbour and the Tweed Byron L.A.L.C. must be contacted as soon as possible, who will advise as to the most appropriate course of action. Works must not proceed without authorisation of the DECC and Tweed Byron L.A.L.C.

### **5.3 Recommendation Area E Northern Pipeline Corridor to Area F**

As the proposed northern pipeline is proposed to be placed approximately 1m below ground in sand strata, the proposed works have a potential to damage or disturb Aboriginal subsurface sites, if they exist. The alternative northern pipeline would likely be placed upon the surface, however, a survey of the alternative corridor has not been completed.

In the event that the alternative northern pipeline corridor were required, as a precautionary measure, it is recommended that an inspection of the route by a consultant and the Tweed Byron L.A.L.C. be undertaken.

It is therefore recommended that, prior to the excavation of the required trenching within the proposed northern pipeline corridor or placement of the pipes within the alternative northern pipeline corridor, a Sites Officer of the Tweed Byron L.A.L.C. be engaged to inspect the excavation and / or placement of the pipeline. The fees charged by the Land Council to be at cost to the Proponent. The Land Council should be given at least two weeks notice of the proposed works.

It is recommended that, if, in the process of the monitoring of works or any other works involving the installation of the proposed underground northern pipeline or the alternative above ground alternative pipeline, Aboriginal sites or relics are identified, works at and adjacent to the material must stop. The regional Archaeologist of the DECC Coffs Harbour and the Tweed Byron L.A.L.C. must be contacted if a Sites Officer of the Land Council is not present. Works in that area must not proceed without authorisation of the DECC and Tweed Byron L.A.L.C.

### **5.4 Recommendation Area F (Lot 10 DP 857710) Proposed Fill Site 7**

Given the extensive area of surface visibility (approximately 75%) over the elevated sand rises west of the western drain and high degrees of visibility (approximately 70%) without locating any evidence of Aboriginal sites or relics it is recommended that no further assessment or investigation is warranted.

There are no further archaeological or Aboriginal cultural heritage issues to be addressed in regard to Lot 10 DP 857710 on the remaining fill sites, however, the following recommendation has been provided as a precautionary measure.

It is recommended that, if in the process of filling and or construction works, Aboriginal sites or relics are identified, works at and adjacent to the material must stop. The regional Archaeologist of the DECC Coffs Harbour and the Tweed Byron L.A.L.C. must be contacted as soon as possible, who will advise as to the most appropriate course of action. Works must not proceed without authorisation of the DECC and Tweed Byron L.A.L.C.



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# APPENDICES

- Appendix A      Correspondence: Tweed Byron Local  
Aboriginal Land Council
- Appendix B      Coverage of Environmental Assessment  
Requirements and Environmental Issues

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# **Appendix A**

## **Correspondence: Tweed Byron Local Aboriginal Land Council**

**(No. of pages excluding this page = 1)**

2-NOV-2005 12:23 FROM:

TO: 0755691341

P:2



**TWEED/BYRON LOCAL  
ABORIGINAL LAND COUNCIL**

P.O. Box 1410  
Kingscliff, NSW 2487  
Telephone: (02) 6674 3600  
Fax: (02) 6674 3603  
E-mail: [tblc@better.net.au](mailto:tblc@better.net.au)

2.11.2005

Attention: Adrian

**Subject: The Cudgen Lakes sand Extraction proposal  
West Kingscliff**

Tweed Byron Local Aboriginal Land Council's sites representative Cyril Scott had accompanied Adrian Piper (consultant Archaeologist) for an Aboriginal heritage review of this area which is located at the above address on the 18<sup>th</sup> of August and 6<sup>th</sup> of September 2005.

The assessment aims to provide identification of Aboriginal sites and relics within the proposed sand extraction corridors, it also assess the significance of sites to the aboriginal people.

**There were 8 proposed parcels of land.**

**Cudgen Lakes sand Extraction proposal**

- Lot 2 dp 611021 and lot 2 dp 218705 (A & B)

**Proposed Eastern pumping Corridor**

- Lot 1 dp 828298 and Lot 3 dp 828298 (C & D)

**Proposed northern pumping Corridor**

- Lot 10 dp 857710 (E)

**Proposed fill area**

- Lot dp 857710 (F)

The parcels of land were cleared off all vegetation, there were no signs of Aboriginal sites or relics within the corridors. Tweed Byron Local Aboriginal Land Council fully supports Adrian Piper Recommendations of the Cudgen lakes sand extraction proposals.

Any Questions please don't hesitate to contact us on the above number

Cyril Scott

Sites Officer

Tweed/Byron local Aboriginal Land Council

# **Appendix B**

## **Coverage of Environmental Assessment Requirements and Environmental Issues**

(No. of pages excluding this page = 2)



**Table B-1**  
**Coverage of Environmental Assessment Requirements and Environmental Issues in the**  
**Aboriginal Heritage Assessment**

Page 1 of 2

ENVIRONMENTAL REQUIREMENTS RAISED BY THE DIRECTOR-GENERAL RELATING TO ABORIGINAL HERITAGE (06.01.06)		
		<b>Relevant Section(s)</b>
<b>Key Assessment Requirements</b> , namely: <ul style="list-style-type: none"> <li><i>Heritage</i> - Assess the following potential impacts of the Project (including any potential cumulative impacts that may arise from the combined operation of the Project with the existing or approved operations at the Bolster Quarry), and describe what measures would be implemented to avoid, minimise, mitigate, offset, manage and/or monitor these impacts.</li> </ul>		Sections 4.6 and 5
<b>References</b> <ul style="list-style-type: none"> <li>Refer to the draft <i>Guidelines for Aboriginal Cultural Heritage Assessment and Community Consultation</i> (Department of Environment and Conservation).</li> </ul>		Foreword
ENVIRONMENTAL REQUIREMENTS RAISED BY GOVERNMENT AGENCIES RELATING TO ABORIGINAL HERITAGE		
<b>Government Agency</b>	<b>Paraphrased Requirement</b>	<b>Relevant Section(s)</b>
Department of Environment and Conservation (15 October 2004)	Provide a description of: <ul style="list-style-type: none"> <li>the existing environment on the subject and surrounding land; and</li> <li>the proposed development and ancillary works;</li> </ul>	Section 2  Section 1.2
	Consult the general requirements from the <i>EIS Guidelines Extractive Industries – Dredging and other extraction in riparian and coastal areas</i> during the preparation of the EIS.	Foreword
	Document surveys and assessments that have been undertaken by suitably qualified persons and provide the qualifications and experience of the person(s) undertaking the work.	Section 3.1
	Describe dates, site locations, design, methodology, analysis techniques, and weather conditions at the time of the assessments and surveys. The limitations of surveys should be identified and the results interpreted accordingly.	Section 4
	Substantiate conclusions drawn in surveys and assessments with evidence resulting from those surveys and assessments.	Section 4.6
	Conduct an archaeological survey using an appropriately experienced person in consultation with the local Aboriginal community and assess the cultural heritage values of the subject property and the proposed route of the pipeline.	Section 4.1

**Table AB-1 (Cont'd)**  
**Coverage of Environmental Assessment Requirements and Environmental Issues in the**  
**Aboriginal Heritage Assessment**

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<b>ENVIRONMENTAL REQUIREMENTS RAISED BY GOVERNMENT AGENCIES RELATING TO ABORIGINAL HERITAGE</b>		
<b>Government Agency</b>	<b>Paraphrased Requirement</b>	<b>Relevant Section(s)</b>
Department of Environment and Conservation (Cont'd) (15 October 2004)	Undertake a search of the DECC Aboriginal Heritage Information Management System (AHIMS) should be made and the local Aboriginal community consulted with regard to any Aboriginal heritage issues associated with the proposed development.	Sections 3.2 and 3.3
	Record Aboriginal objects and places of significance to the Aboriginal community on a plan at the same scale as the plan of the area subject to development.	Figure 5
	Provide an assessment of the impact of the development on the identified cultural sites.	Section 4.6
	Provide a description of the measures proposed to mitigate and/or ameliorate the impact of the development on the identified cultural sites.	Section 5
	Provide a contingency plan that details the measures to be taken in the event that archaeological sites are discovered during the course of operations.	Section 5

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