

# APPENDIX H

## Archaeology and Heritage Assessment



**ARCHAEOLOGICAL SURVEYS FOR  
THE PROPOSED EAST POINT OUTFALL AUGMENTATION  
PROJECT DARWIN, NT**

**A Report for the Power and Water Corporation**

Christine Crassweller  
Begnaze Pty Ltd  
8 Wanguri Tce  
Wanguri NT 0810

September 2009

## **SUMMARY**

Begnaze Pty Ltd was contracted by Power and Water to carry out an archaeological survey over areas that may be disturbed and / or destroyed during the proposed construction of a duplicate effluent rising main that runs from the Ludmilla Wastewater Treatment Plant to East Point then out to sea.

No archaeological sites or objects were located during the survey on land. None of the features in the East Point Military Precinct, which is a protected Registered Heritage Site, will be disturbed by the project. The features that are within 100 metres of the proposed corridor are highly unlikely to be disturbed by the project as they are either behind an existing fence or are well signed and very visible. Therefore it is not considered necessary for temporary fences to be placed around the sites.

To ensure that the provisions of the It is recommended that remote sensing is carried out along the underwater section of the proposed effluent rising main to identify any anomalies on the sea bed which may represent shipwrecks.

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## 1.0. INTRODUCTION

The Power and Water Corporation is proposing to construct a new effluent rising main that runs from the Ludmilla Wastewater Treatment Plant to East Point, then out to sea. This report describes the archaeological survey that was carried out by Begnaze Pty Ltd along the proposed alignment over land and a desktop review of shipwrecks in the underwater section of the corridor.

The proposed corridor is approximately three kilometres over land and 3 kilometres under water. The approximate alignment is shown in Figures 1 and 2. Some sections of the proposed corridor is over the existing rising main. The exact location of the new infrastructure is dependent, in part, on the results of this investigation.

During construction the disturbed area will vary in width, with a minimum of 10-15 metres through existing vegetation and up to 20 metres in cleared areas. At the end of East Point, next the shoreline will be the lay-down area for equipment, pipes etc and the disturbance area there is expected to be approximately 100 x 100 metres.

The archaeological fieldwork was carried out by Christine Crassweller in August 2009.

### 1.1. Consultancy Brief.

The aim of the study is to locate and record any archaeological and historic objects or places to ensure that the provisions of the *Northern Territory Heritage Conservation Act 1991* are not contravened. The archaeological survey will be carried out as follows:

- The archaeological and heritage study will identify archaeological material within the designated area by means of a survey carried out in a manner that will ensure the highest possible coverage of the area.
- Any archaeological or heritage places, objects or classes of objects located during the survey will be recorded in such detail as to permit independent assessment of their significance. The location of any archaeological places and objects will include coordinates obtained by a Global Positioning System (GDA94). All sites will be named in order to identify the sites on the ground.
- After assessing the significance of the archaeological place or object, recommendations will be made regarding compliance with the provisions of the *Northern Territory Heritage Conservation Act 1991*.

## 2.0. THE ENVIRONMENTAL SETTING

The proposed rising main runs across the Northern Plains geomorphic unit of flat to undulating terrain that was originally covered in open eucalypt forests. This surface consists of remnants of the Koolpinyah Surface made up of Cretaceous kaolinitic claystone, clayey sandstones and siltstone (Pietsch and Stuart-Smith 1987).

The vegetation on East Point consists of remnant vine forests, revegetated areas, cleared grasslands and developed parklands. Mangrove communities border the northern coastline of the peninsula and extend west to the Ludmilla Waste Water Treatment Plant. There are *Eucalyptus* and *Pandanus* communities behind the mangroves which are now heavily weed infested (Alford 2005).

The peninsula is currently a recreational area with a man made lake, picnic areas, a horse riding school, a mangrove board walk, the Aeromodellers' Club and a military museum.

### **3.0. CULTURAL SETTING**

#### **3.1. Ethnographic background.**

Evidence of past Aboriginal use of the resources in the Darwin region documented during the late nineteenth and early twentieth century can be used to predict the type and distribution of archaeological material that may be present in the survey area. The following description outlines the subsistence strategies and settlement patterns documented.

The proposed development is located within the country of the Larrakia. Basedow (1907) and Foelsche (1882) noted that they were heavily dependent on fish and shell fish and their preferred camping areas were located near permanent water sources such as swamps and lagoons and sand ridges along the beaches. Resources used in the areas were fish, geese, ducks, turtles, crocodiles and their eggs, shell fish and the roots of water lilies and rushes. Wallabies were often ambushed along well-used paths to water. Items of material culture likely to be preserved in the archaeological record include stone artefacts, such as spearheads, grindstones and stone axes, shell mounds, and hearths made of stone or lumps of termite mounds. Foelsche (1881:5-6) recorded that the Larrakia buried their dead in shallow graves in sand deposits found in coastal areas.

#### **3.2. Historic record.**

The East Point peninsula contains the East Point Military Reserve which was the first fixed defences of Darwin, built in 1932-34 to protect the naval oil depot. It is a declared heritage place listed on the Northern Territory Heritage register and is thus protected under the *NT Heritage Conservation Act 1991*. The fortifications and 2 hectares of surrounding land were separately listed in the Register of the National Estate held by Environment Water Heritage and the Arts in 1980. The entry of a place on the Register of the National Estate does not place any direct legal constraints or control over the actions of state or local government, or private owners.

The following summary of East Point military facilities has been extracted from Bob Alford's report (2005) which describes the historic features in details. In 1932 work commenced to establish guns, magazines and other facilities. Two 6-inch guns were installed in 1933 and work commenced on the Port War Signal Station tower radio shack and engine room commenced in 1935 to receive and send messages to boats at sea and to sight ships entering the harbour. In 1938 the 6-inch guns were test fired and all were condemned and replaced successfully with Type BL X1. In 1939 the Naval Extended Defence Station which contained instruments to detect submarines was erected. An anti-submarine boom net was started in 1940 on Dudley Point and in 1941 work commenced on the construction of two 9.2-inch gun emplacements. This work was postponed after the bombing of Darwin in 1942 when all materials were moved to Berrimah to prevent them falling into Japanese hands in case of an invasion. However work recommenced in the second half of the year and completed in 1945. Two cruciform mounted 6-inch guns were installed as a temporary measure.

The Ack-ack Battery (near Colivas Street) was constructed in 1941 and in 1942 Station "L" the Radio Complex Precinct (now the Aeromodellers' Club) was built in 1942 for general signals and radio and for direction finding. Both of these facilities are within 100 metres of the proposed rising main.

In the 1960s the 9.2 inch guns and some other materials at East Point were sold to a Japanese scrap metal company and were cut up and removed. The 6- inch guns are now located in the RAAA Museum.

#### **3.3. Archaeological background.**

The majority of archaeological sites in the Darwin area are shell middens generally located within 300 metres of Darwin Harbour coastline (Burns 1996). Other sites include

human remains, artefact scatters, stone arrangements and less frequently rock art, knapping floors and quarries (Richardson 1996). All site types, including shell middens are particularly frequent on the boundaries between different biogeographic land units (Bourke 2000, Burns 1999, Burns 1996:37). The middens are dominated by *Anadara granosa*. These range in diameter from 10m to 100m and contained a range of stone artefacts consisting of flakes, pestles, grinding stones and edge ground axes made from quartz, quartzite, sandstone, porcellanite, tuff and dolerite.

There are no archaeological sites listed for the survey area on the Archaeological Site Register at the Heritage Conservation Services. The nearest recorded site is a stone fish trap located approximately one kilometre northeast of the proposed rising main.

The ethnographic and existing archaeological record highlights that there are two main landscape features that were used as a focus of human activity. Likely locations for archaeological sites are those near permanent water and the coastline boundary between the mangroves and the higher ground.

### **3.4. Historic shipwrecks**

The Historic Shipwrecks Act 1976 is maintained by the Department of the Environment, Water, Heritage and the Arts. It protects historic wrecks and associated relics, which are more than 75 years old and are located from below the low water mark to the edge of the continental shelf. Any historically significant wrecks or articles and relics which are less than 75 years old can also be declared as an historic shipwrecks. The Northern Territory has legislation under the Heritage Conservation Act 1991 which protects historic shipwrecks in bays, harbours and rivers.

There is a high potential for the presence of shipwrecks in the vicinity of the proposed submerged effluent main as it is adjacent to the main passage into Darwin Harbour.

## **4.0. METHODOLOGY**

Two pedestrian transects along the entire length of the proposed rising main that runs over land. The transects were made in a zig-zag fashion up to 20 metres from the centre line of the proposed route. As the tide was on the way out approximately 60 metres of the alignment was walked from the beach across the rocks.

A desktop review was carried out to identify any shipwrecks located within the vicinity of the submerged section of the proposed rising main corridor using the resources of the Northern Territory Heritage Advisory Services and the on - line resources provided by the Commonwealths Department of Environment, Water, Heritage and the Arts ([www.environment.gov.au/heritage/shipwrecks](http://www.environment.gov.au/heritage/shipwrecks))

### **4.1. Types of archaeological material.**

There are five types of Aboriginal sites previously recorded in this area of the Northern Territory and can broadly be defined as follows:

- *Artefact scatters*. These may contain flaked or ground artefacts and hearthstones. They occur as surface scatters of materials or as stratified deposits when there has been repeated occupations.
- *Stone arrangements*. These can range from simple cairn to more elaborate arrangements. These stone arrangements were used in ceremonial activities and represent sacred or totemic sites. Other stone arrangements were constructed for route or territory

markers, the walls of huts, fish traps or small walls to stop water from entering a rock shelter or retain the floor.

- *Rockshelter sites* contain a deposit of cultural material that has built up over time and contain flaked or ground stone artefacts, faunal material and other Aboriginal cultural remains.
- *Stone quarries* are generally sites where stone for flaked or edge ground artefacts have been extracted from an outcropping source of rock (Hiscock and Mitchell 1993).
- *Knapping sites* are discrete scatters of artefacts consisting of the remains of a single reduction event associated with the fabrication of implements.

#### **4.2. Site definition.**

An archaeological site is defined for this survey as having ten or more stone artefacts within an area of 2 m<sup>2</sup> or a concentration of artefactual material with an average density that is 5 times greater than the average density of the background scatter. A site will have an identifiable boundary where either artefact densities decrease to the extent as to be classified as background scatter or environmental features determine the boundary.

A background scatter is generally a very low density, more or less continuous distribution of artefacts over the landscape. Although these artefacts do not constitute a site they will be given location details for research purposes.

#### **4.3. Artefact identification.**

A requirement for a successful archaeological project involves the accurate identification of archaeological materials. The following principles were used in artefact identification.

Each time sufficient force is applied to the surface of an isotropic rock it will fracture into two pieces, the core and the flake. For an object to be identified as a flaked object it needs to possess one or more of the following:

- a positive or negative ring crack.
- a distinct positive or negative bulb of percussion.
- a distinct erailure scar in an appropriate position below the platform.
- definite remnants of flake scars on dorsal surface or ridges.

Stone artefacts are divided into four main technological types; cores, unretouched flakes, retouched flakes and flaked pieces (Hiscock 1984:128-129). They are defined as follows:

- *cores* are pieces of stone that have one or more negative scars and the absence of positive flake scars.
- *unretouched flakes* are pieces of stone that have been struck off another piece of stone and ideally possess platforms, positive bulbs of percussion, concentric ripples, ring cracks and /or erailure scars on the ventral surface.
- *retouched flakes* are flaked flakes. They are identified by the presence of negative scars that must have been created after the ventral surface of the flake had been created. There will be either negative scars on the ventral surface or negative scars on the dorsal surface, which have been formed by the flake being hit on the ventral surface.
- *flaked pieces* are stone artefacts that have been formed by knapping but cannot be identified as either a core or a flake.

Other artefact and implement types that have been identified in the region are listed below following characteristics outlined by McCarthy (1976) and Holdaway and Stern (2004).



- *Unifacial points* are flakes that have been retouched along the margins from one surface, either ventral or dorsal to give or enhance its pointed shape. They can be symmetrical or leaf shaped.
- *Bifacial points* are retouched along both ventral and dorsal surfaces of a flake to enhance or give the artefact its pointed shape. They may have the platform removed and the proximal end rounded.
- *Edge ground axes* have been shaped by the process of flaking, pecking and polishing. They generally have only one working edge that has been ground to a sharp margin although occasionally they may have two leading edges.
- *Grindstones* are characterized by a worn and abraded surface or surfaces. There also may be a concave surface.
- *Hammerstones* have use-wear on the surface in the form of the abrasion, pitting, edge fracturing with some negative scarring.
- *Manuports* are stone material that are not found naturally in an area and must have been carried in by humans.

#### **4.4. Assessment of significance and heritage management principles.**

According to Sullivan and Bowdler (1984) archaeological significance means that it has scientific, archaeological or research value, that is, it has the potential to assist current or future research into problems of human history or other areas of enquiry. The Australian ICIMOS Charter for the Conservation of Places of Cultural Significance, otherwise known as the Burra Charter (Maquis-Kyle and Walker 1992:73) states that the scientific value or research potential of a place depends upon the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place or object may contribute to further substantial information.

Therefore the significance of a site is firstly related to the intactness or integrity of a site, that is the state of preservation as well as the stratigraphic reliability of the cultural material. Secondly, the representativeness of a site is important either because a site is unusual or because the site has research potential when taken in conjunction with other sites. Thirdly a site may provide chronology extending back into the past.

When assessing the significance of historic sites, their aesthetic, historic and social value are also considered and consequently further criteria are used. These consist of:

- A site is associated with events, developments or cultural phases in human occupation.
- A site demonstrates a way of life, no longer practiced or in danger of being lost or of exceptional interest
- A site provides information contributing to a broader understanding of the history of human occupation.

It should be noted that historical significance would not necessarily be equated with archaeological significance, as some events may leave nothing in the archaeological record. In order to effectively manage any archaeological and historic material recorded during the survey they have been ranked according to their perceived significance.

## **5.0. RESULTS**

The surface along the entire length of the proposed rising main has been previously disturbed. The northern section of the proposed rising main corridor runs across areas of cleared corridors through vine forests that are now mown areas. There were several isolated small pockets of vine forests within the cleared areas surrounding large trees. Surface visibility on the grass areas was less than 5% as was the surrounding vine forests. There were only a few locations where the 20m wide corridor may infringe upon the vine forests. These were examined in greater detail and it appears that these areas had also been disturbed in the past

with signs of grading. Behind the picnic area the surface has been either disturbed by trenches, clearing activities or by recent revegetation in the vicinity of the mangrove board walk. Surface visibility was 30-40% in these areas except for surfaces covered in Mission Grass. The area south of the Lake Alexandria has either been completely cleared by grading or is covered in dense grass over silty soils. This area appears to have been used as a dumping ground in the past, as has another area of vine forests behind the house blocks and the old oval. The route next to the pumping station has also been highly disturbed with sections near a small freshwater creek covered in monsoon forests and surface visibility was again very poor.

No archaeological material was identified during the survey. The route also avoids all features of the East Point Military Precinct. The closest World War 11 feature of the Singapore Post located on a rocky ridge at the edge of the coast line and is approximately 50 metres east of the proposed alignment. As it is quite visible there is no need for fencing or temporary fences around the feature to highlight its presence and the need to avoid this area. The next closest World War II feature is the remains of the Ack-ack Battery near Colivas Road. This is approximately 70 metres west of the proposed alignment and has signage to draw attention to its presence. The area around the Radio Complex Precinct is protected by an existing fence.



**Monsoon forest near creek**



**Proposed laydown area**



**Edge of vine forest**



**Cleared corridors through vine forest**



**Grass covered area**

**Disturbed and re-vegetated area**

While surface visibility along the proposed rising main was very low, the lack of any identified archaeological material is not unexpected given the amount of disturbance that has occurred in the area.

**5.1. Maritime desktop review**

The desktop review did not identify protected shipwrecks within the proposed rising main corridor. However there are four shipwrecks summarised in Table 1 which may be in the survey area. Unfortunately the location details are not particularly accurate, given that the information may have been derived from an estimate of where the wreck is located. None of these wrecks are protected under any Commonwealth or Northern Territory Acts.

**Table 1. Summary of shipwrecks in area**

Name	Type	Lat	Lon	Where wrecked
DSAC Barge	Unknown	-12.426667 to -12.393333	130.819667 to 130.786333	1km off Dudley Point, Darwin Harbour
Hankow	Ship	-12.638333 to -12.305000	131.01833 to 130.68500	Due west of East Point
Yampi Lass	Lugger	-12.634833 to -12.301500	131.003167 to 130.669833	Darwin
Pinafore	Unknown	-12.138333 to -12.138333	131.018333 to 130.685000	2.5 miles out of Fannie Bay, Darwin Harbour

**6.0. RECOMMENDATIONS AND CONCLUSIONS**

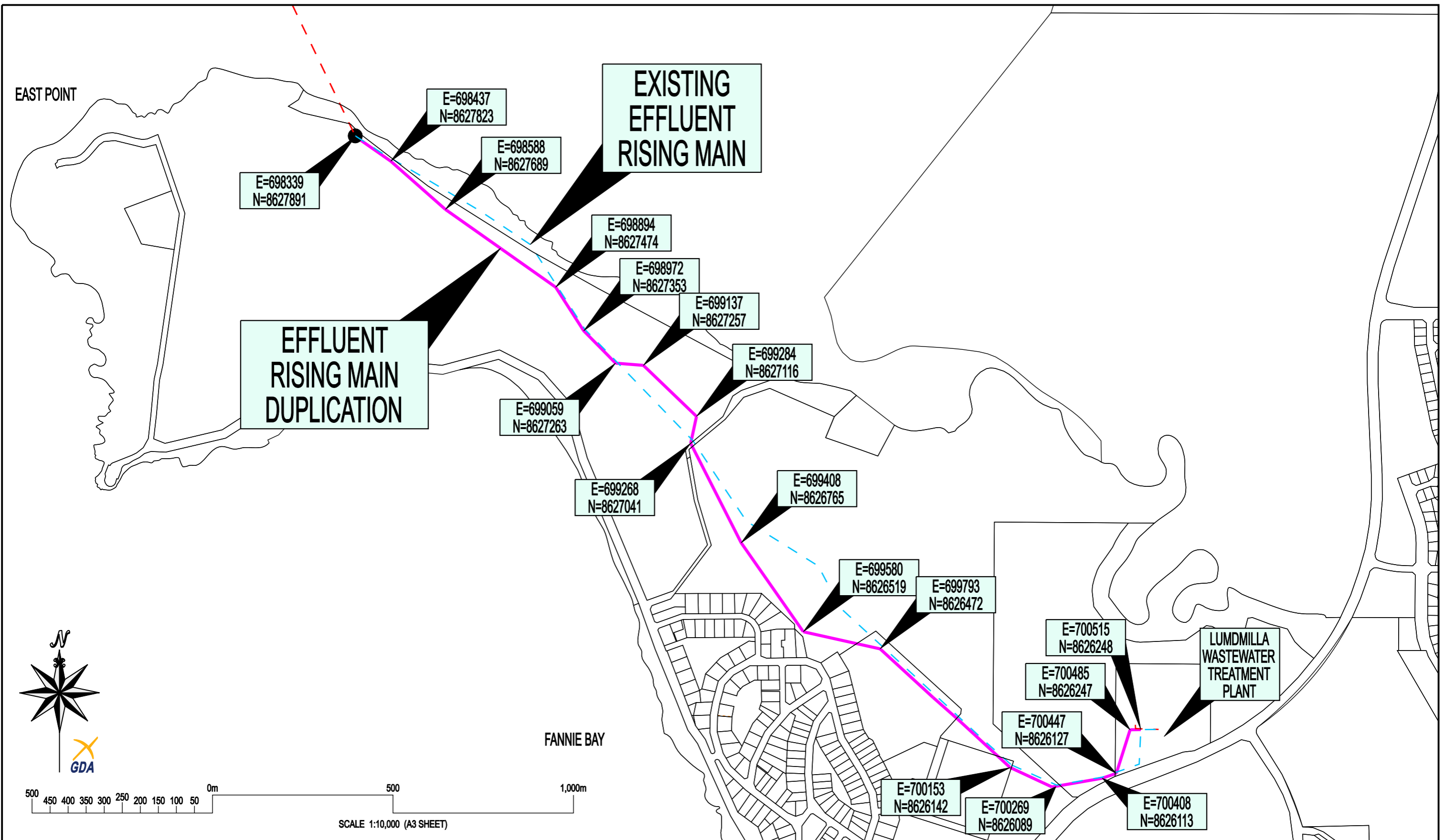
The survey of the corridor along the proposed effluent rising main on land did not identify any archaeological material. The proposed corridor also will not disturb any features of the East Point Military Reserve as the nearest feature is approximately 40 metres from the corridor. Consequently no further action is required for compliance with the provisions of the *Northern Territory Heritage Conservation Act, 1991*.

However the project could potentially damage, destroy or interfere with unidentified historic shipwrecks or relics, or known shipwrecks that have unreliable locational details. Therefore it is recommended that the remote sensing using sonar, magnetometer or bottom profiling surveys occur in the project area to identify any anomalies on the seabed to prevent possible breaches of the *Historic Shipwrecks Act*.

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**DRAWING SERVICES**  
 telephone: (08) 89857141  
**Power and Water Corporation**  
 NORTHERN TERRITORY

NO	DESCRIPTION	DRN	DATE	CKD	APPD
AMENDMENTS					



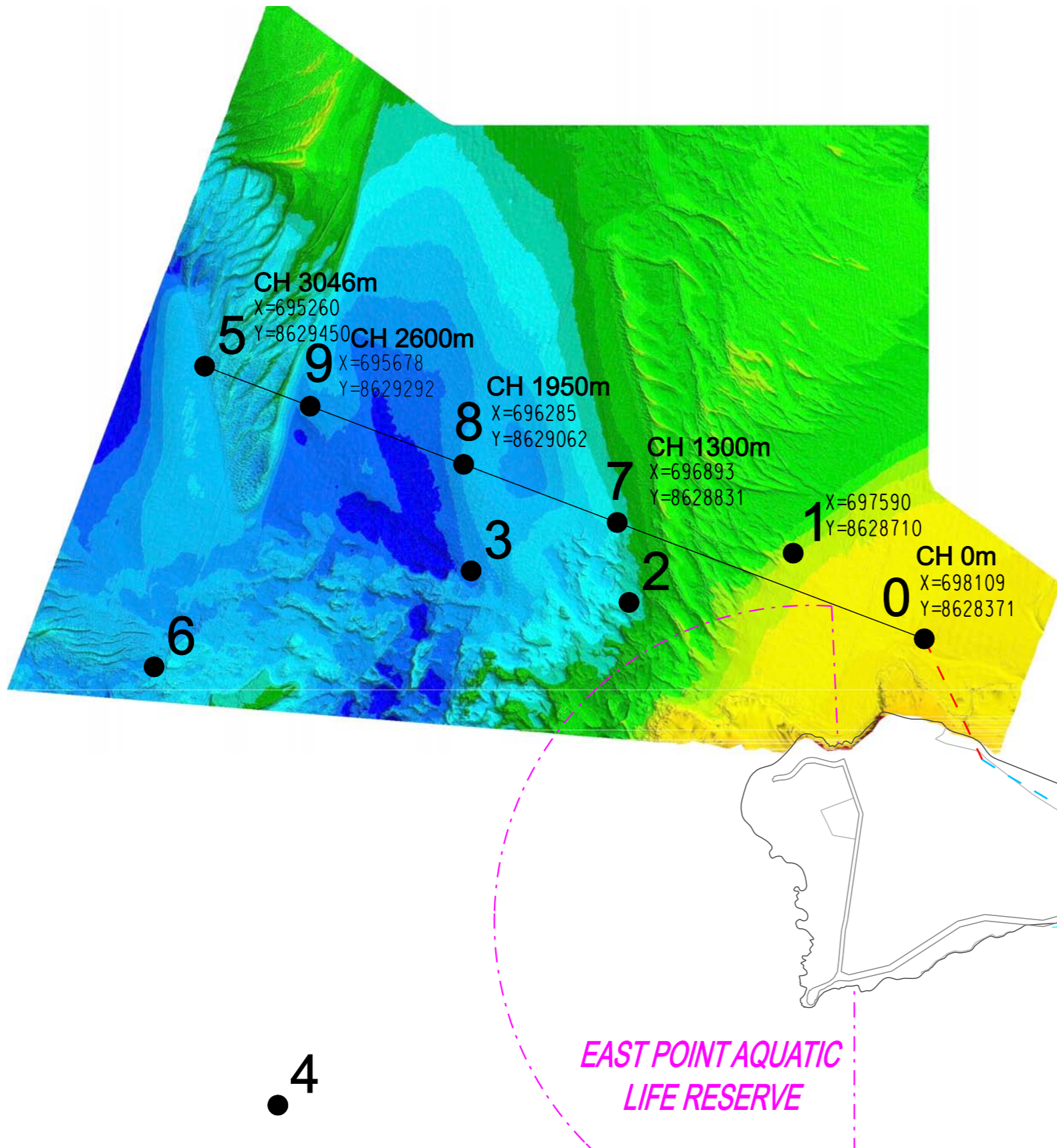
DES	PETER LOCKETT
DRN	RON INNES
CKD	PETER LOCKETT
APPD	PETER LOCKETT
SCALE	1:10,000
ISSUED	10 AUGUST 2009
ALL DIM. IN mm	
DRAFTING STANDARD TO A.S.1100	

**DARWIN SEWERAGE SYSTEM  
 EAST POINT RISING MAIN DUPLICATION  
 LOCATION DIAGRAM**

**A3** DRAWING NUMBER **B09-6781**

CAD PRODUCT - DO NOT AMEND MANUALLY





500 0m 500 1,000 1,500 2,000m

SCALE 1:20,000 (A3 SHEET)

**LEGEND**

**3<sub>6</sub>** WATER DEPTHS AT LOWEST ASTRONOMICAL TIDE  
HEIGHTS IN METRES AND DECIMETRES  
(MEAN SEA LEVEL IS 4.1m ABOVE THIS DATUM)  
UNDERLINED HEIGHTS ARE DRYING HEIGHTS ABOVE LOWEST TIDE

**0** EXISTING OUTFALL DISCHARGE LOCATION

**1-6** PREVIOUSLY MODELLED OUTFALL LOCATIONS

**7-9** NEW OUTFALL LOCATIONS TO BE MODELLED

EAST POINT AQUATIC LIFE RESERVE

EXISTING OUTFALL MAIN

PROPOSED PIPELINE ROUTE

GDA

4

EAST POINT AQUATIC LIFE RESERVE

**DRAWING SERVICES**  
telephone: (08) 89857141  
**Power and Water Corporation**  
NORTHERN TERRITORY

NO	DESCRIPTION	DRN	DATE	CKD	APPD
5	COORDINATES FOR POINT 9 CORRECTED.	RG1	AUG'09	...	...
4	BATHYMETRIC SURVEY ADDED, PORT MAP REMOVED, REPOSITION OUTFALLS 8 AND 9.	RG1	MAR'09	...	...
3	OUTFALL OPTIONS UPDATED.	AJC	JAN'09	AS	TD
2	AREA OF INVESTIGATION AMENDED.	RG1	SEP'08	...	...
1	AREA OF INVESTIGATION AMENDED	AJC	March 08	JF	TD
AMENDMENTS					

**PowerWater**  
NORTHERN TERRITORY

DES	T. DURLING
DRN	R. INNES
CKD	-
APPD	T. DURLING
SCALE	1:20,000
ISSUED	FEB'08
ALL DIM.	IN mm
DRAFTING STANDARD TO	A.S.1100

**EAST POINT SEWAGE OUTFALL AUGMENTATION INVESTIGATIONS PLAN OF OPTIONS**

A3	DRAWING NUMBER	B08-1731
DRAFTING STANDARD TO		A.S.1100
CAD PRODUCT - DO NOT AMEND MANUALLY		

