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ARCHAEOLOGY – HERITAGE – MEDIATION – ARBITRATION

WOOLLOOMOOLOO BAY SSD 6471 SYDNEY MODERN, AGNSW EXPANSION PROJECT

Maritime Archaeological Assessment – Stage 1

PREPARED BY	DAVID NUTLEY
REPORT TO	GML HERITAGE
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COMBER CONSULTANTS

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EXECUTIVE SUMMARY

The Art Gallery of New South Wales (AGNSW) is proposing a Sydney Modern, AGNSW Expansion Program under State Significant Development (SSD) 6471. GML Heritage have been engaged by AGNSW to assist in the preparing of the Heritage Impact Statement for the SSD submission. The proposal for the expansion program includes the use of seawater for temperature control at the AGNSW. This would involve pumping seawater from Woolloomooloo Bay through an intake pipe and then sending the water back to the Bay through a discharge pipe - – each matched with a redundant pipeline as backup.

The NSW Heritage Division has recommended conditions to avoid, minimise and mitigate adverse heritage impacts. These conditions included the conduct of a maritime archaeological assessment, tasked with:

1. Identifying the archaeological potential and significance of maritime heritage sites including
   - shipwrecks
   - maritime infrastructure
   - archaeological items and/or relics (both above and below water)
2. Identifying potential impacts arising from the proposal.
3. Providing procedures and management strategies for the unexpected discovery of heritage items and/or relics.
4. Assessing whether there is a need for underwater surveys to be undertaken that may require remote sensing and/or diver based investigations.

GML Heritage has engaged Comber Consultants to undertake an initial desk-top assessment. This assessment Identifies the archaeological potential and significance of maritime heritage site, and, within the limitations of a desk-top study, potential impacts arising from the proposal.

This report documents the results of a desktop assessment and has not included a site inspection.

The report makes the following recommendations:

1 1. A detailed bathymetric survey of the sea bed be conducted by the AGNSW with input from the maritime archaeological consultant to assist in identifying potential targets for a dive inspection of the study area.

2. A site inspection, including a dive survey, incorporating video and/or still photography, be undertaken prior to finalisation of plans for the path of the intake and outflow pipes. The inspection would assess the seawall and impact of the pipelines where they pass through that wall and identify the location and assess the significance of any relics lying on the bed of the bay.

3. The consultant maritime archaeologist should be contacted once the proposed method has been chosen for laying the pipes to determine the scheduling for a dive inspection of the site prior to the installation of the pipes.

4. As the pipeline seawater system pipework is to travel below ground from the intake and discharge points to the plant room, requiring trenching within the seabed, arrangements should be made for an archaeological diver to inspect the site during the trenching or immediately upon completion of each stage of trenching (dependant on the trenching method being adopted) but prior to the installation of the pipes.

5. If any relics are found during trenching, work must cease in that area and advice sought from the archaeologist.

6. The AGNSW facilitate appropriate materials conservation for any items recovered as a result of the trenching and the archival documentation, appropriate conservation and storage.

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1.0 INTRODUCTION

1.1 Background

The Art Gallery of New South Wales (AGNSW) is proposing a Sydney Modern, AGNSW Expansion Program under State Significant Development (SSD) 6471. GML Heritage have been engaged by AGNSW to assist in the preparing of the Heritage Impact Statement for the SSD submission. The proposal for the expansion program includes the use of seawater for temperature control at the AGNSW. This would involve pumping seawater from Woolloomooloo Bay through an intake pipe and then sending the water back to the Bay through a discharge pipe – each matched with a redundant pipeline as backup.

The draft proposal was submitted by AGNSW to the Department of Planning and Environment and forwarded by the Department to the Heritage Division of the Office of Environment and heritage (OEH) for review. The Heritage Division has recommended conditions to avoid, minimise and mitigate adverse heritage impacts. These conditions included the conduct of a maritime archaeological assessment, tasked with:

1. Identifying the archaeological potential and significance of maritime heritage sites including
   - shipwrecks
   - maritime infrastructure
   - archaeological items and/or relics (both above and below water)
2. Identifying potential impacts arising from the proposal.
3. Providing procedures and management strategies for the unexpected discovery of heritage items and/or relics.
4. Assessing whether there is a need for underwater surveys to be undertaken that may require remote sensing and/or diver based investigations.

In addition to the maritime archaeological assessment, the Heritage Division recommended that a Research Design and Methodology be prepared as soon as possible and before the assessment and determination of SSD 6471. As the Heritage Council conditions requires that an assessment is made to determine if excavation is required, the preparation of a Research Design and Methodology is pending the completion of a detailed investigation, including site inspection and analysis of remote sensing imagery.

The AGNSW has requested an initial desktop study, without site inspection, to provide a preliminary assessment of the need for underwater surveys or other detailed investigations. A site inspection would constitute a second stage in the assessment and inform the need, if any, for archaeological excavations. That excavations are recommended, the report would include a research design, including excavation methodology, artefact analysis and final reporting.

GML Heritage engaged Comber Consultants to undertake the desk-top assessment. This assessment Identifies the archaeological potential and potential significance of maritime heritage sites, and, within the limitations of a desk-top study, potential impacts arising from the proposal.

The locations of the sea water intake and discharge pipes is not yet finalised. The actual locations of these pipes are to be confirmed by AGNSW upon completion of a detailed survey of the sea bed.

1.2 Location

The study area lies in Woolloomooloo Bay between the Royal Botanic Gardens (RBG) and the peninsula of Mrs Macquarie's Point to the west and, to the east, Garden Island and Potts Point (Figure 1). It includes the area in which the intake and discharge pipes will extend into the bay for some 60m from the shoreline. The Domain and the Art Gallery of New South Wales are to the south-west and Woolloomooloo Finger Wharf is to the east.

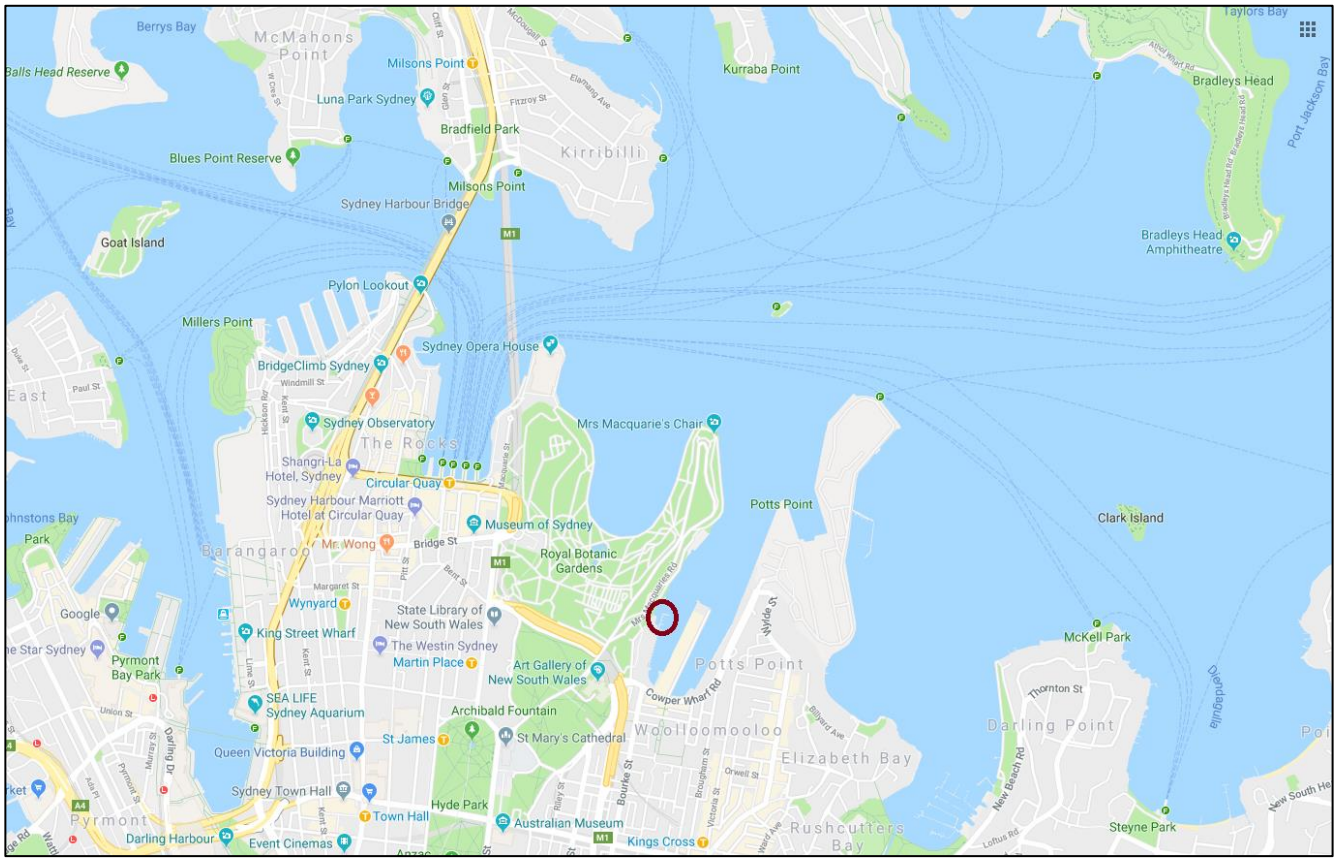

Figure 1: Location of the study area (red circle) (Google Maps 2018)

1.3 Proposal

The Sea Water Heat Exchange report for SSD 6471) (Mulcahy 18/02/2018) describes engineering aspects of the mechanical services systems that are proposed. As noted in section 2, Introduction, it is not an exhaustive compliance document for all aspects associated with the system.

The report indicates that, for redundancy purposes, there will be 2 intake pipes and 2 discharge pipes. The intake pipes have a diameter of 1200mm and the discharge pipes have a diameter of 400mm.

Figure 5.2a of that report (Mulcahy 2018:7), indicates that the concrete discharge pipes will sit 1000mm above the seabed. The relationship of the intake pipes to the seabed, ie, elevated or buried), is not described but the proposal states that the seawater system pipework is to travel 'below ground from the intake and discharge points to a plant room'. Whether elevated on supports or buried in a trench, there some trenching or other seabed disturbance will be required.

The intake from the harbour will incorporate an angled mesh basket (diameter, 1800mm) set out from an intake foot valve and will sit above the seabed.

The pipework will travel to a plant room on the western bank of Woolloomooloo Bay. The plantroom will comprise of a flooded, subterranean component and an above ground component.

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2.0 HISTORY

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SHIPWRECKS
OIL TANKS
FISHING FLEET
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2.0 HISTORY

2.1 Introduction

The history of the study area is that provided in the November 2017 Heritage Impact Statement prepared by GML Heritage for the AGNSW: Sydney Modern project.

2.2 Aboriginal Occupation and History – the Cadi

Woolloomooloo Bay is a part of the traditional lands of the Cadi, which were on the south side of Port Jackson between South Head and Darling Harbour. The Cadi spoke a dialect of the Darug language (Kohen 1993:1; Attenbrow 2002:23). Dialects of the Darug language were spoken from Botany Bay to Port Jackson, north west to the Hawkesbury and west to the Blue Mountains (Kohen 1993:9). The Darug are bounded in the north by the Dharkinjung, in the south by the Dharawal, in the southwest by the Gundungurra and in the west by the Wiradjuri (Kohen 1993:9-10; Attenbrow 2002:23). The base of the Darug community is the band (sometimes referred to as a clan), a smaller kin-based population group that occupied a region of land. The number of people within a band ranged from 25-60 (Attenbrow 2002:28-29). The band appeared to be governed by a headsman (Bradley 1969:77). The Cadi were one band of the Coastal Darug.

Cadi was the name recorded at contact for the people living in one area along the shores of Sydney Harbour. The territory the Cadi occupied runs along the southern shore of Port Jackson (Sydney Harbour) from South Head in the east to Darling Harbour in the west. The extent of the southern border is not fully known but does extend to at least Petersham (H.R. v.1:309; Turbet 1989:22; Attenbrow 2002:24).

Cadigal means man of the Cadi. It is derived from the word Cadi, the indigenous name for what is now called Watson Bay and gal the suffix for man with galleon being the suffix for a woman. Whilst the band and its population are referred to as the Cadi, a man is Cadigal and a woman is referred to as Cadigalleon (Tench 1961:292). At the time of contact in 1788, Governor Phillip estimated some 1500 Aboriginal people lived around Port Jackson from Broken Bay to Botany Bay (H.R. v1: 133, Phillip 1968: 64). The Cadi were one band of 50–60 people of this population estimate. However, occupation of their land by Colonial settlers had a devastating effect. Not only were their food and water sources usurped by the invaders, making survival difficult, introduced diseases compounded the difficulties faced by the Cadi. By 1791 smallpox swept through the Aboriginal population and according to contemporary accounts, reduced the number of Cadi to three (H.R. v1: 308-309; Collins 1910: 52–53).

The study area is adjacent to large middens, which were an accumulation of shell and other cultural material around of living areas of the Cadi, were recorded by European settlers, including those at Wogganmagule (Farm Cove) and Yurong (Mrs Macquarie's Point). At Yurong there is a midden as well as a cave site used by the Cadi for shelter. Ethnographic records and archaeological evidence within the adjacent landscape demonstrates that this area was used in a wide range of cultural practices and had an array of plant, animal and other natural resources (GML Heritage 2017:10).

Sea levels began to rise c18,000-22,000 BP until c6,000-8,000 ka BP (Nutley 2014:261; Nutley 2006:7). The ancestors of the Cadi of today witnessed their lands being consumed by the sea and contracting from around 50km east to the current coast line. Before sea levels rose, the waters of Woolloomooloo Bay would have been mainly dry land within which a small creek fed into the gradually expanding harbour. A study at South West Arm, Port Hacking, (Nutley et al 2015) has shown that the presence of caves sitting above mean high water mark (MHWM) can be an indicator of similar features submerged within adjacent waters. The cave that is located on the rocky headland of Yurong therefore suggests that similar features may have been present along the eastern face of the peninsula. Middens in that area may also have become inundated by the rising sea. (Nutley 2014 2006:1) and may have been the shell recorded as being dredged from the study area in 1908 (Sydney Harbour Trust Commissioners' report 1908:31).

The creation of the colonial farm at Farm Cove in 1788 and subsequent farm leases limited Aboriginal access to and use of the area. Some access was still occurring in the 1840s when Cora Gooseberry and Bowen Bungaree (wife and son of Bungaree, respectively) regularly camped close to Centipede Rock at Woolloomooloo Bay (GML Heritage 2017:10).

2.3 Cowper's Wharf and West Woolloomooloo Bay

Commissary John Palmer, was granted an estate at Woolloomooloo in 1793 by Governor Grose. This comprised 100 acres (40 ha) at the head of Garden Island Cove, then known as Palmer's Cove. On this estate he built Woolloomooloo Farm and

established a large orchard (Steven 1967 in GML Heritage 2017). By 1803 a small shipyard was established on the shore. The property was subdivided from 1835 onwards and it rapidly changed from a semi-rural setting to a residential and commercial suburb during the 1840s. (GML Heritage 2017:13)

Small jetties and small commercial businesses (including boat builders and a sawmill) had been established along the foreshore before 1850 (GML Heritage 2017:13)

Public bath houses became popular in the 1830s and a number of these soon appeared on the western side of the bay. The 1883 map (Figure 3) shows that these included: Robinson's Ladies Baths (1838), Robinson's Gentlemen's Baths (1838), the Corporation Male Baths (c1858–1860), the Corporation Female Baths (1860s), and Cavill's Floating Baths (c1899) (GML Heritage 2017:13). On the 1883 map their location on the natural, irregular shoreline of the western side of Woolloomooloo Bay contracts with the smooth curve of the seawall already established in Farm Cove (Figure 2).

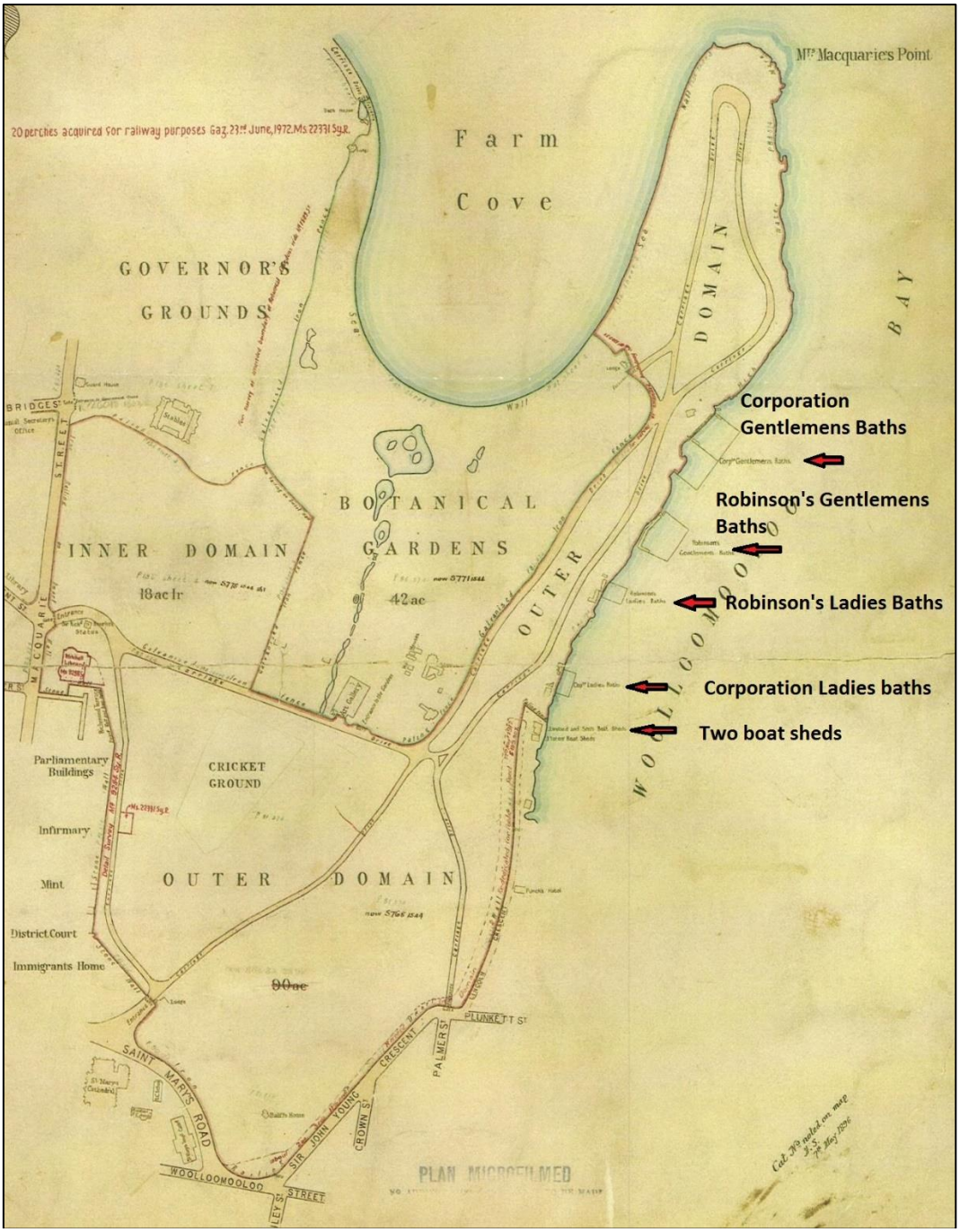

Figure 2: 1883 map showing bathing enclosures and two boat sheds on the western side of Woolloomooloo Bay (Source: Crown Plan 42-2063)

In 1901 the baths at Woolloomooloo Bay were still in use, but in a poor state of repair. State government funding was then provided for their upgrade. However, the occupancies of all baths along the western side of the bay were terminated in 1903. In 1905, the Sydney Harbour Trust's 5th Report notes that there was a State Government scheme to build five public baths on the western side of Woolloomooloo Bay but, that report also, comments on the lack of funding due to demand for 'so many public baths in the outlying suburbs' as well as the lack of public agitation for baths at Woolloomooloo (Sydney Harbour Trust 5th Report 1905:19). A new government funded bath was eventually built. This was an open concrete enclosure constructed that replaced the former floating Robinson's Baths (GML Heritage 2017:13).

The Corporation Male and Female Baths to the north and south respectively of Robinson's Ladies' Baths and Gentlemen's Baths) were open air structures (GML Heritage 2017:13).

Land reclamation at Woolloomooloo Bay began around 1852 - the major projects occurring between 1860 and 1864 in response to the growing needs for commercial maritime facilities. Accompanying the reclamation was construction of a seawall along Cowper Wharf Road. A number of small boat yards as well as the Woolloomooloo Quarantine Depot and Jetty were located in the southwestern portion of Cowper Wharf (Figure 3). The presence of the commercial wharf was in tandem with the transfer of the Sydney fishing fleet from Darling Harbour to Woolloomooloo Bay in the 1870s, drawing a new industry into the bay and leading to the development of Woolloomooloo as a working class suburb (GML Heritage 2017:13).

Figure 3: Detail of the 1903 Map of the City of Sydney, showing installations along the western shore at that time. The northern end of the Admiralty Wharf, Quarantine Jetty and Press' Floating Boat Shed are in the current study area. (Source: City of Sydney Archives)

The Corporation Ladies Baths were the baths that were closest to the growing are commercial facilities at the southern end of the western shore and, in the mid-1880s, these were demolished to make way for construction of the Admiralty Wharf. The Admiralty Wharf extended northward from Cowper Wharf (Figure 3) (GML Heritage 2017:13).

Woolloomooloo Bay is also associated with the Quarantine Station at North Head. Victims of the 1881 smallpox epidemic in Sydney were transferred to the Quarantine Station from Cowpers Wharf. The association of the study area with quarantine extended into the late nineteenth century through the addition of the Quarantine Depot and Jetty to the north of the Admiralty Wharf (Figure 3). The 1901 plague saw those who had fallen victim to the disease followed in the wake of the 1881 smallpox patients, and were ferried to the Quarantine Station at North Head. Again, during the 1918–1919 influenza pandemic, the Depot and Jetty were put into use (GML Heritage 2017:13,14). Then, on 23rd December 1904, the Quarantine Depot was withdrawn from the control of the Sydney Harbour Trust Commission (SHT_1905- Sydney Harbour Trust Commissioners' 5th Report 30-6-1905:18). The depot is believed to have been demolished during the 1930s. The exact date has not yet been determined, however, the facility is no longer present in aerial photographs from the early 1940s.

In the mid-1880s, Press' Boat Shed, owned by Henry Press, was built between the Quarantine Jetty and Robinson's Ladies Bath It was a floating structure where he kept small boats including rowing sculls for hire (Figure 3) (GML Heritage 2017:14).

2.4 Shipwrecks

Two shipwreck events are reported to have occurred in Woolloomooloo Bay. (New South Wales Maritime Heritage Sites database, accessed 15-02-2018)

1. ss *Young Charlie* 1882-1900
   The boiler of the 16m, 21-ton, single screw steamer exploded at Dangar, Gedye and Co's Wharf, Woolloomooloo on the 21st April 1900. There is no mention whether the vessel sank but due to its position at the jetty would have needed to have been removed to maintain access to those wharves.

   The Master and two crew members were on board at the time of the incident and there was one death. The *Young Charlie* was built by Rock Davis in Brisbane Water, NSW (ON 83709) and was registered in Sydney. (The Sydney Morning Herald, Mon 23 Apr 1900:7)

   The location of Dangar, Gedye & Co. Ltd wharf at Woolloomooloo is shown in a 1903 map to have been on the south-eastern shore of the bay and over 300m south-east of the study area (Figure 3).

2. *W H Lincoln* 1881-1892
   On the 4th of January 1892 the W H Lincoln caught fire at Cowper Wharf, at the southern end of Woolloomooloo Bay, upon arrival from Puget Sound in the State of Washington, USA. There were no deaths in the incident The 1727 ton wooden ship was built in 1881 in Newbury, Massachusetts, USA (ON 80856), and registered in Boston. (SMH 6/1, 3/2, 14/1/1892 Lloyd's Register 1891-92). There is no mention whether the vessel sank but due to its position at the jetty would have needed to have been removed to maintain access to Cowper Wharf.

2.5 Oil Tanks

Garden Island, and therefore the waters of Woolloomooloo Bay, has been associated with the navy since the arrival of the First Fleet in 1788. Oil tanks for the Navy were initially constructed on Garden Island in 1917 but were inadequate for the demands of World War II. New oil tanks were therefore installed on an area of land that the Department of Defence leased from the Domain. This was located behind Lincoln Crescent to the south of the study area. The works were undertaken in association with the construction of the Captain Cook Graving Dock at Garden Island which began in August 1940. During World War II this area was the base for fleet operations and the Captain Cook Graving Dock became one of the most important naval bases in the southern hemisphere.

The works for the expansion of the naval base included the graving dock as well as additional wharfage, repair shops and a fitting-out wharf with cranes, plus the additional oil tanks. The aim was to create a major repair facility for all types of warships. Between 1942 and the end of the war in the Pacific, some 4400 men and women laboured night and day to construct the facility. In February 1942 Singapore fell to the Japanese and Sydney's graving dock became essential to re-establishment of naval supremacy in the region.

The tanks supplied fuel to ships at Garden Island until 1984–1985 when they were decommissioned.

(GML Heritage 2017:21,22)

2.6 Fishing Fleet

Forty years after being transferred to Woolloomooloo Bay, the Sydney Fishing Fleet was relocated away from the bay in 1910. Construction of the Woolloomooloo finger wharf began at this time and the turpentine piled structure was completed in 1913. The wharf was lengthened in 1916 to 400m and is 64m wide. The finger wharf was designed to accommodate the loading and unloading of goods as well as the embarkation and disembarkation of passengers. As a result, Woolloomooloo became a major goods and passengers port, serving nor only wool exports but also troops during World War I and World War II (GML Heritage 2017:14).

2.7 Other construction and demolition works

The 1905 Sydney Harbour Trust Commissioners' report refers to the "Extension of Berthing Accommodation at Woolloomooloo". This extension was undertaken to facilitate the berthing of large steamers at Wharves Nos. 5 and 7, and included the removal of 'the old " metal" jetty'. (SHT_1905- Sydney Harbour Trust Commissioners' 5th Report 30-6-1905:13). This metal jetty may be the thin jetty running north from Cowper Wharf in Figure 3. The 1908 Commissioner's Report refers to the metal 'jetty' as the metal 'wharf' and records the construction of a small adjoining wharf for landing explosives (Sydney Harbour Trust Commissioners' 8th report 1908:27). This report also records dredging 'stones and shell' at the site for the 'Municipal Baths' which was nearing completion and of sand and timber at the Corporation Baths (Sydney Harbour Trust Commissioners' report 1908:31).

Even with the advent of the finger wharf, the longshore wharves along the western side of the bay at Lincoln Crescent remained in use.

The Robinson's Ladies Baths were demolished in 1957 although it is reported that an outline of that structure is still visible along the present foreshore. Press' Boat Shed remained in use well into the late twentieth century. (GML Heritage 2017:14).

2.8 Dredging in the bay

While the full extent of dredging within the Bay has not been determined within the scope of this report, dredging works in the harbour are included in the reports of the Sydney Harbour Trust Commissioners. In their 5th report for the 12 months ending 30th June 1905 there is reference to dredging at Cowpers Wharf and ad Admiralty Wharf, ie:

- Cowper Wharf, Woolloomooloo Bay, 27,950 tons Clay and mud by the dredge *Sydney*
- Admiralty Wharf, 1,900 tons Rock and clay by the dredge *Sydney*
- Admiralty Wharf, 150 tons Clay etc by 15-ton Crane

(SHT_1905- Sydney Harbour Trust Commissioners' 5th Report 30-6-1905:13) (SHT_1905- Sydney Harbour Trust Commissioners' 5th Report 30-6-1905:13) (SHT_1905- Sydney Harbour Trust Commissioners' 5th Report 30-6-1905:16)

3.0 ARCHAEOLOGICAL CONTEXT

ARCHAEOLOGICAL POTENTIAL
PHASES OF OCCUPATION AND SIGNIFICANT ACTIVITIES IN WOOLLOOMOOLOO BAY
ASSESSMENT OF ARCHAEOLOGICAL POTENTIAL
CONCLUSION

3.0 ARCHAEOLOGICAL ASSESSMENT

3.1 Archaeological potential

To undertake an archaeological assessment, it is necessary to assess whether an area contains archaeological potential. For the purposes of this report "archaeological potential" is the likelihood of a site to contain archaeological deposits that are protected by the relics provision of the NSW Heritage Act 1977 (amended).

Such an assessment is guided by an understanding of the site as revealed through historical research and a site inspection. This report contains detailed historical research.

It is useful to identify the level of archaeological potential as low, medium or high. This indicates the level of impact on the potential archaeological resource and hence the likelihood of intact archaeological deposits remaining. The degree of archaeological potential does not necessarily equate with the identified level of significance. An area may be mostly intact but it may be assessed as having minimal heritage significance.

The following definitions of high, medium and low archaeological potential will be used to assess the archaeological potential of individual items identified through the historical research.

A **high level of archaeological potential** indicates that there is a high probability that the archaeological remains of a structure or structures are reasonably intact as there have been little or no impact following the demolition of the known structures.

A **medium level of archaeological potential** indicates that there is a medium probability that the archaeological remains of a structure are partially or mostly intact but there has been some impact on its integrity through later development.

A **low level of archaeological potential** indicates that there is a low probability that the archaeological remains survive as there have been extensive impacts by known later development or works.

3.2 Phases of Occupation and significant activities in Woolloomooloo Bay

To assist in determining the archaeological potential the site has been divided into two phases of occupation – (1) Pre-colonial and (2) Colonial and post-colonial. Within these phases key activities are listed. This is followed by an identification of significant features that may have been associated with that usage followed by factors that may have disturbed or destroyed that physical evidence. This analysis provides a framework which assists in determining archaeological potential.

Phase	Activities	Potential significant features	Disturbance factors	Predicted surviving evidence in the study area
Pre-colonial history	The Cadi – habitation and use of coastal resources	Submerged rock shelters & middens	- Land reclamation 1852-1864 - Seawall construction - Bathing pavilion construction - Wharf construction - Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - Dredging	- Seawall and wharf construction in the study area will have removed or obscured any shoreline caves. - Middens, whether consolidated or unconsolidated, will have been destroyed through construction of the wharf and seawall. - Powerful prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf and adjacent waters would have, randomised and dispersed any midden material that remained outside of the wharf and seawall.

Phase	Activities	Potential significant features	Disturbance factors	Predicted surviving evidence in the study area
Colonial and post-colonial history	Early commercial 1803 to 1850s	Remains of and miscellaneous items associated with: - 1803 shipyard - small wooden jetties - small commercial businesses (eg, boat builders and a sawmill)	- Land reclamation 1852-1864 - Seawall construction - Bathing pavilion construction - Wharf construction - Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - Dredging	- The small scale of the early shipyards and jetties would have had a minor footprint within the bay. The bases of the pylons could be present beneath the sediment within the bay. In the absence of any record of a large vessel being wrecked in the study area, any wrecked watercraft would be limited to small wooden craft. However, due to the small scale of such vessels and of the jetties, any remains would have to be buried in undisturbed silt. b - Powerful prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf and adjacent waters would have dispersed this material but some items, particularly metallic or ceramic items may survive.
	Commercial 1860s – 1899	- Post 1864 formalised seawall along Cowper Wharf Road - Small boat yards, eg Ireland's - Woolloomooloo Quarantine Depot and Jetty	- Modifications and maintenance works to seawall - Demolition/removal of boat yard facilities - Demolition of jetty - Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - Dredging	- Demolition material and miscellaneous equipment from this period is likely to have been deposited in the bay. - The presence of boatyards is also likely to have resulted in the deposition of some tools and miscellaneous items from this period. In the absence of any record of a large vessel being wrecked in the study area, any wrecked watercraft would be limited to small wooden craft. - Prop-wash would have dispersed this material but some items, particularly metallic or ceramic items may survive.
		Shipwreck: *W H Lincoln* 1892 – burnt at least 250m from the study area	- Salvage - Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - dredging	The *W H Lincoln* burnt and sank at the Cowper Wharf at the southern end of the Bay. Given the restricted space within the bay and the volume of large shipping movements and the availability of heavy lifting equipment, the vessel would have been salvaged. While there is potential for articles associated with this shipwreck to be present within the vicinity of the incident, their presence within the study area can be discounted.

Phase	Activities	Potential significant features	Disturbance factors	Predicted surviving evidence in the study area
	Recreational 1838-1899	Remains of and miscellaneous items associated with public bath houses: - 1838 Robinson's Ladies Baths - 1838 Robinson's Gentlemen's Baths - c1858–1860 Corporation Male Baths - 1860s Corporation Female Baths - c1885 Press' Boat Shed - floating structure for boats including rowing sculls - c1899 Cavill's Floating Baths	- Land reclamation 1852-1864 - Seawall construction - Bathing pavilion construction - Wharf construction (including mid-1880s demolition of the Corporation Female Baths in 1880s for construction of the Admiralty Wharf as an extension to the existing Cowper Wharf) - 1957 demolition of Robinson's Ladies Baths - Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - Dredging	- None of the bath houses are within the direct path of the proposed pipelines. - In the absence of any record of a large vessel being wrecked in the study area, any wrecked watercraft would be limited to small wooden craft. - Prop-wash would have dispersed this material but some items, particularly metallic or ceramic items may survive.
	Health: late 1800s to 1930s	Quarantine Depot and Jetty to the north of the Admiralty Wharf.Miscellaneous items associated with the use of the Quarantine Station and jetty may have been deposited within the Bay.	- Demolition in 1930s - Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - Dredging	- Prop-wash would have dispersed this material but some items, particularly metallic or ceramic items may survive.
	Post-Federation - recreational	- Remains of bathing pavilions - Items associated with use of the longshore Admiralty Wharves at for passengers and goods.	- Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - Dredging - Wharf construction	- Prop-wash would have dispersed this material but some items, particularly metallic or ceramic items may survive.
	Commercial, post Federation	Shipwreck: ss *Young* 1900 – sank over 300m south-east of the study area	- Salvage - Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - dredging	Given the restricted space within the bay and the volume of large shipping movements and the availability of heavy lifting equipment, the ss *Young Charlie* was certainly salvaged. Therefore, it is highly unlikely that articles associated with this shipwreck will be present within the area of the proposed works.

Phase	Activities	Potential significant features	Disturbance factors	Predicted surviving evidence in the study area
	Commercial fishing: 1870s-1910	Discarded fishing equipment	- Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - Dredging	- Prop-wash would have dispersed this material but some items, particularly metallic or ceramic items may survive.
	Defence – since 1788	Discarded military equipment from use of the Admiralty Wharf and nearby Garden Island and including military activities associated with: - early colonial - World War 1 - World War II	- Prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf - Dredging	- Prop-wash would have dispersed this material but some items, particularly metallic or ceramic items may survive.

3.3 Assessment of archaeological potential

Shipwrecks and discarded fittings and equipment
The is a **very low potential** for shipwreck material to be present in the study area or to be impacted by the proposed works.

The NSW Shipwreck Database identifies two shipwrecks events within Wooloomooloo Bay but none with potential to be within 250m of the study. Although the records do not record whether the vessels actually sank, in both cases they disappear from Lloyd's Register of shipping. This indicates that they were most likely removed and broken up. The most recent event was in 1900. This date, along with their distance from the study area and subsequent dredging works precludes the potential for remains of either of these vessels, or associated relics, to be located in the study area.

While there is potential for items such as small wooden craft that may have sunk accidentally or have been scuttled subsequent to dredging, it is unlikely that these will have survived the environment of regular scouring and aeration of the sediment associated with prop-wash from large vessels.

There is a **medium potential** for non-shipwreck material discarded during repairs to vessels to be present in the study area. These may include anchors associate with use of the harbour since 1788. Discarded engine blocks, propellers and other metallic components could survive as debris in the study area.

Bathing pavilions
The is a **very low potential for** structural or other remains associated with the bathing pavilions to be present in the marine component of the study area or to be impacted by the proposed works.

Beneath the former Quarantine Wharf the proposed pipeline runs along the western edge of the former Corporation Ladies Baths and skirts the northern extent of those baths. The site of the Corporation Ladies Baths now lies beneath the current wharf. Given the enclosed nature of those baths, miscellaneous materials associated with their use is not likely to have extended east or north into the bay. Any surviving structural remains will be beneath the current wharves rather than the marine zone.

Maritime structures and associated relics
The proposed pipelines run beneath the former Quarantine Depot wharf established in the 1880s and through the present seawall and into the bay. There is **high potential** for surviving remains of earlier seawalls and wharves to survive *in land-fill behind the present seawall*. There is evidence of sandstone seawalls along the Admiralty Wharf (pers comm, Don Wallace 29-02-2018).

There is **medium potential** for structural remains of the Quarantine jetty to be present in the *marine portion of the study area* the study area.

Items associated with the Quarantine Depot Wharf and Jetty could include small items dropped or discarded by people from those structures as well as general equipment associated with the vessels arriving and departing. The Quarantine Jetty was withdrawn from the control of the Sydney Harbour Trust Commissioners in 1905 and demolished in the 1930s. The history of dredging in this area, which extended into the twentieth century will have removed much of this evidence in the marine zone. There is a **low potential** for such items to be present in the marine portion of the study area.

After extending through the seawall the two sets of pipelines travel easterly and extend 75-80m into the bay. They travel parallel for some 30m before one set diverges north-east for about 55m. The pipelines pass between the former Quarantine Jetty, (less than 10m to the south) and cross the SE corner of the former Press' Floating Boat Shed. Items associated with the boat shed are could include timbers discarded during maintenance and repair works to vessels as well as other tools and other equipment. The proposed pipeline is also about 100m west of the Finger Wharf. Prop-wash from tug boats assisting large passenger ships to arrive and leave their berths can be expected to have impacted on this zone although any heavy objects such as anchors or propellers could remain *in situ*. This area may have been subjected to twentieth century dredging.

Conclusion

Although incomplete, the record of dredging works in the Bay has been shown to have occurred from at least the first decade of the twentieth century. These works will have removed most physical evidence of activity in the study area prior to dredging. However, advice received for the New south Wales Port Authority is that very little dredging now takes place within Sydney Harbour. This is due to the stability of the harbour bed and lack of accumulated sediment (pers comm Ryan Bennett NSW Ports Authority 15-02-2018). The Commissioners' report of 1934, supports this observation where the only references to dredging are for maintenance dredging. However, as it is not known where dredging actually took place in the bay or when dredging last occurred within the study area, deposition of cultural material in the study area potentially includes material spanning the 2 world wars to the present.

Within, and adjacent to, the study area, disturbance has occurred in the form of dredging and prop-wash from ferries, merchant ships, passenger ships and naval vessels using the long wharf, finger wharf. The disturbance of prop-wash emanating from these large, powerful vessels has the ability to regularly disturb sediments in shallow waters of a bay. The process aerates the sediments and can hasten decomposition of organic materials and abrade harder materials such as ceramics and small metal objects. It can also redistribute, redeposit and rebury those items. The most likely form of organic cultural deposits would be the remains of piles associated with former structures such as the Quarantine Jetty. Any organic materials, including structural timbers associated with small or larger vessels have survived, these would need to be buried in anaerobic sediment for most of the time since they were discarded.

It is therefore concluded that the path of the proposed pipeline may impact on cultural material dating from the usage of the adjacent foreshores, wharves, bathing pavilions. These deposits have the potential to represent themes of commerce, defence, health and recreation. The potential archaeological significance of those items is contained in Section 4 below.

4.0 SIGNIFICANCE ASSESSMENT

HERITAGE SIGNIFICANCE
BASIS OF HERITAGE SIGNIFICANCE
STATEMENT OF SIGNIFICANCE

4.0 SIGNIFICANCE ASSESSMENT

4.1 Heritage Significance

This assessment of significance is in accordance with the Heritage Branch 2009 guidelines: *Assessing significance for historical archaeological sites and relics*.

Apart from NSW State guidelines, the nationally recognised Australia ICOMOS Charter for the Conservation of Places of Significance (*The Burra Charter*) also defines 'cultural significance' as meaning:

'*aesthetic, historic, scientific and social value for past, present and future generations.'*

Significance is therefore an expression of the cultural value afforded a place, site or item.

4.2 Assessment

Criteria to identify whether the archaeological resource is of Local or State significance.

Criterion (a): *Historic Significance - (evolution)*
an item is important in the course, or pattern, of NSW's cultural or natural history (or the cultural or natural history of the local area).
The use of the foreshores for the wharfage that serviced commerce, immigration, health and defence, and the construction of bathing pavilions for recreation, are important components of the NSW's cultural history in an area that has had significant impact on the growth of the State. Any cultural material in the study area that dates from that usage of the adjacent are physical documentation of that cultural history. Potential significance at a State level.

Criterion (b): *Associative Significance* – (*association*)
an item has strong or special association with the life or works of a person, or group of persons, or importance in NSW's cultural or natural history (or the cultural or natural history of the local area);
Cultural items within the sediments of the study area, adjacent to and, in part, associated with the usage of the State Heritage Listed Royal Botanic Gardens, have potential to be associated with the lives of fishers, defence personnel, immigrants and people engaged recreational activities in Woolloomooloo Bay since the nineteenth century. Potential significance at a local level.

Criterion (c): *Aesthetic Significance - (scenic qualities / creative accomplishments)*
an item is important in demonstrating aesthetic characteristics and/or a high degree of creative or technical achievement in NSW (or the cultural or natural history of the local area);
There is not sufficient evidence to suggest that the potential items within the study area would meet this criterion.

Criterion (d): *Social Significance - (contemporary community esteem)*
an item has a strong or special association with a particular community or cultural group in NSW for social, cultural or spiritual reasons (or the cultural or natural history of the local area);
There is not sufficient evidence to suggest that the potential items within the study area would meet this criterion.

Criterion (e): *Technical/Research Significance - (archaeological, educational, research potential and scientific values)*
an item has potential to yield information that will contribute to an understanding of NSW's cultural or natural history (or the cultural or natural history of the local area);
Cultural items within the sediments of the study area, adjacent to and, in part associated with the usage of the State Heritage Listed Royal Botanic Gardens, have potential, through archaeological investigation to contribute to understanding about the evolution of NSW history and the lives of fishers, defence personnel, immigrants and people engaged recreational activities in Woolloomooloo Bay since the nineteenth century.
Potential significance at a State level.

Criterion (f): *Rarity*
an item possesses uncommon, rare or endangered aspects of NSW's cultural or natural history (or the cultural or natural history of the local area);
There is not sufficient evidence to suggest that the potential items within the study area would meet this criterion.

Criterion (g): *Representativeness*
an item is important in demonstrating the principal characteristics of a class of NSW's cultural or natural places of cultural or natural environments (or the cultural or natural history of the local area).
Cultural items within the sediments of the study area have the potential to be representative of phases in evolution of NSW history and the lives of fishers, defence personnel, immigrants and people engaged recreational activities in Woolloomooloo Bay since the nineteenth century.
Potential significance at a local level.

4.3 Statement of significance

Cultural items within the sediments of the study area, adjacent to and, in part associated with the usage of the State Heritage Listed Royal Botanic Gardens, have potential to represent and contribute to understanding about the evolution of NSW history through an important gateway to the State and to understanding of the lives of fishers, defence personnel, immigrants and people engaged in recreational activities in Woolloomooloo Bay since the nineteenth century.

5.0 IMPACT AND MITIGATION

IMPACTS
MITIGATION PRIOR TO INSTALLATION OF THE PIPES
MITIGATION DURING INSTALLATION OF THE PIPES

5.0 IMPACT AND MITIGATION

5.1 Impacts

The manner in which the proposed intake and discharge pipes for the AGNSW climate control plant will be set within the bay has not yet been determined. If the pipe is to be laid proud of the sediment within the Bay it will have no significant impact. If trenching is to take place there is potential for impacts on cultural items within the sediments of the study area.

The area beneath the wharf has some potential to impact on the pre-Quarantine Wharf shoreline and any seawalls dating from that era which are not accessible for inspection at this time. The proposed pipeline will however be required to penetrate through the s1880s seawall of the 1880s Quarantine Wharf (Figure 4). This desktop assessment was unable to determine the nature or current condition of that seawall and whether it is in an original state or has been upgraded with modern materials.

The path of the proposed pipeline is shown in Figure 4 and Figure 5 in relations to the 1883 shoreline (red) and the 1903 shoreline (light blue). The two mauve rectangles show the Corporation Ladies Baths under the northern end of the long wharves and the Robinson's Ladies Baths to the north of the study area.

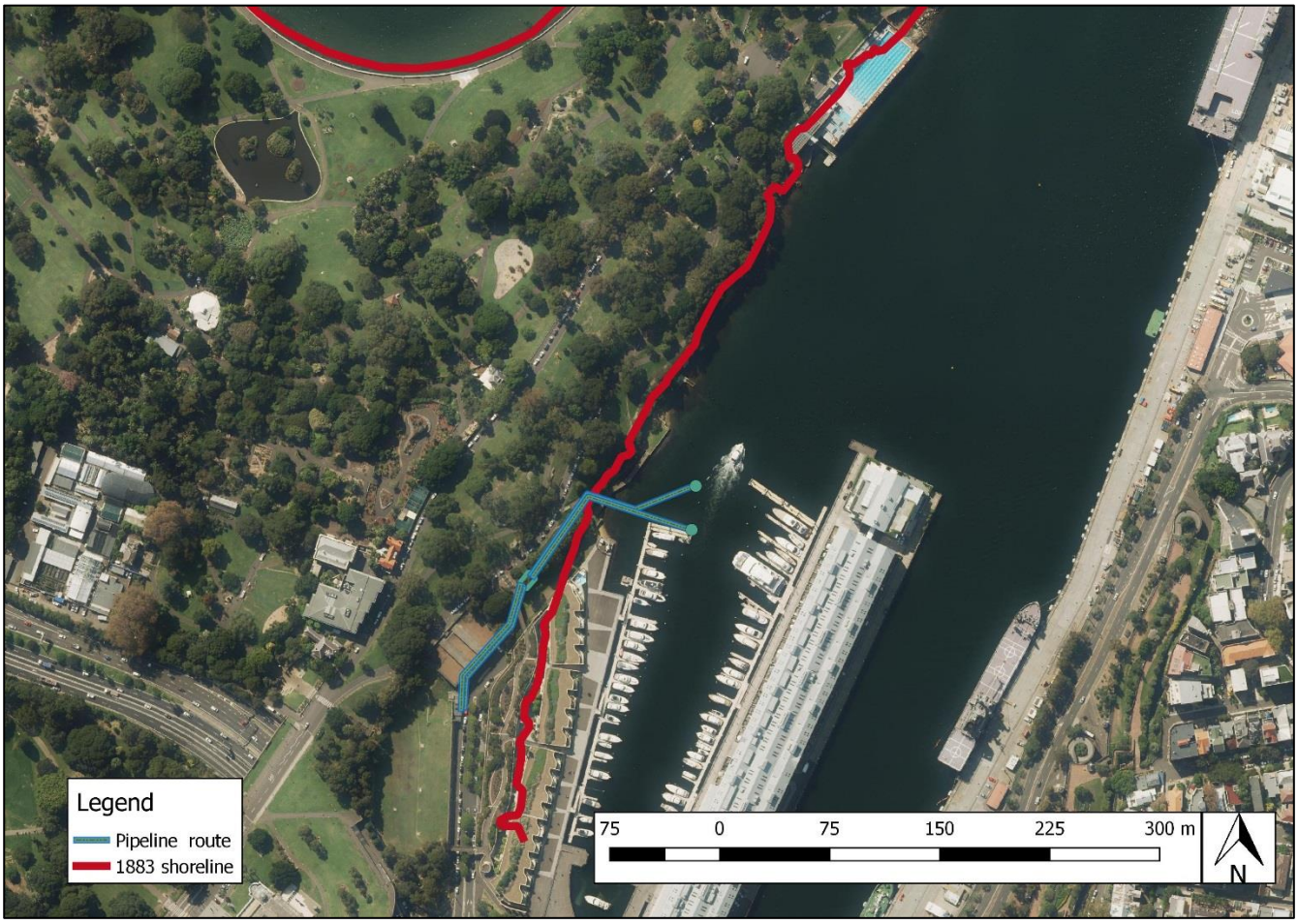

Figure 4: Overlay on aerial photograph showing the route of the proposed pipeline in relation to the current features on the western shore of Woolloomooloo Bay. (Source: Nearmap with GIS overlay by Comber Consultants)

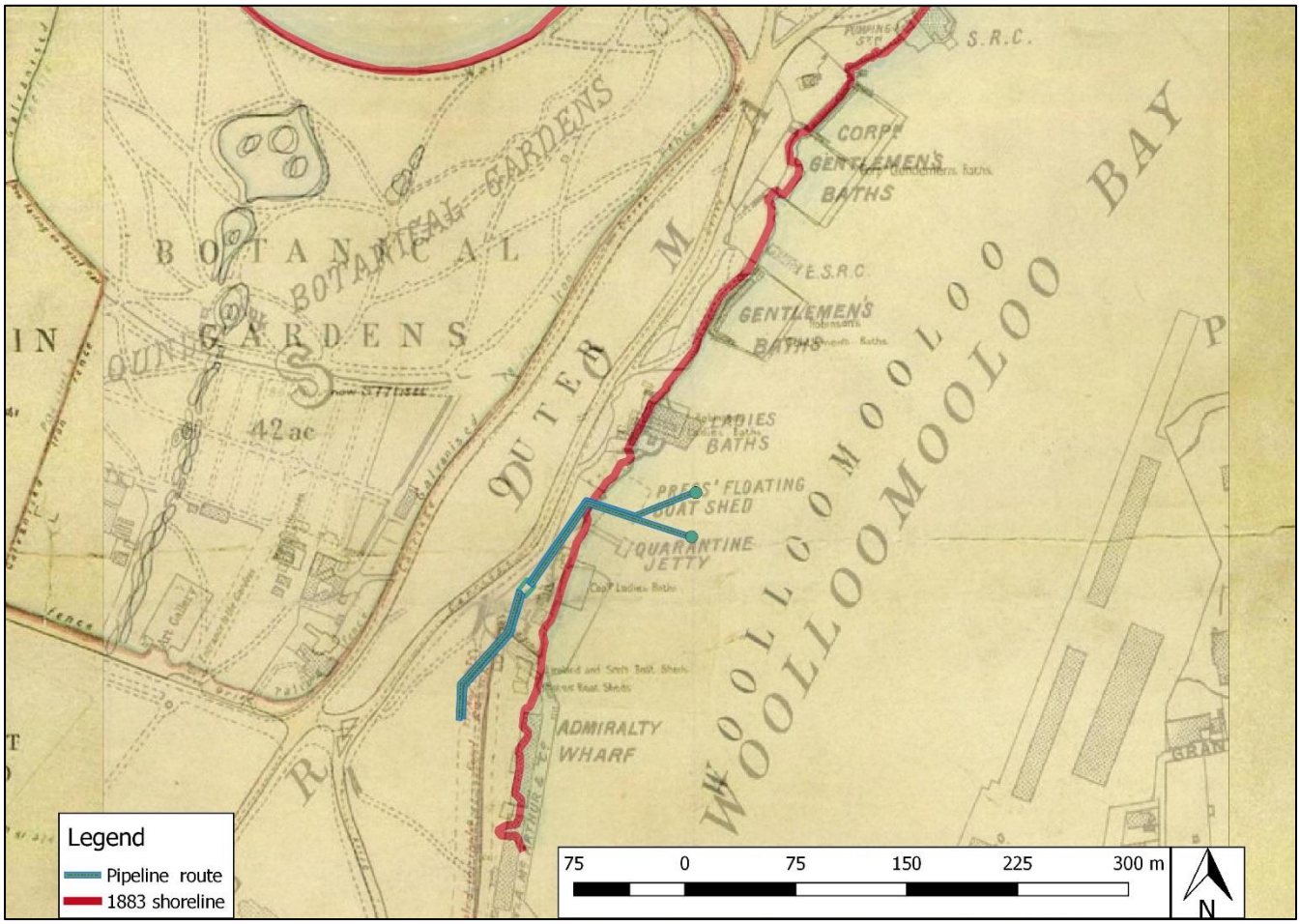

Figure 5: Overlay of proposed pipeline route over both the 1883 and 1903 plans of Woolloomooloo Bay. (Source: City of Sydney Archives with GIS overlay by Comber Consultants)

5.2 Mitigation prior to installation of the pipes

The items of cultural significance that are likely to be present will be in the form of the bases of the Quarantine Station piles and small, largely inorganic items associated with the usage of the area. Anchors, propellers and engine components could also be present. Those that are on the surface of the sediment would be most effectively surveyed by bathymetric, (eg, side scan sonar), and dive surveys to identify and map their location and identify potential significance. A comparison of a current and any existing side scan surveys or would indicate the level of scouring or sediment accretion occurring in within the study area. The relevant extent of the bathymetric survey would be of approximately 5500sqm.

A bathymetric survey and dive inspection along the proposed path of the pipeline would enable avoidance of impact, either by minor re-routing of the pipeline of moving those items away from the zone of impact. Given the impacts of prop-wash in the area, such items are unlikely to be *in* situ and relocation to an adjacent area that will not be impacted by trenching will not impact on their significance.

If the pipeline is to be laid in a trench, there is increased potential for impact on relics beneath the sediment. However, due to the industrial history of Woolloomooloo Bay, there is potential for a high level of contamination to be present within the sediments of the bay. Archaeological sampling prior to installation is therefore not recommended.

A site inspection, including examination of the seawalls that will be impacted upon by the installation of the pipelines would assist in determining the current significance of those items and any adverse impacts.

5.3 Mitigation during installation of the pipes

The consultant maritime archaeologist should be contacted once the proposed method has been chosen for laying the pipes. The consultant's advice should be sought to determine the scheduling for a dive inspection of the site prior to the installation

of the pipes.

If any relics are found during trenching, work must cease in that area and advice sought from the archaeologist. Any potentially significant relics should be recovered should be archivally documented and provided with appropriate conservation and storage.

6.0 LEGISLATION

HERITAGE ACT 1977
SYDNEY LOCAL ENVIRONMENTAL PLAN (LEP) 2012

6.0 LEGISLATION

6.1 Heritage Act 1977 (as amended)

The *Heritage Act* applies to relics in the underwater environment in the same way as it applies to relics in a terrestrial environment. In addition, it also protects historic shipwrecks and articles associated with an historic ship as described below.

State Heritage Register
Under s57 of the Heritage Act a person must not "demolish, despoil, excavate, alter, move, damage or destroy" an item listed on the State Heritage Register without a permit under s60 of the Act.

Woolloomooloo Bay Finger Wharf, immediately adjacent to the proposed works, is listed on the New South Wales State Heritage Register (SHR No. 01437). The Royal Botanic Gardens and Domain, which borders the study area to the west, is also on the State Heritage Register (SHR No. 01070).

While adjacent to those SHR items, the proposed underwater pipelines will not impact on these items.

Relics Provisions *NSW Heritage Act, 1977*
Division 9: Section 139, 140–146 - Relics Provisions Under Section 139:

(1) A person must not disturb or excavate any land knowing or having reasonable cause to suspect that the disturbance or excavation will or is likely to result in a relic being discovered, exposed, moved, damaged or destroyed unless the disturbance or excavation is carried out in accordance with an excavation permit.

(2) A person must not disturb or excavate any land on which the person has discovered or exposed a relic except in accordance with an excavation permit.

A relic is described under the Act as:
..any deposit, object or material evidence –
(a) which relates to the settlement of the area that comprises New South Wales, not being Aboriginal settlement; and
(b) is of State or local heritage significance.

Any item identified as a relic cannot be impacted upon without an excavation permit, under s140 of Act. An excavation permit forms an approval from the Heritage Council for permission to 'disturb' a relic.

However, an excavation permit is not required when the works are only minor in nature, and will have minimal impact on the heritage significance of the place. Under s139(4) of the *Heritage Act* when the impact is minor an application can be made for an excavation exception.

Historic Shipwreck Provisions
A historic shipwreck is described as *… the remains of any ship (including any articles associated with the ship) that have been situated in State waters, or otherwise within the limits of the State, for 75 years or more.* Note that the definition is for an item associated with a ship and does not need to be associated with a ship that was wrecked.

Under section 51 of the Act:

(1) A person must not move, damage or destroy any historic shipwreck otherwise than in accordance with a historic shipwrecks permit.

(2) This section does not apply to a historic shipwreck that is subject to an interim heritage order made by the Minister or a listing on the State Heritage Register.

(3) This section does not prevent a person from moving, damaging or destroying a historic shipwreck situated in any land in accordance with an excavation permit in force in respect of that land.

(4) It is a defence to proceedings for an offence under this section if the defendant establishes that the act giving rise to the offence was done for the purpose of:

(a) Saving human life, or
(b) Securing the safety of a ship where the ship was endangered by stress of weather or by navigational hazards, or
(c) Dealing with an emergency involving a serious threat to the environment.

No shipwrecks have been identified as being potentially with the study area.

Section 170 Registers:
Government agencies have responsibilities under Section 170 of the Heritage Act 1977 (NSW). Section 170 requires agencies to identify, conserve and manage heritage assets owned, occupied or managed by that agency.

The Woolloomooloo Finger Wharf, Berths 6, 7, 8 and 9 are owned by the Roads but are not shown as entries in its current s170 Register. They were identified as items for inclusion in the s170 by the former NSW Maritime but are under review.

The City of Sydney s170 Register does not include any items that are within the study area.

6.2 Sydney Local Environmental Plan (LEP) 2012

The Sydney LEP 2012 lists individual heritage items and Heritage Conservation areas that are significant, and heritage assets that should be conserved. Woolloomooloo Bay is not listed on the heritage schedule of the LEP. It abuts the Mrs Macquarie's Point component of the Royal Botanic Gardens which, along with the Woolloomooloo Bay Finger Wharf, are shown as item of General Heritage in the LEP Heritage Map - Sheet HER_021.

Section 5.10 of the LEP details the provisions for heritage protection. Development Consent is required from City of Sydney Council to demolish or alter an item listed on the Heritage Schedule of the LEP, or to demolish or move an Aboriginal object, except if the work is of a minor nature for the maintenance of the item and would not adversely affect the heritage significance of the item.

This report contains an assessment of the impact of the proposed pipeline works within the Bay and concludes that there will be no adverse impact on the heritage significance of the LEP items in the vicinity of the proposed works.

7.0 RECOMMENDATIONS

7.0 RECOMMENDATIONS

The following recommendations are made on the basis of:

- Legal requirements under the terms of the Heritage Act 1977.
- The research and analysis outlined contained in this report.
- Results of the assessment as outlined in this report.

IT IS RECOMMENDED THAT:

1. A detailed bathymetric survey of the sea bed be conducted by the AGNSW with input from the maritime archaeological consultant to assist in identifying potential targets for a dive inspection of the study area.

2. A site inspection, including a dive survey, incorporating video and/or still photography, be undertaken prior to finalisation of plans for the path of the intake and outflow pipes. The inspection would assess the seawall and impact of the pipelines where they pass through that wall and identify the location and assess the significance of any relics lying on the bed of the bay.

3. The consultant maritime archaeologist should be contacted once the proposed method has been chosen for laying the pipes to determine the scheduling for a dive inspection of the site prior to the installation of the pipes.

4. As the pipeline seawater system pipework is to travel below ground from the intake and discharge points to the plant room, requiring trenching within the seabed, arrangements should be made for an archaeological diver to inspect the site during the trenching or immediately upon completion of each stage of trenching (dependant on the trenching method being adopted) but prior to the installation of the pipes.

5. If any relics are found during trenching, work must cease in that area and advice sought from the archaeologist.

6. The AGNSW facilitate appropriate materials conservation for any items recovered as a result of the trenching and the archival documentation, appropriate conservation and storage.

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REFERENCES

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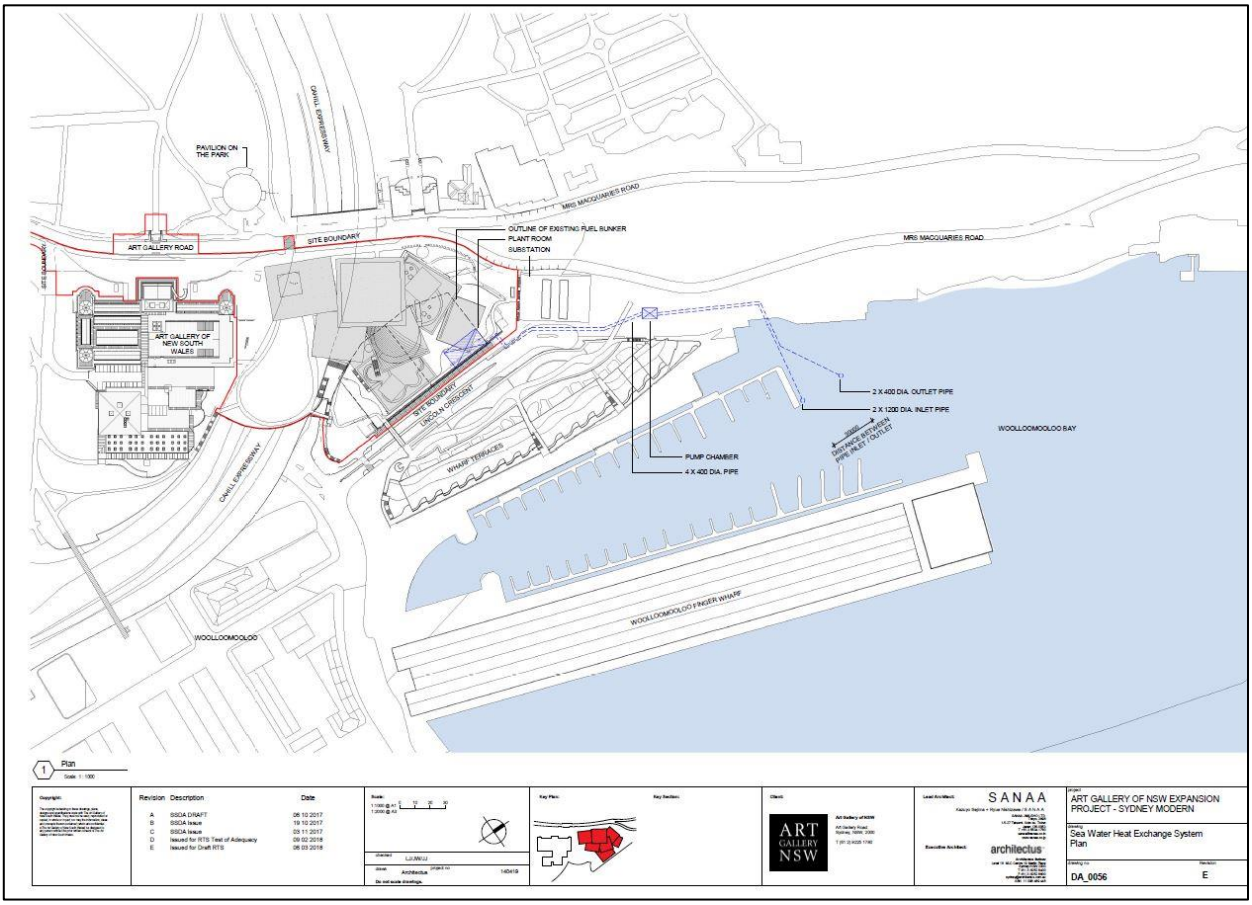
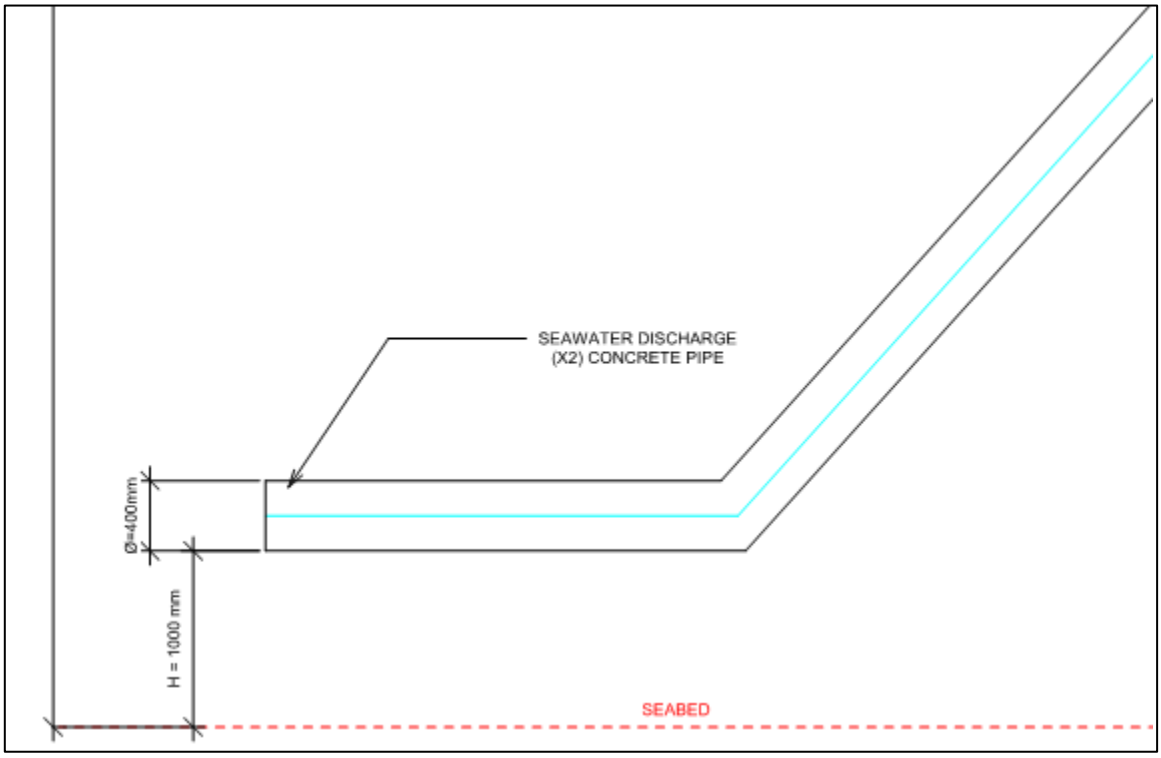
APPENDIX A

PLANS

APPENDIX A – PLANS





Seawater Plantroom Lower Deck (MulCahy Feb 18th 2018:7 Fig 5.,2a)

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