



# Clontarf Tidal Pool Upgrade

Review of Environmental Factors

Northern Beaches Council

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## Abbreviations

Abbreviation	Description
ABP	Allowable bearing pressures
ADD	Aboriginal Due Diligence Assessment
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
ASS	Acid Sulphate Soils
BC Act	<i>Biodiversity Conservation Act 2016</i>
BDAR	Biodiversity Development Assessment Report
BH	Bore hole
Biodiversity Conservation SEPP	<i>State Environmental Planning Policy (Biodiversity Conservation) 2021</i>
Biosecurity Act	<i>Biosecurity Act 2015</i>
CAA	Controlled Activity Approval
CI	CI Australia Pty Ltd
CEMP	Construction Environmental Management Plan
CM Act	<i>Coastal Management Act 2016</i>
CoP	<i>Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales</i>
Council	Northern Beaches Council
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DPE	Department of Planning and Environment
DPI	Department of Primary Industries
EHG	Environment and Heritage
EIS	Environmental Impact Statement
ELA	Eco Logical Australia Pty Ltd
EP&A Act	<i>Environmental Planning &amp; Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning &amp; Assessment Regulation 2021</i>
EPA	NSW Environment Protection Authority
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPI	Environmental Planning Instrument
EPL	Environmental Protection Licence
FM Act	<i>Fisheries Management Act 1994</i>
ha	hectares
HDPE	High Density Polyethylene
Heritage Act	<i>Heritage Act 1977</i>

Abbreviation	Description
KFH	Key Fish Habitat
kPa	Kilopascal (unit of pressure)
LEP	Local Environmental Plan
LGA	Local Government Area
LSPS	Local Strategic Planning Statement
Manly LEP 2013	<i>Manly Local Environmental Plan 2013</i>
MNES	Matters of National Environmental Significance
NDP	North District Plan
NES	National Environmental Significance
NPW Act	<i>National Parks and Wildlife Act 1979</i>
NPWS	National Parks and Wildlife Service
NRAR	Natural Resources Access Regulator
PASS	Potential Acid Sulphate Soils
PMA Regulation	<i>Ports and Maritime Administration Regulation 2012</i>
POEO Act	<i>Protection of the Environment Operations Act 1977</i>
REF	Review of Environmental Factors
Resilience and Hazards SEPP	<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i>
RMS	Roads and Maritime Services
RSWMP	Regional Strategic Weed Management Plans
SDS	Safety Data Sheets
SEPP	State Environmental Planning Policy
SHR	State Heritage Register
SIS	Species Impact Statement
SREP	Sydney Regional Environmental Plan
TfNSW	Transport for New South Wales
Transport and Infrastructure SEPP	<i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i>
WIRES	NSW Wildlife Information, Rescue and Education Service Inc.
WM Act	<i>Water Management Act 2000</i>





*Sandy Beach and Clontarf Tidal Pool*  
Image: Northern Beaches Council

# Executive Summary

The proposed upgrades to the Clontarf Tidal Pool (the Project) will provide a future proofed solution for pool capacity and safety. A Review of Environmental Factors (REF) has been prepared for the Project to support the application for approval of the project under Part 5 of the New South Wales (NSW) *Environmental Planning and Assessment Act 1979* (EP&A Act). The REF describes the Project, considers potential environmental, social, and economic impacts of the Project, and outlines measures to minimise and avoid these impacts. The REF is a robust, thorough, and comprehensive document with analysis and input from leading technical and scientific experts.

The REF has been prepared by Eco Logical Australia Pty Limited (ELA) on behalf of Northern Beaches Council to support the approval of the Project. The REF will be placed on the Northern Beaches Council website to provide the community with the opportunity to review the assessment. Northern Beaches Council will also carry out a regulatory assessment and determine whether the Project should be approved and any conditions to be applied to the consent, should it be granted. Below, a summary of the REF is provided.

## What is the Project and Why is it Needed?

Northern Beaches Council is proposing an upgrade to the existing Clontarf Tidal Pool, located on the foreshore of Clontarf Reserve at Sandy Bay Road, Clontarf NSW 2093. Clontarf Tidal Pool is the most heavily used tidal enclosure in the Northern Beaches local government area, popular with locals and tourists alike. Built in the 1940s, the pool also represents heritage significance.

The pool is situated in a marine environment and is subject to harsh conditions, which cause corrosion and other impacts to the structure over time. The structure has degraded significantly since its original construction and poses a risk to public safety and enjoyment. The structure has reached the end of its life, requiring complete reconstruction.

The works seek to demolish the existing infrastructure and replace the pool using visually similar materials. The pool will be extended by 3 m into the Harbour to provide for swimming in deeper waters and at lower tides and will reduce the requirement for costly dredging operations. The upgrade will also extend its length to 64 m, providing increased protected wading area and shoreline access. The pool will finish at a minimum of 3 m from the existing seawall at the north and south ends of the pool, enabling essential beach management activities, such as beach rake access and cleaning, which are impeded by the current design.

The works will ensure the pool is large enough to cater for the community at peak use and is designed with long-term durability in mind.

## Statutory Requirements

The environmental assessment and determination of the proposal has been undertaken in accordance with Part 5 of the NSW EP&A Act. For this proposal, Northern Beaches Council is both a public authority proponent and the determining authority. Council must examine and consider, to the fullest extent possible, all matters affecting or likely to affect the environment because of the proposed works. This assessment has been prepared in accordance with Section 171 of the *Environmental Planning & Assessment Regulation 2021*, (EP&A Regulation) which sets out a non-exhaustive list of environmental factors required to be assessed by public authorities. Consideration of Section 171 factors is provided in Table 25.



# Assessment of Impacts

## Water Quality

There is a moderate risk of water quality degradation because of increased turbidity by disturbing the bed sediments, during the removal of old piles and installation of the replacements.

## Biodiversity

No threatened ecological community or species listed under the *Biodiversity Conservation Act 2016* (BC Act) were identified within the study area. *Hippocampus whitei* (White's Seahorse), listed as an endangered species under the *NSW Fisheries Management Act 1994* (FM Act) and the *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), has previously been identified to use the pool netting for habitat. To mitigate and manage any potential impacts to the *Hippocampus whitei*, Northern Beaches Council has prepared a Seahorse Relocation Plan in consultation with the Department of Industry – Fisheries (DPI Fisheries), which will be implemented prior to construction. An Assessment of Significance, in accordance with the EPBC Act and FM Act were undertaken and determined no significant impact would occur, provided that the recommended mitigation measures are implemented.

## Aboriginal Heritage

An assessment of Aboriginal heritage was undertaken in accordance with the *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (DECCW, 2010). There are no previously recorded Aboriginal sites or objects within the study area and the assessment identified low potential for intact subsurface archaeological deposits to be present. Therefore, no further assessment is required in the form of an Aboriginal Cultural Heritage Assessment (ACHA).

## Historic Heritage

Clontarf Tidal Pool is adjacent to the Clontarf Foreshore, a listed heritage item in accordance with the *Manly Local Environmental Plan 2013*. Due to the ambiguous nature of the heritage listing, it is unclear whether it was intended to include the tidal pool structure. A desktop historic heritage assessment based on previous work, including a Statement of Heritage Impact prepared by ELA in 2019, has been undertaken within this REF which found that the proposed upgrades will not have a significant impact on historic heritage, given that visually similar materials will be used to construct the new pool. Furthermore, the design of the upgraded pool was made partially based on heritage advice received from the Heritage Manager at RPS Group, Susan Kennedy.

## Cumulative Impacts and Strategic Context

The works are not likely to cause cumulative impacts. A renewed Clontarf Tidal Pool will provide a benefit to the Northern Beaches community and supports several strategic planning priorities at a local, regional and district level.

## Evaluation

The Project has been underpinned by principles to avoid and minimise environmental impacts where possible and has been developed through an iterative design and comprehensive assessment approach. This approach has resulted in significant environmental improvements and outcomes as described in the REF.

This REF has determined that the proposed works are not likely to have a significant impact on any aspect of the environment, subject to the implementation of recommended mitigation measures and safeguards. In addition, through the implementation of proposed mitigation measures, the REF found that the Project could be undertaken without any significant long-term impacts on the local environment including on social and economic factors. There are multitudes of benefits resulting from the proposed works. The extension will reduce the need for costly maintenance works such as dredging and incremental pile and waler replacement. It is in support of several planning priorities under local, regional and district strategic plans through the provision of a safe and enjoyable outdoor recreation asset. The upgraded pool will withstand the test of time against environmental factors such as sea level rise, and social factors including population growth. As such, the Project is in the public interest, providing many benefit the Northern Beaches community.





## SECTION 1

# Introduction

# 1. Introduction

## 1.1 Project Description and Background

Eco Logical Australia Pty Ltd (ELA) was engaged by Northern Beaches Council (herein referred to as 'Council') to prepare a Review of Environmental Factors (REF) for the proposed upgrade to the Clontarf Tidal Pool, located on the foreshore of Clontarf Reserve at Sandy Bay Road, Clontarf NSW 2093 (Figure 1).

The study area (Figure 1) refers to the area surveyed in the field during the Aquatic Flora and Fauna assessment. This is generally the area assessed for environmental factors; however, a broader context is used where appropriate. The direct impact area (Figure 1) refers to the area subject to impacts from the removal of the existing structure and construction of the new pool. This is taken as a 5 m buffer around the old and new pool structures. The plan of the proposed works is presented in Figure 2.

The proposed works include the following:

- Relocation of *Hippocampus whitei* (White's Seahorse) and other Syngnathiformes
  - Demolition of the existing tidal pool structure
  - Construction of an extended tidal pool using visually similar materials as follows:
    - Timber walers are to be replaced on a like-for-like basis.
    - Shark netting will be replaced like-for-like, custom fitted to the new pool structure; and
    - Timber piles will be replaced with steel Circular Hollow Sections sleeved with high density polyethylene (HDPE) piping.
  - Installation of seahorse hotels both adjacent to the new pool (subject to this REF) and within Bradys Point (subject to separate approval)
- Ongoing maintenance works throughout the life of the Clontarf Tidal Pool, on a monthly (for minor repairs) and as-needed basis (for major repairs)

Due to the extreme environment in which Clontarf Tidal Pool is situated, it is subject to large amounts of degradation. Sedimentation has accumulated on the beach, reducing the effective usable area of the tidal pool. In its current state, the Clontarf Tidal Pool poses a risk to public safety and enjoyment. The aim of the proposed works is to provide a long lasting and safe community asset that withstands peak periods, population growth and aligns with other elements of the Clontarf Park Masterplan, including the newly built sandstone bleachers and showers.

The works have been assessed under Part 5 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) with Council as the determining authority. This REF has assessed all environmental factors listed in Section 171 of the *Environmental Planning & Assessment Regulation 2021* (EP&A Regulation); and outlined impact mitigation measures to be undertaken, in line with NBC policies and procedures.

As part of this REF, the following technical assessments have been undertaken by ELA:

- Flora and Fauna Assessment (FFA) (Section 3.3, Appendix A)
- Aboriginal Due Diligence (ADD) Assessment (Section 3.4, Appendix B)
- Historic Heritage Assessment (Section 3.4.3)

The findings of these assessments have been included as a chapter in this REF, eliminating the need for additional standalone reports. Additionally, the following assessments have been undertaken for the proposed works, summarised in this REF, and are contained in the appendices:

- *Geotechnical Investigation for Proposed Tidal Pool, Boat Ramp and Pedestrian Pathway Upgrade* (JK Geotechnics, 2022) (Appendix C)



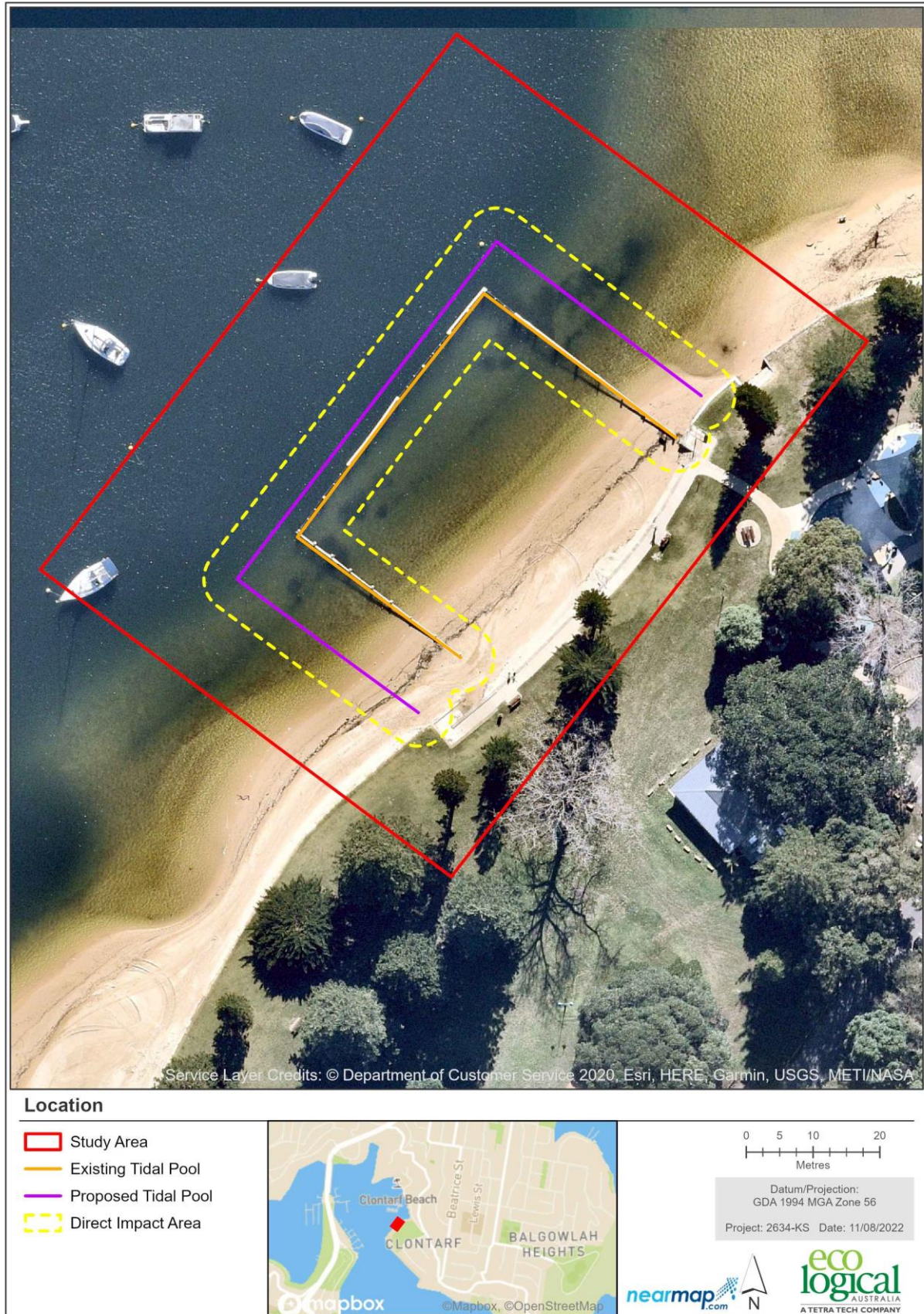


Figure 1: Location of Clontarf Tidal Pool



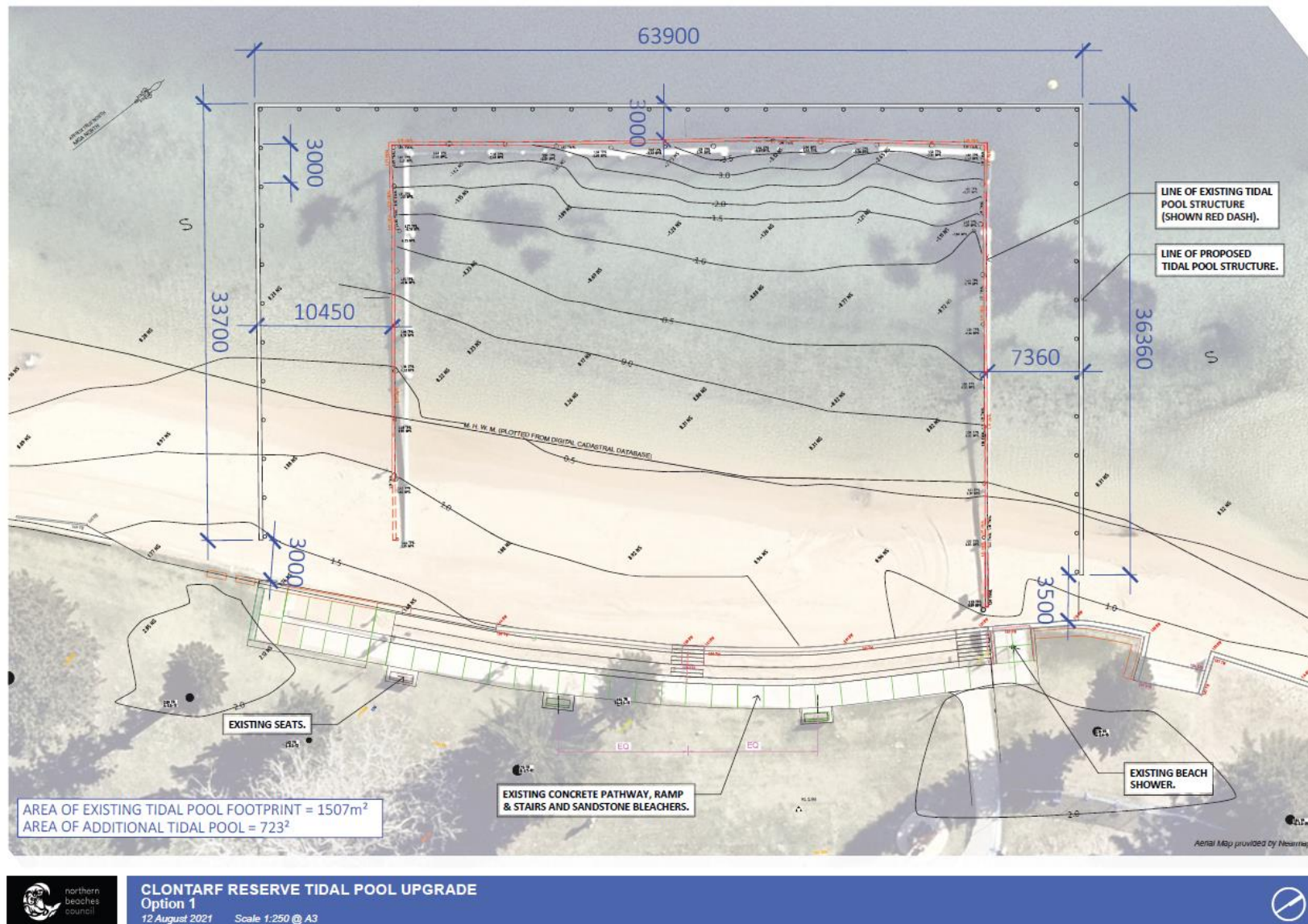


Figure 2 Plans of Clontarf Tidal Pool Upgrade

## 1.2 Project Location and Context

Clontarf Tidal pool is located within Clontarf Reserve, located on the Sydney Harbour Foreshore (Figure 1). Clontarf Reserve is accessed from Sandy Bay Road, Clontarf. The tidal pool structure consists of 28 timber piles and a top rail (waling), with netting in between. The netting has temporarily replaced what was previously vertical shark rebars. The purpose of Clontarf Tidal Pool is to create an exclusion zone from potentially dangerous marine life, namely sharks, so that the public have safe access to swim at Clontarf.

Clontarf Tidal Pool structure is in a poor condition, showing weathering and signs of rust (Figure 3), requiring removal of walers and temporary pile replacement at the rear of the structure. The pool in its current condition is considered a risk to public safety due to its condition. The risk posed by the pool currently includes reported injury from oysters built up on the timber piles, to the decaying timber and failing structure of the pool itself. Over time, the pool has become shallower in depth due to the movement of sediment along the beach. This sedimentation has previously been the subject of an REF prepared by ELA (2019) and subsequent dredging works, which moved sediment to another part of the beach. The proposed works seek to reduce the frequency of dredging works, extending the pool 3 m further into the harbour which will ensure continued access to deeper waters. The pool will also be extended along the shoreline, which will allow greater access for protected wading.



**Figure 3: Southern boundary of Clontarf Tidal Pool, showing the structure of timber piles, walers and netting (RPS, 2022).**

## 1.3 Land Use and Ownership

### 1.3.1 Land Use

Under Chapter 10 of the *State Environmental Planning Policy (Biodiversity and Conservation) 2021* (Biodiversity and Conservation SEPP), the study area is partially zoned as W5 (Water Recreation) (Figure 4). The objectives of this zone are described in Table 4 and are as follows:

- a) *to give preference to and increase public water-dependent development so that people can enjoy and freely access the waters of Sydney Harbour and its tributaries,*
- b) *to allow development only where it is demonstrated that the public use of waters in this zone is enhanced and will not be compromised now or in the future,*
- c) *to minimise the number, scale and extent of artificial structures consistent with their function,*
- d) *to allow commercial water-dependent development, but only where it is demonstrated that it meets a justified demand, provides benefits to the general and boating public and results in a visual outcome that harmonises with the planned character of the locality,*
- e) *to minimise congestion of and conflict between people using waters in this zone and the foreshore,*
- f) *to protect and preserve beach environments and ensure they are free from artificial structures,*
- g) *to ensure that the scale and size of development are appropriate to the locality and protect and improve the natural assets and natural and cultural scenic quality of the surrounding area, particularly when viewed from waters in this zone or from areas of public access.*

Under the Manly Local Environmental Plan 2013 (Manly LEP 2013), the study area is partially zoned as RE1 (Public Recreation) (Figure 4). The objectives of RE1 zoning are as follows:

- a) *To enable land to be used for public open space or recreational purposes.*
- b) *To provide a range of recreational settings and activities and compatible land uses.*
- c) *To protect and enhance the natural environment for recreational purposes.*
- d) *To protect, manage and restore areas visually exposed to the waters of Middle Harbour, North Harbour, Burnt Bridge Creek and the Pacific Ocean.*
- e) *To ensure that the height and bulk of any proposed buildings or structures have regard to existing vegetation, topography and surrounding land uses.*

Under this zoning, no works are permitted without consent. Outdoor recreation facilities and water recreation structures are permitted with consent. The tidal pool works are consistent with the objectives of both W5 and RE1 zoning under the relevant environmental planning instruments.

### 1.3.2 Land Ownership

Transport for NSW (TfNSW) is the registered proprietor of Clontarf Tidal Pool. An updated consolidated license is under negotiation between TfNSW and Council, which would include new conditions for the expanded tidal pool. The license will allow the Council to carry out the construction works and permitted uses agreed upon within the license. Regarding the proposed works to Clontarf Tidal Pool, Section 5.1 of the existing Deed of License states:

*The Licensee must, at its own expense, keep and maintain the Licensed Area and the services to the Licensed Area in good order, repair, and condition, and in a condition that is safe and physically suitable for carrying out the Permitted Use.*



Furthermore, Section 5.4 states:

*The Licensor may (but is not required to) require the Licensee by notice to carry out within a reasonable time any Work in, on or to the Licensed Area that is necessary to ensure the Licensee's proper performance of its obligations under this License and the Licensee must comply with such a notice at its own expense.*

TfNSW will be consulted with prior to commencement of the proposed works. Council will submit the determined REF and an application for a Construction Licence and new consolidated lease to TfNSW via CI Australia. Details of this consultation can be found within Table 21.

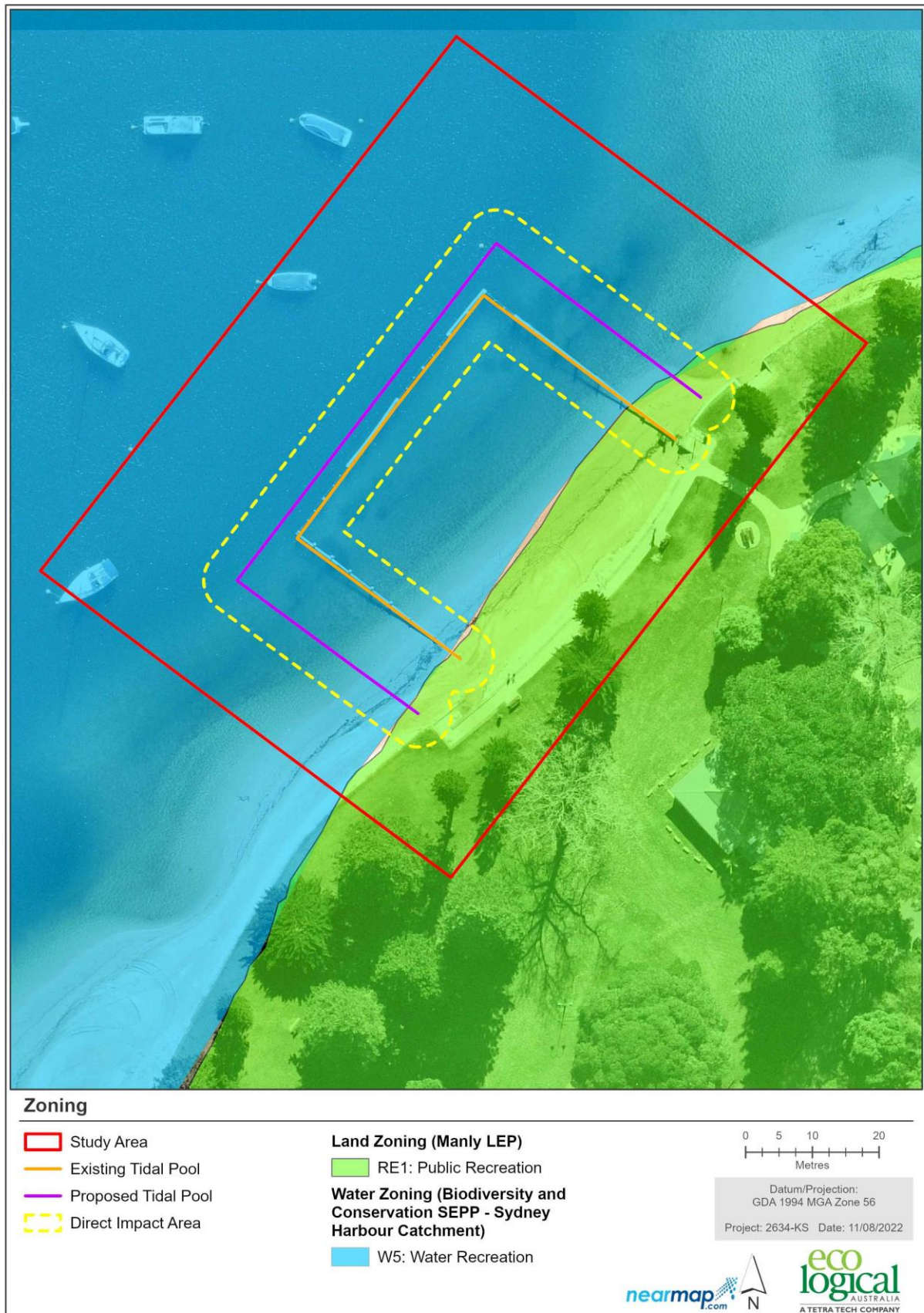
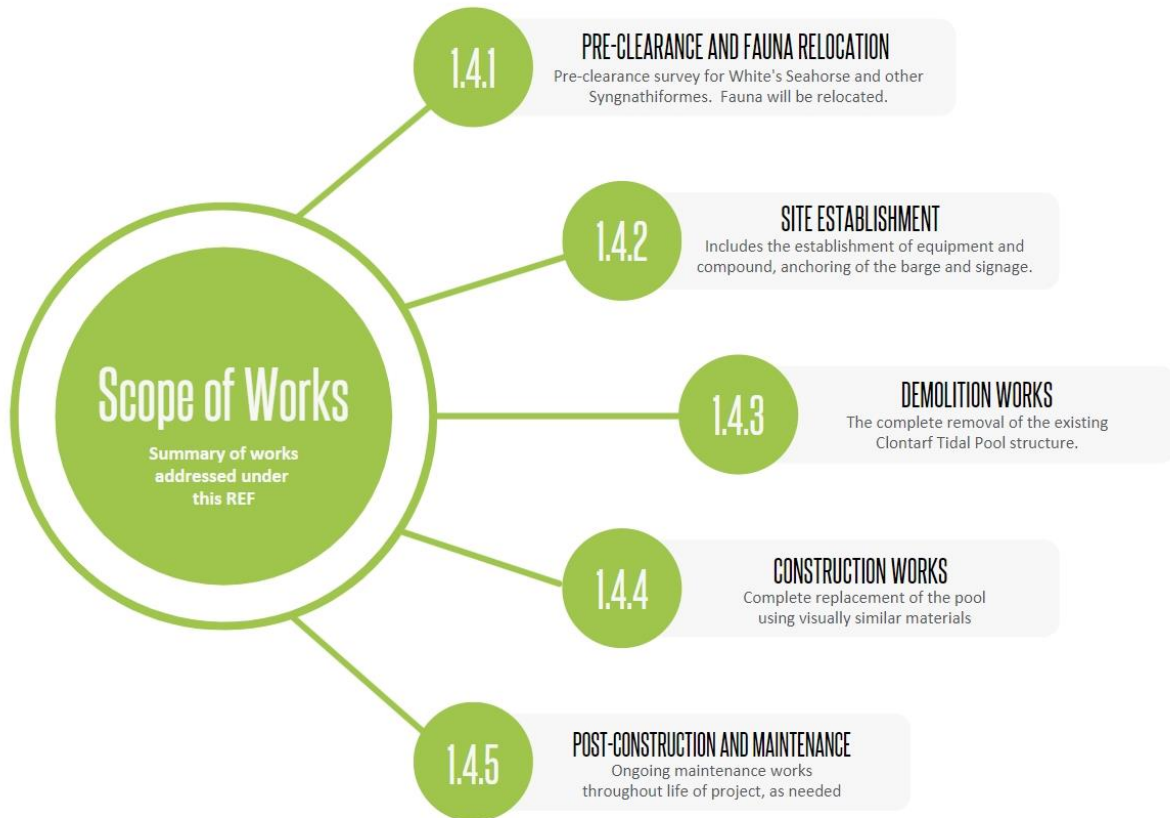


Figure 4: Zoning in relation to the study area

## 1.4 Detailed Scope of Works

The proposed stages of the Clontarf Tidal Pool upgrade works are summarised in Figure 5 below, and discussed in detail throughout Sections 1.4.1– 1.4.5.



**Figure 5: Summary of scope of works addressed under this REF**

### 1.4.1 Pre-Clearance Survey and Relocation

The following fauna pre-clearance works will occur prior to removal of the existing Clontarf Tidal Pool:

- One pre-clearance survey of *Hippocampus whitei* and other Syngnathiformes prior to the demolition works
- Relocation of *H. whitei* and other Syngnathiformes in accordance with the approved Seahorse Relocation Plan

Survey and relocation works will be undertaken by professional divers contracted by Council. One pre-clearance survey is required prior to works. Sea Dragon Diving Co. has prepared a Seahorse Relocation Plan, which details the protocol for movement of White's Seahorse and other Syngnathiformes from Clontarf Tidal Pool to the nearby seahorse hotels at Bradys Point (Sea Dragon 2021). The installation of the seahorse hotels at this location has been addressed through a short-form REF prepared by ELA (2022).

After fauna have been relocated, it is not expected that they will migrate back to the site for the duration of works due to the distance between sites. Bradys Point is approximately 340 m north of the Clontarf Tidal Pool. Hence, no further clearance surveys are required. Fauna will not be manually relocated back to Clontarf Tidal Pool once the new pool has been constructed.

#### 1.4.2 Site Establishment

Minor works will be undertaken by swimmers (and divers when necessary). All minor maintenance works will be undertaken by hand (e.g., removal of seagrass and relocation of seahorses).

Major works will be undertaken through the use of a barge. The barge is approximately 12 m x 6 m. Access of the barge will be achieved via the harbour waters. The barge will be used for storing a crane or excavator, construction equipment and required materials. Piles will be removed through hydraulic action and vibration. Sand-jetting will be used around the pile insertion point to construct the required holes for pile placement. The pile will then be vibrated in or hammered as the sand-jetting occurs. The barge will require anchoring into the seabed using 'spuds' (vertical steel shafts that extend from the barge) to protect the barge from movement resulting from machinery use and environmental factors (such as currents and wind). The barge will not be anchored into areas of seagrass, instead utilising areas of bare sand to avoid further impacts to habitat.

For piles established on or near the shore, a land-based excavator with piling attachments will be used for removal and replacement.

Ancillary site establishment works will include:

- The establishment of appropriate signage to alert the public to the nature and duration of works.
- Set up of a construction compound on the existing paved car park at Sandy Bay Reserve.

#### 1.4.3 Demolition works

The demolition works will include the complete removal of the existing pool, specifically:

- Removal of existing shark netting.
- Removal of fixings, timber struts and structural timber members used to bolster walers and piles.
- Removal of new timber walers.
- Removal of degraded piles will be undertaken through the use of a barge with an excavator, which attaches a lifting chain to the pile. Piles are pulled out using a 'wiggling' motion.

#### 1.4.4 Construction Works

The construction works will include the complete replacement of the pool using visually similar materials:

- Piles will be replaced with High Density Polyethylene (HDPE) sleeved steel piles. A piling barge and excavator will be used to place and install the new piles. Installation method will be determined by the construction contractor, and will likely be either by vibration, screwing or drop hammer methods (or a combination of the above).
- Installation of new timber walers.
- Fixing of new timber struts and structural timber members to bolster walers and piles.
- Installation of customised high strength shark netting.
- Installation of seahorse hotels, located adjacent to the pool structure.

For the purposes of this assessment, a 5 m construction buffer has been assumed. This is referred to as the direct impact area, defined in Figure 1.



#### 1.4.5 Post-Construction, Operation and Ongoing Maintenance

Throughout its operation lifetime, the newly upgraded Clontarf Tidal Pool may require ongoing maintenance works. These would be undertaken on a monthly and as-needed basis and will use like-for-like materials. The likely scope of maintenance works is described below.

##### 1.4.5.1 Monthly Inspections (Minor repairs)

Monthly inspections will be undertaken to maintain the pool and ensure minor repairs are completed in a timely manner. Minor repairs resulting from monthly inspections may include:

- Repair holes in net<sup>1</sup>
- Remove rubbish inside pool or debris in net
- Clean oysters from piles and other pool structures as necessary<sup>1</sup>
- Use of a beach rake to periodically rake sand inside pool (above waterline)
- Conduct minor repairs to bolts, screws or epoxy anti-slip coating on pool
- Install warning signs (either temporary or permanent, as needed) on the structure
- Minor painting as required

Discretion is to be exercised by Council as to the need for pre-clearance surveys. Timing of works (i.e., relationship to White's Sea Horse breeding season), nature of works and potential impacts are to be considered on a case-by-case basis. For example, the cleaning of oysters from piles may be permissible where it occurs above the waterline only, but if maintenance is required below the water or near seagrass habitat then a pre-clearance survey is recommended considering potential direct impacts of biota removal to aquatic fauna (accidental harm) and/or the magnitude of potential falling debris onto seagrass. A record of the inspection will be maintained using the Tidal Pool Inspection Record (Appendix E).

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<sup>1</sup> Works have the potential to cause impacts to habitat for White's Seahorse, namely repairing holes in the net. As such, a pre-clearance survey is required prior to these works to ensure any White's Seahorse or other Syngnathiformes within the minor repairs area are identified and relocated to nearby seahorse hotels. If required, relocation must be in accordance with the Fisheries permit conditions and Seahorse Relocation Plan.

#### 1.4.5.2 Major Repairs and Cleaning

Major repair works will be undertaken on an as-needed basis as follows:

- Remove biofouling from the net periodically (annually or biannually), to reduce weight on net<sup>2</sup>
- Replace larger sections of the net (unlikely to be required)<sup>2</sup>
- Wharf carpentry repairs to walers (in case of boat collision, unlikely to be required)
- Remove walers and repair pile (in case of boat impact, unlikely to be required)<sup>2</sup>
- Install emergency piles up to five (5) to stabilise the pool structure in case of boat impact (unlikely to be required)<sup>2</sup>
- Major repainting of walers including epoxy non-slip coating to the top of waler

For the purposes of these repair works, it has been assumed that all impacts would take place within the 5 m buffer around the expanded tidal pool area as shown in Figure 1.

Repairs to walers are expected to occur above the waterline and therefore in most cases would not require pre-clearance surveys.

#### 1.4.6 Duration and Working Hours

The demolition and construction works will be undertaken for a period of approximately three (3) months outside of the peak summer period, between late February and June 2023, considering the peak White's Seahorse breeding season which occurs between October and April. Advice received in consultation with DPI Fisheries indicates that limited breeding occurs in late February onwards. In addition, the pre-clearance survey to be undertaken prior to the demolition will ensure any identified White's Seahorse are relocated in their breeding pair(s). Works will be completed by the end of May 2023.

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<sup>2</sup> Works require pre-clearance surveys to mitigate potential impacts to White's Seahorse. For each instance of repairs required, Council is to use discretion and consider the potential impacts of the works to White's Seahorse and other Syngnathiformes, and their habitat.

Construction will be in accordance with Northern Beaches Council standard daytime work times, which aims to minimise impacts to residents in proximity to the works. Standard work hours will be:

- Monday to Friday 7.00 am to 5.00 pm
- Saturday 8.00 am to 1.00 pm

No construction works will take place on Sunday or Public Holidays. Some Sunday works will be required to take, being pre-clearance seahorse inspections undertaken by divers. This is a passive activity which will produce limited noise impacts and will have little impact on the surrounding area and sensitive receivers.

#### 1.4.7 Not Included in Scope of Works

Dredging and/or reclamation works within the study area are not included in the current scope of works and would require a separate environmental assessment if these works are required in future.

The installation of Seahorse Hotels at Bradys Point is not included within this REF and has been addressed through a separate short-form REF assessment (ELA 2022).

### 1.5 Project Justification and Consideration of Alternatives

#### 1.5.1 'Do Nothing' Approach

Council has not considered the effects of the 'Do Nothing' approach. This would entail leaving the tidal pool as-is for the foreseeable future, and would result in a several negative outcomes for the local community, including:

- **Risk to public safety.** The pool is at risk of being closed entirely as the degrading piles are not structurally sound. Figure 6 shows signage at Clontarf Tidal Pool, which warns that 'use of this facility may be hazardous' and 'the pool structure is damaged'.
- **Injuries** from marine organisms, such as oysters, accumulated on the piles. Injuries may also result from walking along the damaged piles and/or walers.
- **Reduced usable area** over time due to accumulation of sand. Regular dredging works are costly and cause disturbances to the marine environment.
- **Submersion of structure** over time. Due to climate change, sea levels rise will increase by the end of the century under all emissions pathways. The structure is already near flush with the water at high tide (Figure 6). While the precise extent of sea-level rise at Clontarf Beach is uncertain, global mean sea level (GMSL) is expected to rise between 0.43 m under a stringent emissions pathway, and 0.84 m under a high-emissions pathway (IPCC, 2022).
- **Reduced shark netting efficacy.** As sea level rises, water may exceed the existing height of the pool, potentially allowing animals such as sharks to enter the pool area and compromising public safety.



**Figure 6: Clontarf Tidal Pool at high tide (Northern Beaches Council) (left). Safety warning signage (ELA, 2019) (right).** The 'Do Nothing' approach was not considered as the pool is currently considered a safety hazard and is at risk of submersion due to sea level rise.

#### 1.5.2 Integrated Boardwalk Option

Council considered the addition of a boardwalk and floating pontoon to the north of the pool. Community consultation also raised some support for a boardwalk so that users can walk around the pool. This option was disregarded for the following reasons:

- A boardwalk may encourage fishing activity, as it has at the Forty Baskets tidal pool, resulting in safety issues with swimmers. This would result in activity clashing in the park.
- Heritage advice from RPS indicated that the addition of a boardwalk would result in a poor heritage outcome, adversely impacting on the traditional built form of the pool by introducing a new element. There are few remaining examples of a traditional swimming enclosures without additional structures such as a boardwalk. The loss of this is considered to adversely affect its heritage significance.

As such, after careful consideration and master planning over two years, the final preferred tidal pool upgrade design excludes a boardwalk.

#### 1.5.3 Lesser Expansion Option

A smaller scale expansion was considered, which would see the pool extended into the harbour waters, and 3.5 m to the west. It would move the eastern alignment by 1 m to align with the showers, taking into consideration some symmetry with the Clontarf Reserve design. This option would align with the goal of increasing user capacity, however the alignment with the showers has no historic precedent and limiting the expansion to this point has no benefit for heritage considerations (RPS, 2021).

#### 1.5.4 Least Expansion Option

Another option considered by Council in consultation with RPS was the expansion as above except the eastern alignment would not change. From a heritage perspective, this option is the preferred outcome as it maintains the northern most position and consistency with the current structure. This option was not pursued as it does not offer the ideal increased user capacity.



### 1.5.5 Regular Works Approach

Alternately to the 'Do Nothing' Approach, Council has considered the effects of continuing the routine maintenance and minor extension works that has occurred in the past. This option would entail undertaking upgrades or maintenance on and around the Clontarf Tidal Pool as required. For example, in past Council has undertaken dredging works to relocate sand that caused the pool to become shallow with reduced public usability. Other regular works could include incremental upgrade or replacement of the shark netting, piles or waling as they deteriorate.

The disadvantage of this approach is that each time minor or small-scale works need to occur, an REF would be required to be prepared, and assessment costs accumulate over time. This approach does not offer a long-term holistic solution to the currently identified and predicted issues that may arise over time for the usability of Clontarf Tidal Pool.

### 1.5.6 Preferred Option – The Proposed Works

The preferred option is the demolition and replacement of the pool, the subject of this REF. The preferred option is justified by a range of reasons and benefits, including:

- Climate resilience. The proposed works will construct the pool at a raised level, future proofing it against predicted sea level rise under all climate change scenarios by the end of the century.
- Increased usability. The increased length along the shoreline provides more opportunity for family-friendly recreation closer to the beach within a protected wading area. The increased width provides for lap swimming in deeper waters during lower tides.
- The increased overall area will reduce the need for costly dredging works.
- Improved safety, considering the pool has reached its end of life and materials are currently degrading, posing a public safety hazard.
- Conforms to grant conditions. The NSW Government Legacy Spaces grant, which is funding the proposed works, requires an improvement to the space which includes an expansion. This option was also designed by Council's registered landscape architect Lia Skountzas. It is a grant condition that the pool is designed by a registered landscape architect.
- The structure is largely symmetric around the centre of the original pool, considerate of its heritage appeal.
- It is aesthetically considerate of the Clontarf Reserve Masterplan elements, such as the bleachers.
- Improved access. The 3 m gap between the walers and seawall allows movement of pedestrians longitudinally along the beach and for beach rake access to clean the sand.

As such, the proposed works are the most beneficial option, socially and economically, allowing the continued use of Clontarf Tidal Pool. While the preferred outcome from a heritage perspective was the lesser expansion option, this approach did not sufficiently address issues such as adequate pool expansion for a legacy space. The proposed dimensions are considered the best fit and balance between a modest pool expansion, while remaining sensitive to its historic heritage. The upgrade will result in reduced impacts to the environment over time by providing a more durable asset, requiring less ongoing maintenance, and thus mitigating impacts to the surrounding environment.



*Southern boundary of Clontarf Tidal Pool  
Image: RPS, 2022*

## SECTION 2

# Statutory and Planning Context



## 2. Statutory and Planning Context

### 2.1 Commonwealth Statutory Framework

**Table 1: Commonwealth Statutory Framework**

Name of Act	Relevance to the Project
<i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act)	<p><b>Matters of National Environmental Significance</b></p> <p>The EPBC Act protects matters of National Environmental Significance (MNES), such as threatened species and ecological communities, migratory species (protected under international agreements), and National Heritage places (among others). Any actions that will or are likely to have a significant impact on the MNES require referral and approval from the Australian Government Environment Minister.</p> <p>Significant impacts are defined by the Commonwealth (see <a href="http://www.environment.gov.au/epbc/guidelines-policies.html">http://www.environment.gov.au/epbc/guidelines-policies.html</a>) for MNES.</p> <p>One MNES has been identified within the study area. One threatened species listed under the EPBC Act has been known, and is likely, to occur around the Clontarf Tidal Pool. <i>Hippocampus whitei</i> (White's seahorse) is listed as Endangered under the EPBC Act as of 12 December 2020. A Test of Significance under the EPBC Act was undertaken (Appendix A3). A significant impact is not likely to result if mitigation measures are implemented.</p>

### 2.2 New South Wales State Legislation

**Table 2: NSW State Legislation**

Name of Act	Relevance to the Project
<i>Biodiversity Conservation Act 2016</i> (BC Act)	<p>Section 7.3 of the BC Act requires proponents of activities subject to Part 5 of the EP&amp;A Act to determine whether they will have a significant impact on threatened species. The test for significant impact is described in Section 7.3 of the BC Act. A significant impact also occurs if the activity is carried out in an area of outstanding biodiversity value.</p> <p>A Likelihood of Occurrence assessment has been completed (Appendix A2). It was concluded no threatened flora or fauna species recorded within 5 km of the study area are likely to be impacted by the proposed works. Therefore, no Assessments of Significance under the BC Act were undertaken and the preparation of a Species Impact Statement (SIS) or Biodiversity Development Assessment Report (BDAR) is not required.</p>
<i>Biosecurity Act 2015</i> (Biosecurity Act)	<p>The <i>Biosecurity Act 2015</i> repealed the <i>Noxious Weeds Act 1993</i> and provides a framework for the prevention, elimination and minimisation of biosecurity risks posed by biosecurity matter, dealing with biosecurity matter, carriers and potential carriers, and other activities that involve biosecurity matter, carriers, or potential carriers.</p> <p>Part 3 of the <i>Biosecurity Act 2015</i> applies a general biosecurity duty for any person who deals with biosecurity matter or a carrier to prevent, eliminate or minimise any biosecurity risk they may pose. Under section 23 of the Act, a person who fails to discharge a biosecurity duty is guilty of an offence.</p> <p>Whilst the Act provides for all biosecurity risks, implementation of the Act for weeds is supported by Regional Strategic Weed Management Plans (RSWMP) developed for each region in NSW. Appendix 1 of each RSWMP identifies the priority weeds for control at a regional scale. However, landowners and managers must take appropriate actions to reduce the impact of problem weed species regardless of whether they are listed in Appendix 1 of the RSWMP or not as the general</p>

Name of Act	Relevance to the Project
	biosecurity duty applies to these species. No priority weeds, as identified within the Greater Sydney RSWMP, were present within the study area.
<p><i>Environmental Planning and Assessment Act 1979</i> (EP&amp;A Act)</p>	<p>The EP&amp;A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of proposals.</p> <p>As Northern Beaches Council (a public authority) is the proponent, the works are to be assessed as 'development permissible without consent' under Part 5 of the EP&amp;A Act. Accordingly, Council must satisfy Sections 5.5 and 5.7 of that Act by examining, and considering to the fullest extent possible, all matters which are likely to affect the environment. This REF is intended to assist, and ensure compliance, with the EP&amp;A Act including Sections 5.5 and 5.7.</p> <p>The works are considered development without consent in accordance with Section 2.165 of the <i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i> (Transport and Infrastructure SEPP) which allows public authorities to undertake waterway and foreshore management activities (including construction) without consent on any land.</p> <p>This report addresses the requirements of Section 171 of the EP&amp;A Regulation.</p>
<p><i>Fisheries Management Act 1994</i> (FM Act)</p>	<p>The FM Act provides for the protection, conservation, and recovery of threatened species defined under the Act. It also makes provision for the management of threats to threatened species, populations, and ecological communities defined under the Act, as well as the protection of fish and fish habitat in general. In particular, the FM Act has mechanisms for the protection of saltmarsh, mangroves, seagrasses and seaweeds on public water land and foreshores.</p> <p>It is an offence to harm marine vegetation without a permit from Department of Primary Industries (DPI) Fisheries. In accordance with Section 205, Council will seek a permit under Part 7 of the FM Act prior to the commencement of works, to remove the macroalgae from pile surfaces and shark netting, and to harm 190.05 m<sup>2</sup> of <i>Zostera capricorni</i> and <i>Halophila ovalis</i> seagrass during construction.</p> <p>In accordance with Section 200, a dredging and reclamation permit under Part 7 is also required for the removal and construction of piles.</p> <p>An Assessment of Significance was undertaken in accordance with Section 220ZZ of the FM Act for the following endangered species listed under the Act:</p> <ul style="list-style-type: none"> <li>• <i>Hippocampus whitei</i> (White's Seahorse)</li> </ul> <p>The Assessment of Significance concluded that a significant impact to White's Seahorse is not likely to result from the proposed works. Future maintenance works will be guided by the conditions imposed by the Fisheries Permit.</p> <p>A Section 37 scientific licence and approved relocation plan is required to relocate live seahorses or other members of the Syngnathidae family away from the proposed works area.</p>
<p><i>National Parks and Wildlife Act 1974</i> (NPW Act)</p>	<p>The NPW Act is administered by the Director-General of the National Parks and Wildlife Services (NPWS), who is responsible for the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas (among others). The main aim of the Act is to conserve the natural and cultural heritage of NSW. The Act aims to conserve the natural and cultural heritage of NSW. Where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required.</p> <p>A requirement of Section 2.15 of the Transport and Infrastructure SEPP is for consultation with the NPWS where the proposed works occur on or adjacent to National Parks Estate. The proposed works are not within or adjacent to national park and therefore consultation is not required.</p> <p>ELA has undertaken an Aboriginal Heritage Due Diligence Assessment to determine if the proposed works have the potential to impact upon any Aboriginal objects or places. The assessment determined that there will be no significant impact to any registered Aboriginal objects or places because of the proposed works.</p>



Name of Act	Relevance to the Project
<p><i>Heritage Act 1977</i> (Heritage Act)</p>	<p>The Heritage Act provides protection of the environmental heritage of the State which includes places, buildings, works, relics, movable objects, or precincts that are of State or local heritage significance. A key measure for the identification and conservation of State significant items is listing on the State Heritage Register (SHR) as provided in Part 3A of the Heritage Act. ELA has undertaken a Historic Heritage Assessment for the below heritage items to determine any potential impacts of the works:</p> <ul style="list-style-type: none"> <li>• Manly Foreshores – Item No. I1 (Manly LEP 2013)</li> <li>• Clontarf Park – Item No. I42 (Manly LEP 2013)</li> <li>• Norfolk Island Pine commemorative tree – Item No. I43 (Manly LEP 2013)</li> <li>• Middle Harbour Submarine Syphon (NSOOS) – Item No. I44 (Manly LEP 2013)</li> <li>• Middle Harbour Syphon (NSOOS) – Item No. I45 (Manly LEP 2013) and SHR Listing No. 01628</li> </ul> <p>The assessment determined that the proposed works will not impose a significant impact on the above listed heritage items.</p>
<p><i>Protection of the Environment Operations Act 1997</i> (POEO Act)</p>	<p>The POEO Act is the key environmental protection and pollution statute. The POEO Act is administered by the NSW Environment Protection Authority (EPA) and establishes a licensing regime for waste, air, water and pollution. Relevant sections of the Act are listed below:</p> <ul style="list-style-type: none"> <li>• Part 5.3 Water Pollution</li> <li>• Part 5.4 Air Pollution</li> <li>• Part 5.5 Noise Pollution</li> <li>• Part 5.6 Land Pollution and Waste</li> </ul> <p>Any work potentially resulting in pollution must comply with the POEO Act. Relevant licences must be obtained if required. No licences have been identified as being required including an Environmental Protection Licence (EPL).</p>
<p><i>Water Management Act 2000</i> (WM Act)</p>	<p>The main objective of the WM Act is to manage NSW water in a sustainable and integrated manner that will benefit current generations without compromising future generations' ability to meet their needs. The WM Act is administered by Natural Resources Access Regulator (NRAR) and establishes an approval regime for activities within waterfront land, defined as the land 40 m from the highest bank of a river, lake, or estuary.</p> <p>Approvals under Section 91 are required for controlled activities on waterfront land. Under the WM Act, a controlled activity means:</p> <ol style="list-style-type: none"> <li><i>the erection of a building or the carrying out of a work (within the meaning of the Environmental Planning and Assessment Act 1979),</i></li> <li><i>the removal of material (whether or not extractive material) or vegetation from land, whether by way of excavation or otherwise,</i></li> <li><i>the deposition of material (whether or not extractive material) on land, whether by way of landfill operations or otherwise, or</i></li> <li><i>the carrying out of any other activity that affects the quantity or flow of water in a water source.</i></li> </ol> <p>Section 91E (1) of the WM Act identifies that it is an offence to carry out a controlled activity in, on or under waterfront land without gaining a controlled activity approval. However, under Clause 41 of the <i>Water Management (General) Regulation 2018</i> (WM Regulation) public authorities are exempt from Section 91E (1) of the WM Act, and therefore do not require any approvals for controlled activities on waterfront land.</p>

## 2.3 Environmental Planning Instruments

**Table 3: NSW Environmental Planning Instruments (EPIs)**

Name of EPI		Relevance to Project
<b>State Environmental Planning Policy (SEPP)</b>		
<i>State Environmental Planning Policy (Transport and Infrastructure) 2021</i> (Transport and Infrastructure SEPP)	<b>Permissibility</b>	<p>The aim of this Policy is to facilitate the effective delivery of infrastructure across NSW by identifying whether certain types of infrastructure require consent, can be carried out without consent or are exempt development.</p> <p>Pursuant to Section 2.165 (Part 2.3 Division 25) of the Transport and Infrastructure SEPP, development for the purpose of waterway or foreshore management activities may be carried out by or on behalf of a public authority without consent on any land. This includes construction works.</p>
	<b>Consultation</b>	<p>Part 2.2 Division 1 of the Transport and Infrastructure SEPP contains provisions for public authorities to consult with other agencies prior to the commencement of development. Consultation requirements are detailed in Section 4 of this REF.</p>
<i>State Environmental Planning Policy (Resilience and Hazards) 2021</i> (Resilience and Hazards SEPP)		<p>Chapter 2 of the Resilience and Hazards SEPP 2021 aims to manage development within coastal zones and protect the environmental assets of the coast. In accordance with Section 5 of the <i>Coastal Management Act 2016</i> (CM Act), the term coastal zone is defined as any area of land that is comprised of the following coastal management areas:</p> <ul style="list-style-type: none"> <li>• Coastal wetlands and littoral rainforests</li> <li>• Coastal vulnerability areas</li> <li>• Coastal environment areas</li> <li>• Coastal use areas.</li> </ul> <p>The study area is mapped under the NSW Department of Planning and Environment Coastal Management SEPP Interactive Map. The proposed works are located within the Coastal Environment Area.</p> <p>Section 2.10(3) of the Resilience and Hazards SEPP states that development controls for Coastal Environment Areas do not apply to land within the Foreshores and Waterways Area within the meaning of the <i>Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005</i> (SREP). As of 1 March 2022, the SREP was repealed by Chapter 10 of the Biodiversity and Conservation SEPP. The study area is within the boundary defined by the Sydney Harbour Catchment Map (Amendment 2016).</p> <p>Therefore, the Resilience and Hazards SEPP does not apply.</p>
<i>Ports and Maritime Administration Regulation 2012</i> (PMA Regulation)		<p>Clause 67ZN states that a person must not use drags, grapplings, or other apparatus for lifting any object or material from the bed of a port described in Schedule 1, or otherwise disturb any such bed in any way, except with the written permission of the relevant Harbour Master and in accordance with the conditions attaching to such permission.</p> <p>Schedule 1 describes the port boundaries, that includes the waters of Sydney Harbour and of all tidal bays, rivers and their tributaries connected or leading to Sydney Harbour bounded by mean high water mark together with that part of the Tasman Sea below mean high water mark enclosed by the arc of a circle of radius 4 nautical miles having as its centre the navigation light at Hornby Lighthouse.</p> <p>The Port Authority of NSW requires that a Harbour Masters Approval form is to be lodged for the proposed disturbance to the seabed.</p>
<i>State Environmental Planning Policy (Biodiversity and Conservation) 2021</i>		<p>Chapter 10 of the Biodiversity and Conservation SEPP contains controls for the Sydney Harbour Catchment area. The aim of this chapter is to carry over the provisions of the</p>

(Biodiversity  
Conservation SEPP)

and repealed Sydney Harbour Catchment SREP, by protecting and maintaining the catchment, foreshores, and waterways of the Sydney Harbour.

In accordance with Chapter 10 of the Biodiversity and Conservation SEPP, Clontarf Tidal Pool is zoned as W5 (Water Recreation) (Figure 4). Under Section 10.15 of the Biodiversity and Conservation SEPP, water recreation facilities may only be carried out within W5 zoned land with development consent. However, as the works are being undertaken by a public authority under Part 5 of the EP&A Act, Section 2.165 of the Transport and Infrastructure SEPP allows for the works to be carried out without consent.

The objectives of W5 zoning and relevance to the project are provided in Table 4 below.

**Table 4: W5 Zoning Objectives**

W5 Zoning Objective	Relevance to proposal
a) <i>to give preference to and increase public water-dependent development so that people can enjoy and freely access the waters of Sydney Harbour and its tributaries,</i>	The proposed works seek to restore the Clontarf Tidal Pool to a state that is safe for use and enjoyment by the public. Without the proposed works, the tidal pool is unfit for public use. Furthermore, the effects of sedimentation resulting from coastal processes reduces the usable area of the tidal pool in its current state. By extending the boundary of the pool, the longevity of its use is considered, and the public is able to enjoy, and freely and safely access, the waters of Sydney Harbour within Clontarf Reserve.
b) <i>to allow development only where it is demonstrated that the public use of waters in this zone is enhanced and will not be compromised now or in future,</i>	The effects of sedimentation resulting from coastal processes reduces the usable area of the tidal pool in its current state. By extending the boundary of the pool, the longevity of its use is considered, and the public is able to enjoy, and freely and safely access, the waters of Sydney Harbour within Clontarf Reserve.
c) <i>to minimise the number, scale and extent of artificial features consistent with their function,</i>	The works will not contribute to additional artificial features. The artificial pool structure is essential so that the public can safely enjoy the Clontarf Reserve waters of Middle Harbour, due to the presence of sharks.
d) <i>to allow commercial water-dependent development, but only where it is demonstrated that it meets a justified demand, provides benefits to the general and boating public and results in a visual outcome that harmonises with the planned character of the locality,</i>	<p>The proposed works are considered neither commercial nor development. This clause does not apply.</p> <p>The works do, however, provide benefits to the general public and the resulting extension of the pool will be consistent with the historical local character of Clontarf Reserve.</p>
e) <i>to minimise congestion of and conflict between people using waters in this zone and the foreshore,</i>	The proposed tidal pool does not extend beyond the W5 zoning and will not contribute to congestion once construction works are completed.

- |   |   |
|---|---|
| <p>f) <i>to protect and preserve beach environments and ensure they are free from artificial structures,</i></p>  | <p>Clontarf Tidal Pool is an existing artificial structure, that has existed since the 1940s. The proposal seeks to extend the tidal pool to improve its safety and usability for the foreseeable future. The new structure will not have any additional adverse effect on the beach environment.</p>   |
| <p>g) <i>to ensure that the scale and size of development are appropriate to the locality, and protect and improve the natural assets and natural and scenic quality of the surrounding area, particularly when viewed from waters in this zone or from areas of public access.</i></p> | <p>The proposed extension is relatively minor, increasing the tidal pool area by approximately 0.076 ha. This is proportionate to the size of Clontarf Reserve, while also considering the high use the pool receives during peak periods. The encroachment of the extension on the natural landscape and visual amenity, including from the marina, is relatively minor.</p> |

### Wetlands Protection Area

Wetlands Protection Areas are mapped to the north and south of Clontarf tidal pool (Figure 11). In accordance with the Biodiversity and Conservation SEPP, wetlands are defined as:

*Natural or non-natural wetlands (including marshes, sedge lands, wet meadows, salt marshes, mudflats, mangroves, and seagrasses) that form a shallow water body when inundated (cyclically, intermittently or permanently) with fresh, brackish or salt water.*

In accordance with Section 10.62(1) of the Biodiversity and Conservation SEPP, development within a Wetlands Protection Area must obtain development consent. However, Section 10.62(3) states that development consent is not required for the proposed works (which are not dredging, within a protection area, or restore or enhance the wetlands) if:

- a) *in the opinion of the consent authority –*
  - (i) *the proposed development is of a minor nature, and*
  - (ii) *the proposed development would not adversely affect the wetland or Wetlands Protection Area, and*
- b) *the proponent has notified the consent authority in writing of the proposed development and the consent authority has advised the applicant in writing before any work is carried out that it is satisfied that the proposed development will comply with this subclause and that development consent is not otherwise required by this plan.*

As the works are minor in nature, will impact approximately 190.05 m<sup>2</sup> of seagrass meadows (*Zostera capricorni* and *Halophila ovalis*) within the study area, and will take place outside of the area mapped as Wetlands Protection Area, it is concluded that the proposed works will not adversely affect the Wetlands Protection Area.

### Local Environmental Plan (LEP)

Manly Local Environmental Plan 2013  
(Manly LEP 2013)

#### Land Use Zoning

The study area is partially mapped as RE1 (Public Recreation) under the Manly LEP 2013 (Figure 4). The objectives of RE1 zoning are as follows:

- *To enable land to be used for public open space or recreational purposes.*
- *To provide a range of recreational settings and activities and compatible land uses.*
- *To protect and enhance the natural environment for recreational purposes.*
- *To protect, manage and restore areas visually exposed to the waters of Middle Harbour, North Harbour, Burnt Bridge Creek and the Pacific Ocean.*



- *To ensure that the height and bulk of any proposed buildings or structures have regard to existing vegetation, topography, and surrounding land uses.*

The proposed works support the objectives described above.

#### **Terrestrial Biodiversity**

The foreshore of Clontarf Reserve is mapped as 'Terrestrial Biodiversity' in accordance with the Manly LEP (Figure 4). The objectives of Terrestrial Biodiversity under Clause 6.5 are:

- Protecting native fauna and flora, and*
- Protecting the ecological processes necessary for their continued existence, and*
- Encouraging the conservation and recovery of native fauna and flora and their habitats.*

The proposed works will not impact on areas mapped as Terrestrial Biodiversity and are consistent with the above objectives.

#### **Foreshore Scenic Protection Area**

The foreshore area behind the Clontarf Tidal Pool is mapped as Foreshore Scenic Protection Area under Clause 6.9 of the Manly LEP. The following provisions apply to the proposed works:

- Development consent must not be granted to development on land to which this clause applies unless the consent authority has considered the following matters—*
  - impacts that are of detriment to the visual amenity of harbour or coastal foreshore, including overshadowing of the foreshore and any loss of views from a public place to the foreshore,*
  - measures to protect and improve scenic qualities of the coastline,*
  - suitability of development given its type, location and design and its relationship with and impact on the foreshore,*
  - measures to reduce the potential for conflict between land-based and water-based coastal activities.*

The proposed works will not significantly alter the visual amenity of the coastal foreshore at Clontarf Reserve, considering the works are for the replacement of an existing structure. The works will increase the area of the tidal pool by approximately 0.076 ha. The tidal pool is an existing opportunity for water-based coastal recreation and will not cause conflict with land-based activities associated with the beach itself or the adjacent Clontarf Reserve.

Further to Clause 6.9, under Clause 6.10 of the Manly LEP development consent is not to be granted in the foreshore area except for:

- the extension, alteration or rebuilding of an existing building wholly or partly in the foreshore area,*
- [...] swimming pools [...] or other recreation facilities (outdoors).*

Therefore, the proposed works are permissible in relation to foreshore development controls.

#### **Heritage Conservation**

In accordance with Schedule 5 – Environmental Heritage of the Manly LEP 2013, the following heritage listed items are within or near the study area:

- Clontarf Park (Item No. I42)
- Harbour Foreshores (Item No. I1)
- Norfolk Island Pine commemorative tree (*Araucaria heterophylla*) (Item No. I43)
- Middle Harbour Submarine Syphoon (NSOOS) (Item No. I44)
- Middle Harbour Syphon (NSOOS) (Item No. I45)

One State Heritage Register (SHR) listed item is in vicinity of the proposed works, being the Middle Harbour Syphon (NSOOS) (SHR Listing No. 01628).

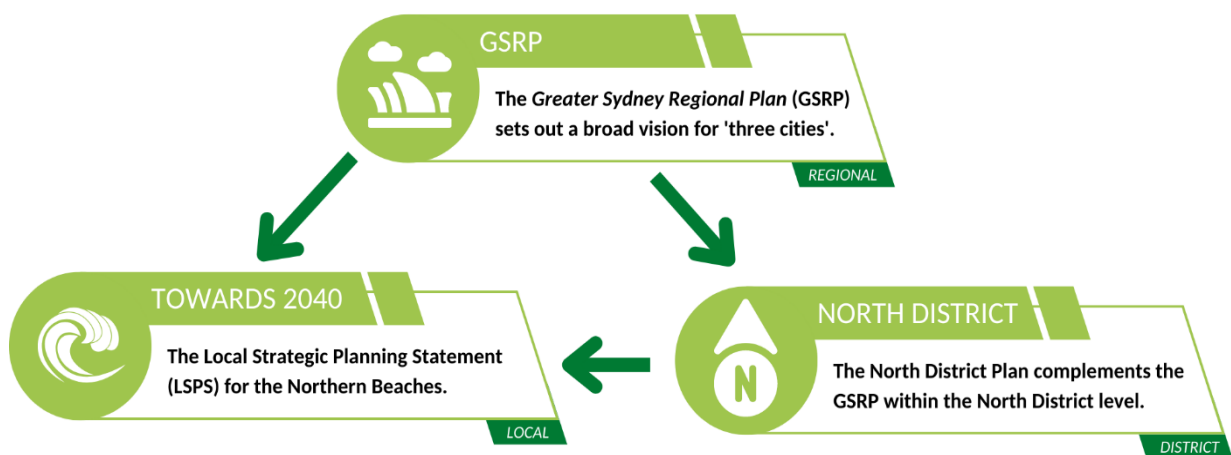
ELA has prepared an Historic Heritage Assessment for above items contained within Section 3.4.3 of this REF. It was determined that no significant impact as a result of the proposed works will occur.

#### Acid Sulphate Soils

In accordance with the Manly LEP, the study area is mapped as having Class 5 Acid Sulphate Soils (ASS) (Figure 10).

## 2.4 Strategic Planning Context

In accordance with Section 171 of the EP&A Regulation, the proposed works are to be considered in the context of any relevant local strategic planning statements, regional strategic plans or district strategic plans made under the EP&A Act. This context is assessed below, and the relationship between the strategic plans is summarised in Figure 7.



**Figure 7: Relationship between the strategic plans relevant to the project. The GSRP is supported by Towards 2040 and the North District Plan. Towards 2040 is also guided by the North District Plan.**

### 2.4.1 Greater Sydney Region Plan – A Metropolis of Three Cities

The *Greater Sydney Region Plan* (GSRP) is the regional plan that applies to the broader Sydney region including its future growth centres. It sets out the vision to build a city in which most residents live within thirty minutes of employment, education, health, services, and open spaces. The study area is within the ‘North District’, one of five districts under the GSRP. One of the key directions of the GSRP is to create ‘a city of great places’, which can be achieved through creating great places that bring people together (Objective 12) and conserving and enhancing environmental heritage (Objective 13). An indicator for the achievement of these goals is increased access to open space. The proposal supports these objectives by providing increased opportunity for protected swimming within the North District, while respecting the environmental heritage of the pool and its surrounds. The renewal works will ensure that the tidal pool is usable for predict sea level rise by the end of the century, which is predicted to occur under any climate change scenario. Importantly, the works ensure infrastructure adapts to meet future needs (Objective 3). The works are intended to future proof Clontarf Tidal Pool for its long-term enjoyment.

### 2.4.2 North District Plan

The *North District Plan* (NDP) is a complementary strategic plan to the GSRP, prepared by the Greater Sydney Commission (GSC) in 2018 at a district level, for the northern region of Greater Sydney. This

encompasses many LGAs north of the Sydney Harbour and includes the Northern Beaches. The NDP sets out the vision for the Future of the North District through the following planning priorities which are supported by the proposal:

- Creating and renewing great places while protecting heritage and local character and improving places for people
- Respecting the District's heritage
- Adapting to the impacts of urban and natural hazards and climate change
- Protecting and improving the health and enjoyment of Sydney Harbour and the District's waterways
- Delivering high quality open space

#### 2.4.3 Local Strategic Planning Statement

*Towards 2040* is the Northern Beaches Councils' first Local Strategic Planning Statement (LSPS), being a 20-year land use planning vision prepared as required under the EP&A Act. The LSPS contains thirty planning priorities that will help to achieve the *Towards 2040* vision. The priorities which apply to the Project, and their relevance, are described in Figure 8. The LSPS aligns with several strategic plans that apply to the study area in its broader context, including the GSRP and the NDP.

Planning Priority	Relevance To Project
<div data-bbox="215 1126 295 1216">6</div> <div data-bbox="384 1115 734 1227">High quality open space for recreation</div>	<p>The use of Clontarf Tidal Pool is currently impeded by limited swimming opportunities due to accumulating sediment, and safety hazards due to the deterioration of the structure. The proposed works will provide an extended tidal pool that is in an appropriately safe condition for public use, expanding and improving opportunities for outdoor recreation.</p>
<div data-bbox="215 1451 295 1541">8</div> <div data-bbox="331 1440 785 1552">Greater community resilience to natural hazards and climate change</div>	<p>Due to the likelihood of tangible sea level rise (SLR) occurring by the end of the century, the current tidal pool is at risk of submersion. The proposal seeks to climate-proof the pool by raising the height to endure likely SLR over the next eighty years. It also ensures adequate protection from marine hazards and potential injuries.</p>
<div data-bbox="215 1753 295 1843">18</div> <div data-bbox="392 1742 724 1854">Protected, conserved, and celebrated heritage</div>	<p>The proposed works are in proximity to locally listed heritage item, Clontarf Reserve (I42) and Harbour foreshores (I1) under the Manly LEP 2013. The proposed works are sensitive to the heritage character of the Clontarf Tidal Pool and will not significantly impact nearby listed heritage items.</p>

**Figure 8: Towards 2040 LSPS Planning Priorities relevant to the project**



*White's seahorse within Clontarf Tidal Pool rebars and seagrass*  
Image: ELA, 2019

## SECTION 3

# Environmental Impact Assessment



## 3. Environmental Impact Assessment

### 3.1 Landform, Geology and Soils

#### 3.1.1 Existing Environment

##### 3.1.1.1 Soil Landscape

The study area is located within the Woy Woy soil landscape (Figure 9). The Woy Woy landscape is typified by marine sand beaches in secluded areas of the Sydney Harbour foreshore. The majority of the beaches are tidal coastal sand flats with low relief of less than 3 m. In areas where residential development has occurred, beach ridges have been levelled out and the swampy swales adjacent to the tidal beaches have been infilled. The soil matrix consists of deep Holocene fine quartz sand above Hawkesbury sandstone bedrock. Sands of the Woy Woy landscape are frequently waterlogged as they are associated with a high-water table and are susceptible to localised high soil erosion.

##### 3.1.1.2 Geology

A geotechnical investigation was undertaken by JK Geotechnics (JKG, 2022). The investigation comprised of four boreholes (of depths 5 – 9.5 m) on land and seven Dynamic Cone Penetration (DCP) tests between 1.8 – 4.7 m below the bay bed level. The purpose of the boreholes was to identify the soils present, assess density and to measure groundwater levels. DCP tests were undertaken to indicate soil relative density where the drill rig could not be used (in the absence of using a barge). Marine sands were encountered in boreholes (BH) BH3 and BH4. Sands varied from loose to medium relative density. Groundwater seepage occurred in BH3 and BH4 at 0.5 m and 0.3 m depths, respectively.

##### 3.1.1.3 Contaminated Land

The Contaminated Land Register (NSW EPA, n.d.) was checked for known contaminated land or potential contamination risk within the LGA 'Northern Beaches Council' on 3 August 2022. There are no current contamination notices applied within or near the study area. There was no obvious indication of gross contamination (i.e., staining, odours or distressed vegetation) noted on the soil or beach surface around the pool during the field survey. While some rubbish was noted around the study area and in the water, it is unlikely that gross contamination exists on site. Soils and groundwater were not tested for contamination during the geotechnical investigation (JKG, 2022).

##### 3.1.1.4 Acid Sulfate Soils

In accordance with Clause 6.1 of the Manly LEP, the study area is partially mapped as having Class 5 Acid Sulphate Soils (ASS) and in close proximity to an area mapped as having Class 3 ASS (Figure 8). ASS are generally not found in areas mapped under Class 5.

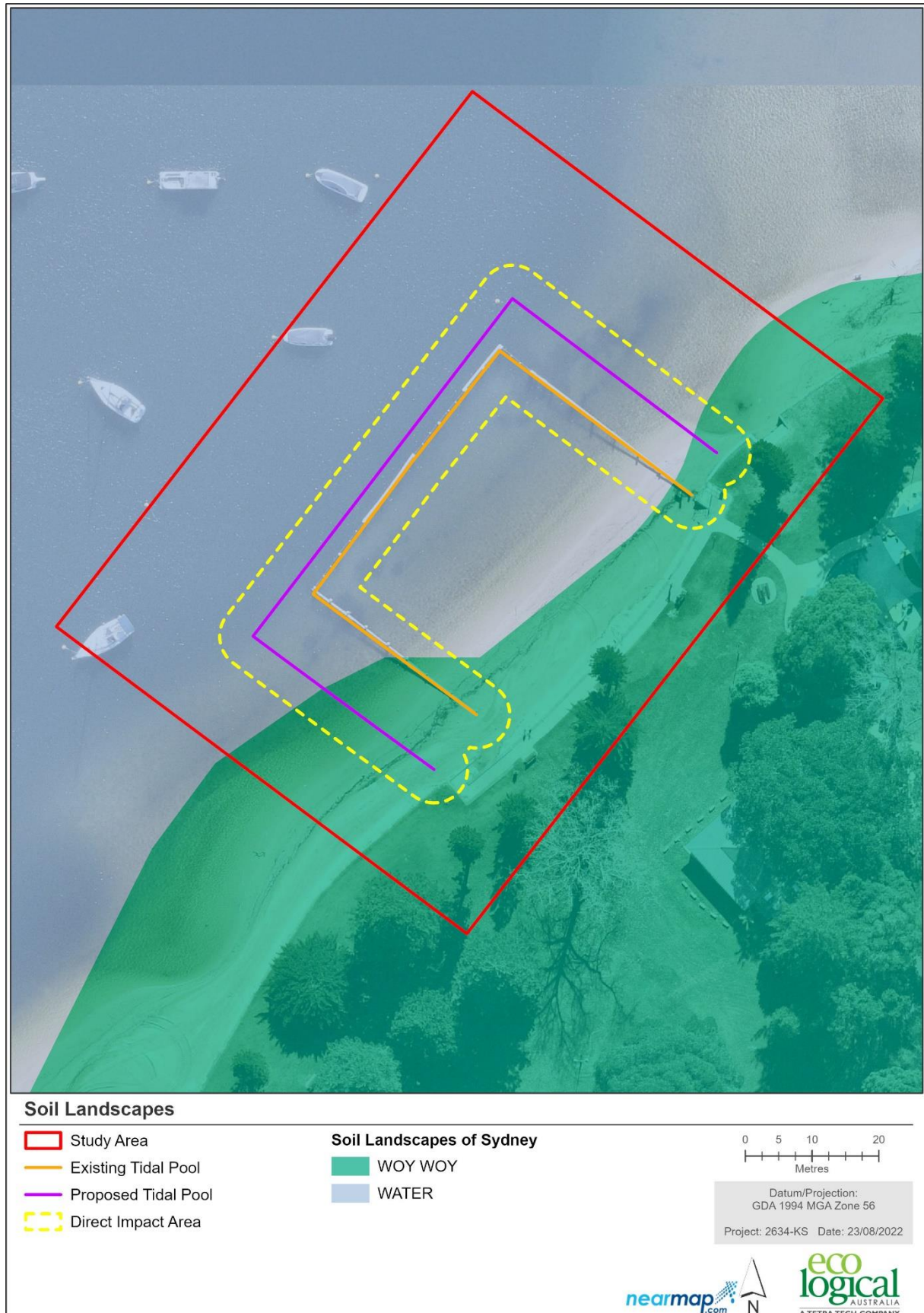


Figure 9: Soil landscapes within the study area



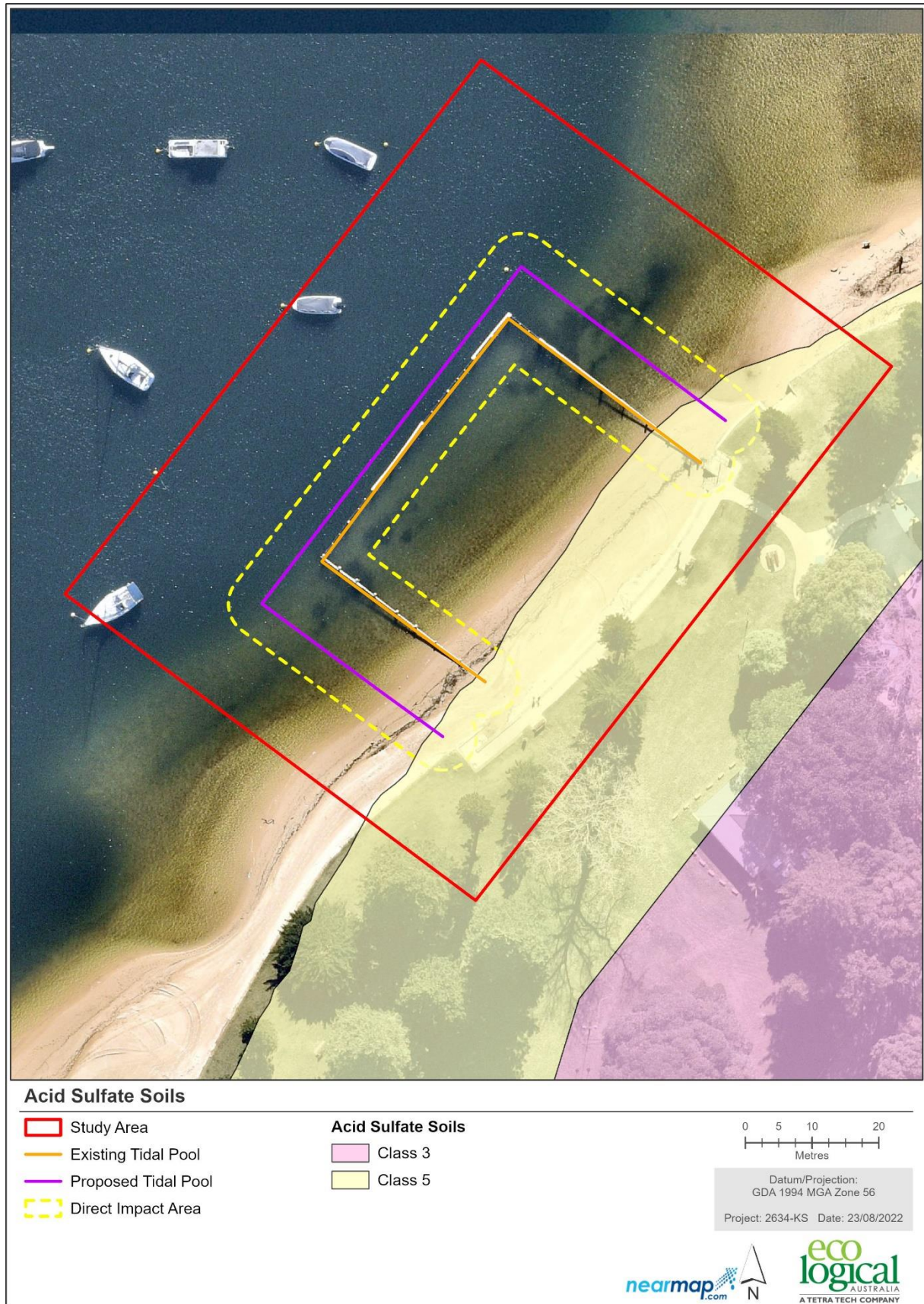


Figure 10: Acid Sulphate Soils in relation to the study area (Manly LEP 2013)

### 3.1.2 Impact Assessment

#### 3.1.2.1 Soils, Erosion and Sedimentation

The proposed works will require the removal and installation of piles within the seabed. These works have the potential to impact on soil stability, turbidity of the water and sedimentation of the adjacent aquatic habitat unless the recommended mitigation measures are implemented. Whilst there is potential during the major maintenance works for erosion and sedimentation to occur, these are expected to be mitigated through the use of strict sediment and erosion controls.

The risk of soil erosion, water turbidity and sedimentation during the works will therefore be low if the mitigation measures described in Section 5 are implemented.

#### 3.1.2.2 Contamination

Based on current site condition, there is low potential for contamination to exist within the study area. If contaminated soils are suspected such as through visual assessment or odorous smells, further surveys should be undertaken to assess the risk. If any excess soils are to be taken offsite for disposal or reuse, material should be tested to ensure they are safe for their end use or disposed of in accordance with EPA (2014) *Waste Classification Guidelines*. If contamination is suspected, contact the Council Compliance and Natural Environment and Climate Change units.

Use of hazardous chemicals will be required to undertake the works. Chemicals such as algaecides to manage algae slip risk along with fuel and oil for the running of machinery will be used. Proper use and storage of these chemicals is outlined in Table 5 below. The potential environmental impacts associated with the proposed works that relate to contaminated soils include pollution of materials from chemical spills (e.g., algaecides and fuel or oil from machinery).

#### 3.1.2.3 Acid Sulfate Soils

ASS do not pose a risk when left undisturbed. Disturbance of ASS causes a chemical reaction, potentially causing damage to waterways and plants, corrosion (including of infrastructure) and irritation or illness (DPE, 2019). There is a low likelihood of ASS of occurring within the study area, therefore potential impacts are considered unlikely.

General and specific mitigation measures relating to landform, geology and soils are provided below (Table 5) and in Section 5.



### 3.1.3 Mitigation Measures

**Table 5: Landform, geology and soils mitigation measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>• Soil erosion and sedimentation during removal of the existing vegetation</li> <li>• Sedimentation caused by erosion and runoff from the site caused by vehicle movements and/or heavy rainfall.</li> <li>• Soil erosion, sedimentation, and bioturbation during excavation</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>• Prepare a Construction Environmental Management Plan (CEMP) prior to any construction works to address measures to be adopted to minimise impacts on the environment as a result of the construction works, including sediment erosion and sedimentation.</li> <li>• Adopt sediment and erosion controls prior to the works commencing.</li> <li>• Inspect erosion controls regularly (daily during workdays) and after rainfall. Fix damaged controls immediately. Remove accumulated sediment or waste material from within the sediment controls regularly.</li> <li>• Leave erosion and sediment controls in place until after the works are completed.</li> <li>• Schedule the work outside of predicted heavy rain periods.</li> <li>• Stop work during and after heavy rainfall to reduce risk of mobilising sediment.</li> </ul> <p><b>Specific</b></p> <ul style="list-style-type: none"> <li>• A permit under Part 7 of the FM Act is required for dredging and reclamation associated with the removal of existing piles and construction of new piles.</li> <li>• A Sediment and Erosion Control Plan is to be implemented prior to works, with the aim of achieving an outcome of 'no visible turbid plumes migrating through the waterway'. The Plan must include, but not be limited to: <ul style="list-style-type: none"> <li>○ A floating sediment curtain is to be erected in a semi-circular arrangement to enclose all suspended sediments and organic material generated within the worksite.</li> <li>○ Sediment curtain must be positioned and secured properly so it does not drag over seagrass and scour seagrass beds.</li> <li>○ Ensure weighted chain of sediment curtain does not drag over any seagrass and inadvertently damage seagrass identified to be retained.</li> <li>○ Tarps to be placed carefully over existing seagrass beds within the immediate work area to prevent seagrass from being smothered by sediment and organic matter as the pool infrastructure is scraped clean.</li> <li>○ Tarps are to be rolled up and sediments and debris removed from the waterway and disposed of at an appropriate waste facility.</li> <li>○ Tarps must not remain on the seagrass beds for more than 24 hours.</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>• Incidental discovery of sediment contamination.</li> <li>• Disturbance of acid sulphate soils</li> <li>• Pollution of sediment from chemical spills (e.g., fuel or oil from machinery).</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>• If contaminated soils are uncovered during the works, all works within the vicinity of the find must cease immediately and the relevant authority must be notified immediately.</li> <li>• For any excess spoil where potentially, contaminating activities have been identified on site this material will be tested and classified prior to leaving site. For any excess spoil material classified as contaminated, disposal of this material will be at an appropriately licensed landfill in accordance with the EPA (2014) <i>Waste Classification Guidelines</i>.</li> <li>• Store all chemicals (e.g., fuel, oil) in appropriate bunding/storage systems within the approved storage facility out of the riparian zone.</li> <li>• Ensure appropriate spill kits are carried with the equipment.</li> </ul>

Impact Description	Safeguards/Mitigation Measures
Geotechnical Recommendations (JKG, 2022)	<p><b><u>Specific</u></b></p> <ul style="list-style-type: none"> <li>• Support the tidal pool structure on underlying sands of at least loose relative density.</li> <li>• Consider potential scour in pile design. Specific advice should be obtained from a coastal engineer on the depth of scour that should be accounted for. JKG should then be recommissioned to review the recommendations below.</li> <li>• When founding the piles in sand, consider the allowable bearing pressures (ABP). As a guide:               <ul style="list-style-type: none"> <li>○ where 0.3 m diameter piles are adopted, establish piles within loose sand at least 1.8 m below the design scour level (as specified by the coastal engineer), an ABP of 100 kPa can be adopted.</li> <li>○ where 0.5 m diameter piles, establish piles within loose sand at least 3 m below the design scour level (as specified by the coastal engineer), an ABP of 175 kPa can be adopted.</li> </ul> </li> <li>• Higher bearing pressures would be appropriate in medium dense or higher relative density and for driven piles. Design is required by the piling contractor, based on the pile type used.</li> <li>• Engagement of a pile designer for lateral and moment loading.</li> <li>• Install initial piles near existing boreholes or Dynamic Cone Penetration tests, so that conditions can be calibrated before installing piles at other locations.</li> </ul>

## 3.2 Waterways and Coastal Wetlands

### 3.2.1 Existing Environment

No Ramsar or Coastal Wetlands (as identified under Chapter 2 – Coastal Management of the Resilience and Hazards SEPP) have been identified within or in close vicinity to the study area.

Clontarf Tidal Pool currently occupies an area of approximately 0.1536 ha within the waters of Middle Harbour. Located in a small embayment opposite the Spit Bridge, the pool is in a relatively sheltered area of the Harbour. In 2015, approximately half of its area was filled with sand that had accumulated before dredging works in 2019. Such accumulation reduces the area available as aquatic habitat and for public use. Longshore drift continues to occur to some extent within and around the pool.

The Department of Planning and Environment (DPE, previously DPIE) monitors water quality at Clontarf Pool as part of its Beach Watch Program. The *State of the Beaches 2020-2021* report (DPIE, 2021) identified the water quality at Clontarf Pool as 'Good' and that the quality was stable compared to previous years. During the aquatic site survey undertaken by ELA consultants Geraint Breese and Nial Roder on 19 July 2022, the water in the pool and surrounding area was slightly turbid with increased debris resulting from rainfall at the time.

#### 3.2.1.1 Coastal Environment Area

As per Table 3, the Resilience and Hazards SEPP objectives relating to Coastal Environment Areas do not apply to this Project, despite the area being mapped as a Coastal Environment Area, as the SEPP is not applicable to land within the mapped Foreshores and Waterways Area under Chapter 10 of the Biodiversity and Conservation SEPP. Regardless, the proposed works are to be designed and carried out in accordance with the required considerations under Part 2, Division 3, Section 2.10 of the Resilience and Hazards SEPP.

#### 3.2.1.2 Wetlands Protection Area

Areas to the north and south of Clontarf pool are mapped as 'Wetlands Protection Area' under Chapter 10 of the Biodiversity and Conservation SEPP (Figure 11). Wetland protection provisions cover areas of seagrass and a 40 m buffer around the seagrasses to allow for movement, growth, and seasonal variation. While Clontarf pool is outside of the mapped Wetland Protection Area under the SEPP, patches of seagrass were found within and immediately adjacent to the pool.

The *Clontarf/Bantry Bay Estuary Management Plan* (Manly Council, 2008) covers Clontarf pool and the surrounding area, being a strategic plan with an applicable time frame of 15 to 20 years. The following objectives apply to the study area:

- AH1: Preserve and maintain existing seagrass beds
- AH4: Ensure all areas of ecological significance are properly protected and conserved

By assessing the proposed maintenance activities and works under Part 5 of the EP&A Act and providing mitigation measures to reduce or eliminate harm to seagrass beds and the aquatic environment, the activities outlined in this REF are in accordance with this Estuary Management Plan.



**Figure 11: Wetlands Protection Area in relation to the study area, under Chapter 10 - Sydney Harbour Catchment of the Biodiversity and Conservation SEPP**



### 3.2.2 Impact Assessment

Any works that involve disturbance to the bed of the harbour, including removing and replacing piles, have the potential to degrade water quality by increasing turbidity by disturbing the bed sediments. Increased turbidity is likely to be localised to the immediate area where works are taking place. Disturbed sediments are likely to be marine sand, like the sediment that is currently evident on the floor of the pool. Marine sand will not stay suspended in the water column for an extended period. As such, impacts on water quality would be short-term and temporary in nature.

Some aquatic organisms live within the dominant substrate of their environment, in this case sand or seafloor sediments, and are known as infauna. Localised and temporary siltation of substrate and infauna burrows is likely to occur because of replacing the piles and shark netting, as well the associated disturbance of the bed sediments. Mitigation measures have been provided in Section 4.3 to reduce the severity of impacts.

#### 3.2.2.1 Wetlands Protection Area (Resilience and Hazards SEPP)

Although the study area is not mapped as a Wetlands Protection Area under Part 10 – Sydney Harbour Catchment of the Biodiversity and Conservation SEPP (Figure 11), patches of seagrass were found within and immediately adjacent to the pool (Figure 15).

In accordance with Section 10.62 of the Biodiversity and Conservation SEPP, development within a Wetlands Protection Area may be carried out only with development consent. However, Clause 62(3) states that development consent is not required by this clause for development if:

*In the opinion of the consent authority:*

- *The proposed development is of a minor nature, and*
- *The proposed development would not adversely affect the wetland or Wetlands Protection Area, and*
- *The proponent has notified the consent authority in writing of the proposed development and the consent authority has advised the applicant in writing before any work is carried out that it is satisfied that the proposed development will comply with this subclause and that development consent is not otherwise required by this plan.*

The proposed works will not be taking place within the mapped areas of Wetlands Protection Area. This REF includes mitigation measures to reduce impacts to the seagrass and aquatic fauna where feasible. By upgrading and expanding Clontarf Tidal Pool, Council is ensuring that safe access to the pool and surrounding open spaces can be maintained into the future.

Council is the consent authority but will be consulting with DPI Fisheries and TfNSW regarding the proposed activities prior to works commencing.

#### 3.2.2.2 Coastal Environment Area (Resilience and Hazards SEPP)

The development controls for Coastal Environment Areas under the Resilience and Hazards SEPP do not apply to land within the Foreshores and Waterways Area within the meaning of Chapter 10 of the Biodiversity and Conservation SEPP. However, the proposed activities should be in line with the development controls for the Coastal Environment Area, which are as follows:

- 1) *Development consent must not be granted to development on land that is within the coastal environment area unless the consent authority has considered whether the proposed development is likely to cause an adverse impact on the following—*
- a) the integrity and resilience of the biophysical, hydrological (surface and groundwater) and ecological environment,*
  - b) coastal environmental values and natural coastal processes,*
  - c) the water quality of the marine estate (within the meaning of the Marine Estate Management Act 2014), in particular, the cumulative impacts of the proposed development on any of the sensitive coastal lakes identified in Schedule 1,*
  - d) marine vegetation, native vegetation and fauna and their habitats, undeveloped headlands and rock platforms,*
  - e) existing public open space and safe access to and along the foreshore, beach, headland or rock platform for members of the public, including persons with a disability,*
  - f) Aboriginal cultural heritage, practices and places,*
  - g) the use of the surf zone.*

This REF includes mitigation measures to reduce impacts to the biophysical, hydrological, and ecological environment including water quality, seagrass, and aquatic fauna where feasible. These mitigations are provided in Table 6 below, and Section 5 of this REF.

### 3.2.3 Mitigation Measures

**Table 6: Water quality and hydrology mitigation measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>Excess sediment input into waterway</li> <li>Pollution of foreshore from chemical spills (e.g. fuel or oil)</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Weather forecasts will be checked daily to ensure that work is not carried out before or during high rainfall.</li> <li>Store all chemicals (e.g., fuel, oil) offsite and if required to be stored onsite, chemicals should be stored in appropriate bunding/storage systems and only for short periods.</li> <li>Ensure appropriate spill kits are present onsite.</li> <li>Ensure all equipment is in good working order.</li> <li>Carry associated Safety Data Sheets (SDS) for all chemicals.</li> </ul> <p><b>Specific</b></p> <ul style="list-style-type: none"> <li>Wash all equipment, including hulls of barges, anchors, sediment curtains and trailers to prevent spread of aquatic pests including <i>Caulerpa taxifolia</i> (Caulerpa). Provide contractors on site with copy of Make 'clean' part of your routine (DPI, 2015).</li> </ul> <p>A visual check for Caulerpa on all equipment and vessels to be used in the activities must be carried out before work commences.</p>

### 3.3 Biodiversity

#### 3.3.1 Existing Environment

##### 3.3.1.1 Terrestrial Biodiversity

Department of Planning and Environment (DPE, 2022) vegetation mapping identified urban native/exotic vegetation within the study area. As the proposed works are in a marine environment, terrestrial vegetation is not relevant to the proposed works. Additionally, no threatened fauna (Figure 12) or flora (Figure 13) species records were found within the study area. *Ninox strenua* (Powerful Owl) has been recorded within proximity to the study area (Figure 12).

##### 3.3.1.2 Threatened Flora

A search for threatened species using the Protected Matters Search Tool and Atlas of NSW Wildlife (within a 5 km buffer around the study area) and the review of literature identified several threatened flora species and threatened fungi.

The literature review identified 24 threatened flora species under the BC and / or EPBC Acts, which may have the potential to occur within a 5 km radius of the study area. However, no threatened flora (Figure 13) species records were found within the study area. A Likelihood of Occurrence assessment for these records is contained within Appendix A2.

##### 3.3.1.3 Threatened Fauna

The literature review identified 94 threatened fauna species listed under the BC, FM and / or EPBC Acts, which may have the potential to occur within a 5 km radius of the study area. However, no threatened terrestrial fauna (Figure 12) species records were found within the study area. A search for threatened species using the Protected Matters Search Tool (within a 5 km buffer around the study area) identified one threatened fauna species with known occurrence within the study area, *Hippocampus whitei* (White's Seahorse). A Likelihood of Occurrence assessment for terrestrial and aquatic fauna records within 5km is contained within Appendix A2.

Two terrestrial threatened fauna species were previously considered to potentially occur within the study area, the *Eudyptula minor* (Little Penguin) and *Perameles nasuta* (Long-nosed Bandicoot). Both of which are both listed as endangered populations in accordance with the BC Act, have both previously been recorded within 5 km of the study area.

Field survey was undertaken by ELA in October 2018 to determine presence of *Eudyptula minor* (Little Penguin) within the study area. The study area contained no potential breeding or nesting habitat and there was no indication of nesting occurring. No penguin burrows or indirect evidence of penguin occupation (such as white streaks of penguin guano) was observed. It is noted that the area experienced extensive rain prior to the site assessment. While this could potentially wash away some evidence of penguin occupation of a site, it is unlikely to remove all such evidence.

The field survey was undertaken to determine the presence of *Perameles nasuta* (Long-nosed Bandicoot) within the study area. The study area did not contain potential nesting or foraging habitat and no individuals were observed.



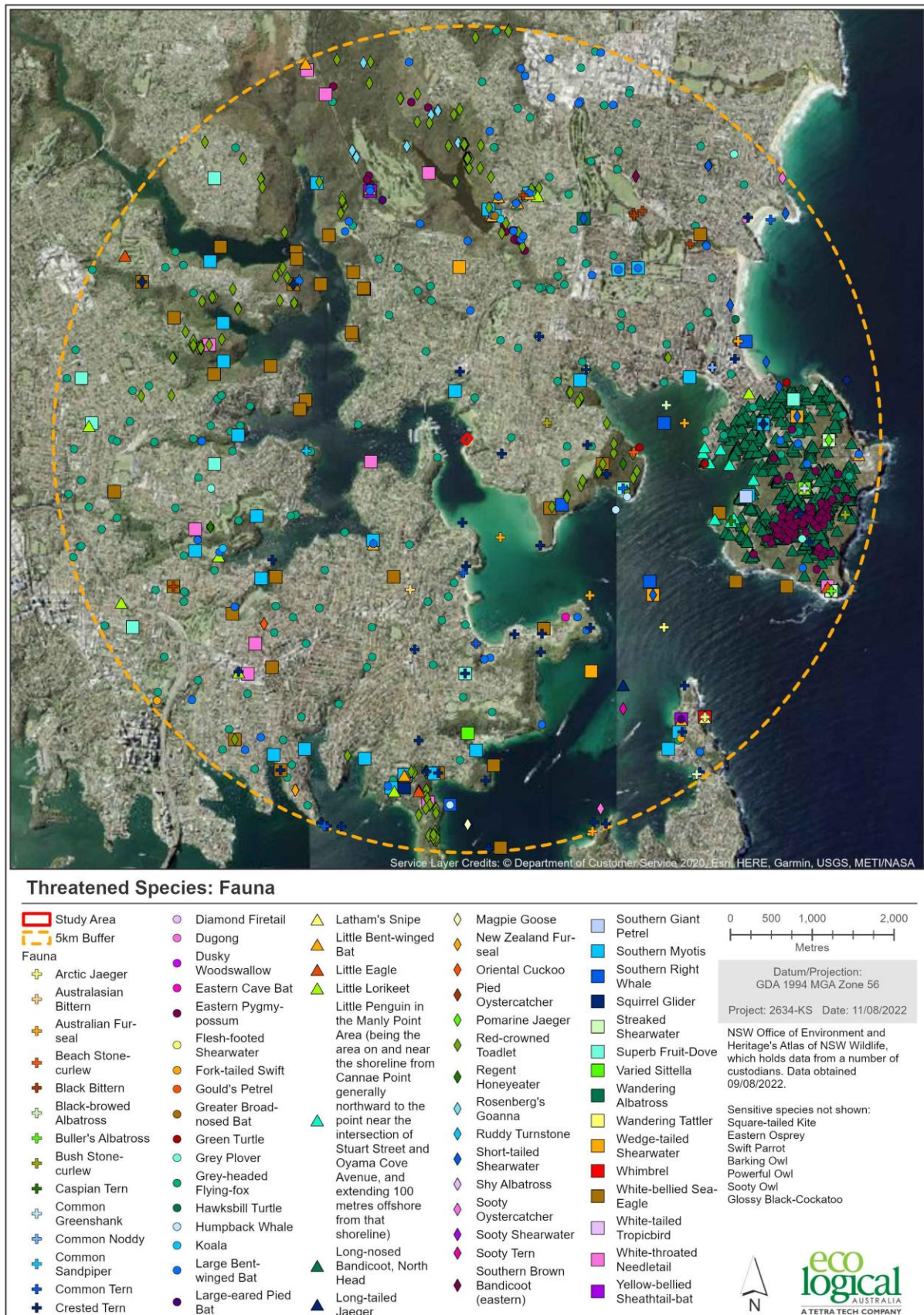


Figure 12: BioNet Atlas search of threatened fauna species within a 5 km buffer surrounding the study area



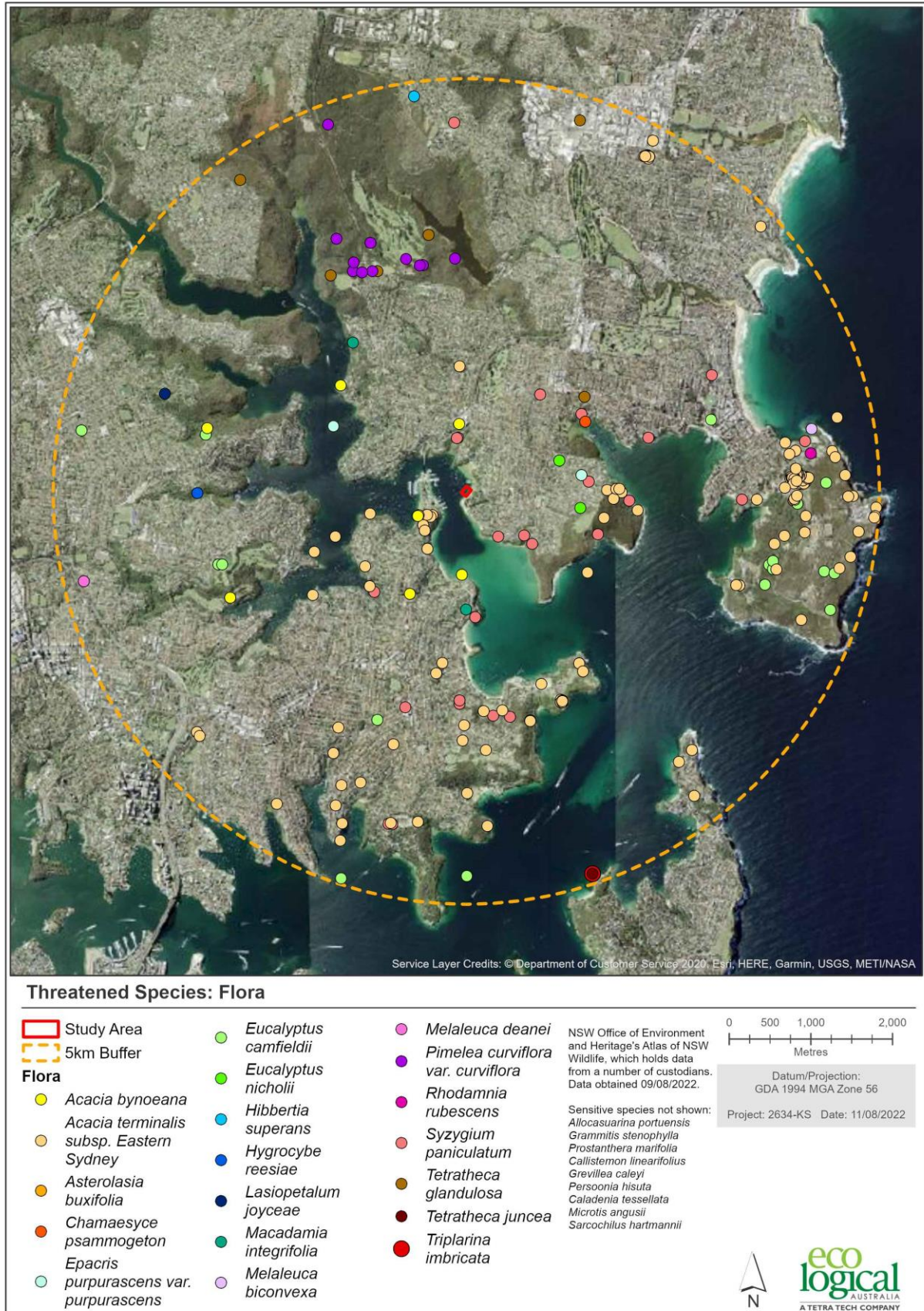


Figure 13: BioNet Atlas search of threatened flora species within a 5 km buffer surrounding the study area

#### 3.3.1.4 Aquatic Flora and Fauna

The aquatic field survey at Clontarf Pool was carried out on 19<sup>th</sup> July 2022. The underwater area inside and outside of the swimming enclosure was surveyed by two ELA consultants snorkelling and filming the underwater environment using handheld Go Pro cameras. This method allowed viewing and recording of substrate and sub-tidal flora in shallow and water to a depth of approximately 4 m. Habitat types were mapped in the field using an iPad following snorkelling. Seagrass densities were estimated visually. Aquatic flora and key fish habitat mapped in the field were merged into a final map using ArcGISpro.

There had been rain during the few days prior to the survey, so visibility in some areas of the water was poor, however examination of the video footage back in the office was used to confirm identifications of aquatic flora and fauna.

Several fish species were observed during the site survey, including *Monacanthus chinensis* (Fan-bellied Leather Jacket), *Tetractenos glaber* (Smooth Toadfish) *Girella tricuspidate* (Luderick) and *Astropecten polyacanthus* (Star Fish). The wooden piles and netting were covered with a variety of marine growth including *Balanus variegatus* (barnacles), *Saccostrea glomerata* (Sydney Rock Oyster), *Codium* sp. and Ascidians.

No *Caulerpa taxifolia*, a potentially invasive seaweed, was observed during the site survey. No threatened or endangered species or populations, as listed within the BC Act, FM Act or EPBC Act, were observed during the site survey.

Whites Seahorse have previously been located within the study area. This species is listed as an endangered species under the FM Act and EPBC Act. Council contractors carrying out pre-clearance surveys in December 2018 ahead of maintenance works on the pool structure located 14 Whites Seahorse individuals that were then moved to the adjacent patch of *Zostera capricorni* and *Halophila ovalis* outside of the pool. One seahorse was located during an aquatic survey on the 25 February 2019, required for a previous dredging REF (ELA, 2019) (Figure 19). Sea Dragon were engaged by Council in September 2020 to collect and relocate seahorses for maintenance works. Approximately 50 Whites Seahorse individuals were relocated across a period of seven days, collected from shark bars and adjacent netting at the rear of the tidal pool. A further 10-20 pipefish were identified during Sea Dragon's works.

#### 3.3.1.5 Aquatic Vegetation Mapping

NSW Estuarine Macrophyte mapping (DPI Fisheries, 2018) did not indicate the presence of any seagrass within or immediately surrounding the pool (Figure 14). The nearest patch of mapped seagrass is a 0.0097 ha patch of *Zostera* approximately 90 m to the north, at the nearby marina. The DPI Fisheries mapping was prepared using aerial photography interpretation.

The site inspection identified one vegetation community within the study area (Figure 15).

Table 7 provides a description of the present vegetation community, including condition and conservation status.

Seagrass was classified and mapped in three densities:

- Sparse (about 1 plant per 25 m<sup>2</sup> or less than 'moderate')
- Moderate (about 10 plants per 5 m<sup>2</sup>)
- Dense (> 20 plants per 5 m<sup>2</sup>).





**Figure 14: Previously mapped seagrass occurrences in the vicinity of the study area (DPI Fisheries)**





Figure 15: Aquatic habitat within the study area (ELA 2022)



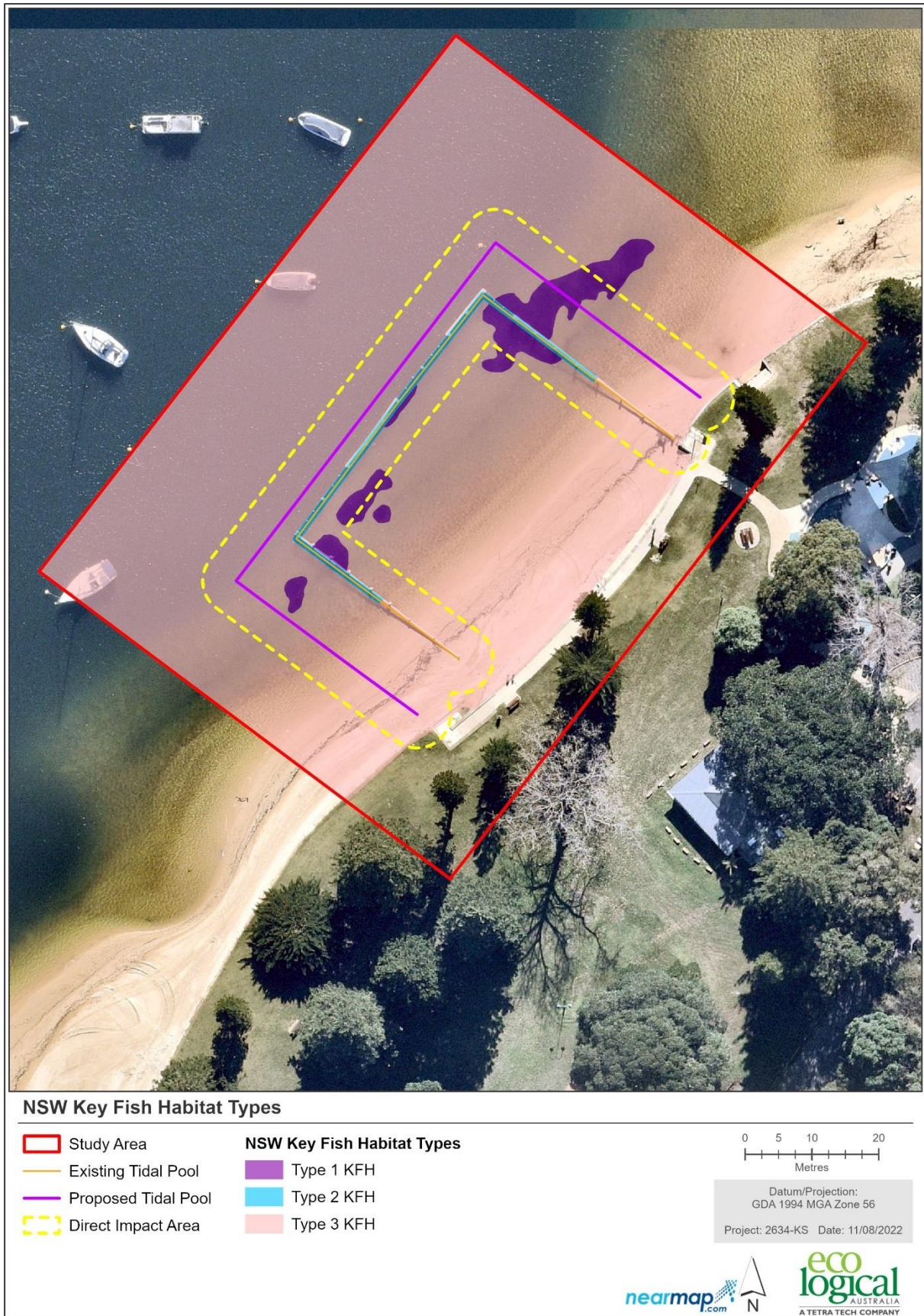


Figure 16: Key Fish Habitat types, based on aquatic vegetation mapping





Figure 17: Sparse *Zostera capricorni* and *Halophila ovalis*



Figure 18: Dense growth of oysters on exposed pile



Figure 19: *Hippocampus whitei* (Whites Seahorse) on shark reobar (ELA, 2019)



Figure 20: Dense *Zostera capricorni* and *Halophila ovalis*

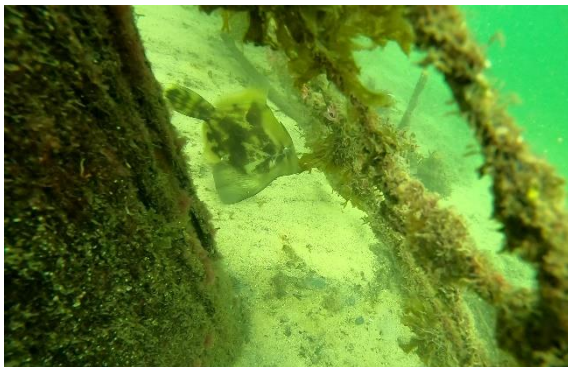


Figure 21: *Monacanthus chinensis* (Fan-bellied Leather Jacket)



Figure 22: Macroalgae on enclosure net

**Table 7: Aquatic Vegetation Communities and their condition mapped within the study area**

Vegetation Community	Plant Community Type (PCT)	Area within study area (ha)	Description	BC Act	EPBC Act	FM Act
Seagrass Meadows	1913	0.023	During the site survey, seagrass species including <i>Zostera capricorni</i> and <i>Halophila ovalis</i> were identified growing in the northern and southern areas of the pool. The patch of <i>Zostera capricorni</i> in the northern area of the pool was quite dense and was part of a larger patch that extended outside of the shark netting. A small, isolated patch of <i>Halophila ovalis</i> was located adjacent to the western shark netting. Outside of the pool, most of the study area was bare sand with evidence of moderate infauna bioturbation.	-	-	Protected
Macroalgae	-	0.008	Macroalgae including <i>Sargassum</i> sp., brown and green algae and <i>Codium</i> sp. were growing densely on the shark netting in the subtidal zone.	-	-	Protected

### 3.3.1.6 Key Fish Habitat

DPI Fisheries identify three types of Key Fish Habitat (KFH) in their *Policy and Guidelines for Fish Habitat Conservation and Management* (Fairfull, 2013): **TYPE 1** (highly sensitive aquatic habitat); **TYPE 2** (moderately sensitive key fish habitat); and **TYPE 3** (minimally sensitive key fish habitat). See Section 5 for details. Clontarf pool exhibits all three types of KFH (Figure 16):

- Type 1: *Zostera capricorni* and *Halophila ovalis* seagrass beds greater than 5 m<sup>2</sup>
- Type 2: *Zostera capricorni* and *Halophila ovalis* seagrass beds less than 5 m<sup>2</sup> and macroalgae including *Sargassum* sp.
- Type 3: Unvegetated sand with infauna.

Regarding other DPI Fisheries policies and guidelines, no aquaculture lease or hauling grounds are located near Clontarf Pool.

## 3.3.2 Impact Assessment

### 3.3.2.1 Direct Impacts

#### Removal of Native Vegetation

As the proposed works are located below the mean highwater mark and the construction compound is to be located within the adjacent carpark, only aquatic vegetation is to be impacted by the proposed works.

A precautionary approach has been taken for the impact assessment of the proposed works. It has been assumed that all vegetation within a construction buffer 5 m either side of the current tidal pool and the new tidal pool will be directly impacted during the proposed activity. This approach is conservative and a worst possible case assessment. It is anticipated that impacts will be lesser than what is described below by implementing the mitigation measures presented in Section 5, and more likely limited to less



than 1 m from the works. A summary of the direct impacts to vegetation is provided in Table 8. It is noted that the impact area of intertidal and subtidal sand with infauna bioturbation is listed, however this area will remain bare sand and therefore is not subject to substantial impacts.

**Table 8: Impacted vegetation**

Vegetation Community	Amount within Study Area (m <sup>2</sup> )	Amount Impacted (m <sup>2</sup> )	Percentage Impacted within Study Area (%)
Seagrass Meadows ( <i>Zostera capricorni</i> and <i>Halophila ovalis</i> )	346.43 m <sup>2</sup>	190.05 m <sup>2</sup>	54.86 %
Macroalgae ( <i>Sargassum</i> spp. and oysters)	82.81 m <sup>2</sup>	82.81 m <sup>2</sup>	100 %
Intertidal and subtidal sand with infauna bioturbation	6263.31 m <sup>2</sup>	1860.97 m <sup>2</sup>	29.71 %
<b>Total</b>	<b>6609.74 m<sup>2</sup></b>	<b>2133.84 m<sup>2</sup></b>	<b>32.28%</b>

Within the direct impact area, all macroalgae and oysters on the shark rebars would be removed by the demolition of the existing tidal pool structure.

#### Removal of Potential Habitat for Threatened Species

Although the Powerful Owl has been recorded within proximity to the study area (Figure 12), this species prefers habitat within open sclerophyll forests. It was determined that no potential foraging or breeding habitat was present within the study area. Furthermore, no terrestrial vegetation is proposed to be removed. Therefore, a Test of Significance in accordance with the BC Act was not undertaken.

The Long-nosed Bandicoot has previously been recorded within 5 km of the study area, however it was determined that no potential foraging or breeding habitat was present within the study area for this species and no terrestrial vegetation would be impacted by the proposed works.

The Little Penguin was also previously recorded within 5 km of the study area. No breeding habitat for this species was identified within the study area, however the study area may be intermittently utilised by penguins for foraging. Mitigation measures have been provided in Section 5 to ensure fish and other aquatic fauna, which may offer foraging resources for Little Penguin, are not harmed during construction. Therefore, a Test of Significance in accordance with the BC Act was not undertaken.

Potential foraging habitat is available for several threatened and migratory water birds. These species are generally highly mobile with abundant similar habitat in the locality. The proposed works would result in only temporary modification of foraging habitat; however, foraging habitat would not be removed. No roosting or nesting habitat for threatened and migratory water birds would be impacted by the works. Considering the relatively minor disturbance of foraging habitat for these highly mobile species, Tests of Significance in accordance with the BC Act and Significance Assessments in accordance with the EPBC Act were not undertaken. It is considered unlikely that the proposed works would have a significant impact on any threatened or migratory species.

*Hippocampus whitei* (Whites Seahorse) have previously been located at the Clontarf tidal pool and the proposed works have the potential to impact on its habitat, primarily through the removal of the pool

structure, seagrass and macroalgae. Tests of Significance in accordance with the FM Act and Significance Assessments in accordance with the EPBC Act were undertaken and it was determined that a significant impact is not likely to occur subject to implementation of mitigation measures provided in Section 5.

#### Loss of Key Fish Habitat

The proposed works would result in the loss of areas of KFH as identified in Figure 16. Works in the direct impact areas would see the loss or damage to 190.05 m<sup>2</sup> of Type 1 KFH, 82.81 m<sup>2</sup> of Type 2 KFH and 1860.97 m<sup>2</sup> of Type 3 KFH. It is noted that the impact area of intertidal and subtidal sand with infauna bioturbation is listed, however this area will remain bare sand and therefore is not subject to substantial impacts.

DPI Fisheries has a 'no net loss' policy regarding aquatic habitats. A precautionary approach has been adopted for calculating the loss of seagrass and macroalgae at Clontarf pool. It has been assumed that all KFH within the direct study area will be harmed or removed as part of the proposed activities. As there are a variety of activities covered under this assessment, the areas of seagrass and macroalgae, and therefore KFH, that are listed in

Table 7 are the maximum areas of aquatic vegetation and habitat to be harmed or removed.

Mitigation measures have been proposed in Section 5 to reduce this impact.

#### Relocation of Whites Seahorse and other Syngnathiformes

A pre-clearance survey will be undertaken prior to major works commencing. Any Whites Seahorse or other Syngnathiformes identified within or near the study area will be relocated to the Bradys Point seahorse hotels, approximately 340 m north of the study area. Relocation of seahorses may cause disturbances or induce stress that may have an adverse effect on the health of the individual, pair, or group.

The establishment of five seahorse hotels at Bradys Point has been addressed through a separate short-form REF (ELA 2022); these works will occur prior to the construction works to allow for the biofouling of the hotel structures before seahorses are relocated. This reduces the risk associated with seahorses rejecting or not surviving in a change of habitat.

The relocation will require the movement of Whites Seahorse and other located Syngnathiformes by boat due to the distance between sites. Diving professionals will capture seahorses in their breeding pairs and transfer them to a water-filled vessel, where they will stay for the duration of the relocation of the boat ride. The hotels will be located amongst a patch of dense seagrass, providing a contingency in the case that the hotels are not accepted by the seahorses. The distance between the study area and Bradys Point mitigates the potential for Whites Seahorse to naturally relocate back to the study area during construction, eliminating the need for ongoing clearance surveys.

Additionally, risks associated with stress on seahorses are reduced as individuals will not be relocated back to the study area post-construction.

Future pool maintenance works will mitigate this risk by undertaking a pre-clearance survey in accordance with the provided mitigation measures (Section 5). Minor maintenance works that do not require impacts to the entire pool structure will not involve major relocation to Bradys Point. If Whites Seahorse or other Syngnathiformes are identified during pre-clearance surveys, they can be relocated to the proposed seahorse hotels located at the back of the pool if appropriate. The risks associated with seahorse relocation are therefore reduced for some minor works.

#### Disturbance of *Whites Seahorse* during breeding season

To meet the conditions of the NSW Government Legacy Spaces grant, construction of the new pool must be completed mid-June. As such, in consultation with DPI Fisheries, works may commence during the breeding season from late February onwards. The majority of Whites Seahorse breeding pairs will have finished their breeding season at this point in time. Additionally, seahorses must be relocated to the new habitat in their breeding pairs in accordance with the approved Seahorse Relocation Plan and Fisheries permit conditions. If implemented, these mitigation measures – provided in Section 5 – will reduce the risk of adverse impacts to the breeding cycle of Whites Seahorse.

### 3.3.2.2 Indirect Impacts

#### Noise Impacts

Underwater noise from the removal and installation of piles has the potential to cause disturbance or physical impact to marine fauna in the area. Fish in the vicinity would be affected by excessive underwater noise, with the impact ranging from mortality to interruption of communication, depending on species anatomy (e.g., fish with swim bladders closer to the ear are more sensitive to acoustic impact than species with swim bladders further from the ear). However, with gentle start-up hammering, fish will have the opportunity to move away from the area during construction and the impact would be low.

#### Creation of New Aquatic Habitat

Any new piles installed would potentially create new fish habitat. Once re-installed, the piles would create new areas of vertical hard substrate, which can provide areas for sessile marine organisms to re-establish and structural habitat for small fish (likely Type 3 KFH, Figure 16). All new piles would be exposed to the same conditions as the current piles, including partial sunlight, potentially allowing for small macroalgae to become re-established. This would apply to newly installed high strength shark netting, in that new areas of vertical hard substrate would be available for colonisation by sessile marine organisms.

#### Construction Vessel Impact

The use of a barge for major maintenance works may increase the potential for chemical/material spills from machinery into the ocean. The use of a barge may also increase the potential for propeller scouring of the bed sediment and seagrass in shallow water as well as damage to seagrass from dragging of the anchor through seagrass beds.

#### Temporary Degradation of Water Quality

Removal and installation of the piles through the use of vibration techniques can lead to increased turbidity. Turbidity within the ocean can reduce the amount of light that is available for aquatic flora and fauna and reduce the productivity of these species. Scouring of benthic sediments, either from propeller operation or water movement from shallow barge operation, could cause benthic sediments to become suspended in the water, increasing turbidity. The increased sediment load would reduce light penetration through the water column, and sediment particles may settle on aquatic plants. Sediment movement may also smother infauna burrows.

Mitigation measures and recommendations are provided in Section 5 to provide more information and help avoid potential indirect impacts and should be reviewed to ensure their continued relevance at the construction stage.

#### Introduction of Aquatic Pest Species

Vessels and machinery used to conduct maintenance and cleaning activities could inadvertently spread the aquatic pest species *Caulerpa taxifolia* (Caulerpa) into the study area. Caulerpa is a hardy, tropical species of algae that is banned from sale and possession in NSW (DPI, 2016). No Caulerpa was identified during the site survey.



### 3.3.2.3 Test of Significance (BC Act)

If a species, population, or ecological community listed in Schedules 1, 1A and 2 of the BC Act is impacted, a review of the factors set out to establish if there is likely to be a significant impact on that species, population, ecological community, or habitat, must be undertaken. Section 7.3 of the BC Act sets out five factors that must be addressed as part of a Test of Significance (5-part test). This enables a decision to be made as to whether there is likely to be a significant effect on the species and, hence, if a SIS or BDAR is required.

Based on the proposed works, Tests of Significance were not undertaken under the BC Act as no terrestrial vegetation will be impacted by the proposed works, and no threatened aquatic species listed under the BC Act are likely to be present within the study area.

### 3.3.2.4 Assessment of Significance (FM Act)

If a species, population, or ecological community listed under Division 2 of the FM Act is impacted, a Test of Significance must be undertaken. Section 221ZV of the FM Act requires the determination of whether the action proposed is likely to significantly affect threatened species, populations or ecological communities, or their habitats. Section 221ZV outlines the factors that must be taken into account when assessing an impact under this section.

Based on the proposed works, a Test of Significance was undertaken for *Hippocampus whitei* (White's Seahorse), listed as threatened under the FM Act.

It is considered unlikely that the proposed works would have a significant impact occur subject to the implementation of mitigation measures provided in Table 9 below and Section 5, and the Seahorse Relocation Plan.

### 3.3.2.5 Significance Assessment (EPBC Act)

A Significance Assessment was undertaken for *Hippocampus whitei*, contained within Appendix A3. The assessment found no significant impact was likely to result from the proposed works if the recommended mitigation measures in Table 9, Section 5 and Seahorse Relocation Plan are implemented.

### 3.3.3 Mitigation Measures

**Table 9: Biodiversity mitigation measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>Crushing and damage to vegetation that is not proposed for removal</li> <li>Harm to identified threatened flora species</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Pre-works briefing to be undertaken by Council, Sea Dragon (Marine Specialist Contractor) and/or the project Ecologist, advising construction staff of sensitive areas and relevant safeguards for these areas.</li> <li>Establishment of clearly defined areas, such as the works area and 'no-go' areas within/adjacent to the work site. These are to be demarcated on land and water.</li> <li>Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until written approval has been provided to do so.</li> </ul> <p><b>Specific</b></p> <ul style="list-style-type: none"> <li>The deployment of ropes, anchors, blocks, chain, or similar devices used to carry out works must not set up in areas identified to contain seagrass, identified in Figure 15. Provide all contractors on site with a fact sheet containing pictures of different types of seagrass species likely to be found on site. Berthing or mooring above seagrass is permitted for periods of less than 48 hours.               <ul style="list-style-type: none"> <li>If mooring of vessel is essential, mooring system for vessels in vicinity of area must utilise a 'screw' mooring system as opposed to traditional 'swing' mooring system to reduce inadvertent impacts on seagrass (see Appendix D for schematic representation)</li> <li>If the use of a swing anchor is essential and all other options have been exhausted, the anchor must be located at least 5 m away from any seagrass beds. The location of the anchor is to be regularly monitored to ensure no impacts to seagrass or other aquatic habitat is occurring.</li> </ul> </li> <li>Store or decant chemicals outside of work area and above mean high tide mark.</li> <li>Post works seagrass surveys must be undertaken to identify amount of seagrass impacted by works.</li> <li>A permit under Part 7 of the FM Act is required before seagrass is removed or harmed.</li> <li>A permit under Part 7 of the FM Act is required for the removal of macroalgae.</li> <li>Seagrass is only to be harmed in areas where authorised under a permit from DPI Fisheries</li> <li>Ensure weighted chain of sediment curtain does not drag over any seagrass and inadvertently damage seagrass identified to be retained.</li> </ul>
	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Pre-works briefing to be undertaken by Council, Sea Dragon (Marine Specialist Contractor) and/or the project Ecologist, advising of sensitive areas and relevant safeguards for these areas.</li> <li>Establishment of clearly defined areas, such as the works area and 'no-go' areas within/adjacent to the work site. These are to be demarked on land and water.</li> <li>Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until written approval has been provided to do so.</li> <li>The site-specific CEMP will include instructions for dealing with orphaned or injured native animals and include the contact details for the NSW Wildlife Information, Rescue and Education Service Inc (WIRES).</li> <li>Store or decant chemicals outside of work area.</li> </ul>
<ul style="list-style-type: none"> <li>Harm to identified threatened fauna species</li> <li>Injured or orphaned wildlife</li> </ul>	

Impact Description	Safeguards/Mitigation Measures
	<p><b><u>Specific – White’s Seahorse</u></b></p> <ul style="list-style-type: none"> <li>• <b>Pre-construction (demolition and replacement – major works):</b> A pre-clearance surveys for Whites Seahorse and other Syngnathiformes is to be carried out prior to the major works. If seahorses are located, they are to be moved to nearby suitable habitat at the Bradys Point seahorse hotels, in accordance with the Seahorse Relocation Plan. <ul style="list-style-type: none"> <li>○ Whites Seahorse must be relocated in their breeding pairs.</li> <li>○ Works are to be in accordance with the Fisheries Permit conditions.</li> </ul> </li> <li>• <b>Pre-maintenance (minor) works:</b> A pre-clearance survey for White’s Seahorse will be required if the proposed maintenance works are to take place in an area of known or predicted seagrass habitat, direct works to shark netting or underwater. For example, works such as painting or minor repairs to walers above the watermark that will not impact the netting structure or require removal of or anchoring into seagrass may proceed with caution, in lieu of a pre-clearance survey. If a pre-clearance survey is deemed necessary and seahorses are located, they are to be moved to nearby suitable habitat in accordance with the Seahorse Relocation Plan. <ul style="list-style-type: none"> <li>○ As above, works are to be in accordance with the Fisheries Permit conditions.</li> </ul> </li> <li>• <b>During construction:</b> Works must cease if White’s Seahorse and other Syngnathiformes are found within the study area. They are to be relocated to nearby suitable habitat in accordance with the Seahorse Relocation Plan.</li> </ul> <p><b><u>Specific – Little Penguin</u></b></p> <ul style="list-style-type: none"> <li>• If foraging penguins (e.g., Little Penguin) or signs of burrowing are identified within or in close vicinity of the construction site, works must cease, and Council is to be contacted. An assessment of the impact and any required approvals must be obtained. Works must not recommence until written approval has been provided to do so.</li> </ul>
Spread of Priority Weeds	<p><b><u>General</u></b></p> <ul style="list-style-type: none"> <li>• Wash down equipment and vehicles prior to and after use, to manage the introduction and spread of weed propagules.</li> </ul>

### 3.4 Aboriginal Heritage

The following section regarding Aboriginal heritage has been conducted in accordance with *Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales* (hereafter referred to as 'CoP') (DECCW 2010).

The due diligence process aims to determine whether Aboriginal objects will be harmed by the proposed works, as required under Part 6 of the NPW Act. The CoP sets out the reasonable and practicable steps which individuals and organisations need to take in order to:

- Identify whether or not Aboriginal objects are, or are likely to be, present in an area;
- Determine whether or not their activities are likely to harm Aboriginal objects (if present); and,
- Determine whether an Aboriginal Heritage Impact Permit (AHIP) from Heritage NSW or further assessment is required.

The methodology of this desktop Aboriginal heritage due diligence assessment is to:

- Undertake a search of the Aboriginal Heritage Information Management System (AHIMS) register maintained by Heritage NSW to establish if there are any previously recorded Aboriginal objects or places within the study area;
- Undertake a search of the NSW State Heritage Inventory, the Australian Heritage Database and the Manly LEP 2013 Schedule 5 (Environmental Heritage) to determine if there are any sites of Aboriginal significance or sensitivity located within the study area.
- Undertake a desktop review of relevant previous archaeological assessments to understand the local archaeological context and assist in predicting the likely occurrence of unrecorded archaeological sites or objects.
- Review historic aerial photographs, if available, to determine past land use and any historic disturbance to the study area.
- Utilise existing field data to identify any sensitive landforms which may suggest Aboriginal objects exist and review landform features to assess whether there are likely to be areas of Aboriginal archaeological potential.

A desktop assessment was conducted to determine the likelihood of previously unrecorded Aboriginal sites or areas of Aboriginal archaeological sensitivity being present within the area of proposed works.

#### 3.4.1 Existing Environment

##### 3.4.1.1 Heritage Database Searches

Searches of the Australian Heritage Database, the Manly LEP 2013 and the State Heritage Inventory using the term 'Clontarf' were conducted on the 28 July 2022, to determine if any places of archaeological significance were located within the study area.

No Aboriginal archaeological sites or heritage items were recorded on these databases as being within the study area.

##### 3.4.1.2 AHIMS Search

The AHIMS database retains information and records pertaining to identified Aboriginal cultural heritage sites, objects and declared places throughout NSW. It is maintained and regulated by Heritage NSW under Section 90Q of the NPW Act.



An extensive search of the AHIMS database was conducted on 27 July 2022 to identify if any registered Aboriginal sites were present within, or adjacent to, the study area (Appendix B). The AHIMS search represents 2 km around the study area and was conducted within the following coordinates: GDA Zone 56, Eastings 336345-340345, Northings 6255931-6259931, with a buffer of 0 m. The search resulted in the identification of one hundred and nineteen (119) Aboriginal sites and one Aboriginal place within the vicinity of the study area (Figure 23).

No Aboriginal sites have previously been recorded within the study area. AHIMS ID 45-6-1026 is listed as 'not a site'. AHIMS ID 45-6-2748 has been listed as a 'restricted site'. AHIMS confirmed that this site will not be impacted by the proposed works.

The majority of sites within the vicinity of the study area have been recorded as shell middens (47%) followed by art sites (27%). The majority of the sites are located associated with freshwater streams and sandstone platforms adjacent to the salt water.

The frequencies of site types recorded within the AHIMS database search area are listed in Table 10 below.

**Table 10: Types of Aboriginal sites found within the AHIMS search area**

Site Features	Number of sites	%
Aboriginal Resource and Gathering	1	0.85
Art (Pigment or Engraved)	32	27.12
Art (Pigment or Engraved); Shell; Artefact	2	1.69
Artefact	4	3.39
Artefact; Shell	56	47.46
Earth Mound	1	0.85
Grinding Groove	2	1.69
Grinding Groove; Art (Pigment or Engraved)	1	0.85
Potential Archaeological Deposit (PAD)	3	2.54
Shell	9	7.63
Shell; Artefact; Art (Pigment or Engraved)	2	1.69
Shell; Artefact; Art (Pigment or Engraved); Burial	1	0.85
Shell; Artefact; Burial	3	2.54
Restricted Site	1	0.85
<b>Total</b>	<b>118</b>	<b>100</b>

Val Attenbrow conducted a study of Aboriginal archaeological sites within the Port Jackson catchment in 1991, of which the current study area is located within the Middle Harbour sub-catchment. Attenbrow's study aimed to re-record and relocate previously recorded middens and deposits.

A total of 335 recorded middens and 34 recorded archaeological deposits were studied within the entire study area, almost half of these sites are located in the Middle Harbour sub-catchment (171; 48%). It is likely that the greater density of sites within this area is due to the greater estuarine foreshore length, larger areas of Hawkesbury sandstone and a larger area of undeveloped bushland and nature reserves.

The majority of middens are recorded on Hawkesbury sandstone (98%), and they are recorded in much greater density and size than those recorded on Wianamatta shale, Quaternary alluvium and Quaternary sands. It is also noted that a large proportion of the middens are recorded within council reserves (230, 62.5%) and Crown Land (79, 21.5%) (Attenbrow, 2010: 50).

Locations of middens are more likely to be located within 10 m of the high-water level (known as the foreshore zone). There are three recorded middens located on ridge tops and under a quarter are located on ridge sides (Attenbrow, 2010: 51).

The pool is located in the intertidal zone where artefacts and midden material would have been washed away by tidal action. There is no sandstone outcropping in the vicinity of the tidal pool. Midden material still has the potential to occur on sand, but there is much lower likelihood within disturbed contexts. The study area is located within the Woy Woy soil landscape, which is typified by deep fine quartz sand deposits overlying Hawkesbury sandstone, it is therefore unlikely that Aboriginal sites associated with sandstone would be located within the study area. The site is located adjacent to salt water in Middle Harbour which would have been a resource gathering area. There are no noted freshwater streams in the vicinity of the study area.

#### *3.4.1.3 Previous Archaeological Assessments*

Eco Logical Australia, 2018. Forty Baskets Beach Tidal Pool Maintenance Works – Review of Environmental Factors. Prepared For Northern Beaches Council.

ELA was previously engaged by the Northern Beaches Council to undertake an Aboriginal Heritage Due Diligence Assessment as part of a REF for the proposed maintenance works of the Forty Baskets Beach Tidal Pool, located approximately 3.2km to the east of the current study area.

An extensive AHIMS search identified a total of 61 Aboriginal sites and one Aboriginal place within the vicinity of the study area. No AHIMS sites had previously been recorded as being within the study area, however three sites were recorded as being within 200 m of the study area, including a shell midden, AHIMS ID 45-6-0282, located approximately 40 m to the south. The majority of sites recorded within the vicinity of the study area were middens, including middens associated with open camp sites and shelters and most of these sites were located in areas associated with freshwater streams and sandstone platforms adjacent to salt water.

A visual inspection of the study area was undertaken which found that the existing tidal pool had been constructed by the insertion of timber piles into the beach and sandy ocean floor. The recorded shell midden, AHIMS ID 45-6-0282, was identified as being outside of the impact area. The visual inspection did not identify any concentrated areas of shell or evidence of the recorded midden, though it was noted that ground visibility was poor due to boats obscuring the interface between the beach and grassed area behind it. The sandstone platform adjacent to the existing pool was also inspected, and no shell midden material or cultural markings were identified.

As a result of the assessment and visual inspection, it was found that the proposed works would be confined to areas that had already been disturbed by the construction of the existing pool and would not impact any nearby recorded AHIMS sites. No new sites were identified during the visual inspection and the study area was identified as having a low to nil potential for Aboriginal objects to be located. As such, no further assessment was recommended, and works could proceed with caution.

Eco Logical Australia, 2019. Clontarf Tidal Pool Maintenance Dredging Works – Review of Environmental Factors. Prepared for Northern Beaches Council.

ELA was previously engaged by the Northern Beaches Council to undertake an Aboriginal Heritage Due Diligence Assessment as part of a REF for the proposed maintenance and dredging works around the Clontarf Tidal Pool, comprising of the current study area.

An extensive AHIMS search identified a total of 36 Aboriginal sites and no Aboriginal places within the vicinity of the study area. No AHIMS sites had previously been recorded as being within the study area and the majority of sites recorded within the vicinity of the study area were middens, including middens associated with open camp sites and shelters. The majority of these sites were located in areas associated with freshwater streams and sandstone platforms adjacent to salt water.

Two visual inspections were undertaken, with one inspection covering the tidal pool and immediate surrounding area and the second inspection covering the stretch of beach from the southern end of Clontarf Reserve to Clontarf Point. The area surrounding the tidal pool was surveyed for deposits of shell and archaeological material and no concentrations of shell material were noted. The majority of the beach had been surrounded by sandstone or timber retaining walls. The second inspection found that the beachfront properties had concrete and stone retaining walls, which would have modified the beach, and sand loss from storm activity which would have removed the potential for deposits of shell and other midden materials. No Aboriginal objects were identified during the visual inspection of both areas and as such, no further archaeological investigation was recommended, and works could proceed with caution.

#### 3.4.1.4 Assessment Methodology

The desktop review identified one hundred and nineteen (119) Aboriginal sites and one Aboriginal place within the vicinity of the study area, with the majority of sites being recorded as shell middens (47%) followed by art sites (27%). No sites have previously been recorded within the study area (Figure 23).

Previous archaeological investigations undertaken within the study area have identified that the landform previously been disturbed in relation to the construction and maintenance of the existing tidal pool, indicating a low potential for *intact* subsurface archaeological deposits.

The CoP states that further investigation in the form of a visual inspection must be conducted if activities are proposed to be:

- within 200 m of waters, or
- located within a sand dune system, or
- located on a ridge top, ridge line or headland, or
- located within 200 m below or above a cliff face, or
- within 20 m of or in a cave, rock shelter, or a cave mouth and is on land that is not disturbed land

The definition of disturbed land is as follows:

*“Land is disturbed if it has been the subject of a human activity that has changed the land’s surface, being changes that remain clear and observable.”*

Examples include ploughing, construction of rural infrastructure (such as dams and fences), construction of roads, trails and tracks (including fire trails and tracks and walking tracks), clearing vegetation, construction of buildings and the erection of other structures, construction or installation of utilities and other similar services (such as above or below ground electrical infrastructure, water or sewerage pipelines, stormwater drainage and other similar infrastructure) and construction of earthworks” (DECCW 2010).

A visual inspection was not undertaken as part of this assessment; however, a visual inspection of the Clontarf Tidal Pool was undertaken by ELA in October 2018, which comprised of the current study area (ELA, 2019). The visual inspection identified that the existing tidal pool had been constructed by the insertion of timber piles into the beach and harbour floor. A concrete retaining wall separated the grassed park area and had created an artificial delineation between the beach and park. The beachfront area was surveyed for deposits of shell and other archaeological material. Shells and oysters were observed along the shoreline, though there were no concentrations of shell material was noted during the inspection and no Aboriginal objects were identified.

The visual inspection determined that the original construction of the tidal pool, as well as refurbishment works and dredging of the sand out of the pool would have impacted any previously existing sites. The proposed works were determined to occur within previously disturbed areas, indicating it was unlikely that any intact Aboriginal objects would be impacted by the proposed works.





Figure 23: Registered AHIMS Sites within the vicinity of the study area

### 3.4.2 Impact Assessment

Aboriginal objects are protected under the NPW Act, regardless of whether they are registered on AHIMS or not. It is an offence to disturb or damage these sites without first having obtained an AHIP. No Aboriginal sites have been recorded on the AHIMS database as being located within the study area. The study area has been identified as having a low likelihood for *intact* subsurface archaeological deposits due to prior ground disturbance related to the construction and maintenance of the existing tidal pool. The proposed works will involve the maintenance of and replacement of existing structures surrounding the tidal pool and as such, no further archaeological assessment is required prior to the start of works.

Based on the findings of the desktop due diligence assessment and the requirements of the NPW Act, the actions described in Table 11 below and Section 5 are recommended relating to unexpected finds.

### 3.4.3 Mitigation Measures

**Table 11: Aboriginal Heritage Mitigation Measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>Discovery of unsuspected Aboriginal objects</li> <li>Discovery of human remains</li> <li>Harm to AHIMS sites as well as other area of Aboriginal Significance</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>All contractors undertaking works on site should be briefed on the protection of Aboriginal heritage objects under the NPW Act, and the penalties for damage to these items.</li> <li>If suspected Aboriginal objects, such as stone artefacts are located during future works, works must cease in the affected area and the area fenced off with suitable markers (star pickets, flagging or barrier mesh). Engage an archaeologist to assess the finds. If the finds are found to be Aboriginal objects, Heritage NSW must be notified under section 89A of the NPW Act. Appropriate management and avoidance or approval under a section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed.</li> <li>In the extremely unlikely event that human remains are found, works should immediately cease, and the NSW Police should be contacted. If the remains are suspected to be Aboriginal, Heritage NSW may also be contacted at this time to assist in determining appropriate management.</li> </ul>

### 3.5 Historic Heritage

#### 3.5.1 Existing Environment

ELA undertook a Historical Heritage Assessment for the proposed works. The assessment aimed to identify all listed historical heritage items in the vicinity of the proposed works area using relevant heritage registers to examine the heritage curtilages and identify those heritage items where there exists potential for impact by the proposed works. The heritage registers included the Australian Heritage Database, State Heritage Register, State Heritage Inventory, and the [Manly LEP 2013](#). The study area is within the curtilage, or in the vicinity, of several heritage listed items. These heritage items are described in Table 12.

**Table 12: Heritage listings**

Name	Listing no.	Significance	Address	Proximity to study area
Clontarf Park	Manly LEP 2013 Item No. I42	Local	Holmes Avenue and Sandy Bay Road, Clontarf	Within study area and direct impact area
Harbour foreshores	Manly LEP 2013 Item No. I1	Local	Manly municipal area boundary adjacent to the Harbour	Within study area and direct impact area
Norfolk Island Pine commemorative tree ( <i>Araucaria heterophylla</i> )	Manly LEP 2013 Item No. I43	Local	Holmes Avenue, Clontarf Reserve, Clontarf	Approximately 120 m south of study area
Middle Harbour Submarine Syphon (NSOOS)	Manly LEP 2013 Item No. I44	Local	Holmes Avenue, Clontarf Reserve, Clontarf	Approximately 80 m southwest of study area
Middle Harbour Syphon (NSOOS)	SHR Listing No. 01628 Manly LEP 2013 Item No. I45	State Local	Monash Crescent (The Spit) East side, Clontarf	Approximately 80 m southwest of study area

The Pleasure Grounds at Clontarf were established in 1863 by the ex-convict turned publican Isaac Moore. The site became a popular place where Sydneysiders could travel by ferry to play games, dance, and have picnics. It was a popular destination in the nineteenth century, so much so that when Prince Alfred, Duke of Edinburgh visited Australia in March of 1868 he visited Clontarf for a picnic. It was at this picnic that Irish born Henry James O'Farrell attempted to assassinate the prince by shooting him at close range. The prince was only minorly injured in the attack (MacRichie 2008).

During the 1930s, 'Clontarf Reserve' and the surrounding area became a 'tent city' during the Great Depression. Hundreds of people lived in tents constructed using posts and hessian which were coated in whitewash, lime, and fat for waterproofing (*Manly Daily* 23 March 1991, p 17). Bathing was a popular past time from the early days of the colony in NSW, but the steep drop-off in the water made swimming at Clontarf Reserve potentially dangerous. There were reports of deaths from drowning and "sharks swarming the beach" in the vicinity of Clontarf (*The Sun* 25 February 1914, p 10).

Manly Council constructed a shark proof bathing enclosure at Clontarf Reserve in 1949, following delays for a proposed pool at the location in 1938 (Figure 24). The enclosure was completed in June 1949 and



extended in 1959. By 2009 it had filled with sand to the extent that at low tide the pool was only 20 to 30 cm in depth. Council agreed to dredge approximately 1,600 m<sup>3</sup> of sand from the pool which was used as beach nourishment behind properties at Monash Crescent (Manly Local Studies Library).



**Figure 24: Clontarf Pool at low tide 20 December 1949 (Source: Manly Library)**

### 3.5.2 Impact Assessment

The Historical Heritage Assessment found that two listed heritage items were at potential risk of impact by the proposed works.

‘Clontarf Park’ is listed as a Local heritage item on the Manly LEP 2013 (Item no. 42). The description of the item on the State Heritage Inventory includes mention of a ‘swimming enclosure,’ however the heritage curtilage mapping of the Manly LEP 2013 does not cover the pool site. The original Manly Heritage Study (1986) does map the pool in association with the rest of the park. For the purposes of this assessment, due to the vague nature of the description in the State Heritage Inventory, the tidal pool at Clontarf is assumed to be part of the item and is considered to be within the study area.

The study area intersects with the Manly LEP 2013 item “Harbour Foreshore” (Item no. 11) which is listed for its aesthetic significance. The heritage inventory sheet prepared by C. Blackmore *et al.* for Manly Municipal Council in 1986 describes the item as:

*“Lengths of foreshore including natural and built elements of the landscape. Rocky sandstone ledges, beaches, mud flats and sandstone retaining walls and timber structures” (C Blackmore et al 1986).*





Figure 25: Listed heritage items in relation to the study area

The proposed works would include the complete replacement of the Clontarf Tidal Pool using visually similar materials of the same size and profile of the existing components. This includes replacement of wooden piles, shark rebars, and walers, and the affixing of new timber struts and structural timber members to bolster walers and piles. It is also understood that the piles and walers will be repainted the same shade of white to maintain the visual amenity of the heritage item. Whilst the tidal pool will be slightly larger in size, this is to reduce the need for dredging activities (associated with sand accumulating within the pool), ensuring the ongoing use and function of the facility. By placing the pool deeper within the harbour, capacity will be increased for recreational purposes, whilst taller piles will ensure continued function in case of sea level rise. The proposal of retaining similar materials, arrangement, number, and colour of piles would maintain the visual character of the pool and ongoing use of the facility, which has been retained since point of construction in the 1940s.

The significance of the pool lies within its ongoing use as a public recreational facility and its aesthetic contribution to 'Clontarf Park' and the wider foreshore and harbour. These works are considered minor impacts, ensuring the continued use of the site. They would not impact the heritage significance of the 'Clontarf Park' or 'Harbour Foreshore' heritage items.

Under Clause 5.10 of the Manly LEP 2013, development consent from the determining authority (Council) is not required when the works impacting the heritage item are considered by the consent authority to be minor in nature or for the maintenance of the heritage item. The proposed works comply with the relevant controls outlined in the Manly LEP 2013.

ELA understands that as part of the project a Photographic Archival Recording was prepared (RPS, 2022) to document Clontarf Tidal Pool in its current condition, to further offset the planned works.

Mitigation measures to avoid impact to this Historical heritage item are detailed below in Table 13 and in Section 5.

### 3.5.3 Mitigation Measures

**Table 13: Historic Heritage Mitigation Measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>Impacts to Heritage Items</li> </ul>	<b>General</b>
	<ul style="list-style-type: none"> <li>A heritage induction should be presented to workers before construction begins.</li> <li>In accordance with Section 146 of the Heritage Act, if an archaeological relic (such as a deposit or artefact) is uncovered during works, work must cease in the affected area and a qualified archaeologist contacted to assess the find. Further advice and clarification may be sought from the Heritage Council of NSW, or the Heritage Division under delegation regarding assessment and approvals.</li> </ul>
	<b>Specific</b>
	<ul style="list-style-type: none"> <li>Use of visually similar materials for the reconstruction of the tidal pool, to reflect its original heritage character.</li> </ul>

## 3.6 Noise and Vibration

### 3.6.1 Existing Environment

The study area is located nearby a highly urbanised residential area and is within a recreational environment. The closest sensitive receiver is a kiosk located directly adjacent to the study area. The Clontarf Marina is located nearby to the north. The closest residential receiver is approximately 100 m from the study area. Existing noise sources in the general vicinity include the current vehicle movement and general residential and community activities, including activity within the Clontarf Reserve playground.

### 3.6.2 Impact Assessment

Work hours will be in accordance with Northern Beaches Council standard daytime work times, which will minimise impacts to residents and other sensitive receivers in proximity to the works:

- Monday to Friday 7.00 am to 5.00 pm
- Saturday 8.00 am to 1.00 pm
- No construction works will take place on Sundays or Public Holidays. Some low impact pre-clearance works undertaken by divers may occur on Sundays. Limited noise will result from these works.

Mitigation measures are provided in Table 14 below and Section 5 to further minimise noise impact. Overall, noise impacts are considered to be minimal.

### 3.6.3 Mitigation Measures

**Table 14: Noise and Vibration Mitigation Measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>• Noise impacts on sensitive receivers in proximity</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>• Avoid simultaneous operation of noisy plant within discernible range of a sensitive receiver.</li> <li>• Construction works will only occur during the following times:               <ul style="list-style-type: none"> <li>○ Monday to Friday 7:00 am to 6:00 pm</li> <li>○ Saturday 8:00 am to 1:00 pm</li> </ul> </li> <li>• Maximise the distance between noisy plant items and nearby residential receivers and potential fauna habitat.</li> <li>• Use slow start-up hammering for piles to allow fish to move away from the area.</li> </ul>

## 3.7 Air Quality

### 3.7.1 Existing Environment

The air quality within the study area is expected to be typical of an urban coastal environment, likely of moderate quality. The National Pollutant Inventory (DEE, 2020) was reviewed to assess potential sources of air pollutants within the vicinity of the study area, using the Search by Map function. No nearby industrial facilities were located in proximity to Clontarf. The nearest facility is approximately 4 km east at North Head, being a sewage treatment plant on Blue Fish Road, Manly NSW.

### 3.7.2 Impact Assessment

Minor dust emissions are predicted as part of the proposed works conducted on the beach. The study area is within an urban area of Sydney, which has a potential to impact nearby residents. The proposed works are also within a highly environmentally sensitive area, including the nearby coastal wetlands and threatened fauna habitat within the study area.

The anticipated impact on residents and fauna species in proximity is low seeing that the proposed works will not be undertaken on a regular basis and are not anticipated to create excessive dust. Mitigation measures are proposed below in Table 15 and in Section 5 to minimise impacts further.

### 3.7.3 Mitigation Measures

**Table 15: Air Quality Mitigation Measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>Dust generation from vibrating and ground disturbing works</li> <li>Fumes generation from machinery</li> <li>Cumulative impacts of greenhouse gas emissions</li> <li>Dust from vehicles</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Works must be minimised during high wind periods.</li> <li>Dust suppression should be applied as required to limit excessive dust generation.</li> <li>Plant and equipment must be regularly inspected to ascertain that fitted emission controls are operating efficiently.</li> <li>Plant and equipment must be maintained in accordance with manufacturer's specifications to ensure that it is in a proper and efficient condition.</li> <li>Do not have machinery running while not in use.</li> <li>Minimise use of machinery for required activity only.</li> <li>Vehicles to maintain recommended speed.</li> <li>Look for excessive dust generation and slow down if needed.</li> <li>Where possible carry out works during the standard daytime working hours.</li> </ul>



## 3.8 Waste Management

### 3.8.1 Impact Assessment

The majority of waste generation is likely in the form of rotten piles and other degraded structures of the tidal pool asset. Additional waste may be generated from excess sediment from minor earthworks during pile installation on the beach, and general waste from staff and contractors. Potential impacts from waste generation include:

- reduced aesthetics in community areas;
- minor spills from hazardous fuel and chemical use; and
- pollution of the environment from other general wastes.

Offsite disposal at a waste facility is the preferred option for managing the rotten and degraded material. Any excess sediment from any minor earthworks is proposed to be classified in accordance with waste classification guidelines and disposed of at an appropriately licenced waste facility. No waste is to be imported into the site.

Removal and appropriate disposal of general waste generated by the contractors during the proposed works is the responsibility of the contractors unless advised differently by Council. No issues are anticipated with the management of waste provided the mitigation measures in Table 16 and Section 5 are implemented.

### 3.8.2 Mitigation Measures

**Table 16: Waste Management Mitigation Measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>• Waste in the form of seabed sediment</li> <li>• Cleared vegetation</li> <li>• Litter left on-site by staff/contractors</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>• Any excess sediment or waste material must be kept on a barge or in a designated stockpile during construction works.</li> <li>• All waste must be removed from the site on completion of the works.</li> <li>• Upon completion of waste disposal, all original weighbridge / disposal receipts issued by the receiving waste facility must be retained in a waste register as evidence of proper disposal.</li> <li>• An adequate number of bins must be placed at the site or on the barge for workers and all litter will be placed in these bins. Work areas of the project site would be kept clean and free of litter, including cigarette butts, at all times.</li> </ul>

## 3.9 Traffic

### 3.9.1 Existing Environment

#### 3.9.1.1 Road Traffic and Site Access

The nearest access roads to the Clontarf Tidal Pool are Sandy Bay Road from the north, and Holmes Avenue from the south of the study area. These are both accessible via Amiens Road. All nearby access points are local, Council managed roads. The nearest state road is Manly Road, approximately 600 m to the northwest. The works are not proposed within any road reserve.

#### 3.9.1.2 Marine Navigability

The existing tidal pool is within the navigable waters of Middle Harbour, being situated in a marine environment with several moored boats and marinas in its vicinity.

### 3.9.2 Impact Assessment

#### 3.9.2.1 Road Traffic and Site Access

The proposed works will be accessed by the existing public road network and by barge. Access for heavy machinery transport will also be via the public road network and by barge. Frequency and duration of movements is anticipated to be of short duration and infrequent.

The number of vehicle movements to and from the site, associated with the transportation of personnel and the removal of waste will be low, infrequent and of short duration. There will be minor impacts to traffic flow and pedestrian movements. Disruptions will be short-term and impacts to the road infrastructure are not anticipated.

#### 3.9.2.2 Marine Navigability

Private moorings in proximity to the tidal pool may be required to be relocated in consultation with TfNSW, however this is unlikely to occur. The relocation of private moorings will not significantly impact navigability, considering the relatively minor extension of the tidal pool considering the broader context of Clontarf Beach and Middle Harbour. This is discussed in further detail in Section 3.11.

Mitigation measures are provided below in Table 24 and in Section 5.

### 3.9.3 Mitigation Measures

**Table 17: Traffic and Navigation Mitigation Measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>Disruption to traffic flows</li> <li>Temporary obstruction of marine traffic during construction</li> <li>Altered marine navigation post-works due to extended tidal pool area</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Vehicles, materials and equipment must be positioned to minimise impacts to public access and parking.</li> <li>Heavy vehicles, if required, will be restricted to specified routes.</li> </ul> <p><b>Specific</b></p> <ul style="list-style-type: none"> <li>The determined REF will be provided to TfNSW.</li> <li>Conditions of the Construction Licence and updated consolidated license will be adhered to.</li> <li>Nearby boat and/or Marina owners will be consulted with prior to the commencement of works, especially in relation to the travel placement of the piling barge in the waters of Middle Harbour.</li> </ul>

### 3.10 Visual Amenity and Landscape

#### 3.10.1 Existing Environment

Clontarf Tidal Pool is in a moderate to fair visual condition, being subject to accumulation of marine biota on the structure, deteriorating wood and peeling paint resulting from the harsh marine conditions it is subject to over time (Figure 3). Sand has accumulated within the tidal pool area, limiting its use for swimming, and reducing capacity. The pool is situated in the marine environment of Middle Harbour with a host of private boats and the nearby Clontarf Marina within its visual catchment. The tidal pool extends northward into the Harbour from Clontarf Beach and is adjacent to Clontarf Reserve, which has recently been subject to upgrade works. The works included upgrades to the seawall behind the pool, a new playground and landscaping.

#### 3.10.2 Impact Assessment

The proposed works will demolish the existing structure completely. The pool will be reconstructed at a larger size to counteract the effects of sand deposition on its usable area, and provide more usable swimming space for used into the future. The length along the shore will be increased to 64 m, from 46 m, in length (along the shore) and will be extended 3 m into the Harbour waters. The renewal will use materials on a visual like-for-like basis. The materials will be like those used in the upgrade of other Northern Beaches tidal pools at 40 Baskets and Little Manly (Figure 26 and Figure 27). The works will lead to an improvement in not only the safety and usability of Clontarf Tidal Pool but will also restore the visual appeal of the pool with new white-painted walers and high strength shark netting. Additionally, the pool renewal will feature a minimum 3 m set back from the existing seawall. This is to allow beach rake access into the pool and adjacent beach area for cleaning. Improved visual amenity will result from the tidal pool and Clontarf Beach being more accessible for pedestrian access and maintenance purposes.



**Figure 26: Materials used for the upgrade works at 40 Baskets Tidal Pool (ELA, 2022)**



**Figure 27: The upgraded Little Manly Tidal Pool (Northern Beaches Council, 2022).**

#### 3.10.3 Mitigation Measures

**Table 18: Traffic and Navigation Mitigation Measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>Impact on the community through removal of vegetation providing screening</li> </ul>	<ul style="list-style-type: none"> <li>Notify community or neighbours where light impacts are anticipated.</li> <li>Position lighting in residential areas to direct light away from houses wherever possible.</li> <li>Visually similar materials will be used to construct the tidal pool extension, which will maintain a similar heritage aesthetic.</li> </ul>

### 3.11 Social and Economic

#### 3.11.1 Existing Environment

The Clontarf Tidal Pool is a popular location for outdoor personal and social recreation. In particular, the pool is popular among young families

##### 3.11.1.1 Community Use

Currently, public use of Clontarf Tidal Pool is discouraged as it is structurally unfit. There are warning signs at the entrance to Clontarf Reserve for the hazards associated with the pool (Figure 6).

##### 3.11.1.2 Clontarf Marina

The proposed renewal will extend the tidal pool into the Harbour by an additional 3 m, which will be in closer proximity to the Clontarf Marina. Currently the tidal pool lies approximately 75 m south of marina, measured from the northernmost corner of the pool to the closest point on the permanent marina structure (excluding boats).

##### 3.11.1.3 Private boat moorings

There are several privately moored boats occupying the space to the northwest of Clontarf Tidal Pool. Several of these are in proximity to the pool structure. Licenses for private moorings are issued by TfNSW in designated mooring areas.

##### 3.11.1.4 Nearby residents

Several nearby dwellings are located within 200 m of the tidal pool. The closest dwellings are located on the east side of Sandy Bay Road. Additional nearby dwellings are located on Peronne Avenue to the east, and Holmes Avenue to the south. Large stands of trees line the residential streets and create a screen between most residences and the Clontarf Tidal Pool.

#### 3.11.2 Impact Assessment

##### 3.11.2.1 Community Use

The proposed pool renewal will have a positive impact for the local community and other pool users. The area, and as a result the depth, of the pool will be increased, allowing for higher volumes of people to use the pool at once. It will allow for more people to use the pool at greater depths for lap swimming, as well as in the shallows for family-friendly outdoor recreation. The height will be increased to account for sea level rise, ensuring ongoing protection from sharks as the high-tide sea level is expected to surpass the existing structure (Figure 28). This would otherwise compromise the effectiveness of the existing shark netting at high tide.

The renewal will address structural safety concerns associated with the existing pool, and removal of piles, including accumulated marine biota, will reduce the likelihood of injury resulting from public pool use. The works will reinstate safe and enjoyable public water recreation within the Clontarf locality, for the local community and other pool users to appreciate.





**Figure 28: A swimmer at Clontarf Tidal Pool, highlighting sea level and proximity to moorings (Ocean Pools NSW, 2016)**

#### *3.11.2.2 Clontarf Marina*

The extended tidal pool is unlikely to significantly impact the function or visual outlook of the Clontarf Marina, considering the existing built structure and relatively minor extension area, considering the 75 m existing distance from the pool. Consultation was undertaken with the owner and employees of Clontarf Marina, which found that the Marina staff were in favour of the proposed works and found no negative aspects of the proposal.

#### *3.11.2.3 Private boat moorings*

The relocation or removal of private boat moorings may be required due to the extended area of the tidal pool. Currently, the closest boats are between approximately 17 to 30 m away from the pool. While an extension of only 3 m is proposed, this may impact mooring radii in the case of a potential 'swing mooring' (with 360-degree movement), or regulation distances between fixed structures and mooring apparatuses. Licenses for private moorings are issued by TfNSW in designated mooring areas. It is therefore up to the discretion of TfNSW to decide on the appropriate relocation or removal of moorings where required, in consultation with mooring owners.

If relocation is to occur, private moorings should be relocated in such a way as to not cause cumulative impacts to the nearby Clontarf Marina. Relocating moorings to the north is not recommended. If required, appropriate mooring relocations are to be agreed by TfNSW in consultation with the owners, the Harbour Master, and other relevant entities (such as the Clontarf Marina). Clontarf Marina should be consulted if the proposed relocations are to encroach beyond their existing outer northern limit. Provided these recommendations are implemented, no significant impact is likely to result from the relocation of moorings.

Individual boatowners or mooring licensees should be consulted with, as minor impacts to individuals are likely to result from the relocations or removal.

#### 3.11.2.4 Economic Benefits

Several smaller-scale renewal works have been undertaken on the pool in previous years. Regular maintenance works are costly and not feasible for Council to maintain. Costly dredging operations would be required to ensure the existing pool has an appropriate usable area, as sand accumulates within the pool. The proposed works are supported by grant funding under the NSW State Government Public Spaces Legacy Program for the improved connectivity, inclusivity and accessibility to recreational spaces and activities.

The proposed works will have multiple economic benefits to the Northern Beaches LGA. Importantly, the proposal will reduce the need for ongoing maintenance works to Clontarf Tidal Pool, including dredging of sand and replacement of walers on a one-by-one basis as the need arises. This ultimately reduces assessment costs, as well as works expenses, in the long term.

Mitigation measures are provided below in Table 19 and in Section 5.

#### 3.11.3 Mitigation Measures

**Table 19: Social and Economic Mitigation Measures**

Impact Description	Safeguards/Mitigation Measures
<ul style="list-style-type: none"> <li>Potential impacts to private boat moorings</li> </ul>	<p><b>Specific</b></p> <ul style="list-style-type: none"> <li>Consult with private boat mooring licensees prior to the commencement of works.</li> <li>Engage with the owner/s of Clontarf Marina prior to the commencement of works and throughout the construction period.</li> </ul>

### 3.12 Cumulative Environmental Impacts

#### 3.12.1 Navigation and Moorings

The relocation or removal of private boat moorings may be required due to the extended area of the tidal pool. If relocation is to occur, private moorings should be relocated in such a way as to not cause cumulative impacts to the nearby Clontarf Marina. Relocating moorings to the north is not recommended. Appropriate mooring relocations are to be agreed by TfNSW in consultation with the owners and other relevant entities. Clontarf Marina should be consulted if the proposed relocations are to encroach beyond their existing outer northern limit. Provided these recommendations are implemented, no significant impact is likely to result from the relocation of moorings.

Individual boatowners or mooring licensees should be consulted with, as minor impacts to individuals are likely to result from the relocations or removal.

#### 3.12.2 Biodiversity

The proposed works have the potential to cause cumulative impacts to the Whites Seahorse population, resulting from multiple relocation works across the tidal pools in the Northern Beaches LGA. Provided the recommended mitigation measures are implemented, it is unlikely that a significant cumulative impact would result from the works. The population will be subject to pre-clearance surveys to ensure appropriate relocation prior to construction. Appropriate habitat in the form of seahorse hotels in a nearby area is proposed by Council to offset the temporary loss of habitat resulting from the works. Like-for-like habitat will be provided when the expanded structure is in place, with shark netting to be reinstated on the newly built pool.

### 3.13 Matters of National Environmental Significance

Under the environmental assessment provisions of the EPBC Act, the following MNES and impacts on Commonwealth land are required to be considered to assist in determining whether the project should be referred to the Australian Government Department of the Environment. Table 20 addresses the MNES for the project.

A Significance Assessment has been undertaken for EPBC Act listed endangered species, *Hippocampus whitei* (White's Seahorse), contained in Appendix A3 of this REF. No significant impact to MNES are likely to result from the proposed tidal pool renewal works.

**Table 20: Consideration of Matters of National Environmental Significance**

Matters of NES	Impact
Any environmental impact on a World Heritage property?	No
Any environmental impact on National heritage places?	No
Any environmental impact on RAMSAR wetlands?	No
Any environmental impact on Commonwealth listed threatened species or ecological communities?	Not significant.
Any environmental impact on Commonwealth listed migratory species?	No
Does any part of the project involve nuclear action?	No
Any environmental impact on a Commonwealth marine area?	No
Any impact on Commonwealth land?	No



*View of Clontarf Marina, looking towards Clontarf Tidal Pool*  
Image: Clontarf Marina, 2021

## SECTION 4

# Consultation



## 4. Consultation

Division 1 of the Transport and Infrastructure SEPP provides guidance on consultation with Council, agencies, and stakeholders (Section 4.1). Additional consultation is in progress in relation to works taking place within KFH and habitat for the FM Act endangered species *Hippocampus whitei* with DPI – Fisheries (Section 4.2), land ownership, work and use licenses and navigation (Section 4.3). Community consultation is also underway and the Harbour Master has been consulted with to meet the requirement for Ports Authority approval under the PMA Regulation.

### 4.1 Consultation Requirements under the Transport and Infrastructure SEPP

**Table 21: Transport and Infrastructure SEPP consultation requirements**

Section	Section Relevance	Consultation Required
Section 2.10	<p><b>Consultation with councils – development with impacts on council-related infrastructure or services</b></p> <p>Consultation is required if the development:</p> <p>(a) will have a substantial impact on stormwater management services provided by a council, or</p> <p>(b) is likely to generate traffic to an extent that will strain the capacity of the road system in a local government area, or</p> <p>(c) involves connection to, and a substantial impact on the capacity of, any part of a sewerage system owned by a council, or</p> <p>(d) involves connection to, and use of a substantial volume of water from, any part of a water supply system owned by a council, or</p> <p>(e) involves the installation of a temporary structure on, or the enclosing of, a public place that is under a council's management or control that is likely to cause a disruption to pedestrian or vehicular traffic that is not minor or inconsequential, or</p> <p>(f) involves excavation that is not minor or inconsequential of the surface of, or a footpath adjacent to, a road for which a council is the roads authority under the Roads Act 1993 (if the public authority that is carrying out the development, or on whose behalf it is being carried out, is not responsible for the maintenance of the road or footpath).</p>	No, Northern Beaches Council is the determining authority.
Section 2.11	<p><b>Consultation with councils – development with impacts on local heritage</b></p> <p>Consultation is required if the development:</p> <p>(a) is likely to affect the heritage significance of a local heritage item, or of a heritage conservation area, that is not also a State heritage item, in a way that is more than minor or inconsequential, and</p> <p>(b) is development that this Chapter provides may be carried out without consent</p>	No, Northern Beaches Council is the determining authority.
Section 2.12	<p><b>Consultation with councils – development with impacts on flood liable land</b></p> <p>In this section, flood liable land means land that is susceptible to flooding by the probable maximum flood event, identified in accordance with the principles set out in the manual entitled <i>Floodplain Development Manual: the management of flood liable land</i> published by the New South Wales Government and as in force from time to time.</p> <p>A public authority, or a person acting on behalf of a public authority, must not carry out, on flood liable land, development that this Chapter provides may be carried out without consent and that will change flood patterns other than to a minor extent unless the authority or person has –</p>	No, Northern Beaches Council is the determining authority.

Section	Section Relevance	Consultation Required
	<p><i>(a) given written notice of the intention to carry out the development (together with a scope of works) to the council for the area in which the land is located, and</i></p> <p><i>(b) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.</i></p>	
Section 2.13	<p><b>Consultation with State Emergency Service – development with impacts on flood liable land</b></p> <p><i>A public authority, or a person acting on behalf of a public authority, must not carry out development on flood liable land that may be carried out without development consent under a relevant provision unless the authority or person has—</i></p> <p><i>(a) given written notice of the intention to carry out the development (together with a scope of works) to the State Emergency Service, and</i></p> <p><i>(b) taken into consideration any response to the notice that is received from the State Emergency Service within 21 days after the notice is given.</i></p>	No, the works are not proposed within flood liable land.
Section 2.14	<p><b>Consultation with councils – development with impacts on certain land within the coastal zone</b></p> <p>Consultation is required of the development:</p> <p><i>(1) This section applies to development on land that is within a coastal vulnerability area and is inconsistent with a certified coastal management program that applies to that land.</i></p>	No, Northern Beaches Council is the determining authority.
Section 2.15	<p><b>Consultation with public authorities other than councils</b></p> <p>Consultation is required if the development is:</p> <p><i>(a) development adjacent to land reserved under the National Parks and Wildlife Act 1974 or to land acquired under Part 11 of that Act — Department of Planning and Environment (DPE) / Biodiversity Conservation Division (BCD),</i></p> <p><i>(b) development on land in Zone E1 National Parks and Nature Reserves or in a land use zone that is equivalent to that zone, other than land reserved under the National Parks and Wildlife Act 1974 — DPE/BCD,</i></p> <p><i>(c) development comprising a fixed or floating structure in or over navigable waters—Transport for NSW,</i></p> <p><i>(d) development that may increase the amount of artificial light in the night sky and that is on land within the dark sky region as identified on the dark sky region map—the Director of the Observatory</i></p> <p><i>(e) development on defence communications facility buffer land within the meaning of clause 5.15 of the Standard Instrument—the Secretary of the Commonwealth Department of Defence,</i></p> <p><i>(f) development on land in a mine subsidence district within the meaning of the Mine Subsidence Compensation Act 1961—the Mine Subsidence Board.</i></p>	Yes. Consultation with TfNSW has been undertaken as the proposed works are within TfNSW owned land and comprises works to a fixed structure in navigable waters.

## 4.2 Consultation with DPI Fisheries

ELA has provided the Draft REF to DPI Fisheries for comment. Consultation has been undertaken with Fisheries throughout the preparation of this REF.

## 4.3 Consultation with Transport for NSW

In preparing this assessment, ELA has consulted with CI Australia Pty Ltd (CI) on behalf of TfNSW, as well as with TfNSW and the Harbour Master directly, in relation to land ownership, licensing and navigational concerns. Table 22 below outlines the provided recommendations and requirements. Northern Beaches Council have considered the below table. Where recommendations have been deemed not feasible, alternative actions have been proposed. These have been included in the mitigation measures found in Section 4.3.

**Table 22: TfNSW Comments resulting from consultation, and response from Council**

Impact	CI / TfNSW / Harbour Master Comments	Council Response and Actions
Landowner Requirements	Given the proposed tidal pool upgrade will be larger than the existing tidal pool, Council will need to enter into a Construction License. As the Clontarf Tidal Pool is currently under a consolidated license, the current license will be renewed with updated license conditions.	Council will submit the determined REF and application for a Construction License and updated consolidated license to CI Australia / TfNSW.
Licencing	TfNSW will engage a solicitor from the NSW Government legal panel (at Council's cost) to prepare the agreement for the Construction Licence and the updated consolidated Licence. TfNSW will review the draft REF from a landowner and navigation authority perspective	Council will submit the determined REF and application for a Construction License and updated consolidated license to CI Australia / TfNSW.
Traffic and Access – impacts to maritime navigation (TfNSW Maritime Operations)	Navigation commentary is required in the REF to address Part 5 of the EP&A Act. TfNSW will review the draft REF from a landowner and navigation authority perspective. Maritime Operations will need to approve the final detailed design for the tidal pool. Detailed design drawings must be provided in both PDF and DWG/CAD georeferenced format.	This REF discusses impacts to navigation resulting from the proposed works. The Draft REF will be provided to TfNSW. Consolidated comments received from TfNSW will be addressed within the Final REF.

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In relation to Private Moorings, Council have consulted with the TfNSW Maritime Operations team on multiple occasions over the past 2 years. The most recent consultation occurred in ~~July 2021~~, where the main concern from TfNSW was the implication of the extended pool potentially requiring the removal of one or more moorings on the western edge of the pool. It was noted that TfNSW did not consider the removal of the mooring to be a significant impact on navigational requirements and that the loss of the mooring, or moorings, is considered to be offset though the proposed works providing improved recreational value to the local community. TfNSW noted that this could add an additional cost to the project.

#### 4.4 Community Consultation

Community consultation commenced on 3 August 2022, via the 'Your Say' portal on the Northern Beaches Council website (<https://yoursay.northernbeaches.nsw.gov.au/clontarf-tidal-pool>). A total of 66 unique responses were received, 63 of which were submitted via the online portal and 3 written responses were submitted via email or letter. Key consultation themes that were raised include:

- Support for a boardwalk
- Inclusion of disabled access
- Protection of seahorses
- Increased traffic, lack of parking
- Support for a structure that users can safely jump off

Many supportive submissions were made to the portal, including:

*"I fully support the proposed upgrade. Especially taking the depth further out into the harbour."*

*"The plan looks to be a great improvement on the failing structure of the present pool. It will allow for much better swimming for dedicated swimmers."*

*"This is an excellent initiative and long overdue. I fully support making the pool wider and deeper as it is simply too small and no good for swimming laps."*

*"I take my grandchildren to this pool and playground, I think its a great idea to enlarge and upgrade the pool. Even in its current state its very popular, so it will be a wonderful improvement when its completed."*

*"Thank you for upgrading Clontarf tidal pool. It is a great asset and much used space. I think it is wonderful that it is being extended, both in length and width. I really enjoy being able to swim in the pool at high tide and look forward to more deep water being available. I am not in favour of a walkway or making it easier for fishermen to use the pool. I think fishing and kids playing and swimming is not compatible."*

A summary of the themes raised during consultation, and how Council has responded to concerns and suggestions is provided in Table 23 below.

**Table 23: Consultation outcomes and Council responses**

Themes, Questions and Suggestions Raised	Council Response
<b>Support for a boardwalk</b> Requests for some form of walking arrangement around the pool.	A boardwalk will not be included in the design for the following reasons: <ul style="list-style-type: none"> <li>• Potential for a clash between user activities (swimmers and fishers)</li> <li>• Poor heritage outcome (preference to maintain the example of an original tidal pool which does not have additional structures)</li> </ul>
<b>Accessibility</b> Requests for some increase in disabled access. Responses varied and included handrail and ramp to sand as well as a rubber mat over sand.	Disabled access is not able to be incorporated into the design as: <ul style="list-style-type: none"> <li>• There would be increased risk of submerged objects within the pool</li> </ul>



Themes, Questions and Suggestions Raised	Council Response
	<ul style="list-style-type: none"> <li>The pool is not staffed. An access mat is required to be rolled out daily. Storage for the mat cannot be managed.</li> <li>An access ramp is provided as part of the bleachers. The gradient is minimal, as such no handrail is required.</li> <li>Accessible pool facilities are provided at local aquatic centres and beach rock pools.</li> </ul>
<b>Biodiversity</b> Protection of seahorses. Concerns around management of seahorses and marine life during construction were raised.	Seahorses are being protected and managed through: <ul style="list-style-type: none"> <li>Preparation of an REF (this report)</li> <li>Implementation of a CEMP which will include the mitigations provided within the REF</li> <li>Relocation of seahorses will be undertaken subject to approval by DPI Fisheries</li> <li>Harm to marine vegetation (i.e., habitat for seahorses) will be minimised and undertaken in accordance with a Fisheries Permit, under Part 7 of the FM Act</li> <li>Works are being undertaken outside of the breeding season for White's Seahorse</li> <li>Assessments of Significance concluded that no significant impact to White's Seahorse would result from the proposed works provided the mitigation measures are implemented.</li> </ul>
<b>Traffic</b> Increased traffic, lack of parking spaces	This concern is not within the scope of the proposed works; however, Council has noted the issue and will be considered under the development and implementation of the Masterplan.
<b>Recreation</b> Requests for a structure for users/children to jump from side walls into the pool	Council does not support this suggestion. The provision of such a structure may result in significant consequences or injury to a user and is deemed an unacceptable risk.  Council has also reviewed responses from swimmers who have raised concerns about children jumping from walls onto swimmers.
<b>Questions raised</b>	
Why are you building the pool in March during the swimming season?	Grant conditions require the pool to be constructed by June. In addition, environmental constraints also dictate the available construction schedule. As such, work must commence in the swimming season to achieve this timeframe and meet environmental constraints.



*Clontarf Tidal Pool, looking north*  
Image: Northern Beaches Council

## SECTION 5

# Mitigation Measures

## 5. Mitigation Measures

**Table 24: Recommended mitigation measures for the proposed Clontarf Tidal Pool upgrade**

Impact	Description	Safeguards/Mitigation Measures	Responsibility
Soil Erosion and Sedimentation	<ul style="list-style-type: none"> <li>During removal of the existing vegetation and sedimentation caused by erosion and runoff from the site caused by vehicle movements and/or heavy rainfall.</li> <li>During excavation</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Prepare a Construction Environmental Management Plan (CEMP) prior to any construction works to address measures to be adopted to minimise impacts on the environment as a result of the construction works, including sediment erosion and sedimentation.</li> <li>Adopt sediment and erosion controls prior to the works commencing.</li> <li>Inspect erosion controls regularly (daily during work days) and after rainfall. Fix damaged controls immediately. Remove accumulated sediment or waste material from within the sediment controls regularly.</li> <li>Leave erosion and sediment controls in place until after the works are completed.</li> <li>Schedule the work outside of predicted heavy rain periods.</li> <li>Stop work during and after heavy rainfall to reduce risk of mobilising sediment.</li> </ul> <p><b>Specific</b></p> <ul style="list-style-type: none"> <li>A permit under Part 7 of the FM Act is required for dredging and reclamation associated with the removal of existing piles and construction of new piles.</li> <li>The Sediment and Erosion Control Plan is to be implemented prior to works, with the aim of achieving an outcome of 'no visible turbid plumes migrating through the waterway'. The Plan must include, but not be limited to:               <ul style="list-style-type: none"> <li>A floating sediment curtain is to be erected in a semi-circular arrangement to enclose all suspended sediments and organic material generated within the worksite.</li> <li>Sediment curtain must be positioned and secured properly so it does not drag over seagrass and scour seagrass beds.</li> <li>Ensure weighted chain of sediment curtain does not drag over any seagrass and inadvertently damage seagrass identified to be retained.</li> </ul> </li> </ul>	Project Manager All Staff/Contractors

Impact	Description	Safeguards/Mitigation Measures	Responsibility
		<ul style="list-style-type: none"> <li>○ Tarps to be placed carefully over existing seagrass beds within the immediate work area to prevent seagrass from being smothered by sediment and organic matter as the pool infrastructure is scraped clean.</li> <li>○ Tarps are to be rolled up and sediments and debris removed from the waterway and disposed of at an appropriate waste facility.</li> <li>○ Tarps must not remain on the seagrass beds for more than 24 hours.</li> </ul>	
<b>Soil Contamination</b>	<ul style="list-style-type: none"> <li>● Incidental discovery of sediment contamination.</li> <li>● Disturbance of acid sulphate soils</li> <li>● Pollution of sediment from chemical spills (e.g., fuel or oil from machinery).</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>● If contaminated soils are uncovered during the works, all works within the vicinity of the find must cease immediately and the relevant authority must be notified immediately.</li> <li>● For any excess spoil where potentially, contaminating activities have been identified on site this material will be tested and classified prior to leaving site. For any excess spoil material classified as contaminated, disposal of this material will be at an appropriately licensed landfill in accordance with the EPA (2014) <i>Waste Classification Guidelines</i>.</li> <li>● Store all chemicals (e.g., fuel, oil) in appropriate bunding/storage systems within the approved storage facility out of the riparian zone.</li> <li>● Ensure appropriate spill kits are carried with the equipment.</li> </ul>	<p>Project Manager All Staff/Contractors</p>
<b>Structural Support and Soils</b>	<ul style="list-style-type: none"> <li>● Geotechnical Recommendations (JKG, 2022)</li> </ul>	<p><b>Specific</b></p> <ul style="list-style-type: none"> <li>● Support the tidal pool structure on underlying sands of at least loose relative density.</li> <li>● Consider potential scour in pile design. Specific advice should be obtained from a coastal engineer on the depth of scour that should be accounted for. JKG should then be recommissioned to review the recommendations below.</li> <li>● When founding the piles in sand, consider the allowable bearing pressures (ABP). As a guide: <ul style="list-style-type: none"> <li>○ where 0.3 m diameter piles are adopted, establish piles within loose sand at least 1.8 m below the design scour level (as specified by the coastal engineer), an ABP of 100 kPa can be adopted.</li> <li>○ where 0.5 m diameter piles, establish piles within loose sand at least 3 m below the design scour level (as specified by the coastal engineer), an ABP of 175 kPa can be adopted.</li> </ul> </li> </ul>	<p>Project Manager All Staff/Contractor</p>



Impact	Description	Safeguards/Mitigation Measures	Responsibility
		<ul style="list-style-type: none"> <li>Higher bearing pressures would be appropriate in medium dense or higher relative density and for driven piles. Design is required by the piling contractor, based on the pile type used.</li> <li>Engagement of a pile designer for lateral and moment loading.</li> <li>Install initial piles near existing boreholes or DCP tests, so that conditions can be calibrated before installing piles at other locations.</li> </ul>	
<b>Water Quality and Hydrology</b>	<ul style="list-style-type: none"> <li>Excess sediment input into waterway</li> <li>Pollution of foreshore from chemical spills (e.g., fuel or oil)</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Weather forecasts will be checked daily to ensure that work is not carried out before or during high rainfall.</li> <li>Store all chemicals (e.g., fuel, oil) offsite and if required to be stored onsite, chemicals should be stored in appropriate bunding/storage systems and only for short periods.</li> <li>Ensure appropriate spill kits are present onsite.</li> <li>Ensure all equipment is in good working order.</li> <li>Carry associated Safety Data Sheets (SDS) for all chemicals.</li> </ul> <p><b>Specific</b></p> <ul style="list-style-type: none"> <li>Wash all equipment, including hulls of barges, anchors, sediment curtains and trailers to prevent spread of aquatic pests including <i>Caulerpa taxifolia</i> (Caulerpa). Provide contractors on site with copy of Make 'clean' part of your routine (DPI, 2015).</li> <li>A visual check for Caulerpa on all equipment and vessels to be used in the activities must be carried out before work commences.</li> </ul>	<p>Project Manager All Staff/Contractors</p>
<b>Biodiversity - Flora</b>	<ul style="list-style-type: none"> <li>Crushing and damage to vegetation that is not proposed for removal</li> <li>Harm to identified threatened flora species</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Pre-works briefing to be undertaken by Council, Sea Dragon (Marine Specialist Contractor) and/or the project Ecologist, advising of sensitive areas and relevant safeguards for these areas.</li> <li>Establishment of clearly defined areas, such as the works area and 'no-go' areas within/adjacent to the work site. These are to be demarked on land and water.</li> <li>Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until written approval has been provided to do so.</li> </ul>	<p>Project Manager All Staff/Contractors</p>

Impact	Description	Safeguards/Mitigation Measures	Responsibility
		<p><b><u>Specific</u></b></p> <ul style="list-style-type: none"> <li>The deployment of ropes, anchors, blocks, chain, or similar devices used to carry out works must not set up in areas identified to contain seagrass, identified in Figure 15. Provide all contractors on site with a fact sheet containing pictures of different types of seagrass species likely to be found on site. Berthing or mooring above seagrass is permitted for periods of less than 48 hours. <ul style="list-style-type: none"> <li>If mooring of vessel is essential, mooring system for vessels in vicinity of area must utilise a 'screw' mooring system as opposed to traditional 'swing' mooring system to reduce inadvertent impacts on seagrass (see Appendix D for schematic representation)</li> <li>If the use of a swing anchor is essential and all other options have been exhausted, the anchor must be located at least 5 m away from any seagrass beds. The location of the anchor is to be regularly monitored to ensure no impacts to seagrass or other aquatic habitat is occurring.</li> </ul> </li> <li>Store or decant chemicals outside of work area and above mean high tide mark.</li> <li>Post works seagrass surveys must be undertaken to identify amount of seagrass impacted by works.</li> <li>A permit under Part 7 of the FM Act is required before seagrass is removed or harmed.</li> <li>A permit under Part 7 of the FM Act is required for the removal of macroalgae.</li> <li>Seagrass is only to be harmed in areas where authorised under a permit from DPI Fisheries</li> <li>Ensure weighted chain of sediment curtain does not drag over any seagrass and inadvertently damage seagrass identified to be retained.</li> </ul>	
<b>Biodiversity – Fauna</b>	<ul style="list-style-type: none"> <li>Harm to identified threatened fauna species</li> <li>Injured or orphaned wildlife</li> </ul>	<p><b><u>General</u></b></p> <ul style="list-style-type: none"> <li>Pre-works briefing to be undertaken by Council, Sea Dragon (Marine Specialist Contractor) and/or the project Ecologist, advising of sensitive areas and relevant safeguards for these areas.</li> <li>Establishment of clearly defined areas, such as the works area and 'no-go' areas within/adjacent to the work site. These are to be demarked on land and water.</li> <li>Works must be stopped if any previously undiscovered threatened species or communities are discovered during works. An assessment of the impact and</li> </ul>	<p>Project Manager All Staff/Contractors</p>

Impact	Description	Safeguards/Mitigation Measures	Responsibility
		<p>any required approvals must be obtained. Works must not recommence until written approval has been provided to do so.</p> <ul style="list-style-type: none"> <li>The site-specific CEMP will include instructions for dealing with orphaned or injured native animals and include the contact details for the NSW Wildlife Information, Rescue and Education Service Inc (WIRES).</li> <li>Store or decant chemicals outside of work area.</li> </ul> <p><b><u>Specific – Aquatic fauna</u></b></p> <ul style="list-style-type: none"> <li><b>Pre-construction (demolition and replacement – major works):</b> A pre-clearance surveys for Whites Seahorse and other Syngnathiformes is to be carried out prior to the major works. If seahorses are located, they are to be moved to nearby suitable habitat at the Bradys Point seahorse hotels, in accordance with the Seahorse Relocation Plan. <ul style="list-style-type: none"> <li>Whites Seahorse must be relocated in their breeding pairs.</li> <li>Works are to be in accordance with the Fisheries Permit conditions.</li> </ul> </li> <li><b>Pre-maintenance (minor) works:</b> A pre-clearance survey for White's Seahorse will be required if the proposed maintenance works are to take place in an area of known or predicted seagrass habitat, direct works to shark netting or underwater. For example, works such as painting or minor repairs to walers above the watermark that will not impact the netting structure or require removal of or anchoring into seagrass may proceed with caution, in lieu of a pre-clearance survey. If a clearance survey is deemed necessary and seahorses are located, they are to be moved to nearby suitable habitat in accordance with the Seahorse Relocation Plan. <ul style="list-style-type: none"> <li>As above, works are to be in accordance with the Fisheries Permit conditions</li> </ul> </li> <li><b>During construction:</b> Works must cease if White's Seahorse and other Syngnathiformes are found within the study area. They are to be relocated to nearby suitable habitat in accordance with the Seahorse Relocation Plan.</li> </ul> <p><b><u>Specific – Little Penguin</u></b></p> <ul style="list-style-type: none"> <li>If foraging penguins (e.g., Little Penguin) or signs of burrowing are identified within or in close vicinity of the construction site, works must cease and Council is to be contacted. An assessment of the impact and any required approvals</li> </ul>	

Impact	Description	Safeguards/Mitigation Measures	Responsibility
		must be obtained. Works must not recommence until written approval has been provided to do so.	
<b>Priority Weeds</b>	<ul style="list-style-type: none"> <li>Spread of priority weeds</li> </ul>	<p><u><b>General</b></u></p> <ul style="list-style-type: none"> <li>Wash down equipment and vehicles prior to and after use, to manage the introduction and spread of weed propagules.</li> </ul>	All Staff/Contractors
<b>Aboriginal Heritage</b>	<ul style="list-style-type: none"> <li>Discovery of unsuspected Aboriginal objects</li> <li>Discovery of human remains</li> <li>Harm to AHIMS sites as well as other area of Aboriginal Significance</li> </ul>	<p><u><b>General</b></u></p> <ul style="list-style-type: none"> <li>All contractors undertaking works on site should be briefed on the protection of Aboriginal heritage objects under the NPW Act, and the penalties for damage to these items.</li> <li>If suspected Aboriginal objects, such as stone artefacts are located during future works, works must cease in the affected area and the area fenced off with suitable markers (star pickets, flagging or barrier mesh). Engage an archaeologist to assess the finds. If the finds are found to be Aboriginal objects, Heritage NSW must be notified under section 89A of the NPW Act. Appropriate management and avoidance or approval under a section 90 AHIP should then be sought if Aboriginal objects are to be moved or harmed.</li> <li>In the extremely unlikely event that human remains are found, works should immediately cease, and the NSW Police should be contacted. If the remains are suspected to be Aboriginal, Heritage NSW may also be contacted at this time to assist in determining appropriate management.</li> </ul>	<p>Project Manager</p> <p>All Staff/Contractors</p>
<b>Historic Heritage</b>	<ul style="list-style-type: none"> <li>Impacts to Heritage items</li> </ul>	<p><u><b>General</b></u></p> <ul style="list-style-type: none"> <li>A heritage induction should be presented to workers before construction begins.</li> <li>In accordance with Section 146 of the <i>Heritage Act 1977</i>, if an archaeological relic (such as a deposit or artefact) is uncovered during works, work must cease in the affected area and a qualified archaeologist contacted to assess the find. Further advice and clarification may be sought from the Heritage Council of NSW, or the Heritage Division under delegation regarding assessment and approvals.</li> </ul> <p><u><b>Specific</b></u></p> <ul style="list-style-type: none"> <li>Use of visually similar materials for the reconstruction of the tidal pool, to reflect its original heritage character.</li> </ul>	<p>Project Manager</p> <p>All Staff/Contractors</p>



Impact	Description	Safeguards/Mitigation Measures	Responsibility
<b>Noise and Vibration</b>	<ul style="list-style-type: none"> <li>Noise impacts on sensitive receivers in proximity</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Avoid simultaneous operation of noisy plant within discernible range of a sensitive receiver.</li> <li>Construction works will only occur during the following times: <ul style="list-style-type: none"> <li>Monday to Friday 7:00 am to 6:00 pm</li> <li>Saturday 8:00 am to 1:00 pm</li> </ul> </li> <li>Maximise the distance between noisy plant items and nearby residential receivers and potential fauna habitat.</li> <li>Use slow start-up hammering for piles to allow fish to move away from the area.</li> </ul>	<p>Project Manager All Staff/Contractors</p>
<b>Air Quality</b>	<ul style="list-style-type: none"> <li>Dust generation from vibrating and ground disturbing works</li> <li>Fumes generation from machinery</li> <li>Cumulative impacts of greenhouse gas emissions</li> <li>Dust from vehicles</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Works must be minimised during high wind periods.</li> <li>Dust suppression should be applied as required to limit excessive dust generation.</li> <li>Plant and equipment must be regularly inspected to ascertain that fitted emission controls are operating efficiently.</li> <li>Plant and equipment must be maintained in accordance with manufacturer's specifications to ensure that it is in a proper and efficient condition.</li> <li>Do not have machinery running while not in use.</li> <li>Minimise use of machinery for required activity only.</li> <li>Vehicles to maintain recommended speed.</li> <li>Look for excessive dust generation and slow down if needed.</li> <li>Where possible carry out works during the standard daytime working hours.</li> </ul>	<p>Project Manager All Staff/Contractors</p>
<b>Waste Management</b>	<ul style="list-style-type: none"> <li>Waste in the form of seabed sediment</li> <li>Cleared vegetation</li> <li>Litter left on-site by staff/contractors</li> </ul>	<p><b>General</b></p> <ul style="list-style-type: none"> <li>Any excess sediment or waste material must be kept on a barge or in a designated stockpile during construction works.</li> <li>All waste must be removed from the site on completion of the works.</li> <li>Upon completion of waste disposal, all original weighbridge / disposal receipts issued by the receiving waste facility must be retained in a waste register as evidence of proper disposal.</li> <li>An adequate number of bins must be placed at the site or on the barge for workers and all litter will be placed in these bins. Work areas of the project site would be kept clean and free of litter, including cigarette butts, at all times.</li> </ul>	<p>All Staff/Contractors</p>

Impact	Description	Safeguards/Mitigation Measures	Responsibility
Traffic and Navigation	<ul style="list-style-type: none"> <li>Disruption to traffic flows</li> <li>Temporary obstruction of marine traffic during construction</li> <li>Altered marine navigation post-works due to extended tidal pool area</li> </ul>	<u>General</u> <ul style="list-style-type: none"> <li>Vehicles, materials, and equipment must be positioned to minimise impacts to public access and parking.</li> <li>Heavy vehicles, if required, will be restricted to specified routes.</li> </ul>	Project Manager
		<u>Specific</u> <ul style="list-style-type: none"> <li>Outcomes of consultation with TfNSW will be implemented.</li> <li>Nearby boat and/or Marina owners will be consulted with prior to the commencement of works, especially in relation to the travel placement of the piling barge in the waters of Middle Harbour.</li> </ul>	All Staff/Contractors
Visual Amenity and Landscape	<ul style="list-style-type: none"> <li>Impact on the community through removal of vegetation providing screening</li> </ul>	<u>General</u> <ul style="list-style-type: none"> <li>Notify community or neighbours where light impacts are anticipated.</li> <li>Position lighting in residential areas to direct light away from houses wherever possible.</li> </ul>	Project Manager
		<u>Specific</u> <ul style="list-style-type: none"> <li>Visually similar materials will be used to construct the tidal pool extension, which will maintain a similar heritage aesthetic.</li> </ul>	All Staff/Contractors
Social and Economic	<ul style="list-style-type: none"> <li>Potential impacts to private boat moorings</li> </ul>	<u>Specific</u> <ul style="list-style-type: none"> <li>Private boat mooring licensees will be consulted with by Council prior to the commencement of works.</li> <li>Council will engage with the owner/s of Clontarf Marina prior to the commencement of works and throughout the construction period.</li> </ul>	



*Sandy Beach, looking toward Clontarf Beach and nearby moorings*  
Image: Northern Beaches Council

## SECTION 6

# Conclusion

## 6. Conclusion

### 6.1 Section 171 of the EP&A Regulation

Section 171 of the EP&A Regulation sets out a non-exhaustive list of factors which must be considered when undertaking a Review of Environmental Factors under Part 5 of the EP&A Act. These factors have been addressed throughout this report and are summarised in Table 25 below.

**Table 25: Section 171 Factors under the EP&A Regulation**

Section 171 Factors	Assessment Outcome
(a) the environmental impact on the community,	Noise and other impacts on the community are anticipated to be minimal. The proposed works will result in a positive impact on the community through providing a safe recreational facility with increased capacity.
(b) the transformation of the locality,	No significant transformation of locality is likely as part of the works. The visual aesthetic of the tidal pool will be maintained, using like for like materials. The proposed works will provide an improved outdoor recreation facility for the local community, accounting for several future circumstances including sea level rise and population growth.
(c) the environmental impact on the ecosystems of the locality,	There will be no significant environmental impact on ecosystems of the locality provided the recommended mitigation measures are followed. Mitigation measures will ensure the protection threatened species through preclearance surveys and relocation of any White's Seahorse to nearby suitable habitat.  No impacts to terrestrial flora or other threatened species will result from the proposed works,
(d) reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality,	The works involve the demolition of the Clontarf Tidal Pool, which has reached its end of life. It will be replaced using like-for-like materials. It will improve the aesthetic quality of Clontarf Reserve, improving the value of the locality for the community and tourists.
(e) the effects on any locality, place or building that has— <ul style="list-style-type: none"> <li>aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or</li> <li>social significance, or other special value for present or future generations,</li> </ul>	Impacts on threatened ecological communities and species have been considered and mitigated. No significant impacts to Aboriginal or Historic heritage will result from the proposed works. The pool will be constructed using like for like materials, maintaining the aesthetic and social significance of the original pool structure.  Overall, the works will not significantly reduce aesthetic, scientific, or other environmental quality or value of the locality
(f) the impact on the habitat of protected animals, within the meaning of the <i>Biodiversity Conservation Act 2016</i> ,	No protected animals listed under the BC Act will be impacted by the proposed works.
(g) the endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air,	No significant impacts to threatened fauna or flora will result from the proposed works provided the recommended mitigation measures are implemented. Mitigation measures will ensure the protection threatened species through preclearance surveys and



Section 171 Factors	Assessment Outcome
	relocation of any <i>Hippocampus whitei</i> (White's Seahorse) to nearby suitable habitat.
(h) long-term effects on the environment,	The works will not have a long-term effect on the environment. It will provide a long-term benefit to the local Northern Beaches community through the upgrade of a highly used and valued outdoor recreation asset.
(i) degradation of the quality of the environment,	No significant impacts to the quality of the environment were found. No degradation to the quality of the environment should occur if mitigation measures are adhered to.
(j) risk to the safety of the environment,	A low risk to the environment is associated with the proposed works. There is a potential for a chemical spill to occur during construction. The risk to the environment is considered minimal if the prescribed mitigation measures are adopted.
(k) reduction in the range of beneficial uses of the environment,	No reduction in the range of beneficial uses of the environment will result as part of the works. The works will not limit or modify any uses of the environment. The works will allow increased use of the Clontarf Tidal Pool, providing additional beneficial use of the environment for locals and visitors.
(l) pollution of the environment,	No pollution of the environment is proposed or likely. The risk is minimal if the appropriate mitigation measures are followed.
(m) environmental problems associated with the disposal of waste,	All waste is to be taken offsite and disposed of appropriately. No environmental problems associated with the disposal of waste is expected.
(n) Any increased demands on resources (natural or otherwise) that are or are likely to become in short supply?	No resources that are being utilised as part of this project are likely to become in short supply.
(o) the cumulative environmental effect with other existing or likely future activities,	No cumulative environment effects are anticipated to result from the proposed works.
(p) the impact on coastal processes and coastal hazards, including those under projected climate change conditions,	The upgrade takes into account future climate change scenarios including sea level rise, ensuring the pool is able to be used for the foreseeable future.
(q) applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1,	The proposed works support the local, regional and district strategic plans by providing quality open space and resilience under climate change.
(r) other relevant environmental factors.	All relevant factors have been addressed in this REF.

## 6.2 Evaluation

The proposal has been subject to assessment under Division 5.1, Part 5 of the EP&A act. This REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity. This has included consideration of other environmental planning instruments as well as other NSW and Commonwealth legislation.

The proposal will aid in the delivery of multiple objectives identified both in the North District Plan and Northern Beaches Council LSPS such as providing improved social infrastructure and delivering high quality open space for current and future generations.

The proposal as described in this REF best meets the proposal objectives, however, would still result in some impacts. Potential environmental impacts associated with the proposal would generally be limited to impacts on aquatic habitat and fauna. However, appropriate mitigation measures have been recommended to ensure such impacts are minimised during construction and operation of the Clontarf Tidal Pool. This includes implementation of several management plans including:

- A CEMP, which summarises all the relevant mitigation measures from this REF is recommended. The CEMP will guide the construction works and will be used as part of the site induction to familiarise all workers with the environmental sensitivities identified through the assessment process.
- A Sediment and Erosion Control Plan
- A Seahorse Relocation Plan
- A Swimming Enclosure Management Plan

This REF has considered and assessed these impacts in accordance with Section 171 of the EP&A Regulation and the requirements of the EPBC Act. Based on the assessment contained in this REF, it is considered that the proposal is not likely to have a significant impact upon the environment or any threatened species, populations, or communities. Accordingly, an Environmental impact Statement (EIS) is not recommended.

The proposal has also taken into account the principles of ecologically sustainable development and the objects of the EP&A Act. The proposal would be delivered to the maximum benefit for the community, be cost effective and minimise any adverse impacts on the environment. On balance, the proposal is considered justified and in the public interest.



*Southwest view of Clontarf Tidal Pool*  
Image: RPS, 2022

## SECTION 7

# Determination

## 7. REF Determination and Conditions

### 7.1 Assessor Declaration

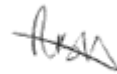
This REF provides a true and fair review of the activity in relation to its likely effects on the environment. It addresses to the fullest extent possible all matters affecting or likely to affect the environment as a result of the project and provides sufficient information to determine whether there is likely to be a significant impact on the environment as a result of the Project.

I have considered all environmental impacts and safeguards to the best of my knowledge and have sought advice where required.

#### Assessor's Declaration and Approval

##### Project Director

Rebecca Ben-Haim  
Eco Logical Australia  
Level 3, 101 Sussex Street, Sydney 2000  
Ph: 02 9259 3745



Date: 3/11/2022

##### Project Manager

Geraint Breese  
Eco Logical Australia  
Level 3, 101 Sussex Street, Sydney 2000  
Ph: 02 9259 3754



Date: 3/11/2022

### 7.2 Determiner Declaration and Approval

I have reviewed the document and consider that the project will not have a significant impact and can proceed subject to the controls outlined in this REF.

#### Determiner's Declaration and Approval

Role:

Name: Refer to approved determination assessment in the Northern Beaches Council  
Company: Environmental Approval Checklist & Review of Environmental Factors Form at  
Address: the end of this report

Date:

Ph:

Role:

Name:

Company:

Address:

Date:

Ph:



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SECTION 8

# References

## 8. References

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*Clontarf Pool at low tide* 20.12.1949

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APPENDIX A

# Terrestrial and Aquatic Appendices



## A1 Species List

**Table 26: Flora species list**

Family	Species Name	Common Name	Exotic (*)	Priority Weed / Weed of National Significance (*)
<i>Zostera</i>	<i>capricorni</i>	Eel grass	-	-
<i>Halophila</i>	<i>ovalis</i>	Paddle weed	-	-
<i>Sargassum</i>	sp.	Seaweed	-	-
<i>Codium</i>	sp.	Seaweed	-	-

**Table 27: Fauna species list**

Family	Species Name	Common Name
<i>Monacanthus</i>	<i>chinensis</i>	Fan-bellied Leather Jacket
<i>Tetractenos</i>	<i>glaber</i>	Smooth toadfish
<i>Girella</i>	<i>tricuspidata</i>	Luderick
<i>Astropecten</i>	<i>polycanthus</i>	Star fish
<i>Balanus</i>	<i>variegatus</i>	Barnacles
<i>Saccostrea</i>	<i>glomerata</i>	Sydney rock oyster
<i>Ascidacea</i>	sp.	Ascidians, sea squirts

## A2 Likelihood of Occurrence Assessment

An assessment of likelihood of occurrence was made for threatened and migratory species identified from the database search. Five terms for the likelihood of occurrence of species are used in this report. This assessment was based on database or other records, presence or absence of suitable habitat, features of the proposal site, results of the site inspection and professional judgement. Some Migratory or Marine species identified from the Commonwealth database search have been excluded from the assessment, due to lack of habitat. The terms for likelihood of occurrence are defined below:

- “known” = the species was or has been observed on the site
- “likely” = a medium to high probability that a species uses the site
- “potential” = suitable habitat for a species occurs on the site, but there is insufficient information to categorise the species as likely to occur, or unlikely to occur
- “unlikely” = a very low to low probability that a species uses the site
- “no” = habitat on site and in the vicinity is unsuitable for the species.

A test of significance was conducted for threatened species or ecological communities that were recorded within the study area or had a higher likelihood of occurring and were not recorded during the site visit. It is noted that some threatened fauna species that are highly mobile, wide ranging and vagrant may use portions of the study area intermittently for foraging. For these fauna species, the habitat present and likely to be impacted is not considered to be important to the threatened species, particularly in relation to the amount of similar habitat remaining in the surrounding landscape. As such, a test of significance in reference to State or Commonwealth legislation was not considered necessary.

The records column refers to the number of records occurring within 5 km of the study area, as provided by the Atlas of NSW Wildlife (BioNet) and Protected Matters Search Tool database search.

Information provided in the habitat associations’ column has primarily been extracted (and modified) from the Commonwealth *Species Profile and Threats Database* and the NSW *Threatened Species Profiles*.

**Table 28: Likelihood of occurrence assessment for threatened fauna species**

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<b>Amphibians</b>							
<i>Pseudophryne australis</i>	Red-Crowned Toad	V	-	Open forests, mostly on Hawkesbury and Narrabeen Sandstones	286	Unlikely	No, suitable habitat is not present within the study area
<b>Aves</b>							
<i>Anseranas semipalmata</i>	Magpie Goose	V	-	Mainly found in shallow wetlands (less than 1 m deep) with dense growth of rushes or sedges. Equally at home in aquatic or terrestrial habitats; often seen walking and grazing on land; feeds on grasses, bulbs and rhizomes. Often seen in trios or flocks on shallow wetlands, dry ephemeral swamps, wet grasslands and floodplains. Roosts in tall vegetation.	1	Unlikely	No, suitable habitat is not present within the study area
<i>Anthochaera phrygia</i>	Regent Honeyeater	E4A	CE	Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of <i>Casuarina cunninghamiana</i> (River Oak).	3	Unlikely	No, suitable habitat is not present within the study area
<i>Artamus cyanopterus cyanopterus</i>	Dusky Woodswallow	V	-	Primarily inhabit dry, open eucalypt forests and woodlands, including mallee associations, with an open or sparse understorey.	1	No	No, suitable habitat is not present within the study area.
<i>Botaurus poiciloptilus</i>	Australasian Bittern	E1	E	Permanent freshwater wetlands with tall, dense vegetation, particularly <i>Typha</i> spp. (bullrushes) and <i>Eleocharis</i> spp. (spikerushes).	1	Unlikely	No, suitable habitat is not present within the study area.

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<i>Burhinus grallarius</i>	Bush Stone-curlew	E1	-	In NSW, it occurs in lowland grassy woodland and open forest.	2	Unlikely	No, suitable habitat is not present within the study area.
<i>Calyptorhynchus lathamii</i>	Glossy Black-Cockatoo	V	-	Open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur.	3	No	No, suitable habitat is not present within the study area.
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	Inhabits eucalypt forests and woodlands, mallee and Acacia woodland.	2	Unlikely	No, suitable habitat is not present within the study area.
<i>Diomedea exulans</i>	Wandering Albatross	E1	E	Marine.	3	Potential	No, this highly mobile marine species is only likely to utilize potential habitat within the study area sporadically
<i>Esacus magnirostris</i>	Beach Stone-curlew	E4A	-	Exclusively along the coast, on beaches, islands, reefs and in estuaries, and edges of or near mangroves.	1	Potential	No, this highly mobile marine species is only likely to utilize potential habitat within the study area sporadically. No habitat will be removed.
<i>Eudyptula minor</i>	Little Penguin in the Manly Point Area	E2	-	This endangered population occurs north of Smedley's Point to Cannae Point, North Sydney Harbour, Manly. A range of nest sites are utilised: under rocks on the foreshore, under seaside houses and structures, such as stairs, in wood piles and under overhanging vegetation including lantana and under coral tree roots.	33	Potential.	No, potential foraging habitat within the study area however the proposed mitigation measures will ensure the foraging habitat is not adversely impacted.



Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	Dry, open eucalypt forests and woodlands, including remnant woodland patches and roadside vegetation.	8	Unlikely	No, suitable habitat is not present within the study area.
<i>Haematopus fuliginosus</i>	Sooty Oystercatcher	V	-	Rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	4	Potential.	No, this species may utilise the study area sporadically however no habitat for this species will be removed.
<i>Haematopus longirostris</i>	Pied Oystercatcher	E1	-	Favours intertidal flats of inlets and bays, open beaches and sandbanks. Favours intertidal flats of inlets and bays, open beaches and sandbanks. Favours intertidal flats of inlets and bays, open beaches and sandbanks.	2	Potential	No, this species may utilise the study area sporadically however no habitat for this species will be removed.
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	-	Freshwater swamps, rivers, lakes, reservoirs, billabongs, saltmarsh and sewage ponds and coastal waters. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest and urban areas.	49	Potential.	No, this species may utilise the study area sporadically however no habitat for this species will be removed.
<i>Hieraaetus morphnoides</i>	Little Eagle	V	-	Open eucalypt forest, woodland or open woodland, including she-oak or Acacia woodlands and riparian woodlands of interior NSW.	4	Unlikely	No, suitable habitat is not present within the study area.
<i>Ixobrychus flavicollis</i>	Black Bittern	V	-	Terrestrial and estuarine wetlands. Also flooded grassland, forest, woodland, rainforest and mangroves where permanent water is present.	6	No	No, there is no suitable habitat located within the study area

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<i>Lathamus discolor</i>	Swift Parrot	E1	CE	Box-ironbark forests and woodlands.	8	No	No, there is no potential habitat located within the study area
<i>Lophoictinia isura</i>	Square-tailed Kite	V	-	Timbered habitats including dry woodlands and open forests, particularly timbered watercourses.	1	Unlikely	No, there is no suitable habitat located within the study area
<i>Macronectes giganteus</i>	Southern Giant Petrel	E1	E	Marine	1	Unlikely	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically
<i>Ninox connivens</i>	Barking Owl	V	-	Woodland and open forest, including fragmented remnants and partly cleared farmland, wetland and riverine forest.	5	Unlikely	No, no potential habitat occurs within the study area.
<i>Ninox strenua</i>	Powerful Owl	V	-	Woodland, open sclerophyll forest, tall open wet forest and rainforest.	703	Unlikely	No, no potential habitat occurs within the study area.
<i>Onychoprion fuscatus</i>	Sooty Tern	V	-	Marine.	2	Unlikely	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically.
<i>Pandion cristatus</i>	Eastern Osprey	V	-	Rocky shorelines, islands, reefs, mouths of large rivers, lagoons and lakes.	20	Unlikely	No, suitable habitat is not present within the study area.
<i>Pterodroma leucoptera leucoptera</i>	Gould's Petrel	V	E	Marine. Nesting habitat is located within steeply sloping rock scree gullies with a canopy of Cabbage Tree Palms.	1	Potential	No, this species may utilise the study area sporadically however no habitat for this species will be removed.

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<i>Ptilinopus superbus</i>	Superb Fruit-Dove	V	-	Rainforest and closed forests. May also forage in eucalypt or acacia woodland where there are fruit-bearing trees.	8	Unlikely	No, suitable habitat is not present within the study area.
<i>Stagonopleura guttata</i>	Diamond Firetail	V	-	Grassy eucalypt woodlands, open forest, mallee, Natural Temperate Grassland, secondary derived grassland, riparian areas and lightly wooded farmland.	1	Unlikely	No, suitable habitat is not present within the study area.
<i>Thalassarche bulleri</i>	Buller's Albatross	-	V	Inshore, offshore and pelagic waters.	1	Potential	No, this highly mobile marine species is only likely to utilize potential habitat within the study area sporadically
<i>Thalassarche cauta</i>	Shy Albatross	V	V	Marine.	4	Potential.	No, this species may utilise the study area sporadically however no habitat for this species will be removed.
<i>Thalassarche melanophris</i>	Black-browed Albatross	V	V	Marine.	8	Unlikely	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically.
<i>Tyto novaehollandiae</i>	Masked Owl	V	-	Dry eucalypt forests and woodlands from sea level to 1100 m.	1	No	No, suitable habitat is not present within the study area.
<i>Tyto tenebricosa</i>	Sooty Owl	V	-	Dry rainforest, subtropical and warm temperate rainforest, as well as moist eucalypt forests.	2	No	No, suitable habitat is not present within the study area.

#### Mammals

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<i>Arctocephalus forsteri</i>	New Zealand Fur-seal	V	-	The species utilises rocky habitat as breeding and haul-out sites and appears to avoid open rock platforms and sandy or pebbly beaches.	1	Unlikely	No, suitable habitat is not present within the study area.
<i>Arctocephalus pusillus doriferus</i>	Australian Fur-seal	V	-	Rocky parts of islands with flat, open terrain	6	Unlikely	No, no potential habitat occurs within the study area
<i>Cercartetus nanus</i>	Eastern Pygmy-possum	V	-	Rainforest, sclerophyll forest (including Box-Ironbark), woodland and heath.	426	Unlikely	No, suitable habitat is not present within the study area.
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V	Close association with sandstone escarpment (for roosts) and fertile valleys (for foraging), particularly where the valleys support box gum woodland	6	No	No, suitable habitat is not present within the study area.
<i>Dugong dugon</i>	Dugong	E1		Wide, shallow protected bays, wide shallow mangrove channels and in the lee of large onshore islands.	1	Unlikely	No, suitable habitat is not present within the study area.
<i>Eubalaena australis</i>	Southern Right Whale	E1	E	In coastal areas, southern right whales generally occur within two kilometres off shore and tend to be distinctly clumped in aggregation areas.	5	Unlikely	Suitable habitat is not present within the study area.
<i>Isodon obesulus obesulus</i>	Southern Brown Bandicoot (eastern)	E1	E	Heath or open forest with a heathy understorey on sandy or friable soils.	1	Unlikely	No, suitable habitat is not present within the study area.
<i>Megaptera novaeangliae</i>	Humpback Whale	V	V	Humpback whales travel along east coast of Australia on seasonal basis as part of their migratory movements	7	Unlikely	Suitable habitat is not present within the study area.



Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<i>Miniopterus australis</i>	Little Bent-winged Bat	V	-	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub.	13	No	No, potential habitat does not occur within the study area
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	-	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Hunt in forested areas.	71	Unlikely	Suitable habitat is not present within the study area.
<i>Myotis macropus</i>	Southern Myotis	V	-	Foraging habitat is waterbodies (including streams, or lakes or reservoirs) and fringing areas of vegetation up to 20m.	33	Unlikely	No, potential habitat does not occur within the study area
<i>Perameles nasuta</i>	Long-nosed Bandicoot, North Head	E2	-	Restricted to North Head in the Manly Local Government Area. Occupies a variety of habitats on North Head.	4878	Potential	No, no potential habitat within the study area.
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	-	Open forest, woodland and riverine forest habitats.	1	Unlikely	No, suitable habitat is not present within the study area.
<i>Phascolarctos cinereus</i>	Koala	E1	E	Eucalypt woodlands and forests.	2	No	No, suitable habitat is not present within the study area.
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.	394	Potential	No, this species is likely to be present adjacent to the study area however no foraging or roosting habitat will be impacted.
<i>Saccolaimus flaviventris</i>	Yellow-bellied Sheath-tail-bat	V	-	Almost all habitats, including wet and dry sclerophyll forest, open woodland,	2	Potential	No, this species is likely to be present adjacent to the study

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
				open country, mallee, rainforests, heathland and waterbodies.			area however no foraging or roosting habitat will be impacted.
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	-	Woodland, moist and dry eucalypt forest and rainforest.	1	No	No, suitable habitat is not present within the study area.
<i>Vespadelus troughtoni</i>	Eastern Cave Bat	V	-	A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs. Occasionally found along cliff-lines in wet eucalypt forest and rainforest.	1	Unlikely	No, suitable habitat is not present within the study area.
<b>Reptiles</b>							
<i>Chelonia mydas</i>	Green Turtle	V	V	Inhabit sub-tidal and intertidal coral and rocky reefs and seagrass meadows, as well as deeper soft-bottomed habitats.	3	Unlikely	No, only a small amount of seagrass habitat occurs within the study area and this highly mobile species is only likely to utilise the study area very rarely.
<i>Eretmochelys imbricata</i>	Hawksbill Turtle		V	Inhabit sub-tidal and intertidal coral and rocky reefs and seagrass meadows, as well as deeper soft-bottomed habitats.	1	Potential	No, this species may utilise the study area sporadically however no habitat for this species will be removed.
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V	-	Heath, open forest and woodland.	8	Unlikely	No, suitable habitat is not present within the study area
<b>Fish</b>							
<i>Histiogamphelus briggsii</i>	Crested Pipefish	-	Marine	Sandy areas, seagrass or algal beds. Use decaying leaves of eelgrass <i>Posidonia</i> .	-	Potential	No, only a small amount of seagrass habitat occurs within the study area and this species is only likely to utilise

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
							the study area very rarely. No <i>Posidonia</i> was recorded within the study area.
<i>Syngnathoides biaculeatus</i>	Double-end Pipehorse	-	Marine	Seagrass and algae, tropical waters.	-	Unlikely	No, only a small amount of seagrass and algal habitat occurs within the study area. The study area is not tropical.
<i>Acentronura tentaculata</i>	Shortpouch Pipehorse	Pygmy -	Marine	Small and sparse seagrass or algae adjacent to reefs at shallow to moderate depths. Typically found in Queensland in Australia.	-	Potential	No, suitable habitat is within the study area however it is not near its typical range.
<i>Solegnathus spinosissimus</i>	Spiny Pipehorse	-	Marine	Muddy, silty, shelly and rubble substrates and rocky reefs.	-	Potential	No, potential habitat will not be impacted. The works propose to remove the pool and seagrass attached – with limited impacts in a confined area to other substrates.
<i>Stigmatopora argus</i>	Spotted Pipefish	-	Marine	Seagrass beds in inshore bays and estuaries to depths of at least 8 m.	-	Unlikely	No, suitable habitat not within study area
<i>Stigmatopora nigra</i>	Widebody Pipefish	-	Marine	Sheltered seagrass and algal beds from intertidal to depths of 35 m.	-	Potential	No, only a small amount of seagrass and algae are within the study area.
<i>Notiocampus ruber</i>	Red Pipefish	-	Marine	Rocky reefs, often in crevices, associated with sponges and filamentous red algae at depths to 20 m.	-	Unlikely	No, suitable habitat is not within the study area.
<i>Phyllopteryx taeniolatus</i>	Common Seadragon	-	Marine	Shallow estuaries to deeper offshore reefs, living seagrass beds and on rocky	-	Unlikely	No, only a small amount of seagrass is within the study area and other suitable

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required	
				reefs covered in macroalgae (especially kelp).			habitat is not within the study area.	
<i>Solenostomus cyanopterus</i>	Blue-finned Pipefish	Ghost	-	Marine	Inhabits shallow protected coral and rocky reefs, along with deep and clear estuaries with seagrass or macroalgae.	-	Unlikely	No, no suitable habitat within the study area.
<i>Maroubra perserrata</i>	Sawtooth Pipefish		-	Marine	Coastal reefs of 3 – 25 m depth, using ledges and caves for shelters during the day.	-	Potential	No, no suitable habitat. Works will take place during daylight hours. There are no ledges or caves within the study area.
<i>Heraldia nocturna</i>	Upside-down Pipefish		-	Marine	Sheltered inshore reefs in harbours, bays and coves. Usually beneath ledges, in holes, crevices and small caves. Depths of 2 – 30 m.	-	Potential	No, no suitable habitat within study area.
<i>Trachyrhamphus bicoarctatus</i>	Bentstick Pipefish		-	Marine	Sheltered coastal lagoon and reef areas on sandy and rubble habitats amongst seagrasses and macroalgae at 1 – 30 m.	-	Unlikely	No, limited potential habitat within the study area.
<i>Vanacampus margaritifer</i>	Mother-of-pearl Pipefish		-	Marine	Shallow estuarine and coastal waters. Seagrass beds (including <i>Zostera</i> and <i>Halophila</i> ), macroalgae, rocky reef, boulder, rubble, sandy and muddy habitats between 2 – 15 m.	-	Potential	No, only a small amount of seagrass is within the study area.
<i>Urocampus carinirostris</i>	Hairy Pipefish		-	Marine	Sheltered estuaries, shallow reefs in seagrass and algal beds at 0 – 6 m.	-	Potential	No, only a small amount of seagrass is within the study area.
<i>Lissocampus runa</i>	Javelin Pipefish		-	Marine	Bay, estuary, and tidepool habitat. Often sheltering amongst seagrass (usually <i>Zostera</i> spp.), in algal beds and	-	Potential	No, only a small amount of seagrass is within the study area.



Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
				on rubble areas near reefs at depths to 20 m.			
<i>Festucalex cinctus</i>	Girdled Pipefish	-	Marine	Sheltered coastal bays, estuaries, rubble, sand or in areas of sparse seagrass, algal and sponge growth. Endemic to tropical and temperate waters of the Northern Territory, Queensland and New South Wales.	-	Potential	No. Some suitable habitat is located within the study area however the species is typically distributed in warmer north eastern waters.
<i>Filicampus tigris</i>	Tiger Pipefish	-	Marine	Shallow seagrass beds and sponge, mud, sand, rock and rubble areas in depths 2 – 30 m.	-	Potential	No, only a small amount of seagrass is within the study area.
<i>Solenostomus paradoxus</i>	Ornate Ghostpipefish	-	Marine	Tropical and warm-temperate waters. Protected coastal, lagoon and outer reef areas with drop-offs or rock faces.	-	Unlikely	No, no suitable habitat is within the study area
<i>Hippocampus whitei</i>	White's Seahorse	Endangered (FM Act)	E Marine	Shallow water estuarine habitats. Sponge gardens, seagrass meadows and soft corals. Artificial habitats such as protective swimming net enclosures and jetty pylons.	-	Likely	Yes, likely to occur within the study area with known records.
<i>Hippichthys penicillus</i>	Beady Pipefish, Steep-nosed Pipefish	-	Marine	Tropical environments. Streams, rivers, estuarine seagrass beds and other shallow inshore habitats.	-	Potential	No, suitable habitat is within the study area however seagrass is sparse and prefers warmer waters.
<i>Hippocampus abdominalis</i>	Big-belly Seahorse, Eastern Potbelly Seahorse	-	Marine	Intertidal rockpools, low rocky reefs in shallow estuaries, deep tidal channels and deeper coastal reefs to 100 m. Cling to seagrasses, sponges, macroalgae such as kelp holdfasts, rocky outcrops	-	Potential	No. Suitable habitat is within the study area however the species is not listed as threatened under the EPBC Act. Additionally, under the Significance Impact

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
				and man-made structure. Also found to cling to floating seagrass rafts.			Guidelines (EPBC Act Policy Statement 1.1) 'Small scale infrastructure projects such as new jetties within an existing port would not normally be expected to have a significant impact on a matter of national environmental significance'.
<b>Migratory</b>							
<i>Actitis hypoleucos</i>	Common Sandpiper	-	Marine Migratory	Coastal wetlands and some inland wetlands, especially muddy margins or rocky shores. Also estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.	2	Unlikely	No, this highly mobile marine species is only likely to utilize potential habitat within the study area sporadically.
<i>Anous stolidus</i>	Common Noddy	-	Marine Migratory	Marine.	1	Unlikely	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically.
<i>Apus pacificus</i>	Fork-tailed Swift	-	Marine Migratory	Riparian woodland., swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes.	4	No	No, suitable habitat is not present within the study area
<i>Ardenna carneipes</i>	Flesh-footed Shearwater	V	Marine Migratory	Marine.	1	Unlikely	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically.
<i>Ardenna grisea</i>	Sooty Shearwater	-	Marine	Breeds on islands off New South Wales (NSW) and Tasmania. Forages in open	1	Unlikely	No, this highly mobile marine species is only likely to utilise

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
			Migratory	ocean, sub-tropical, sub-Antarctic and Antarctic waters.			potential habitat within the study area sporadically.
<i>Ardenna pacifica</i>	Wedge-tailed Shearwater	-	Marine Migratory	Islands, offshore.	11	Unlikely	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically.
<i>Ardenna tenuirostris</i>	Short-tailed Shearwater	-	Marine Migratory	Islands, offshore.	18	Unlikely	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically.
<i>Arenaria interpres</i>	Ruddy Turnstone	-	Marine Migratory	Summer migrant to most coastal regions, with occasional records inland, including in NSW. Tidal reefs and pools; pebbly, shelly and sandy shores; mudflats; inland shallow waters; sewage ponds, saltfields; ploughed ground.	1	Potential	No, this mobile species is only likely to utilize potential habitat within the study area sporadically.
<i>Calonectris leucomelas</i>	Streaked Shearwater	-	Marine Migratory	Marine.	5	Potential	No, this highly mobile marine species is only likely to utilize potential habitat within the study area sporadically. No habitat will be removed.
<i>Gallinago hardwickii</i>	Latham's Snipe	-	Marine Migratory	Freshwater, saline or brackish wetlands up to 2000 m above sea-level; usually freshwater swamps, flooded grasslands or heathlands.	1	Unlikely	No, suitable habitat is not present within the study area.
<i>Hirundapus caudacutus</i>	White-throated Needletail	-	V Marine	Occur most often over open forest and rainforest, as well as heathland, and remnant vegetation in farmland.	17	Unlikely	No, suitable habitat is not present within the study area.

Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
Migratory							
<i>Hydroprogne caspia</i>	Caspian Tern	-	Marine Migratory	Coastal offshore waters, beaches, mudflats, estuaries, rivers, lakes.	3	Potential	No, this species may utilise the study area sporadically however no habitat for this species will be removed.
<i>Numenius phaeopus</i>	Whimbrel	-	Marine Migratory	Intertidal mudflats of sheltered coasts.	1	No.	No, suitable habitat is not present within the study area
<i>Phaethon lepturus</i>	White-tailed Tropicbird	-	Marine Migratory	Marine.	1	Unlikely.	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically.
<i>Pluvialis squatarola</i>	Grey Plover	-	Marine Migratory	Mudflats, saltmarsh, tidal reefs and estuaries.	5	Unlikely	No, suitable habitat is not present within the study area.
<i>Stercorarius longicaudus</i>	Long-tailed Jaeger	-	Marine Migratory	Marine.	1	Unlikely	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically.
<i>Stercorarius parasiticus</i>	Arctic Jaeger	-	Marine Migratory	Marine.	5	Unlikely	No, this highly mobile marine species is only likely to utilise potential habitat within the study area sporadically.
<i>Stercorarius pomarinus</i>	Pomarine Jaeger	-	Marine Migratory	Marine.	1	Unlikely.	No, this species may utilise the study area sporadically however no habitat for this species will be removed.
<i>Sterna hirundo</i>	Common Tern	-	Marine	Offshore waters, ocean beaches, estuaries, large lakes. Less commonly	6	Potential.	No, this species may utilise the study area sporadically



Scientific Name	Common Name	BC / (FM) Act Status	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
			Migratory	freshwater swamps, floodwaters, sewage farms and brackish and saline lakes.			however no habitat for this species will be removed.

KEY: (BC ACT) E = ENDANGERED E2 = ENDANGERED POPULATION E4 = PRESUMED EXTINCT E4A = CRITICALLY ENDANGERED SPECIES V = VULNERABLE  
(EPBC ACT) CD = CONSERVATION DEPENDENT CE = CRITICALLY ENDANGERED E = ENDANGERED V = VULNERABLE X = EXTINCT XW = EXTINCT IN THE WILD

**Table 29: Likelihood of Occurrence - Ecological Communities**

Ecological Community	BC / (FM) Act Status	EPBC Status	Description	Likelihood of Occurrence	Impact Assessment Required
Coastal Swamp Oak ( <i>Casuarina glauca</i> ) Forest of New South Wales and South East Queensland	Endangered	Endangered	Associated with grey-black clay-loams and sandy loams, where the groundwater is saline or sub-saline, on waterlogged or periodically inundated flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains. Generally occurs below 20 m elevation.	Unlikely.	No, this community was not observed during the field survey.
Coastal Upland Swamps in the Sydney Basin Region	Endangered	Endangered	Occur primarily on impermeable sandstone plateaux with shallow groundwater aquifers in the headwaters and impeded drainage lines of streams, and on sandstone benches with abundant seepage moisture. Generally associated with acidic soils.	Unlikely.	No, this community was not observed during the field survey.
Eastern Suburbs Banksia Scrub of the Sydney Region	Endangered	Endangered	Disjunct patches of nutrient poor aeolian (windblown) dune sand.	Unlikely.	No, this community was not observed during the field survey.
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	Endangered	Critically Endangered	Occurs on dunes and flats, cheniers, berms, cobbles, headlands, scree, seacliffs, marginal bluffs, spits, deltaic deposits, coral rubble and islands.	Unlikely.	No, this community was not observed during the field survey.
<i>Posidonia australis</i> seagrass meadows of the Manning-Hawkesbury ecoregion	-	Endangered	The ecological community typically occurs in subtidal waters at depths ranging less than 1m - 10 m on sand and silty mud substrate.	Potential.	No, this community was not observed during the field survey.
<i>Posidonia australis</i> seagrass meadows of the Manning-Hawkesbury ecoregion	-	Endangered	The ecological community typically occurs in subtidal waters at depths ranging less than 1m - 10 m on sand and silty mud substrate.	Potential.	No, this community was not observed during the field survey.
<i>Posidonia australis</i> seagrass - Port Hacking, Botany Bay, Sydney Harbour, Pittwater, Brisbane Waters and Lake Macquarie populations	Endangered (FM Act)	Endangered	The ecological community typically occurs in subtidal waters at depths ranging less than 1m - 10 m on sand and silty mud substrate.	Potential.	No, this community was not observed during the field survey.

**Table 30: Likelihood of occurrence assessment for threatened flora species**

Scientific Name	Common Name	BC Status	Act	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<i>Acacia bynoeana</i>	Bynoe's Wattle	E1		V	Heath or dry sclerophyll forest on sandy soils.	12	Unlikely	No, species not recorded during site inspection.
<i>Acacia terminalis</i> subsp. <i>Eastern Sydney</i>	Sunshine wattle	E1		E	Coastal scrub and dry sclerophyll woodland on sandy soils.	241	Unlikely	No, species not recorded during site inspection.
<i>Allocasuarina portuensis</i>	Nielsen Park She-Oak	E1, 3		E	Closed woodland above sandstone shelves approximately 20 m above the harbour.	54	Unlikely	No, species not recorded during site inspection.
<i>Asterolasia buxifolia</i>		E1		-	Currently only known from one location. The species occurs in the riparian zone of Lett River.	1	Unlikely	No, species not recorded during site inspection.
<i>Caladenia tessellata</i>	Thick Lip Spider Orchid	E1, P, 2		V	Grassy sclerophyll woodland on clay loam or sandy soils, or low woodland with stony soil.	5	Unlikely	No, species not recorded during site inspection.
<i>Callistemon linearifolius</i>	Netted Bottle Brush	V, 3		-	Dry sclerophyll forest.	3	Unlikely	No, species not recorded during site inspection.
<i>Chamaesyce psammaeton</i>	Sand Spurge	E1		-	Fore-dunes, pebbly strandlines and exposed headlands, often with <i>Spinifex sericeus</i> (Spinifex) and <i>Zoysia macrantha</i> (Prickly Couch).	3	Potential	No, species not recorded during site inspection.
<i>Epacris purpurascens</i> var. <i>purpurascens</i>		V		-	Sclerophyll forest, scrubs and swamps. Most habitats have a strong shale soil influence.	2	Unlikely	No, species not recorded during site inspection.

Scientific Name	Common Name	BC Status	Act	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<i>Eucalyptus camfieldii</i>	Camfield's Stringybark	V		V	"Coastal heath on shallow sandy soils overlying Hawkesbury sandstone, mostly on exposed sandy ridges.	27	Potential	No, species not recorded during the site inspection
<i>Eucalyptus nicholii</i>	Narrow-leaved Black Peppermint	V		V	Dry grassy woodland, on shallow soils of slopes and ridges.	2	Unlikely	No, species not recorded during site inspection.
<i>Grammitis stenophylla</i>	Narrow-leaf Finger Fern	E1, 3		-	Dry grassy woodland, on shallow soils of slopes and ridges.	1	Unlikely	No, species not recorded during site inspection.
<i>Grevillea caleyi</i>	Caley's Grevillea	E4A, 3		CE	Open forest, generally dominated by <i>Eucalyptus sieberi</i> and <i>E. gummifera</i> on a ridgetop, in association with laterite soils.	6	Unlikely	No, species not recorded during site inspection.
<i>Hibbertia superans</i>		E1		-	Open woodland and heathland, and appears to prefer open disturbed areas.	1	Unlikely	No, species not recorded during site inspection.
<i>Hygrocybe reesiaae</i>	(Fungus)	V		-	Associated with alluvial sandy soils of the Hawkesbury Soil Landscapes with naturally low fertility and erodible.	1	Unlikely	No, species not recorded during site inspection.
<i>Lasiopetalum joyceae</i>	-	V		V	Grows in heath on sandstone. Has a restricted range occurring on lateritic to shaley ridgetops on the Hornsby Plateau south of the Hawkesbury River. It is currently known from 34 sites between Berrilee and Duffys Forest.	1	Unlikely	No, species not recorded during site inspection.
<i>Macadamia integrifolia</i>	Macadamia Nut	-		V	Drier subtropical rainforest.	2	Unlikely	No, species not recorded during site inspection.



Scientific Name	Common Name	BC Status	Act	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
<i>Melaleuca biconvexa</i>	Biconvex Paperbark	V		V	Damp places, often near streams or low-lying areas on alluvial soils.	2	Unlikely	No, species not recorded during site inspection.
<i>Melaleuca deanei</i>	Deane's Paperbark	V		V	Heath on sandstone.	2	Unlikely	No, species not recorded during site inspection.
<i>Microtis angusii</i>	Angus's Onion Orchid	E1, P, 2		E	Occurs in a range of habitats from open forest to low open forest, and rarely woodland. Currently known from only site at Ingleside, north of Sydney.	1	Unlikely	No, species not recorded during site inspection.
<i>Persoonia hirsuta</i>	Hairy Geebung	E1, P, 3		E	Sandy soils in dry sclerophyll open forest, woodland and heath on sandstone.	5	Unlikely	No, no potential habitat within study area
<i>Pimelea curviflora</i> var. <i>curviflora</i>		V		V	Woodland, mostly on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes.	12	Unlikely	No, no potential habitat within study area
<i>Prostanthera marifolia</i>	Seaforth Mintbush	E4A, 3		CE	In or in close proximity to the endangered Duffys Forest ecological community, on deeply weathered clay-loam soils associated with ironstone and scattered shale lenses.	868	Unlikely	No, no potential habitat within study area
<i>Rhodamnia rubescens</i>	Scrub Turpentine	E4A		CE	Subtropical Rainforests, Northern Warm Temperate Rainforests, Littoral Rainforest, North Coast Wet Sclerophyll Forests, Northern Hinterland WSF, Northern Escarpment WSF, Southern Lowland WSF	1	No	No, no potential habitat within study area
<i>Sarcophilus hartmannii</i>	Hartman's Sarcophilus	V, P, 2		V	Favours cliff faces on steep narrow ridges supporting eucalypt forest and clefts in volcanic rock from 500 to 1,000 m in altitude.	1	Unlikely	No, no potential habitat within study area

Scientific Name	Common Name	BC Status	Act	EPBC Status	Habitat	Number of records within 5 km radius of study area	Likelihood of Occurrence	Impact Assessment Required
					Also found occasionally at the bases of fibrous trunks of trees, including cycads and grass-trees.			
<i>Syzygium paniculatum</i>	Magenta Lilly Pilly	E1		V	"Subtropical and littoral rainforest on gravels, sands, silts and clays.	33	Unlikely	No, no potential habitat within study area
<i>Tetratheca glandulosa</i>		V		-	"Heath, scrub, woodlands and open forest on upper-slopes and mid-slope sandstone benches. Soils generally shallow, consisting of a yellow, clayey/sandy loam.	17	Unlikely	No, no potential habitat within study area
<i>Tetratheca juncea</i>	Black-eyed Susan	V		V	Usually found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest. Majority occur on low nutrient soils of the Awaba Soil Landscape.	2	Unlikely	No, no potential habitat within study area
<i>Triplarina imbricata</i>	Creek Triplarina	E1		E	Along watercourses in low open forest with <i>Tristaniopsis laurina</i> (Water Gum).	1	Unlikely	No, species not recorded during site inspection

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 (EPBC ACT) CD = CONSERVATION DEPENDENT CE = CRITICALLY ENDANGERED E = ENDANGERED V = VULNERABLE X = EXTINCT XW = EXTINCT IN THE WILD

### A3 Test of Significance (EPBC Act)

#### *Hippocampus whitei* (White's Seahorse)

**Table 31: Test of Significance (Endangered Species)**

Criterion	Question	Response
<b>An action is likely to have a significant impact on a critically endangered or endangered species if there is a real chance or possibility of the following:</b>		
1)	will the action lead to a long-term decrease in the size of a population	No, all Whites Seahorse within the direct and indirect impact area will be relocated to nearby habitat.
2)	will the action reduce the area of occupancy of the species	No, all Whites Seahorse within the direct and indirect impact area will be relocated to nearby habitat of a comparable or larger size.
3)	will the action fragment an existing population into two or more populations	No, Whites Seahorse found within the study area will be relocated together to the one alternate habitat site.
4)	will the action adversely affect habitat critical to the survival of a species	No. Whites Seahorse prefers sponge, soft coral, and <i>Posidonia australis</i> seagrass habitat which was not identified within the study area. Populations of Whites Seahorse in the Sydney region also prefer artificial structures such as tidal pools. The tidal pool will be reconstructed using similar materials to a larger size. Therefore, impacts to habitat are considered temporary and not significant.
5)	will the action disrupt the breeding cycle of a population	No, works will take place outside of the Whites Seahorse breeding season, which takes place between October and April.
6) i	will the action modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	No. Whites Seahorse prefers sponge, soft coral, and <i>Posidonia australis</i> seagrass habitat which was not identified within the study area. Populations of Whites Seahorse in the Sydney region also prefer artificial structures such as tidal pools. The tidal pool will be reconstructed using similar materials to a larger size. Therefore, impacts to habitat are temporary and not significant.
6) ii	will the action result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat	No, the works will not introduce invasive species. Weed and pathogen management procedures will be in place for the duration of construction.
7)	will the action introduce disease that may cause the species to decline	No, the works will not introduce disease. Weed and pathogen management procedures will be in place for the duration of construction.
8)	will the action interfere with the recovery of the species	Unlikely.  The works are considerate of the breeding season, habitat and fragmentation of Whites Seahorse, as detailed above. The works will not interfere with the recovery of the species. A recovery plan under the EPBC Act has not been issued for this species.

Criterion	Question	Response
		Under the conservation advice, cleaning of swimming enclosure nets poses a moderate threat to the recovery of the species, causing a decline in population numbers which may take years to recover (TSSC, 2020). However, the swimming net will be replaced and fauna will be relocated to alternate suitable habitat prior to the works commencing. As such, this is not expected to have a significant impact on the recovery of the <i>H. whitei</i> population at Clontarf. Any future maintenance works would ensure the relocation of seahorses prior to works on the net or other potential habitat areas such as seagrass.
<b>Conclusion</b>	<b>Is there likely to be a significant impact?</b>	No.

#### A4 Assessment of Significance (FM Act)

If a species, population or ecological community is listed under Division 2 of the FM Act, an Assessment of Significance must be undertaken. Section 221ZV of the FM Act requires the determination of whether the action proposed is likely to significantly affect threatened species, populations or ecological communities, or their habitats. Section 221ZV outlines the factors that must be taken into account when assessing an impact under this section.

##### *Hippocampus whitei* (White's Seahorse)

The Fisheries Scientific Committee has listed Whites Seahorse as an Endangered species under Schedule 4 Part 1 of the FM Act. As the proposed activities are in the vicinity of potential habitat for *Hippocampus whitei* and records of this species have been recorded in this area, it is necessary to undertake assessment of significance under Section 221ZV of the FM Act.

**Table 32: FM Act s221ZV Assessment of Significance - *Hippocampus whitei***

Question	Response
(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,	<p>Works will not occur during the breeding season.</p> <p>Prior to works commencing, a pre-clearance survey of the entire impact area will be completed. If the works are carried out continuously over multiple days or weeks, a pre-clearance survey will be carried out weekly where applicable (i.e. underwater works, works post-netting installation, works in known seagrass habitat). If works are stopped for more than two days and restarted, a pre-clearance survey must be completed prior to works re-commencing. Any specimens located are to be moved to habitats immediately nearby, out of the works area.</p> <p>The preference for relocation is to nearby proposed 'seahorse hotels', near areas of seagrasses such as <i>Zostera capricorni</i>, <i>Halophila ovalis</i> or macroalgae if <i>P. australis</i> is not nearby. Temporary seahorse hotels have been shown to be highly effective in supporting Whites Seahorse populations during infrastructure works and habitat modification (Simpson <i>et al.</i>, 2020). Kelp and other macroalgae in the vicinity of the study area will be checked thoroughly for the presence of this seahorses, especially within 1.2 m of the seabed, as this is their preferred habitat. In addition, the construction and future maintenance of the new tidal pool enclosures will be guided by the Fisheries Permit conditions.</p>

Question	Response
	If the above mitigation measures are implemented, it is unlikely that there will be an adverse effect on the life cycle of the proposed endangered species.
(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,	Whites Seahorse is not a listed endangered population under Schedule 4 Part 2 of the FM Act.
(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed: (i) and (ii)	Not applicable, as it is not an ecological community.
(d) in relation to the habitat of a threatened species, population or ecological community:  (i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and	Sponge, soft coral, and <i>P. australis</i> is the preferred habitat for Whites Seahorse. <i>P. australis</i> is listed as an endangered population under Schedule 4 Part 2 of the FM Act. There were no occurrences of this seagrass species identified during the field survey. While there will be some <i>Z. capricorni</i> and <i>H. ovalis</i> removed, any seahorses will be relocated out of the works area prior to works commencing. Therefore, only a small amount of habitat will be removed.
(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and	The extent of habitat that will be impacted by the proposed works has largely formed around the tidal pool structure itself (Figure 15) and does not have significant connectivity beyond this artificial structure.
(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,	Sponge, soft coral, and <i>P. australis</i> is the preferred habitat for Whites Seahorse and was not identified within the study area. Juvenile Whites Seahorse have been found to use <i>Sargassum</i> sp. macroalgal habitats (Harasti et al., 2014b in TSSC, 2020), which was found within the study area. The extent of <i>Sargassum</i> sp. Macroalgae was 82.81 m <sup>2</sup> and was found on the existing pool structure, pylons, shark netting and netting.  Whites Seahorse also uses artificial habitats, particularly within Sydney Harbour, such as protective swimming net enclosures and jetty pylons. This is most common where natural seagrass, sponge or soft coral habitat has been lost (TSSC, 2020).  Fauna will be relocated to nearby suitable and similar habitat while the works take place. The tidal pool structure will be constructed using visually and structurally similar materials (i.e. timber walers and netting will be reinstated; piles will be HDPE sleeved). The removal of habitat for Whites Seahorse is considered temporary and will not significantly impact the long-term survival of Whites Seahorse if the mitigation measures are implemented.
(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),	There are currently no declared areas of critical habitat for <i>H. whitei</i> .



Question	Response
<p>(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,</p>	<p>The <i>Priorities Action Statement – Draft Actions for White’s Seahorse (Hippocampus whitei)</i> is published by DPI Fisheries. The consistency of the proposed works has been considered in relation to the following actions:</p> <p><b>Advice to consent and determining authorities</b></p> <p><i>Provide information on the distribution of White’s Seahorse to coastal councils, consent authorities and determining authorities to ensure appropriate consideration during development assessment processes or approval of other activities which may impact this species (e.g. cleaning of swimming nets in key areas) (High priority).</i></p> <p>Council have engaged with DPI Fisheries since 2018 on many methods to reduce and mitigate impacts to Whites Seahorse. As such, it is considered that Council have accurate information to ensure appropriate consideration throughout the approval process.</p> <p><b>Community and stakeholder liaison, awareness and education</b></p> <p><i>Implement education initiatives to improve identification and awareness of the status of White’s Seahorse and ways to minimise impacts on the species by preparing and distributing appropriate advisory material (High priority).</i></p> <p>The publication of this REF and Council other community consultation helps to educate local people on the existence and threats to the population of Whites Seahorse at Clontarf Tidal pool.</p> <p><b>Habitat protection and rehabilitation</b></p> <p><i>Reduce the impact of public and private boat moorings on White’s Seahorse habitats (High priority).</i></p> <p>The proposal does not include any changes to private boat moorings</p> <p><i>Develop and trial artificial habitats to promote recovery of White’s Seahorse populations (High priority).</i></p> <p>The new structure is considered likely to provide artificial habitat for Whites Seahorse populations.</p> <p>As discussed above, the proposal is considered to be in accordance with Draft Actions for White’s Seahorse (<i>Hippocampus whitei</i>) published by DPI Fisheries.</p>
<p>(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.</p>	<p>The primary cause for the decline in abundance of White’s Seahorse is the loss of natural habitats across their range in eastern Australia. The seahorses occur within coastal estuaries and embayments which are areas subject to population pressure.</p> <p>Clontarf is an existing established Suburb and the proposed development is not considered to increase population pressure on the area.</p>

A decorative graphic on the left side of the page, consisting of white, concentric, wavy lines on a gray background, resembling a topographic map or a stylized landscape.

## APPENDIX B

# AHIMS Search Results



## AHIMS Web Services (AWS) Search Result

Your Ref/PO Number : 22SYD2634

Client Service ID : 703405

Eco Logical Australia Pty Ltd - Sydney - Individual users

Date: 27 July 2022

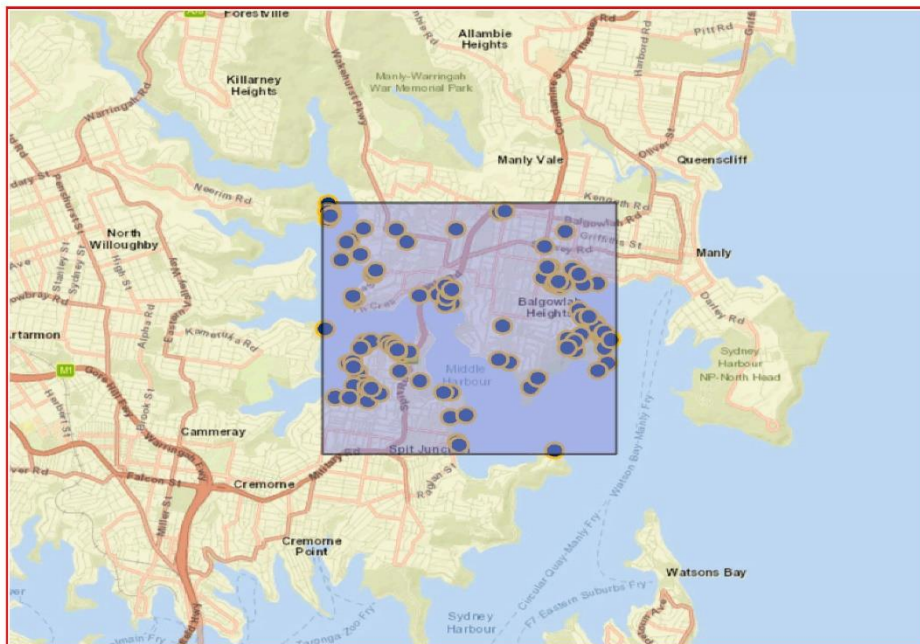
PO Box 12 668 Old Princes Hwy  
Sutherland New South Wales 1499  
Attention: Kate Storan

Email: kate.storan@ecoaus.com.au

Dear Sir or Madam:

**AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 336345.0 - 340345.0, Northings : 6255931.0 - 6259931.0 with a Buffer of 0 meters, conducted by Kate Storan on 27 July 2022.**

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of Heritage NSW AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

119	Aboriginal sites are recorded in or near the above location.
1	Aboriginal places have been declared in or near the above location. *
ID	Aboriginal Place Name
79	Reef Beach Resting Place



## AHIMS Web Services (AWS)

### Extensive search - Site list report

Your Ref/PO Number : 22SYD2634

Client Service ID : 703407

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-1020	Balgowlah,,	GDA	56	336394	6259770	Open site	Valid	Shell : -, Artefact : -	Midden	
	<b>Contact</b>			<b>Recorders</b>	ASRSYS			<b>Permits</b>		
45-6-2887	GURNEY CRESCENT MIDDEN - same as 45-6-0660	AGD	56	336565	6259150	Open site	Valid	Aboriginal Resource and Gathering : -		
	<b>Contact</b> T Russell			<b>Recorders</b>	Aboriginal Heritage Networker Consultant			<b>Permits</b>		
45-6-3672	David Shelter MAN-119	GDA	56	336735	6258355	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>			<b>Recorders</b>	Mr.Phil Hunt			<b>Permits</b>		
45-6-2226	Beauty Point 10;Beauty Point;	AGD	56	336710	6257010	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<b>Contact</b>			<b>Recorders</b>	Margrit Koettig,Michael Guider			<b>Permits</b>		
45-6-2025	Sangrado Reserve 1;	GDA	56	336994	6258770	Open site	Valid	Artefact : -, Shell : -	Midden,Open Camp Site	
	<b>Contact</b>			<b>Recorders</b>	Michael Guider			<b>Permits</b>		
45-6-1984	Beauty Point 2;	AGD	56	337145	6257512	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<b>Contact</b>			<b>Recorders</b>	Michael Guider			<b>Permits</b>		
45-6-1978	Pearl Bay 1;Beauty Point;	AGD	56	337310	6257310	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<b>Contact</b>			<b>Recorders</b>	Michael Guider			<b>Permits</b>		
45-6-1023	Balgowlah;Fallen Forwards Cave;	GDA	56	337904	6258470	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<b>Contact</b>			<b>Recorders</b>	Mr.R Taplin			<b>Permits</b>		
45-6-1163	Rocky Point Edwards Beach;Edwards Beach;	AGD	56	338100	6255900	Closed site	Valid	Shell : -, Artefact : -, Burial : -	Burial/s,Shelter with Midden	1809,2025
	<b>Contact</b>			<b>Recorders</b>	Val Attenbrow			<b>Permits</b>		
45-6-3034	Wellings Reserve #1 MAN 079	GDA	56	339584	6258630	Closed site	Valid	Shell : -		
	<b>Contact</b>			<b>Recorders</b>	Aboriginal Heritage Office			<b>Permits</b>		
45-6-2889	Wellings Reserve 2	GDA	56	339634	6258680	Open site	Valid	Shell : 1		
	<b>Contact</b>			<b>Recorders</b>	Aboriginal Heritage Office			<b>Permits</b>		
45-6-2343	Dobroyd Cave	AGD	56	340160	6257210	Closed site	Valid	Artefact : -	Shelter with Deposit	
	<b>Contact</b>			<b>Recorders</b>	Michael Guider			<b>Permits</b>		
45-6-3012	Clive Park 8, Shelter Midden WILL 170	GDA	56	336349	6257890	Closed site	Valid	Shell : -		
	<b>Contact</b>			<b>Recorders</b>	Aboriginal Heritage Office			<b>Permits</b>		
45-6-2094	C.C.Y.S. 10;	GDA	56	336402	6259776	Open site	Valid	Artefact : -, Shell : -	Midden,Open Camp Site	1809
	<b>Contact</b>			<b>Recorders</b>	Bobbie Oakley			<b>Permits</b>		
45-6-1527	Quakers Hat Bay;	GDA	56	336770	6256870	Closed site	Not a Site	Artefact : -	Not an Aboriginal Site	
	<b>Contact</b>			<b>Recorders</b>	Warren Bluff			<b>Permits</b>		

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## AHIMS Web Services (AWS)

### Extensive search - Site list report

Your Ref/PO Number : 22SYD2634

Client Service ID : 703407

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-2810	QHB Goanna	AGD	56	336840	6256810	Open site	Valid	Art (Pigment or Engraved) : 1		
	<a href="#">Contact</a> T Russell	<a href="#">Recorders</a>	Matthew Kelleher					<a href="#">Permits</a>		
45-6-2026	Sangrado Reserve 2;	AGD	56	336890	6258620	Open site	Valid	Artefact : -, Shell : -	Midden,Open Camp Site	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Michael Guider					<a href="#">Permits</a>		
45-6-1981	Pearl Bay 4;Beauty Point;	AGD	56	337210	6257420	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Margrit Koettig,Michael Guider					<a href="#">Permits</a>		
45-6-1027	Balgowlah;Fishmans Bay 1;Fisher Bay 1;	GDA	56	337904	6258475	Open site	Valid	Shell : -, Artefact : -	Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Val Attenbrow,Julie Stockton,Mr.R Taplin					<a href="#">Permits</a>		
45-6-1024	Balgowlah;South End Cave;	GDA	56	338094	6258570	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	2047
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.R Taplin					<a href="#">Permits</a>		
45-6-0676	Spit Bridge;Seaforth;	AGD	56	337996	6258145	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	ASRSYS					<a href="#">Permits</a>		
45-6-2207	Wy-Ar-gine Point Cave;Balmoral;Edwards Beach;	AGD	56	338210	6256330	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Margrit Koettig,Michael Guider					<a href="#">Permits</a>		
45-6-3035	Wellings Reserve #5 MAN 085	GDA	56	339484	6258670	Closed site	Valid	Shell : -		
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Aboriginal Heritage Office					<a href="#">Permits</a>		
45-6-3030	Jellicoe Street MAN 025	GDA	56	339889	6257855	Open site	Valid	Art (Pigment or Engraved) : 1		
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Aboriginal Heritage Office					<a href="#">Permits</a>		
45-6-2088	Yellow Stencil Cave;	AGD	56	339990	6257850	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	1809
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Michael Guider					<a href="#">Permits</a>		
45-6-1220	Manly View Cave;North Harbour;Dobroyd;	AGD	56	340000	6257800	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	ASRSYS					<a href="#">Permits</a>		
45-6-1434	Reef Beach;Balgowlah;	AGD	56	340100	6257700	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	ASRSYS					<a href="#">Permits</a>		
45-6-0291	C.C.Y.S.8 Castle Cove Magazine Reserve	GDA	56	336375	6259857	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	858
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Bobbie Oakley					<a href="#">Permits</a>		
45-6-0087	C.C.Y.S.9 Castle Cove Magazine Reserve	GDA	56	336392	6259788	Open site	Valid	Shell : -, Artefact : -	Midden,Open Camp Site	858
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Bobbie Oakley					<a href="#">Permits</a>		

Report generated by AHIMS Web Service on 27/07/2022 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 336345.0 - 340345.0, Northings : 6255931.0 - 6259931.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 119

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## AHIMS Web Services (AWS)

### Extensive search - Site list report

Your Ref/PO Number : 22SYD2634

Client Service ID : 703407

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-0660	Pickering Point Seaforth - same as 45-6-2887	AGD	56	336515	6259109	Open site	Valid	Shell : -, Artefact : -	Midden	101111
	<b>Contact</b>	<b>Recorders</b>	T Bartlett, Ms. Mary Dallas					<b>Permits</b>		
45-6-2227	Beauty Point 9;	AGD	56	336570	6257150	Open site	Valid	Shell : -, Artefact : -	Midden	
	<b>Contact</b>	<b>Recorders</b>	Margrit Koettig, Michael Guider					<b>Permits</b>		
45-6-2079	QHB Fish cave; Mosman;	AGD	56	336710	6256990	Closed site	Valid	Art (Pigment or Engraved) : -	Rock Engraving, Shelter with Art	1809, 2025
	<b>Contact</b>	<b>Recorders</b>	Michael Guider					<b>Permits</b>		
45-6-2225	Beauty Point 11; Beauty Point;	AGD	56	336710	6256990	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<b>Contact</b>	<b>Recorders</b>	Margrit Koettig, Michael Guider					<b>Permits</b>		
45-6-2231	Quakers Hat Boat Shed;	AGD	56	336854	6256543	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<b>Contact</b>	<b>Recorders</b>	Margrit Koettig					<b>Permits</b>		
45-6-0666	Frenchs Forest; Frenchs Forest Road;	GDA	56	337304	6259515	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<b>Contact</b>	<b>Recorders</b>	Unknown Author					<b>Permits</b>		
45-6-1028	Balgowlah; Fisher Bay 2;	AGD	56	337900	6258120	Open site	Valid	Shell : -, Artefact : -	Midden	
	<b>Contact</b>	<b>Recorders</b>	Julie Stockton, Mr. R. Taplin					<b>Permits</b>		
45-6-3363	BURNT BRIDGE CREEK PAD	GDA	56	338134	6259532	Open site	Valid	Potential Archaeological Deposit (PAD) : 1		
	<b>Contact</b>	<b>Recorders</b>	Mr. Andrew Costello, Jacobs Group (Australia) Pty Ltd - North Sydney					<b>Permits</b>		
45-6-0684	Mosman; Edward's Beach;	AGD	56	338100	6255900	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	<b>Contact</b>	<b>Recorders</b>	Margrit Koettig, W.D. Campbell					<b>Permits</b>		
45-6-0965	Balgowlah; 200 FT Cave;	GDA	56	338734	6259820	Closed site	Destroyed	Art (Pigment or Engraved) : -	Shelter with Art	
	<b>Contact</b>	<b>Recorders</b>	Mr. R. Taplin					<b>Permits</b>		
45-6-1149	Clontarf;	GDA	56	338804	6257980	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<b>Contact</b>	<b>Recorders</b>	Aboriginal Heritage Office					<b>Permits</b>		
45-6-1030	Gypsy Beach Cave	AGD	56	339100	6256800	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<b>Contact</b>	<b>Recorders</b>	ASRSYS					<b>Permits</b>		
45-6-3036	Burtons Bush #1 MAN 083	GDA	56	339454	6258940	Open site	Valid	Shell : -		
	<b>Contact</b>	<b>Recorders</b>	Aboriginal Heritage Office					<b>Permits</b>		
45-6-2091	Dobroyd Head;	AGD	56	339710	6257410	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1809
	<b>Contact</b>	<b>Recorders</b>	Michael Guider					<b>Permits</b>		

Report generated by AHIMS Web Service on 27/07/2022 for Kate Storan for the following area at Datum : GDA, Zone : 56, Eastings : 336345.0 - 340345.0, Northings : 6255931.0 - 6259931.0 with a Buffer of 0 meters. Number of Aboriginal sites and Aboriginal objects found is 119

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## AHIMS Web Services (AWS)

### Extensive search - Site list report

Your Ref/PO Number : 22SYD2634

Client Service ID : 703407

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-0703	North Harbour;Forty Baskets Beach 1;	GDA	56	339874	6258210	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -, Burial : -	Burial/s,Rock Engraving,Shelter with Art,Shelter with Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Unknown Author					<a href="#">Permits</a>		
45-6-2505	Southern End 40;Baskets Beach;	AGD	56	339890	6257960	Open site	Valid	Shell : -, Artefact : -	Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	D Burns,G Wellham					<a href="#">Permits</a>		
45-6-0706	Manly;Fairlight;	GDA	56	340104	6258690	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Unknown Author					<a href="#">Permits</a>		
45-6-1033	Manly;Flattened Lantana Cave;	AGD	56	340200	6257600	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	ASRSYS					<a href="#">Permits</a>		
45-6-0281	C.C.Y.S.7. Castle Cove Magazine Reserve	GDA	56	336356	6259920	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	858
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Bobbie Oakley					<a href="#">Permits</a>		
45-6-1987	Beauty Point 6;Beauty Point;	AGD	56	336780	6257410	Closed site	Valid	Art (Pigment or Engraved) : -, Shell : -, Artefact : -	Shelter with Art,Shelter with Midden	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Margrit Koettig,Michael Guider					<a href="#">Permits</a>		
45-6-2027	Sangrado Reserve 3;	AGD	56	336930	6258660	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Michael Guider					<a href="#">Permits</a>		
45-6-1587	Seaforth	GDA	56	337454	6259315	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Aboriginal Heritage Office					<a href="#">Permits</a>		
45-6-0736	Mosman;Edward's Beach;	AGD	56	338000	6256300	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Margrit Koettig,I.M Sim					<a href="#">Permits</a>		
45-6-0964	Balgowlah	GDA	56	338804	6259840	Open site	Destroyed	Art (Pigment or Engraved) : -	Rock Engraving	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.R Taplin					<a href="#">Permits</a>		
45-6-0260	Balgowlah;North Harbour Reserve;	GDA	56	339354	6258770	Open site	Valid	Shell : -, Artefact : -	Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Eugene Stockton					<a href="#">Permits</a>		
45-6-2082	Fairlight cave;	AGD	56	339650	6258730	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Michael Guider					<a href="#">Permits</a>		
45-6-1008	Balgowlah,	GDA	56	339864	6258841	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	ASRSYS					<a href="#">Permits</a>		
45-6-2081	Cathedral Rock/Honeycomb cave	AGD	56	339800	6258480	Closed site	Partially Destroyed	Shell : -, Artefact : -	Shelter with Midden	1809

Report generated by AHIMS Web Service on 27/07/2022 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 336345.0 - 340345.0, Northings : 6255931.0 - 6259931.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 119

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## AHIMS Web Services (AWS)

### Extensive search - Site list report

Your Ref/PO Number : 22SYD2634

Client Service ID : 703407

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	<b>Contact</b>	<b>Recorders</b>	Michael Guider, Mr. Phil Hunt, Aboriginal Heritage Office					<b>Permits</b>	3140,3372	
45-6-2748	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	<b>Contact</b>	<b>Recorders</b>	Mr. Dean Kelly					<b>Permits</b>		
45-6-0261	Reef Beach 1	GDA	56	340223	6257831	Open site	Valid	Shell : -, Artefact : -, Burial : -	Burial/s, Midden	723,98264,98975
	<b>Contact</b>	<b>Recorders</b>	Val Attenbrow, Mary Dallas Consulting Archaeologists (MDCA), M.J. Walker, Eugene S					<b>Permits</b>	1924	
45-6-1019	Balgowlah; Fallen Wattle Cave;	GDA	56	336351	6259791	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<b>Contact</b>	<b>Recorders</b>	ASRSYS					<b>Permits</b>		
45-6-0467	C.C.Y.S.12 Castle Cove Magazine Reserve	GDA	56	336367	6259665	Open site	Valid	Shell : -, Artefact : -	Midden	858
	<b>Contact</b>	<b>Recorders</b>	Bobbie Oakley					<b>Permits</b>		
45-6-2285	Pickering Pt. 2 Seaforth.	GDA	56	336550	6259010	Open site	Valid	Shell : -, Artefact : -	Midden	
	<b>Contact</b>	<b>Recorders</b>	Michael Guider					<b>Permits</b>		
45-6-1988	Beauty Point 7;	AGD	56	336636	6257178	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<b>Contact</b>	<b>Recorders</b>	Margrit Koettig, Michael Guider					<b>Permits</b>		
45-6-1088	The Spit; Pearl Bay;	AGD	56	336646	6257092	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	<b>Contact</b>	<b>Recorders</b>	Margrit Koettig, N. Crest					<b>Permits</b>		
45-6-1528	Slippery Jack Cave; Mosman;	GDA	56	336770	6256890	Closed site	Valid	Art (Pigment or Engraved) : -, Shell : -, Artefact : -	Shelter with Art, Shelter with Midden	2025
	<b>Contact</b>	<b>Recorders</b>	Warren Bluff					<b>Permits</b>		
45-6-1986	Beauty Point 5;	AGD	56	336790	6257490	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<b>Contact</b>	<b>Recorders</b>	Margrit Koettig, Michael Guider					<b>Permits</b>		
45-6-1989	Beauty Point 4;	AGD	56	336880	6257510	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<b>Contact</b>	<b>Recorders</b>	Margrit Koettig, Michael Guider					<b>Permits</b>		
45-6-0663	Mosman; Quaker's Hat Bay;	AGD	56	337019	6256663	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	<b>Contact</b>	<b>Recorders</b>	N.L. Moore					<b>Permits</b>		
45-6-1982	Pearl Bay 5;	AGD	56	337190	6257480	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<b>Contact</b>	<b>Recorders</b>	Michael Guider					<b>Permits</b>		
45-6-1437	Beauty Point; Beauty Point Public School;	AGD	56	337286	6257034	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	<b>Contact</b>	<b>Recorders</b>	Val Attenbrow, Margrit Koettig					<b>Permits</b>		
45-6-1979	Pearl Bay 2; Beauty Point;	AGD	56	337410	6257350	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<b>Contact</b>	<b>Recorders</b>	Michael Guider					<b>Permits</b>		

Report generated by AHIMS Web Service on 27/07/2022 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 336345.0 - 340345.0, Northings : 6255931.0 - 6259931.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 119

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## AHIMS Web Services (AWS)

### Extensive search - Site list report

Your Ref/PO Number : 22SYD2634

Client Service ID : 703407

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-2372	Remnants in shelter;	AGD	56	337920	6258240	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2047
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Val Attenbrow					<a href="#">Permits</a>		
45-6-1052	Water Spout Cave	AGD	56	338000	6256700	Closed site	Valid	Art (Pigment or Engraved) : -	Rock Engraving, Shelter with Art	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.R Taplin					<a href="#">Permits</a>		
45-6-3167	MANLY WEST PUBLIC 1. MAN120	GDA	56	339645	6259523	Open site	Valid	Grinding Groove : -		
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Phil Hunt					<a href="#">Permits</a>		
45-6-3038	Esplanade Park West MAN 108	GDA	56	339844	6258835	Open site	Valid	Shell : -		
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Aboriginal Heritage Office					<a href="#">Permits</a>		
45-6-1150	Dobroyd Point;	AGD	56	340028	6257087	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	ASRSYS					<a href="#">Permits</a>		
45-6-2083	Reef Beach Cave;	AGD	56	340110	6257710	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Michael Guider					<a href="#">Permits</a>		
45-6-0469	C.C.Y.S.11 Castle Cove Magazine	GDA	56	336405	6259733	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	858
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Bobbie Oakley					<a href="#">Permits</a>		
45-6-2224	LGB Park;Mosman;Quakers Hat Bay;	AGD	56	336402	6256594	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Michael Guider					<a href="#">Permits</a>		
45-6-0664	Mosman;Beauty Point;	AGD	56	336784	6256825	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	R.H Mathews,Michael Guider					<a href="#">Permits</a>		
45-6-2905	Boronia Lane Pad	GDA	56	336850	6259525	Open site	Valid	Potential Archaeological Deposit (PAD) : -		
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Paul Irish,Ms.Mary Dallas					<a href="#">Permits</a>		
45-6-2070	Chinaman's Beach Cave;The Spit;	AGD	56	337570	6256880	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1809,2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Margrit Koettig,Michael Guider					<a href="#">Permits</a>		
45-6-1026	Balgowlah;Beds and Bottles Cave;	GDA	56	338074	6258530	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Aboriginal Heritage Office					<a href="#">Permits</a>		
45-6-0685	Edwards Beach	AGD	56	338217	6256337	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025,2988
	<a href="#">Contact</a>	<a href="#">Recorders</a>	W.D Campbell					<a href="#">Permits</a>		
45-6-2602	Ogilvy Road grinding grooves	AGD	56	338800	6257200	Open site	Valid	Grinding Groove : -	Axe Grinding Groove	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.Phil Hunt					<a href="#">Permits</a>		

Report generated by AHIMS Web Service on 27/07/2022 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 336345.0 - 340345.0, Northings : 6255931.0 - 6259931.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 119

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## AHIMS Web Services (AWS)

### Extensive search - Site list report

Your Ref/PO Number : 22SYD2634

Client Service ID : 703407

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-0693	Balgowlah;	AGD	56	339258	6259084	Open site	Destroyed	Art (Pigment or Engraved) : -	Rock Engraving	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Unknown Author							
45-6-0282	Balgowlah;Forty Basket Beach	AGD	56	339750	6258070	Open site	Valid	Shell : -, Artefact : -	Midden	2047
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Val Attenbrow,A Conway							
45-6-0705	Fourty Baskets Beach	AGD	56	339800	6257950	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Ms.Lisa Campbell							
45-6-2727	Will-155 - Explosives Reserve 4	GDA	56	336390	6259720	Closed site	Valid	Shell : 1		
	<a href="#">Contact</a>	<a href="#">Recorders</a>	David Watts							
45-6-1529	Quakers Hat Bay;Mosman;	GDA	56	336760	6256980	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Warren Bluff							
45-6-1234	Bluff Head;Foot Cave;	GDA	56	336754	6258380	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Michael Guider							
45-6-2286	Bligh Cres;Seaforth;	AGD	56	336710	6258910	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Michael Guider							
45-6-2809	QHB Trident	AGD	56	336841	6256770	Open site	Valid	Art (Pigment or Engraved) : -		
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Matthew Kelleher							
45-6-0761	Mosman;Quakers Hat Bay;	AGD	56	336899	6256748	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Michael Guider							
45-6-1022	Balgowlah;Spit Bridge Cave;	GDA	56	337644	6258450	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Aboriginal Heritage Office							
45-6-2351	Fisher Bay 6;	AGD	56	337900	6258430	Open site	Valid	Artefact : -	Open Camp Site	2333
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Ms.Tessa Corkill							
45-6-2120	Rocky Point Midden;	AGD	56	338130	6255850	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Margrit Koettig,Michael Guider							
45-6-0414	Grotto Point;Mosman;	AGD	56	339200	6256950	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	1293
	<a href="#">Contact</a>	<a href="#">Recorders</a>	D Beasley,W.D Campbell							
45-6-3037	Burtons Bush #2 MAN 084	GDA	56	339404	6258940	Open site	Valid	Shell : -		
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Aboriginal Heritage Office							
45-6-1006	Manly;Balgowlah;	GDA	56	339519	6258690	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<a href="#">Contact</a>	<a href="#">Recorders</a>	Mr.R Taplin							

Report generated by AHIMS Web Service on 27/07/2022 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 336345.0 - 340345.0, Northings : 6255931.0 - 6259931.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 119

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## AHIMS Web Services (AWS)

### Extensive search - Site list report

Your Ref/PO Number : 22SYD2634

Client Service ID : 703407

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-2888	Wellings Reserve 4	GDA	56	339564	6258710	Open site	Valid	Shell : 1		
	<b>Contact</b>							<b>Permits</b>		
45-6-0887	Mosman;Dobroyd Recreation Reserve Lookout;	AGD	56	339600	6257600	Open site	Valid	Grinding Groove : -, Art (Pigment or Engraved) : -	Axe Grinding Groove,Rock Engraving	
	<b>Contact</b>							<b>Permits</b>		
45-6-1495	Lookout Site	AGD	56	339700	6257550	Closed site	Valid	Artefact : -	Shelter with Deposit	596,940
	<b>Contact</b>							<b>Permits</b>		
45-6-1034	North Harbour;	GDA	56	339994	6258150	Open site	Valid	Shell : -, Artefact : -	Midden	
	<b>Contact</b>							<b>Permits</b>		
45-6-1032	Manly;	AGD	56	340112	6257455	Open site	Valid	Artefact : -, Shell : -	Midden	
	<b>Contact</b>							<b>Permits</b>		
45-6-2038	Reef Beach 3;	AGD	56	340200	6257590	Open site	Valid	Artefact : -, Shell : -	Midden,Open Camp Site	
	<b>Contact</b>							<b>Permits</b>		
45-6-2229	Burton St. 1;Beauty Point;	AGD	56	336600	6256590	Closed site	Valid	Art (Pigment or Engraved) : -	Shelter with Art	2025
	<b>Contact</b>							<b>Permits</b>		
45-6-1808	Seaforth;	GDA	56	336724	6258425	Open site	Valid	Shell : -, Artefact : -, Burial : -	Burial/s,Midden	
	<b>Contact</b>							<b>Permits</b>		
45-6-2228	Beauty Point 8;Beauty Point;	AGD	56	336739	6257398	Open site	Valid	Shell : -, Artefact : -	Midden	2025
	<b>Contact</b>							<b>Permits</b>		
45-6-1985	Beauty Point 3;	AGD	56	337110	6257510	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<b>Contact</b>							<b>Permits</b>		
45-6-1983	Beauty Point 1;	AGD	56	337150	6257450	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<b>Contact</b>							<b>Permits</b>		
45-6-2817	Beauty Point 14	AGD	56	337211	6257436	Open site	Valid	Earth Mound : 1		
	<b>Contact</b> S Scanlon							<b>Permits</b>		
45-6-2037	Pearl Bay;Beauty Point 9;	AGD	56	337250	6257350	Open site	Valid	Artefact : -	Open Camp Site	2025
	<b>Contact</b>							<b>Permits</b>		
45-6-1980	Pearl Bay 3;Beauty Point;	AGD	56	337250	6257380	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<b>Contact</b>							<b>Permits</b>		
45-6-1051	Mosman;Dwarf Bamboo and Beans Cave;	AGD	56	337900	6256700	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	2025
	<b>Contact</b>							<b>Permits</b>		

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## AHIMS Web Services (AWS)

### Extensive search - Site list report

Your Ref/PO Number : 22SYD2634

Client Service ID : 703407

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-1025	Balgowlah; Nearly Joined Cave;	GDA	56	338089	6258555	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<b>Contact</b>	<b>Recorders</b>	Aboriginal Heritage Office					<b>Permits</b>		
45-6-1029	Mosman;	AGD	56	338653	6257244	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	
	<b>Contact</b>	<b>Recorders</b>	ASRSYS					<b>Permits</b>		
45-6-2815	Double Fish	AGD	56	339452	6255785	Open site	Valid	Art (Pigment or Engraved) : 1		
	<b>Contact</b> T Russell	<b>Recorders</b>	Matthew Kelleher					<b>Permits</b>		
45-6-1494	Lookout Site 2	AGD	56	339600	6257450	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	596,940
	<b>Contact</b>	<b>Recorders</b>	ASRSYS					<b>Permits</b>		

#### \*\* Site Status

**Valid** - The site has been recorded and accepted onto the system as valid

**Destroyed** - The site has been completely impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There is nothing left of the site on the ground but proponents should proceed with caution.

**Partially Destroyed** - The site has been only partially impacted or harmed usually as consequence of permit activity but sometimes also after natural events. There might be parts or sections of the original site still present on the ground

**Not a site** - The site has been originally entered and accepted onto AHIMS as a valid site but after further investigations it was decided it is NOT an aboriginal site. Impact of this type of site does not require permit but Heritage NSW should be notified

Report generated by AHIMS Web Service on 27/07/2022 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 336345.0 - 340345.0, Northings : 6255931.0 - 6259931.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 119

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A decorative graphic on the left side of the page consisting of white contour lines on a grey background, resembling a topographic map. The lines are irregular and wavy, with some forming closed loops.

# APPENDIX C

# Geotechnical Investigation

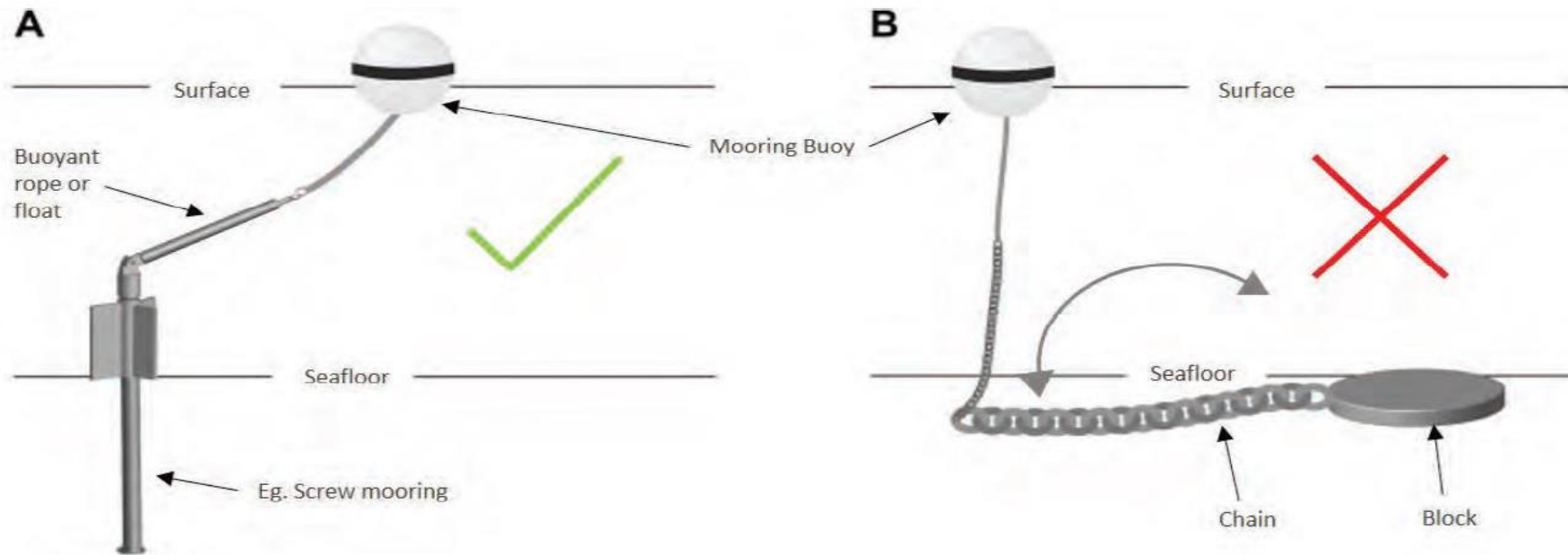
JK Geotechnics, 2022

A light gray background with a white topographic map pattern on the left side. The pattern consists of concentric, irregular lines that resemble contour lines on a map, with some circular shapes in the upper left and more complex, wavy lines extending downwards and to the right.

APPENDIX D

# Mooring Systems Schematic Representation

Commonwealth of Australia, 2018





A light gray background with white contour lines on the left side, resembling a topographic map. The lines are concentric and wavy, with some circular shapes in the upper left and lower left.

APPENDIX E

# Tidal Pool Inspection Record template

Northern Beaches Council, 2021

 <b>northern beaches council</b>	<h1>Tidal Pool Inspection Record</h1>	Revision 1 Date: 01/09/21 Senior Engineer – Asset Projects
---	---	---

<b>Tidal Pool</b>			
<b>Date and Time of Inspection</b>			
<b>Inspected By</b>			
<b>Inspection Type</b>	<input type="checkbox"/> Monthly <input type="checkbox"/> Storm Event <input type="checkbox"/> Exception/Other		
<b>Tide / User Count</b>	<input type="checkbox"/> High <input type="checkbox"/> Mid <input type="checkbox"/> Low	No. Pool Users in Area	
<b>Visual Area Inspection</b>	<input type="checkbox"/> Pass	<input type="checkbox"/> Issue Found	Comment
<b>Advisory Signs</b>	<input type="checkbox"/> Pass	<input type="checkbox"/> Issue Found	Comment
<b>Resus. Sign</b>	<input type="checkbox"/> Pass	<input type="checkbox"/> Issue Found	Comment
<b>Rescue Tube</b>	<input type="checkbox"/> Pass	<input type="checkbox"/> Issue Found	Comment
<b>Net Secure</b>	<input type="checkbox"/> Pass	<input type="checkbox"/> Issue Found	Comment
<b>Ladders clean and free of oysters</b>	<input type="checkbox"/> Pass	<input type="checkbox"/> Issue Found	Comment
<b>Rubbish inside pool area</b>	<input type="checkbox"/> Pass	<input type="checkbox"/> Issue Found	Comment
<b>Handrails secure</b>	<input type="checkbox"/> Pass	<input type="checkbox"/> Issue Found	Comment

 northern beaches council	<h1>Tidal Pool Inspection Record</h1>	Revision 1 Date: 01/09/21 Senior Engineer – Asset Projects
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<b>Jetty decking, steps and walkways</b>	<input type="checkbox"/> Pass	<input type="checkbox"/> Issue Found	Comment
<b>Other - specify</b>	Comments		

<p><b>Pool Inspection Schedule – Monthly all pools and/or after significant Storm Event</b></p> <p>LTP0001 – Clontarf Tidal Pool – Sandy Bay Road, Clontarf</p> <p>LTP0002 – Forty Baskets Beach Tidal Pool – access via Gourlay Avenue or Beattie Street, Balgowlah Hts</p> <p>LTP0003 – Little Manly Tidal Pool – Stuart Street, Manly</p> <p>LTP0006 – Manly Cove Tidal Pool – West Esplanade, Manly Council</p> <p>LTP0007 – Taylors Point Tidal Pool– 170 Hudson Parade, Clareville</p> <p>LTP0008 – Paradise Beach Tidal Pool – 40C Paradise Avenue, Avalon Beach</p>
<p><b>General Instructions:</b> Conduct land inspection for hazards over general area. Swim pool perimeter and look for hazards. Record information on page 1.</p>
<p><b>User Count:</b> Count how many pool users in pool area, not just swimmers. Include those sitting on sand supervising wading children and enjoying the facility (fishermen).</p>
<p><b>Visual Area Inspection:</b> Check sand area for hazards, broken glass, beach wrack, check generally for hazards to the public</p>
<p><b>Advisory Signs:</b> Check main tidal pool warning and hazard signs are present and visible</p>
<p><b>Resus. Sign:</b> Check resuscitation sign is at location and clearly visible</p>
<p><b>Rescue Tube:</b> Check rescue tube is inside red box and is serviceable</p>
<p><b>Net Secure:</b> Swim perimeter of pool and check net is secure with no holes or large gaps. Photograph any issues. Check for excessive cunjevoi growth on the net that requires removal. Check pile growth of oysters and whether net integrity is threatened by excessive oyster growth. Remove excessive sticks/ logs out of the net.</p>
<p><b>Ladders clean and free of oyster:</b> Whilst in water check all stainless steel ladders are free of oysters. This is important. If not clean oyster off ladder and make safe.</p>
<p><b>Rubbish Inside Pool Area:</b> Check for rubbish on seabed and on sand in pool area. Collect and remove to bin.</p>
<p><b>Handrails secure:</b> Check handrails on jetty (if attached) to ensure they are sound</p>

 <p>northern beaches council</p>	<h1>Tidal Pool Inspection Record</h1>	<p>Revision 1 Date: 01/09/21 Senior Engineer – Asset Projects</p>
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<p><b>Jetty Decking, steps and walkways:</b> Check structure is sound. Check for trip hazards. Check bolts and screws are not sticking up or out. Check steps are not slimed and slippery. Clean steps if necessary.</p>
<p><b>Other:</b> Provide details of any other hazard/ issue you find.</p>
<p><b>Recording:</b> Provide some representative photos of each pool (5 max). If nothing wrong with pool, one photo is sufficient. Provide clear photos of issues identified. Extra photos can be taken if required to clearly highlight an issue. Fill out recording form and attach photos to template. Save in TRIM. Ensure TRIM wording is similar to (Month Year) - Inspection Record – XXXXX Tidal Pool – Date</p> <p><b>Example:</b> September 2021 – Inspection Record – Taylors Point Tidal Pool 010921</p> <p>This format allows you to find a month inspection easily by scanning down searches and also allows searches to capture the tidal pool document by typing the string “Taylors Point Tidal Pool”</p>

<p><b>PHOTOGRAPHIC INSPECTION RECORD</b></p> <p>(insert photos)</p>        
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# **Environmental Approval Checklist & Review of Environmental Factors**

(EP&A Act - Part 5, Div 5.1)

**Notes:**

1. This document includes a **MANDATORY** checklist for **ALL** Capex projects.
2. This document includes an REF template (should this be required – as identified in the checklist).
3. Ensure that all licenses and approvals are received prior to the undertaking of any works.
4. Ensure all mandatory sections are completed prior to signature.
5. Make sure to provide necessary supporting evidence where applicable.

<b>SECTION 1 - Details</b>	<b>(MANDATORY)</b>
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PROPOSAL TITLE: Clontarf Tidal Pool Upgrade

PROJECT OFFICER: Lee Steadman

BUSINESS UNIT PROPOSING ACTIVITY: Capital Projects

<b>SECTION 2 - Applicability</b>	<b>(MANDATORY)</b>
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Is the proposed work a routine activity?

*Where a routine activity is - simple, small-scale activities associated with regular (daily, weekly, monthly, etc.) and general upkeep or maintenance of a building, plant, or structure against normal wear and tear.*

~~YES~~ / **NO**

If **Yes**, activity can be undertaken without assessment but must be in line with relevant standards and assessment recorded in the appropriate location.

If **No** proceed to Section 3.

**Note 1:** must ensure “minimal” environmental impact by use of one of the following:

- *Standard operating procedure;*
- *relevant Australian Standards;*
- *the Building Code of Australia;*
- *any relevant NSW Roads and Traffic Authority design guidelines;*
- *Ausspec;*
- *Northern Beaches Councils standard operating procedure;*
- *Northern Beaches Councils Pesticide notification plan;*
- *All product labels and warnings;*
- *Works that have previously been approved .*

**Note 2:** *If any Aboriginal cultural material or heritage constraints are found on any job site, all work should cease and the Office of Environment and Heritage and the Metropolitan Local Aboriginal Land Council notified immediately in accordance with the National Parks and Wildlife Act. An assessment can be undertaken by the Aboriginal Heritage Officer via Aboriginal Heritage Office.*

**DESCRIPTION OF ACTIVITY:**

Northern Beaches Council is proposing an upgrade to the existing Clontarf Tidal Pool, located on the foreshore of Clontarf Reserve at Sandy Bay Road, Clontarf NSW 2093

**TRIM FOLDER:**

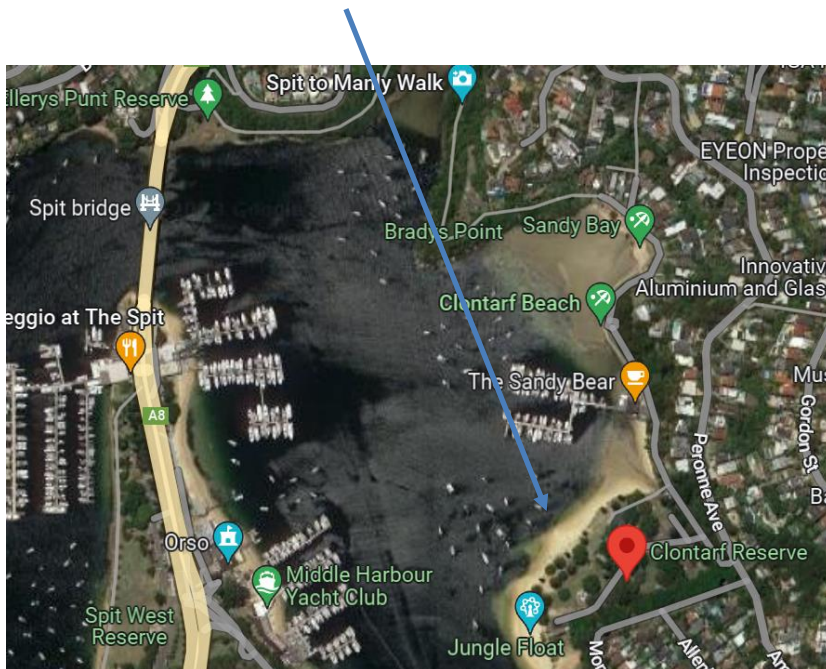
C002995

**REASON FOR ACTIVITY:**

Northern Beaches Council is proposing to remove and upgrade Clontarf Tidal Pool, located at Clontarf Reserve, in the waters of Middle Harbour. The works involve the demolition of the existing structure and complete replacement with an expanded pool structure using visually similar materials. The pool will be extended by 3 m into the Harbour to provide for swimming in deeper waters and at lower tides and will reduce the requirement for costly dredging operations. The upgrade will also extend its length to 64 m, providing increased protected wading area and shoreline access

**LOCATION:**

The proposed location of Clontarf Tidal Pool at Clontarf Reserve:



**LAND OWNER:** Transport for NSW (TfNSW) is the registered proprietor of the study area.

**TIMING AND DURATION OF WORKS:**

Works are planned to commence early March 2023 with an estimated completion of end June 2023. The proposed works will be undertaken during standard working hours according to NSW Environmental Protection Authority as follows:

- 7:00 am – 5:00 pm Monday to Friday
- No work on Saturdays, Sundays or Public Holidays

**APPROXIMATE COST:**

\$600,000 ex GST

**SECTION 3 continued (MANDATORY)**
*All Tables below **MUST** be completed*

**Table 1** will determine if the activity is Exempt Development. If the activity is Exempt Development then no further assessment is required (other than sections 1-4).

<b>Table 1</b>			<b>Yes</b>	<b>No</b>
Q1	Is the activity listed as <b>Exempt Development?</b> (within SEPP Transport & Infrastructure 2021) If YES provide details below. For assistance please refer to a Principal Planner from the Development Assessment business unit.	<i>If YES, provide detail below and complete items 2 to 6 to determine if environmental assessment required</i> <i>If NO Continue to Table 2</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
<b>WHY IS ACTIVITY EXEMPT:</b> Not applicable				
<b>WILL THE ACTIVITY:</b>				
Q2	Involve the removal or damage to any remnant native vegetation or any construction works within Tree Protection Zones (under the drip line). <b>Note.</b> this excludes issues where there is a significant public risk posed from the vegetation. For assistance please see Natural Environment Officer in Bushland and Biodiversity team.	<i>If YES to any of these items, activity is not exempt continue to Table 2- Q7.</i>  <i>If all items are NO, complete Approvals and Licences and Certifications</i>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Q3	Involve construction within 40 metres of a waterway that will impact geomorphology, groundwater, water quality or appearance of the foreshore or waterway. <b>Note.</b> This excludes the removal of built up sediment and maintenance works within drainage channels to restore the channel. For assistance please talk to the Senior Environment Officer – Catchments in Environment & Sustainability.		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Q4	Have a negative impact on amenity in the area either during or post works.		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Q5	Be immediately adjacent to or within a Threatened Ecological Community. (Check SEA or for assistance please talk to the Natural Environment Officer in Bushland and Biodiversity team)		<input type="checkbox"/>	<input checked="" type="checkbox"/>
Q6	Disturb more than 40m <sup>2</sup> excluding man-made surfaces (eg/ road, sportsfield turf) and linear work such as trenching or kerb & gutter.		<input type="checkbox"/>	<input checked="" type="checkbox"/>

..continue to next page for exempt development

### ***Certification Exempt***

I certify that the proposed activity is exempt and will be undertaken in accordance with any relevant environmental controls, standards, procedures, etc. and that any other agency requirements will be met.

Executive Manager	Business Unit	Signature	Date
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**Table 2** will determine if the activity is Permissible Without Consent. If the activity is Permissible Without Consent then no Development Application is required.

Table 2			
	Assessment	Description and References	Tick box
Q7	Permitted Without Consent	The activity is "Permitted Without Consent". Assessment is via Part 5 of the EP&A Act 1979 and <b>Form 1 – Impact Assessment</b> is to be completed, and/or an REF prepared. List the relevant Clause from SEPP Infrastructure or the LEP that determined this outcome below. For assistance please refer to a Principal Planner from the Development Assessment business unit.	<input checked="" type="checkbox"/>
<b>Why is Activity Permitted Without Consent:</b> <i>The proposed works are considered to fall within the scope of development permitted without consent under SEPP Transport and Infrastructure (2021) Division 25 Waterway or foreshore management activities. The proposed works fall within the scope of work permitted under Clause 2.165 (Development permitted without consent) which allows public authorities to undertake waterway and foreshore management activities, (including environmental management works) without consent on any land. In accordance with Part 5 of the EP&amp;A Act, the REF report addresses the requirements of Section 171 of the Environmental Planning and Assessment Regulation 2021 (EP&amp;A Regulation) for an environmental assessment of the proposed work.</i>			
Q8	Permitted With Consent	The activity is Permitted With Consent – a Development Application to be prepared and lodged with Council under Part 4 of the EP&A Act.	<input type="checkbox"/>

### **SECTION 4 – Approvals from other Agencies**

**(MANDATORY)**

**Table 3** will identify what approvals, licenses and permits from other Agencies are required to undertake the proposed works. These approvals, permits and licenses **MUST** be obtained prior to the commencement of works. In some instances the agencies may request an Environmental and/or Species Impact Statement prior to granting approval.

Table 3			
Is the activity:	Approval required		If Yes
	YES	NO	
Working within or impacting on Threatened Species/Populations and/or Threatened Ecological Communities and/or causing any possible damage to those threatened species or communities. For assistance check SEA or for	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Must complete an REF and depending on the assessment the proposed works may require a license from Office of Environment & Heritage (OEH).



assistance please talk to the Natural Environment Officer in Environment & Sustainability			
Working near Aquatic Reserves, Aquatic Habitat or damaging any marine vegetation such as sea grass, mangroves, etc. For assistance please talk to the Senior Environment Officer in Environment & Sustainability	<input checked="" type="checkbox"/>	<input type="checkbox"/>	A Permit from the Department of Primary Industries is required. Fisheries Permit PN22/523 Clontarf Tidal Pool Replacement received from Fisheries 01/02/23.
Dredging of water or banks of creeks	<input type="checkbox"/>	<input checked="" type="checkbox"/>	A Permit from the Department of Primary Industries is required
Working within the 'place' of a Heritage Item identified under the NSW Heritage Act	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Refer to Councils Heritage Officer
Working near known aboriginal relics, places, or potential Aboriginal relics or places – Check with the Aboriginal Heritage Office. see APPENDIX 2 Aboriginal heritage potential desktop assessment checklist	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Must notify the Office of Environment and Heritage prior to commencing works
Working on vacant Crown Lands not under Council Control and/or Council not Trustee - check with the property office.	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Permission must be sought from the Department of Primary Industries
Working on a Classified Roads – not under a current maintenance program	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Approval required from NSW Roads and Maritime Services
If polluting a waterway ie. dewatering, herbicide application, etc	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Licence from the Office of Environment and Heritage
Check Dial Before You Dig to identify any services that may be impacted	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Contact the relevant service authority
On the open coast or estuary. Assistance can be provided from the Coast & Catchments team in Environment & Climate.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Approval from the Office of Environment and Heritage may be required.
On land which is not owned or controlled by Council.	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Contact the landowner to obtain approval

### ***Certification Sections 1-4***

I certify that the above information in **Sections 1 to 4** is correct and I have endeavoured to clarify that all requirements have been met.

Lee Steadman

Capital Projects



01/02/23

**Project Officer**

**Business Unit**

**Signature**

**Date**

**SECTION 5 – Form 1-REF - Consideration of Impacts of the Activity (MANDATORY if Q7 in Table 2 is YES)**

**Notes:**

1. This Form 1 & Form 2 must be completed and evidence provided (you can refer to and attach additional documents to this assessment)
2. Assessment of all impacts must be provided; reason and justification for answers must be provided.
3. For all construction impacts of Minor or greater possible impacts, mitigation measures must be included and a final Impact determined. Additional information detailing justification and/or mitigation of the impact may need to be referenced, provided and attached to the assessment.
4. Possible impact is to be determined utilising the descriptions in the table below.
5. Construction impact - refer to all activities of undertaking the works, ongoing impacts, cumulative impacts, maintenance and permanent impacts.

<b>1 - Negligible</b>	<b>2 - Minor</b>	<b>3 - Moderate or Greater</b>
Does not create a nuisance	Creates a temporary nuisance	Creates a continuous or ongoing nuisance
Impacts contained within work site	Impact short term/localised, for life of project	Impact ongoing/long term or widespread impact
No detectable/noticeable change	Measurable change/may be offensive	Obvious change/offensive
Complies with industry guidelines	Exceeds industry guidelines (minor)	Exceeds industry guidelines (major)
Reasonable inconvenience/financial loss	Sustained/short term inconvenience/financial loss	Unacceptable inconvenience/financial loss
Change but similar to original land use	Slight or temporary change to land use	Transforms a locality permanently
No damage to heritage items or native flora or fauna	Heritage items or native flora and fauna able to be repaired/rehabilitated	Permanent damage/loss of a heritage item/flora or fauna from an area
No foreseen increase to risk from natural hazards	Slight increase to risk from natural hazards	Major increase to risk from natural hazards
Waste disposed/recycled of at licensed waste facility or reused immediately	Waste stockpiled with end use unknown, potential for temporary impact to air, soil, water	Long term contamination of air, soil or water due to waste disposal
No remediation required following work to prevent/remove pollution	Minor /short term site remediation required at completion of work to prevent/remove pollution	Extensive site remediation required over extended timeframe to prevent/remove pollution (e.g. soil or water contamination, severe soil erosion, large scale revegetation)

**FORM - 1 REF – To address Part 8, Clause 171(2) Factors from the EP&A Regulation 2021**

**FORM 1 - IMPACT ASSESSMENT**

	Description	Construction Impact			Mitigation Measures (detail measures)	Ongoing Impact		
A	<b>Any environmental impact on a community</b> <i>eg Social, economic and cultural impacts</i>							
	<div> <div>1</div> <div>2</div> <div>3</div> </div> <div> <div>•</div> </div>	1	2	3	1	2	3	
B	<b>Any transformation of a locality</b> <i>eg . Human and non-human environment</i>							
	<div> <div>1</div> <div>2</div> <div>3</div> </div> <div> <div>•</div> </div>	1	2	3	1	2	3	
C	<b>Any environmental impact on the ecosystems of the locality</b> <i>Flora, fauna, ecological integrity, biological diversity, connectivity/fragmentation, air, water including hydrology, soil</i>							
	<div> <div>1</div> <div>2</div> <div>3</div> </div> <div> <div>•</div> </div>	1	2	3	1	2	3	

D	<b>Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality</b> <i>eg Visual, recreational, scientific and other</i>								
<div>■</div>	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>	•	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>		
E	<b>Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations</b> <i>eg Aboriginal heritage (including intangible cultural significance), architectural heritage, social/community values and identity, scenic values and other</i>								
<div>■</div>	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>		1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>		
F	<b>Any impact on the habitat of protected animals (within the meaning of the Biodiversity Conservation Act 2016)</b> <i>eg Listed species and habitat requirements/ critical habitat</i>								
<div>■</div>	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>	•	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>		

G	<b>Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air</b> eg <i>Listed species, non-listed species and key threatening processes</i>								
	<div>■</div>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	•	<div></div>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
H	<b>Any long-term effects on the environment</b> eg <i>Ecological, social and economic</i>								
	<div>■</div>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	•	<div></div>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
I	<b>Any degradation of the quality of the environment</b> eg <i>Ecological, social and economic</i>								
	<div>■</div>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	•	<div></div>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

Refer to Review of  
Environmental Factors  
completed by EcoLogical



J	<b>Any risk to the safety of the environment</b> <i>eg Public health, contamination, bushfire, sea level rise, flood, storm surge, wind speeds, extreme heat, urban heat and climate change adaptation</i>								
	<div>■</div>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	•		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
K	<b>Any reduction in the range of beneficial uses of the environment</b> <i>eg Natural resources, community resources and existing uses</i>								
	<div>■</div>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	•		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
L	<b>Any pollution of the environment</b> <i>eg Air (including odours and greenhouse gases); water (including runoff patterns, flooding/tidal regimes, water quality health); soil (including contamination, erosion, instability risks); noise and vibration (including consideration of sensitive receptors); or light pollution</i>								
	<div>■</div>	1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	•		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

M	<b>Any environmental problems associated with the disposal of waste</b> <i>eg Transportation, disposal and contamination</i>								
		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	•		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
N	<b>Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply</b> <i>eg Land, soil, water, air, minerals and energy</i>								
		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	•		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>
O	<b>Any cumulative environmental effect with other existing or likely future activities</b> <i>eg Existing activities and future activities</i>								
		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>	•		1 <input type="checkbox"/>	2 <input type="checkbox"/>	3 <input type="checkbox"/>

P	<b>Any impact on coastal processes and coastal hazards, including those under projected climate change conditions</b> <i>eg Coastal processes and hazards (impacts arising from the proposed activity on coastal processes and hazards and impacts on the proposed activity from coastal processes and hazards), climate scenarios</i>								
■	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>	•	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>		
Q	<b>Any applicable local strategic planning statement, regional strategic plan or district strategic plan made under Division 3.1 of the Act</b> <i>eg Issues, objectives, policies and actions identified in local, district and regional plans</i>								
■	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>	•	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>		
R	<b>Any other relevant environmental factors</b> <i>eg Any other factors relevant in assessing impacts on the environment to the fullest extent</i>								
■	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>	•	1  <input type="checkbox"/>	2  <input type="checkbox"/>	3  <input type="checkbox"/>		

**FORM 2 Declarations**
**(MANDATORY)**

Declarations	YES	NO
Sustainability Principles have been applied to the assessment of Environmental, Social, and Economic factors of this project.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
This Impact Assessment provides a true and fair review of the proposal in relation to its likely affects on the environment. It addresses, as best as possible, the impacts affecting or likely to affect the environment as a result of the activity. It provides sufficient information to determine whether this is likely to be a significant impact on the environment as a consequence of the activity.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Alternate methods, activities or designs been investigated for alternate method of delivery for all activities other than Level 1 Impacts.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Community Consultation has been undertaken as per the Community Engagement Framework.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
The implementation of the recommended mitigation measures will minimise the identified impacts/risks.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
All material supporting the assessment has been detailed in the assessment of the item above with a copy attached to this assessment, this is detailed in Addendum 1.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
A risk assessment will be undertaken to ensure that Work Health and Safety requirements are met on the site at all times.	<input checked="" type="checkbox"/>	<input type="checkbox"/>
<b>This environmental review (and a formal REF if required) must be published on Council's website, before activity commences, if any of the following are true - Environmental Planning and Assessment Regulation 2021 (Part 8, clause 171 (4). Refer to legislation to check other requirements...</b> <a href="https://legislation.nsw.gov.au/view/pdf/asmade/sl-2021-759">https://legislation.nsw.gov.au/view/pdf/asmade/sl-2021-759</a>		
(a) the activity has a capital investment value of more than \$5 million, or	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(b) the activity requires an approval or permit as referred to in any of the following provisions before it may be carried out—		
(i) Fisheries Management Act 1994, sections 144, 201, 205 or 219,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(ii) Heritage Act 1977, section 57,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(iii) National Parks and Wildlife Act 1974, section 90,	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(iv) Protection of the Environment Operations Act 1997, sections 47–49 or 122, or	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(c) the determining authority considers that it is in the public interest to publish the review.	<input type="checkbox"/>	<input checked="" type="checkbox"/>

**SECTION 6 – Assessment Result****(MANDATORY)**

Based on the information in Section 5 (ie Forms 1 and 2), the assessment results in the following LEVEL of impact (tick one of the following):

- ☐ LEVEL 4: All items assessed as 1 Negligible Impact - **NO FURTHER ASSESSMENT REQUIRED - Proceed to Section 7**
- ☒ LEVEL 3: Some items assessed as 2 Minor Impact and others as 1 Negligible with proposed mitigation - **CURRENT ASSESSMENT ADEQUATE – Proceed to Section 7**
- ☐ LEVEL 2: Any item assessed as 3 Moderate or Greater Impact **and/or** any works occurring in Endangered Ecological Communities or impacting species as Scheduled in the Biodiversity Conservation Act – a formal **REVIEW OF ENVIRONMENTAL FACTORS REQUIRED** addressing these issues and attach to this assessment. - **Proceed to Section 7**
- ☐ LEVEL 1 – In the assessment numerous items are assessed as 3 Moderate or Greater Impact and deemed to have environmental **and/or** other impact determined as significant by any consent authority (including Council officers) as determined in Part 5 of the *Environmental Planning and Assessment Act 1979* (listed SECTION 4 – Approvals and Other Agencies) - **ENVIRONMENTAL and/or SPECIES IMPACT STATEMENT REQUIRED.** This requires a report to Council with concurrence of the relevant agency. No self-determination possible. For assistance please speak to a Principal Planner from the Development Assessment unit. - **Proceed to Section 7**

**SECTION 7 – Consultation****(MANDATORY)**

The level of consultation and engagement required is to be determined via the community engagement matrix (from Community Engagement Framework).  
<https://www.northernbeaches.nsw.gov.au/council/publications/policies/community-engagement-policy>

Consultation has been completed with the community through consultation on the Clontarf Beach Reserve Masterplan, and further detailed consultation has been completed on the Clontarf Beach Tidal Pool Upgrade.

Consultation with external agencies (DPI, TfNSW) has been undertaken as detailed in REF.

Internal consultation has been completed with Transport and Civil Infrastructure, Environment and Climate Change.



**SECTION 8 – Approval (If proposal permissible without consent)****(MANDATORY)****8.1 REVIEW OF ENVIRONMENTAL FACTORS**

Tick the option which accurately reflects the requirements of a Review of Environmental Factors for the proposal:

- ☐ A formal Review of Environmental factors is not required. This REF document is satisfactory considering the low impact nature of the proposal.
- ☒ A formal Review of Environmental factors is required and has been submitted and is attached.
- ☐ A formal Review of Environmental factors has been submitted, it is considered that the overall impact on the environment is significant. The proposal should not proceed until an Environmental and/or Species Impact Statement is prepared and approved.

Lee Steadman

Capital Projects



01/02/23

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**Project Officer****Business****Signature****Date**

## 8.2 DETERMINATION

For proposal that is “permitted without consent” the following Decision Statement is required.

*The determination is undertaken by an authorised person - an individual authorised by the determining authority to determine the proposal under Division 5.1 of the EP&A Act and Part 8, Division 1 of the EP&A Regulation. That authorised person will produce a decision statement.*

A. For proposal that is “permitted without consent” with Level 3 or 4 impact, under current delegations **any** Executive Manager in the **Transport & Assets** directorate may provide determination.

- the proposed activity is/is not likely to have a significant impact on the environment and therefore an EIS is / is not required
- the proposed activity will/will not be carried out in a declared area of outstanding biodiversity value and is/is not likely to significantly affect threatened species, populations or ecological communities, or their habitats or impact biodiversity values, meaning a SIS and/or BDAR is/is not required
- the proposed activity may/may not proceed and the reasons for the decision
- mitigation measures are/are not required to eliminate, minimise or manage environmental impacts, indicating where in the REF document the mitigation measures are set out, as well as any additional mitigation measures and/or conditions required and the reasons for these mitigation measures and conditions.
- A determining authority may also choose to note whether referral to the Commonwealth Department of Agriculture, Water and the Environment has been considered.

If a SIS and/or BDAR is prepared, and the determining authority is a Minister, the decision statement will identify any recommendations from the Environment Agency Head or the Primary Industries Head that have not been accepted.

The proposal has been assessed and can proceed, subject to the inclusion of the stated mitigation measures below (if any):

N/A

Executive Manager	Business Unit	Signature	Date
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- B. For a proposal that is “permitted without consent” with Level 2 (Section 6) proposals and that requires approval from a state agency (in this case The TFNSW construction licence and Fisheries permits), under current delegations endorsement from the **Executive Manager Development Assessment is required.**

**In this case, this completed form is to be forwarded to the Development Assessments team who will review and determine with conditions (as appropriate) by provision of a separate memo.**

Whilst this proposal falls within a Level 3 Impact – the REF has been reviewed by the planning team and their review is attached.

I have reviewed this document and Addendums and confirm that the proposal has been assessed and can proceed.

I confirm that I have delegation to approve an assessment of the environmental impact of an activity that requires approval from a state or federal agency.

Daniel Milliken	Development Assessments		28 February 2023
<b>Manager, Development Assessments</b>	<b>Business Unit</b>	<b>Signature</b>	<b>Date</b>

## **APPENDIX 1**

### **Biodiversity Conservation Act 2016 – Part 7 Division 1 Section 7.3**

7.3 Test for determining whether proposed development or activity likely to significantly affect threatened species or ecological communities, or their habitats

(1) The following is to be taken into account for the purposes of determining whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats:

- a) in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,
  - b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:
    - i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or
    - ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,
  - c) in relation to the habitat of a threatened species or ecological community:
    - i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and
    - ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and
    - iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,
  - d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),
  - e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.
- (2) The Minister may, by order published in the Gazette with the concurrence of the Minister for Planning, issue guidelines relating to the determination of whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. Any such guidelines may include consideration of the implementation of strategies under the Biodiversity Conservation Program.

## APPENDIX 2

### Aboriginal heritage desktop assessment checklist (direct reference from Aboriginal Heritage Office)

<b>1. Check Aboriginal heritage potential mapping and Aboriginal site data</b>			
<b>a) What level of potential is the subject area in</b>	<input type="checkbox"/>	Very High	
	<input type="checkbox"/>	High	
	<input type="checkbox"/>	Moderate	
	<input type="checkbox"/>	Low	
	<input checked="" type="checkbox"/>	Very Low	
<b>Comments:</b>			
<b>b) Are there registered Aboriginal site within or within the vicinity of the subject area?</b>	<input type="checkbox"/>	Immediate vicinity	
	<input type="checkbox"/>	Within 100-200m	
	<input checked="" type="checkbox"/>	Not recorded nearby	
<b>Comments:</b>			
<b>2. Check landscape features present in the subject area</b>			
<b>a) Are any of the following features present in the subject area?</b>	<input type="checkbox"/>	Watercourses (creek lines, drainage lines even if ephemeral)	
	<input checked="" type="checkbox"/>	Foreshore	
	<input type="checkbox"/>	Cliff lines or boulders (higher than 1m)	
	<input type="checkbox"/>	Overhangs or caves	
	<input type="checkbox"/>	Level sandstone outcrops (>2m <sup>2</sup> )	
	<input type="checkbox"/>	Deep sandy deposits	
<b>Comments:</b>			
<b>b) What is the land use history of the subject area?</b>	<input checked="" type="checkbox"/>	Heavily modified	
	<input type="checkbox"/>	Moderately modified	
	<input type="checkbox"/>	Limited modification	
	<input type="checkbox"/>	No known modification	
<b>Aboriginal heritage potential identified:</b>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input type="checkbox"/> unsure
<b>If yes/unsure, refer to AHO</b>	Date referred:		
<b>If no, works may proceed with caution</b>			



## **ADDENDUM 1**

Please list all attached information to support the Assessment:

- Clontarf Tidal Pool Upgrade Review of Environmental Factors, Eco Logical Australia
  - [2022/710113 - REF - Final - ELA - Eco Logical - Reconstruction - Clontarf Tidal Pool - V4 - 081122](#)
- Fisheries Permit PN22/523 for dredging, reclamation and to harm marine associated with the demolition and replacement of Clontarf Tidal Pool – Middle Harbour
  - [2023/068109 - Fisheries Permit PN22.523 - Northern Beaches Council - Clontarf Tidal Pool Replacement - Middle Harbour](#)
- Clontarf Tidal Pool Upgrade– Review of Environmental Factors – NBC Planning Review and Referral
  - [2022/736028 - REF Planning Referral Clontarf Pool reconstruction](#)