Censored version of the

Biodiversity Development Assessment Report

for a

Replacement Swimming Pool and Stairs

at

16 Addison Road, Manly

This is a censored version of the full BDAR report. Sensitive information relating to Little Penguin nests, habitat and population viability have been deleted at the request of OEH. This version has been made so that the non-sensitive information can be made available for public viewing.

GIS Environmental Consultants

45 Austin Ave, North Curl Curl 2099
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, www.ecology.net.au

Document Information

Prepared for:	Sarah Penelope Joyce
Prepared by:	Nicholas Skelton, B. Sc. (Hons), M. App. Sc. (Ecology and Vegetation Management) and Sophia Mueller Sewell, B. Sc. (Environmental Biology)
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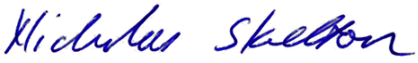

Nicholas Skelton, B.Sc. (Hons), M. App. Sc.
GIS Environmental Consultants

Approval Date: 19th March 2019

GIS Environmental Consultants

ABN: 66011504339
45 Austin Ave,
North Curl Curl, NSW 2099
Phone: (02) 9939 5129
Mobile: 0419 438 672
Email: ecology@ecology.net.au
Web: www.ecology.net.au

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Context

A. Background

This report describes the ecological values and constraints at the Development Site which is the south-east boundary of Lot 2, DP 325220 that is 16 Addison Road, Manly and the adjacent land in North Harbour Marine Reserve to the south-east. This report assesses the importance of the land to the conservation of Threatened flora and fauna species, ecological communities and the likely impacts of the proposed development on terrestrial biodiversity as required by Federal, State and Local Government legislation. This report does not assess most of 16 Addison Road because it will not be affected by the proposed development.

An accurate description of the flora and fauna and an assessment of the ecological impact of the proposed development is required when submitting development applications to allow assessment of the application in relation to the following legislation; the NSW Environmental Planning and Assessment Act 1979, the Biodiversity Conservation Act 2016. In addition, the information in this report is likely to be needed to assess this development with respect to other acts, SEPPs, local government plans (LEPs, DCPs) regulations, orders and policies.

B. Aims of this Report

The aims of this Biodiversity Development Assessment Report are to:

- Determine the site context including native vegetation in the locality and landscape features on the Development Site.
- Record the **findings of an ecological survey** (flora, fauna and ecological communities, and their habitats and vegetation integrity) of the area likely to be impacted by the proposal;
- Provide **ecological information** and **assessment** regarding the importance of the habitat on the site to the conservation of native flora and fauna.
- Determine the ecological constraints of the site and provide advice to the applicant on ways the impact can be **avoided** and **minimised** before finalising the proposal plans as required by the mitigation hierarchy of the Biodiversity Conservation Act regulation 2017;
- To **Assess** the likely **impact** of the proposal on the ecological values of the site in particular the significance of the impact to Threatened species, populations and ecological communities or their habitats in accordance with the requirements of the *Environment Planning and Assessment Act* (EP&A Act) Sections 4.15 (1) a, b and c, the *Biodiversity Conservation Act 2016* and determination of compliance with other relevant NSW legislation including; Acts, regulations SEPPs, LEP and DCPs;
- Determine if the proposal needs **referral** to the Federal government for assessment under the EPBC Act;
- Assess if potential Serious and Irreversible Impacts (SAII) may result from the proposal.
- Determine areas that require **offsetting** under the Biodiversity Conservation Act and calculate the number of offsetting **credits** required and the **cost**.
- Recommend ways the ecological **impacts** can be further **ameliorated** and prescribe appropriate ecological management actions during construction and for the life of the development.
- This report addresses Council legislation (LEP, DCP), the “heads of consideration” in section 4.15 (1) a, b, c of the EP&A Act, SEPPs, other NSW environmental Acts and the Federal EPBC Act 1999.

C. Legislation Addressed by the Report

- ***Environment Planning and Assessment Act 1979***
- ***Federal Environment Protection and Biodiversity Conservation Act, EPBC Act***
- ***Biodiversity Conservation Act 2016***

D. Definitions and Acronyms

5-Part Test of Significance (5-Part Test) - Assessment under Section 7.3 of the BC Act to determine whether a proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats. Mechanism use to enter the BOS and require BAM to be applied.

AOBV- An Area of Outstanding Biodiversity Significance defined in the Biodiversity Conservation Act 2016. Proposals that impact declared AOBVs are required to enter in the BOS.

APZ – Bushfire hazard fuel reduction Asset Protection Zone, defined in the document '*Planning for Bushfire Protection 2018*' by the NSW Rural Fire Service. Usually consisting of an Inner Protection Area (**IPA**) and an Outer Protection Area (**OPA**). Requires identification of the native vegetation to be impact that must be included in any BOS offsets. Could include lawn have rock or native vegetation and be regularly managed in a fuel reduced state in accordance with a compulsory Bushland Management Plan to meet the objectives if habitat retention. Fuel reduction is native vegetation and habitat is to be conducted by qualified bush regenerators.

BAM - Biodiversity Assessment Method is the ecological survey and assessment techniques that is required to be used for the **BOS** assessment (including BAM calculation for impact to native vegetation and Prescribed Impacts for additional offsets) and it is described in a document by Office of Environment and Heritage **OEH** (August 2017) and referred to by the **BC Act** regulation. The types of Biodiversity Assessment Reports (**BAR**) that the BAM method requires are a **BDAR**, **BSSAR** and a **BCAR**.

BC Act - NSW Biodiversity Conservation Act 2016 contains the lists of threatened species, the definitions of the threatened ecological communities, the 5-part Test of Significance, AOBV, Prescribed Impacts, SAII and the BOS. There are associated Biodiversity Conservation regulations which in turn refer to the BAM.

BOS – Biodiversity Offset Scheme the system of trading biodiversity offset credits or paying for offsets to the Biodiversity Trust.

DCP - Development Control Plan, a local planning guideline for each Local Government Area.

Development Site (Subject Land): an area of land that is subject to a proposed Development Application for works or an activity within the meaning under Part 4 and Part 5 of the EP&A Act. The term development also includes establishment or maintenance of a bushfire hazard reduction APZ area or environment management area. The Development Site includes the development footprint and any area that is part of the DA(s), including building envelopes and areas that will have lot boundaries adjusted.

Development Footprint: the area of land that is directly impacted on by a proposed development, including access roads, bushfire Asset Protection Zones and areas used to store construction materials. The term *development footprint* is also taken to include clearing footprint except where the reference is to a small area development or a major project development.

Biodiversity Credits: An estimated measurement of the value of threatened ecological communities, threatened species habitat to be impacted. Including Ecosystem credits and Species Credits. Biodiversity credits are used to measure the loss in biodiversity values at a development site and the gain in biodiversity values at a biodiversity stewardship site. Credits are calculated using the BAM calculator and assessment of Prescribed Impacts.

Direct Impacts - are impacts that directly affect habitat, ecosystems and individuals. They include but are not limited to, death, trampling, poisoning of the animal/plant itself and the removal of vegetation and suitable habitat. Direct impacts that do not impact native vegetation are categorised to as Prescribed Impacts. When applying each factor, consideration must be given to all of the likely direct impacts of the proposed activity or development during construction. As defined by the 2006 DECC Assessment of significance guidelines.

Indirect Impacts - occur when project-related activities affect species, populations or ecological communities in a manner other than direct loss. Indirect impacts can include loss of individuals through starvation, exposure, predation by domestic and/or feral animals, loss of breeding opportunities, loss of shade/shelter, deleterious hydrological changes, increased soil salinity, erosion, inhibition of nitrogen fixation, weed invasion, fertiliser drift, or increased human activity within or directly adjacent to sensitive habitat areas. Indirect impacts may occur after construction during the life of the development, e.g. escape of garden plants, excess nutrients and changes in fire frequency and grazing. Indirect impacts that do not impact native vegetation are categorised to as Prescribed Impacts As with direct impacts, consideration must be given, to all of the likely indirect impacts of the proposed activity or development (2006 DECC Assessment of Significance Guidelines)

EPA Act (EP&A Act) – NSW Environment Planning and Assessment Act 1979, legislation that controls development in NSW.

EPBC Act – Federal Environment Protection and Biodiversity Conservation Act 1999

IBRA region: a bioregion identified under the Interim Biogeographic Regionalisation for Australia (IBRA), which divides Australia into bioregions on the basis of their dominant landscape-scale attributes.

IBRA subregion: a subregion of a bioregion identified under the IBRA system.

LEP – Local Environment Plan, a local planning instrument for each LGA.

OEH – NSW Office of Environment and Heritage, formerly NPWS, DEC, DECC and DECCW. The department responsible for the conservation of native flora and fauna.

Prescribed Impacts- Impacts that do not impact native vegetation such as impacts to rocks, waterbodies, non-native vegetation ect. Prescribed Impacts may result in additional biodiversity credits.

Protected Fauna - refers to any native bird, mammal, reptile or frog in NSW.

SAII- Serious and Irreversible Impacts to Threatened species or communities that fit the Principles in the Guideline to Assist a Decision-Maker to Determine a Serious and Irreversible Impact (Aug 2017).

TBDC – Threatened Biodiversity Data Collection, OEH database within Bionet.

Threatened Species or Ecological Community - refers to those biotas listed in the schedules of the Biodiversity Conservation Act 2016 as “Critically Endangered “, "Endangered" or "Vulnerable".

E. Assumptions and Limitations

- This BDAR does not consider the impacts to the marine environment or marine species caused by any chemicals or paints used in the maintenance of the pool. Impacts to the marine environment and an assessment of the Fisheries Management Act 1994 is in the Marine Habitat Survey (Waterfront Surveys 25/02/19).
- This report only addresses the impacts of the proposal described in this report and shown in the maps in this report. If there are changes to the DA plans that alter the ecological impact of the proposal, then this report is likely to require recalculating and updating.
- This report describes the habitat and species in the Development Site at the time of the field survey. Vegetation and habitat will change over time, as does legislation. Therefore, the findings of this report are likely to be out of date in 12 months.
- There may be flora and/or fauna species present within the study area that may not have been recorded because they are seasonal, cryptic and/or have large home ranges. Some threatened species may only use the study area as habitat at some time. Assessment of habitat potential is used to address this uncertainty. The conclusions drawn in this report are a result of testing, observation and experience.
- This report assesses only the current proposal and does not consider the cumulative impact of other developments on this property or on adjacent land or the potential edge effects or impacts caused by the occupation of the land.
- This report should be read in its entirety and no part should be taken out of context.
- No responsibility is accepted for the use of any part of this report in any other context or for any other purpose or by third parties.
- This report makes recommendations for protection of bushland habitat, weed control, re-establishment of the bushland in part of the site, planting local native species and applying erosion and nutrient control measures. This report assumes these initial and on-going works will be carried out during and on-going for the life of the development.
- It is assumed that there will be no sediment, nutrients or weeds spreading into the adjacent bushland habitat.
- This report assumes that there will be no direct and indirect impact beyond the development footprint.

F. Qualifications and Experience of the Field Ecologist and Authors

Nicholas Skelton’s formal qualifications include a Bachelor of Science with Honours (B. Sc. (Hons) USyd) and a Masters in Applied Science (M. App. Sc. in Vegetation Management UNSW). Nick has been an environmental scientist for 25 years, including a university lecturer, research ecologist and a bush regenerator for 8 years. His work is focused on the Sydney bioregion and he has published many papers in independently reviewed journals on the ecology of NSW. He has expert knowledge of the local soils, the climate of this area and the local indigenous plants and animals as a result of over 900 ecological surveys. Nick is a member of the relevant professional organisations including a practising member of the Ecological Consultants Association of NSW and Royal Zoological Society. He is licensed by NSW OEH and NSW Department of Primary Industries to carry out surveys on threatened plants and animals and he is a qualified Biodiversity Assessor under the BC Act 2016. Nick was the principal ecologist on all field

surveys and was responsible for map making and report editing. Further details can be found at www.ecology.net.au.

Sophia Mueller Sewell has a Bachelor of Science (Environmental Biology UTS). Sophia has been working with GIS Environmental Consultants for over 2 years and has assisted with many ecological surveys and written over 50 reports. Sophia was responsible for project management, assisting with fauna survey, application of the BAM method, recording data for field surveys and report writing.

G. BOS Threshold Assessment

The Biodiversity Conservation Act Regulation (Aug 2017) requires that the Biodiversity Offset Scheme (BOS) threshold test (section 7.1 to 7.3) be applied to all development applications, to determine if the requirement to enter the BOS is triggered. If triggered then the Biodiversity Assessment Method (BAM) needs to be applied and a Biodiversity Development Assessment Report (BDAR) is required to accompany the application.

The Biodiversity Offsets Scheme applies to local developments, major projects or the clearing of native vegetation where the *State* Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 applies.

This proposal as described in this report is considered to meet the BC Act threshold as;

- The proposal will impact an area mapped a containing “Biodiversity Value” of the BC Act 2016 Biodiversity Values Map.

Therefore, the proposal requires a BAM assessment, a BDAR report and BOS offsetting including an assessment of the BAM calculator, Prescribed Impacts and SAIIs.

H. BAM Assessment Type

There are two types of BAM assessment that can be used for Part 4 assessments (local developments or DA’s); the General Module and the Streamlined Module (which includes Small Area and Paddock Trees sub types).

The general Assessment Module had to be used for this proposal as the site is mapped on the Biodiversity Values Map**.**

Note that this is a reduced version of the BDAR that is suitable for public release and may not contain all the required information for a BDAR. The full BDAR contains sensitive information that cannot be released to the public.

Stage 1: Biodiversity Assessment

1 Introduction

1.1 Description of Existing Site

For this proposal, the Development Site (Site) (shown on the maps in Figures 1.4 and 1.5) is a small area straddling the south-eastern boundary of the Property that is Lot 2 DP 325220 known as 16 Addison Road and the adjacent cliff and rocky foreshore to the south-east. The majority of the Development Site is outside of the Property. The Development Site is approximately 55m^2 in size and currently contains a 3m high sandstone cliff line that continues along the extent of Manly Point Headland, weedy vegetation and garden/lawn at the top of the cliff, a concrete spiral staircase along the cliff face, natural sandstone rocky foreshore, concrete platform and existing concrete swimming pool and seawall. The rocky foreshore, concrete platform and pool are all below the Mean High Water Mark and form part of the marine environment that is North Harbour. The Development Site is accessed from 16 Addison Road and via North Harbour by boat. The cover of this report and the map on Figure 1.1 shows a recent aerial photograph of the Development Site.

1.1.1 Location Geographic Co-ordinates

The latitude and longitude of the Study Area is -33.807733°S 151.284490°E

1.1.2 Topography

There is a 3m high cliff along the western part of the site. The rocky foreshore is relatively level, is between 0 and 15m wide and contains boulders. The site is on the eastern site of a headland the juts into North Harbour. Figure 1.3 shows the contours of the site.

1.1.3 Drainage

Run-off from the site will run into North Harbour. Figure 1.2 show the drainage in the locality in light blue.

1.1.4 Riparian Land

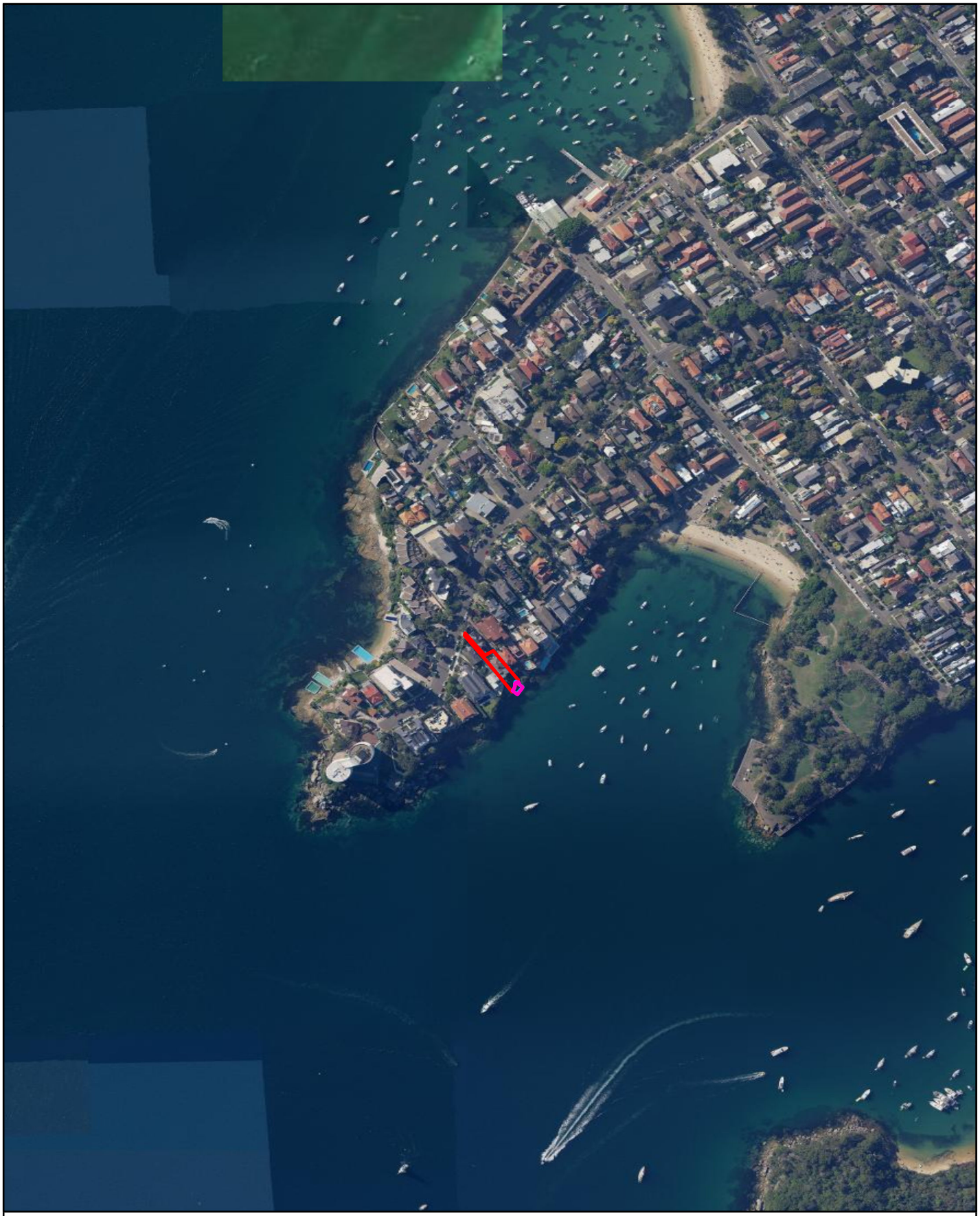
The cliff and vegetation above the Mean High Water mark are Riparian Land.

1.1.5 Geology and Soils

The majority of the site is exposed sandstone rock.

1.1.6 Disturbance History

The natural rock foreshore has been disturbed in the past for the construction of the existing concrete pool and concrete platform. The installation of the existing stairs has disturbed parts of the cliff face. The small amount of vegetation that is on the cliff face is mostly weeds.



Legend

- Property
- Existing Pool and Stair Footprint
- Proposed Pool and Stair Footprint

Figure 1.2
Locality Aerial Photograph

16 Addison Rd, Manly

Date: 12/03/2019

N

0 30 60 120 Meters

Disclaimer: Mapping is indicative and may contain errors from the source of the data. Information on these maps should only be used at the scale provided. Dimensions need to be determined by a registered surveyor.

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

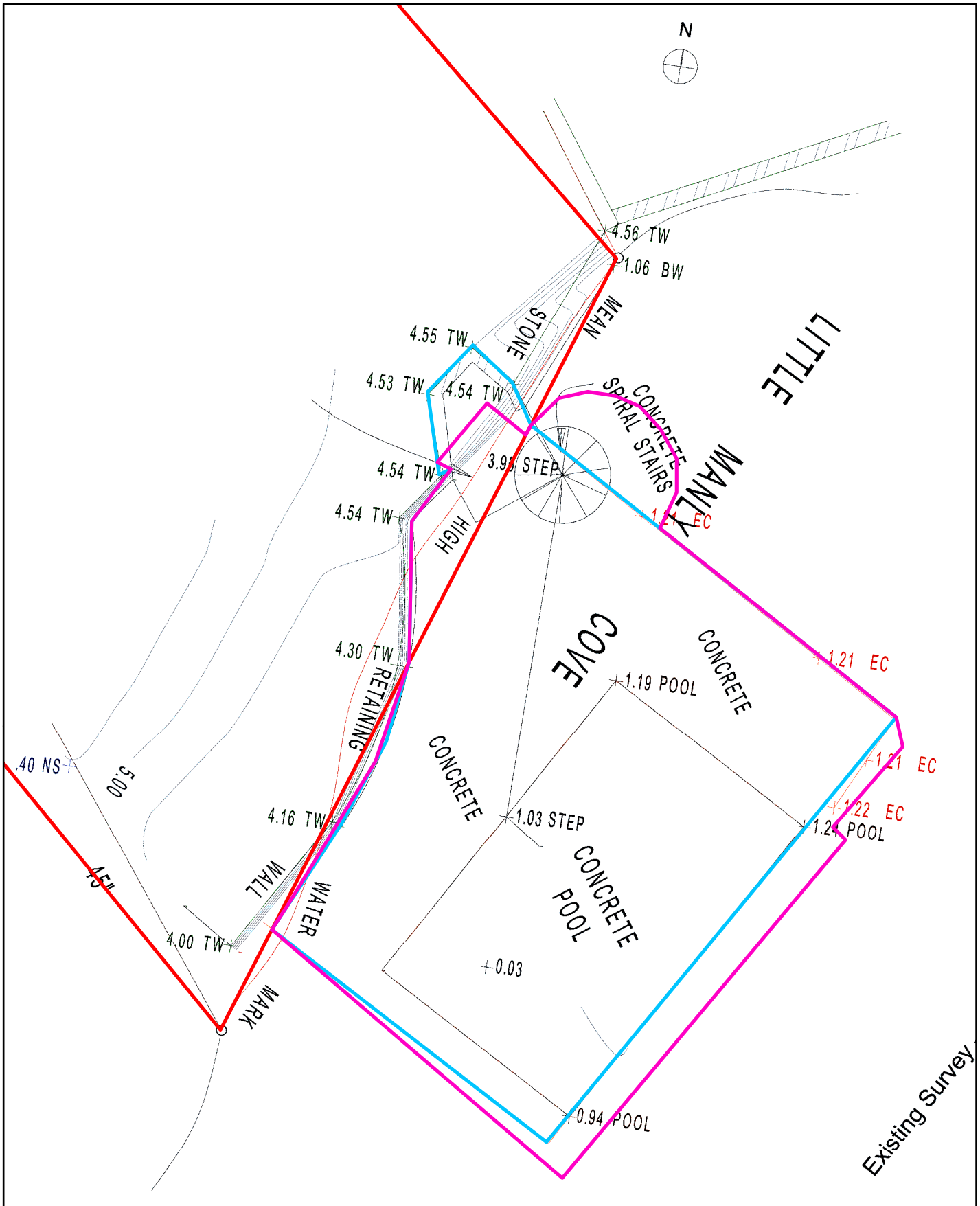


Figure 1.3
Study Site, Survey

16 Addison Rd, Manly

Date: 12/03/2019

Legend

- Property
- Existing Pool and Stair Footprint
- Proposed Pool and Stair Footprint

N

0 0.5 1 2 Meters

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

1.2 Development Footprint

The Development Footprint is the area that will be directly impacted by the proposal which for this proposal will be the same as the Development Site and is approximately 55m^2 in size. The majority of the Development Footprint is the rocky foreshore that is outside of the Property (16 Addison Road).

Figure 1.4 shows the property, the existing pool footprint, the proposal, development footprint and the surrounding context. The development footprint is shown on the cover image.

The operational footprint is not likely to extend further than the development footprint for this development.

1.3 General Description of the Proposal

Figures 1.4 and 1.5 show the proposal which includes;

- Demolition of the existing concrete and metal staircase and sea pool.
- Construction of a new raised swimming pool in the approximate footprint of the existing swimming pool.
- Construction of a new replacement spiral staircase.
- Extension and increasing the height of existing concrete platform/deck
- Construction of new daybed at the base of the cliff

Construction access will be mostly from the water and supplies, and waste will be removed from the site by barge. The concrete is likely to be pumped from Addison Road.

The purpose of the proposed development is to refurbish the existing swimming pool and associated access and landscaping structures to ensure its longevity, safety of use, and aesthetic appeal.

Figure 1.4 shows the detail, location and extent of these features.

1.3.1 Construction of the Replacement Pool

- the pool will be built in approximately the same footprint as that existing providing for a catch pool, weir edge and deck. See Map on Figure 1.4.
- the highest level will be the deck raised to RL 1.675mm allowing for a deeper pool without the need for excavation
- the pool will be built in a terrazzo, pigmented concrete with an exposed aggregate and will be coloured to match/tie-in with the existing sandstone cliff
- the materials will be eco-friendly and the aggregate will be from a sustainable source
- the concrete will be polished with a non-slip finish
- the concrete finish will be non-reflective
- the inside of the pool will be tiled in green-blue glass mosaic tiles, with custom brass coloured handrails
- a daybed will interconnect the pool to the new spiral staircase and provide for storage of the pool pump

1.3.2 Construction of Replacement Stairs

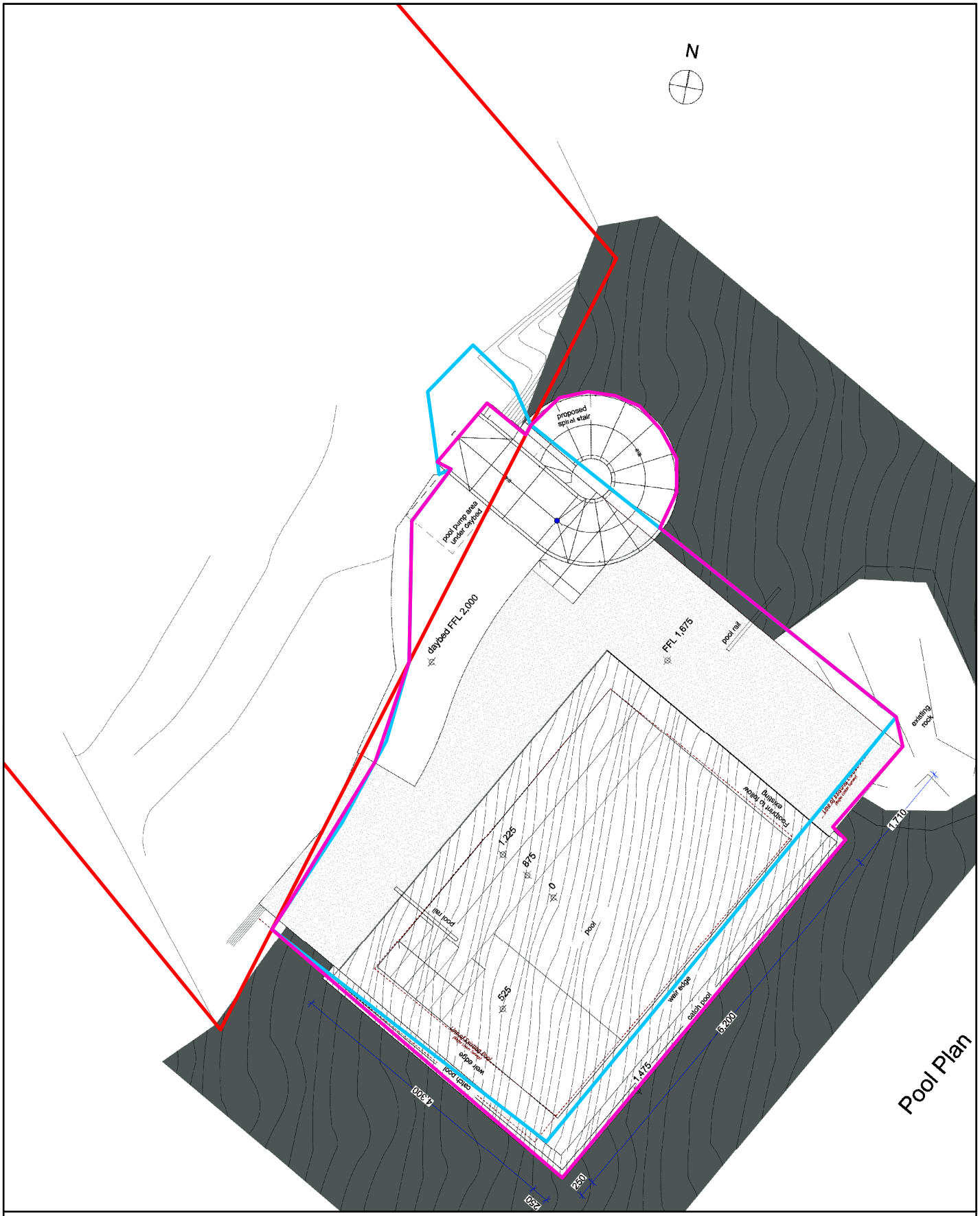
- the spiral staircase will also be built in a terrazzo, pigmented concrete with an exposed aggregate
- the stairs are proposed as 155 rise x 340 tread, 900mm width which complies with Australian building standards
- the staircase will be close to the sandstone cliff face

1.3.3 Timing of Proposed Works

It is recommended that the proposed works occur within the Little Penguin non-breeding season, which is from the 1st March to the 30th June each year. This restriction is to minimise impacts to the Endangered population of Little Penguins (*Eudyptula minor*) that breed along the rocky foreshore.

1.3.4 Plans and Documents Used for this Report

Title	Author	Rev	DWG./Doc. No./Ref.	Date
Plan of Details and Levels	Linker	1	160320	15/04/16
Pool Plan	Patterson	Preliminary	18010/9.4	14/09/18
Elevation	Patterson	Preliminary	18010/9.5	14/09/18
Section	Patterson	Preliminary	18010/9.6	14/09/18
Statement of Intent	Foreshore Design Solutions	-	-	06/11/18
Marine Habitat Survey	Waterfront Surveys Australia Pty Ltd	1	19-030-04	25/2/19



Legend

- Property
- Existing Pool and Stair Footprint
- Proposed Pool and Stair Footprint

Figure 1.4
Study Site, Proposal Development Footprint

16 Addison Rd, Manly

Date: 12/03/2019

N

0 0.5 1 2 Meters

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

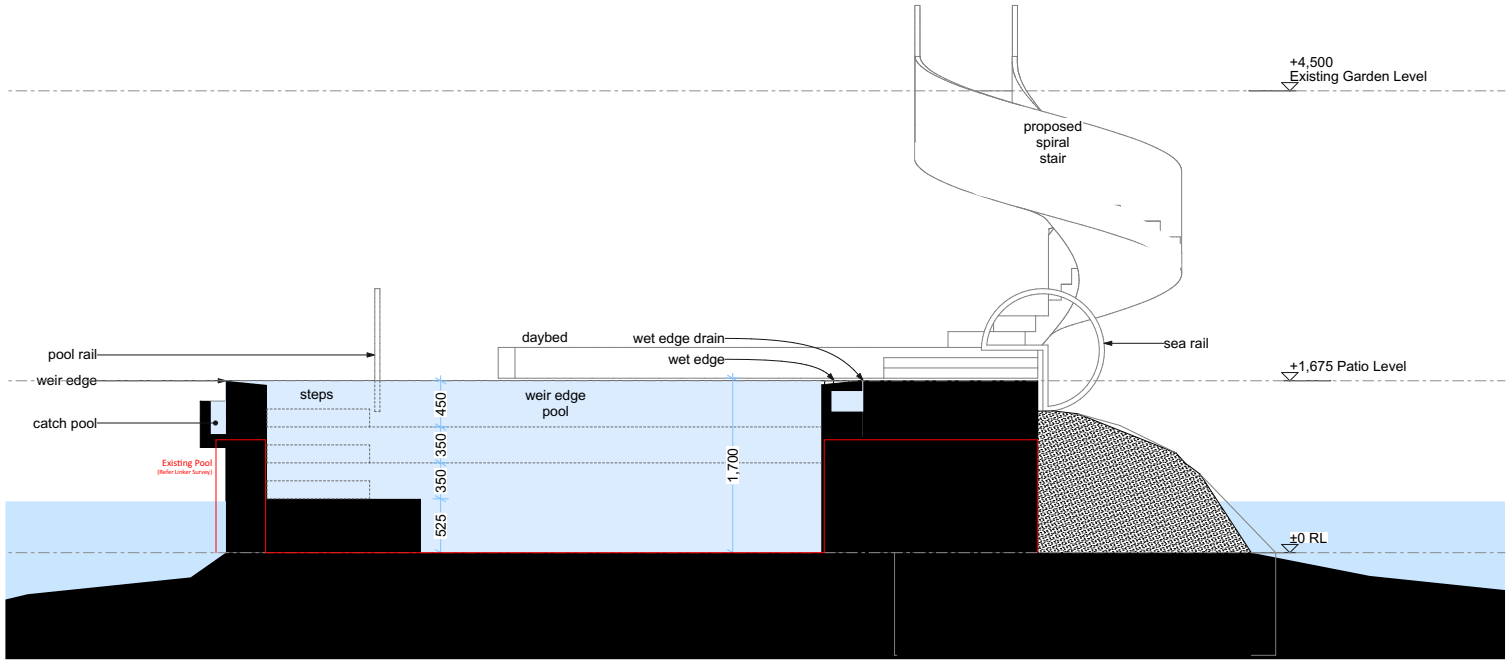


Figure 1.5. Proposal Section

1.4 Literature and Database Search

Relevant information was obtained from literature, local knowledge and established sources such as scientific journals, electronic databases and reports. The data in databases that were consulted included BioNet (5km search area) (including NPWS Atlas of NSW Wildlife records, Australian Museum specimen records and the Royal Botanic Gardens records), TBDC (BioNet), BAM Calculator, ROTAP records and Birds Australia Atlas. Searches were also undertaken on the DOEE – 'protected matters search tool' website to generate a report that will help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in the area of interest.

1.5 Field Survey Method

An ecological field survey was carried out for the following purposes:

- general ecological site survey including observations across the whole of the site,
- mapping the extent of native vegetation
- to determine the Vegetation Types (PCT), their extent on the site and adjacent land and condition (disturbance) to determine the Vegetation Zones
- tree survey including; numbering, species, trunk girth, height, canopy diameter and health
- a formal plot based survey using the BAM method including ID of all plant species, percentage cover in each growth form, tree stem diversity and leaf litter cover.
- targeted Threatened species surveys.
- random meander to search for, identify and record other flora and fauna species.

See sections 3 and 4 for field survey effort, season, weather etc. for each survey technique and targeted survey method.

1.5.1 Extent of Native Vegetation

The extent of native vegetation was determined using aerial photography and on ground field verification.

The definition of native vegetation in the BC Act is the same as in the LLS Act. Figure 3.1 shows the location and extent of native vegetation in the Development Site.

1.5.2 Field Survey

The field surveys were carried out on the 12th of February 2019. The highly experienced Principal Ecologist Nicholas Skelton and the Ecologists; and Joshua Drane, Sophia Mueller Sewell and Sarah Tuxworth, undertook the recent fieldwork. Due to the small size of the Development Site, a larger area was searched for during the field survey so that the presence and habitat for Threatened species in the locality were not missed, in particular, the presence of Little Penguins and their nests. The search area included 50m along the rocky foreshore to the north and south of the site.

1.5.3 Determining the Plant Community Type (PCT)

The vegetation within the study area was classified using structural and floristic indicators and was compared with threatened ecological communities listed in Schedule 2 of the BC Act 2016 and with the vegetation classification titled The Native Vegetation of the Sydney Metropolitan Area V3 Volume 2 (OEH 2016) and the PCT VIS vegetation type database (OEH online). Figure 2.1 shows the mapped vegetation in the locality.

The vegetation on the site was also classified according to Threatened Ecological Communities as listed in the schedules of the BC Act. A detailed description of how the importance of the habitat on the site for Threatened Ecological Communities (EEC) was determined, is given in Section 4.4.

1.5.4 BAM Plot Survey

A BAM plot survey was used to determine the integrity (condition) of the vegetation in each vegetation zone. Figure 3.1 shows the locations of the plots. The landscape features, vegetation type (PCT) and condition were surveyed using the Biodiversity Assessment Method (BAM) (OEH 2016).

The BAM survey recorded the:

- Vegetation Integrity (condition) Assessment
- Composition and Structure
- Function
- Vegetation Integrity Score

Due to the small size of the development site and lack of vegetation on the majority of the Development Site, the BAM plot for this assessment occurred mostly outside of the site and included the cliff, rear yard (south-eastern) of 16 Addison Road and the adjacent 14 Addison Road.

See section 4 for targeted field survey method and field survey effort for Threatened Flora and Fauna species and Section 3 for field survey effort for the vegetation survey.

1.5.5 Targeted Threatened Species Surveys

During the field surveys, all sections of the study area and some of the surrounding land were traversed on foot. The study area was searched for the presence of the Candidate Threatened flora and fauna species and their habitats using the published OEH guidelines.

- Bat Survey Guidelines, 'Species credit' Threatened bats and their habitats NSW survey guide for the Biodiversity Assessment Method OEH 2018
- Plant Survey Guidelines, NSW Guide to Surveying Threatened Plants OEH 2016
- Amphibian and Reptile Survey Guidelines, Threatened species survey and assessment guidelines: field survey methods for fauna, Amphibians DECC 2009
- Threatened Biodiversity Survey and Assessment: Guidelines for Developments and Activities Working Draft DEC 2004

1.6 Areas Not Requiring Assessment

The Development Site does not include any Bio certified Land.

All parts of the Development Site are assessed in this report. This report does assessed the impact of the proposal to the marine environment and marine species listed in the Fisheries Management Act 1994. The impact to the marine environment and species is assessed in the Marine Habitat Survey by Waterfront Surveys Australia (25/02/19).

2 Landscape Features

2.1 Landscape Feature Summary table

Bioregion	Sydney Basin
Sub-region	Pittwater
Mitchel Landscape	The Development Site is not on the Mitchell Landscapes Map.
Native Vegetation % cover in 1.5km buffer	20-30%

2.2 Locality and Adjacent Ecological Values

Adjacent to the site is the marine environment of Little Manly Cove that is part of North Harbour. Little Manly Beach is 200m north of the site. The rocky foreshore extends to the north and south of the site, and the urban environment is to the west. The large area of bushland on North Head is 600m east of the site.

Figures 1.1, 1.2 and 2.1 shows the proximity of the site to National Parks, development and nearby bushland.

2.3 Cleared Areas

The majority of the site does not contain vegetation. The site is comprised mostly of natural sandstone rock (35%) and concrete (60%).

2.4 Rivers and Streams

There are no freshwater rivers or stream on the site. The majority of the site forms parts of the marine environment that is North Harbour.

Waterbodies and hydrological processes are a type of Prescribed Impact, and this report specifically addresses them in accordance with the BAM.

Table 14 describes the impact of the proposal on waterbodies and hydrological processes.

2.5 Wetlands

The property occurs within a 40m buffer zone of seagrass and has been mapped as a Wetland Protection Area by the Department of Infrastructure, Planning and Natural Resources (2005). Impacts to the wetland protection area have been addressed in the Marine Habitat Survey by Waterfront Surveys Australia Pty Ltd.

Waterbodies and hydrological processes are a type of Prescribed Impact, and this report specifically addresses them in accordance with the BAM. Table 14 describes the impact of the proposal on waterbodies and hydrological processes.

2.6 Connectivity Features

The Development Site is accessible from the water by Little Penguins, Seals. There is Water Rat and Little Penguin access to the top of the cliff via the spiral staircase. Penguins can also access the rocky foreshore to the north and south of the site from the Marine Reserve. The site is accessible for Water Dragons.

There is Long-nosed Bandicoot access from 16 Addison Road, however, bandicoot habitat is minimal due to lack of vegetation and soil.

Table 14 describes the impact of the proposal on connectivity.

Figure 1.2 shows the proximity to National Parks, Reserves and remnant vegetation in the locality.

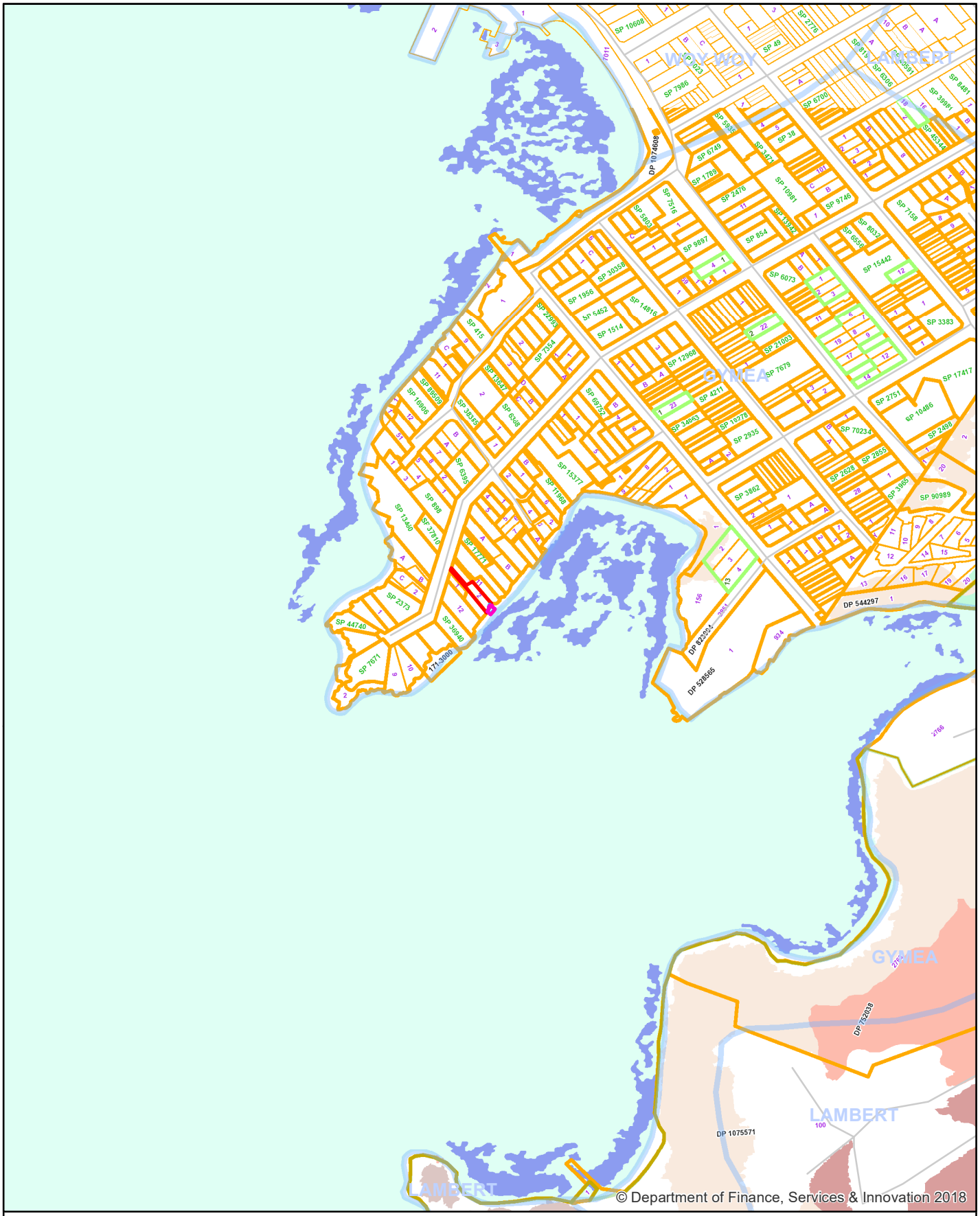
2.7 Areas of Geological Significance

There is a 3m high sandstone cliff at the north-western part of the site. There are no large caves or karst in the cliff. The cliff contains several crevices including one that is potentially suitable for Little Penguin nesting.

The rocky foreshore on this Development Site and to the south has been declared as an Area of Outstanding Biodiversity Significance (AOBV) under the Biodiversity Conservation Act as it provides crucial breeding habitat for the Endangered population of Little Penguins in Manly.

No soil hazard features were identified at the site.

Table 14 describes the impact of the proposal on the rocky foreshore, karsts, caves, cliffs and rocks.



Legend

- Property
- Existing Pool and Stair Footprint
- Proposed Pool and Stair Footprint
- Soils Sydney ed4
- National Park

Vegetation Communities in Locality

- S_DSF06: Coastal Sandstone Foreshores Forest
- S_HL03: Coastal Sand Mantle Heath
- S_HL06: Coastal Headland Banksia Heath
- S_HL07: Coastal Headland Cliffline Scrub
- S_RF07: Coastal Escarpment Littoral Rainforest
- S_SW03: Seagrass Meadows

Figure 2.1
Locality, Mapped Vegetation Types

Vegetation Data from; The Native Vegetation of the Sydney Metropolitan Area V3 2016

16 Addison Rd, Manly

Date: 12/03/2019

N

0 40 80 160 Meters

Disclaimer: Mapping is indicative and may contain errors from the source of the data. Information on these maps should only be used at the scale provided. Dimensions need to be determined by a registered surveyor.

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

3 Native Vegetation

3.1 Vegetation Class

The vegetation on the site is in the class – Sydney Coastal Dry Sclerophyll Forests

3.2 Native Vegetation Type Classification

The vegetation that occurs on the site was classified using three separate methods;

1. using the indicator species in the classification system in Native Vegetation of the Sydney Metropolitan Area (OEH 2016) which determines the PCT
2. VIS vegetation classification database and
3. the definitions of Threatened Ecological Communities in the Scientific Committee's determinations from the schedules of the Biodiversity Conservation Act.

Field survey results including the floristics (species mixture and relative abundance) and structure of the vegetation on the site was collected and these 3 methods were applied and the results are described in the following sections.

3.3 Plant Species List

The plant species that occur on the site are listed in the following table.

Table 1. Plant Species List

16 Addison Road, Manly

Febuary 2019

by Nichlas Skelton, GIS Environmental Consultants

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

Growth Form	Local Native	Planted	Weed	Total
Fern	1		1	2
Grass			2	2
Herb	2		5	7
Palm			1	1
Shrub		1	5	6
Tree	3	1		4
Vine	1	2	1	4
Total	**7**	**4**	**15**	**26**

Plot	% Cover	Genus and Species	Family	Habit	Order	Common Name	Status
Plot 1	0.1	Christella dentata	THELYPTERIDACEAE	Fern	FERN	Christella	Local Native Species
Plot 1	7	Commelina cyanea	COMMELINACEAE	Herb	MONOCOTYLEDON	Creeping Christian	Local Native Species
Plot 1	1	Ficus rubiginosa	MORACEAE	Tree	DICOTYLEDON	Port Jackson Fig	Local Native Species
Plot 1		Callistemon Hybrid	MYRTACEAE	Shrub	DICOTYLEDON	Bottle Brush	Planted
Plot 1		Ficus microcarpa	MORACEAE	Tree	DICOTYLEDON	Fig Cultivar	Planted
Plot 1		Hedera helix	ARALIACEAE	Vine	DICOTYLEDON	English Ivy	Planted
Plot 1		Trachelospermum jasminoides	APOCYNACEAE	Vine	DICOTYLEDON	Star Jasmine	Planted
Plot 1		Brassaia actinophylla	ARALIACEAE	Shrub	DICOTYLEDON	Umberella Tree	Weed
Plot 1		Chlorphytum comosum	LILLIACEAE	Herb	MONOCOTYLEDON	Spider Plant	Weed
Plot 1		Coprosma repens	RUBIACEAE	Shrub	DICOTYLEDON	Looking-glass Bush	Weed
Plot 1		Ehrharta erecta	POACEAE	Grass	MONOCOTYLEDON	Ehrharta	Weed
Plot 1		Monstera deliciosa	ARACEAE	Herb	MONOCOTYLEDON	Swiss Cheese Plant	Weed
Plot 1		Nephrolepis cordifolia	DAVALLIACEAE	Fern	FERN	Fishbone Fern	Weed
Plot 1		Olea europa ssp. africana	OLEACEAE	Shrub	DICOTYLEDON	African Olive	Weed
Plot 1		Parietaria judaica	URTICACEAE	Herb	DICOTYLEDON	Asthma Weed, Pellitory	Weed
Plot 1		Stenotaphrum secundatum	POACEAE	Grass	MONOCOTYLEDON	Buffalo Grass	Weed
Plot 1		Yucca aloifolia	AGAVACEAE	Herb	MONOCOTYLEDON	Yucca	Weed
Additional		Acmena smithii	MYRTACEAE	Tree	DICOTYLEDON	Lily Pilly	Local Native Species
Additional		Banksia integrifolia ssp. integrifolia	PROTEACEAE	Tree	DICOTYLEDON	Coastal Banksia	Local Native Species
Additional		Dianella caerulea var. producta	PHORMIACEAE	Herb	MONOCOTYLEDON	Blue Flax Lily	Local Native Species
Additional		Hibbertia scandens	DILLENIACEAE	Vine	DICOTYLEDON	Golden Guinea Flower	Local Native Species
Additional		Aloe sp.	LILLIACEAE	Herb	MONOCOTYLEDON	Aloe	Weed
Additional		Bougainvillea sp.	NYCTAGINACEAE	Shrub	DICOTYLEDON	Bougainvillea	Weed
Additional		Ipomea indica	CONVOLVULACEAE	Vine	DICOTYLEDON	Morning glory	Weed
Additional		Lantana camara	VERBENACEAE	Shrub	DICOTYLEDON	Lantana	Weed
Additional		Phoenix canariensis	ARECACEAE	Palm	MONOCOTYLEDON	Canary Island Date Palm	Weed

3.4 Justification for PCT (Vegetation Classification)

3.4.1 Candidate Vegetation Communities

OEH has mapped the vegetation in the locality and describes the vegetation communities in The Native Vegetation of the Sydney Metropolitan Area (V3 2016). The vegetation communities of the locality have been extensively mapped by Skelton et al. (2003a) and incorporated in the mapping by OEH 2016.

The site is mostly rock and concrete that contains marine vegetation but no terrestrial vegetation community. The part of the site that contains terrestrial vegetation is primarily weeds and exotics that are not considered to represent native vegetation.

Due to the small size of the development site and lack of vegetation on the majority of the Development Site, the 20x20m BAM plot for this assessment occurred mostly outside of the site and included the top of the cliff, rear yard (south-eastern) of 16 Addison Road and the adjacent 14 Addison Road. The 20x50 function plot extended further to the south-west across 10 Addison Road.

The Biodiversity Assessment Method (BAM) and BAM Calculator require a Plant Community Type (PCT) or native vegetation community be selected for the assessment and offsetting processes.

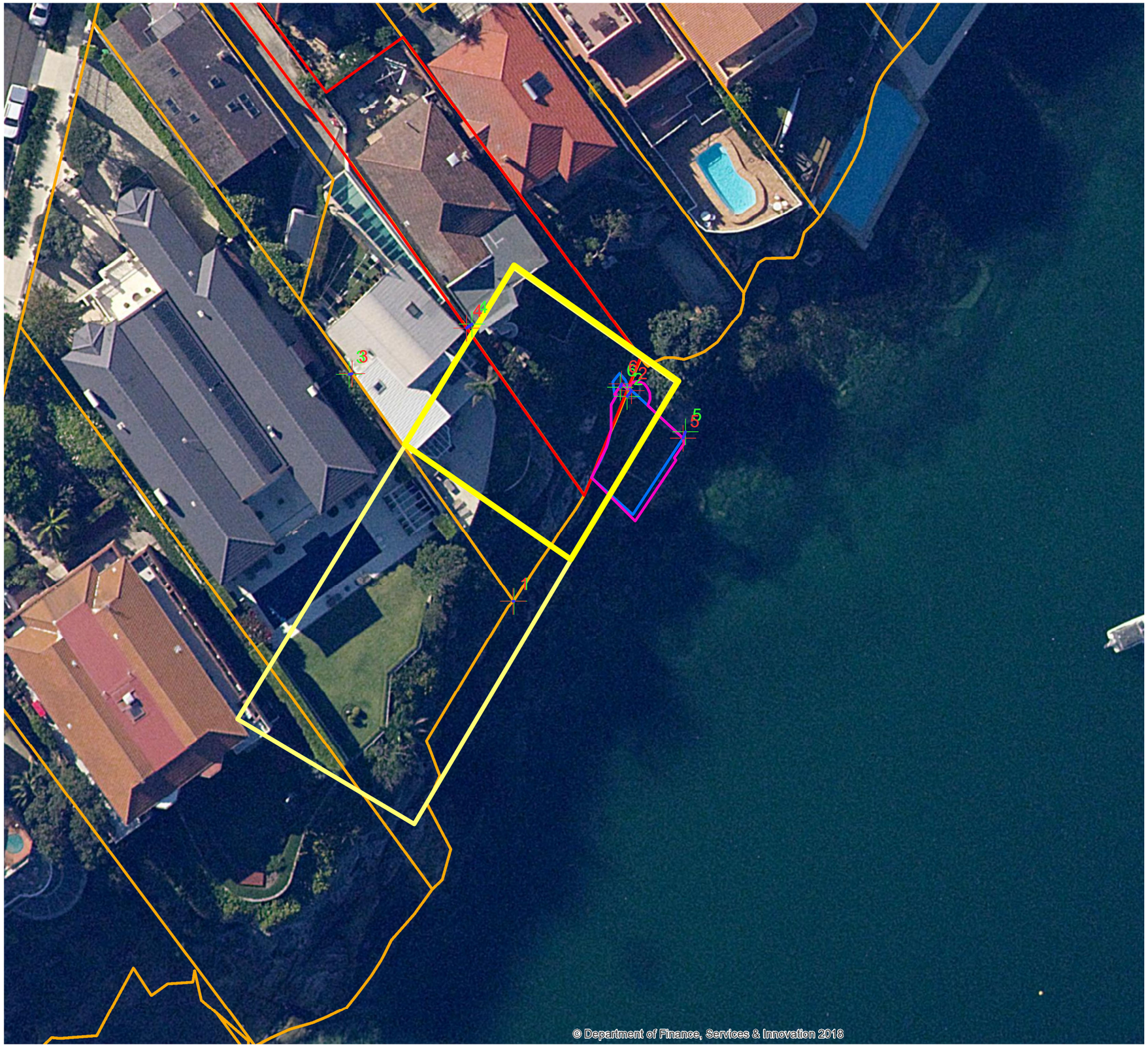
Based on the foreshore location, soil, drainage and remnant native vegetation along other parts of the foreshore in the locality it is most likely that the native vegetation community in the plot was Smooth-barked Apple- Coastal Banksia/ Cheese Tree open forest on sandstone slopes on the foreshores of the drowned river valleys of Sydney (PCT 1778), also referred to as Coastal Sandstone Foreshore Forest (NVSMA V3 2016)

Figure 2.1 shows the location and abundance of vegetation communities (using NVSMA OEH 2016 mapping).

3.5 Area of Each Vegetation Type on the Site

The Area of Each Native Vegetation Type

Vegetation Community	PCT Number	Area (On Site) m^2	Percent Cleared
Costal Sandstone Foreshore Forest	1778	<100m^2	90%



Legend

- Property
- Existing
- Proposal

Plot

- 1000sqm
- 400sqm

Figure 3.1
Zones and Plot Survey

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

by Nicholas Skelton

Date: 18/03/2019

1:390 at A3

0 4 8 16 Meters

N

3.6 Vegetation Integrity Assessment

Due to the small size of the site and small amount of vegetation on the site, the majority of the BAM Plot measuring vegetation integrity occurred outside of the Development Site. The BAM Plot occurred in the rear yard of 16 Addition Road and extended to the south-west into 14A Addison and 10 Addison Road.

The patch size was calculated using an aerial photo of the locality and similar vegetation connected to the vegetation on the site was included in the patch size.

The area of the Vegetation Zone in the Development Footprint and the subsequent impact to the Vegetation Zone is less than 100m^2. However 100m^2 is the minimum area that can be entered into the calculator.

Vegetation Zones and Patch Size

Vegetation Zone	PCT	Area of Zone (m^2) (onsite)	Patch Size (ha)
Zone 1- Foreshore	1778	<100m^2	<1ha

Vegetation Survey Effort

Date	Person Hours	Weather	Type	Location
12/02/19	1	fine 34 - 36°C	Random Meander (Cropper (1993) across each vegetation type	Across the whole of the Development Footprint.
12/02/19	1	fine 34 - 36°C	Plot 1 (Zone 1)	See Figure 3.1

3.6.1 Composition and Structure

A total of 3 local native species and 14 weed or planted exotic species were recorded in Plot 1. An additional 4 local native species and 5 weed species were identified outside of the plot. The high proportion of weeds and exotic is due to the presence of landscaped gardens were the plot was placed.

3.6.2 Function-Habitat Value

The results for tree width diversity, log length and ground cover for the 20m x 50m plot are recorded in the table below.

Fauna Habitat Function Summary for Plots

Plot 1 (Zone 1) Function Results		
Tree Stem Size Class		**Log Length Total (m)**
Width Class (cm)		0
<5	present	
5 to 9	present	**Number of large trees (50cm+)**
10 to 19	present	0
20 to 29	absent	
30 to 49	absent	**Av Leaf Litter % Cover (1m^2 plots)**
50 to 79	absent	6
80+	absent	

Vegetation Integrity Score

Vegetation Zone	Composition Score	Structure Score	Function Score	Integrity Score
Zone 1	2.8	3.2	24.1	6

4 Threatened Species

Table 7. Ecosystem Species Assessment

16 Addison Road, Manly

Threatened species reliably predicted to utilise the site. No surveys are required for these species. Ecosystem credits apply to these species.

Common Name	Scientific Name	Vegetation Zone	Exclude as Ecosystem Credit Species	Justification for Exclusion
Regent Honeyeater	*Anthochaera phrygia*	Zone 1	No change	
Glossy Black-Cockatoo	*Calyptorhynchus lathami*	Zone 1	No change	
Varied Sittella	*Daphoenositta chrysoptera*	Zone 1	No change	
Spotted-tailed Quoll	*Dasyurus maculatus*	Zone 1	No change	
Little Lorikeet	*Glossopsitta pusilla*	Zone 1	No change	
Painted Honey Eater	*Grantiella picta*	Zone 1	No change	
White-bellied Sea-eagle	*Haliaeetus leucogaster*	Zone 1	No change	
Little Eagle	*Hieraaetus morphnoides*	Zone 1	No change	
Swift Parrot	*Lathamus discolor*	Zone 1	No change	
Sqaure-tailed Kite	*Lophoictinia isura*	Zone 1	No change	
Little Bentwing-bat	*Miniopterus australis*	Zone 1	No change	
Eastern Bentwing-bat	*Miniopterus schreibersii oceanensis*	Zone 1	No change	
Eastern Freetail-bat	*Mormopterus norfolkensis*	Zone 1	No change	
Powerful Owl	*Ninox strenua*	Zone 1	No change	
Eastern Osprey	*Pandion cristatus*	Zone 1	No change	
Koala	*Phascolarctos cinereus*	Zone 1	No change	
Grey-headed Flying-fox	*Pteropus poliocephalus*	Zone 1	No change	
Masked Owl	*Tyto novaehollandiae*	Zone 1	No change	

4.1 Candidate Species Credit Species & Justification: Fauna

4.1.1 Existing Fauna Habitat at Development Site

4.1.1.1 Existing Little Penguin Habitat and Access

Information withheld due to sensitivity of this species. A full description of the Little Penguin Habitat on the site and discussion of the population is in the complete version of the BDAR report that is not available for public release due to the sensitivity of this information.

4.1.1.2 Long-nosed Bandicoot Habitat and Access

A small part of the site above the cliff is within the mapped Endangered population boundary in the determination and is within Councils Bandicoot DCP boundary. This area above the cliff contains a concrete platform with a surrounding lawn that is Long-nosed Bandicoot foraging habitat. There is access to this habitat from the neighbouring property to the south. There is bandicoot access to the foreshore down the concrete stairs. However, there is limited habitat due to the lack of soil and vegetation and bandicoots are unlikely to access the foreshore part of the site. Bandicoots have previously been recorded in the rear yard of 16 Addison Road, above the cliff.

4.1.1.3 Other Fauna Habitat

The cliff and concrete platform provides basking and foraging habitat for Eastern Water Dragons. The concrete platform is suitable resting habitat for the Australian Fur Seal. The site is resting and foraging habitat for flying seabirds such as gulls, terns and oystercatchers.

The marine environment contains algae such as Neptune's necklace (*Hormosira banksia*) and Sea Lettuce (*Ulva lactuca*) and is habitat for marine/estuarine molluscs (see Table 9 below), crabs and fish. The native Water Rat may also visit and forage at the site. A detailed description of the marine habitat and species are in the Marine Habitat Survey by Waterfront Surveys (25/02/19).

The Eastern Pygmy Possum, Brown Antechinus had become locally extinct, and the native Bush Rat population became non-viable or locally extinct also. The conservation group, Australian Wildlife Conservancy was employed by the Sydney Harbour Federation Trust to manage the fauna on part of North Head, and as part of their management, in collaboration with Sydney University, they reintroduced the Eastern Pygmy Possum, Brown Antechinus and the native Bush Rat to North Head. These three populations are breeding, and the populations are becoming established with the Bush Rat population being the most successful. So far as they are out-competing the introduced Black Rat and now the population covers most of North Head. The native Bush Rat may occur in the urban area; however, it is unlikely that the Antechinus or the Pygmy Possum would occur in the urban area yet. The site does not contain habitat for these species due to lack of native vegetation cover.

Table 8. Marine Species Observed at the Site

Common Name	Observation Type
Swift-footed crab	Observed
Sydney Rock Oyster	Observed
Blue periwinkle	Observed
Mulberry whelk	Observed
Smooth limpet	Observed
Turban Snail	Observed
Cunjevoi	Observed

The Site and the locality are shown on the maps in Figures 1.2 and 2.1.

4.2 Field Survey Effort

4.2.1 Threatened Flora Field Survey Effort

Date	Person Hours	Weather	Type	Location	Targeted species
12th February 2019	1	Fine 34-36°C	Threatened flora and habitat searches	Across the whole development Site	All threatened flora that has suitable habitat.

4.2.2 Threatened Fauna Field Survey Effort

Date	Time of day	Person Hours	Weather	Type	Location	Targeted Species
23rd February 2016	10am-12pm	2	Fine 25°C	Targeted Little Penguin and Long-nosed Bandicoot Survey	Across the whole development Site and to the and west	Little Penguin and Long-nosed Bandicoot
12th February 2019	12-1pm	2	Fine 28-30°C	Targeted Little Penguin and Long-nosed Bandicoot Survey	Across the whole development Site and to the north, south	Little Penguin and Long-nosed Bandicoot
12th February 2019	12-1pm	2	Fine 28-30°C	Threatened fauna habitat searches	Across the whole development Site and to the north, south	All threatened fauna that has suitable habitat.

4.2.3 Targeted Little Penguin and Long-nosed Bandicoot Survey

All parts of the cliff face and rocky foreshore on the site and 50m to the north and south of the site were thoroughly searched for Little Penguin existing and potential resting, moulting and nesting habitat. Bandicoot and penguin access into and through the site was also determined. There was no nocturnal survey or trapping conducted for this report as the habitat potential and use of the site by Long-nosed Bandicoots and Little Penguins could be determined during the day by observation of footprints, diggings and whitewash. These techniques are the most appropriate for these species at this site.

4.3 Candidate Species Presence

Step 5 of Section 6.4 determines if each species is present (or assumed present) on the site. A map of the location or a count of the number of individuals is also given.

Table 11. Candidate Species Presence

16 Addison Road, Manly

Step 5, 6.4.1.26-34 and Step 6. 6.4.1.35-37

Derived (Predicted) Potential Candidate Species	Biodiversity Risk Weighting	Time of Year Surveyed and Suitability	Presence On Site or Assumed Presence or Expert Report	Vegetation Zone	Habitat Component that is Present	Area of Habitat or Count Impacted including patrs of buffers of features outside impact area
Chalinolobus dwyeri Large-eared Pied Bat *Vunerable*	3.00	Assumed Present	Assumed Present, the survey for this species involves harp and mist net trapping for a long period of time, this can be stressful and dangerous for the species. The 4-16 nights of field survey is more costly than the species offsetting cost. ($865.08 per credit)	Zone 1	Potential roosting habitat in adjacent cliffline	0.01ha
Eudyptula minor Little Penguin *Endangered population*	2.00	Assumed Present	Assumed Present	Zone 1	Suitable loitering habitat and potential roosting habitat on site	Whole Development Site
Myotis maropus Southern Myotis *Vulnerable*	2.00	Assumed Present	Assumed Present, the survey for this species involves harp and mist net trapping for a long period of time, this can be stressful and dangerous for the species. The 4-16 nights of field survey is more costly than the species offsetting cost. ($865.08 per credit)	Zone 1	Potential roosting and breeding habitat	0.01ha
Perameles nasuta Long-nosed Bandicoot *Endangered population*	2.00	Assumed Present	Assumed Present	Zone 1	Suitable foraging habitat on site	0.01ha

Stage 2: Impact Assessment

5 Avoidance and Minimisation of Impacts

5.1 Steps Taken to Avoid and Minimise Ecological Impact

The need to Avoid and Minimise is a consideration the consent authority needs to take into consideration when assessing Site Suitability in s79C (now s 4.15).

The Biodiversity Conservation Act 2016 and Biodiversity Conservation Regulation (2017) require that all developments "Avoid" then "Minimise" ecological impacts.

Chapter 8 of the BAM requires that the measures that were taken to Avoid and Minimise are documented.

The *Biodiversity Conservation Act 2016* (s 7.13(6)) allows the consent authority discretion over what measures are required in relation to avoiding and minimising impacts.

Once all possible impact minimisation and avoidance has been undertaken, then offsetting can be used to mitigate the residual impacts of the proposal on the environment. This report describes ecological constraints on this site that were provided to the planning team for the use in planning and to avoid and minimise the impacts.

The main ecological constraints that have been identified at the site are

- The rocky foreshore/cliff that is habitat for many Threatened and native fauna species including the Endangered population of Little Penguin at Manly.
- The adjacent marine environment that is Manly Cove.

Table 12. Steps Taken to Avoid and Minimise Impact

Avoid and Minimise	Outcome	Timing	Participants
Build new pool in the approximate footprint of the existing pool	Minimise the amount of excavation and demolition needed and minimise impact to natural sandstone rock which will minimise the impact to Little Penguins and other fauna in the locality.	DA Design	Architect/Planner

Recommendations have been made in Part 3 of this report to further minimise the ecological impact from the proposal.

5.2 Residual Direct and Indirect Impacts

Table 13. Summary of Residual Direct and Indirect Impacts

Type	Frequency	Intensity	Duration	Consequence
Replacement of access stairs to the foreshore	Once, during construction ongoing use of stairs	Partial disturbance to the cliff	Impact permanent	Will impact cliff habitat. see section 5.2.1
New swimming pool in footprint of old swimming pool	During Construction	Partial impact to rocky foreshore	Impact permanent	Removal of part of rocky foreshore habitat and impact to penguin access see section 5.2.1
New daybed at the base of the cliff	During Construction	Partial impact to rocky foreshore	Impact permanent	Impact potential little penguin breeding habitat

5.2.1 Vegetation Loss

The development site contains a small amount (<100m^2) of vegetation that is mostly weeds and planted exotic along the cliff and on top of the cliff. The vegetation provides foraging habitat for the Endangered local population of Long-nosed Bandicoots. The proposal will not impact this vegetation.

5.2.2 Direct Impacts to Threatened Species and their Habitat

Table 7, 8 and 10 lists the Ecosystem Credits species and Species Credit Species (flora and fauna).

Candidate Species

Little Penguin

Information withheld due to sensitivity of this species. A full description of the Little Penguin Habitat on the site and discussion of the population is in the complete version of the BDAR report that is not available for public release due to the sensitivity of this information.

Long-nosed Bandicoot

The area above the cliff is suitable foraging habitat for Long-nosed Bandicoots, and there is access to the habitat from the adjacent property. The proposal will not change access and habitat suitability for bandicoots at the site. The area below the cliff is low-value habitat for bandicoots as it is exposed and does not have any soil or vegetation that is suitable for foraging. There is bandicoot access to the foreshore down the existing spiral stairs, the new stairs will maintain this access.

Large Eared Pied Bat

The site does not contain breeding or foraging habitat for the Large-eared Pied-bat due to the lack of tree cover and large caves. The crevices in the cliff contain potential roosting habitat for Large Eared Pied Bat. There was no evidence of roosting during the survey. The replacement stairs will be built close to the cliff and may impact some potential Large Eared Pied Bat habitat.

The impact to Large-Eared Pied Bat habitat is assessed in the Prescribed Impact section in Table 14.

Southern Myotis

Manly Cove provides foraging habitat for the Southern Myotis. The proposal will not impact this foraging habitat. The cliff has crevices that provide potential roosting habitat. There was no evidence of roosting during the survey. The replacement stairs will be built close to the cliff and may impact some potential Southern Myotis habitat.

The impact to Southern Myotis habitat is assessed in the Prescribed Impact section in Table 14.

5.2.3 Potential Indirect Impacts

The concrete used to construct the pool is to be quick drying to prevent any concrete from entering the harbour. Sediment produced by the demolition of the existing concrete pool walls can impact the water quality in the harbour. Appropriate sediment control measures and a wet vac is recommended to prevent sediment from entering the harbour.

Noise from construction works may disturb nesting penguins or deter penguins from nesting in the locality. All works are to occur in the penguin non-breeding season (1st March - 30th June each year). The proposal may increase the amount of human use of the foreshore at this property.

Indirect impacts that do not impact native vegetation are assessed in the Prescribed Biodiversity Impact section below.

5.2.4 Prescribed Biodiversity Impacts

Prescribed Biodiversity Impacts are impacts in addition to native vegetation clearing, and provide the determining authority information to determining the application, writing Condition of Consent and/or adding species credits.

Prescribed Biodiversity Impacts are described in section 6.7 and 8.2.1.1 of the BAM and Division 6.1 2(b) of the Biodiversity Conservation Regulations. Prescribed Biodiversity Impacts include impacts to cliffs, Karsts, caves, rocks, humanmade structures, non-native vegetation, waterbodies & hydrological processes, connectivity features, wind turbine strikes, vehicle strikes and other impacts. Table 14 below assesses Prescribed Impacts relevant to this site.

Table 14. Identification and Assessment of Prescribed Impacts

16 Addison Road, Manly

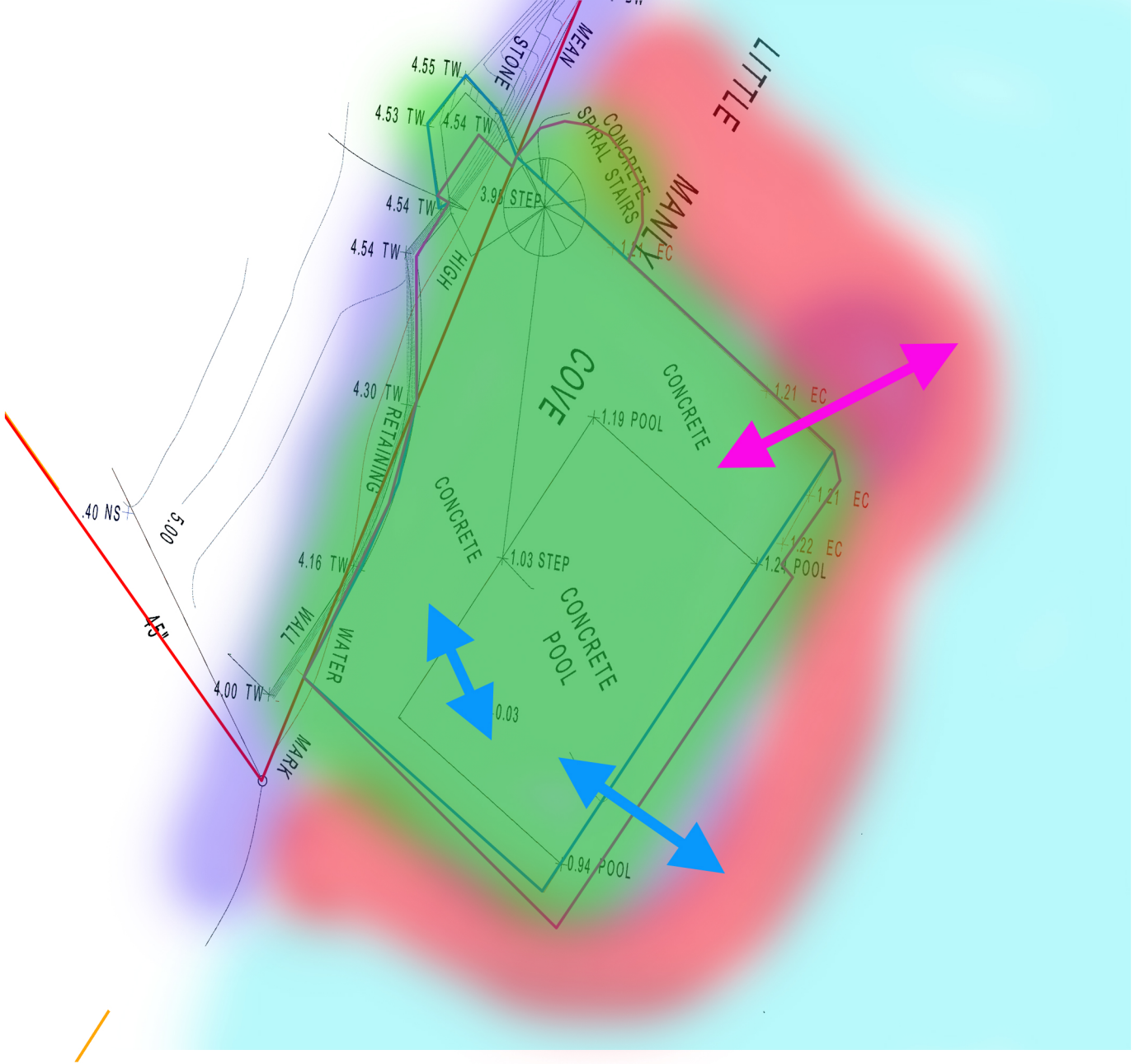
This table addresses division 6.1 of the Biodiversity Conservation Regulation 2017, section 9.2 of the Biodiversity Assessment Method and the Biodiversity Assessment Method Operational Manual

OEH species profiles, the TBDC and other sources were used to assess the impact of this proposal on the Threatened species (BC Act).

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

Potential Prescribed Impact	Prescribed Impact Feature on this Site	Threatened Species Potentially using this Habitat	Importance of the Habitat	Nature, Extent and Duration of Impacts	Prediction of Consequences of Impact	Conclusion and Recommendation regarding Prescribed Impact
Impact to Karst, caves, crevices, cliffs, rock platform or other geologically significant features	Cliffs, crevices and rock platform.	Little Penguin, Australian Fur Seal, Large Eared Pied-bat, Southern Myotis, Eastern Bentwing Bat.	**Microbats:** The cliff on the site is part of a cliff line that continues around the whole of Manly Point headland, the cliff line does have crevices that may be roosting habitat for the Large-eared Pied-bat, Eastern Bentwing-bat and Southern Myotis. In the wider vicinity including North Head and Middle Head, there is a large number of suitable microbat roosting habitat, in old buildings, caves, disused military structure such as tunnels that are known to be roosting habitat for these microbat species. On this site there are no caves, there are crevices which were thoroughly searched for evidence of past or current use by microbats, no use by microbats was found. **Fur Seal:** On this site the existing rock platform (rocky foreshore)(See Photo Page 1) is a partially concrete structure and part natural sandstone rocky foreshore with a pool. The rock platform provides resting habitat for the Australian Fur Seal which has been recorded in the adjacent Manly Cove and Manly Beach. **Little Penguin:** The section contains sensitive information that cannot be released to the public. A full description of Little Penguin Habitat is in the complete BDAR	**Microbats:** The proposal is for the demolition of the stairs and pool and construction of replacement stairs and replacement pool. **Fur Seal:** The proposal will increase the size of the concrete platform by approximately 3m2. **Little Penguin:** The section contains sensitive information that cannot be released to the public. A full description of Little Penguin Habitat is in the complete BDAR	**Microbats:** The cliff on the site has no roosting habitat in comparison with the available habitat in the vicinity and it is not likely the proposal will have any impact on microbats in the locality. **Fur Seal:** The concrete platform will increase in size as part of the proposal, the proposed changes to the rock platform will not impact the habitat suitability for Fur Seals. **Little Penguin:** The section contains sensitive information that cannot be released to the public. A full description of Little Penguin Habitat is in the complete BDAR	This proposal includes modification of the cliff and rock platform and may alter crevices of the cliff face. The extent of the impact is not considered sufficient to warrant additional credits. Recommendations to ameliorate impacts are made at the end of this report.
Impact to Scattered Rocks and Rock Outcrops	Scattered rocks.	Little Penguin and Fur Seal	The section contains sensitive information that cannot be released to the public. A full description of Little Penguin Habitat is in the complete BDAR	No scattered rocks will be removed.	It is recommended that the proposal will not remove or disturb any of the scattered rocks on the site.	This proposal will not result in this Prescribed Impact. No additional credits are recommended for this Prescribed Impact. Recommendations to ameliorate impacts are made at the end of this report.
Impact to Human-made structure	Stairs up the cliff and stairs in the pool, existing sea pool, pump box and concrete platform.	Little Penguin and Fur Seal	The section contains sensitive information that cannot be released to the public. A full description of Little Penguin Habitat is in the complete BDAR. The concrete platform is suitable out of water resting area for Fur Seals but is likely a small part of a large area of habitat.	A replacement staircase will be built as part of the proposal. It is recommended in this report that the construction will not take place during penguin nesting, breeding or molting times to reduce impact to the Little Penguins. The existing pool and stairs will refurbished and the pump box will be removed. The concrete platform will be extended by an area of 3m2. The pool will no longer be open to the adjacent marine reserve this will reduce access to the rock platform from the south and east.	The section contains sensitive information that cannot be released to the public. A full description of Little Penguin Habitat is in the complete BDAR.	This proposal includes replacing the human made structures; stairs up the cliff and stairs in the pool, existing sea pool, pump box and concrete platform and addition of a day bed. The extent of the impact is not considered sufficient to warrant additional credits. Recommendations to ameliorate impacts are made at the end of this report.
Impact to Non-native vegetation	There is scattered weeds and exotic plants on the property.	Little Penguin and Long-nosed Bandicoot	There is scattered weeds but they do not form a cover that is suitable habitat or shelter for penguins or bandicoots.	N/A	N/A	The weedy and exotic vegetation on the site is not suitable habitat for Little Penguins and Long-nosed Bandicoots.
Changes to Hydrological processes sustaining/interacting with rivers, streams or wetlands	There is no rivers, streams or wetlands on the site. The site is subject to tides and wave action.	Little Penguin and Fur Seal	Little Penguins and Fur Seals use adjoining marine habitat as part of a large area of foraging habitat.	The existing rock platform will be refurbished as part of the proposal, the platform will be raised approximately 500mm and the south and east walls of the pool will be removed and rebuilt. The pool will no longer be tidal and wave action will be greatly reduced for the whole construction footprint due to raised levels.	The pool will no longer be tidal and wave action will be greatly reduced for the whole construction footprint due to raised levels. The changes to the concrete platform and pool are not likely to effect the suitability of foraging habitat for Little Penguins and Fur Seals.	This proposal will not result in this Prescribed Impact. No additional credits are recommended for this Prescribed Impact. Recommendations to ameliorate impacts are made at the end of this report.

Potential Prescribed Impact	Prescribed Impact Feature on this Site	Threatened Species Potentially using this Habitat	Importance of the Habitat	Nature, Extent and Duration of Impacts	Prediction of Consequences of Impact	Conclusion and Recommendation regarding Prescribed Impact
Impact to Water bodies and water quality	The large marine area of North Harbour is immediately adjacent to the east.	Little Penguin and Australian Fur Seal	The adjacent Manly Cove Reserve is a small part of a large foraging habitat for the Little Penguin and Fur Seal. The demolition and construction of the concrete walls and platform could potentially impact the water quality in the marine reserve.	Due to the close proximity to the adjacent marine environment there is a possibility of pollution entering Manly Cove Reserve during demolition and construction. The amount of sediment is likely to be small in comparison with the extent of the native habitat in the vicinity. Sediment is likely to be dispersed quickly. Recommendations to remove any sediment using a wetvac are made in this report.	It is recommended in this report that a wetvac is used to remove any slurry or concrete debris during demolition and construction to reduce impact. There is to be no overnight storage of material at the site.	This proposal may result in pollution to the adjacent foraging habitat. Recommendations to prevent impacts are made at the end of this report. If the recommendations are followed then no additional credits are recommended for this Prescribed Impact.
Wind farm development	N/A	N/A	N/A	N/A	N/A	N/A
Impact to Connectivity	Connectivity into and through the site.	Long-nosed Bandicoot, Little Penguin and Fur Seals	The site is currently accessed by Little Penguins and Fur Seals from the marine reserve adjacent to the site. Access across the tops of the site is not likely to be affected for the Little Penguin and Long-nosed Bandicoot.	The proposal will raise the height of the concrete platform and rebuild the pool, this will reduce access to the south and east of the site for Little penguins and Fur Seals.	The proposal will reduce the access for Little Penguins and Fur Seals from the south and east, the site will still be accessible from the north. Access to the top of the site will not change as part of the proposal.	This proposal will reduce access but access to all areas of habitat will be maintained. The extent of the impact is not considered sufficient to warrant additional credits. Recommendations to ameliorate impacts are made at the end of this report.
Migration Interruption	The site is not likely to be important habitat for any migratory species.	N/A	N/A	N/A	N/A	N/A
Vehicle strikes (Road Proposals)	Vehicle strikes due to cars and construction vehicles.	Long-nosed Bandicoot	Bandicoots have been known to shelter under and next to the wheels of vehicles.	During construction there will be an increased number of vehicles accessing the site (e.g. Concrete truck).	We recommend to check under cars before driving off (particularly at dawn and dusk).	This proposal may result in increased traffic. Recommendations to prevent impacts are made at the end of this report. If the recommendations are followed then no additional credits are recommended for this Prescribed Impact.
Other						
Other - Intensification of human use of the site	The DA proposal aims to refurbish facilities for human recreational use of the foreshore area which aims to increase use od foreshore.	Little Penguin	The section contains sensitive information that cannot be released to the public. A full description of Little Penguin Habitat is in the complete BDAR	the DA proposal aims to refurbish facilities for human recreational use of the foreshore area. The refurbishment of the pool surrounds including daybed is likely to increase the use for humans in this part of the site.	Little Penguins in the Manly area occur in a very urbanized setting, interaction with humans is common and is not likely to affect the suitability of habitat. Signs will be permanently present of the fence at the top of the stairs to exclude dogs and cats from the foreshore area.	This proposal may result in increased human use. Recommendations to prevent impacts are made at the end of this report. If the recommendations are followed then no additional credits are recommended for this Prescribed Impact.
Other - Vibration and Noise During Construction	The demolition of existing pool and stairs will require use of angle grinders and pneumatic hammers	Little Penguin	The section contains sensitive information that cannot be released to the public. A full description of Little Penguin Habitat is in the complete BDAR	This impact will only occur during demolition which will be at the beginning of construction and will only last two weeks. This report recommends that the demolition not occur during breeding and malting season (1st July to 28th Feb) and a search should be conducted daily, prior to works.	As long as the recommendations that there be no demolition or construction during penguin breeding and malting season (1st July to 28th Feb) and when penguins are present on the site.	This proposal will cause noise and vibration. Recommendations to prevent impacts are made at the end of this report. If the recommendations are followed then no additional credits are recommended for this Prescribed Impact.



Cliff, Crevices and Rock Platform
Scattered Rocks
Human Made Structures
Water Bodies
Connectivity existing and retained
Conectivity existing and loss

Legend

- Property
- Existing
- Proposal

Figure 5.1
Perscribed Impacts

GIS Environmental Consultants
Ph: (02) 9939 5129, Mobile: 0419 438 672
ecology@ecology.net.au, ecology.net.au

by Nicholas Skelton

Date: 18/03/2019

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6 Impact Summary

6.1 Potential SAII Serious And Irreversible Impacts

A guide to assist a decision-maker to determine a serious and irreversible impact (OEH Aug 2017) lists 5 steps to determine whether an impact is classified as a potential Serious and Irreversible Impact (SAII).

Step 1. Identify the Potential Entities (Threatened Species and Ecological Communities) relevant to this proposal

Potential SAII entities are species or ecological communities that meet the criteria in Appendix 1 of the guide. Appendix 2 of the guide lists some potential entities that are considered to meet the criteria.

The listed SAII entities in Appendix 2 of the guidelines, that are relevant to this development are:

- Large Eared Pied Bat (breeding habitat)

When the four Principles in Appendix 1 are applied the following entities are also relevant to the proposal. Note: only one of the four Principles needs to be met for the species to be an SAII entity.

- **Little Penguin Endangered population at Manly- The Little Penguins at Manly are considered to meet Principles 2 and 3**. The Little Penguins at Manly are listed as an Endangered species population in Schedule 1 of the BC Act.
- Principle 2- species with a very small population size are those that have;
  fewer than 50 mature individuals independent of whether there are any threats, or
  fewer than 250 mature individuals and the species has an observed, estimated or projected continuing decline:
  o of at least 25% in three years or one generation (whichever is longer) OR
  o where the number of mature individuals in each subpopulation is <50 OR
  o the percentage of mature individuals in one subpopulation is 90-100% OR
  o the population is subject to extreme fluctuations in the number of individuals (IUCN 2017).

Information withheld due to sensitivity of the species

- Principle 3- Species with a limited geographic distribution are those that;
  have an area of occupancy (sensu IUCN 2017) of ≤10 km2, or
  have an extent of occurrence (sensu IUCN 2017) of ≤100 km2, and
  have at least two of the following three conditions:
  o are severely fragmented or only known from one location
  o continuing decline
  o extreme fluctuations OR
  inhabit less than or equal to three locations in New South Wales.

Information withheld due to sensitivity of the species

Step 2. Evaluate the nature of Impact on a Potential Entity

These are potential residual impacts on Potential Entities after steps have been taken to avoid and mitigate impact.

- Impact to <100m^2 of potential Large Eared Pied Bat roosting habitat, but no breeding habitat.
- Principal considered to be met. Information withheld due to sensitivity of the species

Step 3. Determine if Impacts Exceed Threshold

Impact assessment information from steps 1 and 2 can be compared to the impact threshold for the SAII entity. Impact thresholds are for potential SAII entities are in the Threatened Biodiversity Data Collection (not yet available).

- The proposal will not impact Large Eared Pied Bat breeding habitat and is therefore not considered to be an SAII for this entity.

- There is no impact threshold for Little Penguins. If the recommendations (including no works in breeding season) are followed it is considered that the proposal will not be an SAII for Little Penguins.
- Principal considered to be met.

Steps 4 and 5 *are for the decision-maker to decide whether they consider the potential SAII to be a SAII and the steps required to be undertaken once that decision has been reached.*

6.2 Summary of Impacts Requiring Offset by the BAM Calculator

The BAM calculator does not require any offset credits or payments. See section 6.3 below for impacts not requiring offsetting and justifications.

6.3 Summary of Impacts Not Requiring Offsetting by the BAM Calculator

6.3.1 Ecosystem Credits

Impacts that do not require offsetting include parts of the site that have native vegetation but the integrity score is less than the following minimum requirements;

- An integrity score of 15 where the PCT is representative of an Endangered or Critically Endangered Ecological Community
- An integrity score of 17 if the PCT is associated with Threatened species habitat (for ecosystem credit species) or is representative of a Vulnerable Ecological Community.
- An integrity score of 20 if the PCT is not representative of a TEC or Threatened species habitat.

The vegetation zone in the Development Footprint has an integrity score of less than the minimum requirement 17 for a PCT that is Threatened species habitat. There is also no change in integrity score therefore, no ecosystem credits or payments are required.

Table 15. Summary of Impacts to Vegetation, Ecosystem Credits and Payments

PCT	Vegetation Zone	Existing Integrity Score	Management Zone	Area of Zone	Future Integrity Score	Credits Required	Price
1778	1-Foreshore	6	N/A	0.01ha	6 (no impact)	0	$0

The justification for future integrity scores

Vegetation Zone 1- Foreshore

The area of vegetation on the site is less than 100m^2. However, an area of 100m^2 was chosen for the vegetation zone as this the minimum area that can be entered into the calculator (without putting in 0). The plot used to determine vegetation integrity for this Zone 1, was mostly outside of the Development Site and Vegetation Zone.

The integrity score for Zone 1 will not change, as the proposal will not remove any native vegetation. Only three local native species were recorded in the plot, and these were all located outside of the Development Footprint. The proposal will not remove any vegetation but will impact the cliff and rocky foreshore that are both assessed as Prescribed Impacts (See Table 14).

The integrity scores were adjusted by an ecologist with 25 years of experience, including experience in this vegetation type and this type of development.

6.3.2 Species Credits

There are two Threatened species and two Endangered population that were observed or assumed present at Development Site.

- The proposal will impact less than 10m^2 of potential roosting habitat on the cliff for Southern Myotis and Large Eared Pied Bat. An area of 0.01ha (100m^2) was put as the area of impact for these species as this is the minimum amount that can be entered in the calculator (besides 0).
- There is Long-nosed Bandicoot foraging habitat within the Vegetation Zone above the cliff; however, the proposal will not impact this habitat. The cliff and rocky foreshore is low-value

bandicoot habitat. An area of 0.01ha (100m^2) was put as the area of impact for these species as this is the minimum amount that can be entered in the calculator.

- The proposal will impact less than 100m^2 of Little Penguin habitat that is mostly outside of the Vegetation Zone (see Prescribed Impacts Table 14 and section 6.4 below). An area of 0.01ha (100m^2) was entered in the calculator for the impact to Little Penguins.

Due to the small areas of impact and the low vegetation integrity score of the Vegetation Zone, **the BAM calculator did not produce any credits or subsequent prices for these species**.

Table 16. Summary of Impacts Species Credits and Payments

Species Credit Species	Associated Vegetation Zone	Total Area of Impact or Count	Credits Required	Price
Large-eared Pied Bat	Zone 1	0.01ha	0	$0
Southern Myotis	Zone 1	0.01ha	0	$0
Long-nosed Bandicoot Endangered population on North Head	Zone 1	0.01ha	0	$0
Little Penguin Endangered population at Manly	Zone 1	0.01ha	0	$0

6.4 Summary of Prescribed Impacts and other additional Impacts that are not Offset

When assessing DAs that may impact Little Penguins it is important to adequately address the Prescribed Impacts and the appropriate sections of the BC Act and Regulations when determining an application and if necessary to determine if additional credits should be added and appropriate conditions of consent.

The majority of the Development Site to be impacted in comprised of the rocky foreshore, human-made structures, waterbody and cliff habitat that is not assessed in the BAM calculator but in the Prescribed Impact section of the Biodiversity Assessment Method. These Prescribed Impact features are habitat for several Threatened species and an Area of Outstanding Biodiversity Value for the Endangered population of Little Penguins in Manly.

The assessment of **Prescribed Impacts** and conclusion to Prescribed Impacts are in Table 14 of this report.

6.5 Environment Protection and Biodiversity Conservation Act 1999

The Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) would only be relevant if the proposal was to be or impact a Matter of National Environmental Significance (MNES), thus triggering referral to the Federal Department of the Environment and Water Resources.

A Protected Matters search was conducted within a 10km radius of the site. A Protected Matters search is a broad scale assessment that includes World Heritage Properties, National Heritage Places, Wetlands of International Importance, Great Barrier Reef Marine Park, Commonwealth Marine Areas, Listed Threatened Ecological communities, Listed Threatened Species and Listed Migratory Species. The only relevant categories to this report are Threatened species, Threatened Ecological Communities and Migratory species.

The report lists the following ecologically relevant items:

- 5 Threatened Ecological Communities
- 73 Threatened species
- 56 Migratory Species

Most of the migratory and aquatic bird species, as well as the fish, sharks and marine mammals are not assessed in this report. This report addresses terrestrial species, which are likely to have potential habitat on the site.

The EPBC Act Threatened species that have potential habitat onsite have been assessed under BC Act criteria in this Flora and Fauna Impact Assessment report. The assessments concluded that no significant impacts are likely to occur to those species as a result of the proposal and a similar conclusion was also reached after consideration of the Commonwealth criteria. The vegetation on the site does not meet the definition of any EEC under the EPBC Act.

It is recommended that this proposal (see Figure 6) does not need to be referred to Environment Australia.

7 Conclusions

The proposed development is for replacement sea pool, access stairs and concrete decking at the rear of 16 Addison Road, Manly and the adjacent foreshore (see Figures 1.4 and 1.5).

The existing rocky foreshore, human-made structures and cliff provide habitat to the Endangered population of Little Penguins in Manly and potential habitat for other Threatened species including the Southern Myotis and Large Eared Pied Bat. The foreshore is low-value habitat for the Endangered population of Long-nosed Bandicoots.

The BAM calculator did not produce any credits or subsequent costs for this proposal as no native vegetation will be removed and the area of impact is small (<100m^2).

The impacts to these habitat features as well as indirect impacts to Threatened species such as increased sediment in the adjacent harbour, increase human use and noise and vibrations produced during construction were assessed as Prescribed Impacts in Table 14 of this report. The Prescribed Impact table assess the need for addition of biodiversity credits or conditions of consent to offset or minimise prescribed impacts. No additional biodiversity credits are recommended for this proposal if impacts are further avoided and minimised through the ameliorative conditions in this report which are to be made into appropriate conditions of consent.

The proposal is not considered to have a Serious And Irreversible Impact to the relevant SAII entities that are Large Eared Pied Bat and Little Penguins at Manly.

Stage 3. Ameliorative Conditions & Recommendations

7.2 During Construction and Planning

- If the plans change from what is described in this report or what is shown on Figure 1.4 and 1.5 then this report may need reviewing.
- **Sediment control barriers and a pollution control device/trap** are to be used **during the entire duration of construction** to prevent sediment, pollutants and other building waste from leaving the site and entering the adjacent North Harbour Marine Reserve.
- All **construction works** below the top of the cliff must be undertaken during the **non-breeding** period of Little Penguins (**1st March to 31st May**). All **works beyond the cliff top** can only occur between the hours of **10am and 4pm**. Outside these times there should be no access to the foreshore for construction workers. Dogs are not allowed access to the foreshore at any time during construction. Dogs and other companion animals are restricted from the Little Penguin declared AOBV under section 3.4 of the Biodiversity Conservation Regulation 2017 with fines of up to $5,500.
- Prior to **commencement of works** below the cliff top an **ecologist** is to certify to Council that there is **no nesting or moulting penguins** on this or the immediately adjacent properties. Regardless of the time of the year all works beyond the cliff top cannot commence if penguins are found to occur or there is evidence of recent use of the site.
- **Noise and vibration** from demolition, pool refurbishment and rock excavation may discourage penguin occupation of this and adjacent sites. Normal construction hours are to be adhered to, with no machinery to be used outside the hours of 7:30am and 4:30pm.
- During works below the clifftop (i.e. on the foreshore) a **wet vac** is to be used to immediately remove any slurry, sand, grit, liquids, paint etc. produced by works below the cliff-top. All sediment or pollutants are to be vacuumed up before high tide every day. The wet vac is to be on the foreshore and functional when any work is being carried out including refurbishment and painting of the sea pool.
- There is to be **no overnight storing, stockpiling or preparation of materials below the cliff.** To prevent pollutants being swept into the marine reserve by tides or wave action.
- A **self-closing gate** is to be installed mid-way down the rear yard (see Map 1) to prevent dogs and foxes from entering the cliff-face and foreshore Critical Habitat areas and to assist with compliance with existing restrictions on use of this area. The gate is to have a gap a minimum of 100 mm for the full length of the gate to allow penguin and bandicoot access.
- All scattered rocks in the Development Footprint are to be retained on the site.
- Access to the potential Little Penguin nest site behind the existing stairs (see Photo Page 2) is to be maintained.
- To avoid direct physical harm to Long-nosed Bandicoots and Little Penguins, all workers on the site are to be made aware of the possible presence and conservation significance and the precautions needed to be taken. All workers on the work site are to be made aware of the potential presence of Long-nosed Bandicoots and Little Penguins through the site induction. All workers are to be inducted prior to commencement of their works. Evidence of the site induction is to be documented.
- The Construction Management Plan is to include information about: the conservation significance of this endangered population, their potential activities on-site, identification and the measures in place on-site to be implemented for their protection, fines and penalties that apply.
- To assist with compliance with existing restrictions on use, an A5 size **sign** is to be permanently fixed to the railing at the top of the spiral stairs to inform users of the requirements of the National Parks and Wildlife Regulation 2009 and the Biodiversity Conservation Regulation 2017. The

wording is to be: The area below the cliff top is a declared Area of Outstanding Biodiversity Value for threatened penguins**:** • No dogs or other companion animals are allowed below the cliff top. • No Fishing is permitted below the cliff top between sunset and sunrise during the Little Penguin breeding season (July 1 to 28 February). • Penguins must not be approached within 5m • No lights are to shine on to penguins • Penguins and their nests must not be interfered with.

- **Bright lighting** and light spill is likely to discourage penguin and bandicoot use of the site and may confuse penguins returning to nests. No bright lighting or motion detectors are to be installed to illuminate the foreshore area. A modest amount of temporary low lighting on the stairs may be allowable for safety purposes. There is to be no lighting or power outlets below the cliff face.

7.2.1 Long-term Management Strategies

Long term Management "Best Practice" Recommendations for after completion of the construction works.

- On-going maintenance in the area below the cliff top is subject to restrictions and may need a **license** from OEH or **approval** by Council.
- Cats carry the disease toxoplasmosis that can be transferred to bandicoots and penguins by a scratch. The disease is not dangerous to cats but it is fatal to native fauna. Cats should not be kept on this ecologically sensitive property.
- It is essential that injured bandicoots and penguins be given expert care in order that they can be rehabilitated and returned to the population where possible. It is also important that any deceased bandicoots are reported, so that appropriate investigations can be undertaken to understand the cause of death to inform the future management and recovery of the endangered populations. Any **injured or dead Long-nosed Bandicoots or Little Penguins** should be reported by phoning Northern Beaches Council on 9976 1500 or Office of the Environment and Heritage (OEH) on 122 555.
- The Companion Animals Act 1998 requires that dog and cat owners ensure that their cat or dog does not threaten or harm a person or animals. Domestic cats and dogs should be kept indoors from dusk to dawn to prevent harm to bandicoots and penguins in this ecologically sensitive area. Cats should only be allowed outside if in a sealed cat run. Example solutions can be seen at these internet addresses:

  http://www.catnip.com.au/design_ideas.html
  http://www.catnets.com.au/
  http://www.catcagesaustralia.com.au/gallery/index.html
  http://www.cat-world.com.au/cat-worldenclosures.htm
  http://www.catmax.com.au/photo-gallery.php

- Dog owners must take all reasonable precautions to prevent your dog from escaping from the property on which it is being kept. The fine is $880. Dogs and other companion animals are restricted from the Little Penguin declared AOBV under section 3.4 of the Biodiversity Conservation Regulation 2017 with fines of up to $5,500.
- **Cats should be kept indoors at night,** as there are benefits to both the cat and the community. Yowling and fighting is more of a problem at night. The noise is likely to be intrusive and may keep your neighbours awake. Keeping your cat indoors at night is recommended in the interests of both your cat's safety and community harmony. Many kinds of native wildlife are more active or more vulnerable to hunting at night. There is also evidence that cats hunt more during the night. By keeping your cat indoors, you can help reduce the number of native birds and animals that are killed in your area. Kittens can quickly become accustomed to staying indoors at night. Consider also containing your cat in a cat enclosure on your premises both during the day and during the night. Council Rangers can issue nuisance orders to cat owners.
- Modest, low external lighting in the garden should be used at the minimum level required for safety. There are to be no lights directed onto the foreshore.

- Landscaping watering and additional cover in the form of planting low, dense vegetation will increase the value of the foraging habitat and help prevent the local populations of native animals becoming extinct.
- Bandicoots and other native animals should **not be fed artificial foods** as it may cause them nutritional problems and may increase predation.
- Feral animals including cats and/or foxes should never be fed, nor should food be left out where they can access it, such as rubbish bins without lids, or in pet food bowls, as these animals present a significant threat to Long-nosed Bandicoots and other wildlife.
- The use of insecticides, fertiliser, poisons and/or baits should be avoided on the property.
- Please drive carefully as vehicle related injuries and deaths of bandicoots regularly occur in the area.
- Care should be taken when driving in the area, especially at night as bandicoots have little road sense.
- Dead bandicoots and penguins should be reported by phoning Northern Beaches Council (Manly) on 9976 1500 or the Local National Parks and Wildlife Service on 9977 6732.
- Report all sightings of feral rabbits, feral or stray cats and/or foxes to Northern Beaches Council.

8 References

Australian Standard 4970 – 2009 Protection of Trees on Development Sites

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9 Appendices

9.1 Appendix A: 5-part Tests of Significance

These Tests of Significance are in accordance with the Threatened Species Assessment Guidelines recommended for use by Manly Development Control Plan 2013 (MDCP 2013) in section 2.1.15.2 (a).

Information withheld due to sensitivity of this species. A 5-part test of significance is available in the complete version of the BDAR report that is not available for public release due to the sensitivity of this information.