Scarborough Park Courts

Review of Environmental Factors

Bayside Council

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DOCUMENT TRACKING

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Template 2.8.1

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Abbreviations

Abbreviation	Description
AASS	Actual Acid Sulfate Soils
ACM	Asbestos Containing Material
AHD	Australian Height Datum
AHIMS	Aboriginal Heritage Information Management System
AHIP	Aboriginal Heritage Impact Permit
AS2021	Australian Standard AS2021-2015 – '*Acoustics – Aircraft Noise Intrusion – Building Siting and Construction*'
ASS	Acid Sulfate Soils
ASSMP	Acid Sulfate Soils Management Plan
BAM	Biodiversity Assessment Method
BC Act	*Biodiversity Conservation Act 2016*
BDAR	Biodiversity Development Assessment Report
Biosecurity Act	*Biosecurity Act 2015*
CAA	Controlled Activity Approval
CBD	Central Business District
CEMP	Construction Environmental Management Plan
CHL	Commonwealth Heritage List
CoPC	Contaminants of Potential Concern
CPTED	Crime Prevention Through Environmental Design
DAWE	Department of Agriculture, Water and Environment
DBYD	Dial Before You Dig
DECC	Department of Environment and Climate Change
DLWC	Department Land and Water Conservation
DPI	Department of Primary Industries
Eastern Harbour City SEPP	*State Environmental Planning Policy (Eastern Harbour City) 2021*
EC	Electrical Conductivity
ELA	Eco Logical Australia
EP&A Act	*Environmental Planning and Assessment Act 1979*
EP&A Regulation	*Environmental Planning & Assessment Regulation 202*1
EPA	Environment Protection Authority
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPL	Environmental Protection License
FM Act	*Fisheries Management Act 1994*
GGBFMP	Green and Golden Bell Frog Management Plan

Abbreviation	Description
Heritage Act	*Heritage Act 1977*
ICNG	Interim Construction Noise Guidelines
KFH	Key Fish Habitat
Koala Habitat Protection SEPP	*State Environmental Planning Policy (Koala Habitat Protection) 2021*
KTP	Key Threatening Process
LEP	Local Environmental Plan
LGA	Local Government Area
LTSMP	Long-Term Site Management Plan
MNES	Matters of National Environmental Significance
MUSIC	Model for Urban Stormwater Improvement Conceptualisation
NHL	National Heritage List
NorBE	Neutral or Beneficial Effects
NPfI	Noise Policy for Industry
NPW Act	*National Parks and Wildlife Act 1974*
NPWS	National Parks and Wildlife Service
NRAR	Natural Resources Access Regulator
NSW	New South Wales
OCP	Organochlorine pesticides
OPP	Organophosphorus pesticides
PACM	Potential Asbestos Containing Material
PAH	Polycyclic aromatic hydrocarbons
PASS	Potential Acid Sulfate Soils
PCT	Plant Community Type
POEO Act	*Protection of the Environment Operations Act 1997*
PPE	Personal Protective Equipment
RAP	Remediation Action Plan
RBL	Rating Background Levels
REF	Review of Environmental Factors
Resilience and Hazards SEPP	*State Environmental Planning Policy (Resilience and Hazards) 2021*
RNP	Road Noise Policy
RSWMP	Regional Strategic Weed Management Plan
SAC	Site Assessment Criteria
SDS	Safety Data Sheet
SEMP	Sediment Erosion Management Plan
SEPP	State Environmental Planning Policy
SHI	State Heritage Inventory

Abbreviation	Description
SHR	State Heritage Register
SIS	Species Impact Statement
TCP	Traffic Control Plan
TEC	Threatened Ecological Community
TfNSW	Transport for NSW
TISEPP	*State Environmental Planning Policy (Transport and Infrastructure) 2021*
VOC	Volatile Organic Compounds
vph	Vehicles per hour
WEMP	Wetlands Environmental Management Plan
WHL	World Heritage List
WIRES	NSW Wildlife Information, Rescue and Education Service Inc
WM Act	*Water Management Act 2000*
WoNS	Weeds of National Significance

Scarborough Park Courts
Image: Eco Logical Australia, 2022

Executive Summary

The proposed Scarborough Park Courts upgrade will deliver a positive community benefit by updating the courts to meet community needs and improving access to a safe and enjoyable outdoor recreation asset. 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 Bayside Council to support the approval of the Project. Bayside Council will 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?

Bayside Council is proposing a redevelopment of the Scarborough Park Courts, located at 7 Hawthorn Street, Ramsgate NSW. Built in 1972, the site contains six existing lawn tennis courts which are in a currently neglected state due to littering, vandalism, and age. The works aim to provide an updated

accessible, safe and energy efficient recreational asset that meets the needs of the community. It will expand opportunity within the Bayside Council local government area (LGA) for locals to be physically and socially active, improving health outcomes and enhancing liveability throughout the LGA.

The proposed upgrades proposed will consist of six upgraded mix use courts, energy efficient lighting, updated items such as nets, posts, kerbs, and drainage. New wayfinding and appropriate lighting will be installed, and the players huts are proposed to be upgraded. An access path from disabled parking to the courts will also be included. Furthermore, the courts will serve multiple purposes and allow sports such as tennis, basketball, volleyball, and futsal to be played.

The works support several strategic plans for the Bayside LGA, including the local strategic plan Future Bayside (Bayside Council, 2020), by providing social infrastructure, protection of the health of waterways and biodiversity and to deliver high quality open space. On a broader scale, the works support the Greater Sydney Commission's goals under the Eastern City District Plan (2018) which aim to increase liveability and promote sustainability.

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, Bayside 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 Section 6.1.

Assessment of Impacts

LANDFORM, GEOLOGY, SOILS AND CONTAMINATION

A Geotechnical Investigation Report was undertaken by ADE Consulting Group (2021), which concluded that besides the construction of the courts, the study area (area assessed to prepare this REF) has maintained limited disturbance and contamination resulting from the continuous land use of the surrounding Scarborough Park as parklands. Construction of the proposed works would involve disturbing the ground surface and subsurface, however contact with contaminated soils is not anticipated. Soil samples indicated largely sandy soils underlying the existing tennis courts. The potential for significant contamination at this site is low.

WATERWAYS, WETLANDS AND AQUATIC HABITAT

The study area is a mapped Coastal Wetlands Proximity Area under the *State Environmental Planning Policy (Resilience and Hazards) 2021*. To determine the impact of the proposal on the coastal wetland a Model for Urban Stormwater Improvement Conceptualisation (MUSIC) modelling was undertaken by ELA (2022). The MUSIC modelling assesses the potential contaminants and nutrients in runoff, comparing the existing environment against the post construction of the proposal environment. The assessment concluded that a neutral or beneficial effect on water quality from the proposal will be

achieved. Flows leaving the site post-construction will have contain less contaminant load than pre-development.

BIODIVERSITY

A Flora and Fauna Assessment was undertaken by ELA in May 2022, which identified the study area as both native vegetation and planted native and exotic vegetation. A total of 0.96 ha of vegetation within the study area corresponds to the following Plant Community Types:

- *PCT 1232 - Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion* (Coastal Freshwater Swamp Forest)
- *PCT 1793 - Smooth-barked Apple - Bangalay / Tuckeroo - Cheese Tree open forest on coastal sands of the Sydney basin* (Coastal Sand Bangalay Forest)

The above communities conformed to Threatened Ecological Communities (TECs) listed under the *Biodiversity Conservation Act 2016* (BC Act):

- *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*
- *Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions*

Test of significance consistent with Section 7.3 of the BC Act were undertaken for the above TECs and the following threatened species:

- *Syzygium paniculatum* (Magenta Lilly Pilly)
- *Botaurus poiciloptilus* (Australasian Bittern)
- *Epthianura albifrons* (White-fronted Chat)
- Glossopsitta pusilla (Little Lorikeet)
- Ixobrychus flavicollis (Black Bittern)
- *Pteropus poliocephalus* (Grey-headed Flying-fox)

In addition, Assessments of Significance consistent with the *Environment Protection Biodiversity Conservation Act 1999* (EPBC Act) were undertaken for the following threatened ecological communities and threatened species:

- *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland*
- *Syzygium paniculatum (Magenta Lilly Pilly)*
- Pteropus poliocephalus (Grey-headed Flying-fox)

The assessments all concluded that the proposed works are unlikely to have a significant impact on these species and communities, as only a small amount of groundcover on the edge of the communities are to be impacted by the proposal and there is a large patch of alternative habitat to be retained within and adjacent to the study area.

ABORIGINAL HERITAGE

A search of the Aboriginal Heritage Information Management System (AHIMS) resulted in the identification of 35 Aboriginal sites within the vicinity of the study area. No sites have previously been recorded as being within the study area. An Aboriginal Due Diligence Assessment was undertaken by ELA, which did not identify any new Aboriginal objects or areas of potential. The visual inspection revealed that the entirety of the study area had previously been disturbed due to the construction of the courts, indicating a low likelihood for Aboriginal objects to be impacted by the proposed works.

HISTORIC HERITAGE

A Statement of Heritage Impact (SoHI) was undertaken by ELA (Appendix E). One local heritage item, 'Hawthorne Street Reserve/Leo Smith Reserve' is listed on the Bayside Local Environment Plan *2021* (Bayside LEP) (Item no. I339) as being located immediately adjacent to the study area. Its significance lies in its representation of the Kurnell Dune Forest, considered of high conservation value and with limited areas remaining throughout the Sydney region. It also provides an example of the landscape prior to 19th century settlement. A site inspection identified that the tennis courts are not located within the curtilage of the heritage item and the heritage item will not be impacted by the proposed works.

Evaluation

Overall, the identified potential environmental impacts associated with the proposed works can be adequately managed provided the design recommendations and mitigation measures outlined within this REF are adhered to.

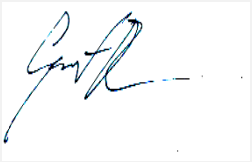
The proposal has been underpinned by principles to avoid and minimise environmental impacts where possible and has been developed through an iterative design and comprehensive assessment approach. This approach has resulted in significant environmental improvements and outcomes as described in the REF.

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 works aim to provide an updated accessible, safe and energy efficient recreational asset that meets the needs of the community. 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. As such, the Project is in the public interest, providing many benefits to the Bayside community.

Determination

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.

Project Name	Scarborough Park Court Upgrade
Project Director Rebecca Ben-Haim Eco Logical Australia Level 3, 101 Sussex Street, Sydney 2000 Ph: 02 9259 3745	 Date: 28 September 2022
Project Manager Geraint Breese Eco Logical Australia Level 3, 101 Sussex Street, Sydney 2000 Ph: 02 9259 3754	 Date: 28 September 2022

1. Introduction

Eco Logical Australia Pty Ltd (ELA) was engaged by Bayside Council to prepare a Review of Environmental Factors (REF) for the proposed upgrade of Scarborough Park Courts, Ramsgate. The upgrade is proposed to provide the growing populations of Kogarah, Ramsgate Beach, and San Souci access to recreational sports courts, including organised sport, as well as upgraded facilities to the park for family outings, bird watching, and environmental education opportunities through upgrades to pathways and disabled parking.

The works have been assessed under Part 5 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) with Bayside 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 Council's policies and procedures.

As part of this assessment, the following studies were undertaken by ELA and other consultants. The findings of such studies have been incorporated into this REF:

- Geotechnical Investigation (ADE Consulting Group, 2021 – Appendix B)
- Preliminary Site Investigation (Geotechnique, 2022 - Appendix C)
- Flora and Fauna Assessment (ELA, 2022 – contained in Section 3.3, assessment tables provided in Appendix D)
- Neutral or Beneficial Effects Assessment (NorBE) (ELA, 2022 - contained in Section 3.2 Appendix G)
- Aboriginal Due Diligence Assessment (ELA, 2022 – contained in Section 3.4, search results provided in Appendix E)
- Statement of Heritage Impact (SoHI) (ELA, 2022 – Appendix F)
- Arboricultural Impact Assessment (Bellevue Tree Consultants, 2022 – Appendix G)

1.1 Project Description and Background

Scarborough Park is a large open space recreation area within the suburb of Ramsgate in the Bayside Council Local Government Area (LGA). Scarborough Park hosts a diverse range of sporting activities including football (soccer), cricket, rugby league, AFL, oz tag, baseball, tennis, archery, athletics, as well as providing passive recreation opportunities such as walking, cycling, picnicking and play spaces. The park is part of an ecological corridor connecting vegetation communities across the LGA.

The Scarborough Park courts have historically been leased and operated by a private tenant. The last lease expired in 2020, and since that time the condition of the facility has become unusable The degradation of the courts includes algae slime and dirt build up, sections of baseline torn up and damages to perimeter fencing and players amenities. Furthermore, lighting and access require upgrading.

Bayside Council are proposing to upgrade the Scarborough Park Courts to enable use of these existing sporting facilities and ensure the future recreational use can be maximised through enhanced accessibility and multi-play surface types.

The proposed works include:

- Demolition of existing tennis courts, buildings, hardstands, and benches
- Site establishment works, including minor vegetation removal
- Removal of twelve (12) trees
- Construction of a new outdoor courts, consisting of:
    - Upgrading of the courts to a compliant acrylic hard court surface;
    - New player and spectator's shelters;
    - New compliant sports fencing;
    - New compliant LED sports lighting;
    - Accessible path from Hawthorne St parking to the courts;

1.2 Project Location and Context

The Scarborough Park Courts are located at 7 Hawthorne Street, Ramsgate to the southwest of Sydney Airport and approximately 20 km south of the Sydney Central Business District (CBD), located within the broader Scarborough Park extending between Barton Street to the north, Tonbridge Street in the south, and Scarborough Lane, Margaret Street in the west and Hawthorne Street and Chuter Avenue in the east (Figure 1-1). Ramsgate is a residential area within Bayside Council comprised of mostly low-density dwellings and some unit developments. The study area is 2.5 km from Carlton Train Station and 1.5 km to the foreshore of Cook Park in Ramsgate Beach

Scarborough Park has road access from Hawthorne Street connecting to Chuter Avenue via adjoining residential streets of Florence Street and Emmaline Street. The study area is serviced by a path that is well used by pedestrians using the surrounding parkland.

1.3 Land Use and Ownership

1.3.1 Land Use

The study area is subject to the Bayside Local Environmental Plan 2021 (Bayside LEP) and is wholly zoned RE1 Public Recreation (Figure 1-2). In accordance with Clause 11 of the LEP, the objectives of this zoning aim to:

a. enable land to be used for public open space or recreational purposes
b. provide a range of recreational settings and activities and compatible land uses
c. protect and enhance the natural environment for recreational purposes

1.3.2 Land Ownership

Scarborough Park is wholly located on Crown Land, with the Bayside Council managing the park areas as trustee. The study area is comprised of the land parcel, Lot 1 DP 1177511.

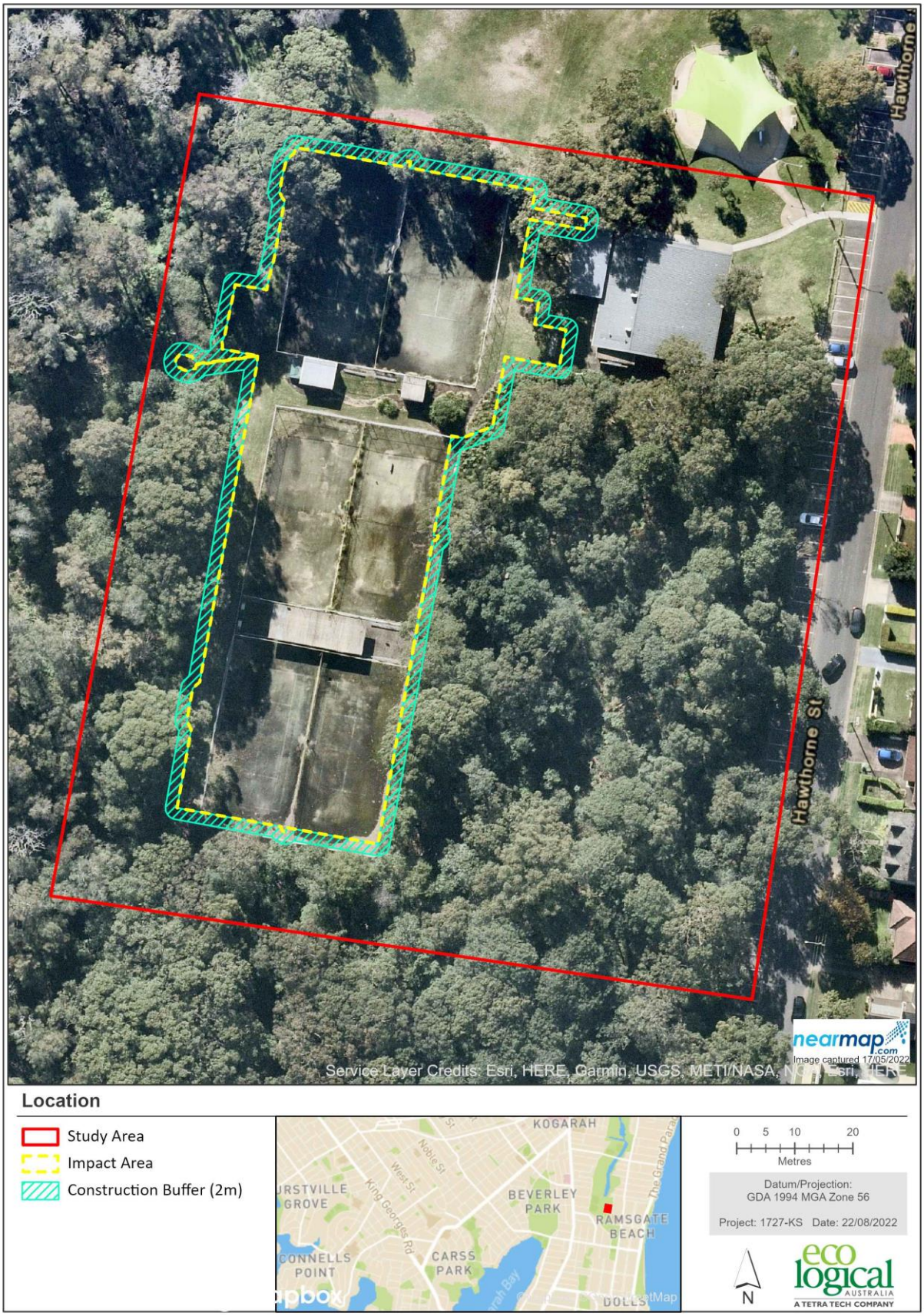


Figure 1-1: Location of Study Area

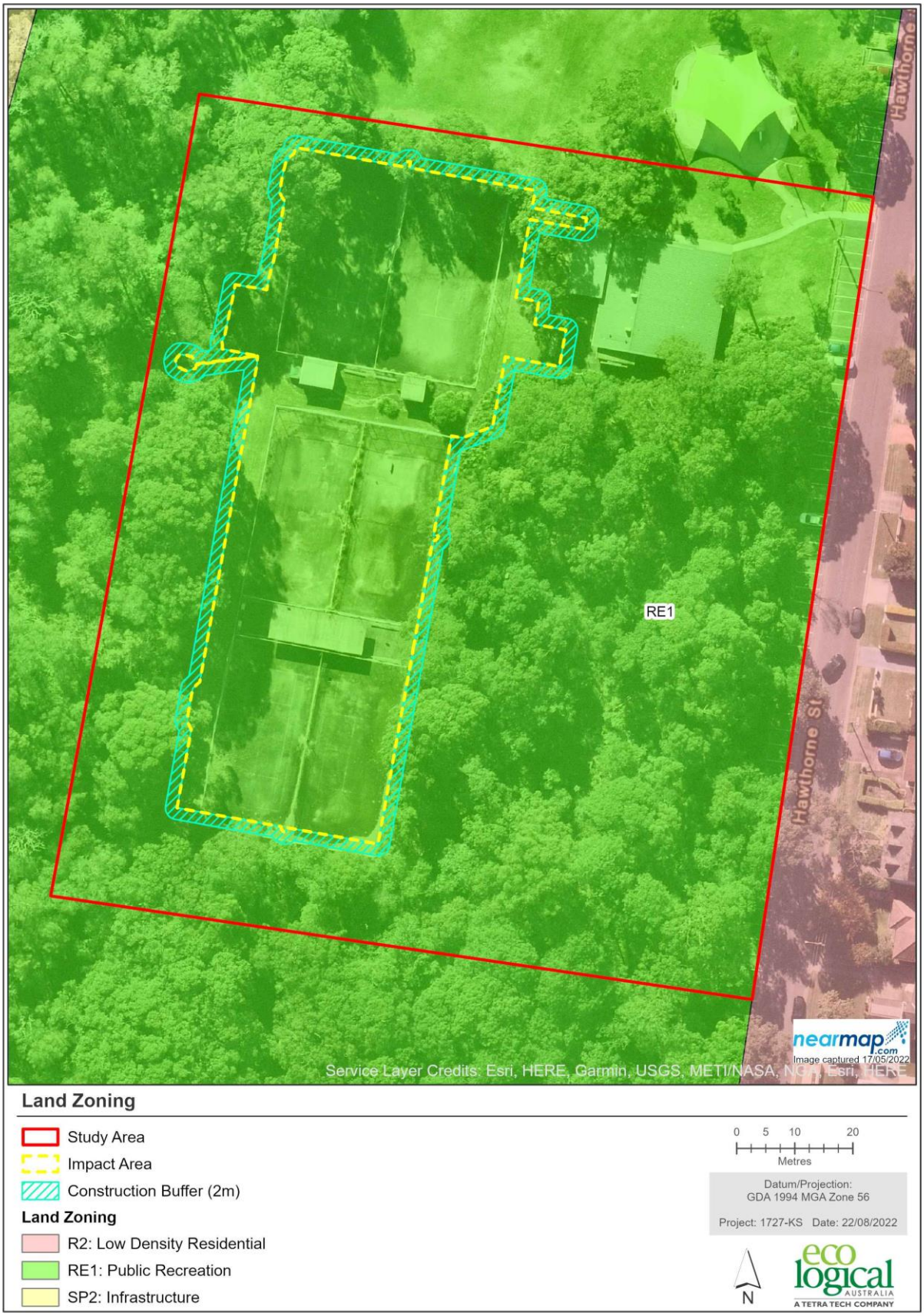


Figure 1-2: Land zoning (Bayside LEP)

1.4 Detailed Scope of Works

This section provides one possible construction method and is used as a guide to assess the impacts of the works. The actual construction methods and timing will be determined by the Contractor. The detailed Masterplan (CHRISP Consulting, 2022) can be found in Appendix A.

1.4.1 Site Set Up

- A Dial Before You Dig Assessment (DBYD) will be undertaken prior to any excavation or construction works to locate any service infrastructure present on site
- Transport of machinery, equipment and materials to the site and establishment of site storage and parking areas (likely existing park and street parking). No formal compound area is proposed at this stage however, for the purpose of this assessment it is assumed that one will be established within the existing cleared area to the north of the existing courts
- Installation of sediment and erosion protection measures in accordance with the 'Blue Book' Soils and Construction, Managing Urban Stormwater (Landcom, 2004) with reference to Chapter 5 'Erosion Control: Management of Water'
- Installation of protection and exclusion fencing around vegetation that is to be protected and to delineate area of works
- Installation of fencing to restrict pedestrian access and temporary court closure
- The shared path will be kept open for use temporarily until the new pathway is constructed

1.4.2 Demolition Work

The following demolition work is proposed:

- Removal of ancillary structures; nets, poles, fencing and player huts
- Removal of existing surface
- Removal of vegetation on existing court surface
    - 12 trees are to be removed during demolition and construction, 1 tree is within the existing court surface

1.4.3 Construction Work

The following works are proposed:

- Vegetation removal within delineated footprint only
    - 11 trees are to be removed outside of the existing court footprint to enable construction
- Construction of temporary construction batters
- Preparation of subgrade for playing surfaces
- Construction of stormwater systems
- Construction of playing surfaces
- Line marking of playing surfaces
- Installation of ancillary structures; nets, poles, basketball hoops and player huts
- Installation of safety and wayfinding lighting to service the facility
- Construction of access path from disabled parking to courts
- Installation of sports compliant fencing
- Installation of spectator shelters

Figure 1-3 shows the proposed scope of works.

1.4.4 Post Construction Work

- Removal of excess materials and disposal of excavated debris as appropriate
- Reinstate disturbed surfaces, including pathways and abutments
- Maintenance of adequate soil cover to minimise human contact with impacted cover soils

A Construction Environmental Management Plan (CEMP) will be prepared by the contractor prior to on-ground works. This will specify the location of proposed site compound and stockpiling areas for materials and equipment, and 'no go' zones around environmentally sensitive areas where appropriate. The CEMP will also prescribe erosion and sediment controls during the construction period and include further mitigation and safeguards in accordance with Section 5.

1.4.5 Site Compound and Access

A site compound would be established prior to the commencement of site works and would be retained in place throughout the works period. No formal compound area is proposed at this stage however, for the purpose of this assessment it is assumed that one will be established within the existing cleared area to the north of the existing courts

1.4.6 Finishing Works

Landscaping and ancillary works would generally be completed after all other activities being completed. Landscaping of areas would take place including replacement planting of vegetation impacted during construction.

Any damage from access or construction would be rectified.

1.4.7 Machinery and Equipment

A list of machinery that may be used at different points within the Project is provided below:

- Hand-held power tools
- Concrete ground line pump
- Excavator (5T)
- Concrete saw
- Concrete Truck
- Concrete Saw
- Site dumpers
- Tipper trucks
- Generator

1.4.8 Access

Vehicular access to the site is to be provided via the entry/exit driveway located directly opposite Emmaline Street at the northern end of the Hawthorne Street parking, which will require access provided by Council.

1.4.9 Duration and Working Hours

Where possible, construction hours will be in accordance with the Department of Environment and Climate Change (DECC) (2009) guidelines:

- 7am - 6pm Mondays to Fridays
- 8am – 1pm Saturdays
- No work on Sunday or public holidays.

Works will commence in late 2022 pending approval.

Figure 1-3: Proposed scope of works

1.5 Project Justification and Consideration of Alternatives

1.5.1 Do-Nothing Approach

The degradation of the current facilities at the site makes it increasingly difficult to use for its intended purpose and present a hazard to the community. Further neglect of the site would exacerbate these issues and create a blight on the landscape. This highlights why the 'do-nothing' approach is not acceptable and why it is not the preferred approach.

1.5.2 Preferred Option – The Proposed Works

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

- Increased usability. The proposal will allow the court to be utilised by the local community for tennis and a range of activities.
- Improved safety, in its current condition the court is unusable. The concrete surfaces are severely cracked causing safety issues and vegetation is being to colonise the court area.

As such, the proposed works are the most beneficial option, socially and economically, allowing the continued use of Scarborough Park Courts.

2. Statutory and Planning Context

Table 2-1 and Table 2-2 provide a description of the legislative context for the proposal. Where a particular approval or consideration is required, this REF addresses the objectives and requirements of the legislation.

2.1 Commonwealth Statutory Framework

Table 2-1: Commonwealth Statutory Framework

Name	Relevance to the project
Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)	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. Significant impacts are defined by the Commonwealth (reference http://www.environment.gov.au/epbc/guidelines-policies.html) for MNES. MNES have been identified within and near the study area. Significance Assessments were undertaken for: • *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland* • *Syzygium paniculatum (*Magenta Lilly Pilly*)* • *Pteropus poliocephalus (*Grey-headed Flying-fox*)* The assessments concluded that the proposed works are not unlikely to significantly impact the ecological community or flora and fauna species.

2.2 New South Wales State Legislation

Table 2-2 NSW State Legislation

Name	Relevance to the project
Biodiversity Conservation Act 2016 (BC Act)	Section 7.3 of the Act requires proponents of activities subject to Part 5 of the EP&A Act to determine whether they will have a significant impact on matters listed under the BC Act. If a significant impact is likely to occur, the proponent of the activity must prepare a Species Impact Statement (SIS) consistent with section 7.20 of the BC Act or prepare a Biodiversity Development Assessment Report (BDAR). Tests of Significance were undertaken for the following threatened communities and species: • *Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions* • *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* • *Syzygium paniculatum (*Magenta Lilly Pilly*)* • *Botaurus poiciloptilus (*Australasian Bittern*)* • *Epthianura albifrons (*White-fronted Chat) • *Glossopsitta pusilla* (Little Lorikeet) • *Ixobrychus flavicollis* (Black Bittern) • *Pteropus poliocephalus* (Grey-headed Flying-fox)

Name	Relevance to the project
	The assessments concluded that the works are unlikely to result in a significant impact to any threatened ecological communities or species and therefore, the preparation of a BDAR or SIS is not required.
Biosecurity Act 2015 (Biosecurity Act)	The Biosecurity Act 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. Part 3 of the Biosecurity Act applies a general biosecurity duty for any person who deals with a 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. 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 biosecurity duty applies to these species. Several priority weeds, as identified within the RSWMP, were present within the study area and will require management by Council.
Environmental Planning and Assessment Act 1979 (EP&A Act)	The EP&A Act is the principal planning legislation for NSW. It provides a framework for the overall environmental planning and assessment of proposals. As Council is the proponent, the works are to be assessed as 'development permissible without consent' under Part 5 of the EP&A Act (see Section 2.3). Accordingly, Council must satisfy Sections 5.5 and 5.6 of that Act by examining, and taking into account 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&A Act including Sections 5.5 and 5.6. This report addresses the requirements of Section 171 of the EP&A Regulation.
Fisheries Management Act 1994 (FM Act)	The FM Act provides for the protection, conservation and recovery of threatened species defined under the Act. It also makes provisions 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. The proposed works do not involve harm to marine vegetation, dredging, reclamation, or obstruction of fish passage. Therefore, a permit or consultation under the FM Act is not required.
Heritage Act 1977 (Heritage Act)	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. The NSW State Heritage Register (SHR) is the statutory register under Part 3A of the Heritage Act. Listing on the SHR means that any proposed works or alterations (unless exempted) to listed items must be approved by the Heritage Council or its delegates under section 60 of the Act. One local heritage item, 'Hawthorne Street Reserve/Leo Smith Reserve' is listed on the Bayside LEP (Item no. I339) as being within the immediate vicinity of the study area. The courts are located outside the curtilage of the heritage item and are not considered to impact on heritage significance.
National Parks and Wildlife Act 1974 (NPW Act)	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.

Name	Relevance to the project
	A requirement of Clause 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. There are no previously recorded Aboriginal sites or objects within the study area. The entirety of the study area has undergone prior ground disturbance related to the existing courts, indicating there is a low potential for intact subsurface archaeological deposits.
Protection of the Environment Operations Act 1997 (POEO Act)	The POEO Act is the key environmental protection and pollution statute. The POEO Act is administered by the Environmental Protection Authority (EPA), and establishes a licensing regime for waste, air, water, and pollution. Relevant sections of the Act are listed below: • Part 5.3 Water Pollution • Part 5.4 Air Pollution • Part 5.5 Noise Pollution • Part 5.6 Land Pollution and Waste. Any work potentially resulting in pollution must comply with the POEO Act. Relevant licences must be obtained if required. In accordance with Section 48 and Schedule 1(15) of the POEO Act, an Environmental Protection Licence (EPL) is required for contaminated soil treatment if: • Treatment of more than 1,000 m^3 per year of contaminated soil received from off site is proposed • Incineration of more than 1,000 m^3 of contaminated soil originating exclusively on site is proposed • Treatment (otherwise than by incineration) and storage of more than 30,000 m^3 of contaminated soil is proposed, or • Disturbance of more than an aggregate area of 3 ha of contaminated soil is proposed. Based on the proposal, less than 1 ha in area of the study area is proposed to be excavated to the extent involved in removing the concrete slab, degraded courts, and upper gravelly fill. On the basis that cover soils have not been deemed to be 'contaminated', the corresponding licensing threshold in Schedule 1 of the POEO Act is not triggered and an EPL is not required for this aspect of the proposed works.
Water Management Act 2000 (WM Act)	The WM Act aims to provide for the sustainable and integrated management of water resources for NSW. The Act requires developments on waterfront land to be ecologically sustainable and recognises the benefits of aquatic ecosystems to agriculture, fisheries, and recreation. The WM Act is administered by the 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. A Controlled Activity Approval (CAA) is typically required for work within waterfront land. Section 91E of the Act creates an offence for carrying out a controlled activity within waterfront land without approval. However, according to Section 41 of the *Water Management (General) Regulation 2018,* a public authority is exempt from Section 91E (1) of the Act. Council does not need to obtain a CAA from the NRAR as part of the works as the works are not located within waterfront land.

2.3 Environmental Planning Instruments

Table 2-3: NSW Environmental Planning Instruments (EPIs)

Name	Relevance to the Project
State Environmental Planning Policy (Transport & Infrastructure) 2021	The aim of the Transport and Infrastructure SEPP 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.

Name	Relevance to the Project
(Transport and Infrastructure SEPP)	Pursuant to clause 73 of the TISEPP, development for the purpose of parks and other public reserves may be carried out by or on behalf of a public authority without consent on any land. Such works include: a. *development for any of the following purposes—* i *roads, pedestrian pathways, cycleways, single storey car parks, ticketing facilities, viewing platforms and pedestrian bridges,* ii *recreation areas and recreation facilities (outdoor), but not including grandstands,* iii *visitor information centres, information boards and other information facilities,* iv *lighting, if light spill and artificial sky glow is minimised in accordance with the Lighting for Roads and Public Spaces Standard,* v *landscaping, including landscape structures or features (such as artwork) and irrigation systems,* vi *amenities for people using the reserve, including toilets and change rooms,* vii *food preparation and related facilities for people using the reserve,* viii *maintenance depots,* ix *portable lifeguard towers,* b. *environmental management works,* c. *demolition of buildings (other than any building that is, or is part of, a State or local heritage item or is within a heritage conservation area).* Th proposed works are considered development without consent as the proposed works are recreation facilities and associated infrastructure and amenities. This is in accordance with clause 73 of the TISEPP. Part 2 of the TISEPP contains provisions for public authorities to consult with other agencies prior to the commencement of development, as described in Section 4.
State Environmental Planning Policy (Resilience and Hazards) 2021 (Resilience and Hazards SEPP)	The Resilience and Hazards SEPP aims to manage development within coastal zones and protect the environmental assets of the coast. In accordance with Part 2, Section 5 of the *Coastal Management Act 2016*, the term coastal zone is defined as any area of land that is comprised of the following coastal management areas: • Coastal wetlands and littoral rainforests • Coastal vulnerability areas • Coastal environment areas • Coastal use areas. The impact area is located entirely within land mapped as 'Proximity Area for Coastal Wetlands' under the Resilience and Hazards SEPP (Figure 3-7). Part 2 Division 1 Section 2.8 of the Resilience and Hazards SEPP states: *"Development consent must not be granted to development on land identified as "proximity area for coastal wetlands" or "proximity area for littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map unless the consent authority is satisfied that the proposed development will not significantly impact on—* *(a) the biophysical, hydrological, or ecological integrity of the adjacent coastal wetland or littoral rainforest, or* *(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest."* A Neutral or Beneficial Effect (NorBE) Assessment was completed to determine compliance with this clause. The NorBE assessment is provided in Section 3.2.2 and Appendix G, which concluded that the proposed works would comply with the Resilience and Hazards SEPP, subject to the installation of erosion and sediment controls during construction to avoid sedimentation of the adjacent wetland.

2.4 Strategic Planning Context

2.4.1 A Metropolis of Three Cities

The Greater Sydney Regional Plan, A Metropolis of Three Cities (Greater Sydney Commission, 2018a), sets a 40-year vision (to 2056) and establishes a 20-year plan to manage growth and change for Greater Sydney in the context of social, economic, and environmental matters. One of the four main themes of the Plan is liveability.

Striving for liveability in communities is centred around providing the infrastructure and spaces for community members to be connected physically, socially, economically, culturally, and digitally. It is central to building healthy, resilient, and diverse communities.

Table 2-4 outlines the objectives within the Plan that are most relevant to the proposed works and how the Masterplan (Chrisp Consulting, 2022) will aid in achieving these objectives.

Table 2-4 *GSRP: A Metropolis of Three Cities* objectives regarding green infrastructure

GSRP Strategy	Relevance to Proposed Works
Strategy 6.1: Deliver social infrastructure that reflects the needs of the community now and in the future	The proposed Project will achieve this objective by: • Renewing existing courts to allow for public use • Undertaking upgrading works to refurbish the courts and facilities to extend the facilities lifespan
Strategy 6.2: Optimise the use of available public land for social infrastructure	The proposed Project will achieve this objective by: • Installing safety and wayfinding lighting to provide better use of the site during times of lower natural light • Constructing an access path from disabled parking allowing additional users access to the courts and facilities
Strategy 7.1: Deliver healthy, safe, and inclusive places for people of all ages and abilities that support active, resilient and socially connected communities	The proposed Project will achieve this objective by: • Providing an opportunity to renew several high-quality courts next to open spaces, which respond to the needs of a growing population • Improving access to high quality and diverse local open space through access works from disabled parking facilities • Delivering a high-quality sporting facility that will be inclusive for people of all ages and abilities aiding in an active, resilient and socially connect community

2.4.2 Eastern City District Plan

The *Eastern City District Plan* (Greater Sydney Commission, 2018b) covers the Bayside, Burwood, City of Canada Bay, City of Sydney, Inner West, Randwick, Strathfield, Waverley, and Woollahra Local Government Areas (LGAs). It is a 20-year plan to manage growth in the context of economic, social, and environmental matters to achieve the 40-year vision for Greater Sydney.

The *Eastern City District Plan* (Greater Sydney Commission, 2018b) contains several objectives with four main goals in mind. These goals are to:

- promote infrastructure and collaboration
- to increase liveability
- to improve productivity
- promote sustainability

The goal of increasing liveability will be attained through the construction of improved, safe, and accessible courts within an existing park. Fostering healthy, creative, culturally rich, and socially connected communities will be achieved in part by developing accessible recreational infrastructure. The renewal of the courts will provide additional recreational space to promote healthy and social activity within the community, improve health outcomes and is intrinsically linked to the Planning Priority E4 of enhancing overall liveability of the district.

2.4.3 Greener Places: Establishing an urban green infrastructure policy for New South Wales

Green infrastructure is the network of green spaces, natural systems and semi-natural systems that support sustainable communities. It has connected elements: waterways; urban bushland; urban tree canopy and green ground cover; parks and open spaces. It is fundamental to creating a high quality of life and is important in creating a region that is climate resilient and adaptable to future needs. The NSW Government's draft green infrastructure policy *Greener Places: Establishing an urban green infrastructure policy for New South Wales* was produced to guide the planning, design, and delivery of green infrastructure and has been considered during detailed design with the retention of a majority of trees alongside replacement plantings while providing specialised park facilities to support healthy, resilient and socially connected communities.

2.4.4 Future Bayside – Local Strategic Planning Statement

Future Bayside – Local Strategic Planning Statement (Bayside Council, 2020) sets out the vision for the area to 2036 and the actions that will be taken to achieve this vision. It provides the land-use planning framework for the LGA, providing a link between the *Eastern* City *District Plan* (Greater Sydney Commission, 2018) and *A Metropolis of Three Cities* (a land use plan for the Sydney region). The Plan sets out several planning priorities, with the most relevant to this Project being:

- B4: Provide social infrastructure to meet the needs of the Bayside community
    - The proposal will provide the local community with a functional recreational asset that enables casual and organised sport to occur in the locality.
- B5: Foster healthy, creative, culturally rich, and socially connected communities
    - The proposal will aid in providing high quality open space for recreation to ensure a healthy and vibrant urban life.
- B21: Deliver high quality open space
    - The proposal will provide a high quality public open space, surrounded by a significant urban tree canopy to help encourage social interaction and activity.

3. Environmental Impact Assessment

3.1 Landform, Geology, Soils and Geotechnical Considerations

A Geotechnical Assessment was undertaken by ADE Consulting Group (2021) and is provided in Appendix B. In addition, a Preliminary Site investigation (PSI) was completed by Geotechnique Pty Ltd (2022), Appendix D, to determine the potential for the site to contain contaminants. These assessments have been used to inform this chapter in additional to a high-level assessment of information and mapping undertaken by ELA.

3.1.1 Existing Environment

3.1.1.1 Geology, Topography and Soils

The study area is a small, dilapidated court complex within Scarborough Park. The site investigated is bounded by open space to the north, Scarborough Ponds trail to the west, a single storey community hall to the northeast, and a highly vegetated area to the east and south. The topography of the site is relatively flat, with a slope of less than 3°.

A review of the Sydney 1:100,000 Scale Geological Sheet indicates that the site located within the Ettalong (et) soil landscape and is primarily underlain by quaternary age peat, sandy peat, and mud (Figure 3-2). The subsoil predominately comprises sandy fill material up to termination depths (2.2 m). The depths of each subsoil were identified via six (6) boreholes across all six (6) existing tennis courts (Figure 3-1). Groundwater levels/seepage may be subject to seasonal variations and following inclement weather conditions. Some organic material was encountered and may indicate a prevailing tidal level, typically at a depth of 1.6 m. The subsoil profiles encountered are presented in Appendix B. Table 3-1 presents the soil layers existing within the study area.

Table 3-1: Stratigraphic sequence

Layer / Unit	Description	Depth to Base of Layer (mbgl)*	Consistency / Relative Density / Rock Strength
1 – Asphalt Concrete	Asphaltic concrete covered with artificial turf below existing tennis court surfaces	0.0 – 0.05	NA
2 – Gravel Sand (fill)	Comprising gravelly sand and silty sand below concrete	0.0 – 0.1	Poorly to moderately compacted
3 – Sand (possibly fill)	Alluvial sand and silty sand (possibly fill) comprising some organic material. Organic material may indicate prevailing tidal level	0.4 – 2.2**	Sand assessed to be very loose to medium dense as well as dense

* MBGL = METRES BELOW GROUND LEVEL

** DEPTH OF MATERIAL EXTENDING BEYOND THE TERMINATION DEPTHS

Figure 3-1: Surface soil borehole sampling locations (ADE Consulting 2022; Appendix B)

3.1.1.2 Contamination

The PSI (Appendix C) aimed to identify areas of potential contamination within the study area from past and present activities. The laboratory results found that contaminants analysed are either not present or in concentrations that do not pose a risk of harm to a human health. Contaminants tested for included:

- Metals
- Total recoverable hydrocarbons
- Polycyclic aromatic hydrocarbons
- Organochlorine pesticides
- Polychlorinated biphenyls
- Asbestos
- Coal tar

As such, it was concluded that the site is environmentally suitable for the proposed use of the site as a sports court.

In addition, a review of the Contamination Land Record of Notices for Bayside Council reflected no records of contaminated lands on or around the Scarborough Park. The closest contaminated site is

approximately 850 m to the southwest of the site and is the former 7-Eleven Ramsgate. This is a significant distance from the site and any leaching of soils to reach the site is highly improbable due to the distance and the likelihood the petrol tanks were encased appropriately. Due to the nature of the contamination site, windblown particulate from the contaminated sites to the reserve is considered to have a low probability of occurrence. The likelihood for unknown contamination to be encountered in the study area is deemed to be low.

3.1.1.3 Acid Sulfate Soils

A review of the Acis Sulfate Soils Risk Map (Naylor et al., 1998) the site is mapped as having high probability of occurrence of Acid Sulphate Soils (ASS) (Figure 3-3).

Figure 3-2: Soil landscapes within the study area

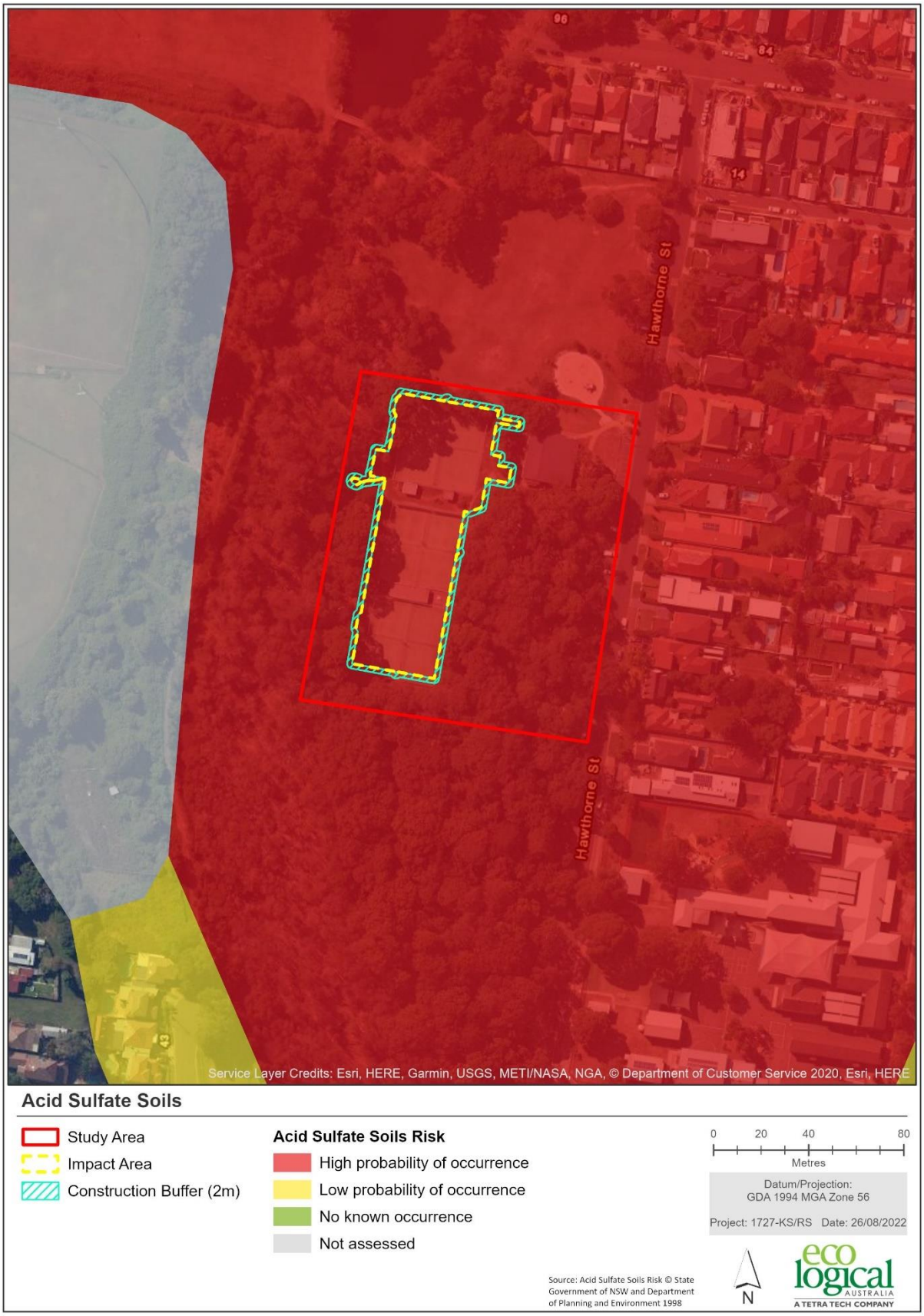


Figure 3-3: Acid Sulfate Soils Risk Mapping within the locality (DPE, 1998)

3.1.2 Impact Assessment

3.1.2.1 Soils and Geology

Besides the construction of the dilapidated courts and associated infrastructure, the study area has maintained limited disturbance and contamination. This is a result of the continuous land use of the study area and surrounding Scarborough Park as parklands. Construction of the proposed works would involve disturbing the ground surface and subsurface. If inadequately managed, excavation and stockpiling activities could have the following impacts:

- Erosion of exposed soil and stockpiled materials
- Dust generation from excavation and vehicle movements over exposed soil
- An increase in sediment loads entering the stormwater system
- Continuation of unregulated contaminated groundwater discharging and then migrating offsite and into the stormwater system

3.1.2.2 Contamination

There is low potential for contamination impacts during the construction process and operations. The potential impacts associated with contaminated land include:

- Unexpected encounters with contaminated fill on site
- Illegal dumping of potentially contaminating materials
- Spills and drips of hydrocarbons including fuel, oil, and greases from equipment in use
- Dust generation during excavation works
- An increased sediment load entering the wetland adjacent to the study area
- Accidental spillages of concrete or other materials

The PSI recommends the testing of soils, for contaminants, in the footprint of existing buildings to be carried out after completion of demolition (Geotechnique, 2022). If contaminants are identified, the recommendations from the assessment must be adhered to.

To minimise potential impacts from unexpected encounters of contaminated materials and accidental chemical spills, mitigation measures have been provided in Table 3-2 to address and mitigate any impacts associated with soil contamination.

3.1.2.3 Acid Sulfate Soils

ASS have the potential to impact the surrounding environment and cause damage to infrastructure. When ASS is disturbed, they can generate large amounts of sulfuric acid, iron, aluminium, and sometimes heavy metals. This can produce poor water quality, impact local flora and fauna that cannot tolerate acidity, and create infestations of acid tolerant species such as mosquitos. Sulfuric acid can also attack concrete and steel, slowly destroying pipes, roads, bridges, and building foundations.

As the study area is mapped as having high probability of occurrence of ASS, the presence of ASS must be confirmed prior to construction. If ASS is identified as occurring with the proposed impact area or being disturbed due to the proposed construction activities, then the preparation and implementation of an ASS Management Plan is recommended.

3.1.3 Mitigation Measures

Table 3-2 identifies mitigation measures that must be implemented to mitigate potential operational and construction impacts.

Table 3-2: Mitigation measures for soils and landform

Environmental Impact	Mitigation Measures
Contamination	• Soils must be tested for contaminants following the completion of demolition works and prior to construction of the new courts • If contaminants are identified, the recommendations from the assessment must be adhered to
Sediment and erosion	• Prepare a 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 • Prepare a Sediment and Erosion Control Plan (SEMP) in accordance with *The Blue Book – Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) and implement prior to works • Install soil and erosion control measures such as sediment fencing prior to on-ground works. Inspect these regularly (weekly), and more frequently during rain periods to ensure structures are in proper working order • Prior to forecast heavy rain, cease work, and remove accumulated material from sediment controls • Schedule the major drainage and earthworks outside of predicted heavy rain periods • Stop work during and following heavy rainfall to reduce risk of mobilising sediment. • Bare areas should be mulched, using on-site native vegetation if removed, following clearance works to prevent erosion or soil damage. Alternatively, erosion prone areas, when not in use, may be covered with biodegradable weed matting or similar product • Monitor sedimentation down slope of excavated areas. • Leave erosion and sediment controls in place until after the works are completed

Stockpiling of material	• Excavated soil and approved, imported materials must be stockpiled within a designated stockpile area
	• During site establishment, stockpile areas must be prepared and managed using the following methods:
	  ○ Establishing stockpiles on existing paved or hardstand surfaces to minimise the requirement for validation after the stockpile has been removed
	  ○ Construction of diversion drains and bunds around the perimeter of the stockpile areas. Installation of sediment and erosion control measures including silt fencing and hay bales, where necessary
	  ○ Erection of signs at the entrance to the stockpile areas and at locations around the stockpile specifying individual stockpile number and the type of materials stored
	  ○ Establishment of buffer zones around each stockpile area to enable access to the stockpiles and minimise impacts of the stockpile area on the surrounding facilities
	• Maintain, repair, and replace the drainage, sediment and erosion control measures installed within the stockpiling areas at the commencement of the Project, where necessary for the duration of the stockpiling activities. All stockpiles must be maintained in a tidy and safe condition with stable batter slopes

Acid Sulfate Soils	• As the study area is mapped as having high probability of occurrence of ASS the presence of ASS must be confirmed prior to construction

Environmental Impact	Mitigation Measures
	• If ASS is identified as occurring with the proposed impact area or being disturbed due to the proposed construction activities, then the preparation and implementation of an ASS Management Plan is recommended.
Imported fill or illegal dumping on site	• Develop and implement an unexpected finds protocol for the site to ensure any material which is potentially contaminated is identified and appropriately assessed and managed
Pollution of soils from chemical spills (e.g., fuel or oil from machinery).	• For any excess spoil material which requires offsite disposal, formally classify waste before being taken to an appropriately licensed landfill in accordance with the EPA (2014) *Waste Classification Guidelines*. • Store all chemicals (e.g., fuel, oil) in appropriate bunding/storage systems within the approved storage facility. • Ensure appropriate spill kits are carried with the equipment. • Establish dedicated refuelling areas outside environmentally sensitive areas and away from creek lines. These areas are to be bunded to ensure any spills do not enter sensitive areas or waterways

3.2 Waterways, Coastal Wetlands and Aquatic Habitat

3.2.1 Existing Environment

3.2.1.1 Scarborough Ponds Catchment

Scarborough Park is in the Scarborough Ponds Catchment. The Scarborough Ponds are the adjacent watercourse to the west of the study area. The topography of the Scarborough Ponds catchment is relatively flat with a slight fall to the southeast where water drains through Council's stormwater system to Ramsgate Beach.

The Scarborough Ponds catchment is highly urbanised catchment on its extremities. Closer to the ponds is Scarborough Park and then strands of native and planted vegetation around the ponds. This provides some biofiltration prior to discharge into the pond.

3.2.1.2 Hydrology and Flooding

Council has notated the site as being affected by the 1% Annual Exceedance Probability (AEP) flood. This means that there is 1% (1 in 100) chance of a flood of this magnitude or higher occurring in any one year. The flood levels for a 1% AEP flood event range from 1.66 m AHD to 2.11 m AHD, this is the height of the flood water. Figure 3-5 shows the distribution of flooding in a 1% AEP event. The court is not impacted due to the local typography and the court being constructed on slightly raised land.

3.2.1.3 Water Quality

Existing water quality is influenced by the previous surfaces it flows over which enable the runoff to collect sediment and other potential contaminants. Currently most surface flows collect in over land flow path that drains to the Scarborough ponds to the west of the study area. A baseline Model for Urban Stormwater Improvement Conceptualisation (MUSIC) model was developed to represent the existing condition of the site as displayed in Figure 3-4.

The model area is defined by the impact area (Figure 1-1). The development footprint was split into two regions; Courts 1 and 2 and Courts 3 to 6, with each region categorised into roofed areas and ground areas (i.e., courts, pavement, and grass areas) as per Table 3-3.

The land uses of each region were categorised using the rainfall-runoff and constituent generation parameters sourced from environmental consultants BMT WBM (2015) as outlined in Table 3-4 and Table 3-5, respectively. The soil profile information required to select the rainfall-runoff parameters was obtained from eSpade online portal (DPE, 2022). Soil assessment information was available for the adjacent property (to the east) and classified the soil as Loamy sand. The pervious proportion of the ground land use categorisation in MUSIC was revegetated land.

Table 3-3 Land use details of the development footprint.

Region	Category	Area (m^2)	Percentage impervious (%)
Courts 1-2	Ground	1665	76
	Roof	46	100
Courts 3-6	Ground	2783	84
	Roof	53	100

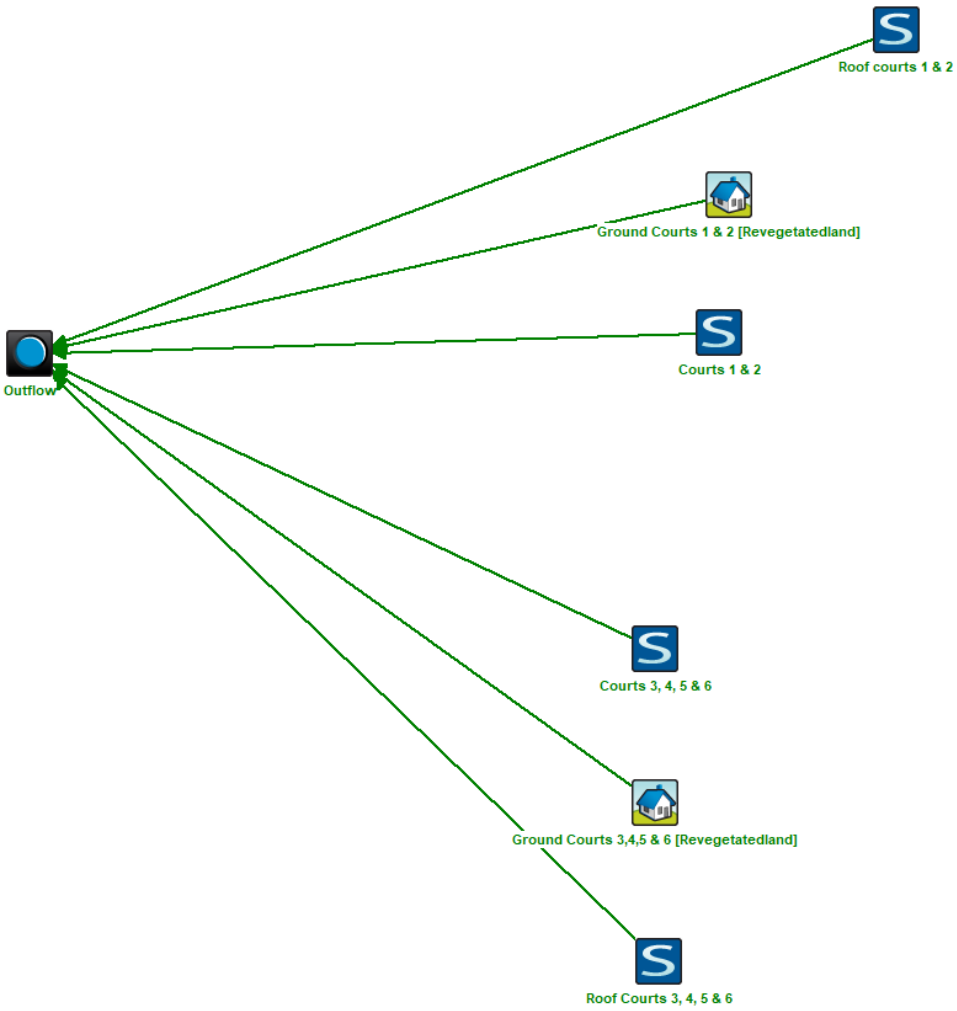


Figure 3-4 Existing condition model set up in MUSIC

Table 3-4 Rainfall-runoff model parameters

Land use	RT (mm/d)	SSC (mm)	FC (mm)	Inf A (mm/d)	Inf B	DRR (%)	DBR (%)	DDSR (%)
Roof	0.3	139	69	360	0.5	100	50	0
Ground	1.5	139	69	360	0.5	100	50	0

Table 3-5 Constituent parameters

Land Use	Constituent	Base Flow		Storm Flow	
		Mean (Log_{10}[mg/L])	Standard Deviation (Log_{10}[mg/L])	Mean (Log_{10}[mg/L])	Standard Deviation (Log_{10}[mg/L])
Roof	Total Suspended Solids	0	0	0	0
	Total Phosphorus	0	0	0	0
	Total Nitrogen	0	0	0	0
Ground (pervious proportion)	Total Suspended Solids	1.15	0.17	1.95	0.32
	Total Phosphorus	-1.22	0.19	-0.66	0.25
	Total Nitrogen	-0.05	0.12	0.30	0.19

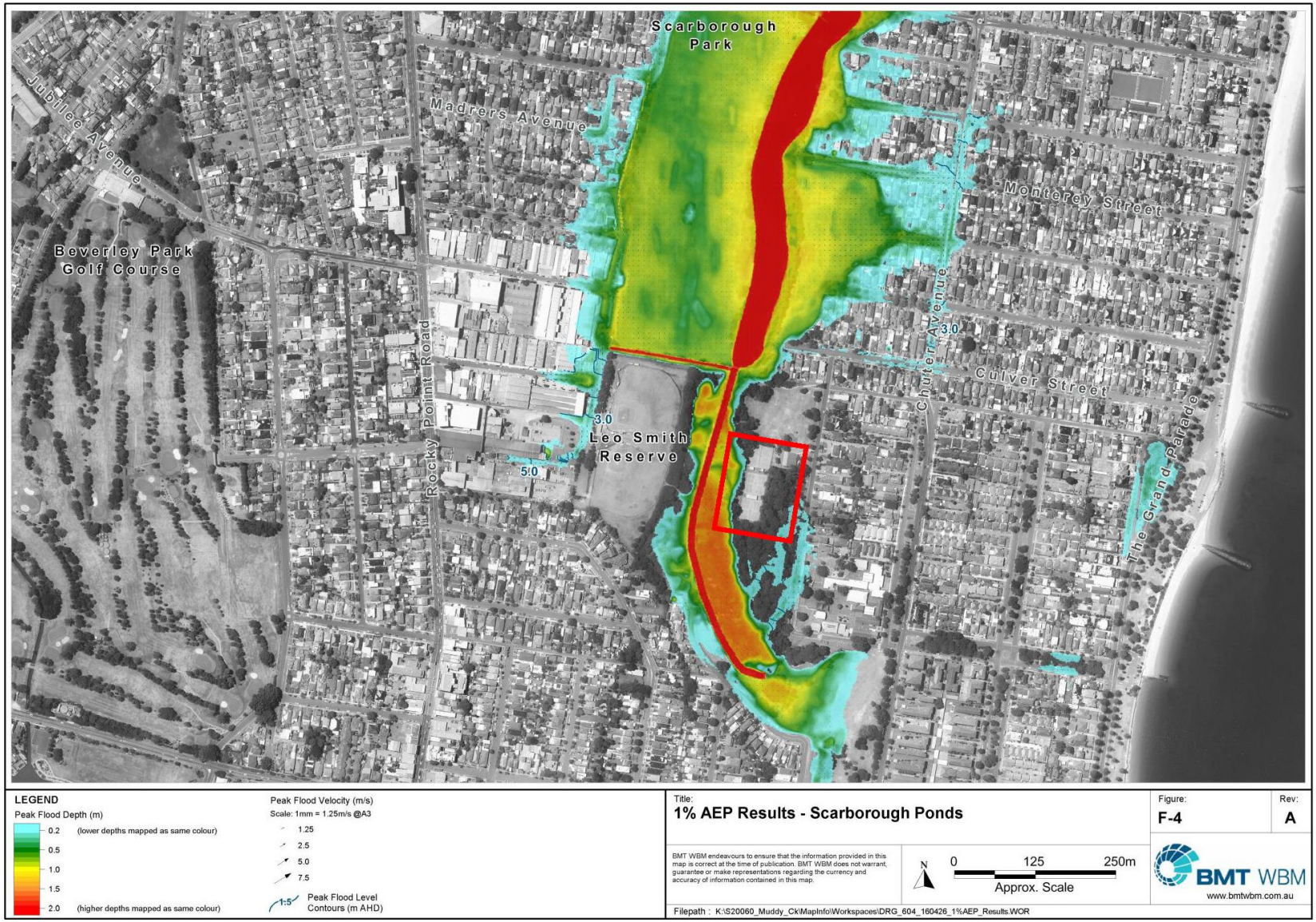


Figure 3-5: Extent of 1% AEP Flooding (yellow graduating to red indicates greater peak flood depth and light blue indicates shallower flood depth) (Bayside Council, 2017)

3.2.1.4 Key Fish Habitat

Ramsgate Beach is mapped as containing Key Fish Habitat (KFH) by DPI Fisheries. The *Policy and guidelines for fish habitat conservation and management* (Fairfull, 2013) identified three types of KFH, as shown in Table 3-6. The study area is approximately 100 m from mapped KFH and does not meet the definition of Type 1 or Type 2 KFH, so it would therefore be considered Type 3 KFH

Table 3-6: Types of Key Fish Habitat and Sensitivity Levels (Fairfull, 2013)

Key Fish Habitat Type	Sensitivity	Example
Type 1	Highly Sensitive	Coastal Management SEPP wetlands, freshwater habitats that contain in-stream gravel beds, rocks greater than 50 mm in two dimensions, snags greater than 300 mm in diameter or 3 metres in length, or native aquatic plants
Type 2	Moderately sensitive	Mangroves, stable intertidal sand/mud flats, coastal and estuarine sandy beaches with large populations of infauna
Type 3	Minimally sensitive	Coastal and freshwater habitats not included in Types 1 or 2, ephemeral aquatic habitat not supporting native aquatic or wetland vegetation

3.2.1.5 Coastal Wetlands

As shown in Figure 3-7, the study area contains areas mapped as 'Coastal Wetlands' and 'Proximity to Coastal Wetlands' under the Resilience and Hazards SEPP. However, the impact area only extends into the 'Proximity to Coastal Wetlands' area mapped under the Resilience and Hazards SEPP. As discussed in Section 2, Part 2 Division 1 Section 2.8 of the Resilience and Hazards SEPP states:

> *"Development consent must not be granted to development on land identified as "proximity area for coastal wetlands" or "proximity area for littoral rainforest" on the Coastal Wetlands and Littoral Rainforests Area Map unless the consent authority is satisfied that the proposed development will not significantly impact on—*
>
> *(a) the biophysical, hydrological, or ecological integrity of the adjacent coastal wetland or littoral rainforest, or*
>
> *(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest."*

A NorBE assessment has been conducted to determine compliance with the Resilience and Hazards SEPP. This is presented in Section 3.2.2.

Figure 3-6: Mapped watercourses (Strahler stream order) within the study area

Figure 3-7: Coastal Wetlands within the study area

3.2.2 Impact Assessment

3.2.2.1 Scarborough Ponds

Sediment-laden runoff from the site could affect water quality in surrounding watercourses, by increasing turbidity and carrying pollutants attached to sediment. Turbidity within the watercourses can reduce the amount of light that is available for aquatic flora and fauna and reduce the productivity of these species. Sediment particles may settle on aquatic plants. Sediment movement may also smother infauna burrows.

Sediment and waste material entering the creek line could potentially introduce chemicals to the water, leading to degraded water quality within the catchment.

3.2.2.2 Hydrology, Flooding and Groundwater

The proposed works will not modify the surface hydrology of the site as the courts will be re-established to the pre-existing surface levels. The works will involve the removal and replacement of the courts and installation of drainage system, the flow velocity of stormwater is managed through a level spreader minimising the potential for scouring and erosion to occur downstream. The works will have a negligible impact on groundwater flows as there are no major excavations proposed. The proposed works are predicted to have negligible impact on flooding as the impact area is not heavily impacted by flooding and the ground surface will be at a similar elevation to the existing.

3.2.2.3 Coastal Wetlands

NorBE Assessment and MUSIC – Overview

To assess potential impacts to the nearby Coastal Wetlands, ELA has undertaken a NorBE Assessment utilising MUSIC Modelling to predict the quantity and quality of surface and groundwater flows both pre- and post-construction. The NorBE Assessment is contained within Appendix G and the MUSIC results are discussed below.

The potential impacts of the proposed construction on water quality relate to the potential for additional or change in runoff characteristics during the construction and operation phases of the project. The main potential contaminant related to the proposed activities is sediment (Total Suspended Solids, TSS). Other less likely contaminants are nitrogen (Total Nitrogen, TN) and phosphorus (Total Phosphorus, TP). Constituents are the collective for referring to the potential contaminants listed above.

Modelling shows that a neutral or beneficial effect from this construction will be achieved. Flows leaving the site post-construction will have less constituent load than pre-construction. Due to the inclusion of a stormwater drainage network, a small increase in flow rates is anticipated expected. The impact of this can be reduced using rainwater tanks or having paths contoured such that they drain to gardens rather than directly to the stormwater network. The post-construction model is presented in Figure 3-8.

During the construction phase a SEMP should be implemented using a range of measures to minimise the risk of erosion and sediment runoff. These measures include those provided in Table 3-10.

The results indicate that the annual flow volume discharged from the construction will be lower than existing conditions and water quality will improve post-construction. Clause 11 of Chapter 2 (Coastal Management) of the Resilience and Hazards SEPP outlines specific requirements for construction on land in proximity to coastal wetlands. Consideration of these requirements is presented in Table 3-9.

MUSIC – Post Construction Model

To model the effects of the proposed court upgrade, a MUSIC model was developed as presented in Figure 3-8. Areas and percentage imperviousness were modified in the model as per Table 3-7. Rainfall and evapotranspiration data remained the same as the construction model along with rainfall runoff parameters and constituent generation parameters.

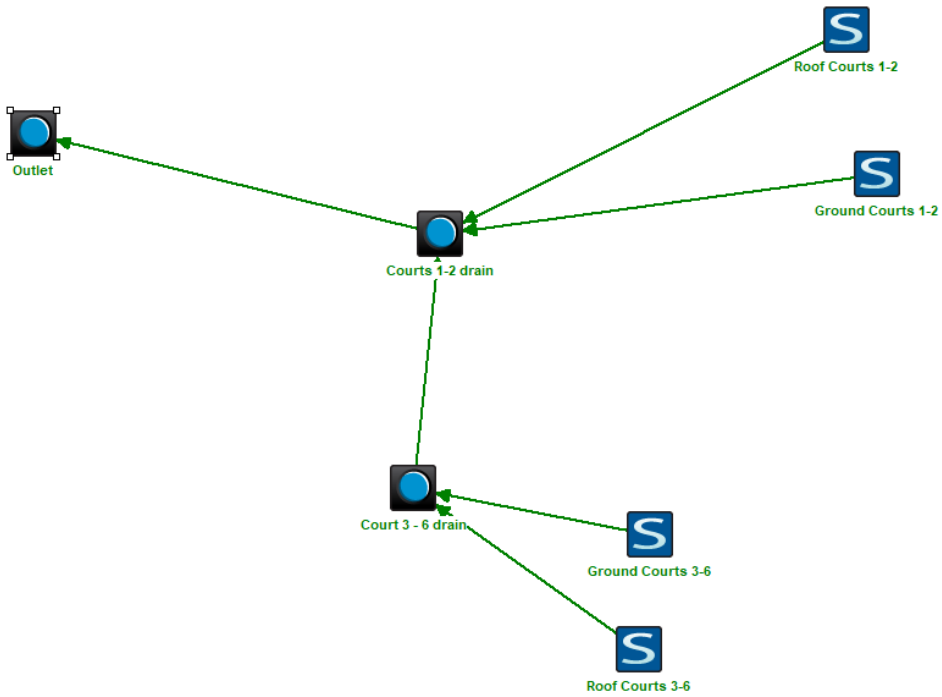


Figure 3-8 Post development MUSIC model

Table 3-7 Post construction sub catchment details

Sub catchments	Sub catchment division	Area (m2)	Percentage impervious (%)
Courts 1-2	Ground	1,623	100
	Roof	88	100
Courts 3-6	Ground	2,800	100
	Roof	36	100

In accordance with the plans (Appendix A), drainage from the courts is passed down and out of the stormwater drainage outlet pipe through tightly, hand packed, rip rap which sits over coarse gravel and cobbles underlain by a geofabric. Sedges and rushes are planted in the topsoil filled voids on the surface of the rip rap. For the purposes of the NorBE Assessment, it has been assumed that the design will not impact on water quality between the discharge and receiving water, however in reality some filtration of nutrients (TN and TP) and capture of sediment (TSS) will occur, but this is considered negligible.

MUSIC Results

The results of the modelling are shown in Table 3-8. The model has inbuilt default values (that match flow rates) for runoff constituent loads even with complete imperviousness (i.e. only direct rainfall impacting) that are not able to be altered. The MUSIC results still show that loads are produced, however with the change to complete impervious area from pre- to post-construction it is expected that the loads would reduce to zero (as indicated in brackets in Table 3-8). Therefore, constituent loads can be considered to have no impact on the downstream environment.

Annual flow volume was increased by 13%. This increase is due to impervious area increasing to 100% of the model area therefore increasing the speed of runoff and removing the infiltration of precipitation into the ground. This can be ameliorated reducing the direct connected impervious areas in the construction (e.g., rainwater tanks or having paths contoured such that they drain to gardens rather than directly to the stormwater network).

Table 3-8 Average annual MUSIC modelling results

Result type	Flow volume (ML/yr)	TSS load (kg/yr)	TP load (kg/yr)	TN load (kg/yr)
Pre-development	3.63	9.71	3.35	3.63
Post-development	4.09	4.09 (0.00)	4.09 (0.00)	4.09 (0.00)
Reduction (%)	-13%	58% (100%)	-22% (100%)	-13% (100%)

Table 3-9: Consideration of the Resilience and Hazards SEPP – Proximity to Coastal Wetland and Littoral Rainforest

Coastal Management Zone	Clause	Relevance to the Proposed Works
Proximity to Coastal Wetland and Littoral Rainforest	11(1)(a) the biophysical, hydrological, or ecological integrity of the adjacent coastal wetland or littoral rainforest	The proposed works will be carried out entirely within proximity to Coastal Wetlands. No vegetation within the mapped Coastal Wetlands is proposed for removal therefore, the biophysical and ecological integrity of these areas will remain unchanged. A small amount of vegetation within the Proximity to Coastal Wetlands area will be removed as part of the proposed works, however it is not anticipated to impact on the health of the Coastal Wetland as the vegetation proposed for removal is primarily exotic groundcover. In addition, revegetation is to occur post construction. Changes in hydrological integrity are discussed below.
	11(1)(b) the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest	The MUSIC results indicate that the annual flow volume discharged from the proposal will be slightly higher than existing conditions due to the increase in impervious areas. However, this can be ameliorated reducing the direct connected impervious areas in the construction (e.g., rainwater tanks or having paths contoured such that they drain to gardens rather than directly to the stormwater network). Water quality will improve post-work due to the increase in impervious areas reducing the opportunity for surface water to collect contaminants.

3.2.3 Mitigation Measures

Table 3-10: Mitigation measures for flooding and waterways

Environmental Impact	Mitigation Measures
NorBE Specific Mitigation Measures – Erosion and Sediment Runoff	• The SEMP must utilise sandbags, sediment fencing and/or other equivalent erosion and sediment control structures in accordance with the *The Blue Book – Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) during construction. • All temporary erosion and sediment control structures to be in place prior to any construction works commencing. • All permanent drainage structures are to be implemented as soon as practical in the works program with appropriate sediment and erosion controls to protect water quality from discharges prior to the completion of construction works. • Temporary sediment and erosion control structures to remain in place until exposed areas are rehabilitated and stabilised. • Ground disturbance works to be scheduled for periods of dry weather as far as practical. • No works involving soil disturbance to take place during heavy rainfall periods, other than work necessary to stabilise the site. • Overland flow from off site to be diverted around construction areas. • Overland flow from within the construction area to be diverted towards the sandbags with the sediment fencing. • General solid waste is to be collected in appropriate bins. • Disturbed soil areas should be rehabilitated/revegetated immediately following completion of construction
Increase in sediment flow into waterways and wetlands	• Wash all equipment, including, erosion and sediment control measures and trailers to prevent spread of exotic species. Conduct a visual check for vegetation and seeds on all equipment machinery used in the activities before work commences. • Install erosion and sediment controls around remediation works area to prevent mobilisation of contaminated soils into adjacent aquatic habitats.
Reduction in water quality	• Store all chemicals (e.g., fuel, oil) offsite. If required to be stored onsite, store chemicals in appropriate bunding/storage systems, outside of the riparian zones and only for short periods. • Ensure appropriate spill kits are present onsite. • Ensure all equipment is in good working order. • Carry associated Safety Data Sheets (SDS) for all chemicals. • Do not use any chemicals that are labelled as 'Class 9 Environmentally hazardous' as part of the proposed activities. • Do not stockpile rubbish or store chemicals near native vegetation or waterways. • Limit the use of fuel, chemicals and herbicides near waterways and other sensitive areas.
Indirect impacts to mapped Coastal Wetlands	• Install the stormwater devices and stormwater detention structures in accordance with the Masterplan (Chrisp Consulting, 2022) to manage the annual volume of flow into the adjacent wetlands and improve water quality being delivered into the wetlands. • Ensure erosion and sediment controls are in place and regularly maintained to prevent sediment runoff to the wetland, which can smother in fauna burrows within the exposed area of soil.

3.3 Biodiversity

3.3.1 Existing Environment

3.3.1.1 Vegetation Communities

Previous vegetation mapping identified the following vegetation types and Plant Community Types (PCTs) within the study area (DPIE 2016):

- **PCT 1793*:*** *Smooth-barked Apple - Bangalay / Tuckeroo - Cheese Tree open forest on coastal sands of the Sydney basin* (Coastal Sand Bangalay Forest)
- **PCT 1232:** *Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion* (Coastal Freshwater Swamp Forest)
- Weeds and exotics.

Field survey validated the above PCTs however, separated Weeds and Exotics into two separate vegetation types being, Planted Natives and Exotics and Exotic Grasses (Figure 3-9). Each vegetation type is described below in Table 3-11 - Table 3-14.

Table 3-11: PCT 1232 description

PCT 1232: Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	
TEC: BC Act	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Endangered) Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions (Endangered)
TEC: EPBC Act	Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community (Endangered)
Vegetation Description	PCT 1232 occurred in small patches along the western boundary of the study area (Figure 3-9). PCT 1232 was characterised by a canopy dominated by *Casuarina glauca* (Swamp Oak) and its swampy understorey. Swamp species were likely present due to its proximity to a stream to the west. This PCT occurs on poorly drained areas that are periodically inundated by fresh or brackish water. The mid-storey was relatively sparse and mostly comprised juvenile *C. glauca*. The groundcover present was relatively dense and submerged in some sections and included native species such as *Gahnia clarkei* (Tall Saw-sedge), *Pteridium esculentum* (Bracken), *Juncus usitatus* (Common Rush) and *Hypolepis* sp. *Occurrences of PCT 1232 within the subject land met the definition for the endangered *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*, as described in the BC Act Final Determination, due to the location, the regular inundation of water and the presence of characteristic vascular species and dominance of *Casuarina glauca.* ** Occurrences of PCT 1232 within the subject land did not meet the definition for the endangered Swamp *Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.* The BC Act Final Determination states that the composition of Swamp Sclerophyll Forest on Coastal Floodplains is primarily determined by the frequency and duration of waterlogging and the texture, salinity nutrient and moisture content of the soil. It states that the ecological community is associated with humic clay loams and sandy loams. A review of the Sydney 1:100,000 Scale Geological Sheet indicates that the site is primarily underlain by Quaternary age Peat, sandy peat, and mud (Qha). Peat is a lot more acidic and less nutrient dense than loam and a such is not considered to contain the characteristics associated to the determination. ***Occurrences of PCT 1232 within the study area met the definition for the endangered *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community*, as described in the EPBC Act Conservation Advice, key diagnostics were met such as IBRA region, elevation and soils, and the canopy was dominated by the *Casuarina glauca* (Swamp Oak). The condition of the vegetation meets Category C. This means that it is a medium sized patch of 2 – 5 ha with a mostly native understorey where non-native species comprised less than 50% of total understorey vegetation cover.
Area within study area(ha)	0.051

Table 3-12: PCT 1793 description

PCT 1793: Smooth-barked Apple - Bangalay / Tuckeroo - Cheese Tree open forest on coastal sands of the Sydney basin	
TEC: BC Act	Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions (Endangered)
TEC: EPBC Act	N/A
Vegetation Description	Occurrences of PCT 1793 within the study area were present throughout most of the eastern half of the site as well as along the southern and western boundaries (Figure 3-9). As is characteristic of this PCT, occurrences of PCT 1793 within the subject land occurred as a moderately tall, open forest on a low-lying area near the coast. The canopy consisted of *Eucalyptus botryoides* (Bangalay), *Angophora costata* (Smooth-barked Apple) and the occasional *Syncarpia glomulifera* (Turpentine). The site contained a diverse midstorey including species such as *Alphitonia excelsa* (Red Ash), *Elaeocarpus reticulatus* (Blueberry Ash), *Pittosporum undulatum* (Sweet Pittosporum), *Pittosporum revolutum* (Rough Fruit Pittosporum), *Acacia ulicifolia* (Prickly Moses), *Banksia integrifolia* (Coast Banksia) and *Breynia oblongifolia* (Coffee Bush). These areas were dominated by a mix of native and exotic groundcover species, including *Pteridium esculentum* (Bracken), *Commelina cyanea* (Scurvy Weed), *Lomandra longifolia* (Spiny-head Mat-rush) and *Imperata cylindrica* (Blady Grass). Weeds included *Ipomoea indica* (Morning Glory) and *Asparagus aethiopicus* (Asparagus Fern), *Cynodon dactylon* (Couch), *Sida rhombifolia* (Arrowleaf Sida) and *Bidens Pilosa* (Cobbler's Pegs). PCT 1793 within the subject land met the description and key diagnostic characteristics for *Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions (Endangered)* as set out by the Final Determination. This ecological community is listed as endangered under the BC Act.
Area within subject land (ha)	0.91

Table 3-13: Planted Native and Exotic

Planted Native and Exotic	
TEC: BC Act	N/A
TEC: EPBC Act	N/A
Vegetation Description	The vegetation along the northern boundary of the study area as well patches in the north-east, eastern boundary and between the top and middle tennis courts were identified as Planted Native and Exotic which did not correspond with a PCT or TEC. There was one main patch of this vegetation type, as well as individual plantings around the study area. The species contained a random assortment of regularly planted native and exotic species that looked as though they had been planted in the last 10-15 years. These included native species such as *Eucalyptus botryoides* (Bangalay), *Casuarina glauca* (Swamp Oak) and *Banksia integrifolia* (Coast Banksia) as well as the exotics *Pinus* sp. and *Jacaranda mimosifolia* (Jacaranda). The ground cover included regularly planted and landscaped species such as *Lomandra longifolia* (Spiny-head Mat-rush), *Dianella revoluta* (Blue flax-lily) and *Cenchrus setaceus* (Fountain Grass). The ground cover for the most part lacked native diversity and suffered incursions from exotic species such as *Asparagus aethiopicus* (Asparagus Fern) and *Cynodon dactylon* (Couch).
Area within subject land (ha)	0.077

Table 3-14: Exotic Grasses

Exotic Grasses	
TEC: BC Act	N/A
TEC: EPBC Act	N/A
Vegetation Description	Along with the parklands adjoining the study area to the north, some areas of the study area are actively managed as cleared grassed areas. These were dominated by exotic species and are regularly mown. Species included *Cynodon dactylon* (Couch) and *Cenchrus setaceus* (Fountain Grass). These grasses had also made incursions onto the unused tennis courts, spreading from edges bordering with the mown sections of sprouting from cracks in the court. Vegetation identified as Exotic Grasses did not correspond with a PCT or TEC.
Area within subject land (ha)	0.15

Figure 3-9: Validated vegetation communities within the Study Area (ELA, 2022)

3.3.1.1.1 Priority Weeds and Weeds of National Significance (WoNS)

Of the weeds identified during the field survey, two species were listed as a state priority weed and one weed is listed as other weeds of regional concern. The weeds present, their priority listing under the Act, their associated asset / value at risk and whether they are Weeds of National Significance (WoNS), are presented in Table 3-15.

Table 3-15: State level determined priority weeds and other weeds of concern present

Scientific name	Common name	WoNS	Priority Weed Obligation
State Level Priority Weeds			
Asparagus aethiopicus	Ground Asparagus	Yes	Asset protection
Senecio madagascariensis	Fireweed	Yes	Asset protection
Other Weeds of Regional Concern			
Cenchrus setaceus	Fountain Grass	No	Other regional weeds

3.3.1.2 Threatened Entities

The search for threatened species using the Protected Matters Search Tool and BioNet (Atlas of NSW Wildlife) (within a 5 km buffer around the study area) and the review of literature resulted in a list of 13 TECs, 24 threatened flora species and 107 threatened or migratory fauna species that are known to occur or have the potential to occur within the study area.

An assessment of the likelihood of occurrence of threatened species within the study area is in Appendix A and was used to guide the site inspection methodology. Note, the likelihood of occurrence provided in Appendix A represents the assessment following the site inspection results. The Bionet database records of flora and fauna site are shown in Figure 3-10. It should be noted that sensitive species cannot be displayed.

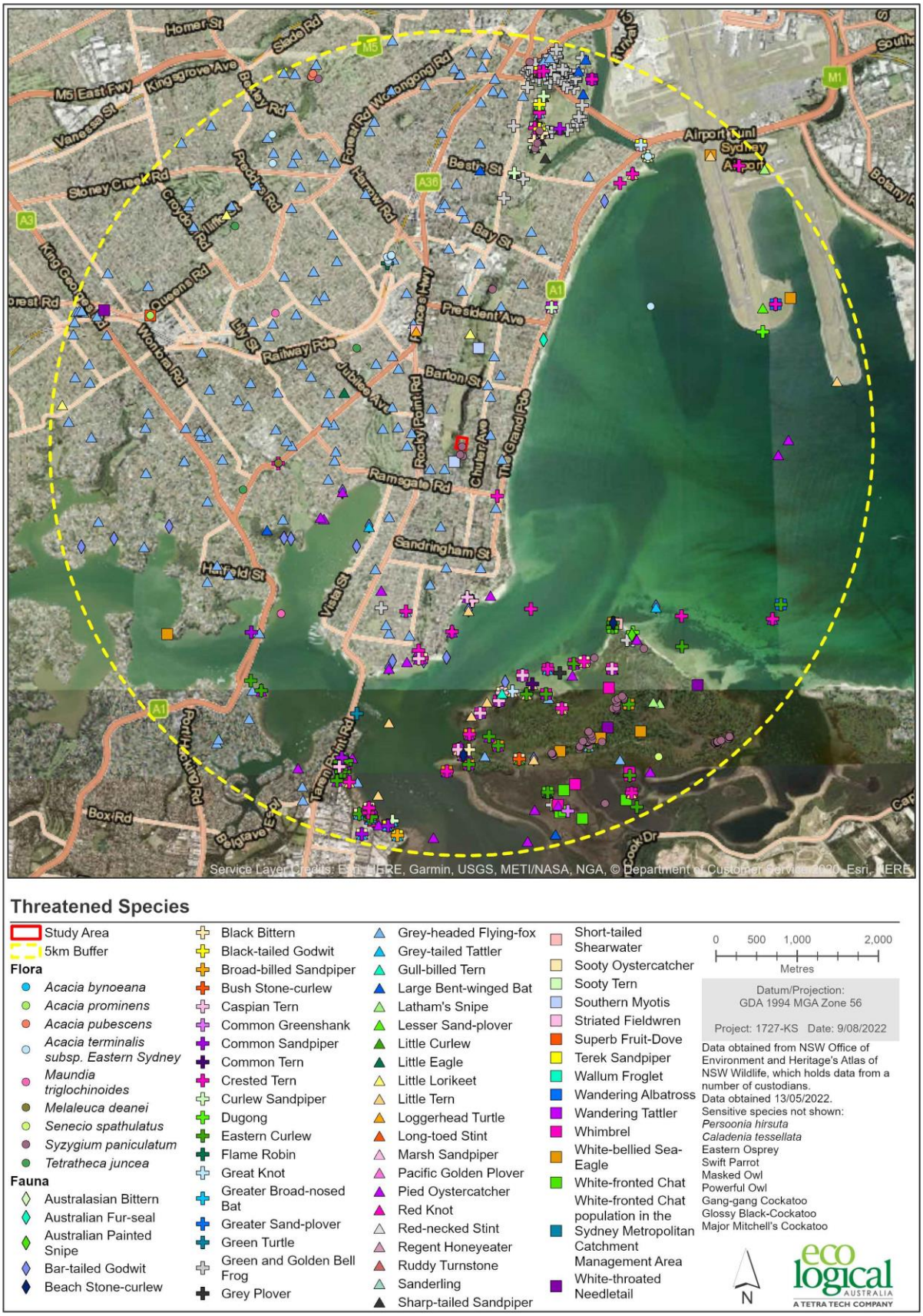


Figure 3-10: Previously recorded threatened species within the study area (BioNet, 2022)

3.3.1.2.1 Threatened Flora

During the survey, one *Syzygium paniculatum* (Magenta Lilly Pilly) individual was identified within the study area, (Figure 3-9). *Syzygium paniculatum* is a medium sized tree that grows to approximately 8 m tall. Restricted to NSW, this species is found in a narrow strip of vegetation along the coast, predominantly in littoral rainforest. In this case it was found in open forest (PCT 1793). It is listed as endangered under the BC Act and vulnerable under the EPBC Act.

No other threatened flora species was identified within the subject land.

3.3.1.2.2 Threatened Fauna

No threatened fauna species were observed within the study area during survey.

The field survey utilised the random meander technique (Cropper, 1993) and opportunistic fauna sighting. No threatened fauna was identified during the field survey. In addition, no hollow bearing trees (HBTs) were found within the study area. As such, it was determined that no potential roosting and/or breeding habitat for microbats or owl species would be affected. However, the subject site was considered to potentially contain foraging habitat within PCT 1232, PCT 1793 Planted Natives and Exotics for the following threatened species:

- *Botaurus poiciloptilus* (Australasian Bittern)
- *Epthianura albifrons* (White-fronted Chat)
- *Glossopsitta pusilla* (Little Lorikeet)
- *Ixobrychus flavicollis* (Black Bittern)
- *Ninox strenua* (Powerful Owl)
- *Pteropus poliocephalus* (Grey-headed Flying-fox)
- *Scoteanax rueppellii* (Greater Broad-nosed Bat).

Tests of Significance and Assessments of Significance under the BC Act and EPBC Act are described in further detail in Section 3.3.2.3.

3.3.2 Impact Assessment

3.3.2.1 Direct Impacts

3.3.2.1.1 Clearing of Vegetation

The proposed works would remove a total of 0.1 ha of vegetation identified as PCT 1232 Coastal Sand Bangalay Forest Coastal Freshwater Swamp Forest, PCT 1793, Planted Natives and Exotics and Exotic Grasses from within the study area (Table 3-16). The Arboricultural Impact Assessment (Bellevue Tree Consultants, 2022) identifies 12 trees for removal. These trees were located within the area identified as planted native and exotic in Figure 3-9. In addition, 0.06 ha of vegetation will be indirectly affected by the proposed works through dust and light from construction activities and during operation.

Two TECs listed as endangered under the BC Act will be directly affected by the proposed works:

- *Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions*
- *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.*

In addition, vegetation that conformed to the EPBC Act listed *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community* is also anticipated to be impacted by the proposed activity.

Tests of Significance and Assessments of Significance under the BC Act and EPBC Act are described in further detail in Section 3.3.2.3.

Table 3-16: Assessment of the vegetation impacted within the study area

Vegetation community	TEC listing	Direct Impacts (ha)	Indirect Impact (ha)
PCT 1232: Swamp Oak floodplain swamp forest, Sydney Basin Bioregion and South East Corner Bioregion	BC Act: *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions* EPBC Act: *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community*	0.0003	0.0015
PCT 1793: Smooth-barked Apple - Bangalay / Tuckeroo - Cheese Tree open forest on coastal sands of the Sydney basin	BC Act: *Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions*	0.0207	0.0311
Planted Natives and Exotics	N/A	0.0155	0.0145
Exotic	N/A	0.0739	0.0161
	TOTAL	**0.1106**	**0.06**

3.3.2.1.2 Threatened Flora

The *Syzygium paniculatum* identified within the study area is not within the impact area and therefore will not be directly affected. However, as there is potential for this individual to be affected by indirect impacts, a Test of Significance under the BC Act, and a Assessment of Significance under the EPBC Act were applied. In both cases it was found that a significant impact to this individual was unlikely.

No other threatened flora or habitat for threatened flora species was identified within the subject land.

3.3.2.1.3 Threatened Fauna

A list of threatened fauna known to occur within the subject land or identified as likely or having the potential to occur within the subject land was compiled based on a review of the existing literature and habitat assessments conducted as part of the field survey (Appendix D1). The following threatened fauna species were considered potential or likely to occur within the impact area:

- *Botaurus poiciloptilus (Australasian Bittern)*
- *Epthianura albifrons (White-fronted Chat)*
- *Glossopsitta pusilla (Little Lorikeet)*
- *Ixobrychus flavicollis (Black Bittern)*
- *Pteropus poliocephalus* (Grey Headed Flying Fox)

Tests of Significance and Assessments of Significance under the BC Act and EPBC Act are described in further detail in Section 3.3.2.3.

3.3.2.2 Indirect Impacts

Indirect impacts are those impacts that do not directly affect habitat and individuals but that have the potential to interfere through indirect action.

3.3.2.2.1 Noise Dust and Vibration

Indirect impacts considered for this assessment are site impacts (noise, light, weed invasion and pathogens) and downwind impacts (sedimentation, dust, accidental spills, and leaks). During the construction, noise, dust and to a small degree vibration will be emitted which could have an indirect impact on local fauna. These impacts result from the operation of heavy machinery to construct the courts and adjacent infrastructure. These impacts are short term only and therefore are unlikely to significantly impact fauna. Also, during the construction period there is a risk that sediment runoff may impact adjacent native vegetation and nearby tributaries if appropriate sediment and erosion measures are not in place. These impacts will be managed via a sediment and erosion control plan.

3.3.2.2.2 Weeds

Possible increase in weed infestation can result if weed propagules are introduced or moved around by machinery during construction. Weed control measures are recommended to minimise this risk.

3.3.2.2.3 Pathogens

Pathogens are agents such as bacterium, virus or fungus that cause disease in flora and fauna, which are spread on footwear, vehicles or machinery. The three most common pathogens found in NSW include:

- **Phytophthora (*Phytophthora cinnamomi*):** A soil-borne fungus that attacks the roots of native plant species, causing them to rot and eventually die
- **Chytrid fungus (*Batrachochytrium dendrobatdis*):** A waterborne fungus that affects native frog species
- **Myrtle rust (*Uredo rangelli*):** An introduced fungus that attacks young leaves, shoot tips and stems of Myrtaceous plants (such as Bottle Brush, Tea Tree, Lilly Pilly and Turpentine), eventually killing the plant.

Indirect impacts to threatened species, TECs and native vegetation are unlikely to be substantial subject to the implementation of mitigation measures presented in Section 5.

3.3.2.2.4 Lighting

The study area is located within an urbanised setting where it is already subject to impacts resulting from artificial light emanating from surrounding residences. The current tennis court facility does not have lighting. New lights are proposed to be installed; however, the system is designed to be on when the courts are in use and then to be off when not in use. The dimming will further reduce at 9 pm and again at 11 pm. Lighting will be off after 11 pm, unless deemed important to be on for an event by Council. All luminaires for the courts will be equipped with glare shield to further reduce any light spill to sensitive areas.

A mapped coastal wetland is located approximately 25 m from the proposed impact area. Therefore, there is potential for indirect light impacts to occur to this wetland. Many aquatic organisms that inhabit

wetlands depend on daily cycles of light and dark, and artificial lights can disrupt behaviours in some species (Rich and Longcore 2013). Artificial lighting can decrease the amount of daily vertical migration of aquatic invertebrates within waterbodies. This can potentially affect ecosystem health through enhanced concentrations of algae, causing a deterioration of water quality and odour problems.

Amphibians are also particularly vulnerable to artificial lighting and increases in illumination can cause temporary reductions in visual acuity (Rich and Longcore 2013). Some amphibians only forage at low light levels so, artificial lighting can also disrupt foraging behaviours.

Additionally, artificial lighting has potential to reduce the abundance and diversity of microbat species utilising the waterbody adjacent to the study area. The impacts of artificial lighting on microbats is complex as it involves a number of factors, including but not limited to, the microbat's response to lighting, the microbat species' normal flight speed and how their prey items (mosquitoes) respond to artificial lighting (Rich and Longcore 2013).

To ensure that the visual impact of lighting on native fauna is minimised, additional restriction to operational hours may be put in place by Council and agreed upon through community consultation. By ensuring that lights are switched off or dimmed outside operational hours, the visual impacts from lighting will be minimal beyond typical usage periods. In addition, all sport and public domain lighting will comply with *AS/NZS 4282:2019 (effect of obtrusive light onto neighbouring properties).* Due to this design, the impact of lighting is not considered to significantly effect fauna subject to the implementation of mitigation measures.

3.3.2.3 Assessment under the BC Act and EPBC Act

Two TECs listed as endangered under the BC Act will be directly affected by the proposed works:

- *Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions*
- *Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.*

A Test of Significance under the BC Act was carried out for these communities and found the proposal is considered unlikely to constitute a significant impact on these communities, subject to the implementation of mitigation measures detailed in Table 3-18 and Section 5.

In addition, an Assessment of Significance under the EPBC Act was applied to *Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community*. The assessment found the impacts of the proposal were considered unlikely to constitute a significant impact, subject to the implementation of mitigation measures detailed in Section 5.

A summary of the assessment for fauna species is presented in Table 3-17. Tests of Significance in accordance with the BC Act and Assessments of Significance in accordance with the EPBC Act were applied to threatened fauna species considered likely to occur. The assessments are provided in D2 and D2.

Table 3-17 Summary of Threatened fauna assessment

Fauna	Threatened Fauna Species
Woodland Birds	Potential foraging habitat for threatened forest birds was identified within the study area for the following threatened birds, in the form of flowering Eucalypt species: • *Botaurus poiciloptilus (Australasian Bittern)* • *Epthianura albifrons (White-fronted Chat)* • *Glossopsitta pusilla (Little Lorikeet)* • *Ixobrychus flavicollis (Black Bittern)* However, the Test of Significance found that proposed vegetation removal is not considered to impact the foraging activities of these species as they are considered to be highly mobile and there is a large area (approx. 9 ha) of native vegetation containing flowering eucalypts adjacent to the study area.
Owls	One threatened owl species, *Ninox strenua* (Powerful Owl) is known to use large hollows for breeding activities and has been recorded within a 5 km radius of the study area. However, no HBTs were identified during the field survey. As the Powerful Owl is known to hunt over a large area the removal of some canopy species is not considered to impact its feeding habitat and as such a Test of Significance was not completed for this species.
Microbats	One threatened microbat species, *Scoteanax rueppellii* (Greater Broad-nosed Bat), that is known to roost in stags and HBTs has been recorded within a 5 km radius of the study area. However, no HBTs or stags were identified during the field survey. As such, a Test of Significance was not completed for this species.
Megabats	Flowering Eucalypts are considered to provide foraging habitat for megabat, *Pteropus poliocephalus* (Grey-headed flying fox). However, the test of Significance and Assessment of Significance found the proposed vegetation removal is not considered to impact the foraging activities of this species as there is a large area (approx. 9 ha) of native vegetation containing flowering eucalypts adjacent to the study area.

3.3.2.4 Key Threatening Processes

The Key Threatened Process (KTP), clearing of native vegetation, is associated with the proposed works. However, impacts resulting from this process would be minimal given that vegetation removal would be primarily in areas dominated by exotic grasses, with only a small number of impacts to native vegetation communities and minimal vegetation removal overall.

Invasion of native plant communities by exotic perennial grasses is another KTP also associated with the proposed works. Impacts resulting from this process are considered minimal given that the study area already contains exotic grasses. Weed control measures are recommended in Table 3-18 to minimise this KTP.

3.3.3 Mitigation Measures

Table 3-18: Mitigation measures for biodiversity

Environmental Aspect	Mitigation Measures
Accidental damage / clearing	• Council staff are to undertake a pre-works briefing advising of sensitive areas and relevant safeguards for these areas. • Stop works if any previously undiscovered threatened species are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until Council has provided written approval to do so.

Environmental Aspect	Mitigation Measures
	• Ensure the site-specific CEMP includes instructions for dealing with orphaned or injured native animals and ensure the CEMP includes the contact details for the NSW Wildlife Information, Rescue and Education Service Inc (WIRES). • Install temporary barrier fencing to prevent entry into adjacent vegetation and appropriate 'no-go zone' signage. This must include the *Syzygium paniculatum* species identified outside of the impact area (Figure 3-9) and areas of Council and any areas of Community bush regeneration activities. • Install tree protection measures around trees to be retained in the study area. Structures should be adequate to prevent machinery from entering within the drip zone. • Maintain temporary fencing to prevent access into the native vegetation.
Indirect lighting to adjacent vegetation and waterbody	• Manage artificial lights using motion sensors and timers. • Aim light onto the exact surface area requiring illumination. Use shielding on lights to prevent light spill into the atmosphere and outside the footprint of the target area. • Avoid lights containing short wavelength, violet / blue light and white LEDs. • Avoid high intensity light of any colour.
Spread of priority weeds	• Wash down equipment and vehicles prior to and after use, to manage the introduction and spread of weed propagules. • Thoroughly clean all equipment of soil and weed propagules prior to entry into the study area. • Remove Priority weeds using best management practices (including appropriate controls to prevent impacts to threatened species) prior to removal of native vegetation. Remove weed propagules offsite. • Bag and remove all weed propagules offsite, preferably the same day and dispose of at designated green waste facility.

Introduction/ spread of pathogens	• Adhere to the *Saving our Species Hygiene* guidelines (DPIE, 2020) at all times https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Wildlife-management/saving-our-species-hygiene-guidelines-200164.pdf . In particularly:
	  ○ Wash down equipment and vehicles prior to entering the site, to manage the introduction and spread of pathogens. Pay particular attention to cleaning mud flaps and tyres.
	  ○ Thoroughly clean all equipment of soil and vegetation debris prior to entry into the study area.
	  ○ Use a solution of 70% ethanol or methylated spirits in 30% water for wash down and equipment cleaning to effectively disinfect areas.
	  ○ Wash down on a hard, well-drained surface, for example a road, and on ramps if possible. Do not allow wash-down water to drain into native bushland.
	  ○ Machinery and equipment must also be cleaned when leaving site.
	• Wash down protocols are required to control multiple impacts including, pathogens, weeds, and contaminated soils. The CEMP should develop a single wash down process that addresses the requirements of all three potential environmental impacts.

3.4 Aboriginal Heritage

3.4.1 Existing Environment

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).

This 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 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 the Heritage NSW or further assessment is required

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

- Undertake a search of the 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 Bayside LEP 2021 Schedule 5 (Environmental Heritage) in order 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.
- Undertake a site inspection to assess landscape features and survey the potential for previously unidentified archaeological items and sites

Consultation with Aboriginal people was not undertaken as part of this assessment. The Local Aboriginal Land Council and other stakeholder groups can provide a cultural assessment for the area if required.

3.4.1.1 Heritage Database Search

Searches of the Australian Heritage Database, the Bayside LEP 2021 and the State Heritage Inventory utilising the term 'Ramsgate/Scarborough Park' were conducted on the 17th of May 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

An extensive search of the AHIMS database, which is maintained by Heritage NSW and regulated under Section 90Q of the NPW Act, was conducted on 12 May 2022 to identify if any registered Aboriginal sites were present within, or adjacent to, the study area (Appendix E). The AHIMS search represents 4 km around the study area and was conducted within the following coordinates: GDA Zone 56, Eastings 324380-332380, Northings 6234521-6242521, with a buffer of 0 m. The search resulted in the identification of 35 Aboriginal sites within the vicinity of the study area. AHIMS ID 45-6-2951 is listed as

'not a site'. AHIMS ID 52-3-1114 has been listed as a 'restricted site', AHIMS confirmed this site will not be impacted by the proposed works.

No sites have previously been recorded as being within the study area (Figure 3-15).

3.4.1.3 Ethnohistoric Context

Aboriginal people have occupied Australia for at least 40,000 years (Attenbrow, 2010). The earliest calibrated date for an occupation site within the eastern coastal strip of the Sydney Basin is 10,700 BP at Discovery Point, indicating Aboriginal people have occupied the Sydney Basin Region for at least 10,000 years (JHcD CHM, 2005). Whilst ethnographic records and oral histories can inform our understanding of the traditional Aboriginal groups that occupied various regions in Australia, this knowledge is often hindered by the ethnocentric bias of early settlers and therefore may not always be entirely accurate.

When the British First Fleet arrived in 1788, the Sydney region was home to numerous Aboriginal communities that had been living there for thousands of years. Current estimates suggest there may have been 3000-5000 Aboriginal people living in the Sydney region at that time. Captain Cook and the later British colonists recorded some of their language and place names, observed and recorded their observations regarding the Aboriginal communities, including their physical appearance, tools, clothing, camps and shelters, diet, their ceremonies, and their items of material culture. In addition, many artists recorded individuals and the activities of groups of people.

The study area is located on Eora land of the Gameygal people. The Eora are comprised into different family groups which varied in dialects and campsites along the coastline. The groups include the Gadigal, the Wangal and the Cammeraygal. 'Eora' is derived from *Ea* (meaning 'yes') and *ora* (meaning "this place" or "here"). Eora territory stretches from the Hawkesbury River in the north, the Georges River and Botany Bay in the south, east to the Sydney coastline and westward towards Parramatta. The Eora and Dharug people further west shared the same language (*Dharug)* (Attenbrow, 2010).

The coastal location of the Eora people meant that marine-based animals and plants were central to their subsistence. The archaeological evidence of previous occupation in the region is primarily midden sites, engraved and pigmented art and lithic artefacts. Both men and women caught fish, but each used different equipment: men used multi-pronged fishing spears to catch from rock platforms and canoes, while women used a hook and line from a canoe. Both men and women used net bags or bark baskets to carry equipment and the fish they caught (Australian Museum, 2019).

3.4.1.4 Previous Archaeological Assessments

Artefact Heritage, 2014. St George Hospital Site Investigations and Campus Infrastructure Masterplan – Archaeological Desktop and Site Assessment Report. Prepared for NSW Health Infrastructure.

Artefact Heritage was previously engaged by NSW Health Infrastructure to prepare an Archaeological Constraints Analysis as part of the St George Hospital Redevelopment (Planning Phase) Campus Infrastructure Master Plan (CIMP). This assessment was undertaken approximately 1 km to the west of the current study area.

The initial desktop assessment, including an extensive search of the AHIMS database, did not identify any Aboriginal sites within 200 m of the study area. The closest registered Aboriginal site, an Aboriginal

art site, was located 2 km to the south-west of the study area. A review of aerial imagery and past land use indicated the land within the study area had been highly disturbed from the initial clearing, landscaping and construction of the existing hospital and associated infrastructure.

A visual inspection of the study area was undertaken which confirmed the study area had been subject to extensive prior ground disturbance. The study area was situated on a moderate slope to the east, with the extent of the base of the slope leading to low, flat, and marshy land towards Botany Bay. It was suggested that the study area could have been conducive to Aboriginal habitation due to its proximity to several food sources and its vantage point, though it was thought unlikely to have been subject to intensive occupation as it was not near a permanent water source. Pastoral use of the study area and the construction of hospital buildings and landscaping would have also had considerable impacts on surface scatters and shallow archaeological deposits. It was noted that some deposits may have been preserved below the footings of buildings or in areas where the natural ground surface was covered in fill, though the modern development of multi-storey levels of the hospital indicated the potential for intact subsurface archaeological deposits was low.

As a result of this investigation, it was deemed unlikely that the study area would have been subject to intensive Aboriginal occupation and would instead have been used intermittently as it was not near a permanent water source. The high level of disturbance from the construction of underground carparks and footing for multi-storey buildings indicated the potential for archaeological deposits was low to nil. Recommendations included heritage inductions be undertaken on site by all contractors and workers and an unexpected finds policy be implemented as a mitigation measure.

Eco Logical Australia, 2016. Turrella Industrial Precinct – Aboriginal Heritage Assessment. Prepared for Turrella Property Pty Ltd.

ELA was previously engaged by Turrella Property Pty Ltd to conduct an Aboriginal heritage assessment to support the Planning Proposal for the Turrella Industrial Precinct, located approximately 5km to the north-west of the current study area and approximately 200 m south of Wolli Creek.

An extensive search of the AHIMS database identified six (6) Aboriginal sites within 1 km of the study area, with the closest site (an artefact site) located approximately 550 m to the east. A review of available historical imagery indicated the study area had previously been cleared of vegetation and subject to ground disturbance because of ploughing, the construction of fences, roads and buildings and earthworks.

A visual inspection of the study area confirmed that most of the study area had been subject to ground disturbance and comprised of large areas of concrete and car parking areas, and single and double storey masonry and metal clad buildings. No Aboriginal objects were identified during the visual inspection the land adjacent to the creek appeared to have been filled in the past. However, given the presence of nearby registered Aboriginal sites and the proximity of the study area to the creek, a moderate potential for subsurface Aboriginal objects was proposed in areas that had not been subject to extensive ground disturbance.

As a result of this assessment, and because of the proximity to the creek, further archaeological investigation, including a program of test excavation was recommended to determine the nature and extent of any Aboriginal objects within the study area.

3.4.1.5 Visual Inspection

A visual inspection of the study area was undertaken by ELA Archaeologist Kate Storan on the 19th of May 2022. The visual inspection aimed to identify Aboriginal objects if present and assess the archaeological potential of the study area.

The visual inspection revealed that the entirety of the study area had undergone prior ground disturbance related to the existing tennis courts and associated buildings. The study area had been cleared of vegetation and the surface modified and covered with asphalt, concrete, and artificial grass. The courts appeared to be in disuse and were covered in moss, weeds and leaf litter (Figure 3-11 – Figure 3-14).

The existing courts were separated by locked cyclone fences, which limited access, with a narrow spectator area between (Figure 3-11, Figure 3-12). The spectator area contained several small brick buildings, likely used as changing and locker rooms, which had been built on top of a concrete slab (Figure 3-13). There was also a picnic area with brick barbeques along the western boundary in the central portion of the study area which was surrounded by overgrown grass (Figure 3-14).

Overall, there was no surface visibility within the study area and no surface artefacts or areas of potential were identified during the visual inspection.

Figure 3-11: View from north-west corner of study area towards south showing existing tennis courts

Figure 3-12: View towards south showing existing tennis courts, boundary fences and associated buildings

Figure 3-13: View west, showing spectator area and building built onto concrete slab

Figure 3-14: View west showing picnic area with barbeques and overgrown grass

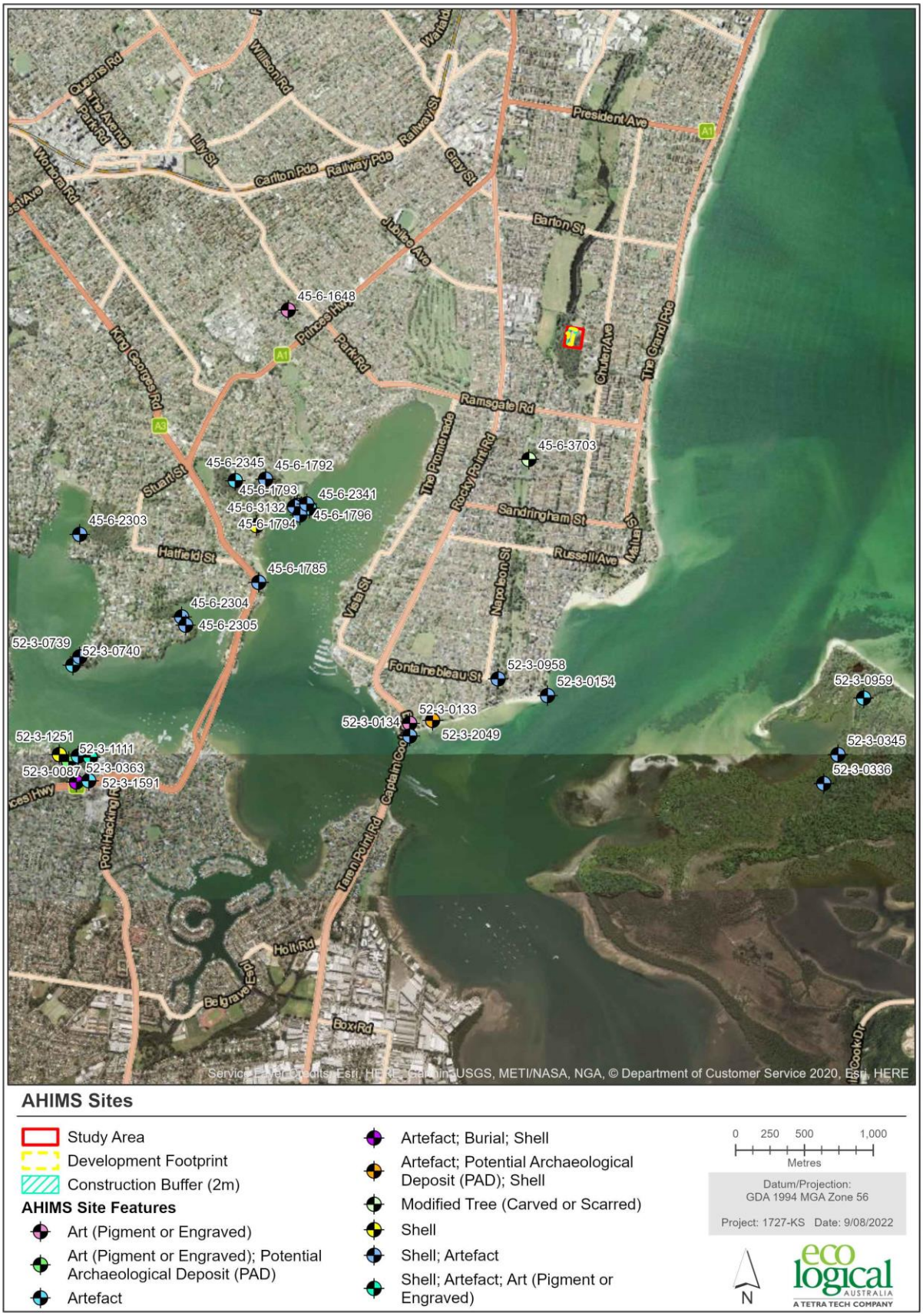


Figure 3-15 AHIMS sites in proximity to the Study Area (ELA, 2022)

3.4.2 Potential Impacts

The proposed works will not impact upon any known Aboriginal sites or objects and no Aboriginal sites are located within the study area. The entirety of the study area has previously been disturbed indicating there is a low potential for intact subsurface archaeological deposits to remain. As such, works can proceed with caution and no further investigation is required. A standard unexpected finds policy should be implemented as a mitigation measure (see Table 3-19 and Section 5).

3.4.3 Mitigation Measures

Table 3-19: Mitigation measures for Aboriginal heritage:

Environmental Aspect	Mitigation Measures
Discovery of unexpected Aboriginal objects	• Brief all contractors undertaking works on site on the protection of Aboriginal heritage objects under the NPW Act, and the penalties for damage to these items. • If an item (or suspected item) of Aboriginal heritage significance is discovered, cease works in the immediate vicinity of the find and fence off the area with suitable markers (star pickets, flagging or barrier mesh). Notify the council project manager and engage an archaeologist to assess the finds. If they are found to be Aboriginal objects, Heritage NSW must be notified under Section 89A of the NPW, and appropriate management sought. Depending on the proposed works in relation to the finds, further assessment and an AHIP may be required. Works may not recommence unless council has provided written approval to do so.
Discovery of human remains	• Stop work if human remains are found and contact NSW Police. If remains are suspected to be Aboriginal, Heritage NSW must be notified as well.

3.5 Historic Heritage

3.5.1 Existing Environment

3.5.1.1 Kogarah and surrounding suburbs

Botany Bay was first encountered by Europeans in 1770 during James Cook's expedition to Australia. In 1788, Governor Arthur Phillip landed at Botany Bay with the intention of settlement, however, relocated to Sydney Cove upon reassessment. As such, European settlement within the Kogarah region did not occur until the turn of the nineteenth century, with Captain John Townson receiving 1950-acres between 1808-1812, and merchant James Chandler accruing 1200-acres from 1822 (Kogarah Historical Society 1973, 4-7). Additional early landowners within the region included George Trace (60-acres) and Patrick Moore (120-acres, encompassing the study area) (Kogarah Historical Society 1973, 4-5). The region during these early years, was defined by timber getting and the sandy soils and swamps were not conducive to farming.

3.5.1.2 Scarborough Park and the study area

The study area falls within a former area of swampland, originally known as 'Patmore Swamp'. The name derives from its original grantee, Irish convict Patrick Moore, who acquired the land in 1812 (60-acres). Moore's descendants held the property for over a century, initially utilised for agricultural purposes (Boon 2022).

On May 23, 1879, Scarborough Park was gazetted, encompassing a large portion of Patmore Swamp. The Park was named by the Hon. Thomas Holt after the English coastal town of Scarborough, North Yorkshire (Kogarah Historical Society 1973, 4-7). Between 1932 and 1935, a portion of the swampland was dredged, drained, and filled, with assistance from a government relief programme during the Great Depression. Land was levelled for recreational purposes and artificial lakes were created. In 1955, a pavilion and toilet block were erected (Boon 2022).

Aerial imagery from 1971 (Figure 3-16) shows the tennis courts under construction, with further land clearances having taken place. Aerial imagery would attest that the tennis courts had been constructed in their current configuration by 1986 (Figure 3-17).

3.5.1.3 Local, State and Heritage Register Searches

Searches of the Australian Heritage Database, the Bayside LEP 2021 and the State Heritage Inventory utilising the term 'Ramsgate/Scarborough Park' were conducted on the 17th of May 2022 to determine if any places of historical archaeological significance were located within the study area.

No historic heritage items were recorded on these databases as being within the study area. One local heritage item, 'Hawthorne Street Reserve/Leo Smith Reserve' is listed on the Bayside LEP (Item no. I339) as being within the immediate vicinity of the study area (Figure 3-18). The heritage significance of this item is discussed in Table 3-20.

Table 3-20: Heritage significance of heritage item in vicinity of study area:

Item Name	Statement of Significance
Bayside LEP 2021: I339 (Hawthorne Street Reserve/Leo Smith Reserve)	The significance of the Hawthorne Street Reserve / Leo Smith Reserve heritage item largely lies within its maintenance of its natural landscape. The vegetation community is representative of Kurnell Dune Forest as listed in

Item Name	Statement of Significance
	the *Threatened Species Conservation Act 1995* (TSC Act) (now referred to as the BC Act) and subsequently is considered to be of high conservation value due to the small areas of this vegetation community left within the Sydney Bioregion. This community also contains a record of the threatened flora species *Syzygium paniculatum* (Magenta Lilly Pilly). Further, the reserve is historically significant for providing an example of the type of landscape which predated 19th century settlement.

Figure 3-16 1971 aerial imagery showing Scarborough Park. The tennis courts are under construction in the centre

Figure 3-17 1986 aerial imagery showing Scarborough Park. The tennis courts are in their current form here

Figure 3-18: Listed heritage items in proximity to the study area (ELA, 2022)

3.5.2 Impact Assessment

The study area for the proposed works enters the curtilage for 'Hawthorne Street Reserve / Leo Smith Reserve'. However, activities within the heritage curtilage are considered minor, and are consistent with the protection of the heritage item's significant values for the following reasons:

- The proposed works are concerned with the replacement of the existing tennis courts within Scarborough Park that are dilapidated and no longer fit for purpose.
- The tennis courts are located outside the curtilage of the 'Hawthorne Street Reserve / Leo Smith Reserve' heritage item and are not considered to maintain heritage significance.
- As a result of the proposal, no significant structures will be obscured or impacted, no views will be changes, no significant fabric will be removed or impacts, and there is no archaeological material likely in this location.
- The proposed works are consistent with maintaining the attributes of the 'Hawthorne Street Reserve / Leo Smith Reserve' and its Local heritage values. The heritage values of the site largely reside with its protection of Kurnell Dune Forest and threatened flora species, and in its ability to provide an example of a landscape pre-dating 19th century settlement. The impacts on vegetation removal and biodiversity are discussed in Section 3.3.2.

The assessment found that proposed works are not considered to have a significant impact on the heritage significance within and adjacent to the study area.

3.5.3 Mitigation Measures

Table 3-21: Mitigation measures for historic heritage

Environmental Aspect	Mitigation Measures
Impacts to Heritage items	• Contractors should be provided with a relevant heritage toolbox talk prior to commencement of works to ensure the heritage values of the area and understood and protected from inadvertent damage. • If unforeseen issues arise during the works, such as location of archaeological material, the heritage advisor should be consulted for management advice. • Ensure trees near the proposed work site are sufficiently protected from inadvertent damage. • If the scope of works change, or new elements are introduced, any heritage impacts will require assessment.

3.6 Noise and Vibration

3.6.1 Existing Environment

Existing noise levels in the vicinity of the study area are variable and impacted by surrounding uses. The site is in proximity to Sydney Airport which experiences a high number of aviation movements generating considerable noise. The airport is approximately 4 km to the northeast of the study area. The land use surrounding the study area is predominately residential in nature. The area is also serviced by local roads such as Hawthorne Street, Emmaline Street and Florence Street, as such the study area is moderately impacted by traffic noise.

3.6.2 Impact Assessment

3.6.2.1 Construction

Machinery and vehicles associated with construction have the potential to impact on nearby noise sensitive receivers, however due to separation distances between and scale of the works areas and the nearest receivers, this impact is anticipated to be minor. Works should occur during the following hours in line with those stipulated within the Interim Construction Noise Guideline (ICNG) (DECC, 2009):

- Monday to Friday 7 am to 6 pm
- Saturday 8 am to 1 pm
- No work on Sundays or public holidays.

It is noted that the closest noise sensitive receivers will be those adjacent to the vehicle access point at the intersection of Emmaline Street and Hawthorne Street as well as residences directly opposite the proposed works. Construction works will be temporary and short-term in nature, however individual notification to sensitive receivers situated near the study area should be provided prior to commencement of any construction works. A complaint register outlining concerns from sensitive receivers in proximity to the works should be maintained throughout the life of the Project. Mitigation measures provided in Table 3-22 must be adhered to.

3.6.2.2 Operation

The operation of the proposed activity is not expected to significantly increase noise levels in the area that will further impact residents. The proposed activity is likely to attract more people to the courts and recreational space which will now have the capacity to allow more stakeholders to utilise the facilities, resulting in an increase in noise in the area. The increased noise levels however are expected to primarily occur during the daytime and the main play space is located approximately 50 m away from the nearest residents and will be shielded by existing and planted vegetation as well as the existing community hall.

It must be noted that the installation of lights will enable use of the courts to occur later into the evening. Council should monitor the noise associated to the increased hours of use and maintain complaints register to monitor and mitigate impacts to residents. Mitigation measures provided in Table 3-22 must be adhered to.

3.6.3 Mitigation Measures

Table 3-22: Mitigation measures for noise and vibration

Environmental Aspect	Mitigation Measures
Site management	• Avoid the use of radios or stereos outdoors where neighbours can be affected. • Avoid shouting and minimise talking loudly and slamming vehicle doors. • Keep truck drivers informed of designated vehicle routes, parking locations, acceptable delivery hours or other relevant practices (for example, minimising the use of engine brakes, and no extended periods of engine idling).
Consultation and Negotiation	• Ensure consultation between Council, contractors, and the community. Consultation must outline: o building times o what works are expected to be noisy o works duration, o what is being done to minimise noise o when respite periods will occur. • Provide information to neighbours prior to and during construction through media such as letterbox drops, website communications, meetings, or individual contact. In some areas, the proponent will need to provide notification in languages other than English. Council will provide information about the works on it's website.
Plant and Equipment	• Use alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric controlled units where feasible and reasonable. Where there is no electricity supply, use an electrical generator located away from residences. • Examine different types of machines that perform the same function and compare the noise level data to select the least noisy machine. For example, rubber-wheeled tractors can be less noisy than steel tracked tractors. • Pneumatic equipment is traditionally a problem – select super silenced compressors, silenced jackhammers, and damped bits where possible. • Operate plants in a quiet and efficient manner. • Reduce throttle setting and turn off equipment when not being used. • Regularly inspect and maintain equipment to ensure it is in good working order and check the condition of mufflers.
On-site considerations	• Place as much distance as possible between the plant or equipment and residences and other sensitive land uses. • Restrict areas in which mobile plant can operate so that it is away from residences and other sensitive land uses at particular times. • In all circumstances, the requirements of the relevant Occupational Health and Safety legislation must be complied with. For information on replacing audible warning alarms on a mobile plant with less annoying alternatives. • Use temporary site buildings and materials stockpiles as noise barriers. • Use natural landform as a noise barrier – place fixed equipment in cuttings, or behind earth berms.
Work Scheduling	• Organise work to be undertaken during the recommended standard hours where possible. • If works outside the recommended standard hours are planned, avoid scheduling on Sundays or public holidays.

Environmental Aspect	Mitigation Measures
	• Schedule noisy activities around times of high background noise (local road traffic or when other local noise sources are active) where possible to provide masking or to reduce the amount that the construction noise intrudes above the background. • Schedule deliveries to nominated hours only.
Complaints handling	• Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow. • Implement all feasible and reasonable measures to address the source of the complaint. • Keep a register of any complaints, including details of the complaint such as date, time, the person receiving the complaint, complainant's contact number, the person referred to, description of the complaint, work area (for larger projects), time of verbal response and timeframe for written response where appropriate. • Complaints register should be kept during the first year of operation to understand and mitigate impacts associated to longer hours of operation. • Should the contractor receive complaints directly they must be forward to Council to administer.

3.7 Landscape and Visual Amenity

3.7.1 Existing Environment

The study area contains the tennis courts, associated facilities, shared paths and access to the community hall and parking facilities. The courts are surrounded by tree canopy comprised of native and exotic vegetation, with a series of shared pathways meandering through the Park. Given the screening provided by the canopy cover and recreation use associated with the area, the current use is not considered to adversely impact the visual amenity of surrounding residents.

3.7.2 Impact Assessment

3.7.2.1 Visual Amenity

The proposed works will not significantly alter the visual landscape and amenity of the area as it involves the construction of like for like infrastructure associated with recreational and sporting use, amenity buildings and landscaping following the completion of works. As the works will facilitate long-term higher amenity public recreation use, the visual impact on the community is anticipated to be positive. The works will predominantly be undertaken within areas that have historically been used for public open space and recreation. As such, the nature of land use will not change. The extent of vegetation removal within the study area has been minimised where possible and the proposal has been developed to be sympathetic to existing site conditions and environmental sensitivities such as wetlands in proximity to the study area. Additionally, is it proposed to use the same discharge points that exist now to manage drainage outflow from the courts to the waterway. The proposed drainage outflow would be that of a dry creek bed style which can be planted out and landscaped with native plantings to be sympathetic to sensitive natural environments.

It is likely that during construction the visual amenity of the park and surrounding residential areas will be impacted. However, vegetation surrounding the impact area will screen most of the visual impact from surrounding residents. In addition, the impact will be temporary and is not considered significant subject to the implementation of recommended mitigation measures provided in Table 3-23.

3.7.2.2 Lighting Impacts on Nearby Residents

Potential impacts of light on native fauna are discussed in Section 3.3.2. Impacts of lighting on surrounding residents would primarily be associated with light spill not allowing residents to darken their house for sleeping and other night-time activities.

The current tennis court facility does not have lighting. New lights are proposed to be installed; however, the system is designed to be on when the courts are in use and then to be off when not in use. Operational hours should be established in consideration with consultation with the community. However, lighting should be dimmed by 9 pm and lighting should be turned off after 11 pm, unless deemed necessary to remain on by Council. All luminaires for the courts will be equipped with glare shield to further reduce any light spill to sensitive areas. All lighting is to comply with ANZS 4282:2019 (effect of obtrusive light onto neighbouring properties).

This lighting will, however, improve visitor safety and wayfinding capacity to service the facility and access from disabled parking to courts. The renewal of new safety and wayfinding lights are not anticipated to have a detrimental impact on nearby residents.

Under the conditions described above and the mitigation measures provide in Table 3-23, visual impacts from lighting will be minimised to a level that will not significantly impact the surrounding residents.

3.7.3 Mitigation Measures

Table 3-23: Mitigation measures for visual and landscape

Environmental Aspect	Mitigation Measures
Impact on the community	• Notify community or neighbours of the construction period • Remove any barriers and ancillary construction equipment from the study area prior to construction. • Where possible, consider additional revegetation to further reduce impact of light spill on residences
Lighting	• All sport and public domain lighting will comply with ANZS 4282 (effect of obtrusive light onto neighbouring properties) • All luminaires should be equipped with glare shield to further reduce any light spill to sensitive areas. • Time periods and periodic dimming of lights ○ Time periods for operation of lights should be determined in consultation with the local community • Angle lighting away from towards courts to minimise light spill on sensitive habitats and residential receivers

3.8 Traffic and Transport

3.8.1 Existing Environment

The study area is principally accessed via vehicle access point at the intersection of Hawthorne Street and Emmaline Street. Access to Hawthorne Street can be gained via Emmaline Street, Florence Street or Culver Street. To the south of Hawthorne Street is Florence Street and to the north is Emmaline Street and Culver Street, all of which provide access to Chuter Avenue. A carpark of 115 vehicles is provided along the western side of Hawthorne Street adjacent to Scarborough Park. The carpark provides a significant number of parks and is approximately 25 m from the study area. The closest street to the study area with traffic data is Florence Street with an approximate vehicle per day rate of 1,425 vehicles (Bayside Council, 2021). This is likely higher than average for the surrounding streets given the presence of the public school on the road.

The study area is accessible through pedestrian pathways that connect to the wider Scarborough Park and Ramsgate Beach pedestrian pathway network. The study area is approximately 400 m from the nearest bus stop on Chuter Avenue, Stop ID 221733. This is the closest public transport to the study area and is serviced by the 947 service, Kogarah to Hurstville.

3.8.2 Impact Assessment

3.8.2.1 Construction

There will be minor impacts to traffic associated with construction of the proposal. This will be associated to the movement of vehicles required for construction purposes including construction workers cars, delivery of materials, delivery of plant, removal of spoils and demolition materials.

Furthermore, as a site compound is to be situated within the worksite within Scarborough Park itself, it is not anticipated that road closures will be required. While some parking spaces will likely be utilised by workers cars, the delivery of materials and plants and specialised vehicle equipment will access the park directly via the park access point on the corner of Emmaline Street and Hawthorne Street. A Traffic Control Plan (TCP) is recommended to be prepared prior to construction.

3.8.2.2 Operation

The proposal is likely to attract an increase in visitors to the park, primarily sports people looking to utilise the upgraded multi-sport facilities. However, due to NSW Government's Everyone Can Play Grant program funding regional play spaces across Greater Sydney and Regional NSW, it is anticipated that similar facilities will be provided across Sydney and the increase in visitation will be mainly by people in the locality who can use active or public transport.

Therefore, it is considered reasonable to conclude that the proposed works will not have unacceptable implications in terms of road network capacity or off-street parking, servicing, or site access requirements.

3.8.3 Mitigation Measures

Table 3-24: Mitigation measures for traffic

Environmental Aspect	Mitigation Measures
Disruption to traffic flows	• Clearly delineate and sign post all alternative pedestrian routes that are obstructed because of the works • Position vehicles, materials, and equipment to minimise impacts to public access and parking • Restrict heavy vehicles to specified routes • Implement a TCP prior to the commencement of any construction works to ensure that traffic disruptions are mitigated, and commuters are notified of detours and closures through signage • Maintain a project complaint register as part of the TCP

3.9 Air Quality

3.9.1 Existing Environment

The study area is in park that has large patches of remanent and planted vegetation. The area surrounding the park is primarily utilised for residential activities. Approximately 4 km northeast of the study area is the Sydney Airport. The existing air quality is typical of a Sydney suburban area.

Potentially affected receivers near the study area include residential properties and schools. Several residences are near the study area. The study area is near the following streets:

- Hawthorne Street
- Emmaline Street
- Chuter Avenue
- Tonbridge Street
- Culver Street

The elderly and children are the most at risk of adverse air quality impacts of the proposed works. Sensitive receivers within proximity to the works include, but are not limited to:

- Ramsgate Public School is < 200 m from study area.

Residents, particularly those located within the streets mentioned above and located near the proposed construction vehicle access points, will be sensitive to air quality impacts from the works.

3.9.2 Impact Assessment

3.9.2.1 Construction

Anticipated sources of dust and dust-generating activities from the proposal include:

- Operation of scrapers, graders, loaders and/or excavators across the entire project area
- Excavation and fill transfer works associated with the proposed works
- Dust loading and transfers from aggregate material on trucks, loaders, and excavators
- Wind erosion from exposed surfaces at disturbed areas
- Uncontrolled dust located within stockpiles due to aeolian transport

The total amount of dust generated depends on the properties of soil materials (silt and moisture content), techniques adopted during excavation, demolition, grading and transfer of soils, and the prevailing meteorological conditions.

The dispersion of the dust relates to the quantity and drift potential of the particles. Larger particles generally settle out near the source, whereas fine particles can be dispersed over greater distances. Typically, the impacts on nearby sensitive receivers decrease with increased distance from the source.

During unfavourable meteorological conditions, dust emissions may be higher. The closeness of sensitive receptors, such as residential properties may require strict dust suppression measures to be utilised through duration of construction works, particularly where dust causing activities such as excavation are undertaken.

Where earthworks are proposed, several dust suppression methods will be required to ensure that the potential for dust generation is mitigated and negative impacts to sensitive receivers are minimised. These methods include utilising fencing with shade cloth, wetting down of stockpiled and exposed material and staging excavation works.

Emissions from construction vehicles and equipment associated with the combustion of fuel and petrol are also anticipated because of the works. Construction plant and equipment must be maintained to manufacturer's operating standards, shut down when not in use and simultaneous use should be minimised where possible. Provided that appropriate mitigation measures, provided in Table 3-25, are adhered to, and good site practices are used, the impacts of the works on greenhouse gas emissions are anticipated to be low.

3.9.2.2 Operation

During operation, the study area will be utilised by pedestrian and cycle traffic only and therefore will not generate emissions associated with greenhouse gases. The impacts to air quality are not anticipated to be significant in comparison to the existing land use of the surrounding area, proximity to the Sydney Airport and significant road use within the area on roads such as Chuter Avenue and Barton Street.

3.9.3 Mitigation Measures

Table 3-25: Mitigation measures for air quality

Environmental Aspect	Mitigation Measures
Dust generation from vibrating and ground disturbing works	• Minimise works during high wind periods. • Apply dust suppression as required to limit excessive dust generation. • Look for excessive dust generation and slow down if needed. • Minimise site movements. • Locate stockpiles away from sensitive receptors where possible. • Cover or water stockpiles that are not used for extended periods and keep moist to minimise transmission of dust. • Rehabilitate construction sites following completion of the works.
Fumes generation from machinery	• Do not have machinery running while not in use. • Minimise use of machinery for required activity only. • Where odour emissions are perceivable and may impact nearby sensitive receivers, consider odour suppression systems.
Cumulative impacts of greenhouse gas emissions	• Maintain plant and equipment in accordance with manufacturer's specifications to ensure that it is in a proper and efficient condition. • Regularly inspect plant and equipment to ascertain that fitted emission controls are operating efficiently. • On site burning of waste of any kind is not permitted

3.10 Waste Management

3.10.1 Existing Environment

The proposed works have the potential to utilise a range of different resources and generate several different types of waste throughout its construction and operational phases. The construction of the Project would require the use of resources such as electricity, water, fuel, concrete, and paving materials. Other resources would be required for infrastructure such as signage, landscaping, and lighting.

The maintenance and occasional repair of project infrastructure during operation would require resources. However, it is not anticipated that these activities would place a significant demand on resources.

3.10.2 Impact Assessment

3.10.2.1 Construction

During construction, waste generating activities will include demolition and removal of current pathways and equipment, excavation of soil, vegetation clearing, drainage works, equipment servicing and maintenance, potential over ordering of materials, packaging, effluent and general waste from staff and contractors. Potential impacts from waste generation include:

- reduced aesthetics in community areas
- health impacts to residential receivers
- minor spills from hazardous fuel and chemical use
- pollution of the environment from other general wastes
- odours and increase in rodent activity
- reduction of materials

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 construction contractors.

Soils and asphalt within the impact area have been pre-classified (Geotechnique, 2022) as General Solid Waste and must be disposed of in accordance with the *Waste Classification Guidelines* (DECC, 2009).

3.10.2.2 Operation

During operation, waste bins should be positioned at accessible locations to encourage users and visitors to dispose of rubbish easily and appropriately. Mitigation measures provided in Table 3-26 must be adhered to.

3.10.3 Mitigation Measures

Table 3-26: Mitigation measures for waste management

Environmental Aspect	Mitigation Measures
General	• As part of the construction environmental management plan, a Waste Management Plan should be developed and implemented • Appropriate staff amenities to be provided onsite for use

Environmental Aspect	Mitigation Measures

Waste Generation	• Consider resource management options for the Project against a hierarchy of the following order embodied in the Waste Avoidance and Resource Recovery Act 2001:
	  ○ Avoid unnecessary resource consumption
	  ○ Recover resources (including reuse, reprocessing, recycling and energy recovery)
	  ○ Dispose (as a last resort)
	• Where appropriate, waste materials generated should be considered for reuse either on site or off site under the Resource Recovery Orders and Exemptions
	• Waste streams should be separated and assessed where possible
	• Classify all waste and excess spoil in accordance with the *Waste Classification Guidelines* (DECC, 2009) prior to disposal and transported to a licensed waste disposal facility
	• Upon completion of waste disposal, retain all original weighbridge/disposal receipts issued by the receiving waste facility in a waste register as evidence of proper disposal
	• Remove all waste from the site on completion of the works
	• Engage a materials estimator and order materials on a just in time basis to reduce likelihood of over ordering
	• Where appropriate, consideration should be given to the use of recycled materials in the Project

Litter left on-site by staff/contractors	• Ensure an adequate number of bins are placed at the site for workers and that all litter is placed in these bins. Ensure work areas of the Study Area are kept clean and free of litter, including cigarette butts, at all times.

3.11 Socio-Economic Considerations

3.11.1 Existing Environment

3.11.1.1 Population

Bayside in 2021 had a population of 175,184 (ABS, 2021) and is forecast to grow to 228,200 by 2036, which equates to an additional 65,300 people (Bayside Council, 2020a). Overall, the Bayside population is forecast to increase by 40% and become an increasingly older community (Table 3-27). This change in the demographic profile is important when planning for community services and social infrastructure such as parks and community facilities.

Table 3-27: Bayside population by age group in 2016 and 2036

Age Group	2021	2036	Anticipated Change (%)
0 – 4	9,986	14,300	143%
5 – 19	24,274	37,500	154%
20 – 29	31,881	29,650	93%
30 – 39	33,362	32,850	98%
40 – 49	22,299	31,700	142%
50 – 64	27,337	39,650	145%
65 – 84	22,198	34,500	155%
85+	3,802	8,050	211%

3.11.1.2 Social Infrastructure

The Bayside LGA has a diverse range of open space and recreation sporting facilities including parklands, sportsgrounds, natural areas, golf courses, aquatic centres, indoor sports facilities and pedestrian and cycle pathways. The distribution and access to open space varies across the LGA as some areas do not have access to local parks within a 400 m safe walking distance and other areas have a low supply of sporting open space (Bayside Council, 2020a).

The provision of new sport and active recreation will be essential in the future with a growing population, however, is challenging due to the urbanised nature of the LGA. It is therefore essential that existing sport and recreation facilities are upgraded to meet future needs. Where access to formal open space is constrained, the enhancement of active transport links between open and green spaces that can build upon the already identified Green Grids within the LGA will also be important, which will be provided, in part, through the proposed upgrading of sections pedestrian pathways identified as part of Scarborough Courts Masterplan (Chrisp Consulting, 2022).

3.11.2 Impact Assessment

The proposed works will ultimately provide several socioeconomic impacts within the local area, these will primarily be positive in the longer term, but may have some small short-term negative impacts.

3.11.2.1 Viability of Local Businesses

The proposed works are unlikely to result in negative impacts to local businesses during construction from a decrease in trade/demand for services due to noise, vibration, access, visual amenity, and traffic congestion as the study area is surrounded by either additional parklands or residential housing. Some

businesses may benefit from increased trade from construction works or demand for construction-related services and construction workers utilising local businesses. In the longer term, there is potential that the increased usage of Scarborough Park, associated public recreation areas and ability for residents to connect to the wider municipality via footpaths through the park will incentivise expenditure in local business.

3.11.2.2 General Disruption Due to Construction

Residents and businesses are likely to have concerns about disruption and disturbances resulting from construction, which may result in a slight negative impact in the short term. Maintenance activities once the upgrades to Scarborough Park are completed are anticipated to be short term and infrequent and cause negligible disruptions on residents. Mitigation measures provided in Table 3-28 must be adhered to.

3.11.2.3 Operation

The proposal is anticipated to provide greater amenity and variety of facilities to residents and visitors to the area. As the proposal is upgrading a dilapidated facility it is anticipated the use of facility will increase and enable access to safe and functional courts. In addition, the proposal will enable the area to also be used for basketball and futsal, providing a greater range of activities to local residents.

3.11.3 Mitigation Measures

Table 3-28: Mitigation measures for socio-economic considerations

Environmental Aspect	Mitigation Measures
General	Prepare a CEMP to include the required management and mitigation measures. The CEMP will provide a framework for establishing how these measures will be implemented and who will be responsible for their implementation. The CEMP will be prepared prior to the proposal's construction and must be reviewed and certified by Council, prior to the start of any on site work. The CEMP will include sub plans for all impacts identified within this REF
Impacts to amenity, noise, traffic, and dust	Ensure all recommended mitigation measures for noise and vibration, amenity, traffic, and air quality are adhered to

3.12 Cumulative Impacts

3.12.1 Existing Environment

A search of the Department of Planning's 'Major Project Assessments Register' (August 2022) indicated there are a small number of major projects located close to the study area, primarily associated with the St. George, Wesley Hospitals, and M6 Extension:

- The St George Hospital upgrades comprises the construction of a new emergency department, Acute services modification, and Stage 3 redevelopment.
- The Wesley Hospital Kogarah redevelopment involves the demolition of existing buildings, and construction and operation of a new larger capacity hospital with increased beds and consulting rooms as well as outpatient facilities.
- The M6 extension proposes to construct a new multi-lane road link between the M5 motorway tunnels at Arncliffe and President Avenue at Kogarah.

3.12.2 Impact Assessment

The major direct cumulative construction impacts that may be experienced from the Project include:

- Increased construction vehicle traffic on public roads causing congestion and delays
- Increased air pollution and noise for residents
- Cumulative noise impacts associated with multiple construction works.

It is unlikely that the construction timeline of the Scarborough Park Courts will match most major projects in the area however, there is a low potential for cumulative impacts on residents that are exposed to periods of construction of both the M6 extension and the Project.

The projects specified above are located at a minimum of 1.5 km away from the works in Scarborough Park. As such, it is not anticipated that the works for these projects will utilise the same access roads for construction delivery.

Provided that the recommended management plans referenced throughout the REF are adhered to, it is not anticipated that negative cumulative impacts will result from the works. The works have been designed to improve the amenity, landscape value and effective uses of the environment. Additionally, the limited scale of the Project is unlikely to add a significant increase in cumulative impacts because of multiple projects.

The proposed works will create opportunity for the community to exercise and socialise through organised sports by utilising an upgraded public asset which had previously been disrepair and unable to be used. Mitigation measures provided in Table 3-29 must be adhered to.

3.12.3 Mitigation Measures

Table 3-29: Mitigation measures for cumulative impacts

Environmental Aspect	Mitigation Measures
Community notification	• Ensure a plan for community consultation is developed which outlines the dissemination of information to the community via letterbox drops, websites, and newsletters.

Environmental Aspect	Mitigation Measures
	• Notify sensitive receivers including businesses and schools which are at risk of impacts to day-to-day functioning and trading at least 2 weeks prior to works commencement. • Where multiple projects are occurring within the same vicinity at the same time, undertake communication between construction contractors to ensure that potentially noisy or disruptive activities are not undertaken at the same time.

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 Climate Change, Energy, the Environment and Water (DCCEEW). Table 3-30 addresses the MNES for the Project.

Table 3-30 Consideration of Matters of National Environmental Significance

MNES	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?	Non-significant impact
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

3.14 Licences and Permits

All relevant environmental impacts have been assessed in this REF. Due to the Project's nature and being a Part 5 activity, there are no other licences or permits are required for the proposed works.

4. Consultation

4.1 Consultation Requirements under the *State Environmental Planning Policy (Transport and Infrastructure) 2021*

Division 1 of the Transport and Infrastructure SEPP provides guidance on consultation with stakeholders. These requirements are addressed in Table 4-1 below.

Table 4-1 Transport and Infrastructure SEPP consultation requirements

Infrastructure SEPP Clause	Clause Relevance	Consultation Undertaken
Section 2.10	**Consultation with councils – development with impacts on council-related infrastructure or services** Consultation is required if the development: *(a) will have a substantial impact on stormwater management services provided by a council, or* *(b) is likely to generate traffic to an extent that will strain the capacity of the road system in a local government area, or* *(c) involves connection to, and a substantial impact on the capacity of, any part of a sewerage system owned by a council, or* *(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* *(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* a. *(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).*	No, Bayside Council is the proponent.
Section 2.11	**Consultation with councils – development with impacts on local heritage** Consultation is required if the development: *(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* a. *(b) is development that this Chapter provides may be carried out without consent*	No, Bayside Council is the proponent.
Section 2.12	**Consultation with councils – development with impacts on flood liable land** *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 Floodplain Development Manual: the management of flood liable land published by the New South Wales Government and as in force from time to time.* *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 –*	No, Bayside Council is the proponent.

Infrastructure SEPP Clause	Clause Relevance	Consultation Undertaken
	(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 *(b) taken into consideration any response to the notice that is received from the council within 21 days after the notice is given.*	
Section 2.13	**Consultation with State Emergency Service – development with impacts on flood liable land** *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—* *(a) given written notice of the intention to carry out the development (together with a scope of works) to the State Emergency Service, and* *(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.*	No, the site is not mapped under the Flood Planning Map as flood liable land.
Section 2.14	**Consultation with councils – development with impacts on certain land within the coastal zone** *(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.*	No, Bayside Council is the proponent
Clause 2.15	**Consultation with Public Authorities other than Councils** Consultation is required if the development is: *(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), *(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, *(c) development comprising a fixed or floating structure in or over navigable waters*—Transport for NSW, *(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 *(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, *(f) development on land in a mine subsidence district within the meaning of the* Mine Subsidence Compensation Act 1961—the Mine Subsidence Board.	N/A

4.2 Community Consultation

The draft concept design (Bayside Council, 2022) for the upgrading of Scarborough Park Courts was publicly exhibited on the Bayside Council 'Have Your Say' website from the 22nd of July 2022 – 15th of August 2022. The public was invited to share feedback through online feedback forms, mail, phone, and email.

5. Mitigation Measures

Table 5-1 Recommended mitigation measures for the proposed works

Impact On	Environmental Impact	Safeguards/Mitigation Measures	Responsibility	Timing
Soils and Landform	Contamination Acid Sulfate Soils Sediment and erosion control Stockpiling Soil stability	Soils must be tested for contaminants following the completion of demolition works and prior to construction of the new courts	Council	Prior to Construction
		If contaminants are identified then recommendations from contamination consultant should be adhered to	Council	Prior to Construction
		As the study area is mapped as having high probability of occurrence of ASS the presence of ASS must be confirmed prior to construction	Council	Prior to Construction
		If ASS is identified as occurring with the proposed impact area or being disturbed due to the proposed construction activities, then an ASS Management Plan must be developed and implemented.	Council	Prior to Construction
		Prepare a 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	Contractor	Prior to Construction
		Prepare a SEMP in accordance with The Blue Book – Managing Urban Stormwater: Soils and Construction (Landcom, 2004) and implement prior to works	Contractor	During Construction
		Install soil and erosion control measures such as sediment fencing prior to on-ground works. Inspect these regularly (weekly), and more frequently during rain periods to ensure structures are in proper working order	Contractor	During Construction
		Regularly check the weather forecast in order to plan works in accordance with following: • Prior to forecast heavy rain, cease work, and remove accumulated material from sediment controls: • Schedule the major drainage and earthworks outside of predicted heavy rain periods • Stop work during and following heavy rainfall to reduce risk of mobilising sediment.	Contractor	During Construction
		Bare areas should be mulched, using on-site native vegetation if removed, following clearance works to prevent erosion or soil damage. Alternatively, erosion prone areas, when not in use, may be covered with biodegradable weed matting or similar product	Contractor	During Construction
		Monitor sedimentation down slope of excavated areas.	Contractor	During Construction
		Leave erosion and sediment controls in place until after the works are completed	Contractor	During Construction
		Excavated soil and approved, imported materials must be stockpiled within a designated stockpile area	Contractor	During Construction
		During site establishment, stockpile areas must be prepared and managed using the following methods: • Establishing stockpiles on existing paved or hardstand surfaces to minimise the requirement for validation after the stockpile has been removed • Construction of diversion drains and bunds around the perimeter of the stockpile areas. Installation of sediment and erosion control measures including silt fencing and hay bales, where necessary • Erection of signs at the entrance to the stockpile areas and at locations around the stockpile specifying individual stockpile number and the type of materials stored • Establishment of buffer zones around each stockpile area to enable access to the stockpiles and minimise impacts of the stockpile area on the surrounding facilities	Contractor	During Construction
		Maintain, repair, and replace the drainage, sediment and erosion control measures installed within the stockpiling areas at the commencement of the Project, where necessary for the duration of the stockpiling activities. All stockpiles must be maintained in a tidy and safe condition with stable batter slopes	Contractor	During Construction
		Develop and implement an unexpected finds protocol for the site to ensure any material which is potentially contaminated is identified and appropriately assessed and managed	Contractor	During Construction
		For any excess spoil material which requires offsite disposal, formally classify waste before being taken to an appropriately licensed landfill in accordance with the EPA (2014) Waste Classification Guidelines.	Contractor	During Construction
		The durability of piles should consider the underlying ground conditions and environmental nature of the site. Reference should be made to Section 6 of AS2159-2009 '*Piling-Design and Installation*' for exposure classification recommendations on steel and concrete	Contractor	During Construction
Water Quality and Coastal Wetlands	Increase in sediment flow into waterways and wetlands Reduction in water quality Impacts to flooding			
		Wash all equipment, including, erosion and sediment control measures and trailers to prevent spread of exotic species. Conduct a visual check for vegetation and seeds on all equipment machinery used in the activities before work commences.	Contractor	During Construction
		Install erosion and sediment controls around remediation works area to prevent mobilisation of contaminated soils into adjacent aquatic habitats	Contractor	During Construction

Impact On	Environmental Impact	Safeguards/Mitigation Measures	Responsibility	Timing
	Indirect impacts to mapped Coastal Wetlands			
	NoRBE Recommendations: Erosion and sediment runoff	• The SEMP must utilise sandbags, sediment fencing and/or other equivalent erosion and sediment control structures in accordance with the *The Blue Book – Managing Urban Stormwater: Soils and Construction* (Landcom, 2004) during construction. • All temporary erosion and sediment control structures to be in place prior to any construction works commencing. • All permanent drainage structures are to be implemented as soon as practical in the works program with appropriate sediment and erosion controls to protect water quality from discharges prior to the completion of construction works. • Temporary sediment and erosion control structures to remain in place until exposed areas are rehabilitated and stabilised. • Ground disturbance works to be scheduled for periods of dry weather as far as practical. • No works involving soil disturbance to take place during heavy rainfall periods, other than work necessary to stabilise the site. • Overland flow from off site to be diverted around construction areas. • Overland flow from within the construction area to be diverted towards the sandbags with the sediment fencing. • General solid waste is to be collected in appropriate bins. • Disturbed soil areas should be rehabilitated/revegetated immediately following completion of construction	Contractor	Prior to Construction During Construction After Construction
	Reduction in water quality	• Store all chemicals (e.g., fuel, oil) offsite. If required to be stored onsite, store chemicals in appropriate bunding/storage systems, outside of the riparian zones and only for short periods. • Ensure appropriate spill kits are present onsite. • Ensure all equipment is in good working order. • Carry associated Safety Data Sheets (SDS) for all chemicals. • Do not use any chemicals that are labelled as 'Class 9 Environmentally hazardous' as part of the proposed activities. • Do not stockpile rubbish or store chemicals near native vegetation or waterways. • Limit the use of fuel, chemicals and herbicides near waterways and other sensitive areas.	Contractor	Prior to Construction During Construction After Construction
	Indirect impacts to mapped Coastal Wetlands	• Install the stormwater devices and stormwater detention structures in accordance with plans to manage the annual volume of flow into the adjacent wetlands and improve water quality being delivered into the wetlands. • Ensure erosion and sediment controls are in place and regularly maintained to prevent sediment runoff to the wetland, which can smother in fauna burrows within the exposed area of soil.	Contractor	Prior to Construction During Construction After Construction
Biodiversity	**Accidental damage / clearing**	• Council staff are to undertake a pre-works briefing advising of sensitive areas and relevant safeguards for these areas. • Stop works if any previously undiscovered threatened species are discovered during works. An assessment of the impact and any required approvals must be obtained. Works must not recommence until Council has provided written approval to do so. • Ensure the site-specific CEMP includes instructions for dealing with orphaned or injured native animals and ensure the CEMP includes the contact details for the NSW Wildlife Information, Rescue and Education Service Inc (WIRES). • Install temporary barrier fencing to prevent entry into adjacent vegetation and appropriate 'no-go zone' signage. This must include the *Syzygium paniculatum* species identified outside of the impact area (Figure 3-9) and areas of Council and any areas of Community bush regeneration activities. • Install tree protection measures around trees to be retained in the study area. Structures should be adequate to prevent machinery from entering within the drip zone. • Maintain temporary fencing to prevent access into the native vegetation.	Council/ Contractor	During Construction
	Indirect lighting to adjacent vegetation and waterbody	• Manage artificial lights using motion sensors and timers. • Aim light onto the exact surface area requiring illumination. Use shielding on lights to prevent light spill into the atmosphere and outside the footprint of the target area. • Avoid lights containing short wavelength, violet / blue light and white LEDs. • Avoid high intensity light of any colour.	Council/ Contractor	During Construction After Construction
	Spread of priority weeds	• Wash down equipment and vehicles prior to and after use, to manage the introduction and spread of weed propagules. • Thoroughly clean all equipment of soil and weed propagules prior to entry into the study area. • Remove Priority weeds using best management practices (including appropriate controls to prevent impacts to threatened species) prior to removal of native vegetation. Remove weed propagules offsite. • Bag and remove all weed propagules offsite, preferably the same day and dispose of at designated green waste facility.	Contractor	During Construction After Construction
	Introduction/ spread of pathogens	• Adhere to the Saving our Species Hygiene guidelines (DPIE, 2020) at all times https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Wildlife-management/saving-our-species-hygiene-guidelines-200164.pdf . In particularly: • Wash down equipment and vehicles prior to entering the site, to manage the introduction and spread of pathogens. Pay particular attention to cleaning mud flaps and tyres. • Thoroughly clean all equipment of soil and vegetation debris prior to entry into the study area. • Use a solution of 70% ethanol or methylated spirits in 30% water for wash down and equipment cleaning to effectively disinfect areas.	Contractor	Prior to Construction During Construction After Construction

Impact On	Environmental Impact	Safeguards/Mitigation Measures	Responsibility	Timing
		• Wash down on a hard, well-drained surface, for example a road, and on ramps if possible. Do not allow wash-down water to drain into native bushland. • Machinery and equipment must also be cleaned when leaving site. • Wash down protocols are required to control multiple impacts including, pathogens, weeds and contaminated soils. The CEMP should develop a single wash down process that addresses the requirements of all three potential environmental impacts.		
Aboriginal Heritage	Discovery of unexpected Aboriginal objects Discovery of Human Remains	Brief all contractors undertaking works on site on the protection of Aboriginal heritage objects under the NPW Act, and the penalties for damage to these items If an item (or suspected item) of Aboriginal heritage significance is discovered, cease works in the immediate vicinity of the find and fence off the area with suitable markers (star pickets, flagging or barrier mesh). Notify the council project manager and engage an archaeologist to assess the finds. If they are found to be Aboriginal objects, Heritage NSW must be notified under Section 89A of the NPW, and appropriate management sought. Depending on the proposed works in relation to the finds, further assessment and an AHIP may be required. Works may not recommence unless council has provided written approval to do so	Contractor	Prior to Construction
		Stop work if human remains are found and contact NSW Police. If remains are suspected to be Aboriginal, Heritage NSW must be notified as well	Contractor	During Construction
Historic Heritage	Impacts to Heritage items	Contractors should be provided with a relevant heritage toolbox talk prior to commencement of works to ensure the heritage values of the site and understood and protected from inadvertent damage	Contractor	During Construction
		If unforeseen issues arise during the works, such as location of archaeological material, the heritage advisor should be consulted for management advice	Contractor	During Construction
		Ensure trees near the proposed work site are sufficiently protected from inadvertent damage	Contractor	During Construction
		If the scope of works change, or new elements are introduced, any heritage impacts will require assessment	Contractor	During Construction

Noise and Vibration	Consultation and Negotiation	• Ensure consultation between Council, contractors, and the community. Consultation must outline:
		  ○ building times
		  ○ what works are expected to be noisy
		  ○ works duration,
		  ○ what is being done to minimise noise
		  ○ when respite periods will occur.
		• Provide information to neighbours prior to and during construction through media such as letterbox drops, website communications, meetings, or individual contact. In some areas, the proponent will need to provide notification in languages other than English. Council will provide information about the works on it's website.
			Council/ Contractor	Prior to Construction
				During Construction

	Plant and Equipment	• Use alternatives to diesel and petrol engines and pneumatic units, such as hydraulic or electric controlled units where feasible and reasonable. Where there is no electricity supply, use an electrical generator located away from residences. • Examine different types of machines that perform the same function and compare the noise level data to select the least noisy machine. For example, rubber-wheeled tractors can be less noisy than steel tracked tractors. • Pneumatic equipment is traditionally a problem – select super silenced compressors, silenced jackhammers, and damped bits where possible. • Operate plants in a quiet and efficient manner. • Reduce throttle setting and turn off equipment when not being used. • Regularly inspect and maintain equipment to ensure it is in good working order and check the condition of mufflers.	Contractor	During Construction
	On-Site Conditions	• Place as much distance as possible between the plant or equipment and residences and other sensitive land uses. • Restrict areas in which mobile plant can operate so that it is away from residences and other sensitive land uses at particular times. • In all circumstances, the requirements of the relevant Occupational Health and Safety legislation must be complied with. For information on replacing audible warning alarms on a mobile plant with less annoying alternatives. • Use temporary site buildings and materials stockpiles as noise barriers. • Use natural landform as a noise barrier – place fixed equipment in cuttings, or behind earth berms.	Contractor	During Construction
	Work Scheduling	• Organise work to be undertaken during the recommended standard hours where possible. • If works outside the recommended standard hours are planned, avoid scheduling on Sundays or public holidays. • Schedule noisy activities around times of high background noise (local road traffic or when other local noise sources are active) where possible to provide masking or to reduce the amount that the construction noise intrudes above the background. • Schedule deliveries to nominated hours only.	Contractor	During Construction
	Complaints Handling	• Have a documented complaints process, including an escalation procedure so that if a complainant is not satisfied there is a clear path to follow. • Implement all feasible and reasonable measures to address the source of the complaint. • Keep a register of any complaints, including details of the complaint such as date, time, the person receiving the complaint, complainant's contact number, the person referred to, description of the complaint, work area (for larger projects), time of verbal response and timeframe for written response where appropriate. • A complainants register should be kept during the first year of operation to understand and mitigate impacts associated to longer hours of operation.	Council	Prior to Construction During Construction

Impact On	Environmental Impact	Safeguards/Mitigation Measures	Responsibility	Timing
		• Should the contractor receive complaints directly they must be forward to Council to administer.		
Landscape and Visual Amenity	Impact on Community	• Notify community or neighbours of the construction period • Remove any barriers and ancillary construction equipment from the study area prior to construction. • Where possible, consider additional revegetation to further reduce impact of light spill on residences	Council	Prior to Construction
	Lighting	• All sport and public domain lighting will comply with ANZS 4282 (effect of obtrusive light onto neighbouring properties) • All luminaires should be equipped with glare shield to further reduce any light spill to sensitive areas. • Time periods and periodic dimming of lights • Time periods for operation of lights should be determined in consultation with the local community • Angle lighting towards courts to minimise light spill on sensitive habitats and residential receivers	Council	Prior to Construction During Construction Operation
Traffic and Transport	Disruption to traffic flows	• Clearly delineate and sign post all alternative pedestrian routes that are obstructed because of the works • Position vehicles, materials and equipment to minimise impacts to public access and parking • Restrict heavy vehicles to specified routes • Implement a TCP prior to the commencement of any construction works to ensure that traffic disruptions are mitigated, and commuters are notified of detours and closures through signage • Maintain a project complaint register as part of the TCP	Contractor	During Construction
Air Quality	Dust generation from vibrating and ground disturbing works	• Minimise works during high wind periods. • Apply dust suppression as required to limit excessive dust generation. • Look for excessive dust generation and slow down if needed. • Minimise site movements. • Locate stockpiles away from sensitive receptors where possible. • Cover or water stockpiles that are not used for extended periods and keep moist to minimise transmission of dust. • Rehabilitate construction sites following completion of the works	Contractor	During Construction
	Fumes generation from machinery	• Do not have machinery running while not in use. • Minimise use of machinery for required activity only. • Where odour emissions are perceivable and may impact nearby sensitive receivers, consider odour suppression systems.	Contractor	During Construction
	Cumulative impacts of greenhouse gas emissions	• Maintain plant and equipment in accordance with manufacturer's specifications to ensure that it is in a proper and efficient condition. • Regularly inspect plant and equipment to ascertain that fitted emission controls are operating efficiently. • On site burning of waste of any kind is not permitted	Contractor	During Construction
Waste Management	General	• As part of the construction environmental management plan, a Waste Management Plan should be developed and implemented • Appropriate staff amenities to be provided onsite for use	Contractor	During Construction

	Waste Generation	• Consider resource management options for the Project against a hierarchy of the following order embodied in the Waste Avoidance and Resource Recovery Act 2001:
		  ○ Avoid unnecessary resource consumption
		  ○ Recover resources (including reuse, reprocessing, recycling and energy recovery)
		  ○ Dispose (as a last resort)
		• Where appropriate, waste materials generated should be considered for reuse either on site or off site under the Resource Recovery Orders and Exemptions
		• Waste streams should be separated and assessed where possible
		• Classify all waste and excess spoil in accordance with the Waste Classification Guidelines (DECC, 2009) prior to disposal and transported to a licensed waste disposal facility
		• Upon completion of waste disposal, retain all original weighbridge/disposal receipts issued by the receiving waste facility in a waste register as evidence of proper disposal
		• Remove all waste from the site on completion of the works
		• Engage a materials estimator and order materials on a just in time basis to reduce likelihood of over ordering
		• Where appropriate, consideration should be given to the use of recycled materials in the Project
			Contractor	During Construction

	Litter left on-site by staff/contractors	Ensure an adequate number of bins are placed at the site for workers and that all litter is placed in these bins. Ensure work areas of the Study Area are kept clean and free of litter, including cigarette butts, at all times.	Contractor	During Construction
Socio-Economic Considerations	General	Prepare a CEMP to include the required management and mitigation measures. The CEMP will provide a framework for establishing how these measures will be implemented and who will be responsible for their implementation. The CEMP will be prepared prior to the proposal's construction and must be reviewed and certified by Council, prior to the start of any on site work. The CEMP will include sub plans for all impacts identified within this REF	Contractor	During Construction

Impact On	Environmental Impact	Safeguards/Mitigation Measures	Responsibility	Timing
	Impacts to amenity, noise, traffic and dust	Ensure all recommended mitigation measures for noise and vibration, amenity, traffic, and air quality are adhered to	Council/ Contractor	Prior to Construction During Construction After Construction
Cumulative Impacts	Community Notifications	• Ensure a plan for community consultation is developed which outlines the dissemination of information to the community via letterbox drops, websites and newsletters. • Notify sensitive receivers including businesses and schools which are at risk of impacts to day-to-day functioning and trading at least 2 weeks prior to works commencement. • Where multiple projects are occurring within the same vicinity at the same time, undertake communication between construction contractors to ensure that potentially noisy or disruptive activities are not undertaken at the same time.	Council/ Contractor	Prior to Construction During Construction

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 6-1 below.

Table 6-1 Section 171 Factors under the EP&A Regulation

Section 171 Factors		Impact
(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 and usable public open space and recreational facility.
(b)	the transformation of the locality,	No significant transformation of locality is likely as part of the works. The proposed works involve the demolition of derelict buildings and construction new recreational facilities in an area which has previously been modified. Vegetation removal will be minimised where possible.
(c)	the environmental impact on the ecosystems of the locality,	Impacts on ecosystems are anticipated to be non-significant if the recommended mitigation measures are followed.
(d)	reduction of the aesthetic, recreational, scientific, or other environmental quality or value of the locality,	The works involve the demolition of derelict buildings and construction of recreational facilities in an area that has predominantly been previously modified. Impacts on threatened ecological communities and species have been considered and mitigated. Therefore, the works will not significantly reduce aesthetic, scientific, or other environmental quality or value of the locality.
(e)	the effects on any locality, place or building that has— • aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or • social significance, or other special value for present or future generations,	The proposed works will not have an effect on any known Aboriginal sites and is there is a low likelihood for Aboriginal objects to be present within the site. The proposed works will not have any significant effect upon a place or building having aesthetic, architectural, cultural, historical, scientific, or social significance or any other special value for present or future generations if the recommended mitigation measures are implemented.
(f)	the impact on the habitat of protected animals, within the meaning of the Biodiversity Conservation Act 2016,	The impact assessment on threatened fauna has been addressed and mitigated. The impact, if any, will not be significant. In addition, the impact resulting from the loss of general fauna habitat as a result of vegetation disturbance is not likely to result in the loss or reduction in the viability of more common fauna species.
(g)	the endangering of a species of animal, plant or other form of life, whether living on land, in water or in the air,	Potential impacts on flora and fauna have been considered as part of this REF. There will be no significant impact on any threatened species or other more common fauna species.

Section 171 Factors		Impact
(h)	long-term effects on the environment,	The Project will not result in long-term impact if mitigation procedures are followed. Maintenance following the completion of the works will be infrequent. The works will have a long-term positive impact on the community through providing a safe and usable recreational facility.
(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 works. Potential for contamination is possible if the relevant management plans and mitigation measures are not adhered to. There is a small potential for sedimentation from stockpiles during construction of the works. 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.
(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 or as stipulated in the relevant remediation plan
(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,	Minimal cumulative environmental effect is likely because of the works.
(p)	the impact on coastal processes and coastal hazards, including those under projected climate change conditions,	There are no impacts on coastal processes or hazards that will result as part of the works.
(q)	applicable local strategic planning statements, regional strategic plans or district strategic plans made under the Act, Division 3.1,	The proposal is consistent with and supports the objectives of local, regional and district level strategic plans.
(r)	other relevant environmental factors.	All relevant environmental factors have been assessed in Section 3 of this REF.

6.2 Evaluation

The Project has been subject to assessment under Division 5.1, Part 5 of the EP&A act. This REF has examined and fully considered 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 Eastern City District Plan and Bayside Council LSPS such as providing improved social infrastructure, delivering high quality open space, and promoting the health of Bayside community members.

The Project as described in this REF best meets the Project objectives, however, would still result in some impacts. Environmental impacts associated with the Project would generally be limited to biodiversity. Appropriate mitigation measures to be undertaken both during the detailed design stage and during construction have been recommended to ensure such impacts are minimised. This includes the recommendation for the following management plans:

- Construction Environmental Management Plan
- Sediment and Erosion Plan
- Traffic Control Plan

Further assessments are required to determine the presence of ASS and contaminated soils under buildings requiring demolition. If further assessment identifies these materials, then appropriate management plans must be developed and implemented prior to construction, such as an ASS Management Plan.

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 Project has also considered 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 Project is considered justified and in the public interest.

7. References

ADE Consulting Group 2021. *Geotechnical Investigation Report.* Prepared for Bayside Council.

Australian Bureau of Statistics (ABS) 2021. *Bayside (NSW). 2021 Census All persons QuickStats.* Accessed 24 August 2022 from https://www.abs.gov.au/census/find-census-data/quickstats/2021/LGA10500.

Bayside Council 2020a. *Future Bayside – Local Strategic Planning Statement*.

Bayside Council 2021. *Bayside Local Environmental Plan*. Accessed August 2022 from www.bayside.nsw.gov.au/services/development-construction/planning-our-city/controls/local-environmental-plans.

Bayside Council 2017. *Spring Street Drain, Muddy Creek and Scarborough Ponds Catchments Flood Study Review.* Mapping Compendium, pg. 42.

Bellevue Tree Consultants 2021. *Arboricultural Impact Assessment.* Prepared for Bayside Council.

BMT WBM 2015. *NSW MUSIC Modelling Guidelines*. August 2015. Prepared for Greater Sydney Local Land Services.

Department of the Environment (DOE) 2015. *Arrive Clean, Leave Clean (Guidelines to help prevent the spread of invasive plant diseases and weeds threatening our native plants, animals and ecosystems).* Australian Government, Department of the Environment., Canberra.

Department of Environment and Climate Change NSW (DECC) 2009. *Interim Construction Noise Guidelines*.

Geoffrey Britton t 2014. *Conservation Management Plan for Scarborough Park.* Environmental Design & Heritage Consultant. Produced for Rockdale City Council.

Green Business Light UK, n.d. *Read our ultimate guide to lux vs lumens vs Watts for lighting installations: Warehouse & Factory Lighting*. Green Business Light. Retrieved December 2, 2021, from https://greenbusinesslight.com/resources/lighting-lux-lumens-watts/.

Greater Sydney Commission (GSC) 2018a. *The Greater Sydney Regional Plan, A Metropolis of Three Cities* (Australia, Greater Sydney Commission). Sydney, NSW.

Greater Sydney Commission (GSC) 2018b. *Eastern City District Plan*. Sydney, NSW.

State of NSW and Department of Planning, Industry and Environment, (DPE) 2022. *Soil Profile Report for Profile 70.* Accessed August 2022 from http://www.environment.nsw.gov.au/eSpade2WebApp.

WaterNSW (2015) Neutral or Beneficial Effect on Water Quality Assessment Guideline 2015. WaterNSW. Penrith.

APPENDIX A

Scarborough Tennis Courts Masterplan

Chrisp Consulting, 2022

APPENDIX G

Geotechnical Investigation Report

ADE Consulting Group, 2021

APPENDIX C

Preliminary Site Investigation

APPENDIX D

Biodiversity Appendices

D1 Likelihood of Occurrence

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.

Tests of Significance (Appendix D2) were conducted for threatened species or ecological communities that were recorded within the subject land 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 subject land 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 subject land, 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 7-1: Likelihood of occurrence of threatened ecological communities within the study area

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence	Impact Assessment Required
Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	V / CE	E	Sydney Basin Bioregion, mostly in the Cumberland IBRA sub-region, with small occurrences in the Sydney Cataract, Wollemi and Burragorang sub-regions. It occurs primarily in the Castlereagh area in the north-west of the Cumberland Plain with other known occurrences near Holsworthy, Kemps Creek and Longneck Lagoon. Occurs primarily on Tertiary sands and gravels of the Hawkesbury-Nepean river system. At Agnes Banks it primarily occurs on aeolian (wind-blown) sands overlying Tertiary alluvium. Found on flat or gently undulating terrain in rain shadow areas typically receiving 700–900 mm annual rainfall. The ecological community occurs primarily at low elevations up to 80 m above sea level (ASL), including old ridges, dunes and terraces.	No – not identified during field survey.	No
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	**E**	**-**	**Occurs in the intertidal zone along the NSW coast.** **The intertidal zone on the shores of estuaries and lagoons that are permanently or intermittently open to the sea. Frequently found as a zone on the landward side of mangrove stands.**	**Yes – identified during field survey.**	**Yes**
Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland ecological community	**-**	**E**	**The ecological community occurs in coastal catchments, mostly at elevations of less than 20 m above sea-level (ASL) that are typically found within 30 km of the coast. However, this distance varies by catchment; for example, low elevations can occur as far as 40 km inland on the Hawkesbury River, or more than 100 km on the Clarence River. On the mid and north coast of NSW the ecological community may also occur up to 50 m ASL on floodplains of, or coastland flats associated with, former or current coastal river systems (Department of Environment and Climate Change, 2007).**	**Yes – identified during field survey.**	**Yes**
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	-	E	The ecological community typically occurs in low-lying coastal alluvial areas with minimal relief, such as swamps, floodplain pockets, depressions, alluvial flats, back-barrier flats, fans, terraces, and behind fore-dunes (DPI 2016; Queensland Government 2019a). The ecological community most commonly occurs at elevations below 20m above sea-level (ASL) but may occur occasionally up to 220m	No - not identified during field survey.	No

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence	Impact Assessment Required
			ASL on hill slopes, for example in association with perched swamps and lakes, or a naturally high-water table.		
Coastal Upland Swamps in the Sydney Basin Bioregion	E	E	Endemic to NSW and confined to the Sydney Basin Bioregion. It occurs in the eastern Sydney Basin from the Somersby district in the north (Somersby-Hornsby plateaux) to the Robertson district in the south (n the Woronora plateau).	No - not identified during field survey.	No
Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	E	CE	Occurs in western Sydney, with the most extensive stands occurring in the Castlereagh and Holsworthy areas. Smaller remnants occur in the Kemps Creek area and in the eastern section of the Cumberland Plain. Mainly occurs on clay soils derived from the deposits of ancient river systems (alluvium), or on shale soils of the Wianamatta Shales.	No – not identified during field survey.	No
Eastern Suburbs Banksia Scrub of the Sydney Region	E	E	Eastern and south eastern suburbs of Sydney. Nutrient-poor sand deposits. Predominately a sclerophyllous heath or scrub occasionally with small areas of woodland or low forest.	No - not identified during field survey.	No
Littoral Rainforest and Coastal Vine Thickets of Eastern Australia	E	CE	Typically occurs within two kilometres of the coast; in NSW, found in the NSW North Coast, Sydney Basin and South East Corner bioregions. Occurs on dunes and flats, cheniers, berms, cobbles, headlands, scree, seacliffs, marginal bluffs, spits, deltaic deposits, coral rubble and islands.	No – not identified during field survey.	No
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion	-	E	The ecological community occurs mostly within the sheltered environments of permanently open estuaries along the warm temperate New South Wales coastline, from Wallis Lake (32°S) to Port Hacking (34°S). *Posidonia australis* dominated seagrass meadows occurring around islands within the geographic range are also included within the ecological community. The ecological community typically occurs in subtidal waters at depths ranging less than 1m to 10 m on sand and silty mud substrate. In these waters, salinity is close to marine levels, dropping only for short periods following rainfall. The ecological community is absent from brackish water (i.e. hyposaline) conditions such as intermittently open lagoons.	No – not identified during field survey.	No
River-Flat Eucalypt Forest on Coastal Floodplains of	E	CE	Found on the river flats of the coastal floodplains. Known from parts of the Local Government Areas of Port Stephens, Maitland, Singleton, Cessnock, Lake	No - not identified during field survey.	No

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence	Impact Assessment Required
the New South Wales and eastern Victoria			Macquarie, Wyong, Gosford, Hawkesbury, Baulkham Hills, Blacktown, Parramatta, Penrith, Blue Mountains, Fairfield, Holroyd, Liverpool, Bankstown, Wollondilly, Camden, Campbelltown, Sutherland, Wollongong, Shellharbour, Kiama, Shoalhaven, Palerang, Eurobodalla and Bega Valley.		
Shale Sandstone Transition Forest of the Sydney Basin Bioregion	CE	CE	Occurs at the edges of the Cumberland Plain in western Sydney, most now occurs in the Hawkesbury, Baulkham Hills, Liverpool, Parramatta, Penrith, Campbelltown and Wollondilly local government areas. Intergrade between clay soils from the shale rock and earthy and sandy soils from sandstone, or where shale caps overlay sandstone.	No – not identified during field survey.	No
Subtropical and Temperate Coastal Saltmarsh	-	V	Within a relatively narrow margin of the Australian coastline, within the subtropical and temperate climatic zones south of the South-east Queensland IBRA bioregion. Typically restricted to the upper intertidal environment; mainly associated with the soft substrate shores of estuaries and embayments (sandy and/or muddy) and on some open, low wave energy coasts).	No – not identified during field survey.	No
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	**E**	**-**	**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.**	**Yes – identified during field survey.**	**Yes**
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	E	-	Associated with humic clay loams and sandy loams, on waterlogged or periodically inundated alluvial flats and drainage lines associated with coastal floodplains. Generally occurs below 20 m (though sometimes up to 50 m) elevation.	No - not identified during field survey.	No
Upland Basalt Eucalypt Forests of the Sydney Basin Bioregion	-	E	Generally confined to the Sydney Basin bioregion, including the Moss Vale, Ettrema, Burragorang, Sydney Cataract, and Wollemi IBRA sub-regions. However, some patchesmay extend into in the Kanangra and Oberon IBRA sub-regions of the South Eastern Highlands bioregion. Found on igneous rock (predominately Tertiary basalt	No - not identified during field survey.	No

Scientific Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Likelihood of Occurrence	Impact Assessment Required
			and microsyenite). Typically occurs at elevations between 650 and 1050 m above sea level.		
Western Sydney Dry Rainforest and Moist Woodland on Shale	E	CE	Cumberland Plain Sub-region of the Sydney Basin Bioregion. It generally occurs in rugged terrain and other patches may occur on undulating terrain, with dry rainforest patches typically occupying steep lower slopes and gullies, and moist woodland patches typically occupying upper sections of the slope Occurs almost exclusively on clay soils derived from Wiannamatta Group shales.	No – not identified during field survey.	No

KEY
BC ACT: E = ENDANGERED
EPBC ACT: V = VULNERABLE, E = ENDANGERED, CE = CRITICALLY ENDANGERED

Table 7-2: Likelihood of occurrence of threatened fauna species within the study area

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
				FAUNA			
Actitis hypoleucos	Common Sandpiper	-	M	Summer migrant. In NSW, widespread along coastline and also occurs in many areas inland. Coastal wetlands and some inland wetlands, especially muddy margins or rocky shores. Also estuaries and deltas, lakes, pools, billabongs, reservoirs, dams and claypans, mangroves.	5	Unlikely – lack of suitable habitat for this species within the study area.	No
Anous stolidus	Common Noddy	-	M	Casual visitor to coastal NSW.	0	Unlikely – lack of suitable habitat for this species within the study area.	No
Anthochaera phrygia	Regent Honeyeater	E4A	CE	Inland slopes of south-east Australia, and less frequently in coastal areas. In NSW, most records are from the North-West Plains, North-West and South-West Slopes, Northern Tablelands, Central Tablelands and Southern Tablelands regions; also recorded in the Central Coast and Hunter Valley regions. Eucalypt woodland and open forest, wooded farmland and urban areas with mature eucalypts, and riparian forests of Casuarina cunninghamiana (River Oak).	0	Unlikely – not a vegetation community associated with this species, no local records.	No
Apus pacificus	Fork-tailed Swift	-	M	Recorded in all regions of NSW. Riparian woodland., swamps, low scrub, heathland, saltmarsh, grassland, Spinifex sandplains, open farmland and inland and coastal sand-dunes.	0	Unlikely – breeds overseas and rarely alights in vegetation. No local records.	No
Ardenna carneipes	Flesh-footed Shearwater	V	M	Recorded in NSW coastal waters. Breeds on Lord Howe Island. Marine.	0	Unlikely – marine species. No local records.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
Ardenna grisea	Sooty Shearwater		M	Breeds on islands off NSW from Montague Island to Broughton Island. Present off eastern NSW mainly October-February. Islands, offshore.	0	Unlikely – marine species. No local records.	No
Ardenna tenuirostris	Short-tailed Shearwater	-	M	Breeds on islands north to Broughton Island off NSW. Commonly observed south of coastal northern NSW during summer. Islands, offshore.	3	Unlikely – marine species.	No
Arenaria interpres	Ruddy Turnstone	-	M	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.	576	Unlikely – marine species.	No
Botaurus poiciloptilus	Australasian Bittern	E1	E	Found over most of NSW except for the far north-west. Permanent freshwater wetlands with tall, dense vegetation, particularly *Typha* spp. (bullrushes) and *Eleocharis* spp. (spikerushes).	1	Potential – some wetland vegetation in the west of the study area.	No – this vegetation will not be impacted.
Calidris acuminata	Sharp-tailed Sandpiper	-	M	Summer migrant. Widespread in most regions of NSW, especially in coastal areas, but sparse in the south-central Western Plain and east Lower Western Regions.	180	Unlikely – lack of suitable habitat for this species within the study area.	No
Calidris alba	Sanderling	V	M	Occur along the NSW coast, with occasional inland sightings. Arrives from September and leaves by May (some may overwinter in Australia).	3	Unlikely – lack of suitable habitat for this species within the study area.	No
Calidris canutus	Red Knot	-	E, M	Summer migrant to Australia. In NSW, widespread in suitable habitat along the coast. Occasionally recorded inland in all regions. Intertidal mudflats, sandflats sheltered sandy beaches, estuaries, bays, inlets, lagoons, harbours, sandy ocean beaches,	27	Unlikely – lack of suitable habitat for this species within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
				rock platforms, coral reefs, terrestrial saline wetlands near the coast, sewage ponds and saltworks. Rarely inland lakes or swamps.			
Calidris ferruginea	Curlew Sandpiper	E1	CE, M	Occurs along the entire coast of NSW, and sometimes in freshwater wetlands in the Murray-Darling Basin. Littoral and estuarine habitats, including intertidal mudflats, non-tidal swamps, lakes and lagoons on the coast and sometimes inland.	180	Unlikely – lack of suitable habitat for this species within the study area.	No
Calidris ruficollis	Red-necked Stint	-	M	Summer migrant to Australia, widespread coastal and inland NSW.	389	Unlikely – lack of suitable habitat for this species within the study area.	No
Calidris subminuta	Long-toed Stint	-	M	Summer migrant to Australia. Widely scattered irregular records in NSW: the estuary of the Richmond River, Kooragang Island, Pitts Town Lagoon, McGrath's Hill, Bushell's Lagoon, the Hawkesbury River, Shell Point, Botany Bay, Parkes, Fivebough Swamp, Tullakool Saltworks, Dareton, Mortanally Billabong, Wentworth and Cobar. Coastal and inland shallow wetlands, sewage ponds, tidelines, tidal mudflats.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Calidris tenuirostris	Great Knot	V	CE, M	In NSW, recorded at scattered sites along the coast down to about Narooma. It has also been observed inland at Tullakool, Armidale, Gilgandra and Griffith.	5	Unlikely – lack of suitable habitat for this species within the study area.	No
Callocephalon fimbriatum	Gang-gang Cockatoo	E2,V	-	In NSW, distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. Isolated records known from as far north as Coffs Harbour and as far west as Mudgee. Tall mountain forests and woodlands in summer; in winter, may occur at lower altitudes in open eucalypt forests and woodlands, and urban areas.	0	Unlikely – vegetation in study area not associated with this species, no breeding habitat, no local records.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
Calonectris leucomelas	Streaked Shearwater	-	M	Regular summer visitor south to Wollongong, less common further south.	0	Unlikely – marine species. No local records.	No
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	In NSW, widespread along coast and inland to the southern tablelands and central western plains, with a small population in the Riverina. Open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur.	1	Unlikely – no preferred vegetation types (sheoak) within the study area.	No
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Recorded from Rockhampton in Qld south to Ulladulla in NSW. Largest concentrations of populations occur in the sandstone escarpments of the Sydney basin and the NSW north-west slopes. Wet and dry sclerophyll forests, Cyprus Pine dominated forest, woodland, sub-alpine woodland, edges of rainforests and sandstone outcrop country.	0	Unlikely – no suitable breeding habitat in the form of caves/rock formations in the vicinity of the study area.	No
Charadrius bicinctus	Double-banded Plover	-	M	Found in both coastal and inland areas. During the non-breeding season (Feb to Aug), it is common in eastern and southern Australia.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Charadrius leschenaultii	Greater Sand-plover	V	V, M	In NSW, recorded between the northern rivers and the Illawarra, with most records coming from the Clarence and Richmond estuaries. Almost entirely restricted to coastal areas in NSW, mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks.	3	Unlikely – lack of suitable habitat for this species within the study area.	No
Charadrius mongolus	Lesser Sand-plover	V	E, M	Summer migrant to Australia. Found around the entire coast but in NSW most common on north coast. Rarely recorded south of the Shoalhaven estuary, and there are few inland records.	1	Unlikely – lack of suitable habitat for this species within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
				Almost entirely coastal in NSW, using sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats, sandy beaches, coral reefs and rock platforms.			
Crinia tinnula	Wallum Froglet	V	-	Along the coastal margin from Litabella National Park in south-east Qld to Kurnell in Sydney. Acidic swamps on coastal sand plains (typically in sedgelands and wet heathlands), drainage lines, and swamp sclerophyll forests.	1	Unlikely – lack of suitable habitat in the form of heathy wetlands for this species within the study area.	No
Cuculus optatus	Oriental Cuckoo, Horsfield's Cuckoo	-	M	Northern and eastern Australia, records mainly coastal in NSW south to Bega area.	0	Unlikely – lack of suitable habitat for this species within the study area, no local records.	No
Dasyornis brachypterus	Eastern Bristlebird	E1	E	There are three main populations: Northern - southern Qld/northern NSW, Central - Barren Ground NR, Budderoo NR, Woronora Plateau, Jervis Bay NP, Booderee NP and Beecroft Peninsula and Southern - Nadgee NR and Croajingalong NP in the vicinity of the NSW/Victorian border. Central and southern populations inhabit heath and open woodland with a heathy understorey. In northern NSW, habitat comprises open forest with dense tussocky grass understorey.	0	Unlikely – not within distinct population. No local records.	No
Dasyurus maculatus	Spotted-tailed Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld. Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline.	0	Unlikely – vegetation within study area not associated with this species, no local records.	No
Diomedea antipodensis	Antipodean Albatross	V	V	Regularly occurs off the NSW south coast from Green Cape to Newcastle during winter.	0	Unlikely – marine species. No local records.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
Diomedea antipodensis gibsoni	Antipodean Albatross	V	V	Regularly occurs off the NSW south coast from Green Cape to Newcastle during winter.	0	Unlikely – marine species. No local records.	No
Diomedea epomophora	Southern Royal Albatross	-	V, M	Offshore waters of southern Australia, including off southeastern NSW.	0	Unlikely – marine species. No local records.	No
Diomedea exulans	Wandering Albatross	E1	V, M	Has been recorded along the length of the NSW coast.	0	Unlikely – marine species. No local records.	No
Diomedea sanfordi	Northern Royal Albatross	-	E	Observed in Australian waters off south-eastern Australia. Feeds regularly in Tasmanian and South Australian waters, and less frequently in NSW waters.	0	Unlikely – marine species. No local records.	No
Epthianura albifrons	White-fronted Chat	V	-	Occurs mostly in the southern half of the state, in damp open habitats along the coast, and near waterways in the western part of the state.	182	Potential – some suitable habitat in the western portion of the study area.	No – this vegetation will not be impacted.
Esacus magnirostris	Beach Stone-curlew	E4A	-	Across northern and north-eastern Australia, south to the Manning River in north-eastern NSW, with occasional vagrants to south-eastern NSW and Victoria.	2	Unlikely – lack of suitable habitat within the study area.	No
Falco hypoleucos	Grey Falcon	E1	-	Arid and semi-arid zones. In NSW, found chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Shrubland, grassland and wooded watercourses, occasionally in open woodlands near the coast, and near wetlands.	0	Unlikely – predominantly found west of Great Dividing Range, no local records.	No
Fregata ariel	Lesser Frigatebird	-	M	In NSW, irregularly observed after tropical cyclones south to central coast, sometimes observed south to Merimbula. Marine.	0	Unlikely – marine species. No local records.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
Fregata minor	Great Frigatebird	-	M	Occasionally observed coastal north-east NSW after cyclones, straggler to central coastal NSW. Marine.	0	Unlikely – marine species. No local records.	No
Fregetta grallaria grallaria	White-bellied Storm-Petrel	V	V	Vagrant birds occur in coastal NSW waters, particularly after storm events. Marine.	0	Unlikely – marine species. No local records.	No
Gallinago hardwickii	Latham's Snipe	-	M	Migrant to east coast of Australia, extending inland west of the Great Dividing Range in NSW.	4	Unlikely – lack of suitable habitat within the study area.	No
Gallinago megala	Swinhoe's Snipe	-	M	Few definite records exist for Swinhoe's Snipe in Australia but has been observed in northern WA and NT and also Normanton and Mt. Isa in QLD.	0	Unlikely – lack of suitable habitat within the study area. No local records.	No
Gallinago stenura	Pin-tailed Snipe	-	M	The species distribution within Australia is not well understood. There are some confirmed records from NSW.	0	Unlikely – lack of suitable habitat within the study area. No local records.	No
Gelochelidon nilotica	Gull-billed Tern	-	M	All continents except Antarctica. Freshwater swamps, brackish and salt lakes, beaches and estuarine mudflats, floodwaters, sewage farms, irrigated croplands and grasslands.	1	Unlikely – lack of suitable habitat within the study area.	No
Glossopsitta pusilla	Little Lorikeet	V	-	In NSW, found from the coast westward as far as Dubbo and Albury. Dry, open eucalypt forests and woodlands, including remnant woodland patches and roadside vegetation.	42	Potential – some foraging habitat in the form of flowering eucalypts and banksias within the study area.	No – impacts would be restricted to understory species.

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
Grantiella picta	Painted Honeyeater	V	V	Widely distributed in NSW, predominantly on the inland side of the Great Dividing Range but avoiding arid areas. Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests.	0	Unlikely – lack of suitable habitat for this species within the study area, no local records.	No
Haematopus fuliginosus	Sooty Oystercatcher	V	-	Distributed along the entire NSW coast. Rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries.	9	Unlikely – lack of suitable habitat within the study area.	No
Haematopus longirostris	Pied Oystercatcher	E1	-	Thinly scattered along the entire NSW coast. Intertidal flats of inlets and bays, open beaches and sandbanks.	4396	Unlikely – lack of suitable habitat within the study area.	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	V	-	Distributed along the coastline of mainland Australia and Tasmania, extending inland along some of the larger waterways, especially in eastern Australia. 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.	47	Unlikely – species may pass over on foraging forays, however unlikely to utilise dense vegetation as hunting habitat. No stick nests indicating breeding habitat.	No
Hieraaetus morphnoides	Little Eagle	V	-	Throughout the Australian mainland, with the exception of the most densely-forested parts of the Dividing Range escarpment. Open eucalypt forest, woodland or open woodland, including sheoak or *Acacia* woodlands and riparian woodlands of interior NSW.	1	Unlikely – species may pass over on foraging forays, however unlikely to utilise dense vegetation as hunting habitat. No stick nests indicating breeding habitat.	No
Hirundapus caudacutus	White-throated Needletail	-	M	All coastal regions of NSW, inland to the western slopes and inland plains of the Great Divide. Occur most often over open	299	Unlikely – migrant that breeds overseas, rarely alighting in trees. May	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
				forest and rainforest, as well as heathland, and remnant vegetation in farmland.		occasionally pass over study area but unlikely to utilise vegetation.	
Hoplocephalus bungaroides	Broad-headed Snake	E1	V	Largely confined to Triassic and Permian sandstones within the coast and ranges in an area within approximately 250 km of Sydney.Dry and wet sclerophyll forests, riverine forests, coastal heath swamps, rocky outcrops, heaths, grassy woodlands.	0	Unlikely – lack of suitable habitat in the form of rocky outcrops for this species within the study area. No local records.	No
Hydroprogne caspia	Caspian Tern	-	M	Widespread in coastal and inland NSW. Coastal offshore waters, beaches, mudflats, estuaries, rivers, lakes.	175	Unlikely – lack of suitable habitat within the study area.	No
Isoodon obesulus obesulus	Southern Brown Bandicoot (eastern)	E1	E	Found in south-eastern NSW, east of the Great Dividing Range south from the Hawkesbury River. Heath or open forest with a heathy understorey on sandy or friable soils.	0	Unlikely – lack of suitable habitat within the study area. No local records.	No
Ixobrychus flavicollis	Black Bittern	V	-	In NSW, records are scattered along the east coast, with individuals rarely being recorded south of Sydney or inland. Terrestrial and estuarine wetlands. Also flooded grassland, forest, woodland, rainforest and mangroves where permanent water is present.	4	Potential – some wetland vegetation in the west of the study area.	No – this vegetation will not be impacted.
Lathamus discolor	Swift Parrot	E1	CE	Migrates from Tasmania to mainland in Autumn-Winter. In NSW, the species mostly occurs on the coast and south west slopes. Box-ironbark forests and woodlands.	9	Unlikely – breeds in Tasmania, no preferred feed trees within study area.	No
Limicola falcinellus	Broad-billed Sandpiper	V	M	Occur occasionally on the southern Australian coast. In NSW, mainly recorded in Hunter River estuary, with birds occasionally	2	Unlikely – lack of suitable habitat within the study area.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
				reaching the Shoalhaven estuary. There are few records for inland NSW.			
Limosa lapponica	Bar-tailed Godwit	-	M	Summer migrant to Australia. Widespread along the coast of NSW, including the offshore islands. Also numerous scattered inland records.	19252	Unlikely – lack of suitable habitat within the study area.	No
Limosa limosa	Black-tailed Godwit	V	M	Arrives in August and leaves in March. In NSW, most frequently recorded at Kooragang Island, with occasional records elsewhere along the coast, and inland in the Murray-Darling Basin, on the western slopes of the Northern Tablelands and in the far north-western corner of the state.	2	Unlikely – lack of suitable habitat within the study area.	No
Litoria aurea	Green and Golden Bell Frog	E1	V	Since 1990, recorded from ~50 scattered sites within its former range in NSW, from the north coast near Brunswick Heads, south along the coast to Victoria. Records exist west to Bathurst, Tumut and the ACT region. Marshes, dams and stream-sides, particularly those containing Typha spp. (bullrushes) or *Eleocharis* spp. (spikerushes). Some populations occur in highly disturbed areas.	4290	Unlikely – preferred habitat not within or adjacent to study area.	No
Macronectes giganteus	Southern Giant Petrel	E1	E, M	Common visitor off the coast of NSW. Marine.	0	Unlikely – marine species. No local records.	No
Macronectes halli	Northern Giant-Petrel	V	V, M	Common visitor in NSW waters, predominantly along the south-east coast during winter and autumn. Marine.	0	Unlikely – marine species. No local records.	No
Meridolum maryae	Maroubra Woodland Snail	E	E	The species is found in the leaf litter of coastal vegetation communities, most commonly in heathland on foredunes also from areas of podsolised dunes/sand plains that support taller heath communities including Eastern Suburbs Banksia Scrub. This species is confined to a narrow band of habitat along the coast from the north-eastern corner of the Royal National Park	0	Unlikely – no suitable habitat, not near ocean and no local records.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
				to Palm Beach in Sydney. Records of the species are generally within 1 km of the ocean but occur up to 5 km inland.			
Miniopterus orianae oceanensis	Eastern Bentwing-bat	V	-	In NSW it occurs on both sides of the Great Dividing Range, from the coast inland to Moree, Dubbo and Wagga Wagga. Rainforest, wet and dry sclerophyll forest, monsoon forest, open woodland, paperbark forests and open grassland.	6	Unlikely – vegetation presents some foraging habitat, however no suitable roosting habitat in the form of caves nearby.	No
Monarcha melanopsis	Black-faced Monarch	-	M	In NSW, occurs around the eastern slopes and tablelands of the Great Divide, inland to Coutts Crossing, Armidale, Widden Valley, Wollemi National Park and Wombeyan Caves. It is rarely recorded farther inland. Rainforest, open eucalypt forests, dry sclerophyll forests and woodlands, gullies in mountain areas or coastal foothills, Brigalow scrub, coastal scrub, mangroves, parks and gardens.	0	Unlikely – some potentially suitable habitat however no local records.	No
Monarcha trivirgatus	Spectacled Monarch	-	M	Coastal eastern Australia south to Port Stephens in NSW. Mountain/lowland rainforest, wooded gullies, riparian vegetation including mangroves.	0	Unlikely – some potentially suitable habitat however no local records.	No
Motacilla flava	Yellow Wagtail	-	M	Regular summer migrant to mostly coastal Australia. In NSW recorded Sydney to Newcastle, the Hawkesbury and inland in the Bogan LGA. Swamp margins, sewage ponds, saltmarshes, playing fields, airfields, ploughed land, lawns.	0	Unlikely – lack of suitable habitat for this species within the study area, no local records.	No
Myiagra cyanoleuca	Satin Flycatcher	-	M	In NSW, widespread on and east of the Great Divide and sparsely scattered on the western slopes, with very occasional records on the western plains. Eucalypt-dominated forests, especially near wetlands, watercourses, and heavily-vegetated gullies.	0	Unlikely – some potentially suitable habitat however no local records.	No

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Myotis macropus	Southern Myotis	V	-	In NSW, found in the coastal band. It is rarely found more than 100 km inland, except along major rivers. Foraging habitat is waterbodies (including streams, or lakes or reservoirs) and fringing areas of vegetation up to 20m.	2	Potential – riparian habitat presents some foraging habitat.	No – these areas will not be impacted.
Neophema chrysogaster	Orange-bellied Parrot	E4A	CE	Breeds in Tasmania and migrates in autumn to spend the winter on the mainland coast of south-eastern SA and southern Victoria. Occasional reports from NSW, most recently Shellharbour and Maroubra in May 2003.	0	Unlikely – breeds in Tasmania, no preferred feed trees within impact area.	No
Ninox strenua	Powerful Owl	V	-	In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains. Woodland, open sclerophyll forest, tall open wet forest and rainforest.	10	Potential – some foraging habitat, however no breeding habitat.	No – will not be impacts to foraging habitat.
Numenius madagascariensis	Eastern Curlew	-	CE, M	Summer migrant to Australia. Primarily coastal distribution in NSW, with some scattered inland records. Estuaries, bays, harbours, inlets and coastal lagoons, intertidal mudflats or sandflats, ocean beaches, coral reefs, rock platforms, saltmarsh, mangroves, freshwater/brackish lakes, saltworks and sewage farms.	9320	Unlikely – lack of suitable habitat for this species within the study area.	No
Numenius minutus	Little Curlew	-	M	Summer migrant to Australia. In NSW, most records scattered east of the Great Dividing Range, from Casino, south to Greenwell Point with a few scattered records west of the Great Dividing Range.	0	Unlikely – lack of suitable habitat for this species within the study area, no local records.	No
Numenius phaeopus	Whimbrel	-	M	Summer migrant to Australia. Found along almost the entire coast of NSW; scattered inland records.	2674	Unlikely – lack of suitable habitat for this species within the study area.	No
Onychoprion fuscata	Sooty Tern	V	-	In NSW only known to breed at Lord Howe Island. Occasionally seen along coastal NSW, especially after cyclones. Marine.	1	Unlikely – marine species.	No

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Pachyptila turtur subantarctica	Fairy Prion (southern)	-	V	Often beachcast on the south-eastern coast of Australia, and are commonly seen offshore over the continental shelf and over pelagic waters. Beachcast birds are found along the whole coast of NSW.	0	Unlikely – marine species. No local records.	No
Pandion cristatus	Eastern Osprey	V	-	Common around the northern NSW coast, and uncommon to rare from coast further south. Some records from inland areas.	7	Unlikely – species may pass over on foraging forays, however unlikely to utilise dense vegetation as hunting habitat. No stick nests indicating breeding habitat.	No
Petauroides volans	Greater Glider	E2	V	This population on the south coast of NSW is bounded by the Moruya River to the north, Coila Lake to the south and the Princes Highway and cleared land exceeding 700 m in width to the west. Eucalypt forests and woodlands.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Petaurus australis australis	Yellow-bellied Glider (south-eastern)	V	V	Tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Petroica phoenicea	Flame Robin	V	-	In NSW, breeds in upland areas, and in winter many birds move to the inland slopes and plains, or occasionally to coastal areas. Likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands.	1	Unlikely – vegetation not associated with this species. No local records.	No
Phaethon lepturus	White-tailed Tropicbird	-	M	Uncommon south to Ballina January-April; casual visitor south to Batemans Bay, some well inland. Marine.	0	Unlikely – marine species.	No

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Phascolarctos cinereus	Koala	V	E	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct populations in the Bega District, and at several sites on the southern tablelands. Eucalypt woodlands and forests.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Pluvialis fulva	Pacific Golden Plover	-	M	Regular widespread summer migrant to Australia, including coastal NSW, Lord Howe and Norfolk Island. Estuaries, mudflats, saltmarshes, mangroves, rocky reefs, inland swamps, ocean shores, paddocks, sewage ponds, ploughed land, airfields, playing fields.	159	Unlikely – lack of suitable habitat for this species within the study area.	No
Pluvialis squatarola	Grey Plover	-	M	Regular summer migrant to coastal Australia, including NSW. Rarely inland, on passage. Mudflats, saltmarsh, tidal reefs and estuaries.	2	Unlikely – lack of suitable habitat for this species within the study area.	No
Pommerhelix duralensis	Dural Land Snail	E1	E	Endemic to NSW. Occurs along the northwest fringes of the Cumberland Plain, within the Hills Shire, Blue Mountains City, Penrith City, Hornsby Shire and Parramatta City LGAs.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Pseudomys novaehollandiae	New Holland Mouse	-	V	Fragmented distribution across eastern NSW. Open heathlands, woodlands and forests with a heathland understorey, vegetated sand dunes.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Pterodroma leucoptera leucoptera	Gould's Petrel	V	E	Recorded off NSW coast. Breeds on Cabbage Tree Island offshore from Port Stephens, and on nearby Boondelbah island.	0	Unlikely – marine species.	No
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria. Subtropical and temperate rainforests,	567	Potential – some foraging habitat within	No – no canopy species that GHFF would

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
				tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops.		the study area. No camps oberved.	feed on would be impacted by the proposed works.
Pycnoptilus floccosus	Pilotbird	-	V	Found in NSW between Wollemi National Park and Blue Mountains National Park then all the way down to the Dandenong Ranges in Victoria. Typically it occurs in temperate wet sclerophyll forests and occasionally temperate rainforest, favouring areas with dense undergrowth.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Rhipidura rufifrons	Rufous Fantail	-	M	Coastal and near coastal districts of northern and eastern Australia, including on and east of the Great Divide in NSW. Wet sclerophyll forests, subtropical and temperate rainforests. Sometimes drier sclerophyll forests and woodlands.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Rostratula australis	Australian Painted Snipe	E1	E	In NSW most records are from the Murray-Darling Basin. Other recent records include wetlands on the Hawkesbury River and the Clarence and lower Hunter Valleys. Swamps, dams and nearby marshy areas.	1	Unlikely – lack of suitable habitat for this species within the study area.	No
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	Both sides of the great divide, from the Atherton Tableland in Qld to north-eastern Victoria, mainly along river systems and gullies. In NSW it is widespread on the New England Tablelands. Woodland, moist and dry eucalypt forest and rainforest.	1	Potential – some foraging habitat.	No – no habitat will be impacted.
Sterna hirundo	Common Tern	-	M	Regular summer migrant to northern and eastern coastal Australia, including coastal NSW. Also scattered inland records.	3	Unlikely – marine species.	No
Sternula albifrons	Little Tern	E1	M	In NSW, it arrives from September to November, occurring mainly north of Sydney, with smaller numbers found south to Victoria.	1858	Unlikely – marine species.	No
Sternula nereis nereis	Australian Fairy Tern	-	V	Known from NSW in the past, but it is unknown if it persists.	0	Unlikely – lack of suitable habitat for this	No

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				Embayments of a variety of habitats including offshore, estuarine or lake islands, wetlands and mainland coastline. Nests on sheltered sandy beaches, spits and banks above the high tide line and below vegetation.		species within the study area, no local records.	
Thalassarche bulleri	Buller's Albatross, Pacific Albatross	-	V	Off the coast from Coffs Harbour, south to Tasmania and west to Eyre Peninsula. Inshore, offshore and pelagic waters.	0	Unlikely – marine species. No local records.	No
Thalassarche cauta	Shy Albatross	V	V	Occurs along the east coast south from Stradbroke Island and across the south coast to Carnarvon in WA. It is commonly recorded off southeast NSW, though rarely north of Sydney.	0	Unlikely – marine species. No local records.	No
Thalassarche eremita	Chatham Albatross	V	E	Rare vagrant to southeast Australian waters.	0	Unlikely – marine species. No local records.	No
Thalassarche impavida	Campbell Albatross, Campbell Black-browed Albatross	-	V	Mainly oceanic continental slopes off Tasmania, Victoria and NSW. May enter Australia's temperate shelf waters.	0	Unlikely – marine species. No local records.	No
Thalassarche melanophris	Black-browed Albatross	V	V	Regularly recorded off the NSW coast during May-November.	0	Unlikely – marine species. No local records.	No
Thalassarche salvini	Salvin's Albatross	-	V	Waters from southern QLD to SA, and Tasmania. Subantarctic and subtropical waters. It occurs both onshore and offshore, and enters harbours and bays.	0	Unlikely – marine species. No local records.	No
Thakassarche steadi	White-capped Albatross	-	V	Subantarctic and subtropical waters. It occurs both inshore and offshore, and enters harbours and bays.	0	Unlikely – marine species. No local records.	No

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Thalasseus bergii	Crested Tern	-	M	Identified as a conservation value in the Temperate East and North marine regions.	436	Unlikely – marine species.	No
Tringa brevipes	Grey-tailed Tattler	-	M	Summer migrant to Australia. In NSW, distributed along most of the coast from the Qld border, south to Tilba Lake. More heavily distributed along coastal regions north of Sydney.	3630	Unlikely – lack of suitable habitat for this species within the study area.	No
Tringa incana	Wandering Tattler	-	M	Uncommon summer migrant. Recorded along the east coast, often on offshore or nearshore islands including Lord Howe and Norfolk Island, south as far as Moruya in NSW.	2	Unlikely – lack of suitable habitat for this species within the study area.	No
Tringa nebularia	Common Greenshank	-	M	Summer migrant to Australia. Recorded in most coastal regions of NSW; also widespread west of the Great Dividing Range, especially between the Lachlan and Murray Rivers and the Darling River drainage basin, including the Macquarie Marshes, and north-west regions.	1	Unlikely – lack of suitable habitat for this species within the study area.	No
Tyto novaehollandiae	Masked Owl	V	-	Recorded over approximately 90% of NSW, excluding the most arid north-western corner. Most abundant on the coast but extends to the western plains. Dry eucalypt forests and woodlands from sea level to 1100 m.	2	Unlikely – no nesting or roosting habitat in the form of lrage patches of vegetation with tall trees available in the study area.	No
Xenus cinereus	Terek Sandpiper	V	M	A rare migrant to the eastern and southern Australian coasts. The two main sites in NSW are the Richmond River estuary and the Hunter River estuary. Mudbanks and sandbanks near mangroves, rocky pools and reefs, and occasionally up to 10 km inland around brackish pools.	37	Unlikely – lack of suitable habitat for this species within the study area.	No
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Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
Acacia bynoeana	Bynoe's Wattle	E1	V	Found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. Heath or dry sclerophyll forest on sandy soils.	2	Unlikely – lack of suitable habitat for this species within the study area.	No
Acacia prominens	Gosford Wattle, Hurstville and Kogarah Local Government Areas	E2	-	Occurs at a few sites along the railway line at Penshurst, at Carss Bush Park, Carss Park and there is an unconfirmed siting at Oatley Park, Oatley. Open situations on clayey or sandy soils.	4	Unlikely – lack of suitable habitat for this species within the study area.	No
Acacia pubescens	Downy Wattle	V	V	Restricted to the Sydney region around the Bankstown-Fairfield-Rookwood and Pitt Town area, with outliers occurring at Barden Ridge, Oakdale and Mountain Lagoon. Open woodland and forest, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland. Occurs on alluviums, shales and at the intergrade between shales and sandstones.	4	Unlikely – lack of suitable habitat for this species within the study area.	No
Acacia terminalis subsp. Eastern Sydney	Sunshine Wattle	E1	E	Limited mainly to near-coastal areas from the northern shores of Sydney Harbour south to Botany Bay.	10	Unlikely – lack of suitable habitat for this species within the study area.	No
Allocasuarina glareicola	-	E1	E	Primarily restricted to the Richmond (NW Cumberland Plain) district, but with an outlier population found at Voyager Point, Liverpool. Castlereagh woodland on lateritic soil. Found in open woodland with *Eucalyptus parramattensis, Eucalyptus fibrosa, Angophora bakeri, Eucalyptus sclerophylla* and *Melaleuca decora.*	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
Caladenia tessellata	Thick Lip Spider Orchid	E1	V	Currently known from two disjunct areas; one population near Braidwood on the Southern Tablelands and three populations in the Wyong area on the Central Coast.	0	Unlikely – vegetation within study area not associated with this species. No local records.	No
Cryptostylis hunteriana	Leafless Tongue Orchid	V	V	In NSW, recorded mainly on coastal and near coastal ranges north from Victoria to near Forster, with two isolated occurrences inland north-west of Grafton. Coastal heathlands, margins of coastal swamps and sedgelands, coastal forest, dry woodland, and lowland forest.	0	Unlikely – vegetation within study area not associated with this species. No local records.	No
Eucalyptus camfieldii	Camfield's Stringybark	V	V	Narrow band from the Raymond Terrace area south to Waterfall. Coastal heath on shallow sandy soils overlying Hawkesbury sandstone, mostly on exposed sandy ridges.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Genoplesium baueri	Bauer's Midge Orchid	E1	E	Has been recorded from locations between Nowra and Pittwater and may occur as far north as Port Stephens. Dry sclerophyll forest and moss gardens over sandstone.	0	Unlikely – vegetation within study area not associated with this species. No local records.	No
Melaleuca biconvexa	Biconvex Paperbark	V	V	Only found in NSW, populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Damp places, often near streams or low-lying areas on alluvial soils.	0	Unlikely – not observed during survey, no local records.	No
Melaleuca deanei	Deane's Paperbark	V	V	Ku-ring-gai/Berowra area, Holsworthy/Wedderburn area, Springwood (in the Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas.	2	Unlikely – not observed during survey.	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
Persicaria elatior	Tall Knotweed	V	V	In south-eastern NSW recorded from Mt Dromedary, Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). Beside streams and lakes, swamp forest or disturbed areas.	0	Unlikely – not observed during survey, no local records.	No
Persoonia hirsuta	Hairy Geebung	E1	E	Scattered distribution around Sydney, from Singleton in the north, along the east coast to Bargo in the south and the Blue Mountains to the west.	1	Unlikely – not observed during survey.	No
Pimelea curviflora var. curviflora	-	V	V	Confined to the coastal area of the Sydney and Illawarra regions between northern Sydney and Maroota in the north-west and Croom Reserve near Albion Park in the south.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Pimelea spicata	Spiked Rice-flower	E1	E	Two disjunct areas; the Cumberland Plain (Marayong and Prospect Reservoir south to Narellan and Douglas Park) and the Illawarra (Landsdowne to Shellharbour to northern Kiama).	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Pomaderris brunnea	Brown Pomaderris	E1	V	In NSW, found around the Colo, Nepean and Hawkesbury Rivers, including the Bargo area and near Camden. It also occurs near Walcha on the New England tablelands.	0	Unlikely – lack of suitable habitat for this species within the study area. No local records.	No
Pterostylis saxicola	Sydney Plains Greenhood	E1	E	Restricted to western Sydney between Freemans Reach in the north and Picton in the south. Small pockets of shallow soil in depressions on sandstone rock shelves above cliff lines, adjacent to sclerophyll forest or woodland on shale/sandstone transition soils or shale soils.	0	Unlikely – vegetation within study area not associated with this species. No local records.	No
Rhizanthella slateri	Eastern Australian	V	E	In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue	0	Unlikely – vegetation within study area not associated with this	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
	Underground Orchid			Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Sclerophyll forest in shallow to deep loams.		species. No local records.	
Rhodmania rubescens	Scrub Turpentine	CE	CE	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of R. rubescens typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000-1,600 mm.	0	Unlikely – not observed during survey. No local records.	No
Rhodomyrtus psidioides	Native Guava	CE	CE	Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW.	0	Unlikely – not observed during survey. No local records.	No
Syzygium paniculatum	**Magenta Lilly Pilly**	**E1**	**V**	**Only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. Subtropical and littoral rainforest on gravels, sands, silts and clays.**	**103**	**Yes – identified during survey.**	**Yes**
Tetratheca juncea	Black-eyed Susan	V	V	Confined to the northern Sydney Basin bioregion and the southern North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock.	6	Unlikely – vegetation within study area not associated with this species.	No
Thelymitra kangaloonica	Kangaloon Sun Orchid	E4A	CE	Only known to occur on the southern tablelands of NSW in the Moss Vale / Kangaloon / Fitzroy Falls area at 550-700 m above sea level.	0	Unlikely – vegetation within study area not associated with this species. No local records.	No
Thesium australe	Austral Toadflax	V	V	In eastern NSW it is found in very small populations scattered along the coast, and from the Northern to Southern Tablelands.	0	Unlikely – vegetation within study area not associated with this	No

Scientific Name	Common Name	BC Act Status	EPBC Act Status	Distribution and Habitat	Number of records within 5 km	Likelihood of occurrence	Impact Assessment Required
				Grassland on coastal headlands or grassland and grassy woodland away from the coast.		species. No local records.	

KEY
BC ACT: V = VULNERABLE, E1 = ENDANGERED, E2 = ENDANGERED POPULATION, E4A = CRITICALLY ENDANGERED, P = PROTECTED
EPBC ACT: V = VULNERABLE, E = ENDANGERED, CE = CRITICALLY ENDANGERED, M = MIGRATORY

D2 Tests of Significance

The 'Test of significance' (5-part test) is applied to species, populations and ecological communities listed on Schedules 1 and 2 of the BC Act. The assessment sets out 5 factors, which when considered, allow proponents to undertake a qualitative analysis of the likely impacts of an action and to determine whether a significant impact is likely. All factors must be considered, and an overall conclusion made based on all factors in combination.

Bangalay Sand Forest of the Sydney Basin and South East Corner bioregions

Bangalay Sand Forest is listed as endangered under the BC Act. This ecological community is comprised of an open forest dominated by eucalypt and Banksia species in the canopy, a diverse midstory and a dense understory of shrubs and grasses. Pre-European settlement this community was extensive across the coast of NSW.

The study contains approximately 0.92 ha of Bangalay Sand Forest. The proposed works would affect approximately 0.02 ha of this community, however impacts will be limited to the ground cover and understorey with all canopy and larger midstory trees retained. A Test of Significance was undertaken for Bangalay Sand Forest of the Sydney Basin and South East Corner Bioregions.

BC Act	Question	Response
7.3.1 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	Not applicable.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	There would be a direct impact to 0.02 ha Bangalay Sand Forest which occurs within a known larger patch of the ecological community (approximately 0.9 ha will be retained within the study area) and which is likely to extend further within the surrounding landscape. It is considered unlikely that the loss of 0.02 ha in the groundcover and understorey of Bangalay Sand Forest which is located within a larger patch would adversely impact on this ecological community to an extent that its local occurrence will be placed at risk of becoming extinct. Indirect impacts associated to construction include dust, vibration, and sedimentation. These are not anticipated to affect the ecological community subject to the implementation of required mitigation measures.
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	The proposed works would result in a direct impact to groundcover and understorey species in 0.02 ha of Bangalay Sand Forest. This is a small area considering what will be retained within the study area and the greater locality. Impacts will be minimal, and restricted to the groundcover and understory, which was comprised of a mix of exotic and native species. Thus it is considered unlikely that the direct impacts would result in substantial and adverse modifications to such an extent to place this community at risk of extinction.

BC Act	Question	Response
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed works would directly affect 0.02 ha in the groundcover and under story of Bangalay Sand Forest. Canopy species would be retained.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: 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	The vegetation to be removed is relatively small compared with the remaining extent of this community within the study area and surrounding landscape. Connectivity of the Bangalay Sand Forest community will not be reduced as only minor impacts isolated to just the groundcover and understorey will occur, out from the courts which are an already cleared area. connectivity to the rest of this community will be maintained through the canopy as well as retained patches. The impacts will not further fragment or isolate areas of this ecological community.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: 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.	The proposed works would result in a direct impact to 0.02 ha of Bangalay Sand Forest, it is unlikely that this would impact upon the long-term survival of this ecological community in the locality as the direct impact will not significantly affect the long-term viability, tenure, quality and integrity of the habitat within the remaining patch and within locality. The vegetation to be directly affected is groundcover and understorey retaining important canopy species overhanging the impact area. Due to this it is not anticipated to affect the stages of the community's life cycles and reproductive success as the other strata will enable natural revegetation to occur.
7.3.1 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).	The proposed works would not impact any declared area of outstanding biodiversity value.
7.3.1 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.	Two Key Threatening Processes (KTP) are relevant to this proposal with respect to Bangalay Sand Forest. These include: • clearing of native vegetation • invasion of native plant communities by exotic perennial grasses The removal of approximately 0.02 ha of Bangalay Sand Forest would contribute to the above KTPs. However, this vegetation is located on the edge of a patch which has previously been cleared (the courts) and is already subject to edge effects. These are considered unlikely to significantly exacerbate weed invasion. Clearing is minimal considering and is isolated to the groundcover and understory. Therefore, the proposed works are unlikely to significantly increase the impacts of these KTPs.
Conclusion	Is there likely to be a significant impact?	No. The proposed activity is unlikely to significantly impact upon Bangalay Sand Forest given that: • A relatively small proportion of vegetation is to be removed (0.02 ha) compared to what will be retained within the study area (0.9 ha).

BC Act	Question	Response
		• Additionally, impacts will be limited to the groundcover and understory, retaining important canopy species. • And, the proposed activity will not increase fragmentation or reduce connectivity.

Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions

Swamp Oak Floodplain Forest is listed as endangered under the BC Act. This ecological community is characterised by a canopy layer dominated by *Casuarina glauca* (Swamp Oak) with an understorey of diverse smaller trees and grasses, forbs and sedges. Relative abundances of these species is determined by the frequency of inundation with this community frequently waterlogged or underwater.

The study contains approximately 0.051 ha of Swamp Oak Floodplain Forest. The proposed works would affect approximately 0.0003 ha of this community, however impacts will be limited to the groundcover and understorey with all canopy and larger midstory trees retained. A Test of Significance was undertaken for Swamp Oak Floodplain Forest of the Sydney Basin and South East Corner Bioregions.

BC Act	Question	Response
7.3.1 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	Not applicable.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	There would be a direct impact to 0.0003 ha Bangalay Sand Forest which occurs within a known larger patch of the ecological community (approximately 0.5 ha will be retained within the study area) and which is likely to extend further within the surrounding landscape. It is considered unlikely that the loss of 0.0003 ha in the groundcover and understorey of Swamp Oak Floodplain Forest which is located within a larger patch would adversely affect this ecological community to an extent that its local occurrence will be placed at risk of becoming extinct Vegetation that has the potential to be affected is located close to a previously cleared area currently subject to edge effects. Indirect impacts associated to construction include dust, vibration and sedimentation. These are not anticipated to affect the ecological community and place it at risk of becoming extinct subject to the implementation of required mitigation measures.
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	The proposed works will result in direct impacts to 0.0003 ha of Swamp Oak Floodplain Forest. Vegetation that is to be impacted is groundcover and understory which is comprised of a mix of native and exotic species this is associated to existing impact of the edge effect on this community. A brief assessment of vegetation assemblage's species outside the study area was observed to be the same as those within the potential impact area. In addition, the majority of flora species recorded during the survey are known to be common in the locality. Therefore, it is considered unlikely that the impacts would result in substantial and adverse modifications to such an extent to place this community at risk of extinction.

BC Act	Question	Response
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed works will result in direct impacts to 0.0003 ha of Swamp Oak Floodplain Forest. Vegetation that is to be impacted is groundcover and understory which is comprised of a mix of native and exotic species this is associated to existing impact of the edge effect on this community. As such the area that is proposed to be impacted is already in a degraded condition and is not considered to significantly modify the extent of the community. In addition approximately 0.5 ha of this community will be retained within the study area.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: 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	The proposed works will result in direct impacts to 0.0003 ha of Swamp Oak Floodplain Forest. Vegetation that is to be impacted is groundcover and understory which is comprised of a mix of native and exotic species this is associated to existing impact of the edge effect on this community. Impacts are primarily associated to the edge of the existing community in areas that are already degraded. As such, it is not considered to fragment or isolate areas of this ecological community or reduce connectivity.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: 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.	The proposed works will result in direct impacts to 0.0003 ha of Swamp Oak Floodplain Forest. Vegetation that is to be impacted is groundcover and understory which is comprised of a mix of native and exotic species this is associated to existing impact of the edge effect on this community. Impacts are primarily associated to the edge of the existing community in areas that are already degraded. As such, it is not considered to impact upon the long-term survival of this ecological community in the locality as approximately 0.5 ha of this community will be retained within the study area. In addition, indirect impacts associated to dust, vibration and sedimentation are not anticipated to affect the retained vegetation subject to the implementation of mitigation measures.
7.3.1 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).	The proposed works would not impact any declared area of outstanding biodiversity value.
7.3.1 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.	A Key Threatening Processes (KTP) relevant to this proposal is invasion of native plant communities by exotic perennial grasses. The proposed works will result in direct impacts to 0.0003 ha of Swamp Oak Floodplain Forest. Vegetation that is to be impacted is groundcover and understory which is comprised of a mix of native and exotic species this is associated to existing impact of the edge effect on this community. As impacts are located in areas that are already degraded and impacted by the edge effect, it is considered unlikely that the proposal would significantly exacerbate this KTP subject to implementation of mitigation measures.

BC Act	Question	Response
Conclusion	Is there likely to be a significant impact?	No. The proposed activity is unlikely to significantly impact upon Swamp Oak Floodplain Forest given that: 1. The proposed works will result in direct impacts to 0.0003 ha of Swamp Oak Floodplain Forest. Vegetation that is to be impacted has undergone previous disturbance and is already subject to edge effects. In addition, only groundcover an understorey will be affected. 2. The vegetation which has the potential to be affected is currently subject to edge effects and invasion of exotic perennial grasses. These are unlikely to be increased as a result of the proposed works. 3. The proposed development will not further fragment of isolate this ecological community from other patches of Swamp Oak Floodplain Forest.

Syzygium paniculatum

Syzygium paniculatum is listed as endangered under the BC Act. A medium sized tree in the Lilly Pilly family, it is now restricted entirely to a narrow strip along the coast of NSW between Upper Lansdowne to Conjola State Forest. It tends to occur in remnant littoral rainforest, though can be found in open forest too. It is also commonly planted as a horticultural species now as well.

One individual was found in the study area, approximately 11 m to the east of the courts. The proposed works would not directly impact on this species. However, indirect impacts from vibration dust and sedimentation have the potential to affect this community. There would also be minor works to remove vegetation in the understory of the community this species occurs in. A Test of Significance was undertaken for *Syzygium paniculatum*.

BC Act	Question	Response
7.3.1 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	There is the potential for indirect impacts of dust and runoff to affect the *Syzygium paniculatum* individual. These impacts would be restricted to during construction and occur as a result of digging, demolition and earthworks that would occur. The proposed works are not extensive; therefore the potential indirect impacts would be small and temporary. No clearing is proposed adjacent to the *Syzygium paniculatum* individual, thus there will be no increase in edge effects. This species reproduces through seedlings from fruit distributed by birds and flying-foxes, and it is believed life expectancy for this species is between 75 – 200 years. Minimal indirect impacts from noise have the potential to disturb the feeding habitat of birds and flying foxes. However, this will only occour for a short period of time during construction and is unlikely to significantly impact this species lifecycle such that it is placed at risk of extinction.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	Not relevant.
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	Not relevant.
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community:	The proposed works could potentially indirectly affect a *Syzygium paniculatum* individual. Potential impacts include dust and sedimentation during construction works. These

BC Act	Question	Response
	The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	would be mitigated through the implementation of mitigation measures. No direct impacts are anticipated to occour.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: 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	The potential habitat of this species within the study area is Bangalay Sand Forest and Swamp Oak Floodplain Forest, of which there is a total of 1.4 ha within the study area. The impact of the proposed activity is concentrated on the edge of this habitat and as such is not anticipated to fragment or isolate the habitat.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: 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.	The *Syzygium paniculatum* individual occurs in a relatively large patch of vegetation. Several individuals of this species have been recorded in this patch in the past. This habitat would therefore be considered locally important to this species. The potential habitat of this species within the study area is Bangalay Sand Forest and Swamp Oak Floodplain Forest, of which there is a total of 1.4 ha within the study area. The impact of the proposed activity is concentrated on the edge of this habitat and as such is not anticipated to affect the long term survival of this species as no fragmentation will occour.
7.3.1 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).	The proposed works would not impact any declared area of outstanding biodiversity value.
7.3.1 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.	Key Threatening Processes (KTP) relevant to this proposal are clearing of native vegetation and invasion of native plant communities by exotic perennial grasses. The potential habitat of this species within the study area is Bangalay Sand Forest and Swamp Oak Floodplain Forest, of which there is a total of 1.4 ha within the study area. The impact of the proposed activity associated to vegetation removal is concentrated on the edge of this habitat and as such is not anticipated to affect the species. It is considered unlikely that the proposal would significantly exacerbate the invasion of native plant communities by exotic perennial grasses subject to implementation of mitigation measures.
Conclusion	Is there likely to be a significant impact?	No. The proposed activity is unlikely to significantly impact upon *Syzygium paniculatum* given that: • A minimal amount nearby habitat is proposed to be cleared. • Potential indirect impacts will mostly be temporary (limited to during construction) and minimal • The vegetation which has the potential to be impacted is currently subject to edge effects and invasion of exotic perennial grasses. These are unlikely to be increased as a result of the proposed works.

BC Act	Question	Response
		• The proposed development will not further fragment of isolate habitat for this species.

Woodland Birds

The following species were not observed during field survey but have the potential to occur within the subject land:

- *Botaurus poiciloptilus* (Australasian Bittern)
- *Epthianura albifrons* (White-fronted Chat)
- *Glossopsitta pusilla* (Little Lorikeet)
- *Ixobrychus flavicollis* (Black Bittern)

These species have varying habitat associations (Appendix C1). However, within the context of the proposed works foraging habitat within the subject land was limited to PCT 1232, PCT 1793 and Planted Natives and Exotics. The proposed works would remove 0.0175 ha of this vegetation. No breeding habitat would be impacted. Given the similarity between foraging habitat within the subject land, a single Test of Significance was applied for the above species.

BC Act	Question	Response
7.3.1 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	The proposed works would remove 1.91 ha of vegetation, containing foraging habitat for the Australasian Bittern, White-fronted Chat, Little Lorikeet and Black Bittern. No breeding habitat would be impacted as part of the proposed works. Therefore, it is considered unlikely that the proposed works would place a viable population of any of these species at risk of extinction. Similar habitat would be retained within and adjacent to the study area.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	Not relevant.
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	Not relevant.
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed works would remove 0.0175 ha of vegetation, containing foraging habitat for the threatened bird species listed above. No breeding habitat would be impacted as part of the proposed works. The extent of this removal is considered minimal given that Similar habitat would be retained within and adjacent to the study area.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community:	The proposed works would remove 0.0175 ha of PCT 1232, PCT 1793 and planted native and exotic vegetation from around the perimeter of the court. As the vegetation removal

BC Act	Question	Response
	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	is limited to the edges of the vegetation it is not considered to contribute to further fragmenting or isolating of habitat for the threatened species. These species are highly mobile and will still be able to access foraging habitat in within the study area and surrounds.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: 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.	The works would remove 0.0175 ha of PCT 1232, PCT 1793 and planted native and exotic vegetation from around the perimeter of the court. This habitat to be removed is not considered vital to the long-term survival of these species within the locality because the species is highly mobile and would be able to continue foraging in similar vegetation within study area and surrounds. Furthermore, the proposed works would not remove breeding habitat.
7.3.1 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).	The proposed works would not impact any declared area of outstanding biodiversity value.
7.3.1 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.	One key threatening process, clearing of native vegetation, is associated with the proposed works and is relevant to the threatened species. The impacts of this key threatening process resulting from the proposed works are considered minimal. The species is highly mobile and would be able to continue foraging in similar vegetation retained within and adjacent to the study area and adjacent to the subject land.
Conclusion	Is there likely to be a significant impact?	No. The proposed activity is unlikely to significantly impact on Australasian Bittern, White-fronted Chat, Little Lorikeet and Black Bittern upon given that: • The works would only remove a minimal amount of potential foraging habitat for these species, 0.0175 ha of PCT 1232, PCT 1793 and planted native and exotic vegetation, from around the perimeter of the court. • Similar habitat for this species will be retained within and adjacent to the study area • No breeding habitat would be removed.

Grey Headed Flying Fox

No *Pteropus poliocephalus* (Grey-headed Flying-fox) were identified during the field survey and no Grey-headed Flying-fox (GHFF) camps were identified within the study area. However, within the context of the proposed works foraging habitat within the subject land was limited to PCT 1232, PCT 1793 and Planted Natives and Exotics, vegetation containing of flowering eucalypts. The proposed works would remove 0.0175 ha of this vegetation. The closest GHFF camp to the study area is located at Oatley approximately 5km to the west of the study area.

BC Act	Question	Response
7.3.1 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	The closest GHFF camp to the study area is located at Oatley approximately 5km to the west of the study area. GHFF forage in a radius of 50km from their camps. The proposed works would remove 0.0175 ha of vegetation, containing foraging habitat. Therefore, it is considered unlikely that the proposed works would place a viable population of GHFF at risk of extinction as there is similar habitat would be retained within and adjacent to the study area. The species occupies a large portion of the eastern seaboard, responding to fluctuations in flowering and fruiting. The species would not solely rely on 0.0.175 ha of habitat to be sustained, and life cycle of the species would not be impacted.
7.3.1 b) i	In the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity: 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	Not relevant.
7.3.1 b) ii	In the case of an endangered ecological community or critically endangered ecological community: Whether the proposed development or activity 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.	Not relevant.
7.3.1 c) i	In relation to the habitat of a threatened species or ecological community: The extent to which habitat is likely to be removed or modified as a result of the proposed development or activity	The proposed works would remove 0.0175 ha of vegetation, containing foraging habitat for the GHFF. The extent of this removal is considered minimal given that Similar habitat would be retained within and adjacent to the study area.
7.3.1 c) ii	In relation to the habitat of a threatened species or ecological community: 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	The proposed works would remove 0.0175 ha of PCT 1232, PCT 1793 and planted native and exotic vegetation from around the perimeter of the court. As the vegetation removal is limited to the edges of the vegetation it is not considered to contribute to further fragmenting or isolating of habitat for the GHFF. The GHFF is highly mobile and will still be able to

BC Act	Question	Response
		access foraging habitat in within the study area and surrounds.
7.3.1 c) iii	In relation to the habitat of a threatened species or ecological community: 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.	It is unlikely that any known camp or an important population will be fragmented under the proposed action. The proposed action will only result in a small area of potential foraging habitat being directly affected (up to 0.0175 ha). The proposed action would not place any barrier or obstacle in any known flyway or commuting route for the GHFF such that the single important population would become two or more populations.
7.3.1 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).	The proposed works would not impact any declared area of outstanding biodiversity value.
7.3.1 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.	One key threatening process, loss of roosting and foraging sites, is associated with the proposed works and is relevant to the GHFF. The impacts of this key threatening process resulting from the proposed works are considered minimal. The species is highly mobile and would be able to continue foraging in similar vegetation retained within and adjacent to the study area and adjacent to the subject land.
Conclusion	Is there likely to be a significant impact?	No. The proposed activity is unlikely to significantly impact on GHFF given that: • The works would only remove a minimal amount of potential foraging habitat for these species, 0.0175 ha of PCT 1232, PCT 1793 and planted native and exotic vegetation, from around the perimeter of the court. • Similar habitat for this species will be retained within and adjacent to the study area • No breeding habitat would be removed.

D3 Application of Significant Impact Criteria

This assessment has been prepared in accordance with the *EPBC Act Matters of National Environmental Significance: Significant Impact Guidelines 1.1 (*DAWE 2013). These guidelines have been established to assist proponents to determine whether a proposed action is likely to result in a significant impact on a matter of national environmental significance.

The EPBC Act establishes a process for assessing the environmental impact of activities and developments where MNES may be affected. Under the Act, any action which "has, will have, or is likely to have a significant impact on MNES" is defined as a "controlled action", and requires approval from the Commonwealth Department of Agriculture, Water and the Environment (DAWE), which is responsible for administering the EPBC Act.

Ecological Community: Coastal Swamp Oak (Casuarina glauca) Forest of New South Wales and South East Queensland

Criterion	Question	Response
An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:		
1)	reduce the extent of an ecological community	There are potential indirect impacts in the form of dust and runoff that may affect this patch of this community. There will be no direct removal of vegetation and no direct impacts to this community. The potential indirect impacts will be limited to the construction phase, and will be minimal in nature due to the small scale of the works. It is therefore considered unlikely that the potential indirect impacts will reduce the extent of this ecological community.
2)	fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines	As there will be no vegetation removal from this community, there will be no fragmentation as a result of the proposed works.
3)	adversely affect habitat critical to the survival of an ecological community	The Approved Conservation Advice for Coastal Swamp Oak (Casuarina Glauca) Forest states that remnant patches that are considered condition Category A or B are habitat critical to the survival of this community. The small patches that enter the study area are contiguous with a larger patch that is likely Category B, therefore this vegetation can be considered habitat critical to the survival of this community. However, the potential indirect impacts would be minimal and temporary, unlikely to cause any adverse impact in the long-term. Additionally, mitigation measures to prevent sedimentation and runoff will prevent any indirect impacts from occurring at all.
4)	modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns	The proposed development has the potential to indirectly modify abiotic factors such as changed water runoff, increased sedimentation, and increased nutrients. However, during and following construction these impacts will be mitigated through preparation and implementation of an Erosion and Sediment Control Plan. Therefore, it is unlikely that the proposed

Criterion	Question	Response
		works would modify or destroy abiotic factors necessary for an ecological community's survival.
5)	cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting	The proposed action may cause minimal and temporary indirect impacts such as dust and runoff from construction works to this community. The proposed actions are unlikely to result in a decline or loss of functionally important species as the area to be potentially impacted is small and the nature of the impacts are temporary. No substantial change is species composition would be expected of the works.
6) i)	cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: assisting invasive species, that are harmful to the listed ecological community, to become established, or	The proposed actions are unlikely to result in reduction of quality or integrity of the vegetation as the impacts are minimal and temporary and the site is already managed for weeds by a bush regeneration team. Mitigation measures to minimise such as sedimentation controls will assist in preventing invasive species movement into the community.
6) ii)	cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community, or	There is the potential for chemicals to be included in the runoff during construction. This potential indirect impact would be temporary, limited to the construction phase, and with the correct implementation of mitigation measures, is unlikely. Regular mobilisation of fertilisers and herbicides will not increase as a result of the proposed works.
7)	will the action interfere with the recovery of an ecological community	No. The potential indirect impacts from dust and runoff are temporary and minor and unlikely to have any long-term affect on the community such that it would affect its recovery.
Conclusion	Is there likely to be a significant impact?	No. In consideration of the above, the proposed works are unlikely to have a significant impact on the Coastal Swamp Oak (Casuarina Glauca) Forest and therefore, an EPBC Act referral is not required.

Syzygium Paniculatum

Criterion	Question	Response
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:		
1)	will the action lead to a long-term decrease in the size of a population	A 'population of a species' refers to a population, or collection of local populations, that occurs within a particular bioregion. There are several records of *Syzygium paniculatum* in in the patch of vegetation that the individual occurs in. The proposed works would remove a small amount of understory vegetation elsewhere in the study area and may have indirect impacts such as dust and runoff affecting this individual. These indirect impacts would be temporary and minimal. Given that neither of these impacts are likely to significantly affect the *Syzygium paniculatum* individual if they occur, they are unlikely to lead to a long-term decrease in the size of the population.
2)	will the action reduce the area of occupancy of the species	The proposed action would impact on a small amount of understory vegetation while retaining canopy species. These impacts would be prioritised in already cleared areas and may only affect very minor areas of the community that *Syzygium paniculatum* occurs in. Ample vegetation will be retained within the study area and surrounds. Therefore, a small area of occupancy may be affected, however it is unlikely to be substantial. Additionally, the potential indirect impacts would not reduce the area of occupancy of this species.
3)	will the action fragment an existing population into two or more populations	The *Syzygium paniculatum* individual occurs in a patch of vegetation that contains several records of this species. These species could reasonably be grouped into a subpopulation in line with those outlined in the National Recovery Plan for this species. The proposed action would remove a small amount of vegetation that this species occurs in on the edges of already cleared areas. Additionally, these impacts would be restricted to the groundstory, with canopy species being retained. No fragmentation of this community will occur therefore no fragmentation of this species local population will occur.
4)	will the action adversely affect habitat critical to the survival of a species	The National Recovery Plan for this species states that any naturally occurring individuals of this species are considered important and therefore any habitat they occur in are critical to their survival. The proposed works would have minor direct and potential indirect impacts on this vegetation community, however these impacts are not considered to be substantial or significant. Therefore, while habitat critical to the survival of these species would be adversly impacted through minor clearing in the understory, these impacts are not considered significant.
5)	will the action disrupt the breeding cycle of a population	This species reproduces through the production of thousands of fruit a year each containing up to nine seeds. These fruit are distributed around via fauna that eat them such as birds and bats. Minor and temporary indirect impacts are unlikely to affect this cycle. Nor is clearing of a small amount of native vegetation nearby.
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	The proposed works would remove 0.02 ha of habitat available for this species within the subject site (PCT 1793). Ample habitat would be retained within the study area and surrounds. Additionally, these impacts would be restricted to the understory. It is therefore unlikely that this minor decrease would affect this species to the point it is likely to decline.

Criterion	Question	Response
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	The proposed action is unlikely to result in the establishment of an invasive species that is harmful to *Syzygium paniculatum.* There are already exotic species in the understory (actively managed through bush regeneration) and these are unlikely to increase as a result of the proposed works.
7)	will the action introduce disease that may cause the species to decline	There is the potential for harmful pathogens such as Myrtle Rust, to be transported in on machinery during works. As works will not take place near the individual, it is unlikely that pathogens would be directly introduced to this species. Addtionally, mitigation measures to prevent the spread of pathogens, such as 'Come Clean, Go Clean' protocols will be adhered to. The proposed action is unlikely to introduce disease that may cause *Syzygium paniculatum* to decline.
8)	will the action interfere with the recovery of the species	One threat activity identified within the National Recovery Plan is relevant to the proposed development: To minimise the decline of Magenta Lilly Pilly through in situ habitat protection and management. The proposed action would remove 0.02 ha of habitat for this species (PCT 1793). However, this threat is considered minimal given that similar habitat would still be available for *Syzygium paniculatum* within the study area and surrounds.
Conclusion	Is there likely to be a significant impact?	No. The proposed activity is unlikely to have a significant impact on *Syzygium paniculatum* for the following reasons: The extent of habitat to be removed is minimal (0.02 ha). Similar habitat for this species will be retained within the study area and more is available adjacent to the study area. Potential indirect impacts would be temporary and minimal.

Pteropus poliocephalus Grey-Headed Flying-fox

Criterion	Question	Response
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:		
1)	will the action lead to a long-term decrease in the size of a population	The closest known Grey-headed Flying fox camp as identified on the National Flying-fox Monitoring viewer (DotEE 2016) is at Oatley, which is located approximately 5 km to the West of the study area. Individuals will move between camps around Sydney to search for foraging resources. Foraging for this species occurs generally within a 50 km radius around camp sites. Available foraging resources include street trees, urban bushland and conservation reserves. The proposed action will result in the removal of up to 0.0175 ha of potential foraging habitat. The amount of habitat to be affected is relatively small compared to the amount of vegetation available in the locality. No individuals or camps of Grey-headed Flying-fox were recorded in the study area and the study area would only be used on occasion as foraging habitat. The proposed works will not impact on any part of a known camp. Given that foraging habitat exists in the surrounding landscape, and that this species is wide-ranging (traveling up to 50 km in one night), the proposed works are unlikely to lead to a long-term decrease in the size of an important population of this species
2)	will the action reduce the area of occupancy of the species	Native vegetation in Sydney is important for the Grey-headed Flying-fox as individuals are known to move up to 50 km a night between camps to forage. This species is highly mobile and populations at each camp may change during seasonal fluctuations. Under the proposal a relatively small area of potential habitat would be removed, which may cause a temporary disturbance to the Grey-headed Flying-fox. However, these impacts are unlikely to reduce the area of occupancy for any known individuals, populations or camps given no works are to be carried out at night, the availability of foraging and roosting habitat present in adjacent areas and the highly mobile nature of this species. The area of occupancy would remain as most of the eastern seaboard would be unaffected by the proposed action.
3)	will the action fragment an existing population into two or more populations	The Grey-headed Flying-fox population across camps in Sydney is highly dynamic and individuals move between permanent camps to search for foraging resources. They will return to permanent camps to rear offspring. Individuals are highly mobile, and the population is dynamic. It is unlikely that any known camp or an important population will be fragmented under the proposed action. The proposed action will only result in a small area of potential foraging habitat being directly affected (up to 0.0175 ha). The proposed action would not place any barrier or obstacle in any known flyway or commuting route for the Grey-headed Flying Fox such that the single important population would become two or more populations.
4)	will the action adversely affect habitat critical to the survival of a species	Where the existence of important winter and spring flowering vegetation communities is verified in the field, they are considered habitat critical to the survival of the Grey-headed Flying-fox. Habitat critical to the survival of the Grey-headed Flying-fox may also be vegetation communities not containing the above tree species but which:

Criterion	Question	Response
		contain native species that are known to be productive as foraging habitat during the final weeks of gestation, and during the weeks of birth, lactation and conception (August to May) contain native species used for foraging and occur within 20 km of a nationally important camp as identified on the Department's interactive flying-fox web viewer, or contain native and or exotic species used for roosting at the site of a nationally important Grey-Headed Flying-Fox camp as identified on the Department's interactive flying-fox web viewer. The study area is approximately 20 km southeast of the camp at Parramatta Park. The camp at Parramatta Park has recorded numbers between 10,000 and 49,000 for the past year. Therefore, foraging habitat within the study area is consistent with habitat that would be critical to the survival of this species. While the habitat would be critical to the survival of the species, the removal of 0.0175 ha of potential foraging habitat is unlikely to significantly affect the population. The adverse effects of removing about 0.56 ha of potential foraging habitat is not likely to affect the survival of the species as a whole. The species occupies a large portion of the eastern seaboard, responding to fluctuations in flowering and fruiting. The species would not solely rely on 0.0175 ha of habitat to be sustained.
5)	will the action disrupt the breeding cycle of a population	As no breeding habitat would be removed or disturbed, it is unlikely the proposed work would disrupt the breeding cycle of the important population that roosts in the Sydney basin.
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 campsites would be removed, or disturbed, and foraging habitat will remain immediately adjacent to the study area and wider locality. The proposed action would therefore be unlikely to modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.
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	The proposal would not result in invasive species, such as weeds, that would be harmful to Grey-headed Flying Fox. It is unlikely that the proposed action will result in a large increase in the number of weeds due to the current disturbed nature of the site.
7)	will the action introduce disease that may cause the species to decline	Grey-headed Flying-foxes are reservoirs for the Australian bat lyssavirus (ABL) and can cause clinical disease and mortality in GHFF (DECCW 2009). The proposed action is unlikely to present a significant ecological stress on any camps or on individuals that may utilise the subject site and therefore the works are unlikely to introduce or exacerbate this virus or any other disease that may cause this species to decline.
8)	will the action interfere with the recovery of the species	A National Recovery Plan for the Grey-headed Flying-fox was published in 2021. No maternity camps would be removed, and the proposed action will remove a small area of potential foraging habitat. Foraging habitat will be retained within the development site. It is therefore unlikely the proposed action would interfere with the recovery of this species.
Conclusion	Is there likely to be a significant impact?	The action will not affect known breeding habitat and will only impact on a relatively small amount of potential foraging for this species. No

APPENDIX E

AHIMS Search Results

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : 22SYD1727
Client Service ID : 682347

Eco Logical Australia Pty Ltd - Sydney - Individual users

Date: 12 May 2022

PO Box 12 668 Old Princes Hwy
Sutherland New South Wales 1499

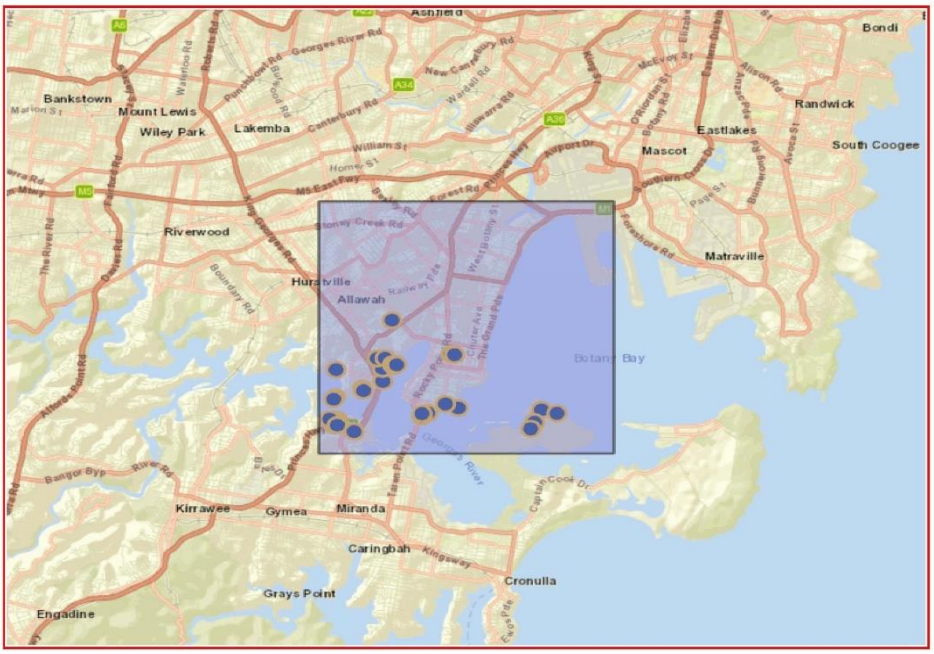
Attention: Kate Storan

Email: kate.storan@ecoaus.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Datum :GDA, Zone : 56, Eastings : 324380.0 - 332380.0, Northings : 6234521.0 - 6242521.0 with a Buffer of 0 meters, conducted by Kate Storan on 12 May 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:

35	**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
97	Towra Point Resting Place

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 22SYD1727

Client Service ID : 682347

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
45-6-1648	Bibby Street;Carlton;	AGD	56	326215	6238528	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	ASRSYS					**Permits**		
52-3-0959	Towra Beach 1; Towra Point Nature Reserv-	AGD	56	330396	6235710	Open site	Valid	Artefact : -	Isolated Find	
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists (MDCA),Mr.Phil Hunt					**Permits**		
52-3-0154	Sandringham;	AGD	56	328099	6235729	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Australian Museum					**Permits**		
45-6-1785	Dover Park;	AGD	56	326000	6236550	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Warren Bluff					**Permits**		
52-3-0958	Stan Moses Reserve 1;	AGD	56	327740	6235850	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Mr.Phil Hunt					**Permits**	1322	
52-3-2049	St George Sailing Club Carpark	GDA	56	327368	6235738	Open site	Valid	Artefact : 1, Potential Archaeological Deposit (PAD) : 1, Shell : 1		
	Contact	**Recorders**	Mr.Dominic Steele					**Permits**	4617	
45-6-2951	Ritchie St Sans Souci (this is not a site)	GDA	56	327970	6237653	Open site	Not a Site	Shell : -		
	Contact	**Recorders**	Mr.Shaun Longbottom					**Permits**		
52-3-0363	Glen Robin Port Hacking	AGD	56	324676	6235100	Closed site	Valid	Artefact : -, Burial : -, Shell : -	Burial/s,Midden,Shelter with Deposit	
	Contact	**Recorders**	Ms.Bronwyn Conyers					**Permits**		
52-3-0224	5 Pembroke St;Sylvania Cloned	GDA	56	325340	6235109	Closed site	Valid	Shell : -, Artefact : -, Habitation Structure : -, Potential Archaeological Deposit (PAD) : -	Shelter with Midden	
	Contact	**Recorders**	P Ireland,Mr.Graham Avery,Sutherland Shire Council - Graham Avery					**Permits**		
45-6-2304	Shipwright Bay 1;	AGD	56	325440	6236300	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
45-6-3132	2 Beach Street Midden Carss Pk	GDA	56	326089	6237153	Open site	Valid	Shell : -		
	Contact Metropolitan Local Aboriginal	**Recorders**	Ms.Miranda Fire-Star (nee Morton)					**Permits**		
45-6-2345	Carss Park 1	AGD	56	325830	6237290	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider					**Permits**		
52-3-0087	Sandringham;	AGD	56	324776	6235280	Closed site	Valid	Shell : -, Artefact : -, Art (Pigment or Engraved) : -	Shelter with Art,Shelter with Midden	
	Contact	**Recorders**	Australian Museum					**Permits**		
45-6-2340	Carss Park 2	AGD	56	326280	6237110	Open site	Valid	Shell : -, Artefact : -	Midden	

Report generated by AHIMS Web Service on 12/05/2022 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 324380.0 - 332380.0, Northings : 6234521.0 - 6242521.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 35

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 22SYD1727

Client Service ID : 682347

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Michael Guider					**Permits**		
52-3-0134	Taren Point;Sans Souci;	AGD	56	327098	6235435	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Unknown Author					**Permits**		
45-6-3703	Lou's Healing Place	GDA	56	328068	6237633	Open site	Valid	Modified Tree (Carved or Scarred) : -		
	Contact	**Recorders**	Mr.Paul Irish,Coast History & Heritage					**Permits**		
45-6-1794	Carss Bush Park;	AGD	56	326310	6237100	Open site	Valid	Shell : -, Artefact : -	Midden	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
45-6-1792	Carss Bush Park;	AGD	56	326050	6237300	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
52-3-1572	Sylvania 3	AGD	56	324690	6235290	Open site	Valid	Artefact : -		
	Contact	**Recorders**	Jo McDonald Cultural Heritage Management see GML					**Permits**		
45-6-2305	Shipwright Bay_2;	AGD	56	325470	6236240	Open site	Valid	Shell : -, Artefact : -	Midden	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
52-3-0739	Baldface Point;	AGD	56	324700	6236010	Closed site	Valid	Shell : -, Artefact : -	Shelter with Midden	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
45-6-2303	Lyle Williams Reserve;	AGD	56	324700	6236900	Open site	Valid	Shell : -, Artefact : -	Midden	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
52-3-0133	Sandringham;Rocky Point;	AGD	56	327097	6235527	Open site	Valid	Art (Pigment or Engraved) : -	Rock Engraving	
	Contact	**Recorders**	I.M Sim					**Permits**		
52-3-0345	See 52-3-336;	AGD	56	330210	6235300	Open site	Valid	Shell : -, Artefact : -	Midden	1607
	Contact	**Recorders**	ASRSYS					**Permits**		
52-3-1111	Sylvania 2-	AGD	56	324620	6235250	Closed site	Valid	Art (Pigment or Engraved) : -, Potential Archaeological Deposit (PAD) : -		97793
	Contact	**Recorders**	Mary Dallas Consulting Archaeologists (MDCA),Jo McDonald Cultural Heritage Man					**Permits**		
52-3-1114	Restriction applied. Please contact ahims@environment.nsw.gov.au.					Open site	Valid			
	Contact Mr.David Ingrey	**Recorders**	Mr.Dean Kelly					**Permits**		
52-3-0022	5 Pembroke St;Sylvania	GDA	56	325340	6235107	Closed site	Valid	Shell : -, Artefact : -, Habitation Structure : -, Potential Archaeological Deposit (PAD) : -	Shelter with Midden	

Report generated by AHIMS Web Service on 12/05/2022 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 324380.0 - 332380.0, Northings : 6234521.0 - 6242521.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 35

This information is not guaranteed to be free from error omission. Heritage NSW and its employees disclaim liability for any act done or omission made on the information and consequences of such acts or omission.

AHIMS Web Services (AWS)

Extensive search - Site list report

Your Ref/PO Number : 22SYD1727

Client Service ID : 682347

SiteID	SiteName	Datum	Zone	Easting	Northing	Context	Site Status **	SiteFeatures	SiteTypes	Reports
	Contact	**Recorders**	Fred McCarthy,Mr.Graham Avery,Sutherland Shire Council - Graham Avery					**Permits**		
52-3-0336	Towra point 2; (TP2)	AGD	56	330106	6235090	Open site	Valid	Artefact : -, Shell : -	Midden,Open Camp Site	1607
	Contact	**Recorders**	Doctor.Susan (left ahms) Mcintyre-Tamwoy					**Permits**		
45-6-1795	Carss Bush Park;	AGD	56	326260	6237100	Open site	Valid	Shell : -, Artefact : -	Midden	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
45-6-1796	Carss Bush Park;	AGD	56	326300	6237040	Open site	Valid	Shell : -, Artefact : -	Midden	
	Contact	**Recorders**	Warren Bluff					**Permits**		
45-6-1793	Carss Bush Park;	AGD	56	326350	6237120	Open site	Valid	Shell : -, Artefact : -	Midden	1333
	Contact	**Recorders**	Warren Bluff					**Permits**		
52-3-1251	Sylvania - Tara Street	AGD	56	324552	6235301	Open site	Valid	Shell : -		
	Contact T Russell	**Recorders**	Sutherland Shire Council					**Permits**		
52-3-0740	Bald Face Point;	AGD	56	324650	6235950	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider					**Permits**		
45-6-2341	Carrs Park 3	AGD	56	326370	6237090	Closed site	Valid	Artefact : -	Shelter with Deposit	
	Contact	**Recorders**	Michael Guider,Michael Guider					**Permits**		
52-3-1591	Syvania Cave	GDA	56	324870	6235300	Closed site	Valid	Artefact : -		
	Contact	**Recorders**	Michael Guider					**Permits**		

**** 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 12/05/2022 for Kate Storan for the following area at Datum :GDA, Zone : 56, Eastings : 324380.0 - 332380.0, Northings : 6234521.0 - 6242521.0 with a Buffer of 0 meters.. Number of Aboriginal sites and Aboriginal objects found is 35

APPENDIX F

Statement of Heritage Impact

Eco Logical Australia, 2022

APPENDIX G

Neutral or Beneficial Effects Assessment

Eco Logical Australia, 2022

Neutral or Beneficial Effects (NorBE) Assessment

The Scarborough Park Courts are located in an area that is mapped as Coastal Wetlands Proximity Area under Chapter 2 (Coastal Management) of the Resilience and Hazards SEPP (Figure 3-7). Clause 2.8(1) of the Resilience and Hazards SEPP states:

Development consent must not be granted to development on land identified as "proximity area for coastal wetlands" unless the consent authority is satisfied that the proposed development will not significantly impact on—

a. *the biophysical, hydrological, or ecological integrity of the adjacent coastal wetland or littoral rainforest, or*
b. *the quantity and quality of surface and ground water flows to and from the adjacent coastal wetland or littoral rainforest.*

To address the above, a Neutral or Beneficial Effects (NorBE) has been prepared along with MUSIC water quality modelling (Section 3.2.2) to underpin it. The NorBE Assessment is presented below in Table E-1.

Table E-1 NorBE Assessment

Will there be a neutral or beneficial effect on water quality? *Assessment must consider surface & ground waters and must consider construction & operational stages.*	
1. Are there any identifiable potential impacts on **water quality**? What **pollutants** are likely? *Major potential pollutants are **sediments** (fine & coarse), **nitrogen**, **phosphorus**, **pathogens** and **hazardous chemicals and contaminants** such as oil/fuel.* During construction and/or post construction?	The development has the potential to impact water quality through generation and release into the surrounding environment of sediment runoff during the construction phase and negligible amounts of sediments (TSS) and nutrients (TN and TP) during the operational phase.
2. For each pollutant list the **safeguards** needed to prevent or mitigate potential impacts on water quality (*these may be SCA endorsed current recommended practices (CRPs) and/or equally effective other practices*)?	This development will require minimal safeguards to protect against potential impacts. For all identified pollutants (TSS, TN and TP), these are: • All temporary erosion and sediment control structures shall be in place prior to any construction works commencing • All permanent drainage structures are to be implemented as soon as practical in the works program and protected from pollutants during construction. • Temporary sediment and erosion control structures will remain in place until exposed areas are rehabilitated and stabilised at which time they will be removed. • Ground disturbance works will be scheduled for periods of dry weather as far as practical; no works involving soil disturbance shall take place during heavy rainfall periods, other than work necessary to stabilise the site • Overland flow will be diverted towards the sandbags with the sediment fencing • General solid waste is to be collected in appropriate bins • Disturbed soil areas should be rehabilitated/revegetated immediately following construction completion

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3. Will the safeguards be adequate for the time required? How will they need to be maintained?	The safeguards outlined will be adequate for the proposed development. Noting that erosion and sediment control measures should not be removed until the works are complete and the disturbed areas adequately stabilised and rehabilitated.
4. Will all **impacts** on water quality be effectively **contained on the site** by the identified **safeguards** (above) and not reach any watercourse, waterbody, or drainage depression? Or will **impacts** on water quality be **transferred outside the site** for treatment? How? Why?	All impacts will be contained on site and/or be mitigated by the proposed safeguards. There will be no water quality impact on downstream watercourses, waterbodies, or drainage depressions.
5. Is it likely that a **neutral or beneficial effect** on water quality will occur? Why?	It is likely that the proposal will have a neutral or beneficial effect on water quality within the locality. The development itself and the mitigation measures outlined in this document, if appropriately implemented and maintained, will maintain, or improve the water quality discharges leaving the development.

APPENDIX H

Arboricultural Impact Assessment

Bellevue Tree Consultants, 2021