REVIEW OF ENVIRONMENTAL FACTORS

GROSS POLLUTANT TRAP (CDS TYPE)

Derribong Place, Thornleigh

PREPARED FOR

HORNSBY SHIRE COUNCIL

BY APPLIED ECOLOGY PTY LTD

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Client contact	**Craig Naughton**

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DISCLAIMER

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1 Summary

1.1 Overview

This REF addresses proposed works that involve the installation of a CDS type GPT beside Derribong Place on Larool Creek in Thornleigh. The proposed impact area includes approximately 170m^2 on the eastern side of Larool Creek and on the south side of Derribong Place. Scope of works is described as:

- Construct weir to divert low flows to proposed CDS style GPT unit
- Install CDS GPT unit and diversion chamber
- Construct head wall and outlet structure to direct flows downstream on Larool Creek
- Locate GPT maintenance access for trucks.
- Restoration of disturbed ground including fencing and revegetation as required

Planning regarding the following factors was assessed as part of this REF. These factors include, but are not limited to:

1. Management of other waste soils and waste concrete
2. Protecting existing services;
3. Protecting the adjacent native vegetation from clearing, runoff and other indirect impacts (e.g., sedimentation/erosion);
4. Avoiding damage to individual trees (including impact to tree roots) not designated for clearing;
5. Water quality, flow, turbidity, and aquatic fauna; and
6. Road management during construction.

1.2 Purpose of the Review of Environmental Factors

This Review of Environmental Factors (REF) is to assess impacts of the proposal on the environment. For the purposes of these works, the Council is the proponent and the consent authority under Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act). The works consist of storm

water management works that are described in State Environmental Planning Policy (Transport and Infrastructure) 2021.

The description of the proposed works and associated environmental impacts have been undertaken in line with the *Guidelines for Division 5.1 assessments* (Department of Planning and Environment, June 2022). This assists the determining authorities to fulfil duties under section 5.5 of the EP&A Act by considering, to the fullest extent possible, all matters affecting or likely to affect the environment, for the purpose of protection and enhancement of the environment. The REF takes into account the requirements of clause 171(2) of the Environmental Planning and Assessment Regulation 2021, and also considers the Biodiversity Conservation Act 2016 (BC Act), Protection of the Environment Operations Act 1997 (POEO Act) and the Federal Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act) and other relevant Acts and State and Local Environment Planning Policies.

1.3 Environmental Impacts and Mitigation

The environmental issues identified for the proposal during construction phase include:

- Mobilisation of sediment from the bank and creek bed during excavation
- Temporary increases to turbidity and sedimentation
- Erosion and runoff issues impacting adjacent vegetation.
- Waste disposal management
- Clearing of native vegetation
- Spread of pathogens
- Noise, air and visual impacts
- Damage to native trees and revegetation plantings

This document identifies mitigation measures to minimise the potential for environmental harm. The operational phase of the proposed works would have some relatively minor impacts. These impacts include:

- Minor short term increases in noise and visual impacts during cleaning and maintenance activities of the GPTs

1.4 Justification For the Project

The project is designed to reduce gross pollutants entering Larool Creek. A reduction in gross pollutants entering natural systems will lead to improvements in water and habitat quality, and improve visual amenity along the creek line and the downstream environment.

2 Introduction

The Review of Environmental Factors report provides a detailed analysis of the environmental constraints that exist on the site, the potential environmental impacts that may arise from the implementation of the proposal and recommended actions to mitigate those impacts. The Review of Environmental Factors report will be used to assess the proposal under Part 5 of the EPA act (1979) and includes provisions of the State Environmental Planning Policy (Transport and Infrastructure) 2021.

Table 1: Proponent details

Project Name	Gross Pollutant Trap - CDS type
Proponent (Council) Name	Hornsby Shire Council
Project Manager	Craig Naughton, Catchments Project Officer
Contact Details	Craig Naughton cnaughton@hornsby.nsw.gov.au

3 Project Description and Background

3.1 Background and Options

Larool Creek drains an industrial area centred on Sefton Rd and Chivers Rd in Thornleigh, with the remainder of the upstream catchment predominantly urban residential development. The creek has been identified as frequently having high pollution loads. The location of a GPT on Derribong Place meets several important criteria, including access for maintenance, achievable treatment capacity, and treating stormwater before it reaches Berowra Valley Regional Park

The 'do nothing' option was rejected to ensure that the downstream environment would be protected from poor water quality flows.

3.2 The proposal - scope of Works

- Site mobilisation, general clearing of vegetation and excavation to prepare subgrade;
- Supply and deliver Atlan Vorceptor (CDS) Unit;
- Excavate minimum 4.06m x 4.06m x 6.180m hole for CDS unit (approx. 102m3)
- Construct weir to using concrete cast insitu to 1100m high to divert low flows to proposed CDS style GPT unit
- Mass concrete filling of rock pool in stream bed approx. 2m x 3m surface area
- New cast insitu concrete retaining wall upstream and downstream of the CDS unit
- Include 150mm diameter capped low flow bypass pipe through the weir wall at the lowest point of the stream bed
- Install CDS GPT unit and diversion chamber
- Construct concrete cast insitu retaining wall and outlet structure to direct flows downstream on Larool Creek
- Locate GPT maintenance access for trucks.
- Restoration of disturbed ground including fencing and revegetate as required
- Retain existing debris control structures

3.3 Machinery and Equipment

Excavator, bogie etc.

(Additional machinery and equipment to be advised)

3.4 Access and Ancillary Works

Access is from Derribong Place, Thornleigh. The site has easy access onto grassed open space adjacent to works areas immediately after pulling off the sealed road. Construction compound and storage areas will be located as follows (Figure 1):

- meal shed directly opposite the work site in Derribong Place, placed on the grass nature strip halfway between the culvert and driveway
- tool container there is a cleared area around the corner opposite number 75 Wareemba Ave (this area has been used in the past)
- stockpile area outside 2 Derribong Place, between the worksite and driveway

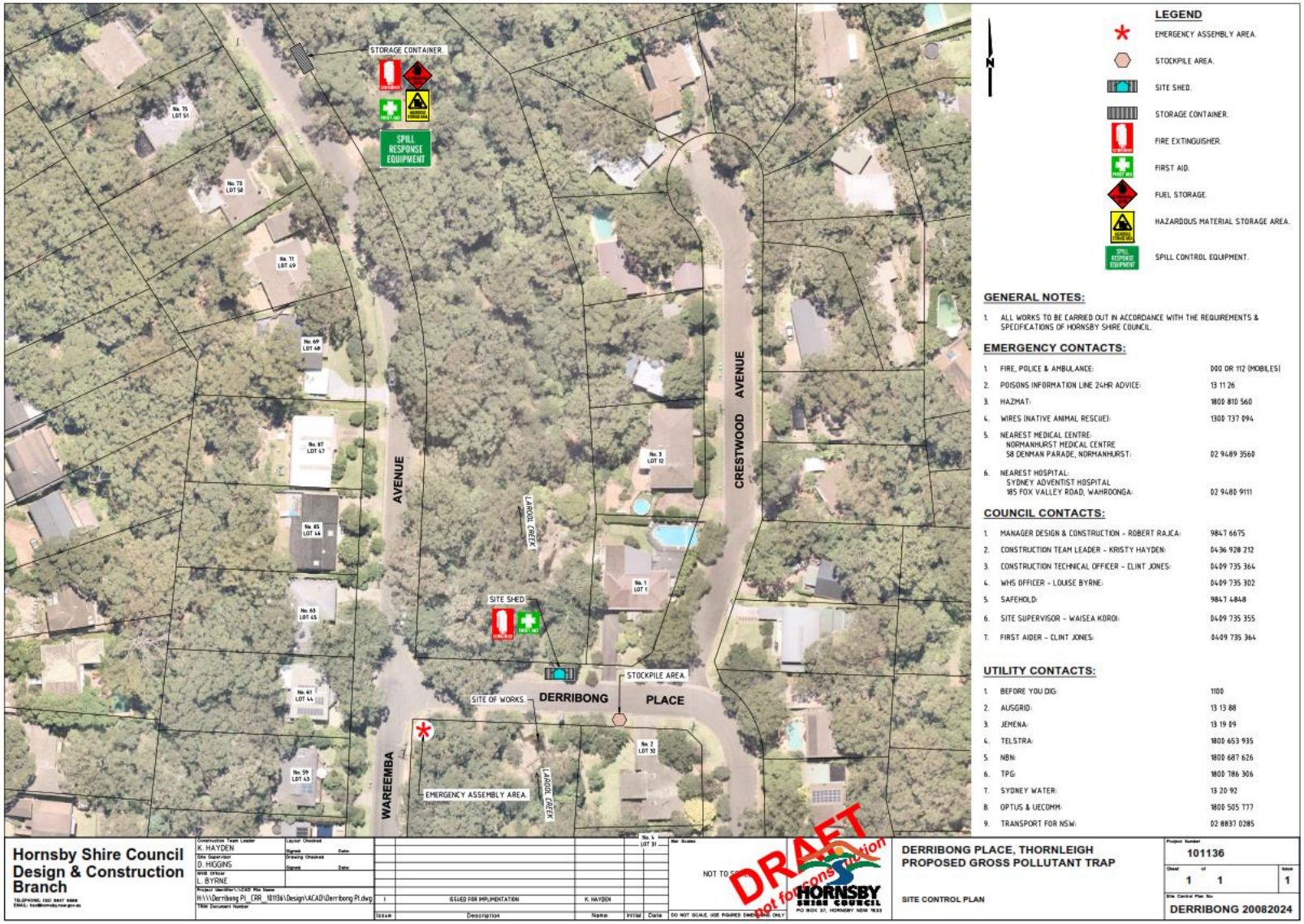


Figure 1 Proposed locations of site sheds, storage compounds and other ancillary requirements

3.5 Duration and Working Hours

The works are relatively short term, as outlined in Table 2.

Table 2: Project timeframes

Commencement Date	TBA
Work Duration	TBA
Work Hours	Standard working hours: Monday to Friday 7 am to 6 pm Saturday 8 am to 1 pm **No work on Sundays or public holidays**

3.6 Project Location and Context

3.6.1 Location of the Proposed Activities

- Cnr Wareemba Ave & Derribong Place, Thornleigh
- Street address: 54 Wareemba Avenue, Thornleigh
- Lot and DP: Lot 76 in DP233580

3.6.2 Site Context and description

The area of proposed works is located beside a predominantly modified urban waterway (Larool Creek) in the suburb of Thornleigh (Figure 1).

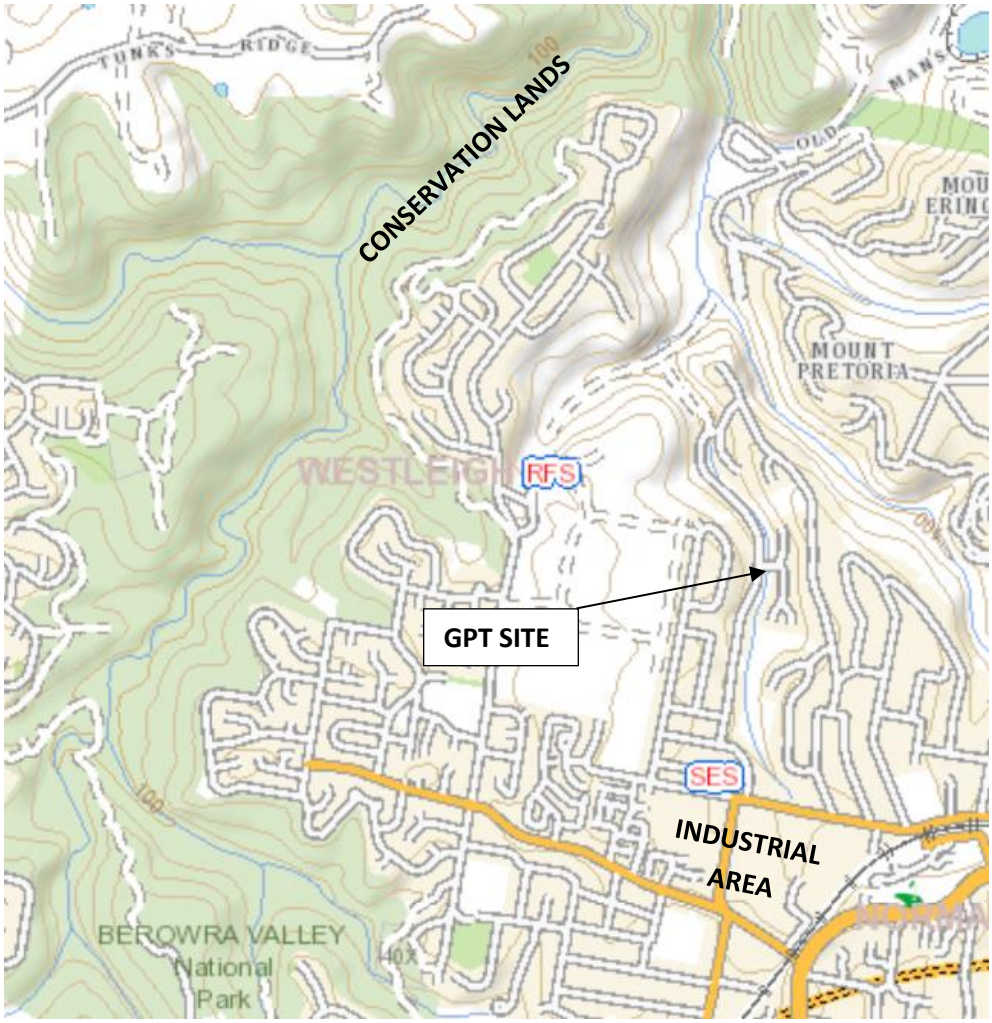


Figure 2 Overview of study area location

The site is located on the eastern bank of Larool Creek (**Error! Reference source not found.**). In this location Larool Creek has been reshaped and the eastern bank formalized using a concrete pillow retaining wall. Most of the reserve is on the western side of the creek and consists of regenerating bushland.

Figure 3 The site of the proposed GPT would be on the eastern side of Larool Creek behind a retaining wall

Figure 4 Most of the reserve is on the western side of Larool Creek and has regenerating bushland

The site is underlain by Hawkesbury Sandstone and is located on the Hawkesbury soil landscape (see sections 6.1 and 12.4). This part of Thornleigh began to be developed in 1930 with the construction of Norman Ave and Beresford Rd/Dartford Rd nearby (Figure 5). Development progressed slowly and the site remained undisturbed bushland in 1951 (Figure 6). By 1971 many of the streets in northern

Thornleigh had been laid out and many of the blocks developed, including Derribong Place (Figure 7), and by 1978 the catchment was largely fully developed and has changed very little to the current time (Figure 8).

Figure 5 Aerial imagery from 1930 (Historical Imagery (nsw.gov.au)) – Larool Creek is undisturbed bushland

Figure 6 Aerial imagery from 1951 (Historical Imagery (nsw.gov.au)); developed has begun on the eastern ridge

Figure 7 Aerial imagery from 1971 (Historical Imagery (nsw.gov.au)); Derribong Place is laid out for construction

Figure 8 Aerial imagery from 1978 (Historical Imagery (nsw.gov.au)); Larool Creek catchment is fully developed

3.6.3 Landuse and Ownership

- Land use at the site and surrounds: riparian bushland reserve
- The land zoning at the site according to the LEP: RE1 Public Recreation (see section 12.2)
- Land ownership - is it council, Crown, private? Council
- Do any works, including access requirements, impinge on a National Park or land owned by NPWS? No

4 Statutory and Planning Framework

4.1 Environmental Planning and Assessment Act 1979

The *Environmental Planning and Assessment Act 1979* (EP&A Act) and the Environmental Planning and Assessment Regulation 2000 (EP&A Regulation) provide the framework for development and environmental assessment in NSW.

As Council is the proponent, the works have been assessed as 'development permissible without consent' under Part 5 of the EP&A Act. Therefore, the activity has been assessed in accordance with Sections 5.5, 5.6 and 5.7 of that Act by examining and taking into account to the fullest extent possible all matters which are likely to affect the environment. Environmental Planning Instruments made under the EP&A Act 1979 may also be relevant and are addressed below.

4.2 State Environmental Planning Policy Transport and Infrastructure 2021 (TISEPP)

Pursuant to Division 20 Stormwater management, Clause 2.137 of the SEPP, development or the purpose of stormwater management systems may be carried out by or on behalf of a public authority without consent on any land.

The proposed works are therefore assessed under Part 5 of the EP&A Act.

4.3 Other Environmental Legislation

Table 3 outlines how the project has been considered under other relevant Commonwealth and State environmental legislation.

Table 3: Other environmental legislation

Legislation	Summary	Relevance to the Proposed Activity
COMMONWEALTH LEGISLATION		
***Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act)**	The EPBC Act protects matters of National Environmental Significance (NES), such as threatened species and ecological communities, migratory species (protected under international agreements), and National Heritage places (among others).	There are 9 threatened ecological communities within 2 km of the three sites, potentially 68 threatened species and 15 listed migratory birds. No Matter of NES have been identified on, or in the immediate vicinity of the proposed works sites. The proposal has been assessed (Appendix A) and a referral to the Commonwealth Department of Environment is not required.
STATE LEGISLATION		
***Biodiversity Conservation Act 2016* (BC Act)**	Part 7 of the BC Act provides the environmental assessment requirements for activities being assessed under Part 5 of the EP&A Act 1979. If a significant impact is likely, a Species Impact Statement (SIS) is required. Alternatively, a Biodiversity Development Assessment Report (BDAR) may be prepared in place of a SIS if the proponent (Council) so elects. Section 7.2(1)(a) and 7.3 describe the assessment requirements and thresholds for what is considered a significant impact.	Threatened entities listed under this Act are present in the vicinity of the works [see section 9.2]. Assessments of Significance were undertaken for these nearby matters (Appendix A). The assessment concluded that a significant impact would not result and therefore a Species Impact Statement or Biodiversity Development Assessment Report is not required.
State Environmental Planning Policy (Biodiversity and Conservation) 2021	The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (BC SEPP) commenced on the 1 March 2022 and consolidates, transfers and repeals provisions of a number of SEPPs (or deemed SEPPs). Chapter 4 is one of a number of NSW Government initiatives that seek to address the declining population status of koalas in NSW. It does this through conservation and management	No recognised Koala habitat or feed trees will be removed as part of this proposal therefore there will be no impact on Koala habitat as a result of works. The proposed works do not trigger provisions of the BC SEPP 2021.

Legislation	Summary	Relevance to the Proposed Activity
	of koala habitat as part of the planning and development assessment process. Assessment for activities assessed under Part 5 of the EP&A Act do not require assessment. **Chapter 6 Water Catchments** replaces several regional environmental plans, including SREP 20 – Hawkesbury Nepean River. Part 6.2 deals with development in regulated catchments. Division 2 provides general controls, and Division 3 provides development controls in specific areas, with 6.13 relevant for Hawkesbury-Nepean conservation area sub-catchments.	The proposed development has been designed to improve the quality of water discharged to Waitara Creek before flowing via Berowra Creek to Hawkesbury River, thus it has no net detrimental impact on the water quality of the receiving waters and therefore meets the primary objectives of the BC SEPP. As a part of construction works, Erosion and Sediment control measures should be put in place to ensure that downstream environments are protected and Pollution during the construction phase will be controlled as per the guidelines of the Blue Book (Managing Urban Stormwater: Soils and Construction, 4th Edition, Landcom, 2004). Impacts on the structure and floristics of native vegetation will be minimised (clause 6.13(2)(b)), noting that development has previously been carried out on site (clause 6.13(2)(d)).
State Environmental Planning Policy (Resilience and Hazards) 2021	State Environmental Planning Policy (Resilience and Hazards) 2021 provides controls for undertaking development and activities in coastal management areas.	The proposed activity is not located on land subject to the State Environmental Planning Policy (Resilience and Hazards) 2021.
National Parks and Wildlife Act 1974 (NPW Act)	The NPW Act regulates the control and management of all national parks, historic sites, nature reserves, and Aboriginal areas. The main aim of the Act is to conserve the natural and cultural heritage of NSW. Where works will disturb Aboriginal objects, an Aboriginal Heritage Impact Permit (AHIP) is required.	An AHIMs extensive search was undertaken for the general area [see section 6.6]. Only very minor earthworks would be required to lay the pad to support the nets. This coupled with the disturbed nature of the site of proposed works makes it unlikely that the proposed activity would harm Aboriginal objects. Normal safeguards apply and a permit under the NP&W Act is not required.

Legislation	Summary	Relevance to the Proposed Activity
Heritage Act 1977	Is approval of works on the site required under Part 4 of the Heritage Act?	The proposed activity does not impact any items or places listed on the NSW State Heritage Register or the subject of an interim heritage order or listing and is therefore not a controlled activity.
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 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. Check the POEO Public Register for any relevant Environment Protection Licences (EPLs).	No licenses have been identified as being required including an Environmental Protection Licence (EPL). Off-site disposal of surplus soils excavated (if any) as part of the proposals are regulated by the provisions of the Act and associated regulations and guidelines including the DEC NSW EPA 2014 guidelines – Part 1 Classification of waste.
Biosecurity Act 2015	The *Biosecurity Act 2015* and regulations provide requirements for state level priority weeds. The Act regulates all plants, with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk they may pose. The Biosecurity Act 2015 provides powers to Local Control Authorities to take action in relation to weeds of particular concern in particular circumstances, for example where a weed threatens a high value asset and prevention, elimination or reduction of the risk is feasible and reasonable.	Priority control weeds occur in the vicinity of proposed works at Derribong Place but not in the immediate works area [see section 6.2].
Fisheries Management	FM Act provides for the protection, conservation, and recovery of threatened species, populations and ecological	The development involves installing a weir with height 1100mm across the entire channel to divert stream flows through the CDS unit,

Legislation	Summary	Relevance to the Proposed Activity
Act 1995 (FM Act)	communities of fish and marine vegetation and fish habitats, as well as promoting the development and sharing of fishery resources in NSW.	which would be installed into the creek bank <1m from the stream bed, in a location defined as water land. Sections of the creek bank may be altered during or as a result of the works, sediment disturbance, vegetation removal and shading impacts may result from these works. The development occurs on water land but not in an area mapped as Key Fish Habitat. NSW Fisheries have advised that a Part 7 permit under the FM Act is not required (email from Karthika Krishna Pillai dated 26 August 2024). Threatened species/populations listed under this Act were not identified as having the potential to occur in the vicinity of works. Preliminary Assessments of Significance were undertaken for aquatic species [see section 8.2]. No significant impacts are likely and no further assessment is required.

5 Community and Agency Consultation

Table 4: Community and Agency Consultation

Community / agency consultation	Have any community stakeholders been identified for the proposed works? Yes ☒ No ☐ Wareemba Avenue Bushcare group meet weekly on site with activities centred just downstream from the proposed GPT site but stretching upstream to include this area. Recent plantings have been installed in or near the site of proposed works. Is consultation with other authorities required under the requirements of clause 2.15 of the Transport and Infrastructure SEPP? Yes ☐ No ☒ Are the works adjacent to a national park, nature reserve or other area reserved under the *National Parks and Wildlife Act 1974*? Yes ☐ No ☒ Are the works adjacent to a declared aquatic reserve under the *Fisheries Management Act 1994*? Yes ☐ No ☒ If yes, provide details of consultation carried out and identify where comments received are considered in the REF. Also include copies of any correspondence in the REF appendices. NSW Fisheries have advised that a Part 7 permit under the FM Act is not required (email from Karthika Krishna Pillai dated 26 August 2024 attached in Appendix B, section 12.13). Other agency and community consultation: Sydney Water has a sewer line running along the western side of Larool Creek with a sewer pit located at the western end of the proposed weir.

6 Environmental Assessment

This section describes in detail the potential key environmental impacts associated with the proposal during both construction and operation and includes identifying site-specific safeguards to ameliorate the identified potential impacts.

6.1 Landform, geology and soils

Issue	Description
Landform, geology and soils	Does the project involve the disturbance of large areas (eg >2ha) for earthworks? Yes ☐ No ☒ Does the site have constraints for erosion and sedimentation controls such as steep gradients, narrow corridors or is located on private property? Yes ☐ No ☒ Are there any sensitive receiving environments that are located in or nearby the likely project footprint or that would likely receive stormwater discharge from the project? Sensitive receiving environments include (but are not limited to) wetlands, state forests, national parks, nature reserves, rainforests, drinking water catchments). Yes ☒ No ☐ If yes, provide details of species present on the works site: The GPT would be designed to treat creek flows diverted by the weir on Larool Creek. The proposal would improve water quality discharged to the receiving environments.
Desktop investigation	The site is underlain by Hawkesbury Sandstone and are located in the Hawkesbury soil landscape (see section 12.4). Qualities and Limitations of this landscape are described by Chapman, GA and Murphy, CL 1989 (Department of Conservation and Land Management): **Hawkesbury Soil Landscape:** **Landscape–**rugged, rolling to very steep hills on Hawkesbury Sandstone. Local relief 40–200 m, slopes >25%. Rock outcrop >50%. Narrow crests and ridges, narrow incised valleys, steep sideslopes with rocky benches, broken scarps and boulders. Mostly uncleared eucalypt open woodland (dry sclerophyll forest) and tall open-forest (wet sclerophyll forest). **Soils–**shallow (>50 cm), discontinuous Lithosols/Siliceous Sands (Uc1.21) associated with rock outcrop; Earthy Sands (Uc5.11, Uc5.23), Yellow Earths (Gn2.24) and some Yellow Podzolic Soils (Dy4.11) on inside of benches and along joints and fractures; localised Yellow and Red Podzolic Soils (Dy4.11, Dy5.21, Dy5.11, Dr5.21) associated with shale lenses; Siliceous Sands (Uc1.2) and secondary Yellow Earths (Gn2.41) along drainage lines. **Limitations–**extreme soil erosion hazard, steep slopes, rock outcrop, shallow, stony, highly permeable soil, low soil fertility.

Issue	Description
Site investigation	Applied Ecology inspected the site on 24th July 2024. The creek bed is largely sandstone bedrock constrained, while the proposed GPT site is in predominantly imported fill maintained by a stacked concrete pillow retaining wall.  **Figure 9** Site soils are predominantly imported fill behind a retaining wall Part of the concrete pillow retaining wall will be removed for the diversion weir inlet and the outlet structures. The CDS unit will be positioned into a hole approximately 6.2m deep, and is likely to have approximately 4.2m excavated into bedrock, based on the stream profile. Waste classification was undertaken by SESL (August 2024) and the results included in section 6.3.
Potential Impacts	• Any disturbance of groundcover presents a potential risk for erosion and sediments released from the site • Exposure of unknown contaminated soils /asbestos bearing materials – impact on human health and environment • Incorrect disposal
Safeguards	• See also section 6.3 for treatment of site soils • A Construction Environment Management Plan (CEMP) is to be prepared prior to any construction works commencing. The CEMP should include relevant safeguards including unexpected finds protocols (Section 12.5) and REF Environmental Safeguards and Mitigation Measures. • Site management will incorporate best management erosion and sediment control practices such as those found in the Landcom's "Blue Book (4th Edition) on erosion and sediment control. • The rehabilitation of disturbed areas will be carried out immediately

6.2 Biosecurity

Issue	Description
Biosecurity	Are the works located within an area with identified Weeds of National Significance, or State or Regional priority weeds? Yes ☐ No ☒ If yes, provide details of species present on the works site: Blackberry is present in the drainage line upstream and downstream of the works area. These are small patches and this species appears to be controlled by the local Bushcare group Are there any other identified biosecurity risks associated with the works? Yes ☒ No ☐ If yes, provide details: Materials imported/exported from the site including plant, machinery and tools have the potential to import pathogens and weed propagules to and from the site.
Potential impacts	Spread of pathogens and weed propagules to or from the area of proposed works
Safeguards	• Thoroughly clean vehicles and equipment to remove all adhering soil or plant debris before moving between different work sites and within this site. Ensure all imported material is from areas free of pathogens such as *Phytophthora cinnamomi* and Myrtle rust[1]

[1] ***Phytophthora cinnamomi*** **'s** growth, reproduction and spread is favoured by free water in the soil or ponding on the water surface. Consequently, the movement of infested water and soil play a key role in the spread of this pathogen, and in contrast to other pathogens of natural ecosystems, human activity has played a significant role in the spread *of P. cinnamomi* in infested soil (http://www.cpsm.murdoch.edu.au). In NSW, strong evidence of *Phytophthora cinnamomi*-induced dieback has been identified in forest, woodland and heathland vegetation. Myrtle rust *Uredo rangelii* produces a multitude of spores in the pustules. These may be carried to new host plants by wind, water splash, by insects such as bees (which may work on the spores on infected leaves), on equipment, or on clothing. The rust spores can be carried long distances by wind. Rust diseases can also spread through cuttings, plants and cut stems from infected plants. The fungus can also survive on stock plants. Spores can survive for up to 3 months in the environment and on crop trash, if conditions are favourable.

6.3 Contaminated Land and Acid Sulfate Soils

Issue	Description
Potential Impacts	Is the project located within an area mapped as Potential Acid Sulfate Soils? Yes ☐ No ☒ Are there any known occurrences of acid sulfate soils (ASS) in the area? Yes ☐ No ☒ Is the project located within an area mapped as Contaminated Land? Yes ☐ No ☒ If yes, provide details: N/A SESL (2024) undertook soils assessments and waste classification as follows. Based on the site observations and results of the laboratory analysis, the in-situ borehole material located at the proposed Gross Pollutant Trap location at 2 Derribong Place Thornleigh NSW (the Site) consisting of 'CLAYEY SAND' (0-1000 mm) and 'CLAYEY LOAM' (1000-1500 mm) is classified as CT1 – **General Solid Waste (non-putrescible)** due to concentrations of all analytes presenting < CT1 values for General Solid Waste (GSW). Material classified as General Solid Waste (non-putrescible) is considered suitable for offsite disposal at an appropriately licensed facility. This material may be considered recyclable depending on the contaminant acceptance limits permissible under the Environmental Protection License (EPL) of the receiving facility.
Safeguards	• Undertake in situ waste classification before reuse on site or disposal off site, noting that this is likely to be more than 100m3 in total, of which around two thirds is likely to be VENM • If other contaminated areas are encountered during activities appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with relevant government agencies.

6.4 Water Quality and Hydrology

Issue	Description
Water Quality and Hydrology	Are the works located within or adjacent to a waterbody or wetland, or within 40m of a waterway? Yes ☒ No ☐

	Works are located within 10m of Larool Creek, a 1st order stream. Receiving waters flow via Waitara Creek and then Berowra Creek to Hawkesbury River. It is highly likely that groundwater as well as surface water run off move through the sites in the same direction as surface waters. **If yes, the NSW DPI Water or DPI Fisheries should be notified. Have they been notified? NA** Works occur in an area mapped as key fish habitat. Yes ☐ No ☒ **The proposed works (diversion weir) will obstruct fish passage on Larool Creek and will require materials to be removed (concrete pillow retaining wall) and placed into (CDS unit, concrete retaining walls, inlet and outlet structures, etc) water land, or directly into the creek channel (concrete filled pool). A Part 7 Permit from NSW Fisheries is required for this project.** Is the location known to flood or be prone to water logging? Yes ☐ No ☒ If yes, provide details: Works are located within the Hawkesbury soil landscape. Soils in this landscape are predominantly sandy and prone to erosion but not typically prone to waterlogging. The vicinity of proposed works is not mapped as Flood Prone in Hornsby LEP 2012.
Potential Impacts	Does the project pose any potential risk to the surrounding water quality? Yes ☒ No ☐ Disturbance of groundcover, excavation, use of chemicals and generation of waste all have the potential to impact on ground water and surface water runoff. This risk can be minimised through implementation of the following safeguards along with the project Sediment and Erosion Control Plan and adherence to unexpected finds protocols.
Safeguards	• Works are not to be carried out soon after rainfall or when rain is forecast • Wash down of equipment and hand tools should use potable water and must be filtered before release, and away from the waterways. • Prevent sediment moving off-site and sediment laden water entering the waterway • Prevent waste moving outside the works area • Store fuels, and any other chemical and hazardous materials in secure, bunded areas. • Provide spill kits. Capture and dispose of spill and contaminated materials at a licensed facility.

6.5 Biodiversity

Issue	Description
Biodiversity	Have relevant database searches been carried out? • NSW Bionet • Threatened species profile search (www.environment.nsw.gov.au/threatenedspeciesapp/) • Commonwealth EPBC • Fisheries? Yes ☒ No ☐ Date searches undertaken: 22nd July 2024 Are the proposed works likely to impact on any vegetation including native shrubs, trees? Yes ☒ No ☐ Searches of several databases were made to identify threatened species and Endangered Ecological Communities (EECs) that may potentially be found on the subject site. Databases were accessed on 22nd July and 2nd August 2024. These included: • NSW Wildlife Atlas (www.bionet.nsw.gov.au/), • EPBC Act database (www.environment.gov.au/erin/ert/epbc/index.html). **Survey results** Flora and fauna species present, vegetation type and quality, and special features and values were identified and recorded during the site inspection on the 24th of July 2024. The areas of proposed works consisted of mown lawn or regenerating native vegetation. Banks were predominantly vegetated with introduced grasses. A total of 23 native flora species were recorded (Table 4) and 5 introduced species (Table 5).

Table 4 Native flora species recorded on the site of proposed works, Derribong Place

SPECIES NAME	COMMON NAME	PLANT FORM
Acacia decurrens	Sydney Green Wattle	shrub
Angophora subvelutina	Broad-leaved Apple	tree
Brachychiton acerifolius	Illawarra Flame Tree	tree
Bursaria spinosa	Blackthorn	shrub
Callistemon citrinus	Crimson Bottlebrush	shrub
Commelina cyanea	Scurvy Weed	forb
Cyathea australis	Rough Tree Fern	fern
Dichondra repens	Kidney Weed	forb
Eucalyptus globoidea	White Stringybark	tree
Ficus coronata	Sandpaper Fig	shrub
Glycine microphylla	Lesser Lovecreeper	vine
Indigofera australis	Austral Indigo	shrub
Kennedia rubicunda	Dusky Coral Pea	vine
Leptospermum morrisonii		shrub
Livistona australis	Cabbage Palm	tree

Lomandra longifolia	Spiny Mat-rush	forb
Lomatia silaifolia	Crinkle Bush	shrub
Microlaena stipoides	Weeping Meadow Grass	grass
Oplismenus aemulus	Basket Grass	grass
Pimelea linifolia	Riceflower	shrub
Pteridium esculentum	Harsh Bracken	fern
Sigesbeckia orientalis	Indian Weed	forb
Themeda triandra	Kangaroo Grass	grass

Table 5 Introduced flora species recorded on the site of proposed works, Derribong Place

SPECIES NAME	COMMON NAME	CONTROL PRIORITY
Cardamine hirsuta	Common Bittercress	
Ehrharta erecta	Ehrharta, Panic Veldt Grass	
Erigeron karvinskianus	Seaside Daisy	
Oxalis pes-caprae	Soursob	
Stenotaphrum secundatum	Buffalo Grass	

Site description

Upstream of the proposed GPT site, Larool Creek is a partially modified stream with a concrete pillow retaining wall on the eastern bank and regenerating native vegetation on the western side (Figure 10). While this is predominantly remnant vegetation it has been extensively weeded and the weeds replaced with native plantings. The result is a stream with overhanging vegetation providing good shade to the channel and stream flows.

The downstream environment has a continuation of the retaining wall directing flows towards a concrete culvert under Derribong Place (Figure 11). The stream bed is largely bedrock constrained with rock benching and shallow pools. The creek has a row of wooden poles across the channel that are designed to trap large woody debris that has washed down the creek (Figure 12). There is an informal access ramp from the western bank that is used for cleaning (Figure 13). This ramp runs beside the Sydney Water sewer pit that is adjacent to the point where the proposed diversion weir will key into the bank.

Figure 10 The upstream environment has concrete pillow retaining wall and overhanging native vegetation

Figure 11 Downstream, the creek drains under Derribong Place via a concrete culvert

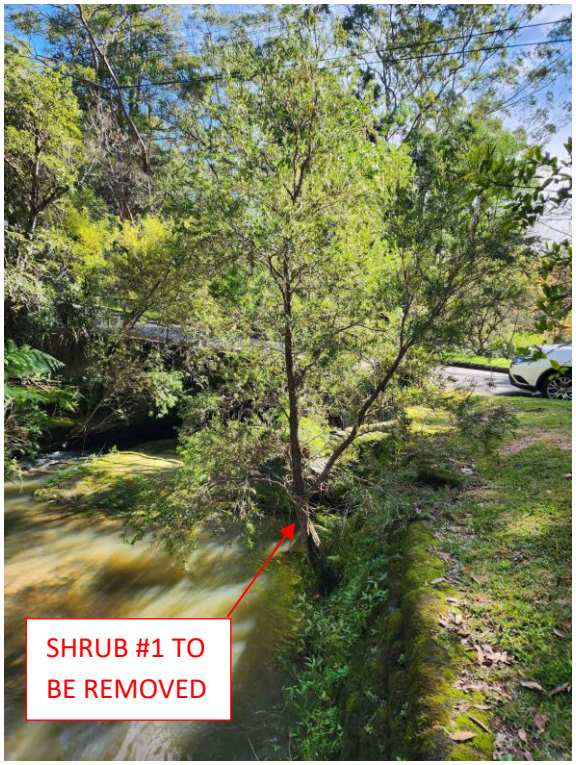
Figure 12 A row of wooden poles across the creek bed acts as a large woody debris trap

Figure 13 The woody debris is cleared from the western bank via an access point near the sewer pit

Figure 14 The site requires some clearing of native shrubs and groundcovers

The actual site of the proposed GPT will require removal of some mown lawn grasses, and some native shrubs and groundcovers (Figure 14). Three trees or large shrubs have been identified as requiring removal for the project (Figure 15), including:

1) *Callistemon citrinus* – Crimson Bottlebrush
2) *Ficus coronata* – Sandpaper Fig
3) *Leptospermum morrisoni* – a teatree



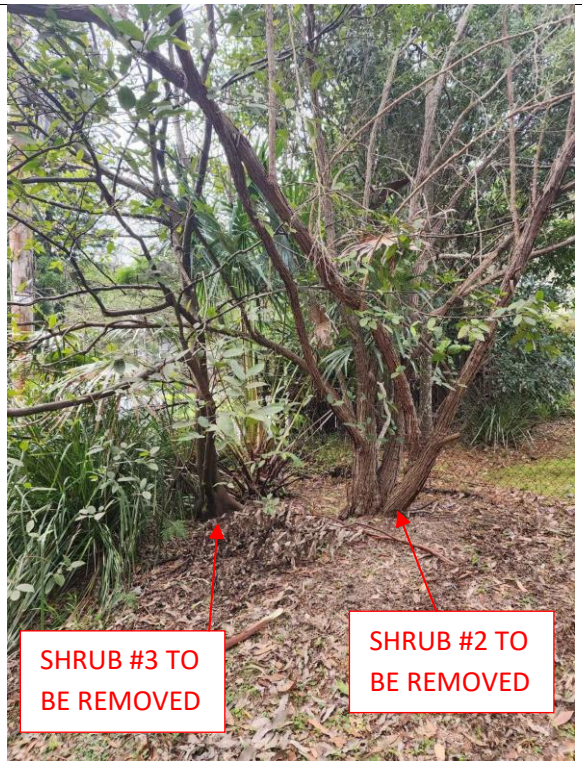


Figure 15 Trees to be removed

VEGETATION MAPPING

Vegetation mapping has been developed for the vicinity by © State Government of NSW and Department of Planning and Environment 2022 State vegetation Type Map OEH, 2022 (Section 12.3). There are two Plant Community Types (PCTs) mapped in the vicinity of the works:

- PCT 3592 Sydney Coastal Enriched Sandstone Forest, adjacent to the site
- PCT 3621 Sydney Hinterland Turpentine-Apple Gully Forest, directly downstream

Neither of these are associated with any Threatened Ecological Community.

FAUNA

A variety of birds were observed in the general area but none in the area of the proposed works. Birds observed in the general area included Australian Ravens, Australian Magpies, Little Corellas, Sulphur-crested Cockatoos, Australian White Ibis and Common Mynas.

Habitat value

The area of regenerating bushland that will be affected is small and located in a narrow section of the riparian reserve. The width of the riparian corridor varies from less than 40m to less than 50m for most of its length in the urban area, including from the industrial area at the top of the ridge to Berowra Regional Park around 650m downstream. The creek is currently subject to sewage overflows, evidenced by exclusion flagging tape, signage and discoloration of the creek water (Figure 16). This reduces the habitat value of the stream and the adjacent riparian areas, especially for birds and animals that need to drink regularly. At best it serves as buffer habitat to the much larger bushland patch centred on Waitara Creek

approximately 300m east. Several larger trees and stags are located nearby but adjoining neighbouring residences and are of moderate habitat value.

Figure 16 Exclusion tape, signage and discoloration of the water indicate sewer overflows

Do the proposed works involve pruning, trimming or removal of any tree/s?

Yes ☒ No ☐

If yes, provide details: **Three large shrubs/small trees will be removed, along with several native groundcovers and an area of introduced turfed lawn**

Will the proposed works affect any tree hollows or hollow logs?

Yes ☐ No ☒

If yes, provide details: **Not applicable**

Will the proposed works disturb any crevices or other locations (such as on bridges and culverts) for potential bat habitat?

Yes ☐ No ☒

If yes, provide details: **Not applicable**

Are there any known areas of Areas of Outstanding Biodiversity Value (formerly known as critical habitat), Directory of Important Wetlands in Australia within the vicinity of the proposed works?

Yes ☐ No ☒

If yes, provide details: **Not applicable**

	Will the proposed works disturb any natural waterways or aquatic habitat? Yes ☒ No ☐ If yes, provide details: an area of channel bed approximately 1-1.5m and up to 3 metres in length would be disturbed to allow construction of the diversion weir, and approximately 3m x 3m for the GPT, with a total site footprint of approximately 250m2. **Do any trees to be removed form part of a streetscape, an avenue or roadside planting?** Yes ☐ No ☒ If yes, provide details: **Not applicable** **Have the trees been planted by a community group, Landcare group or by council or is the tree a memorial or part of a memorial group eg. has a plaque?** Yes ☒ No ☐ If yes, provide details: **There are new plantings that are likely to be disturbed, planted by Wareemba Rd Bushcare group** **Do the trees form part of a heritage listing or have other heritage value?** Yes ☐ No ☒ If yes, provide details **Not applicable** **Are there any significant weeds present?** Yes ☐ No ☒ If yes, provide details: Very small patches of Blackberry were noted nearby but outside the area of proposed works.
Potential Impacts	Does the project pose any potential risk to the biodiversity within the vicinity of the site? Yes ☒ No ☐ If yes, describe the potential impacts: • Importation of pathogens to the site on plant and equipment • Mobilisation of sediment to receiving waters during construction

Safeguards	<u>General considerations</u> • Use the smallest possible machinery to undertake works safely and efficiently • Should unexpected threatened fauna be located at any time during construction, cease work immediately in the area to prevent further harm to

	the individual. Contact Council's Environmental Officer or a suitably qualified ecologist to determine if further assessment or management plans are required. • Use adjoining open space for all storage of materials, stockpiling, plant and equipment. • Do not store materials or park vehicles/machinery within the driplines of trees. • If any damage occurs to vegetation outside of the boundaries of the works area as a result of the implementation of the proposal, the Project Manager will be notified and will establish strategies for mitigation of impacts and site restoration. <u>Pre-clearing</u> • Clearly delineate the extent of works and locations of stockpile areas and works compounds <u>Invasion of Exotic Species and pathogens</u>: • Construction machinery and equipment should be washed prior to entering and leaving site to ensure weed propagules are not transported. <u>Site Restoration:</u> ▪ The rehabilitation of any disturbed areas on the banks (if any) would be carried out as soon as practicably possible. ▪ Exposed soils will be vulnerable to erosion – recommend seeding turfing if required ▪ The rehabilitation of disturbed areas would be carried out in accordance with: o Landcom's "Blue Book (4th Edition) on sediment and erosion control

6.6 Aboriginal Heritage

Issue	Description
Aboriginal Heritage	Are the works likely to disturb previously undisturbed areas of the landscape? Yes ☐ No ☒ Has an AHIMS register search been conducted? Yes ☒ No ☐ Are there any known Aboriginal artefacts/sites within the vicinity of the work site? Yes ☐ No ☒ See section 12.8 for AHIMs reports. The CDS unit requires excavation of approximately 2m into an area with predominantly imported soils, and a further 4.2m into bedrock. Natural soils in the vicinity may also be impacted, but not significantly. These soils are likely to be sandy loams. All soils potentially disturbed may include sediments deposited from stormwater and stabilised by the construction of a retaining wall. These

	previous works makes it unlikely that the proposed activity would harm unknown Aboriginal objects. Normal safeguards apply and a permit under the NP&W Act is not required. Would the proposal involve the removal of mature native trees? Yes ☐ No ☒ If yes, provide details of whether the trees have been checked to see if they are scarred or are of Aboriginal cultural significance. N/A
Potential Impacts	Does the project pose any potential risk to Aboriginal heritage? Yes ☐ No ☒  **Figure 17 Results of AHIMs Extensive Search, August 2024 (subject site marked in red)** If yes, provide details: **There is a minor risk of unexpected finds.**
Safeguards	• Provide printed photographic examples of local Aboriginal artefacts to all staff, new staff and any contractors. • Ensure all staff on site are aware of the stop work procedure if potential Aboriginal objects are found. • Address both matters in site inductions and toolbox talks before commencing works. • If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Project Manager contacted immediately, and the Standard Management Procedure - Unexpected Heritage Items (RMS, 2015) followed. • In the very unlikely event that human remains, or suspected human remains, are uncovered during the development, then works in that area are to stop and the area is to be cordoned off. The Project Manager is to contact the

	NSW Police to establish whether the area is a crime scene. If it is not a crime scene, then Heritage NSW is to be notified via the Environment Line on 131 555 and management measures are to be devised in consultation with the local Aboriginal community. Works are not to recommence in the area until the management measures have been implemented.

6.7 Non-Aboriginal Heritage

Issue	Description
Non-Aboriginal Heritage	Complete online heritage database searches • NSW Heritage database • Commonwealth EPBC heritage list • Australian Heritage Places Inventory • Local Environmental Plan(s) heritage items Are there any items of Non-Aboriginal heritage located within the vicinity of the proposed works? Yes ☐ No ☒ If yes, list the item(s) and their heritage significance. Not applicable
Potential Impacts	Does the project pose any potential risk to Non-Aboriginal heritage? Yes ☐ No ☒ If yes, provide details: Not applicable.
Safeguards	• If heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Project Manager contacted immediately

6.8 Noise and vibration

Issue	Description
Noise and vibration	**Are there any noise sensitive areas near the location of the proposed works that may be affected by the works (i.e. church, school, hospital, residences)?** **During construction?** Yes ☒ No ☐ During Operation? Yes ☒ No ☐ If yes, provide details: Yes – sensitive receivers (residential dwellings) are located within 20m of the site

	Are the proposed works going to be undertaken during standard working hours detailed below? Yes ☒ No ☐ Standard working hours Monday – Friday 7:00am to 6:00pm Saturday 8:00am to 1:00pm Sunday and Public Holidays No work **Would operation of the proposal alter the noise environment for sensitive receivers?** If yes, provide details: Yes – during minor disturbances during periodic maintenance and cleaning activities, likely to be similar to those currently undertaken to clean the woody debris trap.
Potential Impacts	Does the project pose any potential risk to the surrounding noise quality? Yes ☒ No ☐ If yes, provide details: Noise impacts would be temporary during construction and during periodic cleaning and maintenance of the GPTs
Safeguards	Signage: • Install signage informing the local residents of the proposed construction works and their duration. Standard Hours of Operation for construction and maintenance activities: • Works to be carried out during normal work hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays).

6.9 Air quality

Issue	Description
Air quality	Are the proposed works likely to result in large areas (>2ha) of exposed soils? Yes ☐ No ☒ Are there any dust sensitive receivers located within the vicinity of the proposed works during the construction period (i.e. church, school, hospital, residences)? Yes ☒ No ☐ Is there likely to be an emission to air of dust, smoke, steam or vehicle emissions? Yes ☒ No ☐
Potential Impacts	Does the project pose any potential risk to the surrounding air quality? Yes ☒ No ☐

	If yes, provide details: Emissions from plant and machinery; dust may be generated by the proposed works and may impact nearby sensitive receivers
Safeguards	• Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely • Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation • Vehicles and equipment are to be maintained in good working order. • Monitor work areas and stockpiles for dust generation and seed/cover/spray to suppress. • Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust • Do not leave vehicles idling

6.10 Waste and Chemical Management

Issue	Description
Waste and Chemical Management	Are the proposed works likely to generate >200 tonnes of waste material (contaminated and /or non-contaminated material)? Yes ☐ No ☒ Are the proposed works likely to require a licence from EPA? Yes ☐ No ☒ Is waste being transported off site to another location*? Yes ☒ No ☐ * Note that if waste soils are generated then normal safeguards apply Approximately 100m3 of waste soils are likely to be generated from this activity. Soils will be classified on site before reuse or disposal off site. Does the project pose any potential risk to the surrounding environment as a result of waste generated? Yes ☐ No ☒ If YES to any of these items, you need to prepare a Waste Management Plan
Potential Impacts	Describe the potential impacts: Incorrect disposal of waste

Safeguards	• All surplus material, soils and any other debris resulting from the work shall be removed from site and disposed of by a licensed contractor to a licensed waste management facility. • Waste material is not to be left on site once the works have been completed. • Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.

6.11 Traffic and transport

Issue	Description
Traffic and transport	Are the proposed works likely to result in detours, disruptions or delays to traffic flow (vehicular, cycle and pedestrian) or access to properties or businesses? During construction Yes ☒ No ☐ During Operation Yes ☒ No ☐ Are the proposed works likely to affect any other transport nodes or transport infrastructure (eg bus stops, bus routes) in the surrounding area? Result in detours or disruptions to traffic flow (vehicular, cycle and pedestrian) or access during operation? Yes ☐ No ☒
Potential Impacts	Pedestrian access along the creek bank may be disrupted during construction. Some parking on adjacent roads may be limited by work vehicles and other machinery. Pedestrian access along waterways and parking in adjacent areas may be disrupted during periodic cleaning of the GPTs.
Safeguards	• Comply with Council requirements regarding traffic control, access and road access. • Install signage indicating duration of works

6.12 Visual Amenity/ Landscape

Issue	Description
Visual Amenity/ Landscape	Will the project have any potential impact on visual amenity of the site and surrounding landscape? Yes ☒ No ☐ **If yes, provide details:** Construction impacts are temporary. The GPT, weir wall, concrete filling into the channel and the new section of retaining wall would be permanently visible from top of banks.
Potential Impacts	**Describe the potential impacts:** Plant and equipment near the channels, staff vehicles, waste during construction (negative – minor impact). During the operation phase the GPT would be visible (very minor impact)

Safeguards	• Contain all work within the boundaries designated on the site plan • Restore work sites to as close to their original condition as possible • Minimise spread of stockpiles, waste, and parking • Ensure disturbed soils are stabilised returfed or seeded.

6.13 Socio-economic

Issue	Description
Socio-economic	**Are the proposed works likely to impact on local business?** Yes ☐ No ☒ **Are the proposed works likely to alter any access for properties (either temporarily or permanently)?** Yes ☐ No ☒ **Are the proposed works likely to impact on any items or places of social value to the community (either temporarily or permanently)?** Yes ☒ No ☐ **Are the proposed works likely to reduce or change visibility of any businesses, farms, tourist attractions or the like (either temporarily or permanently)?** Yes ☐ No ☒
Potential Impacts	Does the project pose any potential risk to the socio-economic factors? Yes ☐ No ☒
Safeguards	• Install signage informing the community of the proposed works and their duration. • Contain all work within the boundaries designated on the site plan • Restore work sites • Notify the project manager immediately of any complaints or any accidental damage to property • All staff will exercise courtesy in dealing with the community

7 Summary

7.1 Summary of impacts

Summarise the impacts and consider the cumulative impacts of the activity based on the classification of individual impacts as low, medium or high adverse, negligible or positive.

Table 6 Summary of impacts

Category of impact	**Significance of impacts**		
	Extent of impact	**Nature of impact**	**Environmentally sensitive features**

Physical and chemical	Low	Sediments mobilised	Receiving waters
Biological	Negligible	Removal of 3 large shrubs, several groundcover species, introduced lawn grasses	Nil
Natural resources	Low	Materials for construction and transport	Greenhouse gas emissions-materials and transport
Community	Minor impacts during construction Negligible once completed	May impact revegetation planting undertaken by Wareemba Rd Bushcare group during construction Noise, visual amenity, disruption during construction and operational phase - GPT cleaning	Community assets (Bushcare plantings)
Cultural heritage	NA/Negligible	NA	NA

7.2 Summary of safeguards

The following table provides a summary of environmental safeguards to be implemented at a minimum for the project CEMP.

General considerations	• Use the smallest possible machinery to undertake works safely and efficiently • Should unexpected threatened fauna be located at any time during construction, cease work immediately in the area to prevent further harm to the individual. Contact Council's Environmental Officer or a suitably qualified ecologist to determine if further assessment or management plans are required. • Use adjoining open space for all storage of materials, stockpiling, plant and equipment. • Do not store materials or park vehicles/machinery within the driplines of trees. • If any damage occurs to vegetation outside of the boundaries of the works area as a result of the implementation of the proposal, the Project Manager will be notified and will establish strategies for mitigation of impacts and site restoration. • Clearly delineate the extent of works and locations of stockpile areas and works compounds
Landform, geology and soils	• See also section 6.3 for treatment of site soils • A Construction Environment Management Plan (CEMP) is to be prepared prior to any construction works commencing. The CEMP should include relevant safeguards including unexpected finds protocols (Section 12.5) and REF Environmental Safeguards and Mitigation Measures.

	• Site management will incorporate best management erosion and sediment control practices such as those found in the Landcom's "Blue Book (4th Edition) on erosion and sediment control. • The rehabilitation of disturbed areas will be carried out immediately
Biosecurity	• Thoroughly clean vehicles and equipment to remove all adhering soil or plant debris before moving between different work sites and within this site. Ensure all imported material is from areas free of pathogens such as *Phytophthora cinnamomi* and Myrtle rust[2]
Contaminated Land and Acid Sulfate Soils	• Undertake in situ waste classification before reuse on site or disposal off site, noting that this is likely to be more than 100m3 in total, of which around two thirds is likely to be VENM • If other contaminated areas are encountered during activities appropriate control measures will be implemented to manage the immediate risks of contamination. All other works that may impact on the contaminated area will cease until the nature and extent of the contamination has been confirmed and any necessary site-specific controls or further actions identified in consultation with relevant government agencies.
Water Quality and Hydrology	• Works are not to be carried out soon after rainfall or when rain is forecast • Wash down of equipment and hand tools should use potable water and must be filtered before release, and away from the waterways. • Prevent sediment moving off-site and sediment laden water entering the waterway • Prevent waste moving outside the works area • Store fuels, and any other chemical and hazardous materials in secure, bunded areas. • Provide spill kits. Capture and dispose of spill and contaminated materials at a licensed facility.
Biodiversity	<u>Invasion of Exotic Species and pathogens</u>: • Construction machinery and equipment should be washed prior to entering and leaving site to ensure weed propagules are not transported.

[2] ***Phytophthora cinnamomi*** **'s** growth, reproduction and spread is favoured by free water in the soil or ponding on the water surface. Consequently, the movement of infested water and soil play a key role in the spread of this pathogen, and in contrast to other pathogens of natural ecosystems, human activity has played a significant role in the spread *of P. cinnamomi* in infested soil (http://www.cpsm.murdoch.edu.au). In NSW, strong evidence of *Phytophthora cinnamomi*-induced dieback has been identified in forest, woodland and heathland vegetation. Myrtle rust *Uredo rangelii* produces a multitude of spores in the pustules. These may be carried to new host plants by wind, water splash, by insects such as bees (which may work on the spores on infected leaves), on equipment, or on clothing. The rust spores can be carried long distances by wind. Rust diseases can also spread through cuttings, plants and cut stems from infected plants. The fungus can also survive on stock plants. Spores can survive for up to 3 months in the environment and on crop trash, if conditions are favourable.

	<u>Site Restoration:</u>
	• The rehabilitation of any disturbed areas on the banks (if any) would be carried out as soon as practicably possible.
	• Exposed soils will be vulnerable to erosion – recommend seeding turfing if required
	• The rehabilitation of disturbed areas would be carried out in accordance with
	  ○ Landcom's "Blue Book (4th Edition) on sediment and erosion control
	  ○ Use appropriate local native species found in the vicinity and/or the extant PCT

Aboriginal Heritage	• Provide printed photographic examples of local Aboriginal artefacts to all staff, new staff and any contractors. • Ensure all staff on site are aware of the stop work procedure if potential Aboriginal objects are found. • Address both matters in site inductions and toolbox talks before commencing works. • If Aboriginal heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Project Manager contacted immediately, and the Standard Management Procedure - Unexpected Heritage Items (RMS, 2015) followed. • In the very unlikely event that human remains, or suspected human remains, are uncovered during the development, then works in that area are to stop and the area is to be cordoned off. The Project Manager is to contact the NSW Police to establish whether the area is a crime scene. If it is not a crime scene, then Heritage NSW is to be notified via the Environment Line on 131 555 and management measures are to be devised in consultation with the local Aboriginal community. Works are not to recommence in the area until the management measures have been implemented.
Non-Aboriginal Heritage	• If heritage items are uncovered during the works, all works in the vicinity of the find must cease and the Project Manager contacted immediately
Noise and vibration	Signage: • Install signage informing the local residents of the proposed construction works and their duration. Standard Hours of Operation for construction and maintenance activities: • Works to be carried out during normal work hours (i.e. 7am to 6pm Monday to Friday; 8am to 1pm Saturdays).
Air quality	• Works are not to be carried out during strong winds or in weather conditions where high levels of dust or air borne particulates are likely • Vehicles and vessels transporting waste or other materials that may produce odours or dust are to be covered during transportation • Vehicles and equipment are to be maintained in good working order. • Monitor work areas and stockpiles for dust generation and seed/cover/spray to suppress.

	• Measures (including watering or covering exposed areas) are to be used to minimise or prevent air pollution and dust • Do not leave vehicles idling
Waste and Chemical Management	• All surplus material, soils and any other debris resulting from the work shall be removed from site and disposed of by a licensed contractor to a licensed waste management facility. • Waste material is not to be left on site once the works have been completed. • Working areas are to be maintained, kept free of rubbish and cleaned up at the end of each working day.
Traffic and transport	• Comply with Council requirements regarding traffic control, access and road access. • Install signage indicating duration of works
Visual Amenity/ Landscape	• Contain all work within the boundaries designated on the site plan • Restore work sites to as close to their original condition as possible • Minimise spread of stockpiles, waste, and parking • Ensure disturbed soils are stabilised returfed or seeded.
Socio-economic	• Install signage informing the community of the proposed works and their duration. • Contain all work within the boundaries designated on the site plan • Restore work sites • Notify the project manager immediately of any complaints or any accidental damage to property • All staff will exercise courtesy in dealing with the community

8 Certification, Review and Decision

This Review of Environmental Factors provides a true and fair review of the proposal in relation to its potential 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 proposal. It identifies the likely impacts of the proposal on the environment and details the environmental safeguards and mitigation measures to be implemented to minimise the potential impact to the environment. In light of the above assessment of the proposed activity, it is considered that the overall impact on the environment is likely to be minor during construction and therefore acceptable. There are lo ng-term positive environmental benefits of the activity through the removal of gross pollutants f rom stormwater ultimately entering Berowra Creek and then the Hawkesbury River, therefore th e activities should proceed accordingly.

Any changes to design, or exposure of currently unknown risks must be assessed by an addendum to this REF once approved by Council.

REF Author

Signature:

Name: MEREDITH BRAINWOOD

Title: DOCTOR

Date: 10/8/2024

Reviewed and endorsed by:

Signature:

Name: ANNE CAREY

Date: 10/8/2024

8.1 Decision Statement

To be completed by authorised person on behalf of the determining authority.

Based on the REF document, other information and any advice from other relevant determining authorities:

- The proposed activity is ☐ is not ☑ likely to have a significant impact on the environment and therefore an EIS is ☐ is not ☑ required
- the proposed activity will ☐ will not ☑ be carried out in a declared area of outstanding biodiversity value and is ☐ is not ☑ likely to significantly affect threatened species, populations or ecological communities, or their habitats or impact biodiversity values, meaning a SIS and/or BDAR is ☐ is not ☑ required
- mitigation measures are ☑ are not ☐ required to eliminate, minimise or manage environmental impacts
- the proposed activity may proceed

Reasons for the decision and any additional information

Endorsed by: Dr Peter Coad

Signature: 

Name: Dr Peter Coad

Title: Branch Manager Environment

Date: 21/10/24

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10 APPENDIX A - ASSESSMENT OF SIGNIFICANCE

10.1 ASSESSMENT OF SIGNIFICANCE (NSW BC ACT 2016)

The assessment of significance must be completed when a threatened species may be impacted in accordance with the requirements of section 1.7 of the *Environmental Planning and Assessment Act 1979:* the Assessment of Significance under Section 7.3 the *Biodiversity Conservation Act* 2016 and the Federal *Environmental Protection and Biodiversity Conservation Act 1999.*

The area was assessed according to the impact of the proposed works on habitat and potential habitat for threatened species that may or are likely to utilise the subject site and study area.

Assessment of Significance (NSW BC Act 2016)

As per section 7.3 the *Biodiversity Conservation Act 2016*, the following factors must be taken into account when making a determination of an activity or development:

a. in the case of a threatened species, whether the proposed development or activity is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

b. in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity:

    i. is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

    ii. is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

c. in relation to the habitat of a threatened species, population or ecological community:

    i. the extent to which habitat is likely to be removed or modified as a result of the action propose, and

    ii. whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

    iii. the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

d. whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),

e. whether the proposed development or activity constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The following threatened species have been recorded within 1km of the subject site and are assessed for potential impacts (Table 6, see **Error! Reference source not found.**).

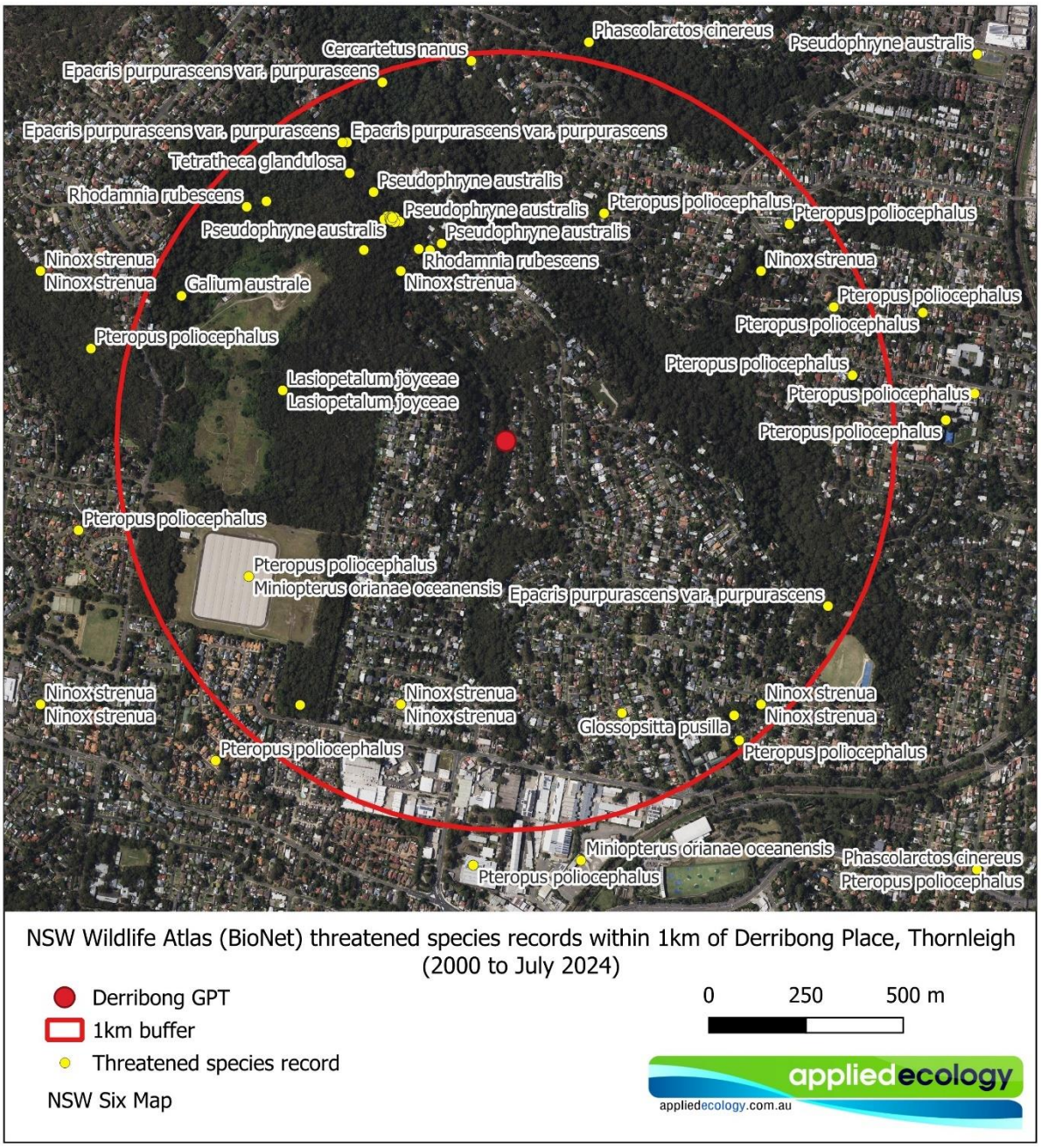


Figure 18 Threatened species records within 1km of the subject site (BioNet 2000- August 2024)

Table 7 Threatened species records within 1km of the subject site (BioNet 2000- August 2024)

Class	Scientific Name	Common Name	NSW status	Comm. Status	Habitat on site?	Records within 5km	Records within 1km
Amphibia	*Pseudophryne australis*	Red-crowned Toadlet	V,P		marginal	148	20
Aves	*Glossopsitta pusilla*	Little Lorikeet	V,P		marginal	8	1
Aves	*Lophoictinia isura*	Square-tailed Kite	V,P,3		foraging	16	1
Aves	*Ninox strenua*	Powerful Owl	V,P,3		foraging	693	31
Flora	*Epacris purpurascens var. purpurascens*		V		yes	113	8
Flora	*Galium australe*	Tangled Bedstraw	E1		yes	5	3

Class	Scientific Name	Common Name	NSW status	Comm. Status	Habitat on site?	Records within 5km	Records within 1km
Flora	*Grammitis stenophylla*	Narrow-leaf Finger Fern	E1,3		marginal	6	1
Flora	*Lasiopetalum joyceae*		V	V	no	2	2
Flora	*Rhodamnia rubescens*	Scrub Turpentine	E4A	CE	yes	6	2
Flora	*Syzygium paniculatum*	Magenta Lilly Pilly	E1	V	yes	16	1
Flora	*Tetratheca glandulosa*		V		marginal	123	1
Mammalia	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P		foraging	145	1
Mammalia	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	foraging	214	7

10.1.1 Flora

No threatened flora species are recorded on or in the immediate vicinity of the site and none were observed during the site inspections. Seven threatened flora species have been recorded within 1km of the site:

1) *Epacris purpurascens var. purpurascens* – a small shrub
2) *Galium australe* – a sprawling forb
3) *Grammitis stenophylla* – a small fern
4) *Lasiopetalum joyceae* – a small shrub
5) *Rhodamnia rubescens* – a large shrub
6) *Syzygium paniculatum* – a large shrub/small tree
7) *Tetratheca glandulosa* – a large forb or subshrub

(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,

None of these threatened flora species were recorded on site, and none have been recorded on Larool Creek. The proposed development or activity is not 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.

(c) in relation to the habitat of a threatened species or ecological community—

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

There are minimal to moderate habitat resources on site for these species. Any changes will be minor and some may be temporary. Minimal habitat is likely to be removed or modified, therefore there will be no increase in fragmentation and isolation of habitat, and no additional impacts to the long-term survival of these species.

10.1.2 Fauna

A total of 6 threatened fauna species have been recorded within 1km of the proposed development site. Fauna species have been grouped for assessment where there are similarities in behaviours or potential use of the site.

10.1.2.1 Birds

Highly mobile species:

1) **Little Lorikeet (*Glossopsitta pusilla*)**
   NSW status: Vulnerable
   Comm. Status: not listed
   BioNet records < 1km: 1
2) **Square-tailed Kite (*Lophoictinia isura*)**
   NSW status: Vulnerable
   Comm. Status: not listed
   BioNet records < 1km: 1
3) **Powerful Owl (*Ninox strenua*)**
   NSW status: Vulnerable
   Comm. Status: not listed
   BioNet records < 1km: 31

(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 three species of birds listed above are all highly mobile, and would have moderate foraging resources on the subject site, but limited, if any, nesting or roosting opportunities on site. Therefore, the proposed development or activity is not likely to have an adverse effect on the life cycle of these species such that a viable local population of the species is likely to be placed at risk of extinction.

(c) in relation to the habitat of a threatened species or ecological community—

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

There are moderate habitat resources on site for these three species. Any changes will be very minor and temporary, for example, increased noise and movement during construction may impact overfly behaviours on a temporary basis. Minimal habitat is likely to be removed or modified, therefore there will be no increase in fragmentation and isolation of habitat, and no additional impacts to the long-term survival of these species.

10.1.2.2 Mammals

1) **Large Bent-winged Bat (*Miniopterus orianae oceanensis*)**
   NSW status: Vulnerable
   Comm. Status: not listed
   BioNet records < 1km: 1

1) **Grey-headed Flying-fox (*Pteropus poliocephalus*)**

NSW status: Vulnerable
Comm. Status: Vulnerable
BioNet records < 1km: 7

(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 two species listed above are highly mobile, and would use the site for foraging. Roosting opportunities are likely to be limited and competitive for occupancy, and there are better and more plentiful habitat resources in bushland reserves nearby. Therefore, the proposed development or activity is not likely to have an adverse effect on the life cycle of these species such that a viable local population of the species is likely to be placed at risk of extinction.

(c) in relation to the habitat of a threatened species or ecological community—

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

There are moderate habitat resources on site for these two species. Any changes will be very minor and temporary, for example, increased noise and movement during construction may impact foraging behaviours on a temporary basis. Therefore, no habitat is likely to be removed or modified, there will be no increase in fragmentation and isolation of habitat, and no additional impacts to the long-term survival of these species.

10.1.3 Gastropoda

There are no threatened snails reported as potentially present in the vicinity of proposed works.

It is therefore considered that the proposed works will not have an adverse effect on the life cycle of any threatened species of gastropod such that a viable local population of the species is likely to be placed at risk of extinction.

10.1.4 Reptilia

No threatened reptile species are reported for the area of proposed works or in the immediate vicinity on the subject site. There is no suitable habitat for threatened reptiles on or in the immediate vicinity of the subject site.

It is therefore considered that the proposed works will not have an adverse effect on the life cycle of any threatened species of reptile such that a viable local population is likely to be placed at risk of extinction.

10.1.5 Amphibia

One threatened frog species are reported for the area of proposed works or in the immediate vicinity on the subject site. There is no suitable habitat for threatened reptiles on or in the immediate vicinity of the subject site.

1) *Pseudophryne australis* – Red-crowned Toadlet
   NSW status: Vulnerable
   Comm. Status: not listed
   BioNet records < 1km: 20

Occurs in open forests, mostly on Hawkesbury and Narrabeen Sandstones.

Inhabits periodically wet drainage lines below sandstone ridges that often have shale lenses or cappings.

Shelters under rocks and amongst masses of dense vegetation or thick piles of leaf litter.

Breeding congregations occur in dense vegetation and debris beside ephemeral creeks and gutters. Red-crowned Toadlets have not been recorded breeding in waters that are even mildly polluted or with a pH outside the range 5.5 to 6.5.

(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,

Given the quality of stormwater observed and anecdotally reported for the site, this species is highly unlikely to occur in the Larool Creek catchment. However, there is some potential that it may occupy the areas of dense vegetation and debris observed upstream and downstream from the works area.

Overall, the proposed development or activity is not likely to have an adverse effect on the life cycle of these species such that a viable local population of the species is likely to be placed at risk of extinction.

(c) in relation to the habitat of a threatened species or ecological community—

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

There are very degraded habitat resources on site for this species. Any changes will be relatively minor. No habitat is likely to be removed or modified, there will be no increase in fragmentation and isolation of habitat, and no additional impacts to the long-term survival of these species.

10.1.6 Insecta

No threatened insect species are reported are reported for the area of proposed works or in the immediate vicinity on the subject site. There is no suitable habitat for threatened invertebrates on or in the immediate vicinity of the subject site.

It is therefore considered that the proposed works will not have an adverse effect on the life cycle of any threatened species of insect such that a viable local population is likely to be placed at risk of extinction.

10.1.7 Threatened Ecological Communities

No threatened ecological communities listed under the EPBC Act or the Biodiversity Conservation Act occur in the vicinity of the proposed works.

(b) in the case of an endangered ecological community or critically endangered ecological community, whether the proposed development or activity—

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

No TEC was identified on the subject site. The small area of disturbance associated with the proposed works is unlikely to have an adverse effect on the local occurrence of any EEC, nor substantially modify the composition of any EEC such that its local occurrence is likely to be placed at risk of extinction.

(c) in relation to the habitat of a threatened species or ecological community—

(i) the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed development or activity, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species or ecological community in the locality,

No TEC occurs on site, therefore, there will be minimal removal or modification of habitat, with no increase in fragmentation or isolation of habitat as a result of the proposed works.

10.1.8 Other parts of the test

(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),

No Area of Outstanding Biodiversity has been identified on or near the subject site, therefore there will be no impact from the proposed development.

10.1.9 Key Threatening Process

(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.

Of the 39 key threatening processes described in Schedule 4 of the Biodiversity Conservation Act 2016, three are applicable to the proposed works with several others historically operating in the area generally and the area of proposed works. Potential threats arise from the accidental transfer of seed propagules and pathogens from affected areas to unaffected areas carried on cars and trucks, and boots of workers and include:

- Infection of frogs by amphibian chytrid fungus causing the disease chytridiomycosis
- Infection of native plants by *Phytophthora cinnamomi*
- Introduction and establishment of Exotic Rust Fungi

Table 8 BC Act 2016, Schedule 4- Key Threatening Processes Assessment.

KEY THREATENING PROCESS	TYPE OF THREAT	APPLICABLE TO PROPOSED WORKS?
Alteration to the natural flow regimes of rivers and streams and their floodplains and wetlands (as described in the final determination of the Scientific Committee to list the threatening process)	Habitat loss/change	Historic
Bushrock removal (as described in the final determination of the Scientific Committee to list the threatening process)	Habitat loss/change	No
Clearing of native vegetation (as defined and described in the final determination of the Scientific Committee to list the key threatening process)	Habitat loss/change	Historic
Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners, *Manorina melanocephala* (Latham, 1802)	Pest animal	No
Alteration of habitat following subsidence due to longwall mining	Habitat loss/change	No
Competition and grazing by the feral European Rabbit, *Oryctolagus cuniculus (L.)*	Pest animal	Historic
Competition and habitat degradation by Feral Goats, *Capra hircus* Linnaeus 1758	Pest animal	No
Competition from feral honey bees, *Apis mellifera* L.	Pest animal	No
Death or injury to marine species following capture in shark control programs on ocean beaches (as described in the final determination of the Scientific Committee to list the key threatening process)	Other threat	No
Ecological consequences of high frequency fires	Habitat loss/change	No
Entanglement in or ingestion of anthropogenic debris in marine and estuarine environments (as described in the final determination of the Scientific Committee to list the key threatening process)	Other threat	No
Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners	Other threat	No
Habitat degradation and loss by Feral Horses (brumbies, wild horses), Equus caballus Linnaeus 1758	Pest animal	No
Herbivory and environmental degradation caused by feral deer	Pest Animal	No
Human-caused Climate Change	Habitat loss/change	No
Importation of Red Imported Fire Ants *Solenopsis invicta* Buren 1972	Pest animal	No
Infection by Psittacine Circoviral (beak and feather) Disease affecting endangered psittacine species and populations	Disease	No
Infection of frogs by amphibian chytrid causing the disease chytridiomycosis	Disease	Possible
Infection of native plants by *Phytophthora cinnamomi*	Disease	Possible
Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae	Disease	Possible
Introduction of the Large Earth Bumblebee *Bombus terrestris* (L.)	Pest animal	No
Invasion and establishment of exotic vines and scramblers	Weed	No
Invasion and establishment of Scotch Broom (*Cytisus scoparius*)	Weed	No
Invasion and establishment of the Cane Toad (*Bufo marinus*)	Pest animal	No
Invasion of native plant communities by exotic perennial grasses	Weed	Historic
Invasion of native plant communities by bitou bush and boneseed	Weed	No
Invasion of native plant communities by African Olive *Olea europaea* subsp. *cuspidata* (Wall. ex G. Don) Cif.	Weed	No
Invasion of the Yellow Crazy Ant, *Anoplolepis gracilipes* (Fr. Smith) into NSW	Pest animal	No
Invasion, establishment and spread of Lantana (*Lantana camara* L. *sens. lat*)	Weed	No
Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants	Weed	Historic

KEY THREATENING PROCESS	TYPE OF THREAT	APPLICABLE TO PROPOSED WORKS?
Loss of hollow-bearing trees	Habitat loss/change	Historic
Loss and/or degradation (or both) of sites used for hill-topping by butterflies	Habitat loss/change	No
Predation and hybridisation by Feral Dogs, *Canis lupus familiaris*	Pest animal	No
Predation by *Gambusia holbrooki* Girard, 1859 (Plague Minnow or Mosquito Fish) (as described in the final determination of the Scientific Committee to list the threatening process)	Pest animal	No
Predation by the European Red Fox *Vulpes vulpes* (Linnaeus, 1758)	Pest animal	Historic
Predation by the Feral Cat *Felis catus* (Linnaeus, 1758)	Pest animal	Historic
Predation by the Ship Rat *Rattus rattus* on Lord Howe Island	Pest animal	No
Predation, habitat degradation, competition and disease transmission by Feral Pigs, *Sus scrofa* Linnaeus 1758	Pest animal	No
Removal of dead wood and dead trees	Habitat loss/change	Historic

10.2 ASSESSMENT OF SIGNIFICANCE (FISHERIES MANAGEMENT ACT 1994)

The assessment of significance must be completed when a threatened species may be impacted in accordance with the requirements of section 220ZZ.

Matters to be assessed are:

(a) in the case of a threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction,

(b) in the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction,

(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed—

(i) is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or

(ii) is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction,

(d) in relation to the habitat of a threatened species, population or ecological community—

(i) the extent to which habitat is likely to be removed or modified as a result of the action proposed, and

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and

(iii) the importance of the habitat to be removed, modified, fragmented or isolated to the long-term survival of the species, population or ecological community in the locality,

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

(g) whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

Endangered species – No endangered species listed under the Fisheries Management Act are reported for the subject site

Vulnerable Species - No vulnerable species listed under the Fisheries Management Act are reported for the subject site

Endangered population **-** No endangered populations listed under the Fisheries Management Act are reported for the subject site

10.3 ASSESSMENT OF SIGNIFICANCE (COMMONWEALTH EPBC ACT 1999)

10.3.1 General assessment overview

The provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) require determination of whether the proposal has, will or is likely to have a significant impact on a "matter of national environmental significance". These matters are listed and addressed in summary as follows:

1) **World Heritage Properties**: The site is not listed as a World Heritage area nor does the proposal affect any such area.

2) **National Heritage Places**: The site is not listed as a National Heritage Place nor does the proposal affect any such area.

3) **Ramsar Wetlands of International Significance**: A Ramsar wetland does not occur on the site, nor does the proposal affect a Ramsar Wetland.

4) **EPBC Act listed Threatened Species and Communities**: No threatened species or communities are likely to be significantly affected by the proposal as assessed below.

5) **Migratory Species Protected under International Agreements**: No Migratory species is likely to be significantly affected by the proposal.

6) **The Commonwealth Marine Environment (CME)**: The site is not within the CME nor does it affect such

7) **The Great Barrier Reef Marine Park:** The proposal does not affect the Great Barrier Reef Marine Park.

8) **Nuclear Actions**: The proposal is not a nuclear action.

9) **A water resource, in relation to coal seam gas development and large coal mining development:** The proposal is not a mining development.

It is considered that the proposal does not require referral to the Department of Agriculture, Water and the Environment (DAWE) for approval under the *EPBC Act 1999*.

10.3.2 Significant impact criteria

As per Part 3 of the *Environment Protection and Biodiversity Conservation Act 1999,* the following factors must be taken into account when making considering whether the matter is a controlled

activity and whether the matter needs to be referred to the Commonwealth Minister for the Environment:

(a) Are there any matters of national environmental significance located in the area of the proposed action: **No.**

(b) Considering the proposed action at its broadest scope (that is, considering all stages and components of the action, and all related activities and infrastructure), is there potential for impacts, including indirect impacts, on matters of national environmental significance? **No**

(c) Are there any proposed measures to avoid or reduce impacts on matters of national environmental significance (and if so, is the effectiveness of these measures certain enough to reduce the level of impact below the 'significant impact' threshold)? **Yes –PROJECT CEMP**

(d) Are any impacts of the proposed action on matters of national environmental significance likely to be significant impacts (important, notable, or of consequence, having regard to their context or intensity)? **No**

The following species are listed as endangered or critically endangered under the EPBC Act and were recorded within 1km of the subject site:

- Swift Parrot – Critically Endangered

Significant Impact Criteria for Critically Endangered and Endangered Species
a. Is the action likely to have a significant impact on a critically endangered or endangered species **No**
b. Will it lead to a long-term decrease in the size of a population of a species **No**
c. Will it reduce the area of occupancy of the species **No**
d. Will it fragment an existing important population into two or more populations **No**
e. Will it adversely affect habitat critical to the survival of a species **No**
f. Will it disrupt the breeding cycle of a population **No**
g. Will it modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline **No**
h. Will it result in invasive species that are harmful to a critically endangered or endangered species becoming established in the critically endangered or endangered species' habitat **No**
i. Will it introduce disease that may cause the species to decline, **No** ;or
j. Will it interfere substantially with the recovery of the species. **No**

The following species are listed as vulnerable under the EPBC Act and were recorded within 1km of the subject site:

- Grey-headed Flying-Fox
- *Lasiopetalum joyceae*
- *Syzygium paniculatum*

Significant Impact Criteria for Vulnerable Species
a. Is the action likely to have a significant impact on a vulnerable species **No**
b. Will it lead to a long-term decrease in the size of an important population of a species **No**
c. Will it reduce the area of occupancy of an important population **No**
d. Will it fragment an existing important population into two or more populations **No**
e. Will it adversely affect habitat critical to the survival of a species **No**
f. Will it disrupt the breeding cycle of an important population **No**
g. Will it modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline **No**
h. Will it result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat **No**
i. Will it introduce disease that may cause the species to decline, **No** or
j. Will it interfere substantially with the recovery of the species. **No**

No threatened ecological communities that are listed under the EPBC Act were recorded on or near the subject site.

Significant Impact Criteria for Critically Endangered and Endangered Communities
a. Is the action is likely to have a significant impact on a critically endangered and endangered community **No**
b. Will it reduce the extent of an ecological community **No**
c. Will it fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines **No**

d. Will it adversely affect habitat critical to the survival of an ecological community **No**
e. Will it disrupt the breeding cycle of an important population **No**
f. Will it modify, 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 **No**
g. Will it 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 **No**
Will it cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to: a. Assisting invasive species, that are harmful to the listed ecological community, to become established, or b. 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 Will it interfere with the recovery of an ecological community. • **No**

10.3.3 Migratory Species

A search of BioNet for migratory species returned the following results: CAMBA listed, JAMBA listed or ROKAMBA listed Entities within 5kms of the subject site recorded since 01 Jan 2000 until 28 July 2024 returned 21 records for 9 species.

Table 9 Listed migratory species – BioNet records 2000-2024

Class	Scientific Name	Common Name	NSW status	Comm. Status	Records within 5km
Aves	*Lathamus discolor*	Swift Parrot	E1	Critically Endangered	6
Aves	*Neophema chrysostoma*	Blue-winged Parrot	V,P	Vulnerable	0
Aves	*Rostratula australis*	Australian Painted Snipe	not listed	Endangered	0
Aves	*Hirundapus caudacutus*	White-throated Needletail	V,P	Vulnerable	14
Aves	*Numenius madagascariensis*	Eastern Curlew, Far Eastern Curlew	not listed	Critically Endangered	0
Aves	*Calidris acuminata*	Sharp-tailed Sandpiper	V,P	Vulnerable	0
Aves	*Calidris ferruginea*	Curlew Sandpiper	E1	Critically Endangered	0

Class	Scientific Name	Common Name	NSW status	Comm. Status	Records within 5km
Aves	*Tringa nebularia*	Common Greenshank, Greenshank	not listed	Endangered	0
Aves	*Gallinago hardwickii*	Latham's Snipe, Japanese Snipe	V,P	Vulnerable	0

The subject site contains marginal habitat for terrestrial and wetland listed migratory species that are known to occur or may potentially occur, including species listed in BioNet records and species listed in the Protected Matters Search. Potential impacts are assessed below.

Factors to be considered

The guidelines to assessment of significance to this Matter, define an action as likely to have a significant impact on a migratory species, if it will:

a) Substantially modify (including fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species, or;

b) Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat of the migratory species, or

c) Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species.

An important area of habitat is:

1) Habitat used by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species, or:

2) Habitat utilised by a migratory species which is at the limit of the species range, or

3) Habitat within an area where the species is declining.

10.3.4 Assessment of impacts – migratory species
This section addresses each of the previous points listed.

- **Substantially modify (including fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat of the migratory species;**

  The site is considered unlikely to constitute an important area of habitat on the basis of the following:

  The proposal does not affect important habitat. The subject site is not of sufficient extent to support an ecologically significant proportion of any listed species (at most, only a small group or transient individuals). The value of the habitat is a fraction of a significant extent of similar habitat not only in the LGA, but the wider landscape nearby, particular to the north of the LGA.

b) Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat of the migratory species;

An invasive species is one that may become established in the habitat, and harm the migratory species by direct competition, modification of habitat, or predation. The proposal will not introduce any such invasive species, given they are currently likely to occur i.e. fox and feral cat.

c) Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of the species.

No disruption of the lifecycle of any migratory bird is likely as:

Habitat affected is either only marginally suitable, and/or locally abundant.

No significant extent of potential or known nesting/breeding habitat is affected.

No significant extent of potential or known foraging habitat will be affected.

Conclusion

In view of the above, it is considered unlikely that any migratory bird will be significantly affected by the proposal.

11 PRELIMINARY ASSESSMENTS

11.1 BC Act 2016 and MNES Assessment -threatened species and listed migratory preliminary

Species with numerous records, or records with reasonable currency (past 20+ years) on and near the subject sites, and with habitat available in the area of proposed works are selected for further assessment. The following table lists species with records in BioNet for the past 20+ years within 5km of the subject site, and species listed in the protected matters search within 2km of the site excluding marine/pelagic species. This table forms the basis of any further assessments/tests of significance.

A total of 13 species were selected for detailed assessment in section **Error! Reference source not found.**

Table 10 Flora and fauna threatened species eligibility for Test of Significance and MNES Assessment -threatened species

Class	Scientific Name	Common Name	NSW status	Comm. Status	Presence Text	Habitat on site?	Impact likely? Assessed?	Records within 5km	Records within 1km
Amphibia	*Heleioporus australiacus*	Giant Burrowing Frog	V,P	V	Species or species habitat known to occur	no	no/no	3	0
Amphibia	*Litoria aurea*	Green and Golden Bell Frog	E,P	V	Species or species habitat likely to occur	marginal	no/no	0	0
Amphibia	*Mixophyes balbus*	Stuttering Frog, Southern Barred Frog (in Victoria)	E,P	V	Species or species habitat may occur	no	no/no	0	0
Amphibia	*Pseudophryne australis*	Red-crowned Toadlet	V,P	not listed	not listed	marginal	no/yes	148	20
Aves	*Anthochaera phrygia*	Regent Honeyeater	CE	Critically Endangered	Species or species habitat known to occur	foraging	no/no	0	0
Aves	*Artamus cyanopterus cyanopterus*	Dusky Woodswallow	V,P	not listed	not listed	marginal	no/no	1	0
Aves	*Botaurus poiciloptilus*	Australasian Bittern	E,P	Endangered	Species or species habitat known to occur	no	no/no	0	0
Aves	*Calidris acuminata*	Sharp-tailed Sandpiper	V,P	Vulnerable	Species or species habitat may occur	no	no/no	0	0
Aves	*Calidris ferruginea*	Curlew Sandpiper	E,P	Critically Endangered	Species or species habitat may occur	no	no/no	0	0

Class	Scientific Name	Common Name	NSW status	Comm. Status	Presence Text	Habitat on site?	Impact likely? Assessed?	Records within 5km	Records within 1km
Aves	*Callocephalon fimbriatum*	Gang-gang Cockatoo	E1,P,3	E	Species or species habitat known to occur	foraging	no/no	33	0
Aves	*Calyptorhynchus lathami lathami*	South-eastern Glossy Black-Cockatoo	V,P,2	V	Species or species habitat known to occur	foraging	no/no	11	0
Aves	*Climacteris picumnus victoriae*	Brown Treecreeper (south-eastern)	V,P	Vulnerable	Species or species habitat likely to occur within area	foraging	no/no	0	0
Aves	*Daphoenositta chrysoptera*	Varied Sittella	V,P	not listed	not listed	no	no/no	2	0
Aves	*Dasyornis brachypterus*	Eastern Bristlebird	E,P	Endangered	Species or species habitat may occur	no	no/no	0	0
Aves	*Erythrotriorchis radiatus*	Red Goshawk	E,P	Endangered	Species or species habitat may occur	foraging	no/no	0	0
Aves	*Falco hypoleucos*	Grey Falcon	E,P	Vulnerable	Species or species habitat may occur	foraging	no/no	0	0
Aves	*Gallinago hardwickii*	Latham's Snipe, Japanese Snipe	V,P	Vulnerable	Species or species habitat likely to occur	no	no/no	0	0
Aves	*Glossopsitta pusilla*	Little Lorikeet	V,P	not listed	not listed	marginal	no/yes	8	1
Aves	*Grantiella picta*	Painted Honeyeater	V,P	Vulnerable	Species or species habitat likely to occur	marginal	no/no	0	0
Aves	*Haliaeetus leucogaster*	White-bellied Sea-Eagle	V,P	not listed	not listed	foraging	no/no	4	0
Aves	*Hieraaetus morphnoides*	Little Eagle	V,P	not listed	not listed	foraging	no/no	2	0
Aves	*Hirundapus caudacutus*	White-throated Needletail	V,P	V,C,J,K	Species or species habitat known to occur	no	no/no	14	0
Aves	*Ixobrychus flavicollis*	Black Bittern	V,P	not listed	not listed	marginal	no/no	1	0
Aves	*Lathamus discolor*	Swift Parrot	E1,P	CE	Species or species habitat known to occur	marginal	no/no	6	0
Aves	*Lophoictinia isura*	Square-tailed Kite	V,P,3	not listed	not listed	foraging	no/yes	16	1
Aves	*Melanodryas cucullata cucullata*	South-eastern Hooded Robin, Hooded Robin (south-eastern)	V,P	Endangered	Species or species habitat may occur	marginal	no/no	0	0

Class	Scientific Name	Common Name	NSW status	Comm. Status	Presence Text	Habitat on site?	Impact likely? Assessed?	Records within 5km	Records within 1km
Aves	*Neophema chrysostoma*	Blue-winged Parrot	V,P	Vulnerable	Species or species habitat may occur	marginal	no/no	0	0
Aves	*Neophema pulchella*	Turquoise Parrot	V,P,3	not listed	not listed	marginal	no/no	1	0
Aves	*Ninox connivens*	Barking Owl	V,P,3	not listed	not listed	foraging	no/no	3	0
Aves	*Ninox strenua*	Powerful Owl	V,P,3	not listed	not listed	foraging	no/yes	693	31
Aves	*Numenius madagascariensis*	Eastern Curlew, Far Eastern Curlew	not listed	Critically Endangered	Species or species habitat may occur	no	no/no	0	0
Aves	*Pycnoptilus floccosus*	Pilotbird	not listed	Vulnerable	Species or species habitat likely to occur	marginal	no/no	0	0
Aves	*Rostratula australis*	Australian Painted Snipe	not listed	Endangered	Species or species habitat likely to occur	no	no/no	0	0
Aves	*Stagonopleura guttata*	Diamond Firetail	not listed	Vulnerable	Species or species habitat likely to occur	foraging	no/no	0	0
Aves	*Tringa nebularia*	Common Greenshank, Greenshank	not listed	Endangered	Species or species habitat likely to occur	no	no/no	0	0
Aves	*Tyto novaehollandiae*	Masked Owl	V,P,3	not listed	not listed	foraging	no/no	2	0
Fish	*Macquaria australasica*	Macquarie Perch	not listed	Endangered	Species or species habitat may occur	no	no/no	0	0
Fish	*Prototroctes maraena*	Australian Grayling	not listed	Vulnerable	Species or species habitat may occur	no	no/no	0	0
Flora	*Acacia bynoeana*	Bynoe's Wattle, Tiny Wattle	E1	Vulnerable	Species or species habitat likely to occur	marginal	no/no	0	0
Flora	*Acacia pubescens*	Downy Wattle	V	V	Species or species habitat likely to occur	marginal	no/no	1	0
Flora	*Acacia terminalis subsp. Eastern Sydney (G.P.Phillips 126)*	Sunshine Wattle (Sydney region)	E1	Endangered (listed as Acacia terminalis subsp. terminalis MS)	Species or species habitat may occur	no	no/no	0	0
Flora	*Allocasuarina glareicola*	null	not listed	Endangered	Species or species habitat may occur	no	no/no	0	0

Class	Scientific Name	Common Name	NSW status	Comm. Status	Presence Text	Habitat on site?	Impact likely? Assessed?	Records within 5km	Records within 1km
Flora	*Asterolasia elegans*	null	E1	Endangered	Species or species habitat may occur	no	no/no	0	0
Flora	*Caladenia tessellata*	Thick-lipped Spider-orchid, Daddy Long-legs	E1	Vulnerable	Species or species habitat may occur	no	no/no	0	0
Flora	*Callistemon linearifolius*	Netted Bottle Brush	V,3	not listed	not listed	marginal	no/no	2	0
Flora	*Cryptostylis hunteriana*	Leafless Tongue Orchid	V,P,2	V	Species or species habitat likely to occur	marginal	no/no	3	0
Flora	*Cynanchum elegans*	White-flowered Wax Plant	E1	Endangered	Species or species habitat likely to occur	marginal	no/no	0	0
Flora	*Darwinia biflora*		V	V	Species or species habitat known to occur	marginal	no/no	326	0
Flora	*Darwinia peduncularis*		V	not listed	not listed	no	no/no	1	0
Flora	*Epacris purpurascens var. purpurascens*		V	not listed	not listed	yes	no/yes	113	8
Flora	*Eucalyptus camfieldii*	Camfield's Stringybark	V	V	Species or species habitat known to occur	marginal	no/no	4	0
Flora	*Eucalyptus nicholii*	Narrow-leaved Black Peppermint	V	V	not listed in area	no	no/no	1	0
Flora	*Galium australe*	Tangled Bedstraw	E1	not listed	not listed	yes	no/yes	5	3
Flora	*Genoplesium baueri*	Bauer's Midge Orchid	E1,P,2	E	Species or species habitat known to occur	no	no/no	6	0
Flora	*Grammitis stenophylla*	Narrow-leaf Finger Fern	E1,3	not listed	not listed	marginal	no/yes	6	1
Flora	*Haloragodendron lucasii*		E1	E	Species or species habitat likely to occur	marginal	no/no	21	0
Flora	*Hibbertia spanantha*	Julian's Hibbertia	E4A,2	CE	not listed in area	no	no/no	5	0
Flora	*Hibbertia superans*		E1	not listed	not listed	no	no/no	5	0
Flora	*Hygrocybe austropratensis*		E1	not listed	not listed	marginal	no/no	2	0
Flora	*Kunzea rupestris*	null	V	Vulnerable	Species or species habitat may occur	marginal	no/no	0	0

Class	Scientific Name	Common Name	NSW status	Comm. Status	Presence Text	Habitat on site?	Impact likely? Assessed?	Records within 5km	Records within 1km
Flora	*Lasiopetalum joyceae*		V	V	Species or species habitat known to occur	no	no/yes	2	2
Flora	*Leptospermum deanei*	Deane's Tea-tree	V	Vulnerable	Species or species habitat likely to occur	yes	no/no	0	0
Flora	*Leucopogon exolasius*	Woronora Beard-heath	V	Vulnerable	Species or species habitat may occur	marginal	no/no	0	0
Flora	*Macadamia integrifolia*	Macadamia Nut	V	V	not listed in area	no	no/no	15	0
Flora	*Melaleuca biconvexa*	Biconvex Paperbark	V	Vulnerable	Species or species habitat likely to occur	marginal	no/no	0	0
Flora	*Melaleuca deanei*	Deane's Paperbark	V	V	Species or species habitat known to occur	marginal	no/no	19	0
Flora	*Micromyrtus blakelyi*	null	V	Vulnerable	Species or species habitat likely to occur	no	no/no	0	0
Flora	*Persicaria elatior*	Knotweed, Tall Knotweed	V	Vulnerable	Species or species habitat may occur	yes	no/no	0	0
Flora	*Persoonia hirsuta*	Hairy Geebung, Hairy Persoonia	E1	Endangered	Species or species habitat likely to occur	no	no/no	0	0
Flora	*Persoonia mollis subsp. maxima*		E1,P	E	Species or species habitat known to occur	marginal	no/no	90	0
Flora	*Pimelea curviflora var. curviflora*		V	V	Species or species habitat likely to occur	marginal	no/no	2	0
Flora	*Pimelea spicata*	Spiked Rice-flower	E1	Endangered	Species or species habitat may occur	no	no/no	0	0
Flora	*Pomaderris brunnea*	Rufous Pomaderris, Brown Pomaderris	V	Vulnerable	Species or species habitat may occur	marginal	no/no	0	0
Flora	*Rhizanthella slateri*	Eastern Australian Underground Orchid	V,P,2	E	Species or species habitat may occur	no	no/no	1	0
Flora	*Rhodamnia rubescens*	Scrub Turpentine	E4A	CE	Species or species habitat known to occur	yes	no/yes	6	2
Flora	*Rhodomyrtus psidioides*	Native Guava	E4A	Critically Endangered	Species or species habitat may occur	marginal	no/no	0	0
Flora	*Syzygium paniculatum*	Magenta Lilly Pilly	E1	V	Species or species habitat known to occur	yes	no/yes	16	1

Class	Scientific Name	Common Name	NSW status	Comm. Status	Presence Text	Habitat on site?	Impact likely? Assessed?	Records within 5km	Records within 1km
Flora	*Tetratheca glandulosa*		V	not listed	not listed	marginal	no/yes	123	1
Flora	*Thesium australe*	Austral Toadflax, Toadflax	V	Vulnerable	Species or species habitat likely to occur		no/no	0	0
Gastropoda	*Pommerhelix duralensis*	Dural Land Snail	E1	E	not listed in area	marginal	no/no	3	0
Mammalia	*Cercartetus nanus*	Eastern Pygmy-possum	V,P	not listed	not listed	foraging	no/no	75	0
Mammalia	*Chalinolobus dwyeri*	Large-eared Pied Bat	V,P	E	Species or species habitat likely to occur	foraging	no/no	2	0
Mammalia	*Dasyurus maculatus*	Spotted-tailed Quoll	V,P	E	Species or species habitat known to occur	foraging	no/no	4	0
Mammalia	*Falsistrellus tasmaniensis*	Eastern False Pipistrelle	V,P	not listed	not listed	foraging	no/no	2	0
Mammalia	*Isoodon obesulus obesulus*	Southern Brown Bandicoot (eastern)	E1,P	E	Species or species habitat likely to occur	foraging	no/no	1	0
Mammalia	*Micronomus norfolkensis*	Eastern Coastal Free-tailed Bat	V,P	not listed	not listed	foraging	no/no	14	0
Mammalia	*Miniopterus australis*	Little Bent-winged Bat	V,P	not listed	not listed	foraging	no/no	58	0
Mammalia	*Miniopterus orianae oceanensis*	Large Bent-winged Bat	V,P	not listed	not listed	foraging	no/yes	145	1
Mammalia	*Myotis macropus*	Southern Myotis	V,P	not listed	not listed	foraging	no/no	10	0
Mammalia	*Notamacropus parma*	Parma Wallaby	V	Vulnerable	Species or species habitat may occur	foraging	no/no	0	0
Mammalia	*Petauroides volans*	Southern Greater Glider	E1,P	E	Species or species habitat known to occur	foraging	no/no	1	0
Mammalia	*Petaurus australis australis*	Yellow-bellied Glider (south-eastern)	V,P	Vulnerable	Species or species habitat likely to occur		no/no	0	0
Mammalia	*Petaurus norfolcensis*	Squirrel Glider	V,P	not listed	not listed	foraging	no/no	1	0
Mammalia	*Petrogale penicillata*	Brush-tailed Rock-wallaby	E1	Vulnerable	Species or species habitat may occur		no/no	0	0
Mammalia	*Phascolarctos cinereus*	Koala	E1,P	E	Species or species habitat known to occur	foraging	no/no	14	0

Class	Scientific Name	Common Name	NSW status	Comm. Status	Presence Text	Habitat on site?	Impact likely? Assessed?	Records within 5km	Records within 1km
Mammalia	*Pseudomys novaehollandiae*	New Holland Mouse, Pookila	P	Vulnerable	Species or species habitat likely to occur	no	no/no	0	0
Mammalia	*Pteropus poliocephalus*	Grey-headed Flying-fox	V,P	V	Foraging, feeding or related behaviour known to occur	foraging	no/yes	214	7
Mammalia	*Saccolaimus flaviventris*	Yellow-bellied Sheathtail-bat	V,P	not listed	not listed	foraging	no/no	5	0
Mammalia	*Scoteanax rueppellii*	Greater Broad-nosed Bat	V,P	not listed	not listed	foraging	no/no	12	0
Reptilia	*Hoplocephalus bungaroides*	Broad-headed Snake	E1	Endangered	Species or species habitat may occur	no	no/no	0	0
Reptilia	*Varanus rosenbergi*	Rosenberg's Goanna	V,P	not listed	not listed	no	no/no	8	0
Snail	*Pommerhelix duralensis*	Dural Land Snail	E1	Endangered	Species or species habitat known to occur	marginal	no/no	0	0

Table 11 Fauna species eligibility for Test of Significance and MNES Assessment - Listed migratory species

Class	Scientific Name	Common Name	NSW status	Comm. Status	Records within 5km	Records within 1km	Migratory Status	Migratory Category	Marine Status
Aves	*Lathamus discolor*	Swift Parrot	E1	Critically Endangered	6	0			Listed - overfly marine area
Aves	*Neophema chrysostoma*	Blue-winged Parrot	V,P	Vulnerable	0	0			Listed - overfly marine area
Aves	*Rostratula australis*	Australian Painted Snipe	not listed	Endangered	0	0			Listed - overfly marine area (as Rostratula benghalensis (sensu lato))
Aves	*Hirundapus caudacutus*	White-throated Needletail	V,P	Vulnerable	14	0	Migratory	Migratory Terrestrial Species	Listed - overfly marine area
Aves	*Numenius madagascariensis*	Eastern Curlew, Far Eastern Curlew	not listed	Critically Endangered	0	0	Migratory	Migratory Wetlands Species	Listed

Class	Scientific Name	Common Name	NSW status	Comm. Status	Records within 5km	Records within 1km	Migratory Status	Migratory Category	Marine Status
Aves	*Calidris acuminata*	Sharp-tailed Sandpiper	V,P	Vulnerable	0	0	Migratory	Migratory Wetlands Species	Listed
Aves	*Calidris ferruginea*	Curlew Sandpiper	E1	Critically Endangered	0	0	Migratory	Migratory Wetlands Species	Listed - overfly marine area
Aves	*Tringa nebularia*	Common Greenshank, Greenshank	not listed	Endangered	0	0	Migratory	Migratory Wetlands Species	Listed - overfly marine area
Aves	*Gallinago hardwickii*	Latham's Snipe, Japanese Snipe	V,P	Vulnerable	0	0	Migratory	Migratory Wetlands Species	Listed - overfly marine area

12 APPENDIX B INFORMATION ON WHICH THIS REF IS BASED

Overleaf

12.1 GPT detailed design

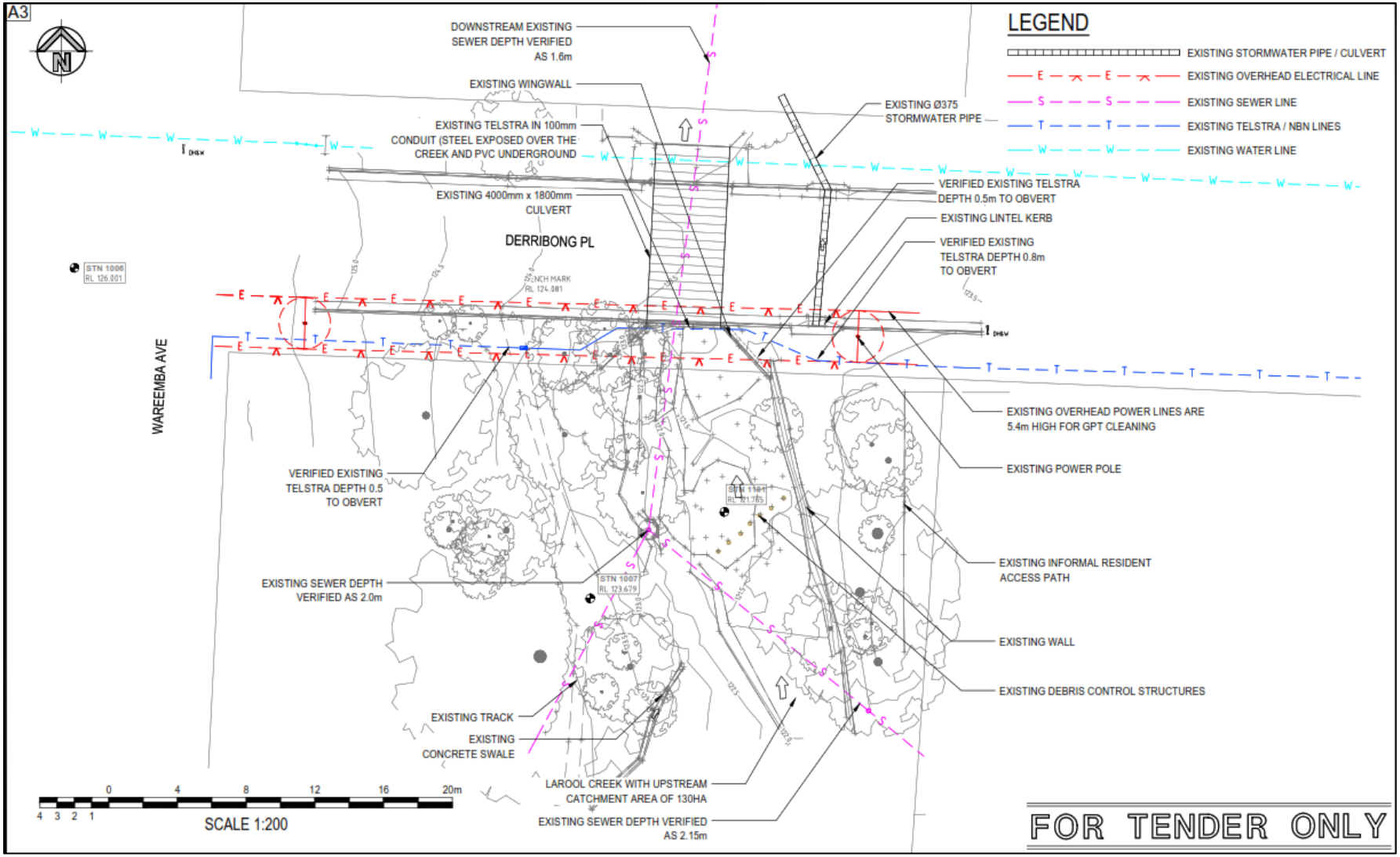


Figure 19 Location of services

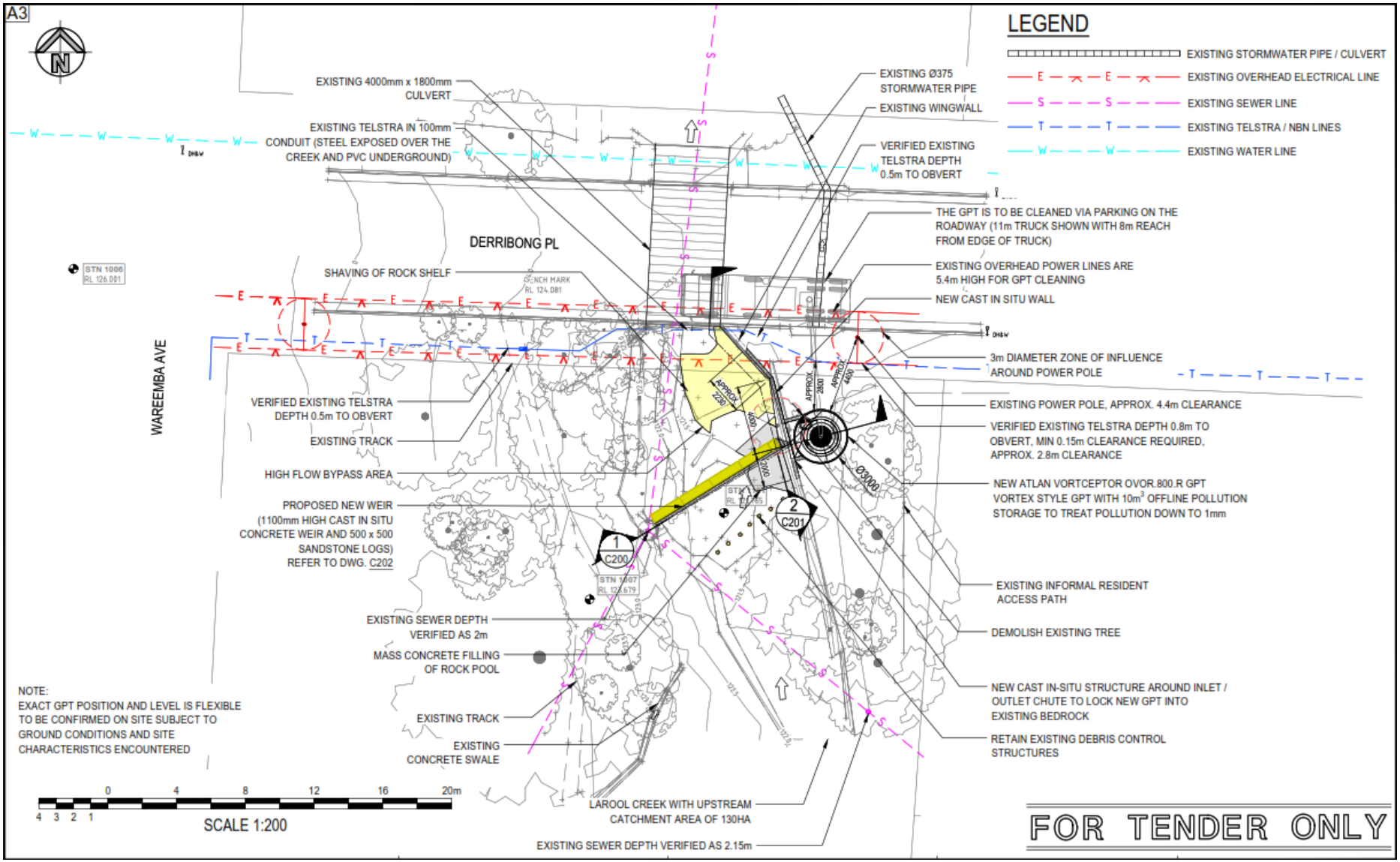


Figure 20 General arrangement of site elements (Optimal Stormwater 2024)

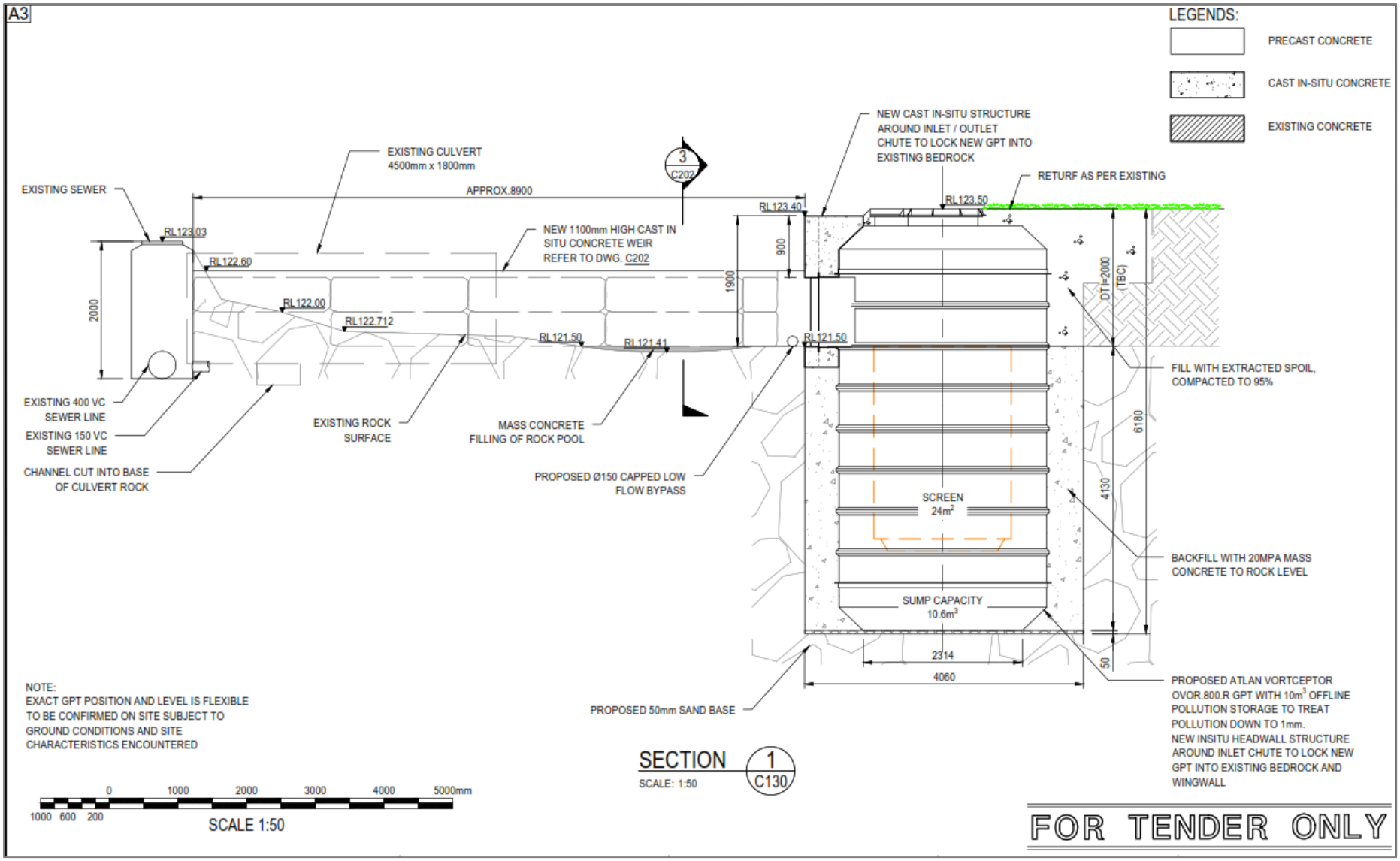


Figure 21 Detailed design for GPT – Atlan Vortceptor

12.2 LAND ZONING

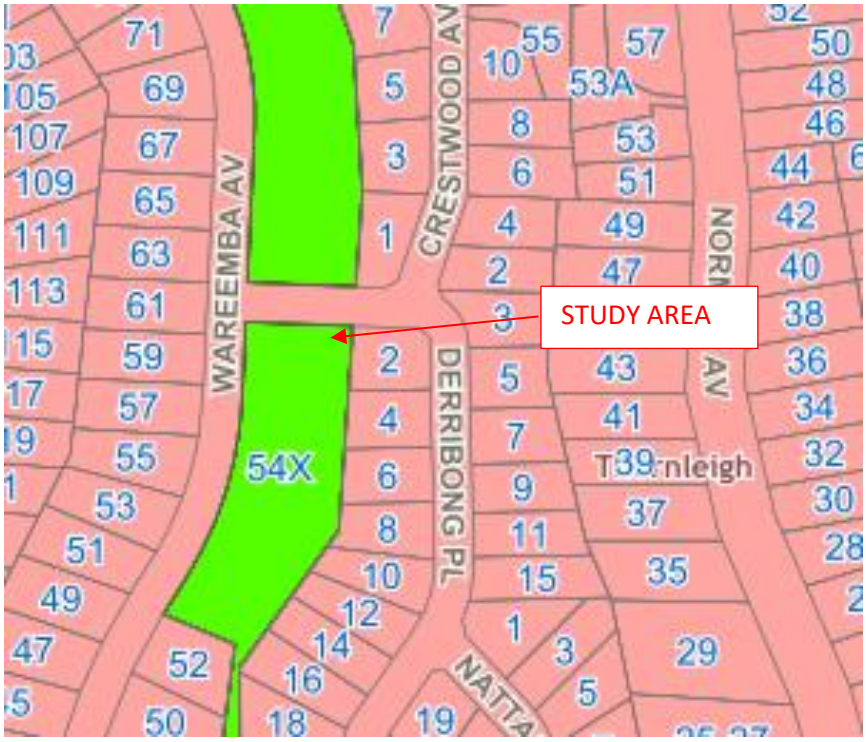


Figure 22 Zoning LEP 2008

R2 - Low Density Residential
SP1 - Special Activities
SP2 - Infrastructure
R3 - Medium Density Residential
RE1 - Public Recreation

12.3 MAPPED VEGETATION

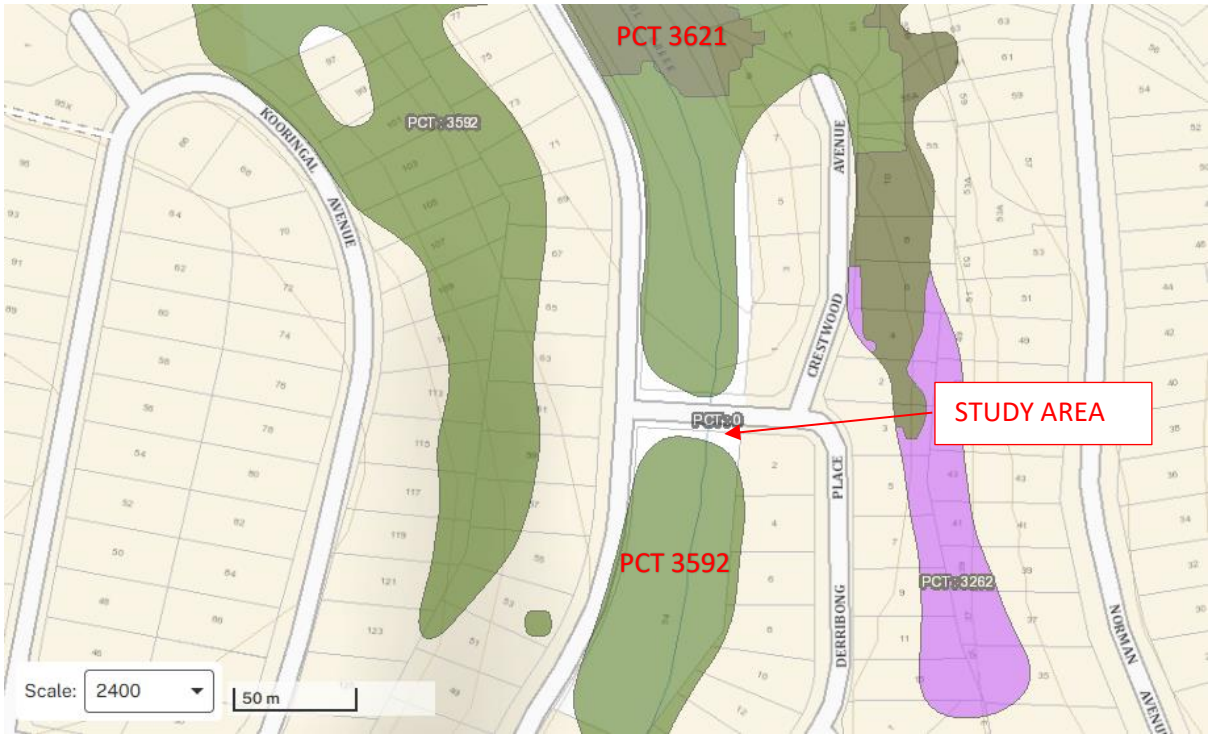


Figure 23 Vegetation mapping for the site (**SEED Map (nsw.gov.au)**); PCT 3592 Sydney Coastal Enriched Sandstone Forest on site, and PCT 3621 Sydney Hinterland Turpentine-Apple Gully Forest located downstream

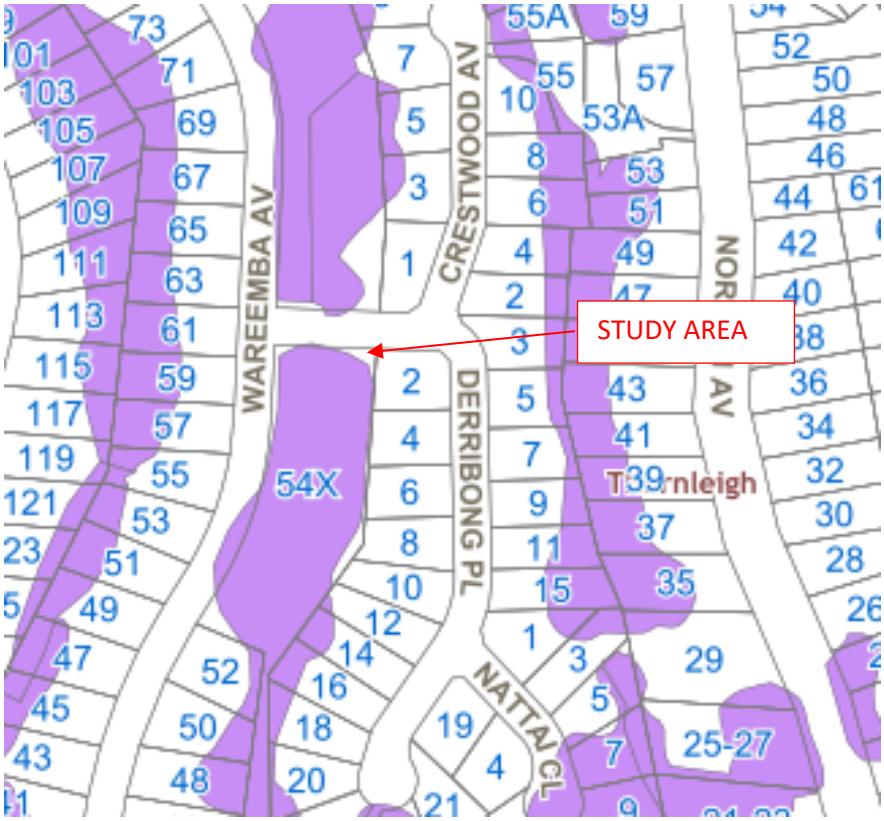


Figure 24 Hornsby Shire Council's HELP intramaps shows the vegetation as Peppermint-Angophora Forest (**HornsbyPublic > HLEP 2013 (nsw.gov.au)**)

12.4 SOIL LANDSCAPE MAPPING

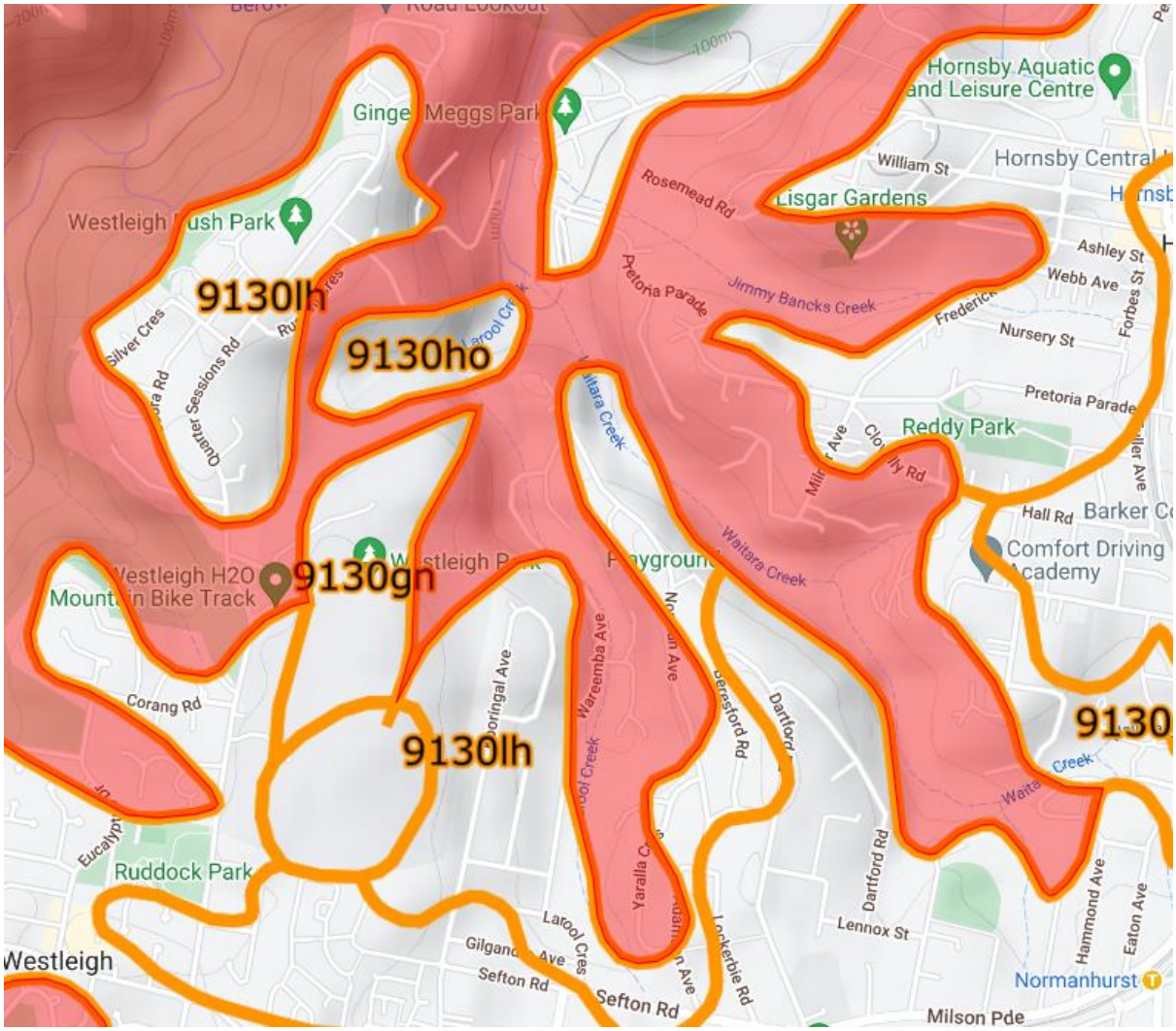


Figure 25 Soil landscapes mapping (eSPADE v2.2 (nsw.gov.au)); the extent of the Hawkesbury Soil Landscape (9130ha) is highlighted in red

12.5 UNEXPECTED FINDS PROTOCOL

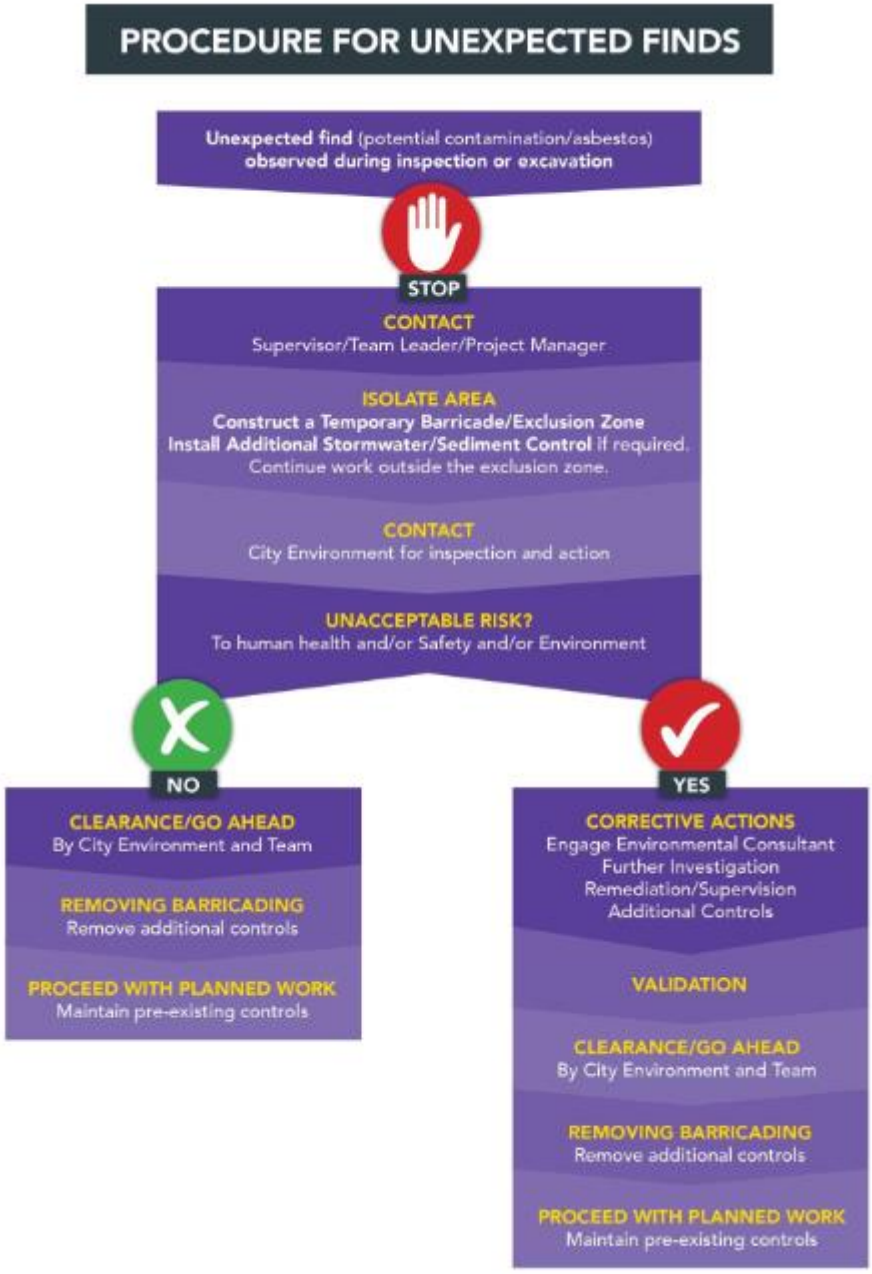


Figure 26 Example of an unexpected finds protocol

12.6 BUSH FIRE PRONE LAND

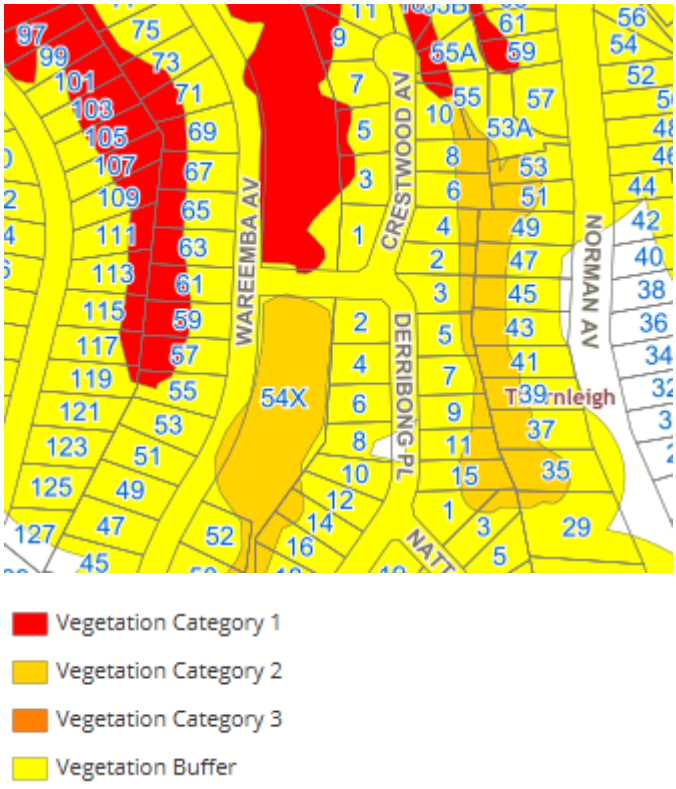


Figure 27 Bush Fire Prone Land mapping (**HornsbyPublic > HLEP 2013 (nsw.gov.au)**)

12.7 STATE HERITAGE INVENTORY

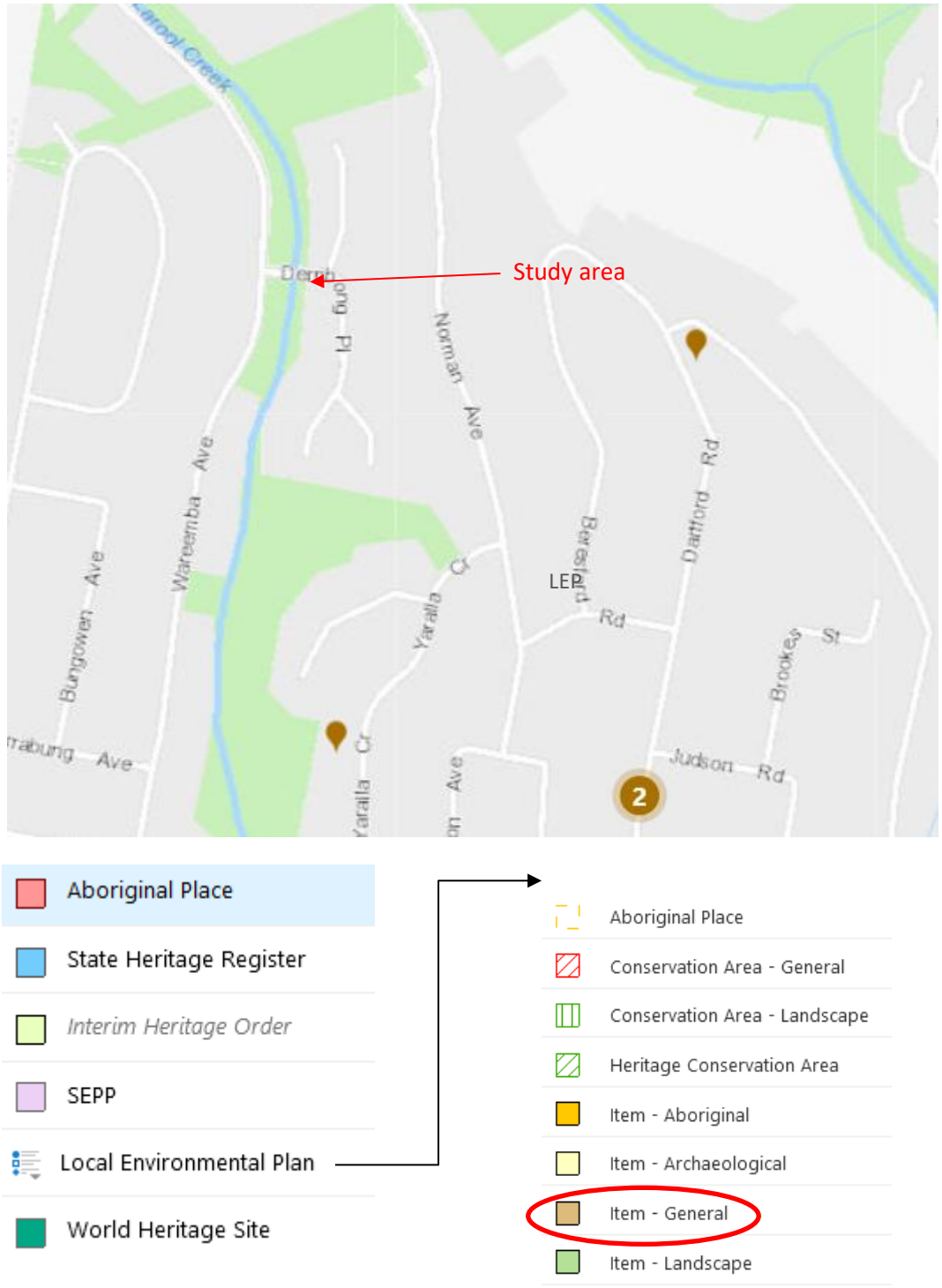


Figure 28 State Heritage inventory **HMS - Start your search (nsw.gov.au)**

Heritage items include two heritage houses, and two heritage houses with gardens

12.8 AHIMS REPORT

AHIMS Web Services (AWS)
Search Result

Your Ref/PO Number : derribong
Client Service ID : 916162

applied ecology pty Limited
43 albion street
katoomba New South Wales 2780
Attention: Meredith Brainwood

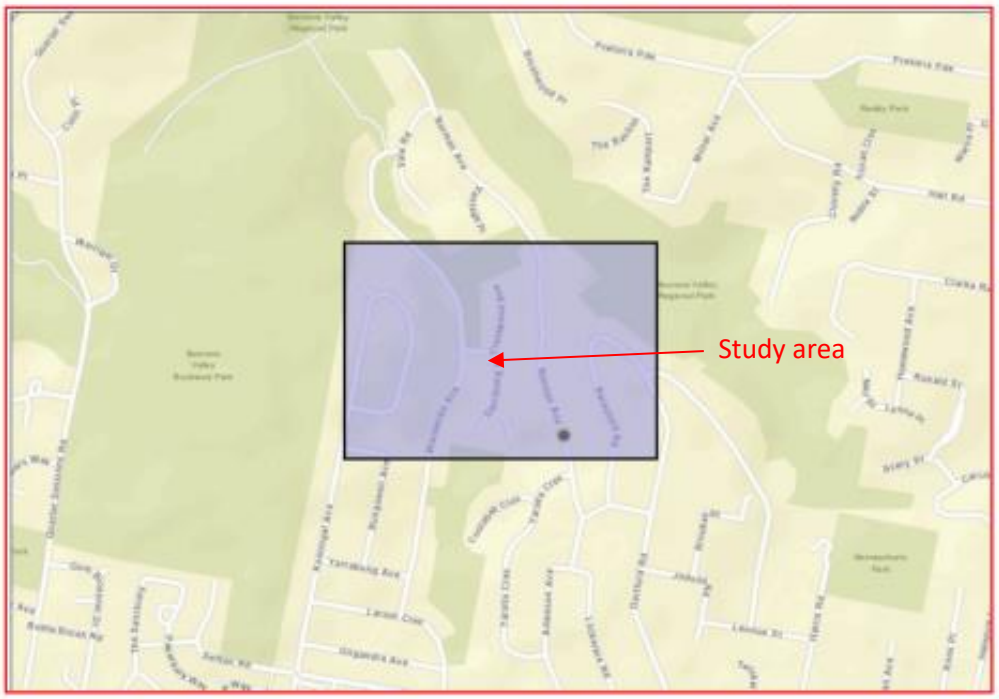
Date: 02 August 2024

Email: meredithbrainwood@appliedecology.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -33.7161, 151.0796 - Lat, Long To : -33.7116, 151.0873, conducted by Meredith Brainwood on 02 August 2024.

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:

1	Aboriginal sites are recorded in or near the above location.
0	Aboriginal places have been declared in or near the above location. *

Figure 29 AHIMs search area

12.9 THREATENED SPECIES RECORDS

12.9.1 BioNET records 2000-2022

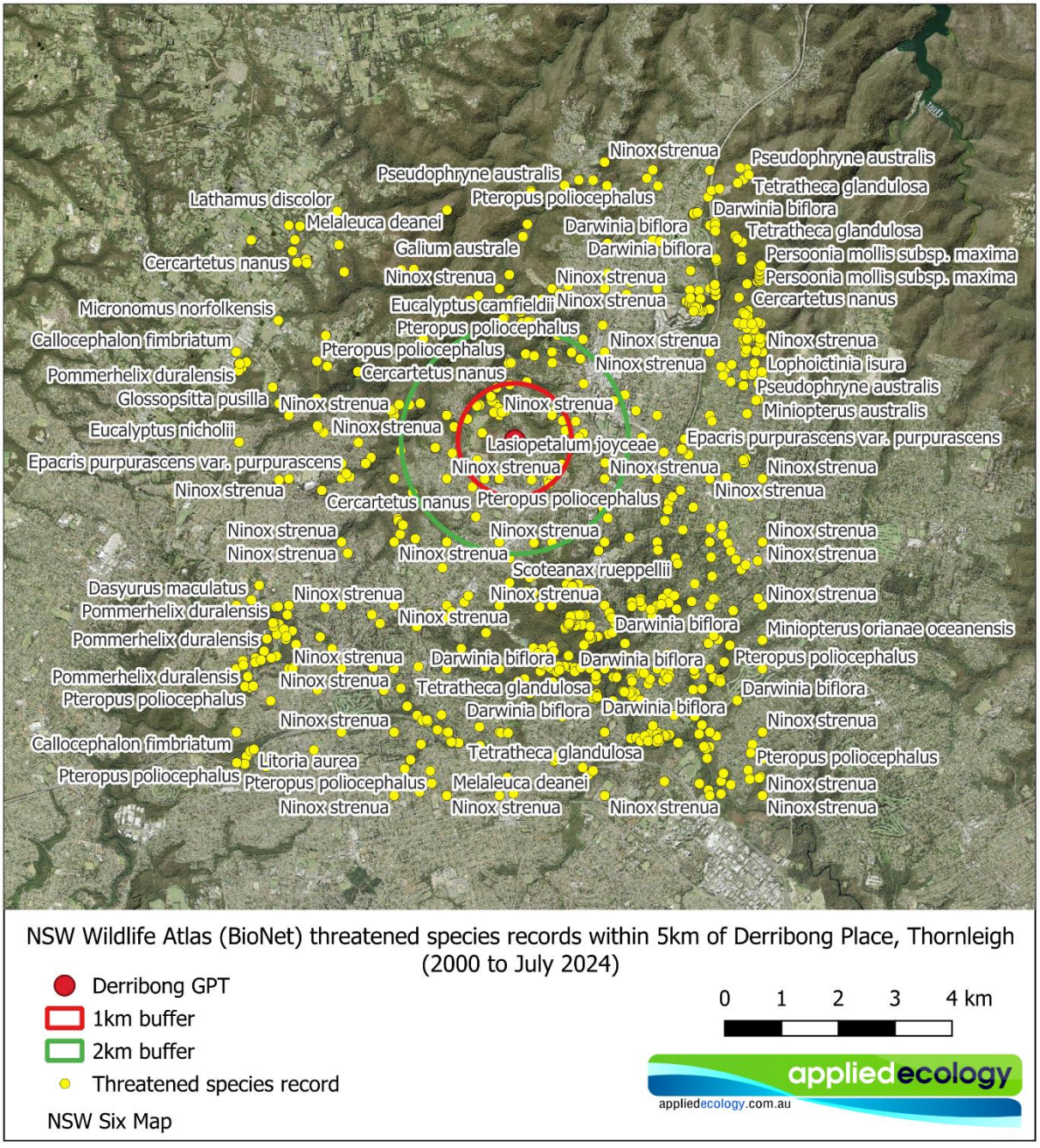


Figure 30 Threatened and listed migratory species records BioNet 2000-August 2024

Table 12 Threatened and listed migratory species records BioNet 2000-August 2024 within a 10km2 cell centred on the site

12.10 BIODIVERSITY VALUES MAP

Figure 31 Biodiversity values map – no biodiversity values are mapped for this location

12.11 Key Fish Habitat mapping

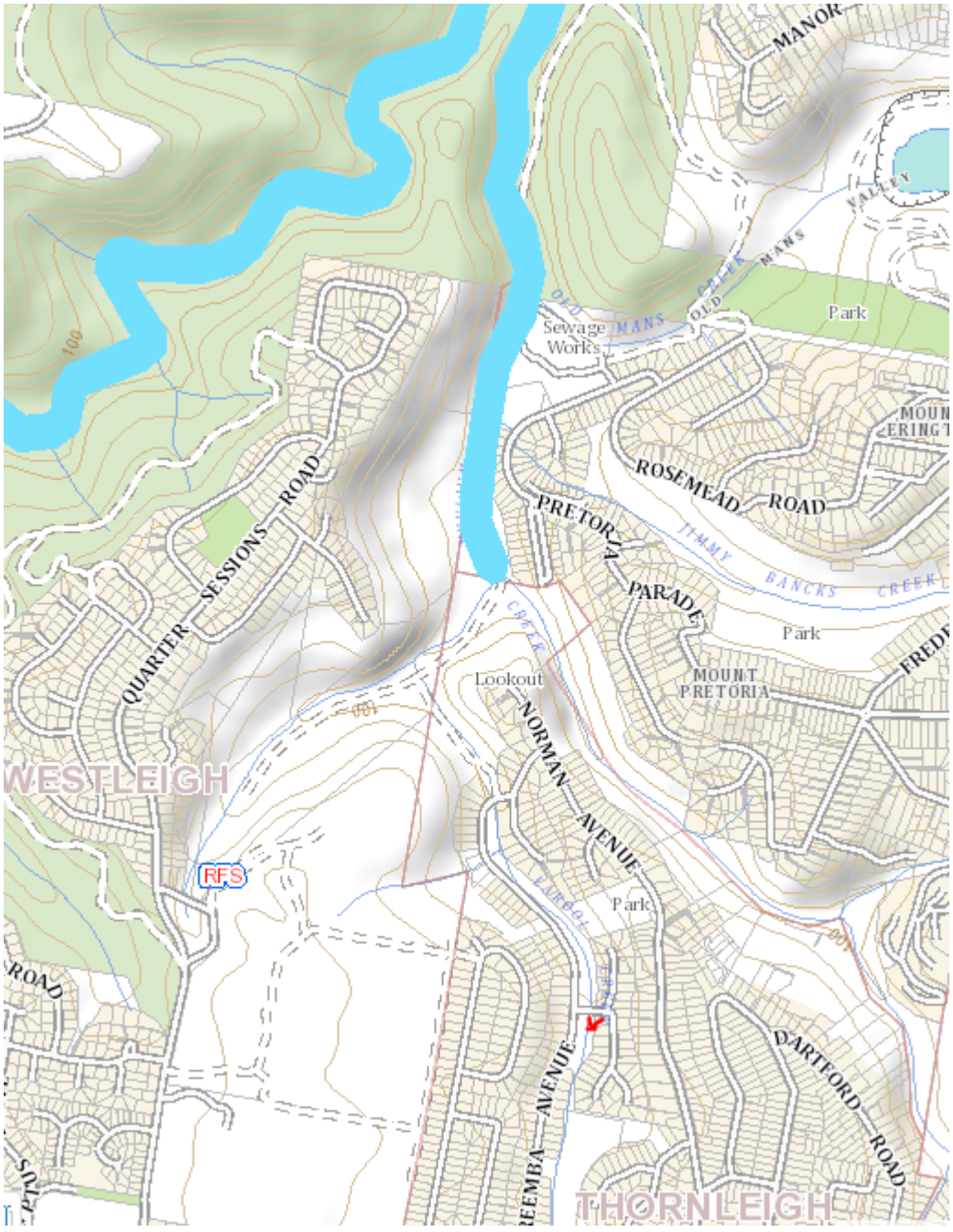


Figure 32 Key Fish Habitat mapping for the vicinity of Larool Creek (Geocortex Viewer for HTML5 (nsw.gov.au))

12.12 EPBC ACT PROTECTED MATTERS REPORT

Table 13 Protected matter search EXTRACT

Protected Matters Search Tool

Report Generated - 3:44PM - 02 August 2024

Matters of National Environment Significance	Count
World Heritage Properties	0
National Heritage Places	0
Wetlands of International Importance (Ramsar Wetlands)	0
Great Barrier Reef Marine Park	0
Commonwealth Marine Area	0
Listed Threatened Ecological Communities	9
Listed Threatened Species	68
Listed Migratory Species	15

Other Matters Protected by the EPBC Act	Count
Commonwealth Lands	24
Commonwealth Heritage Places	0
Listed Marine Species	22
Whales and Other Cetaceans	0
Critical Habitats	0
Commonwealth Reserves Terrestrial	0
Australian Marine Parks	0
Habitat Critical to the Survival of Marine Turtles	0

Extra Information	Count
State and Territory Reserves	3
Regional Forest Agreements	0
Nationally Important Wetlands	0
EPBC Act Referrals	7
Key Ecological Features	0
Biologically Important Areas	0
Bioregional Assessments	1
Geological and Bioregional Assessments	0

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected and is accurate at the time of generation. Please see the caveat for interpretation of information provided here. Consider carefully the age of information for decision making.

Report Metadata	Caveat

Listed Threatened Ecological Communities

Community ID	Community Name	Threatened Category	Website	Presence Rank
146	Shale Sandstone Transition Forest of the Sydney Basin Bioregion	Critically Endangered	Species Profile and Threat Database (SPRAT)	May
119	Castlereagh Scribbly Gum and Agnes Banks Woodlands of the Sydney Basin Bioregion	Endangered	Species Profile and Threat Database (SPRAT)	May
38	Turpentine-Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Species Profile and Threat Database (SPRAT)	Likely

171	Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Species Profile and Threat Database (SPRAT)	May
140	Coastal Upland Swamps in the Sydney Basin Bioregion	Endangered	Species Profile and Threat Database (SPRAT)	May
47	Blue Gum High Forest of the Sydney Basin Bioregion	Critically Endangered	Species Profile and Threat Database (SPRAT)	Likely
129	Cooks River/Castlereagh Ironbark Forest of the Sydney Basin Bioregion	Critically Endangered	Species Profile and Threat Database (SPRAT)	May

12.13 CORRESPONDENCE

12.13.1 Fisheries Permit

From: Karthika Krishna Pillai <karthika.krishnapillai@dpi.nsw.gov.au>
Sent: Monday, August 26, 2024 9:33 AM
To: Craig Naughton <cnaughton@hornsby.nsw.gov.au>
Subject: RE: Advice on Part 7 permit application - Hornsby Shire

Hi Craig

Thank you for the email.

The Larool Creek is not a mapped key fish habitat and there are no mapped threatened fish species in this creek.

However, the creek joins Waitara Creek further downstream which is mapped key fish habitat of class 3.

It is recommended that erosion and sediment mitigation devices are erected in a manner consistent with current Best Management Practice (i.e. Managing Urban Stormwater: Soils and Construction 4th Edition Landcom, 2004) to prevent entry of sediment into the waterway prior to any earthworks being undertaken. These are to be maintained in good working order for the duration of the works and subsequently until the site has been stabilised and the risk of erosion and sediment movement from the site is minimal.

Kindly get in touch if you need any further information.

Karthika Krishna Pillai | Fisheries Manager – Coastal Systems Unit
NSW Department of Primary Industries and Regional Development | Fisheries
66 Harrington St, The Rocks, Sydney, NSW, 2000
M: 0456 985 908| E: karthika.krishnapillai@dpi.nsw.gov.au

13 APPENDIX C CLAUSE 171(2) OF THE ENVIRONMENTAL PLANNING AND ASSESSMENT REGULATION 2021

This REF has been prepared in accordance with the requirements of the *EP&A Act* and *EP&A Regulation*. The matters listed in Clause 171(2) of the *EP&A Regulation* must be taken into account when assessing the environmental impact on the environment. A summary assessment of these matters is provided below and is supported by the information provided in the body of this REF.

Factors to consider	Consideration
a) Any environmental impact on a community	• Some temporary noise and traffic disruptions during works and visual impacts have been considered in this assessment. • Adverse impacts would be temporary and minimised as a result of identified mitigation measures during construction. • No significant impacts on the community would occur as a result of the proposed works.
b) Any transformation of a locality	• The GPT would be permanently visible
c) Any environmental impact on the ecosystems of the locality	• Nil
d) Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of a locality	• The construction impacts of the proposed works on the aesthetic, recreational and scientific values of the locality would be temporary. • The permanent structure would be predominantly located outside the area of environmental value
e) Any effect on a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or other special value for present or future generations	• No impacts are anticipated due the degraded and altered state of the sites

f) Any impact on the habitat of protected fauna (within the meaning of the National Parks and Wildlife Act, 1974)	• The proposed works would have very minor impacts on temporary habitats of fauna during construction.
g) Any endangering of any species of animal, plant or other form of life, whether living on land, in water or in the air	• No significant effects on flora and fauna would occur as a result of the proposed works.
h) Any long-term effects on the environment.	• No significant long-term adverse effects on the environment as a result of the proposed works.
i) Any degradation of the quality of the environment	• The proposed works would not result in degradation of the quality of the environment.
j) Any risk to the safety of the environment	• No risks or adverse effects to the environment would result from the works.
k) Any reduction in the range of beneficial uses of the environment	• The proposed works would not result in any reduction in the range of beneficial uses of the environment.
l) Any pollution of the environment	• The proposed works would not result in any pollution of the environment by the correct implementation of appropriate mitigation measures.
m) Any environmental problems associated with the disposal of waste	• The disposal of waste soils (if any) and other wastes generated would not have any significant environmental impacts.
n) Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	• The works would not increase demand on resources in short supply.
o) Any cumulative environmental effect with other existing or likely future activities	• The cumulative environmental effect would be positive

p) Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	• The project is not located in an area where coastal processes and hazards are applicable
q) Any applicable local strategic planning statement, regional strategic plan or district strategic plan made under Division 3.1 of the Act	• No strategic plans are relevant to the proposal
r) Any other relevant environmental factors	• Nil

14 APPENDIX D PROJECT SENIOR STAFF

Dr. Meredith Brainwood

Dr. Meredith Brainwood undertook detailed review. Meredith holds a Bachelor of Applied Science (Environmental Science), a Master of Science (Honours) and completed a PhD in Ecohydromorphology.

Meredith has extensive experience in preparing plans of management, aquatic and terrestrial flora and fauna surveys, and the development of rigorous scientific methodologies. She held contract roles with companies such as A&S Bushcare Services, National Trust Bushland Management Services, Good Bush People and NSW National Parks and Wildlife Service. Meredith worked as a senior environmental scientist with Australian Wetlands before joining Applied Ecology Pty Ltd.

Anne Carey

Anne undertook field work, report writing and mapping for the project. Anne has a Degree in Science (Conservation Biology) and a Masters Degree in Wildlife Management and has over 20 years industry experience. Prior to Applied Ecology, Anne worked as the Operations Manager at Australian Wetlands (Sydney Design group), as an Environmental Manager for PSP- an alliance of private companies delivering infrastructure projects for Sydney Water, as field ecologist, undertaking fauna and flora assessments and vegetation mapping, for various companies including NSW National Parks and Wildlife Service.