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Review of Environmental Factors

Carlingford Road and Hepburn Avenue Traffic Signals Upgrade

Report prepared by Narla Environmental Pty Ltd

For City of Parramatta Council

October 2020

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environmental

Report:	Carlingford Road and Hepburn Avenue Traffic Signals Upgrade
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Report Certification

Works for this report were undertaken by:

Staff Name	Position	Role
Emily Rix *BSc (Hons)*	Narla Environmental – Project Manager/Ecologist	Document Review, Project Management, Desktop Review
James Kirk *BEnvSci*	Narla Environmental – Project Coordinator/Ecologist	Field Ecologist, Mapping, Reporting

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Executive Summary

City of Parramatta Council (CoP) propose to install traffic signals at the Hepburn Avenue and Carlingford Road Intersection (the proposal area) as a part of the high-density residential developments nearby in Keeler Street, Carlingford NSW. The proposal aims to improve safety and traffic flow through the area in response to increasing traffic volume.

Key features of the proposal are:

- New traffic signals at the intersection of Carlingford Rd and Hepburn Ave.
- Signalised pedestrian crossings on Carlingford Rd and Hepburn Ave.
- Dedicated right hand turn from Carlingford Rd into Hepburn Ave.
- "No Stopping" along Hepburn Ave immediately adjacent to the intersection with Carlingford Rd.
- "No Parking" restrictions in Hepburn Ave (western side to Keeler Street) during morning and afternoon peaks to improve traffic flow at the intersection.
- Existing clearways along Carlingford Rd will exist outside the proposed areas of "No Stopping" as required by Traffic Signal Design Guidelines.
- Reconstruction of footways and ramps to improve accessibility.

Local government boundary changes in May 2016, resulted in the area south of the M2 Motorway removed from Hornsby Shire LGA by the State Government and given to the City of Parramatta Council LGA. As a result, the Hornsby Shire planning legislation including the Development Control Plan (DCP) and Local Environmental Plan (LEP) has been adopted for the purpose of this Review of Environmental Factors.

The objectives of the proposal are:

- Improve traffic flow;
- Provide for safe and efficient movement of vehicles and pedestrians within the locality; and,
- Minimise environmental impacts.

Clause 94 of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) permits development, on any land, for the purpose of a road or road infrastructure facilities to be to be carried out by or on behalf of a public authority without consent. As the proposal meets the definitions of 'road infrastructure facilities' provided for by clauses 93 and 94(2) of the ISEPP, and is being carried out by CoP, it is permissible without consent under ISEPP. As a result, it can be assessed under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act), and development consent is not required. A review of environmental factors (REF) has been prepared.

Aboriginal Heritage

The proposal area contains no evidence of past Aboriginal occupation. No sites have been previously recorded on the Aboriginal Heritage Information Management System (AHIMS) within 200 metres of the proposal area. No impact to Aboriginal sites is anticipated.

There are no non-aboriginal heritage items located within proximity to the proposal area. A search of the NSW State Heritage Inventory indicated no items in the vicinity of the proposal area are included on the State Heritage Register, therefore no s60 applications are required. The Hornsby LEP (2013) revealed no proximal local heritage items that have potential for impact under the proposal.

Biodiversity

Vegetation within the proposal area was largely comprised of a series of small fragmented median-strips comprised of common exotic roadside grasses and forbs. Exotic species included *Bromus catharticus*, *Bidens pilosa*, *Rumex acetosa*, *Soliva sessilis*, *Taraxacum officinale* and *Plantago lanceolata*.

One (1) *Eucalyptus saligna* (Sydney Blue Gum) was located in a private property, overhanging part of the proposal area. The *Eucalyptus saligna* is consistent with the definition of the critically endangered ecological community Blue Gum High Forest in the Sydney Basin Bioregion under the BC Act. This tree may require trimming however it will not be removed.

No threatened flora species were recorded in the proposal area during the field surveys carried out in August 2020. No threatened fauna or suitable threatened fauna breeding habitat was identified within the proposal area.

A test of significance in accordance with the BC Act was carried out for Blue Gum High Forest. With appropriate safeguards, the proposal would be unlikely to have a significant impact on any listed threatened species, populations or ecological community.

Noise and Vibration

The desktop noise and vibration assessment determined that during construction, noise levels at surrounding receivers are unlikely to exceed day, evening or night time noise management levels during all phases of construction, or sleep disturbance guidance values.

Social and Visual

Visual and landscape impacts would occur during construction and operation. Construction impacts would include a changed visual environment from the presence of construction plant, equipment, and temporary ancillary facilities.

The proposal has the potential for both wider regional and local positive benefits in the medium to long term through improved road safety and freight efficiency. However, during construction, the community would experience temporary noise and visual amenity cumulative impacts.

There would be minor impacts associated with air quality. These impacts would be managed using the safeguards and mitigation measures included in this REF.

Traffic and Transport

The proposal would cause temporary disruptions to traffic, including reduced speed limits, potential changes to property access and increased heavy vehicle movements on the existing road network during the construction.

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Glossary

Acronym/Term	Definition
AHIMS	Aboriginal Heritage Information Management System
Aquatic organisms	Organisms that live in water – stored water, river and streams
BC Act	Biodiversity Conservation Act 2016
BDAR	Biodiversity Development Assessment Report
Biodiversity	Variety and number of different species living in an ecosystem or a defined geographic area
Biosecurity Act	Biosecurity Act 2015
Catchment	The area of land draining to a waterway. May also refer to areas served by a wastewater or stormwater system
CEMP	Construction Environmental Management Plan
CoP	City of Parramatta Council
DBH	Diameter at Breast Height
DDA	Disability Discrimination Act 1992
DPI	Department of Primary Industries
Ecologically sustainable development (ESD)	Development that improves the quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends
Ecosystem	A community of organisms, interacting with one another, and the environment in which they live. Processes occurring within an ecosystem are the flow of energy by food chains and food webs and nutrient cycling.
CEEC	Critically Endangered Ecological Community
EP&A Act	Environmental Planning and Assessment Act 1979
Emission	Anything given off as a result of a process, for example, gases, heat and odours.
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMS	Environmental Management System, the framework for the management of environmental issues
Environmental impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products and services
EPA	Environmental Protection Authority
EP&A Act	Environmental Planning and Assessment Act 1979
EP&A Regulation	Environmental Planning and Assessment Regulation 2000

Acronym/Term	Definition
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
FM Act	Fisheries Management Act 1994 (NSW)
Freshwater	Water found in lakes, rivers, streams; generally containing less than 1,000 mg/L of dissolved solids (salts)
Groundwater	Water found below the surface, usually in porous rock or soil or in underground aquifers (natural underground formations that contains sufficient saturated, permeable material to yield significant quantities of water)
ha	hectare
Heritage Act	Heritage Act 1977 (NSW)
ISEPP	State Environmental Planning Policy (Infrastructure) 2007
LEP	Local Environment Plan – a statutory environmental planning instrument under the EP&A Act
LGA	Local Government Area
NPWS	National Parks and Wildlife Service
OEH	Office of the Environment and Heritage
pH	A measure of the alkalinity or acidity of water expressed on a scale from 1 to 14: 1 is most acidic, 7 neutral and 14 most alkaline
Pollutants	Contaminants in water, soil or air that, when in sufficient quantity, may cause environmental degradation
Proposal area	Limit of works area for the Carlingford Road and Hepburn Avenue Intersection Upgrade
REF	Review of Environmental Factors (this document)
Sediment	Soil or other particles that settle to the bottom of lakes, rivers, oceans and other waters
SEPP	State Environmental Planning Policy – a statutory environmental planning instrument under the EP&A Act
SHR	State Heritage Register
SIS	Species Impact Statement
Stakeholder	A stakeholder is any individual or group, which can affect or is affected by an organisation's activities
Survey Area	Public land within the Carlingford Road easement
TEC	Threatened Ecological Community
Turbidity	This is a measure of suspended material in water that may cause it to look muddy or discoloured. It is measured in Nephelometric Turbidity Units (NTU)
Waterways	All streams, creeks, rivers, estuaries, inlets and harbours
Wetland	A wetland is a low-lying area of land often inundated or permanently covered by shallow water. They play a major role in the water cycle by storing and filtering water and replenishing underground water supplies. Wetlands can also be effective in cleaning polluted water by reducing aquatic plant nutrients, suspended solids and oxygen demands

1. Introduction

1.1 Background Information and Proposed Activity

The proposed activity involves the installation of traffic signals and pedestrian crossings at the intersection of Carlingford Road and Hepburn Avenue as well as associated works reconstructing and improving five (5) footpaths and kerbside ramps (75m^2). These proposed activities will involve the removal/trimming of one (1) *Eucalyptus saligna* and exotic species. A detailed description of the proposed activity is provided in Section 2.4.

For the purposes of these works, CoP is the proponent and the determining authority under Part 5 of the EP&A Act.

1.2 Purpose of the Review of Environmental Factors

This REF has been commissioned by CoP to assess the environmental impacts associated with the proposed activity in order to meet the relevant due diligence environmental requirements pursuant Part 5 of the Environmental Planning and Assessment Act 1979 (EP&A Act) and State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) for public works activities.

The purpose of the REF is to:

- Document the likely impacts of the proposal on the environment; and
- Detail protective measures to be implemented to mitigate impacts

The description of the proposal and the identification of associated environmental impacts have been undertaken in consideration of the EP&A Act, clause 228 of the Environmental Planning and Assessment Regulation 2000, the Biodiversity Conservation Act 2016 (BC Act), Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) NSW National Parks and Wildlife Act 1974 (NPWS Act) and the Fisheries Management Act 1994 (FM Act) when determining:

- Whether the proposal is likely to have a significant impact on the environment and therefore the necessity for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning and Public Spaces under Division 5.1 of the EP&A Act;
- The significance of any impact on threatened species as defined by the BC Act and/or the FM Act, and the requirement for a Species Impact Statement or a Biodiversity Development Assessment Report;
- The significance of any impact on nationally listed biodiversity matters under the EPBC Act, including whether there is a real possibility that the activity may threaten long-term survival of these matters, and whether offsets are required and able to be secured; and
- The potential for the proposal to significantly impact a Matter of National Environmental Significance or Commonwealth land and the need to make a referral to the Australian Government Department of Environment and Energy for a decision by the Commonwealth Minister for the Environment on whether assessment and approval is required under the EPBC Act.

Under section 111 of the EP&A Act, CoP is responsible for assessing the impacts of its activities. Consideration of the factors outlined in this report enables Council as the proponent to take into account, to the best possible extent, all matters that may affect or are likely to affect the environment.

1.3 Location of proposed activity

The proposed activity is located at the intersection of Carlingford Road and Hepburn Avenue, Carlingford.

Figure 1. Carlingford Road opposite Hepburn Avenue (eastbound).

Figure 2. Carlingford Road opposite Hepburn Avenue (westbound).

1.4 Description of the proposed activity

The proposed works are to include:

- New traffic signals at the intersection of Carlingford Rd and Hepburn Ave.
- Three (3) signalised pedestrian crossings on Carlingford Rd and Hepburn Ave.
- Dedicated right hand turn from Carlingford Rd into Hepburn Ave.
- "No Stopping" along Hepburn Ave immediately adjacent to the intersection with Carlingford Rd.
- "No Parking" restrictions in Hepburn Ave (western side to Keeler Street) during morning and afternoon peaks to improve traffic flow at the intersection.
- Existing clearways along Carlingford Rd will exist outside the proposed areas of "No Stopping" as required by Traffic Signal Design Guidelines.
- Reconstruction of footways and ramps to improve accessibility.

Any additional scope of works required that are not included in this REF must be addressed in an amendment to this REF before works commencement. Refer to **Appendix A** for the engineering design.

1.5 Existing infrastructure

1.5.1 Road Infrastructure

Carlingford Road extends for a distance of approximately 2.9 kilometres, and acts as an important connection between Pennant Hills Road and Epping Station. The road is also under an increasing amount of traffic volume to the development of higher density housing along Carlingford Road and parallel Keeler Street. The proposal area consists of a dual lane in each direction along Carlingford Road and a single lane in each direction along Hepburn Avenue. The existing lane widths are about 3.5 metres (**Figure 3**). Property accesses along both sides of Carlingford Road within the proposal area include formal driveways to access residential properties. Bus stops are located within the proposal area on both sides of Carlingford Road Carlingford Road Near Kent Street is located on the eastbound side and Carlingford Road After Kent Street is located on the westbound side.

1.5.2 Surrounding Land

The works will span approximately 50 metres of Carlingford Road and 20 metres of Hepburn Avenue and are situated within the City of Parramatta Local Government Area (LGA). The proposal is bordered by private residences.

1.5.2.1 Native Vegetation

One (1) *Eucalyptus saligna* is located in a private property adjacent to the proposal area. This *Eucalyptus saligna* conforms to Blue Gum High Forest which is listed as Critically Endangered Ecological Community (CEEC) under the Biodiversity Conservation Act 2016 (BC Act). See **section 5.3.2.1** for further details.

1.5.2.2 Heritage Values

A search of the Aboriginal Heritage Information Management System (AHIMS), revealed no Aboriginal Heritage archaeological sites located in the vicinity (200m) of the proposal area. A search of the NSW State Heritage Inventory indicated no items in the vicinity of Carlingford Road are included on the SHR. The nearest heritage item listed on the SHR is St. Pauls Anglican Church (former) which is located approximately 1km from the proposal area. The Hornsby LEP lists the nearest heritage item (Epping West Public School), which is located approximately 1km from the proposal area. No heritage items were listed in the Parramatta LEP.

Figure 3. Location of the Proposal Area

2. Proposal objectives and development criteria

2.1 Objectives of the proposal

The objectives of the proposal are to:

- Improve traffic flow;
- Provide for safe and efficient movement of vehicles and pedestrians within the locality; and,
- Minimise environmental impacts.

2.2 Strategic need for the proposal

The installation of traffic signals was proposed by the Former Hornsby Shire Council at the intersection of Carlingford Road and Hepburn Avenue as part of the high-density residential developments in Keeler Street. The Hornsby Development Control Plan (DCP) identified a number of traffic management works to provide for safe and efficient movement of vehicles and pedestrians around the area as the population grows. As part of these works the intersection of Carlingford Rd and Hepburn Ave in Carlingford will be upgraded to traffic signals by the City of Parramatta Council.

2.3 Alternatives and selection of the preferred option

2.3.1 Option 1: Do nothing

This option involves the existing intersection remaining as is. Traffic efficiency would not be improved and as a result, intersection delays would increase and traffic queues would extend into adjacent intersections.

2.3.2 Option 2: Construction of Traffic Light Signal at the intersection of Carlingford Road and Hepburn Avenue

Option 2 involves the construction of traffic light signals at the intersection of Carlingford Road and Hepburn Avenue in order to provide for safe and efficient movement of vehicles and pedestrians around the area as the population grows. The proposed traffic signals are being designed in accordance with the requirements of the Disability Inclusion Action Plan and will provide signalised pedestrian and bicycle crossing facilities in Carlingford Road and Hepburn Avenue.

This is the preferred option.

Proposal Objectives	Analysis
Improve traffic flow	Option 2 will improve traffic flow and reduce banked traffic along Hepburn Avenue.
Provide for safe and efficient movement of vehicles and pedestrians within the locality	Option 2 will provide safe and efficient movement for vehicles and pedestrians along Hepburn Avenue and Carlingford Road.
Minimise environmental impacts	Environmental impacts are minor. A small portion of exotic, roadside groundcover vegetation will require removal to facilitate the traffic signals. No significant increase in noise. Potential impacts will be minimised by implementation of the safeguards are identified in this REF.

2.4 Construction Activities

Construction activities will be guided by a Construction Environmental Management Plan (CEMP) to ensure work is carried out to CoP specifications within the proposal area. Detailed work methodologies will be identified by the construction contractor. The staging of construction will be sequenced so as to complete construction within the minimum possible timeframe, while maintaining traffic flow through the work zones at all times.

2.4.1 Construction Methodology

The following methodology and sequence will be employed for implementation of the project:

- Council will open tenders to select and appoint principal contractor for implementing the project:
- Trees and shrubs approved for removal shall be removed to make way for construction activities;
- Demolition work for existing footpath, kerb and gutter and other existing features shall be undertaken as per the sequencing proposed by the principal contractor;
- Traffic Control Signal (TCS) posts including all ancillary fittings and fixtures on them shall be installed as per TfNSW approved TCS design;
- Streetlighting shall be installed as per AusGrid approved design;
- New kerb and gutter shall be constructed;
- Concrete kerb ramps shall be constructed as per approved civil design;
- New footpath and associated concrete structures are constructed as per approved civil design;
- Existing road pavement shall be profiled as preparation for new road pavement as per approved civil design;
- New road pavement and TCS detector loops shall be installed as per approved civil design and TCS design respectively;
- New line markings shall be done as per approved TSC design;
- New Traffic Signals shall be commissioned as per TSC design; and
- Landscape works shall be completed.

2.4.2 Construction Timeline

Construction works are estimated to have a duration of approximately 4 months. The expected schedule for construction is between July 2021 to October 2021.

2.4.3 Construction Hours

Works will take place in accordance with the Interim Construction Noise Guideline (DECC 2009):

- Monday to Friday 7.00am to 5.00pm
- Saturday 8.00am to 5.00pm
- No work on Sunday or public holidays

There is potential for works to be undertaken outside these hours. If work outside standard hours is required then they will be undertaken in accordance with the NSW Interim Construction Noise Guidelines.

2.4.4 Plant and Equipment

A variety of plant and equipment will be required for the construction. The final plant and equipment will be determined by the construction contractors however an indicative list is provided below.

- Excavator;
- Loader;
- Bobcat;

- Roller/Compactor;
- Profiler;
- AC laying machine;
- Concrete and Asphalt saw-cutter;
- Haulage trucks;
- Chainsaw, cherry picker; and
- Vacuum trucks.

2.4.5 Traffic Management

Traffic management will be required during construction. The work would be staged to minimise traffic impacts.

2.4.6 Changes to the Scope of Work

If the scope of work or construction methods described in this document change significantly following the awarding of the contract, supplementary environmental impact assessment must be prepared for the amended components.

2.5 Adherence to Principals of Ecologically Sustainable Development

The most common and broadest definition of Ecologically Sustainable Development (ESD) is 'development that improves the quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends' (Environment Australia 1992). The proposal must be considered in accordance with the four principles of ESD as outlined in section 6(2) of the Protection of the Environment Administration Act 1991 and Schedule 2 of the EP&A Regulation.

These principles are described below:

- The precautionary principle;
    - If there are threats of serious or irreversible damage to the environment, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- Intergenerational equity;
    - The present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations.
- Conservation of biological diversity and ecological integrity;
    - These are fundamental considerations to the sustainability of development.
- Improved valuation, pricing and incentive mechanisms;
    - Cost-effective market mechanisms to attribute externalities.

The principles of Ecologically Sustainable Development have been incorporated from the conception of the proposal, through to and as part of, the environmental impact assessment process. The potential environmental risks associated with the proposal have been identified. Appropriate mitigation measures have been recommended for implementation during the construction and operational phases of the proposal. The project aims to have minimal impacts to the surrounding environment by being located predominantly within the footprint of the existing road. This minimises the requirement to disturb vegetation and fauna habitat within the locality. Active impact mitigation measures will be put in place to prevent significant impact to any known or potentially occurring threatened fauna, flora or ecological community. Such mitigation measures are discussed throughout this report.

3. Statutory and Planning Framework

3.1 Local Environment Plans (LEP)

3.1.1 Parramatta Local Environmental Plan 2011

The proposed activity is located within the Parramatta LGA on Land zoned as SP2 - Infrastructure. **Table 1** includes a summary of the planning information relevant to the proposal area.

Table 1. Zoning and Objectives

Zoning	SP2 - Infrastructure
Objectives of the Zone	▪ To provide for infrastructure and related uses. ▪ To prevent development that is not compatible with or that may detract from the provision of infrastructure.
Permitted without consent	▪ Environmental protection works; ▪ Roads; ▪ Water reticulation systems
Permitted with consent	▪ Aquaculture; ▪ The purpose shown on the Land Zoning Map, including any development that is ordinarily incidental or ancillary to development for that purpose

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
The proposal falls within the scheme of *'Roads';* which are permitted with consent under the Hornsby LEP 2011. However, Assessments of activities under the EP&A Act as prescribed in SEPP Infrastructure do not require assessment under an LEP or associated DCP.

3.2 Commonwealth Legislation

3.2.1 Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

Approval from the Environment Minister is required if an action is likely to have a significant impact on a Matter of National Environmental Significance (MNES) or if it is listed as a matter of national significance.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
Threatened Ecological Communities The one (1) *Eucalyptus saligna* (Sydney Blue Gum) that overhangs the location in which one of the traffic signals is proposed to be installed does not meet the criteria for listing under the EPBC Act. **Threatened Flora** No habitat for Commonwealth threatened flora or terrestrial fauna will be impacted by the proposed activity. **Threatened Fauna** It is likely that the vulnerable *Pteropus poliocephalus* (Grey-headed Flying-fox), and the endangered *Lathamus discolor* (Swift Parrot), may forage in the single Blue Gum tree that overhangs the proposal area, on occasion when the tree is in flower. These species are highly mobile and nomadic species and will forage or pass over the proposal area during part of their lifecycle. No breeding is likely to occur for either species. The lifecycle of either of these species will not be significantly impacted as they are highly mobile and unlikely to rely on any of the trees proposed for removal for foraging and/or breeding. **Assessment of Significance** No MNES species or ecological communities were deemed likely to occur in the proposal area during or post construction works, therefore no further assessment of MNES or referral to the Commonwealth Department of Environment (DoE) is required.

3.3 State Legislation

3.3.1 Environmental Planning and Assessment Act 1979

The NSW Environmental Planning and Assessment Act 1979 (EP&A Act) and its associated regulations provide the framework for assessing environmental impacts and determining planning approvals for developments and activities in NSW. The EP&A Act also establishes State Environmental Planning Policies (SEPPs) and Local Environmental Plans (LEPs).

Under the EP&A Act, CoP is classified as a proponent and a determining authority (under Part 5 of the Act). A project can be assessed by a determining authority under Part 5 of the Act if it:

- may be carried out without development consent;
- is not a prohibited development; and
- is carried out, or approved, by a determining authority.

This REF has been prepared to determine if the proposal is likely to have a significant impact on the environment. If a determining authority decides an activity is likely to significantly affect the environment, it must either apply the Biodiversity Offsets Scheme or prepare a Species Impact Statement (SIS).

The proposed work is unlikely to have a significant impact on the environment or a threatened species, population or ecological community, and is not on land that is declared critical habitat. Therefore, an SIS is not required to be prepared, nor is the BOS applied.

CoP intends to carry out the proposed activity under Part 5 of the EP&A Act. Accordingly, they must satisfy Sections 5.5 and 5.7 of that Act by examining, and taking into account to the fullest extent possible, all matters that are likely to affect the environment. This REF is intended to assist, and ensure compliance, with the EP&A Act including Sections 5.5 and 5.7.

Clause 228 of the EP&A Regulation lists factors that must be taken into account when considering the likely impact of an activity on the environment. Consideration of these factors is presented in section 6.2.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
The proposed activity is considered development that does not need consent under section 4.1 of the EP&A Act. This means that the activity may be carried out, in accordance with the ISEPP by or on behalf of Council as a public authority without the need for development consent. However, as the proposed activity is not 'exempt development', it required an assessment under Part 5 of the EP&A Act comprising this REF.

3.3.2 Biodiversity Conservation Act 2016

The Biodiversity Conservation Act 2016 (BC Act) aims to conserve and protect certain classes of threatened; vulnerable and endangered species, populations and ecological communities.

Impacts to species, populations, or ecological communities listed under the BC Act have been assessed against section 7.3 being the test for determining whether proposed development or activity will be likely to significantly affect threatened species or ecological communities, or their habitats (Test of Significance).

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
Tests of significance are contained in **Appendix E** of this REF. One (1) *Eucalyptus saligna* (Sydney Blue Gum) overhangs the location in which one of the traffic signals is proposed to be installed. This tree conforms to Blue Gum High Forest in the Sydney Basin Bioregion (BGHF) which is listed as a Critically Endangered Ecological Community (CEEC) under the BC Act. As a result, this tree will be required to be pruned to facilitate the installation of the traffic signal. A Tests of Significance (5-part test) pursuant to section 7.3 of the BC Act determined that the proposed activity will have no significant impact such that no local viable population of a species and no local occurrence of a threatened ecological community will be placed at risk of extinction. Therefore, no further impact assessment such as a Biodiversity Development Assessment Report (BDAR) or a Species Impact Statement (SIS) will be required for this project to commence.

3.3.3 Water Management Act 2000

The Water Management Act 2000 (WM Act) provides the statutory framework for works along rivers, lakes and estuaries. The Act's definition of 'river' includes any watercourse, including an artificially improved channel, but not a piped drain. The definition of 'lake' includes any body of natural or artificial still water, including a wetland. In an urban context, the Act would apply to any river, creek, (open) drainage channel, lake or pond.

A Controlled Activity Approval under s91 of the WM Act is not required as the proponent is a public authority and therefore exempt under s38 of the WM Regulation 2011.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
No mapped watercourses occur within the proposal area. A Controlled Activity Approval under s91 of the WM Act is not required as the proponent is a public authority and therefore exempt under s38 of the WM Regulation 2011.

3.3.4 National Parks and Wildlife Act 1974

The NPW Act provides protection for National Parks, Nature Reserves, State Conservation Areas and Flora Reserve estates, only Aboriginal Heritage (other state heritage subject to Heritage Act 1977). Certain activities require permit under the NPW Act before proceeding including working within a National Park.

The NPW Act provides specific protection for Aboriginal objects and places by making it an offence to destroy, deface, damage, or move them from the land. The Due Diligence Code of Practice for the Protection of Aboriginal Objects in New South Wales as adopted under the NPW Act and regulations, provides guidance to individuals and organisations to exercise due diligence when carrying out activities that may harm Aboriginal objects and to determine whether they should apply for consent in the form of an Aboriginal Heritage Impact Permit (AHIP). An assessment for non-Aboriginal Heritage under the Heritage Act 1977 has been addressed in section 5.1.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
The proposal area is not located within or near a national park or any other conservation estate. A search of the Aboriginal Heritage Information Management System (AHIMS) revealed there were no registered Aboriginal objects or places within 200m of the proposal area. Desktop assessment revealed the site did not contain any Aboriginal objects or landforms that suggest Aboriginal objects are likely. The due diligence approach for this assessment deems no further assessment for Aboriginal heritage is required.

3.3.5 Fisheries Management Act 1994

The provisions of the Fisheries Management Act 1994 (FM Act) relating to the development approval process operate similarly to the BC Act. The Act identifies threatened aquatic species, populations and ecological communities and requires a test of significance if such species could be impacted by the activity.

Activities that trigger the requirement for City of Parramatta to notify Fisheries include:

- Dredging or reclamation of waterways, including removal of snags or aquatic vegetation;
- Temporary or permanent blockage of fish passage requires a permit under section 219.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
No threatened species or ecological communities listed under the FM Act are considered likely to occur within the proposal area. There is no Key Fish Habitat as declared under the FM Act within the proposal area. The proposed activity will no cause an obstruction to any mapped watercourse or any Key Fish Habitat.

3.3.6 Wilderness Act 1987

The *Wilderness Act 1987* applies to the protection and management of wilderness areas. A 'wilderness area' means lands (including subterranean lands) declared to be a wilderness area under this Act or the *National Parks and Wildlife Act 1974*. The objective of this Act is to provide for the permanent protection of wilderness areas, the proper management of wilderness areas, and to promote the education of the public in the appreciation, protection and management of wilderness. Wilderness areas shall be managed to restore and protect unmodified areas of their plant and animal communities. Wilderness areas shall also be managed to preserve the capacity of an area to evolve without significant human interference and permit opportunities for solitude and appropriate self-reliant recreation.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
The proposal area and surrounds are not classified as a wilderness area.

3.3.7 Rural Fires Act 1997

The Rural Fires Act 1997 is implemented by the Rural Fire Service and aims to provide for the prevention, mitigation and suppression of bush and other fires in local government areas and rural fire districts. The Act also includes an aim of coordinating bush firefighting and prevention, protection of persons from injury and death and property from damage due to fires. Under this Act there is a continuous chain of command from the Commission to the firefighter within the NSW Rural Fire Service. It has an emphasis on having regard to the principles of ecologically sustainable development when carrying out firefighting and prevention activities included in this Act.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
The proposal area occurs entirely outside mapped *Bushfire Prone Land*. The proposal is not expected to impact upon bushfire risk or current protections.

3.3.8 Protection of the Environment Operations Act 1997 (PoEO Act)

Under this Act, should an activity involve the pollution of waters, defined under the Act as any chemical, biological, physical change to existing water quality (i.e. turbidity, release of untreated wastewater) an Environment Protection License should be sought from DPIE under the PoEO Act. In addition, the Act relates to any pollution of the environment through noise, air and waste. The Act also obliges the Contractor to notify DPIE when a "pollution incident" occurs that causes or threatens "material harm" to the environment.

The PoEO Act also establishes the licensing framework and classification system for managing and regulating waste in NSW. The Act was amended on 28 April 2008 updating the way wastes are classified and replaces the Environmental Guidelines: Assessment, Classification & Management of Liquid & Non-liquid Wastes. See **section 6.1** for further information regarding the removal and disposal of site waste as outlined by the Proposal.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
The hours of operation will be: Works will only take place generally in accordance with the Interim Construction Noise Guideline (DECC 2009): ▪ Monday to Friday 7:00am to 5:00pm ▪ Saturday 8:00am to 5:00pm ▪ No work on Sunday or public holidays There should be minimal air pollution as the proposed materials are not fibrous, however; all soil and dust should be kept wet to reduce the incidence of particle matter. The use of trucks and vehicles to transport personnel and materials to and from site are not expected to increase local pollution levels significantly beyond standard levels. Effort will be taken to minimise vehicle use and idling of unused vehicles. Sedimentation and erosion control measures shall be put in place during the entire construction of the proposed activity. Planning advice on previous projects has recommended that the sedimentation and erosion control measures be taken from 'The Blue Book' 'Managing Urban Stormwater: Soils and Construction' (Landcom 2004). Planned project works are not expected to result in excess excavated spoil. Construction methodology by the project is designed to have minimal disturbance to the site which includes excavation for the creation of kerb ramps at the pedestrian crossings and some footpaths which will require reconstruction to improve access to the kerb ramps. Any excess spoil should be removed from site as not to cause any potential for sedimentation occurrence into nearby drains or local waterways. Any spoil not suited for retaining on-site shall be removed to an approved disposal facility. If any asbestos is found on site, works will be stopped immediately and the location of the asbestos reported to the Project Manager. Appropriate measures to remove this waste to approved asbestos landfill sites as dictated by Council and in accordance with the Protection of the Environment Operations (Waste) Regulation 2014 and SafeWork NSW Codes of Practice will take place.

3.3.9 Heritage Act 1977

The NSW Heritage Act 1977 is a statutory tool designed to conserve the cultural heritage of NSW and used to regulate development impacts on heritage assets. Works to item listed on the State Heritage Register (SHR) or likely to disturb archaeological remains will require approval from the Heritage Council under s60 of the Act.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
A search of the NSW State Heritage Inventory indicated one (1) Heritage Item (St. Paul's Anglican Church (former) occurs within 1km of the proposal area. This item will not be impacted by the proposal. Within the vicinity of the proposal, four (4) Heritage items have been mapped within the Heritage Register within the Hornsby LEP. These items are not likely to contain archaeological relics due to a high level of disturbance from previous road and utility construction works. These Heritage Items occur approximately 1km west of the proposal area, and will not be impacted by the proposal. An assessment under the Heritage Act 1977 has been addressed in **Section 5.2**.

3.3.10 Biosecurity Act 2015

The Biosecurity Act 2015 includes mechanisms to control the impact of weeds and pest animals through the monitoring, reporting and effectiveness of weed management. Council has an obligation to control Environmental Weeds under this Act on their land. It also has an obligation to prevent Environmental Weeds from spreading to adjoining land.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
No Priority weeds were located within the proposal area. The proponent will ensure that the proposed activity does not facilitate the introduction or encourage growth of weeds. This will be achieved through careful selection of construction materials. Contractors on the site are to ensure footwear is correctly cleaned prior to entering and leaving the site to mitigate against further spread.

3.4 State Environmental Planning Policies (SEPP)

3.4.1 State Environmental Planning Policy (Infrastructure) 2007

The aim of State Environmental Planning Policy (Infrastructure) 2007 (ISEPP) is to facilitate the effective delivery of infrastructure across NSW it assists the NSW Government, local councils and the communities they support by simplifying the process for providing infrastructure like schools, hospitals, roads, railways, emergency services, water supply and electricity delivery. The policy includes specific planning provisions and development controls for 25 types of infrastructure works or facilities.

Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent.

As the proposal is for the upgrade of Carlingford Road and Hepburn Road intersection, to be carried out by CoP, it is to be assessed under Part 5 of the EP&A Act. Development consent from council is not required.

Additional SEPPs relating to the local environment and/or ecology have been assessed and found to not relate directly to the proposal area.

Is activity permissible under this legislation?
✓ Yes ☐ No
Justification
Clause 94 of ISEPP permits development on any land for the purpose of a road or road infrastructure facilities to be carried out by or on behalf of a public authority without consent. As the proposal is for the upgrade of an existing road (intersection), to be carried out on behalf of City of Parramatta Council, it can be assessed under Part 5 of the EP&A Act.

3.5 Government Agency and Stakeholder Involvement

3.5.1 ISEPP Consultation

A public authority, or person acting on behalf of a public authority, must not carry out specified development that this Policy provides with consent unless the authority or person has:

- Given written notice of the intention to carry out the development to the specified authority in relation to the development; and
- Taken into consideration any response to the notice that is received from that authority within 21 days after the notice is given.

4. Consultation

The installation of traffic signals was proposed by the Former Hornsby Shire Council at the intersection of Carlingford Road and Hepburn Avenue, Carlingford in response to the high-density residential developments in Keeler Street.

Residents in this area are experiencing delays and difficulties in turning right to and from Hepburn Avenue at Carlingford Road during peak hours. Furthermore, the nearest signalised pedestrian crossing in Carlingford Road is located at Rembrandt Street with is 350m west of Hepburn Avenue.

Accordingly, Traffic and Transport Services is proposing to install new traffic signals at the intersection of Carlingford Road and Pennant Hills Road. The proposed traffic signals will provide safe and efficient movement of pedestrians and vehicles in this area.

The proposed new traffic signals will support the high-density residential development in Keeler Street and provide safe and efficient movement of pedestrians and vehicles in this area.

5. Environmental Assessment

This section of the REF provides a detailed description of the potential environmental impacts associated with the construction and operation of the proposal. All aspects of the environment potentially impacted upon by the proposal are considered, including:

- Potential impacts on Matters of National Environmental Significance (MNES) listed under the EPBC Act;
- Potential impacts on threatened species, populations, and ecological communities listed under the BC Act;
- Potential impacts on Aboriginal heritage listed under State Heritage Register and AHIMS Register;
- The factors specified in the guidelines Is an EIS required? (DUAP 1995/1996) as required under clause 228 (1) of the Environmental Planning and Assessment Regulation 2000 and the Roads and Related Facilities EIS Guideline (DUAP 1996);

The factors specified in clause 228(2) of the Environmental Planning and Assessment Regulation 2000 are considered in section 6.2. Site specific safeguards and management measures are provided to mitigate the identified potential impacts.

5.1 Aboriginal Heritage

A desktop assessment for the potential impacts on Aboriginal heritage during construction and operation of the proposal have been assessed in this REF. The potential impacts, and safeguards to mitigate them, are summarised below.

A search of the AHIMS database was carried out on 3rd September 2020. The proposal area for the desktop Aboriginal Heritage assessment is defined as the intersection of Carlingford Road and Hepburn Avenue, with a 200m buffer on either side of the road. This assessment was comprised of:

- An overview of the Aboriginal history of the proposal area;
- A search of the AHIMS Register maintained by the Office of Environment and Heritage (OEH 2019a).

No records were identified within 200m of the proposal. The AHIMS results report can be found in Appendix F.

5.1.1 Potential Impacts

The proposal will be largely restricted to existing road and pavement. It is highly unlikely any Aboriginal Heritage items will occur within the proposal area. Safeguards are provided to address the unexpected circumstance that Aboriginal Heritage items and sites are unearthed or encountered during the works.

The operation of the proposal would not adversely impact Aboriginal heritage significance of archaeological potential along the proposal area.

5.1.2 Safeguards and management measures

Suggested safeguards and management measures for Aboriginal heritage are presented in **Table 2.**

Table 2. Aboriginal heritage safeguards and management measures

Consideration	Environmental safeguards	Responsibility	Timing
Soil surface disturbance	Soil surface disturbance is to be limited to the existing road pavement and road verges which have been extensively, historically disturbed.	Contractor	Construction
Aboriginal Heritage – unexpected finds (e.g. artefacts or scar trees)	All personnel working on site will be made aware of relevant statutory responsibilities. The Standard Management Procedure – Unexpected Heritage Items (Roads and Maritime, 2015) should be followed in the event that an unknown or potential Aboriginal object, including skeletal remains, is found during construction. Work is to only re-start once the re-start once the requirements of the procedure have been satisfied.	Contractor	Construction

5.2 Non-Aboriginal Heritage

The following databases were reviewed to identify any listed or potential heritage items in the proposal area:

- Searches of national and state heritage databases:
    - Australian Heritage Database (National and Commonwealth heritage lists);
    - NSW Heritage Division State Heritage Inventory.
- Searches of the Hornsby Local Environmental Plan (LEP).
    - There are no non-aboriginal heritage items located within proximity to the proposal area. A search of the NSW State Heritage Inventory indicated that there are no items in the vicinity of the proposal that are included on the SHR, therefore no s60 applications are required. The nearest heritage item listed on the SHR is St. Pauls Anglican Church (former) which is located approximately 1km from the proposal area.
    - The Hornsby LEP lists the nearest heritage item (Epping West Public School), at 96–104 Carlingford Road (365) located approximately 1.2km from the proposal area.
    - It is assessed that the proposal is unlikely to have an adverse impact upon non-Aboriginal archaeological or cultural heritage items.
- Searches of the Parramatta Local Environmental Plan (LE).
    - There are no non-aboriginal heritage items located within proximity to the proposal area.

5.3 Biodiversity

Background searches of existing information in order to identify potential biodiversity constraints along the proposal site were undertaken. This included a search of relevant databases, including but not limited to:

- Searches of Commonwealth and State databases to determine whether any threatened flora and fauna species, populations, ecological communities, migratory species and critical habitats as detailed in State and Commonwealth legislation occur or are likely to occur within a 10km radius of the proposal area. Specifically, a search of the Bionet database (DPIE 2020) and the Department of the Environment Protected Matters database within a 10km search radius were undertaken in August 2020.
- Accurate mapping of vegetation communities and flora through site assessment, aerial photographic interpretation, broad-scale vegetation mapping, and elevation data to stratify vegetation and habitats in the investigation area;

A field survey was undertaken on the 27th August 2020 for threatened flora and fauna species and their habitats. Flora species targeted during survey are listed in **Appendix D.** The fauna survey method included habitat assessment throughout the proposal area, including searches for evidence of threatened fauna, and opportunistically recording fauna species active at the time of the survey. No targeted fauna survey techniques were carried out (i.e. mammal trapping, spotlighting, amphibian surveys or call playback).

A Test of Significance was undertaken for threatened species and ecological communities positively identified during surveys and inspections or that are considered to have a moderate or high likelihood of occurring in the proposal area.

5.3.1 Database Search

A thorough literature review of local information relevant to the ecology and natural environment of the locality of the City of Parramatta LGA was undertaken. Online databases were utilised to obtain threatened species and biodiversity data recorded from, or modelled within the proposal area and its surrounds.

Searches utilising NSW Wildlife Atlas (Bionet) and the Commonwealth Protected Matters Search Tool were conducted to identify all current threatened and migratory flora and fauna records within the City of Parramatta LGA. This data was used to assist in establishing the presence or likelihood of any such ecological values as occurring on or adjacent to the proposal area, and helped inform the Ecologist on what to look for during the site assessment. The following documents were also reviewed as part of the preparation of this report:

- Parramatta LEP 2011;
- The Native Vegetation of the Sydney Metropolitan Area. Volume 1: Technical Report (OEH 2016a); and
- The Native Vegetation of the Sydney Metropolitan Area. Volume 2: Vegetation Community Profiles (OEH 2016b).

Soil landscape and geological mapping (Chapman et al 2009) was examined to gain an understanding of the environment on the proposal area and assist in determining whether any threatened flora or ecological communities may occur there.

Table 3. Bionet Search (10 x 10km)

Scientific Name	Common Name	BC Act	EPBC Act	No. Records
	Fauna			
Heleioporus australiacus	Giant Burrowing Frog	Vulnerable	Vulnerable	2
Pseudophryne australis	Red-crowned Toadlet	Vulnerable	-	14
Litoria aurea	Green and Golden Bell Frog	Endangered	Vulnerable	495
Ptilinopus superbus	Superb Fruit-Dove	Vulnerable	-	3
Botaurus poiciloptilus	Australasian Bittern	Endangered	Endangered	1
Haliaeetus leucogaster	White-bellied Sea-Eagle	Vulnerable	-	115
Hieraaetus morphnoides	Little Eagle	Vulnerable	-	5
Lophoictinia isura	Square-tailed Kite	Vulnerable	-	3
Falco hypoleucos	Grey Falcon	Endangered	-	1
Calidris ferruginea	Curlew Sandpiper	Endangered	Critically Endangered	17
Limosa limosa	Black-tailed Godwit	Vulnerable	-	4
Callocephalon fimbriatum	Gang-gang Cockatoo	Vulnerable	-	74
Calyptorhynchus lathami	Glossy Black-Cockatoo	Vulnerable	-	1
Glossopsitta pusilla	Little Lorikeet	Vulnerable	-	12
Lathamus discolor	Swift Parrot	Endangered	Critically Endangered	13
Ninox connivens	Barking Owl	Vulnerable	-	6
Ninox strenua	Powerful Owl	Vulnerable	-	241
Tyto novaehollandiae	Masked Owl	Vulnerable	-	2
Epthianura albifrons	White-fronted Chat	Vulnerable	-	460
Daphoenositta chrysoptera	Varied Sittella	Vulnerable	-	2
Artamus cyanopterus cyanopterus	Dusky Woodswallow	Vulnerable	-	25
Petroica boodang	Scarlet Robin	Vulnerable	-	1
Petroica phoenicea	Flame Robin	Vulnerable	-	2
Dasyurus maculatus	Spotted-tailed Quoll	Vulnerable	Endangered	3
Phascolarctos cinereus	Koala	Vulnerable	Vulnerable	5
Petaurus norfolcensis	Squirrel Glider	Vulnerable	-	1
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable	Vulnerable	298
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	Vulnerable	-	12
Mormopterus norfolkensis	Eastern Freetail-bat	Vulnerable	-	8
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	Vulnerable	2
Falsistrellus tasmaniensis	Eastern False Pipistrelle	Vulnerable	-	6
Miniopterus australis	Little Bentwing-bat	Vulnerable	-	8
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	Vulnerable	-	91
Myotis macropus	Southern Myotis	Vulnerable	-	12
Scoteanax rueppellii	Greater Broad-nosed Bat	Vulnerable	-	7
Pommerhelix duralensis	Dural Land Snail	Endangered	Endangered	28

Scientific Name	Common Name	BC Act	EPBC Act	No. Records
Flora				
Wilsonia backhousei	Narrow-leafed Wilsonia	Vulnerable	-	60
Hibbertia spanantha	-	Critically Endangered	Critically Endangered	1
Tetratheca glandulosa	-	Vulnerable	-	35
Epacris purpurascens var. purpurascens	-	Vulnerable	-	75
Dillwynia tenuifolia	-	Vulnerable	-	1
Dillwynia tenuifolia	Dillwynia tenuifolia Sieber ex D.C. in the Baulkham Hills local government area	Endangered	-	1
Acacia bynoeana	Bynoe's Wattle	Endangered	Vulnerable	1
Acacia clunies-rossiae	Kanangra Wattle	Vulnerable		1
Acacia pubescens	Downy Wattle	Vulnerable	Vulnerable	7
Grammitis stenophylla	Narrow-leaf Finger Fern	Endangered	-	2
Callistemon linearifolius	Netted Bottle Brush	Vulnerable	-	3
Darwinia biflora	-	Vulnerable	Vulnerable	148
Darwinia peduncularis	-	Vulnerable		1
Eucalyptus nicholii	Narrow-leaved Black Peppermint	Vulnerable	Vulnerable	2
Eucalyptus scoparia	Wallangarra White Gum	Endangered	Vulnerable	1
Leptospermum deanei	-	Vulnerable	Vulnerable	13
Melaleuca biconvexa	Biconvex Paperbark	Vulnerable	Vulnerable	1
Melaleuca deanei	Deane's Paperbark	Vulnerable	Vulnerable	9
Rhodamnia rubescens	Scrub Turpentine	Endangered	-	8
Syzygium paniculatum	Magenta Lilly Pilly	Endangered	Vulnerable	9
Triplarina imbricata	Creek Triplarina	Endangered	Endangered	4
Genoplesium baueri	Bauer's Midge Orchid	Endangered	Endangered	2
Pterostylis nigricans	Dark Greenhood	Vulnerable		1
Pomaderris prunifolia	P. prunifolia in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas	Endangered	-	4
Pimelea curviflora var. curviflora		Vulnerable	Vulnerable	6

5.3.1.1 Hydrology, geology and soils

The proposal area is situated within the Glenorie soil landscapes (Chapman et al 2009). The Glenorie soil landscape is characterised by undulating to rolling low hills on Wianamatta Group shales. Local relief 50-80m, slopes 5-20%. Narrow ridges, hillcrests and valleys. Extensively cleared tall open-forest (wet sclerophyll forests).

There are no watercourses in the proposal area.

5.3.1.2 Historical Vegetation Mapping

The Native Vegetation of Sydney Metropolitan Area (OEH 2016a) mapping indicates the presence of one vegetation community represented within the proposal area (**Figure 4**):

- 'Urban_E/N: Urban Exotic/Native'.

Figure 4. Historical Vegetation Mapping (OEH 2016a)

5.3.2 Existing Environment

5.3.2.1 Vegetation Communities

Site assessment revealed vegetation within the proposal area was largely comprised of common exotic roadside grasses and forbs within small fragmented median strips.

One (1) *Eucalyptus saligna* (Sydney Blue Gum) was located approximately 3-4m from the proposal area, and as such was overhanging the proposal area.

The characteristic features that lead Narla to select the vegetation community is provided in a detailed summary in Table 4.

These determinations, were based on species composition and desktop assessments using elevation data and geological mapping (Chapman et al 2009).

Table 4. Summary of Vegetation Composition, structure and condition within the proposal area

Urban Native/Exotic	
	
Extent within proposal area (approximate)	0.04 ha
Description of Vegetation within the proposal area	
Vegetation within the Proposal Area was largely comprised of a series of small fragmented median-strips comprised of area common exotic roadside grasses and forbs. Exotic species included *Bromus catharticus, Bidens pilosa, Rumex acetosa, Soliva sessilis, Taraxacum officinale* and *Plantago lanceolata.* One (1) *Eucalyptus saligna* (Sydney Blue Gum) was located in a private property adjacent to the Proposal Area which was overhanging part of the Proposal Area.	

Figure 5. Field-validated Vegetation Mapping

5.3.2.2 Threatened flora

The NSW Wildlife Atlas (Bionet) (DPIE 2020) database search revealed a suite of threatened flora species (**Table 3**). Despite thorough in-field searches, no other flora species of conservation significance listed under either "Rare or Threatened Australian Plants" (RoTAP) (Briggs and Leigh 1996), BC Act or EPBC Act were confirmed on or immediately adjacent the proposal area.

5.3.2.3 Priority and environmental weeds

All midstory and groundcover species within the proposal area were exotic species. No priority weeds were located in the proposal area. The full list of the flora species including exotic species and priority weeds recorded is presented in **Appendix C.**

5.3.2.4 Threatened fauna

The NSW Wildlife Atlas (Bionet) (DPIE 2020) database search revealed a suite of threatened fauna species (**Table 3**). An Assessment of Likely Occurrence (**Appendix D**) identified the potential presence of a range of threatened species within the proposal area.

A thorough assessment of fauna habitat availability across the proposal area was conducted as a priority. The habitat assessment provided an understanding of the threatened fauna species that may potentially occur in the proposal area during part of their lifecycle.

One (1) *Eucalyptus saligna* that overhangs the proposal area may provide foraging habitat for nomadic threatened fauna, including:

- Little Lorikeet
- Swift Parrot
- Regent Honeyeater, and
- Grey-headed Flying Fox.

The total list of threatened species deemed as having potential to occur in the proposal area is presented in **Appendix D**. The full list of the fauna species including exotic species and priority weeds recorded is presented in **Appendix C**.

5.3.3 Potential Impacts

5.3.3.1 Removal of native vegetation

The potential loss of vegetation associated with the proposal has been quantified by overlaying the proposal footprint onto Narla's vegetation mapping (**Figure 5).** The results are summarised in **Table 4**. To facilitate the proposal, one (1) *Eucalyptus saligna* will require trimming. No trees are proposed for removal. Safeguards and mitigation measures designed to reduce the impact of vegetation removal are provided in **Section 6.1**.

5.3.3.2 Loss of threatened flora

No threatened flora species were identified during site assessment. Habitat for threatened flora is considered sub-optimal due to the severely fragmentated and highly disturbed nature of the site. No significant impact to threatened flora or their habitats will occur as a result of the proposal.

5.3.3.3 Loss of threatened fauna habitat

No hollow-bearing trees were identified within the proposal area. Owing to the location of the proposal area (Carlingford Road), vegetation within the proposal area is highly unlikely to provide any suitable breeding habitat for threatened fauna. Highly mobile, and vagrant species (Little Lorikeet, Swift Parrot, Regent Honeyeater and Grey-Headed Flying Fox) may forage on nectar when trees are flowering, and pass through the proposal area. However, it is unlikely that these species would be significantly impacted by the removal of temporary foraging habitat. No breeding is expected to occur from any threatened species in the proposal area. No significant impact to threatened fauna or their habitats will occur as a result of the proposal.

5.3.3.4 Habitat fragmentation

The proposal will not divide any areas of continuous habitat. Vegetation within the proposal area is highly fragmented due to its location within small median strips between driveways and footpaths. In addition, all vegetation within such median strips was comprised of common, exotic roadside vegetation.

5.3.3.5 Impacts to hydrology

The construction phase of the proposal presents a low risk to degradation of any downstream aquatic habitat. If any signs of erosion or sedimentation are observed, works will stop immediately and appropriate mitigation measures will be employed as per 'The Blue Book' (Landcom 2004). To prevent risk of exacerbated erosion, sedimentation or pollution events, works will not take place prior, during or immediately post periods of above average rainfall. The closest mapped watercourse, Terrys Creek, is located approximately 1km south-east of the proposal area.

5.3.3.6 Pathogens

While pathogens were not observed or tested for in the proposal area, the potential for pathogens to occur would be treated as a risk during construction.

5.3.3.7 Conclusion on significance of impacts

A Test of Significance (5-Part Test) in accordance with section 7.3 of the NSW Biodiversity Conservation Act (BC Act) has been carried out for threatened species and ecological communities that have been positively identified or that were considered to have a moderate or high likelihood of occurring in the proposal area (Appendix D).

The following threatened species, and EECs species assessed for significance under the BC Act (Appendix E):

- Threatened Ecological Communities;
    - Blue Gum High Forest in the Sydney Basin Bioregion – Critically Endangered Ecological Community
- Nomadic nectarivorous fauna
    - Swift Parrot (Endangered)
    - Regent Honeyeater (Critically Endangered)
    - Little Lorikeet (Vulnerable), and
    - Grey-headed Flying-fox (Vulnerable)

The tests of significance found that the proposal would not be likely to significantly impact threatened species, populations or ecological communities therefore no further impact assessment pursuant to the BC Act, such as a Species Impact Statement (SIS) nor a Biodiversity Development Assessment Report (BDAR) will be required.

5.3.4 Biodiversity Offsets

In accordance with Roads and Maritime Services (RMS) policy (considered to be best practice for road upgrades), biodiversity offsets are to be provided where more than one hectare of 'high conservation value' vegetation is cleared and/or more than five hectares of habitat for threatened species is cleared (Roads and Maritime Services 2011).

In accordance with RMS offset guidelines, this proposal does not trigger the need for offsets as the impacts to the listed critically endangered ecological communities are not greater than 1 hectare.

In accordance with the BC Act, the NSW Biodiversity Offset Scheme (BOS) is only triggered if the proponent determines that the proposed action will cause a 'significant impact' to a threatened species, population or ecological community. Following preparation of 'Tests of Significance' (5-part test) for occurring and potentially occurring threatened species, populations and ecological communities, it was confirmed that the proposed action will not trigger the BOS.

5.3.5 Safeguards and management measures

Suggested safeguards and management measures for Biodiversity are presented in **Table 5.**

Table 5. Biodiversity safeguards and management measures

Consideration	Environmental safeguards	Responsibility	Timing
Prevent harm to fauna	▪ Management arrangements will be implemented to ensure safe fauna handling. As a minimum that will include: o Inspection for potential nests in the event that trees require trimming (such as the *Eucalyptus saligna*).	Contractor	Construction
Protect native flora and fauna, minimise edge effects	▪ Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal are to be investigated during detailed design and implemented where practicable and feasible.	Contractor	Pre-clearance
Unexpected threatened species finds	▪ An unexpected finds procedure will be implemented in the event that a threatened species or ecological community that had not been identified and assessed by the REF is unexpectedly encountered during the construction process.	Contractor	Construction
Protect native flora and fauna and avoid inadvertent impacts	▪ Consistent with the approved best practice methods: o The limits of clearing within the construction site are to be delineated using appropriate signage and barriers, identified on site construction drawings and during construction staff induction; o Vegetation to be retained, should be clearly identified and protected by suitable fencing, signage or markings.	Contractor	Construction

Consideration	Environmental safeguards	Responsibility	Timing

Habitat management and impact minimisation	▪ As a minimum the contractor should ensure:
	  ◦ No vegetation clearing removal beyond limits identified in this REF;
	  ◦ Avoiding identified exclusion zones and protected habitat features;
	  ◦ Avoiding mixing of topsoil with woody debris materials;
	  ◦ Separation of woody vegetation suitable for re-use during construction and rehabilitation or revegetation works;
	  ◦ Implementation of staged clearing;
	  ◦ Trimming and pruning to be carried out in accordance with relevant Australian Standards.
		Contractor	Construction

Impacts to Native Vegetation	▪ If native tree removal is required, in order to ensure no long-term, net loss of foraging habitat, each native tree removed should be replaced through planting in a nearby council reserve at a ratio of one tree to replace each tree removed. Tree species will be selected from the following list: ◦ Eucalyptus saligna ▪ The authority (City of Parramatta) may choose to provide a contractor with a suitable location nearby within Council land for the plantings (where required).	City of Parramatta	Construction
Stockpiles, plant and ancillary sites	▪ Cover stockpiles to prevent erosion and sedimentation ▪ Avoid stockpiling of materials within the dripline of canopy trees	Contractor	Construction
Biosecurity - Weed, Pest Species and Pathogen Management	▪ Implement appropriate weed control methods and weed disposal; ▪ Implement appropriate hygiene protocols where there are potential or known pathogen risks.	Contractor	Construction

5.4 Noise and Vibration

A desktop assessment for the potential impacts on noise and vibration during construction and operation of the proposal have been assessed in this REF.

Noise and vibration guidelines for construction and operations are based on the publications managed by the Environmental Protection Authority (EPA). The guidelines relevant to this assessment include:

- Operational Noise – Road Noise Policy (RNP) (EPA 2011);
- Noise Criteria Guideline (RMS 2015);
- AS 2436 – 2010 Guide to noise and vibration control on construction, demolition and maintenance sites;
- Construction Noise – Interim Construction Noise Guideline (ICNG) (DECC 2009);
- Construction Vibration (human comfort) – Assessing Vibration – a technical guideline (DEC 2006); and
- Construction Vibration (damage limits) – German Standard DIN 4150, Part 3: Structural Vibration in buildings: Effects on Structures.

In summary, the methodology for the noise and vibration assessment included the following:

- Identifying noise and vibration sensitive receivers and defining the proposal area;
- Establishing noise and vibration assessment criteria;
- Prediction of construction and operational noise levels;
- Assessing predicted noise and vibration levels against the relevant criteria to identify potential impacts;
- Identify safeguards and management measure to be implemented to minimise impacts.

5.4.1 Existing Environment

The proposal area is predominantly situated in an urban landscape. It is expected that the works required for the proposed activity will generate moderate noise and vibration.

5.4.1.1 Sensitive Receivers

The areas surrounding the proposed project can be described as being primarily residential, however, several nearby businesses occur within proximity to the proposal area.

5.4.2 Criteria

5.4.2.1 Construction Noise Criteria

The DECC (2009) Interim Construction Noise Guideline recommends that, where works are likely to occur over more than two consecutive nights, maximum noise levels should be analysed in terms of the extent and number of times the maximum noise exceeds the RBL. Additionally, the DECCW (2011) Road Noise Policy discusses a guideline aimed at limiting the level of sleep disturbance due to environmental noise being that a L^{AF1} 1 minute level of any noise should not exceed the ambient L^{A90} noise level by more than 15 dB(A).

Sound power levels (L_w) produced by construction plant anticipated to be used were sources from AS 2436 – 2010 Guide to noise and vibration control on construction, demolition and maintenance sites. The sound power level of each item of equipment/plant was then distance attenuated from the proposal areas. Propagation calculations take into account sound intensity losses due to hemi-spherical spreading. Minor losses such as; atmospheric absorption, directivity and ground absorption are not taken into account in the calculations. As a result, predicted noise levels are expected to be conservative. Received noise at each assessed distance, from each item of plant on site, is added (where appropriate) to determine the total received noise at that distance from construction activities and compared to the criteria.

Received noise levels produced by anticipated activities, during the construction of the proposed activity are shown in Table 6 for a variety of distances to a typical receiver, with no noise barriers or acoustic shielding in place and with each plant item operating at full power.

Table 6. Predicted Plant Item Noise Levels dB(A)

Plant Activity	L_w dB(A)	Distance from Source (m)				
		50m	100m	200m	500m	1000m
Backhoe	104	62	56	50	42	36
Compressor	100	58	52	46	38	32
Bulldozer	104	62	56	50	42	36
Dump Truck	103	61	55	49	41	35
Excavator	103	61	55	49	41	35
All plant combined		68	62	56	48	42

The sound power levels show in **Table 6** are maximum levels produced when machinery is operating under full load.

The construction noise criteria are set for noise levels determined as $L_{10(15min)}$. During a full 15-minute period the machinery items to be used on site will operate at maximum sound power levels for sound power levels for only brief stages. At other times the machinery may produce lower sound levels while carrying out activities not requiring full power. In addition, mobile machinery will likely move about during the 15 minutes, variously altering the directivity of the noise source with respect to individual receivers.

The construction work is expected to be complete within 4 months of its commencement, however, it is unlikely that the any part of the project will be in any one place for more than 1 consecutive weeks and as such the construction noise criterion should be considered as being Background + 20 dB(A). As a consequence, in a worst-case configuration, exceedances of this criterion could occur when construction activity is within close proximity of sensitive receivers along the proposal area. It is unlikely that all of the machinery would be operating at full power at the same time for an extended period.

Noise Management Levels (NMLs) for noise at sensitive receivers and how they should be applied is presented (**Table 7**). Restrictions to the hours of construction may apply to activities that generate noise at sensitive receivers above the 'highly noise affected' noise management level. The rating background level (RBL) is used when determining the management level. The RBL is the overall single-figure background noise level measured in each relevant assessment period (during or outside the recommended standard hours).

Table 7. General construction noise management levels

Time period	Criteria	Notes
Recommended standard hours of work	Noise affected (RBL + 10dB)	The noise affected level represents the point above which there may be some community reaction to noise. Where the predicted or measured $L_{Aeq(15\ minute)}$ is greater than the noise affected level, the proponent should apply all feasible and reasonable work practices to meet the noise affected level. The proponent should also inform all potentially impacted residents of the nature of works to be carried out, the expected noise levels and duration, as well as contact details.

Time period	Criteria	Notes
	Highly noise affected (>75dB[A])	The highly noise affected level represents the point above which there may be strong community reaction to noise. Where noise is above level, the relevant authority (consent, determining or regulatory) may require respite periods by restricting the hours that the very noisy activities can occur, taking into account: ▪ Times identified by the community when they are less sensitive to noise (such as before and after school for works near schools, or mid-morning or mid-afternoon for works near residences; and ▪ If the community is prepared to accept a longer period of construction in exchange for restrictions on construction times.
Outside recommended standard hours	Noise affected (RBL + 5dB)	A strong justification would typically be required for works outside the recommended standard hours. The proponent should apply all feasible and reasonable work practices to meet the noise affected levels. Where all feasible and reasonable practices have been applied and noise is more than 5 dB(A) above the noise affected level, the proponent should negotiate with the community.

5.4.2.2 Construction Vibration Criteria

There are two types of vibration criteria that are used when assessing impacts. The first is the human comfort criteria, which as the name suggests is designed to minimise impacts that may disrupt day to day activities of humans. The other form of vibration criteria is designed to avoid damage to buildings and structures.

5.4.2.3 Human Comfort Criteria

When assessing vibration, the NSW EPA classifies vibration as one of three types:

- Continuous – where vibration occurs uninterrupted and can include sources such as machinery and constant road traffic;
- Impulsive – where vibration occurs over a short duration (typically less than two seconds) and occurs less than three times during the assessment period, which is not defined. This may include activities such as occasional dropping of heavy equipment or loading / unloading activities; and
- Intermittent – occurs where continuous vibration activities are regularly interrupted, or where impulsive activities recur. This may include activities such as rock hammering, drilling, pile driving and heavy vehicle or train passbys.

Where the vibration is classed as intermittent, the DECC uses a vibration dose value (VDV) to assess levels of vibration (**Table 8**) VDV is calculated using the acceleration rate of the vibration event and the time over which it occurs. This method is more sensitive to the level of vibration than its duration and is a measure of the total quantity of vibration perceived. The VDV method is the most suitable for assessing human comfort amenity from intermittent vibration sources.

Table 8. Acceptable vibration dose values (VDV's) for intermittent vibration (m/s1.75) 1-80 Hz

Location	Day time (7am – 10pm)		Night time (10pm - 7am)	
	Preferred value	Maximum value	Preferred value	Maximum value
Critical areas (e.g. Hospitals)	0.10	0.20	0.10	0.20
Residential buildings	0.20	0.40	0.13	0.26
Offices, schools, churches, etc	0.40	0.80	0.40	0.80
Workshops	0.80	1.60	0.80	1.6

5.4.2.4 Criteria for building structures (including heritage)

When assessing potential vibration impacts on building structures, the velocity and direction of the movement is measured. The measurement is referred to as the Peak Particle Velocity (PPV), presented in mm/s.

Vibration from construction activities, with regard to building damage, is assessed using the German standard DIN 4150-3:2015 Effects of Vibration on Structures (DIN Guideline). The DIN Guideline values for PPV measured at the foundation of various structures are summarised in Table 9.

Table 9. Guideline values of vibration velocity, for evaluating the effects of short-term vibration DIN 4150

Type of structure	Guideline values for velocity, v_i (mm/s)		
	Vibration at the foundation at a frequency of:		
	1 Hz to 10 Hz	10 Hz to 50 Hz	50 Hz to 100 Hz*
Buildings used for commercial purposes, industrial buildings and buildings of similar design	20	20 to 40	40 to 50
Dwellings and buildings of similar design	5	5 to 15	15 to 20
Structures that, because of their sensitivity to vibration, do not correspond to those listed in lines 1 and 2 and area of great intrinsic value	3	8 to 10	8 to 10
*For frequencies above 100Hz, at least the values specified in this column shall be applied			

The Construction Noise and Vibration Guideline (RMS 2016) recommends safeworking distances for achieving human comfort and cosmetic building damage criteria for a range of different plant and equipment. Although it is noted that these distances are indicative and vary depending on local geotechnical conditions; these offsets have been considered for the initial assessment of potential vibration impacts during the construction of the proposal (Table 10).

Table 10. Recommended safe working distances for vibration-intensive plant and equipment (RMS 2016)

Plant	Rating	Safe working distance (m)	
		Cosmetic Damage (BS7385-2 1993)	Human Response (DECC 2006)
Vibratory Roller	<50 kN (typically 1-2 tonne)	5	15 to 20
	<100 kN (typically 2-4 tonne)	6	20
	<200 kN (typically 4-6 tonne)	12	40
	<300 kN (typically 7-13 tonne)	15	100
	>300 kN (typically 13-18 tonne)	20	100
	>300 kN (> 18 tonne)	25	100
Small hydraulic hammer	300 kg – 5 to 12 tonne excavator	2	7
Medium hydraulic hammer	900 kg – 12 to 18 tonne excavator	7	23
Large hydraulic hammer	1600 kg – 18 to 34 tonne excavator	22	736
Vibratory pile driver	Sheet piles	2 to 20	20
Pile boring	≤800 mm	2 (Nominal)	4
Jackhammer	Hand held	1 (Nominal)	2

5.4.2.5 Buried Services

DIN 4150-3:2015 provides guidance for evaluating the effects of short-term vibration on buried services (**Table 11**).

Table 11. DIN 4150-3:2015 guidance for evaluating effects of short-term vibration on buried services

Pipe Material	Guideline value for velocity measure on the pipe (mm/s)
Steel (including welded pipes)	100
Clay, concrete, reinforced concrete, pre-stressed concrete, metal (with or without flange)	80
Masonry, plastic	50

5.4.3 Safeguards and management measures

Suggested safeguards and management measures for noise and vibration are presented in **Table 12.**

Table 12. Noise and vibration safeguards and management measures

Consideration	Environmental safeguards	Responsibility	Timing
Noise and vibration	The contractor should ensure: ▪ All potential significant noise and vibration generating activities associated with the activity is kept to a minimum; ▪ A monitoring program to assess performance against relevant noise and vibration criteria; ▪ Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures; and ▪ Contingency measures to be implemented in the event of noncompliance with noise and vibration criteria.	Contractor	Pre-clearance
Noise and vibration	All sensitive receivers (e.g. local residents) likely to be affected will be notified at least five business days prior to starting any works associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of: ▪ The proposal; ▪ The construction period and construction hours; ▪ Contact information for senior project management staff; ▪ Complain and incident reporting; and ▪ How to obtain further information.	Contractor	Pre-clearance
Site induction	All personnel working on site will receive training (such as a site induction) to ensure awareness of requirements of the noise and vibration issues associated with the project. Site-specific training will be given to personnel when working in the vicinity of sensitive receivers.	Contractor	Pre-clearance / Construction
Noise and vibration	Where possible, works outside of standard construction hours will be planned so that noisier works are carried out in the earlier part of the evening or night time.	Contractor	Pre-clearance / Construction

5.5 Social and Visual

A desktop assessment for the potential impacts on social and visual during construction and operation of the proposal have been assessed in this REF. The potential impacts, and safeguards to mitigate them, are summarised below.

5.5.1 Methodology

For the assessment of landscape character and visual impact, the impact area includes all areas from which the proposal would be potentially seen. The visual impact assessment was carried out in accordance with Transport for NSW Guidelines for Landscape Character and Visual Impact Assessment - Environmental impact assessment practice note EIA-N04 (2020).

The methodology for the preparation of the socio-economic and land use assessment involved a two-stage process, as follows:

- Identifying the scope of assessment and defining the proposal area based on the likely range of potential socio-economic and land use impacts and the communities most likely to be affected by the proposal; and
- Identifying safeguards and management measures to avoid, minimise or mitigate potential socio-economic and land use impacts identified in the assessment.

5.5.2 Existing Environment

The area surrounding the proposal area is low and high density residential, with private dwellings surrounding the proposal area. Only a small number of local business occur within close proximity to the proposal area.

5.5.3 Potential Impacts

5.5.3.1 Construction - Visual

No impacts on visual amenity from minor clearing of roadside weed vegetation.

Short term visual impacts include earthworks, generation of waste, traffic barriers and temporary signage would result in a more cluttered streetscape Construction worksites would be restored following the completion of construction. Measures to ameliorate the impacts are summarised in Section 5.5.4.

5.5.3.2 Construction – Social

During construction, potential impacts on access and connectivity in the proposal area would generally relate to:

- Temporary traffic delays and disruptions for motorists and other road users along Carlingford Road and Hepburn Avenue due to the implementation of traffic management measures, such as temporary lane closures or stoppages and reductions in speed limits;
- Temporary increased construction traffic on Carlingford Road, including light and heavy vehicles used to deliver equipment, materials and spoil, and construction workers accessing the work site; and
- Potential temporary change to access arrangements for private property access for residents. Access to private properties would be maintained during construction. Where temporary changes are required, suitable access arrangements would be implemented in consultation with affected property owners.

5.5.3.3 Operation

Due to highly disturbed, historically cleared landscape, the landscape character has been assessed as having low sensitivity to change as a result of the minor clearing of exotic weeds within small median strips along Carlingford Road.

5.5.4 Safeguards and management measures

Suggested safeguards and management measures for visual and social impacts are presented in **Table 13**.

Table 13. Visual and social safeguards and management measures

Consideration	Environmental safeguards	Responsibility	Timing
Visual impact of work sites	Project work sites, including construction areas and supporting facilities (such as storage compounds and offices) should be managed to minimise visual impacts. This is to include avoiding temporary light spill, rehabilitation of disturbed areas, appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials.	Contractor	Construction
Visual impact of work sites	Any compound and ancillary facilities are to be decommissioned and the sites rehabilitated to their existing condition or as otherwise agreed with the landowner on completion of works.	Contractor	Construction
Emergency vehicle access	Access for emergency vehicles should be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.	Contractor	Pre-construction / Construction
Complaints	A complaint handling procedure and register should be included in the CEMP or in accordance with the protocols of CoP.	Contractor	Construction

5.6 Waste and Pollution

5.6.1 Policy

Waste management will be undertaken in accordance with the Waste Avoidance and Resource Recovery Act 2001. The objectives of this Act that area applicable to the proposal are:

- To encourage the most efficient use of resources and to reduce environmental harm in accordance with the principles of ecologically sustainable development;
- To ensure that resource management options are considered against a hierarchy of the following order:
    - Avoidance of unnecessary resource consumption;
    - Resource recovery (including reuse, reprocessing, recycling and energy recovery);
    - Disposal;
- To provide for the continual reduction in waste generation;
- To minimise the consumption of natural resources and the final disposal of waste by encouraging the avoidance of waste and the reuse and recycling of waste; and
- To assist in the achievement of the objectives of the Protection of the Environment Operations Act 1997 (POEO Act).

It is not intended that substantial waste will be produced during the course of the proposed activity.

Pollution will be managed in accordance with the POEO Act and its regulations as amended.

5.6.2 Potential impacts

Construction would generate waste streams typical of road construction, including:

- Green waste from cleared vegetation;
- Bitumen, concrete and asphalt from removal of any existing road surfaces;
- Roadside materials (i.e. guide posts, guard rails, traffic signage);
- Excess fill material from any excavation of soils and fill embankments during construction;
- Exhaust fumes from vehicles, plant and machinery;
- Oil, grease and other liquid wastes from the maintenance of construction plant and equipment;
- General wastes and sewage from site compounds and offices;
- Plant and equipment maintenance waste including liquid wastes from cleaning, repairing and maintenance; and
- Packaging materials from items delivered to sites, such as pallets, creates, cartons, plastics and wrapping materials.

Any remaining surplus material would be stockpiled in a suitable location, or disposed of to a licensed facility following validation assessment of the type of spoil waste classification.

Unintended impacts or hazards may include:

- Spills
- Incorrect disposal (dumping) of solid waste
- Inappropriate stockpiling of materials.

5.6.3 Safeguards and management measures

Suggested safeguards and management measures for waste are presented in **Table 14.**

Table 14. Waste and pollution management safeguards and management measures

Consideration	Environmental safeguards	Responsibility	Timing
Waste Generation	The contractor is to ensure they have the following procedures in place before project commencement: ▪ Measures to avoid and minimise waste associated with the project; ▪ Classification of wastes generated by the project and management options (re-use, recycle, stockpile, disposal) ▪ Classification of wastes received from off-site for use in the project and management options; ▪ Reduce amount of time vehicles, machinery and plant are used (i.e. do not leave vehicles or machines idling unnecessarily). ▪ Identifying any statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemption; ▪ Procedures for storage, transport and disposal; and ▪ Monitoring, record keeping and reporting, including any documentation management obligations arising from resource recovery exemptions.	Contractor	Life of Project
Spills	The contractor is to ensure they have the following procedures in place before project commencement: ▪ All staff inducted and informed of their legal responsibilities in accordance with the POEO Act. ▪ CEMP Available at all times ▪ Standard Operating Procedures (SOP) ▪ Spill Kit	Contractor	Life of Project
Dumping or Inappropriate Stockpiling of Solid Wastes	The contractor is to ensure they have the following procedures in place before project commencement: ▪ All staff inducted and informed of their legal responsibilities in accordance with the POEO Act. ▪ No stockpiling under tree drip lines. All stockpiling to be undertaken away from trees proposed to be retained. ▪ All stockpiles to be covered to prevent dust, erosion and sedimentation. ▪ All proposed stockpiling areas clearly delineated from 'no-go-zones' ▪ CEMP Available at all times ▪ Standard Operating Procedures (SOP)	Contractor	Life of Project

5.7 Traffic and transport

A desktop assessment for the potential impacts on traffic and transport during construction and operation of the proposal have been assessed in this REF. The potential impacts, and safeguards to mitigate them, are summarised below.

5.7.1 Existing Environment

Carlingford Road extends for a distance of approximately 2.8 kilometres, and acts as an important connection between Pennant Hills Road and Beecroft Road, connecting to the M2. Carlingford Rocks Road (within the proposal area) is a four-lane road (dual lane in each direction) with a posted speed limit of 60km per hour. The existing lane widths are about 2.5 metres with narrow shoulders on both sides of the road. Property access along both sides of Carlingford Road within the proposal area, include formal driveways to residential properties and private businesses.

5.7.2 Potential Impacts

Construction would be planned to minimise impacts on traffic. Standard traffic management measure will be used to minimise short-term traffic impacts, and ensure that traffic flow along Carlingford Road is maintained throughout construction.

5.7.2.1 Local Access

Access to properties would be maintained for the duration of construction, however, there may be a need to temporarily change access to some properties to establish safe construction working areas while maintaining local through traffic. These temporary changes to local access would include change to access arrangements for vehicles using Carlingford Road and Hepburn Avenue within the proposal area.

Where temporary disruptions are required, alternative access would be identified in consultation with property owners and this process will be managed by CoP. The need for temporary access requirements would be identified during detailed design and construction staging planning.

During these works access to private property will not be significantly impacted by the works. All residences will be given notice as to the dates and times of the works and is property entrances are likely to be blocked only for a short period (maximum of 15 minutes at a time).

5.7.2.2 Increased Travel Times

During construction, the speed limit would be reduced to 40km per hour, where required throughout the proposal area.

This would temporarily delay travel time across the proposal area when lane closures are in place. There will also be increased travel times if traffic needs to be temporarily redirected onto other nearby roads (unlikely to be necessary), as this would also increase the volume of traffic along these roads.

The improved road surface and conditions will improve travel times in the long-term.

5.7.3 Safeguards and management measures

Suggested safeguards and management measures for impacts to traffic are presented in **Table 15.**

Table 15. Visual and social safeguards and management measures

Consideration	Environmental safeguards	Responsibility	Timing
Traffic and transport	If required, a Traffic Management Plan (TMP) is to be prepared and implemented. The TMP should include: ▪ Measures to maintain access to local roads and properties ▪ Site specific traffic control measures (including signage) to manage and regulate traffic movement ▪ Requirements and methods to consult and inform the local community of impacts on the local road network ▪ Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads ▪ A response plan for any traffic incidents within the construction zone	Contractor	Pre-clearance
Property Access	Access to properties is to be maintained during construction. Where that is not feasible, alternate arrangements will be made in consultation with the CoP Project Manager.	Contractor / City of Parramatta	Construction
Reduce speeds, traffic delays and disruptions during construction	Road users, local communities and sporting user groups will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities.	Contractor	Construction

5.8 Other Considerations

Table 16. Other Impacts

Coastal risk areas	Not applicable.
State Environmental Planning Policy (Coastal Management) 2018	Not applicable.
Areas of Outstanding Biodiversity Value declared under the BC Act	No Areas of Outstanding Biodiversity Value (AOBV) declared under the BC Act is present within or in the vicinity of the proposed work location.
Wilderness (either nominated or declared)	Not applicable.
Vegetation of cultural landscape values	There is no known vegetation of cultural landscape value associated with the proposal area, nor within close vicinity. This is reflective of the proposal areas highly disturbed, urban history.
Recreation values	The Proposal will not impact upon recreational values. The proposal (intersection upgrade) will be largely restricted to within the footprint of the existing pavement/road easement. Pedestrian access (footpaths) will be maintained.
Education and scientific values	Nil.
Interests of external stakeholders (e.g.: adjoining landowners, leaseholders)	Parts of the proposed Carlingford Road and Hepburn Avenue upgrade come in to close proximity of private residences and public amenities. Such land and the locations where encroachment is evident should be identified to site workers. Consultation should occur with residents adjoining areas of works prior to upgrade work taking place. This may take place through direct communication with affected residents (e.g. letter box drop or door visit) or through indirect means such as website notification, temporary signage at entry points and possibly an advertisement in a local newspaper.

6. Environmental Management

This chapter describes how the proposal will be managed to reduce potential environmental impacts throughout detailed design, construction and operation. A framework for managing the potential impacts is provided. A summary of site-specific environmental safeguards is provided and license and/or approval requirements required prior to construction are also listed.

6.1 Summary of suggested safeguards and management measures

An impact assessment has been undertaken to determine which environmental issues are relevant to the Proposal. Only those with a medium to high adverse are further discussed in this document. Descriptions of the impact level definitions are provided in **Table 17.**

Suggested environmental safeguards and management measures outline in this REF (**Table 18**) are to be incorporated into the Construction Environmental Management Plan (CEMP). These safeguards and management measures will minimise any potential adverse impacts arising from the proposal works on the surrounding environment and are summarised in **Table 18.**

Table 17. Description of Impact Levels

Impact Levels	
The potential importance of each impact has been estimated, taking into account all the criteria used to analyse the nature of the impact, including the following: ▪ The level of confidence in predicting the impact; ▪ The reversibility of the impact; ▪ The effectiveness of the proposed methods to manage or mitigate the impact; ▪ Compliance with any relevant policies or plans; ▪ The extent of public interest; ▪ Whether further information is required to confidently determine the impact of the activity Subjective methods have been utilised for assessing impact levels of the proposal with consideration being given to the size and intensity of the activity.	
Descriptor	**Description**
Negligible	No adverse social or environmental impact. No noticeable impact on the community, low financial loss.
Low	Some reversible impacts but readily managed with minimum financial cost.
Medium	Reversible impact on environment. Impacts managed with moderate financial cost, possibly with outside assistance. Measurable adverse environmental or social impact. Will result in annoyance or nuisance to community.
High	Significant impact on environment, possibly irreversible. Impacts either unmanageable or managed at a high cost with outside assistance. Potential for major off-site release with detrimental effects. Irreversible impact due to cost or other factors.
Positive	Effective mitigation measures available, positive impact to environment and community.

Table 18. Potential environmental impacts and proposed ameliorative measures

No.	Consideration	Environmental safeguards	Responsibility	Timing	Residual Impact
Abhe1	Soil surface disturbance	Soil surface disturbance is to be limited to the existing road pavement and road verges which have been extensively, historically disturbed.	Contractor	Construction	Low
Abhe2	Aboriginal Heritage – unexpected finds (e.g. artefacts or scar trees)	All personnel working on site will be made aware of relevant statutory responsibilities. The Standard Management Procedure – Unexpected Heritage Items (Roads and Maritime, 2015) should be followed in the event that an unknown or potential Aboriginal object, including skeletal remains, is found during construction. Work is to only re-start once the re-start once the requirements of the procedure have been satisfied.	Contractor	Construction	Low
Biod1	Prevent harm to fauna	Management arrangements will be implemented to ensure safe fauna handling. As a minimum that will include: ▪ Fauna handling being carried out by appropriately licenced ecologists or wildlife carers ▪ Liaison with local animal rescue agency, wildlife carer group or vet to establish agreed arrangements for fauna rescue or injured animal assistance; and ▪ Induction information for construction staff.	Contractor	Construction	Low
Biod2	Protect native flora and fauna, minimise edge effects	Measures to further avoid and minimise the construction footprint and native vegetation or habitat removal are to be investigated during detailed design and implemented where practicable and feasible.	Contractor	Pre-clearance	Low

No.	Consideration	Environmental safeguards	Responsibility	Timing	Residual Impact
Biod3	Unexpected threatened species	An unexpected finds procedure will be implemented in the event that a threatened species or ecological community that had not been identified and assessed by the REF is unexpectedly encountered during the construction process.	Contractor	Construction	Low
Biod4	Protect native flora and fauna, minimise edge effects and avoid inadvertent impacts	Consistent with the approved best practice methods: ▪ The limits of clearing within the construction site are to be delineated using appropriate signage and barriers, identified on site construction drawings and during construction staff induction; ▪ Vegetation to be retained, should be clearly identified and protected by suitable fencing, signage or markings.	Contractor	Construction	Low
Biod5	Habitat management – minimising impacts	As a minimum the contractor should ensure: ▪ No vegetation clearing beyond limits identified in this REF; ▪ Avoiding identified exclusion zones and protected habitat features; ▪ Avoiding mixing of topsoil with woody debris materials; ▪ Separation of woody vegetation suitable for re-use during construction and rehabilitation or revegetation works; ▪ Implementation of staged clearing; Trimming and pruning to be carried out in accordance with relevant Australian Standards.	Contractor	Construction	Low
Biod6	Impacts to native vegetation	If native tree removal is required, in order to ensure no long-term, net loss of foraging habitat, each native tree removed should be replaced through planting in a nearby council reserve at a ratio of one tree to replace each tree removed. Tree species will be selected from the following list: ▪ Eucalyptus saligna	City of Parramatta	Construction	Medium

No.	Consideration	Environmental safeguards	Responsibility	Timing	Residual Impact
		The authority (City of Parramatta) may choose to provide a contractor with a suitable location nearby within Council land for the plantings (where required).			
Biod7	Stockpiles, plant and ancillary sites	Cover stockpiles to prevent erosion and sedimentation Avoid stockpiling of materials within the dripline of canopy trees	Contractor	Construction	Low
Biod8	Biosecurity - Weed, Pest Species and Pathogen Management	Implement appropriate weed control methods and weed disposal; Implement appropriate hygiene protocols where there are potential or known pathogen risks.	Contractor	Construction	Low
Novi1	Noise and vibration	The contractor should ensure: ▪ All potential significant noise and vibration generating activities associated with the activity is kept to a minimum; ▪ A monitoring program to assess performance against relevant noise and vibration criteria; ▪ Arrangements for consultation with affected neighbours and sensitive receivers, including notification and complaint handling procedures; and ▪ Contingency measures to be implemented in the event of noncompliance with noise and vibration criteria.	Contractor	Pre-clearance	Medium
Novi2	Noise and vibration	All sensitive receivers (e.g. local residents) likely to be affected will be notified at least five business days prior to starting any works associated with the activity that may have an adverse noise or vibration impact. The notification will provide details of: ▪ The proposal; ▪ The construction period and construction hours; ▪ Contact information for senior project management staff; ▪ Complain and incident reporting; and ▪ How to obtain further information.	Contractor	Pre-clearance	Medium

No.	Consideration	Environmental safeguards	Responsibility	Timing	Residual Impact
Novi3	Site induction	All personnel working on site will receive training to ensure awareness of requirements of the noise and vibration issues associated with the project. Site-specific training will be given to personnel when working in the vicinity of sensitive receivers.	Contractor	Pre-clearance / Construction	Low
Novi4	Noise and vibration	Where possible, works outside of standard construction hours will be planned so that noisier works are carried out in the earlier part of the evening or night time.	Contractor	Pre-clearance / Construction	Low
Sovi1	Visual impact of work sites	Project work sites, including construction areas and supporting facilities (such as storage compounds and offices) should be managed to minimise visual impacts. This is to include avoiding temporary light spill, rehabilitation of disturbed areas, appropriate storage of equipment, parking, stockpile screening and arrangements for the storage and removal of rubbish and waste materials.	Contractor	Construction	Medium
Sovi2	Visual impact of work sites	Compound and ancillary facilities are to be decommissioned and the sites rehabilitated to their existing condition or as otherwise agreed with the landowner on completion of works.	Contractor	Construction	Low
Sovi3	Emergency vehicle access	Access for emergency vehicles should be maintained at all times during construction. Any site-specific requirements will be determined in consultation with the relevant emergency services agency.	Contractor	Pre-construction / Construction	Low
Sovi4	Complaints	A complaint handling procedure and register should be included in the CEMP or in accordance with the protocols of CoP.	Contractor	Construction	Low
Wast1	Waste Generation	The contractor is to ensure they have the following procedures in place before project commencement: ▪ Measures to avoid and minimise waste associated with the project; ▪ Classification of wastes generated by the project and management options (re-use, recycle, stockpile, disposal)	Contractor	Life of Project	Low

No.	Consideration	Environmental safeguards	Responsibility	Timing	Residual Impact
		▪ Classification of wastes received from off-site for use in the project and management options; ▪ Reduce amount of time vehicles, machinery and plant are used (i.e. do not leave vehicles or machines idling unnecessarily). ▪ Identifying any statutory approvals required for managing both on and off-site waste, or application of any relevant resource recovery exemption; ▪ Procedures for storage, transport and disposal; and ▪ Monitoring, record keeping and reporting, including any documentation management obligations arising from resource recovery exemptions.			
Wast2	Spills	The contractor is to ensure they have the following procedures in place before project commencement: ▪ All staff inducted and informed of their legal responsibilities in accordance with the POEO Act. ▪ CEMP Available at all times ▪ Standard Operating Procedures (SOP) ▪ Spill Kit	Contractor	Life of Project	Low
Wast3	Dumping or Inappropriate Stockpiling of Solid Wastes	The contractor is to ensure they have the following procedures in place before project commencement: ▪ All staff inducted and informed of their legal responsibilities in accordance with the POEO Act. ▪ No stockpiling under tree drip lines. All stockpiling to be undertaken away from trees proposed to be retained. ▪ All stockpiles to be covered to prevent dust, erosion and sedimentation. ▪ All proposed stockpiling areas clearly delineated from 'no-go-zones' ▪ CEMP Available at all times ▪ Standard Operating Procedures (SOP)	Contractor	Life of Project	Low

No.	Consideration	Environmental safeguards	Responsibility	Timing	Residual Impact
Traf1	Traffic and transport	If required, a Traffic Management Plan (TMP) is to be prepared and implemented. The TMP should include: ▪ Measures to maintain access to local roads and properties ▪ Site specific traffic control measures (including signage) to manage and regulate traffic movement ▪ Requirements and methods to consult and inform the local community of impacts on the local road network ▪ Access to construction sites including entry and exit locations and measures to prevent construction vehicles queuing on public roads ▪ A response plan for any traffic incidents within the construction zone	Contractor	Pre-clearance	Medium
Traf2	Property Access	Access to properties is to be maintained during construction. Where that is not feasible, alternate arrangements will be made in consultation with the CoP Project Manager.	Contractor / City of Parramatta	Construction	Low
Traf3	Reduce speeds, traffic delays and disruptions during construction	Road users, local communities and sporting user groups will be provided with timely, accurate, relevant and accessible information about changed traffic arrangements and delays owing to construction activities.	Contractor	Construction	Low

No.	Consideration	Environmental safeguards	Responsibility	Timing	Residual Impact
GENERAL CONSIDERATIONS					
Topography, geology and soils					
Tgs1	Erosion and sedimentation	The contractor is to implement the following safeguards: ▪ A Construction Environmental Management Plan (CEMP) incorporating environmental safeguards recommended in this REF. The CEMP is to be approved by CoP prior to commencement of works; ▪ An Erosion and Sedimentation Control Plan (ESCP) subplan consistent with the Blue Book (Landcom 2004) is to be incorporated into the CEMP and implemented prior to commencement of any works; ▪ Always follow the recommendations of the Blue Book (Landcom 2004) prior to any construction works and adopt the required measures to minimise impacts on the environment; and ▪ Adequate erosion and sediment controls are to be maintained regularly until the proposed works are completed (including the removal of any built-up soils and materials). ▪ Vehicles, plant and equipment are to be restricted to designated areas. ▪ A CoP approved Construction Environmental Management Plan (CEMP) incorporating environmental safeguards recommended in this REF; ▪ All works are to be scheduled a week following any rain events. ▪ In the event of rainfall, all material and debris (dispersible materials) in the excavation area are to be covered	Contractor	Construction	Low
Tgs2	Contaminated Land/Material	The contractor is to implement the following safeguards: ▪ Current SDS and Spill kits are to be kept on all machinery; ▪ All incidents involving spills are to be reported and discussed at Toolbox/pre-start meetings; ▪ All re-fuelling of vehicles and equipment will be undertaken in 'spill safe' bunded areas, at the compound site;	Contractor	Construction	Low

No.	Consideration	Environmental safeguards	Responsibility	Timing	Residual Impact
		▪ In the event of a spill or paint contamination of a waterway, works are to immediately cease and the CoP Project Manager is to be notified, and the incident reported to the EPA immediately; ▪ If any soils are identified that are discoloured, unusual in odour, or showing signs of asbestos contamination, should be flagged for assessment by an experienced environmental consultant; ▪ Minimise potential for ponding or water logging areas on the site; ▪ If storage of chemicals and fuels are required these should be stored within designated bunded areas, identified with appropriate signage; ▪ Record all stored chemicals on a register with their MSDS's; ▪ Ensure all tools and machinery are in good working order and without fuel, oil or hydraulic leaks; ▪ Repair or remove faulty equipment immediately; ▪ Include emergency procedures for chemical/fuel spills in the CEMP.			
		Air Quality			
Airq1	Dust and air pollution	The proponent is to implement the following safeguards: ▪ Only well serviced vehicles, machinery and other plant or equipment is to be used during works; ▪ Dust suppression techniques should be utilised to minimise dust pollution; ▪ Ongoing surveillance for dust generation is to be undertaken; ▪ Works are to cease in high-wind conditions, where dust suppression cannot be adequately undertaken; ▪ All trucks transporting materials are to be covered at all times; ▪ Machinery and vehicles are not to be left running or idling when not in use; Odour or air pollutant emission complaints will be dealt with promptly and the source will be eliminated wherever practicable. Details of the complaint will be recorded.	Contractor	Construction	Low

6.2 Licensing and approvals

Licences and approvals required for the proposal are listed in **Table 19**.

Table 19. Licences and approvals required for the proposal

Instrument	Requirement	Timing
Roads Act 1993	Road Occupancy Permit would need to be obtained as necessary prior to construction commencing.	Prior to start of the activity
Permission to enter from private landowners and residents	Permission to enter from private landowners and residents must be obtained to access proposal work sites.	Before accessing any private property

7. Conclusion

The proposed Carlingford Road and Hepburn Avenue Intersection upgrade is subject to assessment under Division 5.1 of the EP&A Act. This REF has examined and taken into account to the fullest extent possible all matters affecting or likely to affect the environment by reason of the proposed activity.

The preferred option minimises impacts to the environment whilst best meeting the project objectives of improved safety and travel efficiency for motorists and pedestrians. Minor impacts include; Traffic and Transport, including temporary impacts to property access and increased traffic times during road works. Impacts are to be avoided or minimised through implementation of the safeguards and management measures as recommended in this REF.

The proposal would be unlikely to cause a significant impact on the environment. Therefore, it is not necessary for an environmental impact statement to be prepared and approval to be sought from the Minister for Planning under Division 5.2 of the EP&A Act. A Test of Significance (5-Part Test) was conducted for the following threatened entity:

- Blue Gum High Forest in the Sydney Basin Bioregion.

The proposal is not likely to have a significant impact on Matters of National Environmental Significance or Commonwealth land within the meaning of the EPBC Act. A referral to the Australian Department of the Environment and Energy is not required.

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9. Certification

Pursuant to the various provisions of the Environmental Planning and Assessment Act 1979 and the Environmental Planning and Assessment Regulation 2000 an environmental assessment of the proposed activity has been undertaken. This REF provides a true and fair review of the Proposal in relation to its potential effects on the environment. This assessment meets the objectives of the principles of Ecologically Sustainable Development (ESD). On the basis that the activity will, if carried out in accordance with the identified mitigation measures, not be significant. Activity is authorised to proceed.

Assessing Officer

Emily Rix

Narla Environmental –

Ecologist

Authorising Officer

Alexander Graham

Narla Environmental –

Senior Ecologist

10. Appendices

Appendix A. Proposed Design

Appendix B. Considerations of Important Environmental Factors

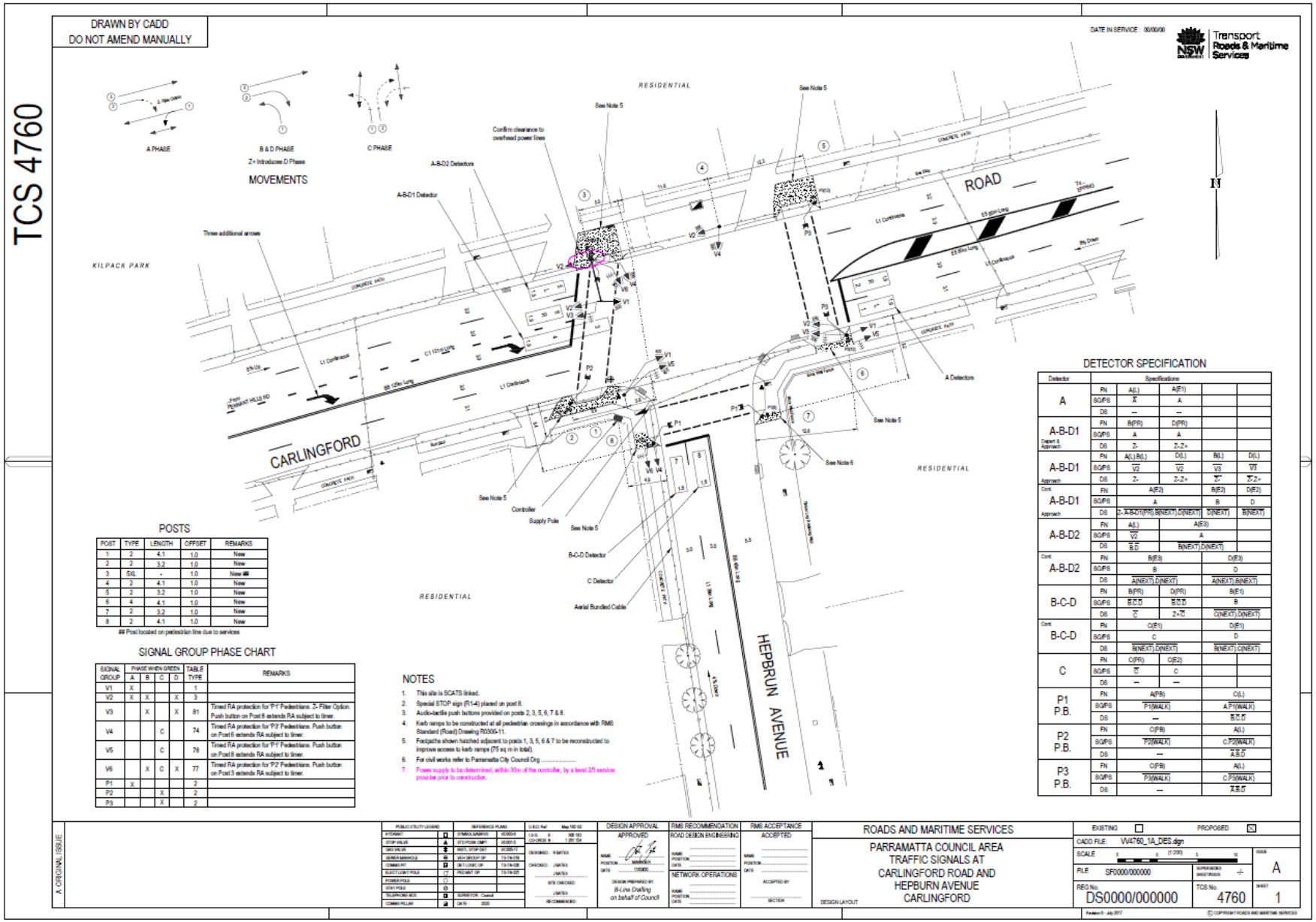
Appendix C. Flora and Fauna Species Lists (Narla Environmental

Appendix D. Assessment of Likely Occurrence

Appendix E. BC Act Tests of Significance (5-Part Test)

Appendix F. AHIMSs Search Results (200m radius)

Appendix A. Proposed Design



POST	TYPE	LENGTH	OFFSET	REMARKS
1	2	4.1	1.0	New
2	2	3.2	1.0	New
3	SXL	-	1.0	New ##
4	2	4.1	1.0	New
5	2	3.2	1.0	New
6	4	4.1	1.0	New
7	2	3.2	1.0	New
8	2	4.1	1.0	New

Post located on pedestrian line due to services

SIGNAL GROUP	PHASE WHEN GREEN A	B	C	D	TABLE TYPE	REMARKS
V1	X				1	
V2	X	X		X	3	
V3		X		X	81	Timed RA protection for 'P1' Pedestrians. Z- Filter Option. Push button on Post 8 extends RA subject to timer.
V4			C		74	Timed RA protection for 'P3' Pedestrians. Push button on Post 6 extends RA subject to timer.
V5			C		78	Timed RA protection for 'P1' Pedestrians. Push button on Post 8 extends RA subject to timer.
V6		X	C	X	77	Timed RA protection for 'P2' Pedestrians. Push button on Post 3 extends RA subject to timer.
P1	X				2	
P2			X		2	
P3			X		2	

Detector		Specifications			
A	FN	A(L)	A(P1)		
	SG/PS	$\overline{A}$	A		
	DS	—	—		
A-B-D1 Depart & Approach	FN	B(PR)	D(PR)		
	SG/PS	A	A		
	DS	Z-	Z-/Z+		
A-B-D1 Approach	FN	A(L),B(L)	D(L)	B(L)	D(L)
	SG/PS	$\overline{V2}$	$\overline{V2}$	$\overline{V5}$	$\overline{V5}$
	DS	Z-	Z-/Z+	$\overline{Z-}$	$\overline{Z-}$/Z+
Cont. A-B-D1 Approach	FN	A(E2)		B(E2)	D(E2)
	SG/PS	A		B	D
	DS	Z-/A-B-D1(PR),B(NEXT),D(NEXT)		D(NEXT)	B(NEXT)
A-B-D2	FN	A(L)	A(E3)		
	SG/PS	$\overline{V2}$	A		
	DS	B,D	B(NEXT),D(NEXT)		
Cont. A-B-D2	FN	B(E3)		D(E3)	
	SG/PS	B		D	
	DS	A(NEXT),D(NEXT)		A(NEXT),B(NEXT)	
B-C-D	FN	B(PR)	D(PR)	B(E1)	
	SG/PS	B,C,D	B,C,D	B	
	DS	$\overline{C}$	Z-/$\overline{D}$	C(NEXT),D(NEXT)	
Cont. B-C-D	FN	C(E1)		D(E1)	
	SG/PS	C		D	
	DS	B(NEXT),D(NEXT)		B(NEXT),C(NEXT)	
C	FN	C(PR)	C(E2)		
	SG/PS	$\overline{C}$	C		
	DS	—	—		
P1 P.B.	FN	A(PB)		C(L)	
	SG/PS	$\overline{P1(WALK)}$		A,$\overline{P1(WALK)}$	
	DS	—		B,C,D	
P2 P.B.	FN	C(PB)		A(L)	
	SG/PS	$\overline{P2(WALK)}$		C,$\overline{P2(WALK)}$	
	DS	—		A,B,D	
P3 P.B.	FN	C(PB)		A(L)	
	SG/PS	$\overline{P3(WALK)}$		C,$\overline{P3(WALK)}$	
	DS	—		A,B,D	

Appendix B. Considerations of Important Environmental Factors - Clause 228(2) Factors

In the context of clause 228 of the Environmental Planning and Assessment Regulation 2000, consideration of the likely impact on the environment of the proposed work is summarised below:

Clause 228 factor	Review of Environmental Factors finding	Impact
Any environmental impact on a community	There will be negligible (if any) dust, visual, odour, or social impacts on the community. By upgrading Carlingford Road and Hepburn Avenue Intersection the proposal will contribute to an improvement to the local infrastructure as well as the freight network, and to improve road safety. Short term impacts that may result during construction include: ▪ Minor traffic and access impacts; and ▪ Minor, and temporary noise impacts to sensitive receivers. Any potential impacts have been assessed and mitigation measures provided in **Section 6.1.**	Long term positive impacts Short term negative impacts
A transformation of a locality	The proposed activity will not cause a transformation of the locality, as the works involve only a relatively minor upgrade and maintenance along an existing road.	Nil
Any environmental impact on the ecosystem of the locality	There will be no significant impacts on ecosystems of the locality as outlined in **Section 6.1; Appendix E**. All impacts on threatened species, populations and communities have been considered and can be adequately mitigated.	Short-term negative impact Long-term positive impact
Any reduction of the aesthetic, recreational, scientific or other environmental quality or value of the locality	The works are temporary and will not significantly reduce aesthetic, scientific, or other environmental quality or value of the locality. The proposed action will improve the asset in the long term for the community through the provision of a safer route for road travel.	Negligible short-term impact Long-term positive impact

Clause 228 factor	Review of Environmental Factors finding	Impact
Any effect upon a locality, place or building having aesthetic, anthropological, archaeological, architectural, cultural, historical, scientific or social significance or any other special value for present or future generations	The desktop analysis deemed that Aboriginal objects are unlikely to be present within the proposal area due to past levels of historic disturbance and landform types. The current aesthetic, cultural, historical, social and environmental values will be retained by the proposed activity. The site is not associated with, and will not impact any non-aboriginal heritage values.	Negligible short-term impact No long-term impact
Any impact on the habitat of any protected fauna (within the meaning of the Biodiversity Conservation Act 2016	There will be no significant impacts on habitat of protected fauna from within or around the locality as outlined in **Section 6.1; Appendix E** of this report. All impacts on protected fauna have been considered and can be adequately mitigated.	Minor long-term negative
Any endangering of any species of animal or plant or other form of life, whether living on land, in water or in the air	There will be no significant impacts on habitat of protected fauna from within or around the locality as outlined in **Section 6.1; Appendix E** of this report. All impacts on threatened species, populations and communities have been considered and can be adequately mitigated. The majority of species occurring within the proposal area (impact area) are exotic. No species of animal, plant or other form of life, whether living on land, in water or in the air are likely to be significantly impacted by the proposal.	Negligible long-term negative
Any long-term effects on the environment	The proposal would have a long-term positive effect on the environment through improvements to the road network. Negative impacts, are limited to the modification of native vegetation, which will be very minor, through the potential trimming of one (1) *Eucalyptus saligna*.	Long term positive impacts Minor long-term negative impacts

Clause 228 factor	Review of Environmental Factors finding	Impact
Any degradation of the quality of the environment	The works may cause very minor, short-term impacts on the environment from limited ground disturbance and the removal of exotic vegetation. The impact is restricted and will be mostly remediated following the disturbance. Furthermore, local environmental conditions may improve, as effort will be made to focus on removal of environmentally detrimental priority weeds. The work will not cause or lead to a degradation of the quality of environment at this locality.	Short-term negative impacts Long term positive impacts
Any risk to the safety of the environment	A low risk to the environment is associated with the works. Potential for a minor chemical spill (e.g. petrol, oil or concrete) is possible. When undertaken in compliance with the safeguards outlined in **Section 6.1**, the work will not impact the risk to the environment.	Short-term negative impacts
Any reduction in the range of beneficial uses of the environment	No reduction in the range of beneficial uses of the environment will result as part of the works.	Nil
Any pollution of the environment	No pollution of the environment is proposed or likely. When undertaken in compliance with the safeguards outlined in **Section 6.1**, the work will not impact the environment. A CEMP should be developed to address site works and waste management procedures in detail. The CEMP will detail, the location of site compounds, stockpile sites, machinery used, refuelling procedures.	Unlikely short-term negative impacts.
Any environmental problems associated with the disposal of waste	Any waste generated as a result of the works would be dealt with in accordance with the principles of the Protection of Environment Operations Act (1997). The safeguards outlined in **Section 6.1** will ensure appropriate and legal disposal of wastes generated by this proposal. When undertaken in compliance with the safeguards outlined in **Section 6.1**, the work will not cause or contribute to environmental problems associated with the disposal of waste. All waste is to be disposed of at a licensed waste facility.	Short term negative impact

Clause 228 factor	Review of Environmental Factors finding	Impact
Any increased demands on resources (natural or otherwise) that are, or are likely to become, in short supply	No increase in the demands for resources that are likely to become in short supply.	Nil
Any cumulative environmental effect with other existing or likely future activities	No significant cumulative environmental effect is likely as a result of the proposed activity. The proponent is unaware of any other existing or future developments in the area that the proposal could interact with and result in a cumulative impact.	Nil
Any impact on coastal processes and coastal hazards, including those under projected climate change conditions	There is no impact on coastal processes and coastal hazards, including those under projected climate change conditions that will result as part of the proposed activity.	Nil

Matters of National Environmental Significance

An EPBC Act Protected Matters Search was undertaken to identify known or potential Matters of National Environmental Significance (MNES) within a 5 km radius of the proposal area.

The identified MNES and site-specific responses are listed below.

Wetlands of International Importance

No Wetlands of International Importance listed under the EPBC Act occurs within the search area (5km).

Listed Threatened Ecological Communities

One (1) Threatened Ecological Community (TEC) listed under the BC Act occurs within the proposal area. A Test of Significance was undertaken for the pruning of one (1) *Eucalyptus saligna*, and found that no significant impact would result from the proposal, therefore, a Biodiversity Development Assessment Report (BDAR) or Species Impact Statement (SIS) was not required.

Listed Threatened Species

In total, 86 threatened species listed under the EPBC Act, were predicted or known to occur within 10km of the proposal area. No EPBC Act listed species were identified within the proposal area.

As assessment of likely occurrence revealed all species were unlikely to occur within the proposal area, due to absent or sub-optimal habitat requirements. Due to sub-optimal habitat (adjoining an arterial road) this habitat is considered sub-optimal and its removal considered unlikely to impact on the species.

Listed Migratory Species

In total, 59 migratory species listed under the EPBC Act, or their habitat, were known to occur, or are predicted to occur within 10 km of the proposal area. Due to the marginal, and sub-optimal habitat proposed to be removed, the proposed activity is unlikely to substantially modify, destroy or isolate this habitat, resulting in the establishment of a harmful invasive species or seriously disrupt the lifecycle or migration of an ecologically significant population of a migratory species.

Appendix C. Flora and Fauna Species Lists (Narla Environmental 2020)

Table 20. Flora List

Scientific Name	Exotic	Canopy	Midstorey	Groundcover	Bio Act Status
Bidens pilosa	x			x	Not Listed
Bromus catharticus	x			x	Not Listed
Duranta erecta	x		x		Not Listed
Eucalyptus saligna		x			Not Listed
Oxalis spp.	x			x	Not Listed
Pelargonium zonale	x			x	Not Listed
Pennisetum clandestinum	x			x	Not Listed
Plantago lanceolata	x			x	Not Listed
Rumex acetosa	x				Not Listed
Solanum nigrum	x				Not Listed
Soliva sessilis	x				Not Listed
Sonchus oleraceus	x			x	Not Listed
Taraxacum officinale	x			x	Not Listed
Trifolium repens	x			x	Not Listed

Table 21. Fauna List

Class	Scientific Name	Common Name
Aves	*Acridotheres tristis*	Common Myna
Aves	*Cacatua galerita*	Sulphur-crested Cockatoo
Aves	*Corvus coronoides*	Australian Raven
Aves	*Dacelo novaeguineae*	Laughing Kookaburra
Aves	*Eolophus roseicapilla*	Galah
Aves	*Gymnorhina tibicen*	Australian magpie
Aves	*Manorina melanocephala*	Noisy Miner
Aves	*Strepera graculina*	Pied Currawong
Aves	*Trichoglossus moluccanus*	Rainbow Lorikeet

Appendix D. Assessment of Likely Occurrence

Scientific Name	Common Name	NSW Status (BC Act)	EPBC Act Status	Distribution (DPIE 2020)	Habitat (DPIE 2020)	Habitat or species on site directly or indirectly impacted	Impact Assessment Required
Frogs							
Heleioporus australiacus	Giant Burrowing Frog	V	V	The northern population largely confined to the sandstone geology of the Sydney Basin and extending as far south as Ulladulla.	Found in heath, woodland and open dry sclerophyll forest on a variety of soil types except those that are clay based. Breeding habitat of this species is generally soaks or pools within first or second order streams.	None. Soaks, pools and waterbodies not present on site.	No
Pseudophryne australis	Red-crowned Toadlet	V	-	The Red-crowned Toadlet has a restricted distribution. It is confined to the Sydney Basin, from Pokolbin in the north, the Nowra area to the south, and west to Mt Victoria in the Blue Mountains.	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.	None. Soaks, pools and waterbodies not present on site.	No
Litoria aurea	Green and Golden Bell Frog	E	V	Since 1990 there have been approximately 50 recorded locations in NSW, most of which are small, coastal, or near coastal populations. These locations occur over the species' former range, however they are widely separated and isolated. Large populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast	Inhabits marshes, dams and stream-sides, particularly those containing Bullrushes (Typha spp.) or Spikerushes (Eleocharis spp.). Optimum habitat includes water-bodies that are unshaded, free of predatory fish such as Plague Minnow (Gambusia holbrooki), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas.	None. Soaks, pools and waterbodies not present on site.	No

Scientific Name	Common Name	NSW Status (BC Act)	EPBC Act Status	Distribution (DPIE 2020)	Habitat (DPIE 2020)	Habitat or species on site directly or indirectly impacted	Impact Assessment Required
				(one an island population). There is only one known population on the NSW Southern Tablelands.			
Litoria littlejohni	Littlejohn's Tree Frog	V	V	Littlejohn's Tree Frog has a distribution that includes the plateaus and eastern slopes of the Great Dividing Range from Watagan State Forest (90 km north of Sydney) south to Buchan in Victoria. The majority of records are from within the Sydney Basin Bioregion with only scattered records south to the Victorian border and this species has not been recorded in southern NSW within the last decade. Records are isolated and tend to be at high altitude.	This species breeds in the upper reaches of permanent streams and in perched swamps. Non-breeding habitat is heathy forests and woodlands where it shelters under leaf litter and low vegetation, and hunts for invertebrate prey either in shrubs or on the ground.	None. Soaks, pools and waterbodies not present on site.	No
Forest and Woodland Birds							
Ptilinopus superbus	Superb Fruit-Dove	V	-	The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. It is much less common further south, where it is largely confined to pockets of suitable habitat as far south as Moruya. There are records of vagrants as	Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees. The nest is a structure of fine interlocked forked twigs, giving a stronger structure than its flimsy appearance would suggest,	None. No suitable fruit-bearing trees or rainforest trees suitable for foraging or nesting will be removed.	No

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				far south as eastern Victoria and Tasmania.	and is usually 5-30 metres up in rainforest and rainforest edge tree and shrub species.		
Daphoenositta chrysoptera	Varied Sittella	V	-	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west.	Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Minor. One (1) potential foraging tree (*Eucalyptus saligna*) is proposed for trimming. No removal of trees.	No
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-	Dusky woodswallows are widespread in eastern, southern and south western Australia. The species occurs throughout most of New South Wales, but is sparsely scattered in, or largely absent from, much of the upper western region. Most breeding activity occurs on the western slopes of the Great Dividing Range.	Often reported in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests and very occasionally in moist forests or rainforests	Minor. One (1) potential foraging tree (*Eucalyptus saligna*) is proposed for trimming. No removal of trees.	No
Petroica boodang	Scarlet Robin	V	-	In NSW, it occurs from the coast to the inland slopes. After breeding, some Scarlet Robins disperse to the lower valleys and plains of the tablelands and slopes. Some birds may appear as far west as the eastern edges of the inland plains in autumn and winter.	The Scarlet Robin lives in dry eucalypt forests and woodlands. The understorey is usually open and grassy with few scattered shrubs. This species lives in both mature and regrowth vegetation. It occasionally occurs in mallee or wet forest communities, or in wetlands and tea-tree swamps. The Scarlet Robin is primarily a resident in forests and woodlands, but some adults and young	Minor. One (1) potential foraging tree (*Eucalyptus saligna*) is proposed for trimming. No removal of trees.	No

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					birds disperse to more open habitats after breeding		
Petroica phoenicea	Flame Robin	V	-	In NSW, it breeds in upland areas and in winter, many birds move to the inland slopes and plains. It is likely that there are two separate populations in NSW, one in the Northern Tablelands, and another ranging from the Central to Southern Tablelands.	Breeds in upland tall moist eucalypt forests and woodlands, often on ridges and slopes. Prefers clearings or areas with open understoreys. Occasionally occurs in temperate rainforest, and also in herbfields, heathlands, shrublands and sedgelands at high altitudes. Often occurs in recently burnt areas; however, habitat becomes unsuitable as vegetation closes up following regeneration. In winter lives in dry forests, open woodlands, heathland and in pastures and native grasslands, with or without scattered trees. In winter, occasionally seen in heathland or other shrublands in coastal areas.	Minor. One (1) potential foraging tree (*Eucalyptus saligna*) is proposed for trimming. No removal of trees.	No

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Glossopsitta pusilla	Little Lorikeet	V		The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury.	Forages primarily in the canopy of open Eucalyptus forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g. paddocks, roadside remnants and urban trees also help sustain viable populations of the species.	Minor. One (1) *Eucalyptus saligna* is proposed for trimming. No removal of trees. No suitable nesting habitat being removed.	No
Lathamus discolor	Swift Parrot	E	CE	In NSW mostly occurs on the coast and south west slopes.	On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Forest Red Gum E. tereticornis, Mugga Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Inland Grey Box E. microcarpa, Grey Box E. moluccana, Blackbutt E. pilularis, and Yellow Box E. melliodora.	Minor. One (1) *Eucalyptus saligna* is proposed for trimming. No removal of trees. Swift Parrot only breeds in Tasmania.	No

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Diurnal Birds of Prey							
Haliaeetus leucogaster	White-bellied Sea Eagle	V	-	Distributed around the Australian coastline, including Tasmania, and well inland along rivers and wetlands of the Murray Darling Basin. In New South Wales it is widespread along the east coast, and along all major inland rivers and waterways.	Habitats are characterised by the presence of large areas of open water including larger rivers, swamps, lakes, and the sea. Occurs at sites near the sea or sea-shore, such as around bays and inlets, beaches, reefs, lagoons, estuaries and mangroves; and at, or in the vicinity of freshwater swamps, lakes, reservoirs, billabongs and saltmarsh. Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, and forest (including rainforest). Breeding habitat consists of mature tall open forest, open forest, tall woodland, and swamp sclerophyll forest close to foraging habitat. Nest trees are typically large emergent eucalypts and often have emergent dead branches or large dead trees nearby which are used as 'guard roosts'. Nests are large structures built from sticks and lined with leaves or grass.	Minor. One (1) *Eucalyptus saligna* is proposed for trimming. No suitable breeding or foraging habitat to be removed.	No
Hieraaetus morphnoides	Little Eagle	V	-	Throughout New South Wales, mostly in the central west.	Open eucalypt forest, woodland or open woodland, including she-oak or Acacia woodlands and riparian woodlands of interior NSW.	Minor. One (1) *Eucalyptus saligna* is proposed for trimming. No suitable breeding or	No

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						foraging habitat to be removed.	
Lophoictinia isura	Square-tailed Kite	V	-	Throughout New South Wales, mostly along the coast and the central west.	Open eucalypt forest, woodland or open woodland, including she-oak or Acacia woodlands and riparian woodlands of interior NSW. Usually near watercourses.	Minor. One (1) *Eucalyptus saligna* is proposed for trimming. No suitable breeding or foraging habitat to be removed.	No
Falco hypoleucos	Grey Falcon	E		The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. The breeding range has contracted since the 1950s with most breeding now confined to arid parts of the range. There are possibly less than 5000 individuals left. Population trends are unclear, though it is believed to be extinct in areas with more than 500mm rainfall in NSW.	Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	Minor. One (1) *Eucalyptus saligna* is proposed for trimming. No suitable breeding or foraging habitat to be removed.	No
Owls							
Ninox strenua	Powerful Owl	V	-	In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered	Woodland, open sclerophyll forest, tall open wet forest and rainforest. Powerful Owls nest in large tree hollows (at least 0.5 m deep), in large eucalypts.	No suitable nesting habitat being removed.	No

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				records on the western slopes and plains.			
Ninox connivens	Barking Owl	V	-	In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with strongholds in the western slopes and plains.	Occurs in a wide but sparse distribution in NSW. Core populations exist on the western slopes and plains and in some northeast coastal and escarpment forests.	No suitable hunting or suitable nesting habitat being removed for this sensitive forest owl.	No
Tyto novaehollandiae	Masked Owl	V	-	In NSW, it is widely distributed throughout the eastern forests from the coast inland to tablelands, with scattered records on the western slopes and plains.	Woodland, open sclerophyll forest, tall open wet forest and sometimes rainforest. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	No suitable hunting or suitable nesting habitat being removed for this sensitive forest owl.	No
Large Parrots							
Callocephalon fimbriatum	Gang-gang Cockatoo population in the Hornsby and Ku-ring-gai Local Government Areas	V/EP	-	The Gang-gang Cockatoo is distributed from southern Victoria through south- and central-eastern New South Wales. In New South Wales, the Gang-gang Cockatoo is distributed from the south-east coast to the Hunter region, and inland to the Central Tablelands and south-west slopes. It occurs regularly in the Australian Capital Territory. It is rare at the extremities of its range, with isolated records known from as	In spring and summer, generally found in tall mountain forests and woodlands, particularly in heavily timbered and mature wet sclerophyll forests. In autumn and winter, the species often moves to lower altitudes in drier more open eucalypt forests and woodlands, particularly box-gum and box-ironbark assemblages, or in dry forest in coastal areas and often found in urban areas. May also occur in sub-alpine Snow Gum (Eucalyptus pauciflora) woodland and occasionally in temperate rainforests.	None. Trees are too exposed. No suitable nesting hollows. This endangered population is thought to be extinct.	No

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				far north as Coffs Harbour and as far west as Mudgee.	Favours old growth forest and woodland attributes for nesting and roosting. Nests are located in hollows that are 10 cm in diameter or larger and at least 9 m above the ground in eucalypts.		
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-	The species is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia.	Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (Allocasuarina littoralis) and Forest Sheoak (A. torulosa) are important foods. Dependent on large hollow-bearing eucalypts for nest sites. A single egg is laid between March and May.	None. No suitable feed trees or nest hollows being removed. No recent proximal records.	No
Bats							
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V		South-east coast and ranges of Australia, from southern Qld to Victoria and Tasmania. In NSW, records extend to the western slopes of the Great Dividing Range.	Tall (greater than 20m) moist habitats. Generally roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	None. No tree-hollows being removed.	No
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V		Eastern Bentwing-bats occur along the east and north-west coasts of Australia.	Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures.	None. No caves/suitable artificial structures present on site and	No

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						no tree-hollows being removed.	
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	Along the eastern coast of Australia, from Bundaberg in Qld to Melbourne in Victoria.	Subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	One (1) *Eucalyptus saligna* is proposed for trimming. No suitable roosting (camp) habitat being removed.	No
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and North West Slopes.	Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	None. No tree-hollows being removed.	No
Mormopterus norfolkensis	Eastern Freetail-bat	V	-	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW.	Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	None. No tree-hollows being removed.	No

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					Roost mainly in tree hollows but will also roost under bark or in man-made structures.		
Miniopterus australis	Little Bentwing-bat	V	-	East coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW.	Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	None. No caves/suitable artificial structures present on site and no tree-hollows being removed.	No
Myotis macropus	Southern Myotis	V	-	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers.	Generally roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	None. No caves/suitable artificial structures present on site and no tree-hollows being removed. No open waterbodies for foraging.	No
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland.	Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings.	None. No tree-hollows being removed.	No

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				It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m.			
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and North West Slopes.	Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies.	None. No caves present on site.	No
Other Mammals							
Dasyurus maculatus	Spotted-tail Quoll	V	E	Found on the east coast of NSW, Tasmania, eastern Victoria and north-eastern Qld.	Rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites.	None. No tree-hollows being cleared. No caves on site.	No
Phascolarctos cinereus	Koala	V	V	In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. There are sparse and possibly disjunct	Eucalypt woodlands and forests.	Minimal. One (1) *Eucalyptus saligna* is proposed for trimming.	No

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				populations in the Bega District, and at several sites on the southern tablelands.			
Petaurus norfolcensis	Squirrel Glider	V	V	The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria.	Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey. Require abundant tree hollows for refuge and nest sites.	None. No tree-hollows being cleared	No
Snails							

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Pommerhelix duralensis	Dural Land Snail	E	E	The species is a shale-influenced-habitat specialist, which occurs in low densities along the western and northwest fringes of the Cumberland IBRA subregion on shale-sandstone transitional landscapes. *Pommerhelix duralensis* in the strict sense is found in an area of north-western Sydney between Rouse Hill - Cattai and Wiseman's Ferry, west from Berowra Creek. The species is definitely found within the Local Government Areas of The Hills Shire, Hawkesbury Shire and Hornsby Shire. Records from the Blue Mountains City, Penrith City and Parramatta City may represent this species.	The species has a strong affinity for communities in the interface region between shale-derived and sandstone-derived soils, with forested habitats that have good native cover and woody debris. It favours sheltering under rocks or inside curled-up bark. It does not burrow nor climb. The species has also been observed resting in exposed areas, such as on exposed rock or leaf litter, however it will also shelter beneath leaves, rocks and light woody debris..	None.	No
Flora							
Eucalyptus nicholii	Narrow-leaved Black Peppermint	V	V	This species is sparsely distributed but widespread on the New England Tablelands from Nundle to north of Tenterfield, being most common in central portions of its range. Found largely on private property and roadsides,	Typically grows in dry grassy woodland, on shallow soils of slopes and ridges. Found primarily on infertile soils derived from granite or metasedimentary rock.	Outside natural distribution.	No

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				and occasionally in conservation reserves.			
Eucalyptus scoparia	Wallangarra White Gum	E	V	In NSW it is known from only three locations near Tenterfield, including Bald Rock National Park.	Found in open eucalypt forest, woodland and heaths on well-drained granite/rhyolite hilltops, slopes and rocky outcrops, typically at high altitudes. At lower elevations can occur in less rocky soils in damp situations.	Outside natural distribution.	No
Acacia bynoeana	Bynoe's Wattle	E	V	Bynoe's wattle is found in central eastern NSW, from the Hunter District (Morisset) south to the Southern Highlands and west to the Blue Mountains. The species is currently known from about 30 locations, with the size of the populations at most locations being very small (1-5 plants). It has recently been found in the Colymea and Parma Creek areas west of Nowra.	Occurs in heath or dry sclerophyll forest on sandy soils. Seems to prefer open, sometimes slightly disturbed sites such as trail margins, edges of roadside spoil mounds and in recently burnt patches. Associated overstorey species include Red Bloodwood, Scribbly Gum, Parramatta Red Gum, Saw Banksia and Narrow-leaved Apple.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Acacia clunies-rossiae	Kanangra Wattle	V		Kanangra Wattle grows in the Kowmung and Coxs River areas entirely within Kanangra-Boyd and Blue Mountains National Parks.	Grows in dry sclerophyll forest on skeletal soils on rocky slopes, or on alluvium along creeks.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Acacia pubescens	Downy Wattle	V	V	Concentrated around the Bankstown-Fairfield-Rookwood area and the Pitt Town area, with outliers occurring at	Occurs on alluviums, shales and at the intergrade between shales and sandstones. The soils are	No habitat. The landscape is too disturbed and historically cleared	No

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				Barden Ridge, Oakdale and Mountain Lagoon.	characteristically gravely soils, often with ironstone. Occurs in open woodland and forest, in a variety of plant communities, including Cooks River/Castlereagh Ironbark Forest, Shale/Gravel Transition Forest and Cumberland Plain Woodland.	with co-occurring species not present.	
Grammitis stenophylla	Narrow-leaf Finger Fern	E		Occurs in eastern Queensland and eastern NSW. In NSW it has been found on the south, central and north coasts and as far west as Mount Kaputar National Park near Narrabri.	Moist places, usually near streams, on rocks or in trees, in rainforest and moist eucalypt forest.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Callistemon linearifolius	Netted Bottle Brush	V		Recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW. Recorded in 2000 at Coalcliff in the northern Illawarra. For the Sydney area, recent records are limited to the Hornsby Plateau area near the Hawkesbury River. hree of the remaining populations are reserved in Ku-ring-gai Chase National Park, Lion Island Nature Reserve and Spectacle Island Nature Reserve. The species has also been recorded from Yengo National Park.	Grows in dry sclerophyll forest on the coast and adjacent ranges.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No

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Darwinia biflora		V	V	Recorded in Ku-ring-gai, Hornsby, Baulkham Hills and Ryde local government areas. The northern, southern, eastern and western limits of the range are at Maroota, North Ryde, Cowan and Kellyville, respectively.	Occurs on the edges of weathered shale-capped ridges, where these intergrade with Hawkesbury Sandstone. Associated overstorey species include Eucalyptus haemastoma, Corymbia gummifera and/or E. squamosa. The vegetation structure is usually woodland, open forest or scrub-heath.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Darwinia peduncularis		V	-	Occurs as local disjunct populations in coastal NSW with a couple of isolated populations in the Blue Mountains. It has been recorded from Brooklyn, Berowra, Galston Gorge, Hornsby, Bargo River, Glen Davis, Mount Boonbourwa and Kings Tableland.	Usually grows on or near rocky outcrops on sandy, well drained, low nutrient soil over sandstone.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Leptospermum deanei		V	V	Occurs in Hornsby, Warringah, Ku-ring-gai and Ryde LGAs.	Woodland on lower hill slopes or near creeks. Sandy alluvial soil or sand over sandstone. Occurs in Riparian Scrub - e.g. Tristaniopsis laurina, Baechea myrtifolia; Woodland - e.g. Eucalyptus haemstoma; and Open Forest - e.g. Angophora costata, Leptospermum trinervium, Banksia ericifolia.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Melaleuca biconvexa	Biconvex Paperbark	V	V	Biconvex Paperbark is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in	Biconvex Paperbark generally grows in damp places, often near streams or low-	No habitat. The landscape is too disturbed and historically cleared	No

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				the south and the Gosford-Wyong area in the north.	lying areas on alluvial soils of low slopes or sheltered aspects.	with co-occurring species not present.	
Melaleuca deanei	Deane's Paperbark	V	V	Deane's Paperbark occurs in two distinct areas, in the Ku-ring-gai/Berowra and Holsworthy/Wedderburn areas respectively. There are also more isolated occurrences at Springwood (in the Blue Mountains), Wollemi National Park, Yalwal (west of Nowra) and Central Coast (Hawkesbury River) areas.	The species occurs mostly in ridgetop woodland, with only 5% of sites in heath on sandstone.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Rhodamnia rubescens	Scrub Turpentine	E	-	Rhodamnia rubescens is currently known to occur in coastal districts north from Batemans Bay in New South Wales (NSW), approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland.	Suitable habitat for R. rubescens is likely to occur in the following vegetation types: Subtropical Rainforests, Warm Temperate Rainforests, Littoral Rainforests, and Wet Sclerophyll Forests. It may also occur as a pioneer in adjacent areas of dry sclerophyll and grassy woodland associations (Keith 2004; Floyd 2008;). Rhodamnia rubescens has been documented occurring in association with Acacia melanoxylon, Acmena smithii, Breynia oblongifolia, Corymbia intermedia, Endiandra discolor, Eucalyptus bosistoana, E. tereticornis, Glochidion sumatranum, Guioa semiglauca, Lophostemon suaveolens and Mallotus philippensis.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No

Scientific Name	Common Name	NSW Status (BC Act)	EPBC Act Status	Distribution (DPIE 2020)	Habitat (DPIE 2020)	Habitat or species on site directly or indirectly impacted	Impact Assessment Required
Syzygium paniculatum	Magenta Lilly Pilly	E	V	The Magenta Lilly Pilly is found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest.	On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Triplarina imbricata	Creek Triplarina	E	E	Found only in a few locations in the ranges south-west of Glenreagh and near Tabulam in north-east NSW. The species was previously recorded in Parramatta, near Sydney, however, the species is no longer thought to occur in this area.	Occurs along watercourses in low open forest with Water Gum (Tristaniopsis laurina) or in montane bogs, often with Baekea amissa.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Genoplesium baueri	Bauer's Midge Orchid	E	E	The species has been recorded from locations between Ulladulla and Port Stephens. The species has been recorded at locations now likely to be within the following conservation reserves: Berowra Valley Regional Park, Royal National Park and Lane Cove National Park. May occur in the Woronora, O'Hares, Metropolitan and Warragamba Catchments.	Grows in dry sclerophyll forest and moss gardens over sandstone.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No

Scientific Name	Common Name	NSW Status (BC Act)	EPBC Act Status	Distribution (DPIE 2020)	Habitat (DPIE 2020)	Habitat or species on site directly or indirectly impacted	Impact Assessment Required
Pterostylis nigricans	Dark Greenhood	V		The Dark Greenhood occurs in north-east NSW north from Evans Head, and in Queensland.	Coastal heathland with Heath Banksia (Banksia ericifolia), and lower-growing heath with lichen-encrusted and relatively undisturbed soil surfaces, on sandy soils.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Pomaderris prunifolia		E	-	The species has been recorded from the tablelands and slopes of New South Wales, but is generally uncommon. An isolated population of Pomaderris prunifolia occurred in the Parramatta, Auburn, Strathfield and Bankstown Local Government Areas, disjunct from other populations. The only recent collection from this area is from Rydalmere, where only 3 plants occur.	On rocky slopes, often along creeks	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present. No creek present on or near site.	No
Pimelea curviflora var. curviflora		V	V	Confined to the coastal area of the Sydney and Illawarra regions. Populations are known between northern Sydney and Maroota in the north-west. New population discovered at Croom Reserve near Albion Park in Shellharbour LGA in August 2011. Formerly recorded around the Parramatta River and Port Jackson region	Occurs on shaley/lateritic soils over sandstone and shale/sandstone transition soils on ridgetops and upper slopes amongst woodlands. Also recorded in Illawarra Lowalnd Grassy Woodland habitat at Albion Park on the Illawaraa coastal plain.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No

Scientific Name	Common Name	NSW Status (BC Act)	EPBC Act Status	Distribution (DPIE 2020)	Habitat (DPIE 2020)	Habitat or species on site directly or indirectly impacted	Impact Assessment Required
				including Five Dock, Bellevue Hill and Manly.			
Wilsonia backhousei	Narrow-leafed Wilsonia	V		In NSW Narrow-leaf Wilsonia is found on the coast between Mimosa Rocks National Park and Wamberal north of Sydney (Nelson's Lake, Potato Point, Sussex Inlet, Wowly Gully, Parramatta River at Ermington, Clovelly, Voyager Point, Wollongong and Royal National Park).	This is a species of the margins of salt marshes and lakes.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Tetratheca glandulosa		V		Restricted to the following Local Government Areas: Baulkham Hills, Gosford, Hawkesbury, Hornsby, Ku-ring-gai, Pittwater, Ryde, Warringah, and Wyong. There are approximately 150 populations of this plant ranging from Sampons Pass (Yengo NP) in the north to West Pymble (Lane Cove NP) in the south. The eastern limit is at Ingleside (Pittwater LGA) and the western limit is at East Kurrajong (Wollemi NP).	Associated with shale-sandstone transition habitat where shale-cappings occur over sandstone, with associated soil landscapes such as Lucas Heights, Gymea, Lambert and Faulconbridge. Topographically, the plant occupies ridgetops, upper-slopes and to a lesser extent mid-slope sandstone benches. Soils are generally shallow, consisting of a yellow, clayey/sandy loam. Stony lateritic fragments are also common in the soil profile on many of these ridgetops.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Epacris purpurascens var. purpurascens		V	-	Recorded from Gosford in the north, to Narrabeen in the east, Silverdale in the west and Avon Dam vicinity in the South.	Found in a range of habitat types, most of which have a strong shale soil influence.	No habitat. The landscape is too disturbed and historically cleared	No

Scientific Name	Common Name	NSW Status (BC Act)	EPBC Act Status	Distribution (DPIE 2020)	Habitat (DPIE 2020)	Habitat or species on site directly or indirectly impacted	Impact Assessment Required
						with co-occurring species not present.	
Dillwynia tenuifolia		V	-	The core distribution is the Cumberland Plain from Windsor and Penrith east to Dean Park near Colebee. Other populations in western Sydney are recorded from Voyager Point and Kemps Creek in the Liverpool LGA, Luddenham in the Penrith LGA and South Maroota in the Baulkham Hills Shire. Disjunct localities outside the Cumberland Plain include the Bulga Mountains at Yengo in the north, and Kurrajong Heights and Woodford in the Lower Blue Mountains.	In western Sydney, may be locally abundant particularly within scrubby/dry heath areas within Castlereagh Ironbark Forest and Shale Gravel Transition Forest on tertiary alluvium or laterised clays. May also be common in transitional areas where these communities adjoin Castlereagh Scribbly Gum Woodland. At Yengo, is reported to occur in disturbed escarpment woodland on Narrabeen sandstone.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Hibbertia spanantha	Julian's Hibbertia	C	C	Endemic to NSW where it is restricted to three locations.	Grows in forest with canopy species including Eucalyptus pilularis, E. resinifera, Corymbia gummifera and Angophora costata. The understorey is open with species of Poaceae, Orchidaceae, Fabaceae and Liliaceae.	No habitat. The landscape is too disturbed and historically cleared with co-occurring species not present.	No
Key: V = vulnerable ; E = Endangered; CE = Critically Endangered							

Appendix E. BC Act Tests of Significance (5-Part Test)

<table>
<tr><th colspan="3">NSW Biodiversity Conservation Act 2016
Test of Significance (5-part Test)
for
Blue Gum High Forest in the Sydney Basin Bioregions</th></tr>
<tr><th colspan="3">BC Act Status: Critically Endangered Ecological Community</th></tr>
<tr><td>Background to Test of Significance</td><td colspan="2">This Biodiversity Conservation Act 2016 Test of Significance (5-Part Test) is for the combined impacts of the proposed activity upon the local occurrence of Blue Gum High Forest in the Sydney Basin Bioregions, which specifically includes:

▪ Pruning of (1) Eucalyptus saligna (Sydney Blue Gum).</td></tr>
<tr><td>Community Description</td><td colspan="2">Blue Gum High Forest (BGHF) is tall open forest (also called wet sclerophyll forest) with a lower tree layer, an open, low shrub layer and prominent ground layer. It occurs mainly in areas with deep clay soil derived from shale, generally at altitudes greater than 100 m above sea level, and that have an annual rainfall of more than 1050 mm. Blue Gum High Forest is associated with the Cumberland Lowlands (Bannerman & Hazelton 1990). It occurs at elevations of 50–178 m above sea level, although on the Hornsby Plateau it is generally confined to altitudes higher than 100 m above sea level.</td></tr>
<tr><td>(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,</td><td colspan="2">Not Applicable –BGHF is not a species.</td></tr>
<tr><td>(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,</td><td colspan="2">Not applicable –BGHF is not an endangered population.</td></tr>
<tr><td>(c) in the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:</td><td>(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</td><td>i) No. The action is unlikely 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.

In total one (1) Eucalyptus saligna that is reflective of BGHF may require trimming to facilitate the proposal. No BGHF trees will</td></tr>
</table>

NSW Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for Blue Gum High Forest in the Sydney Basin Bioregions		
BC Act Status: Critically Endangered Ecological Community		
		require removal, therefore there will be no change to the local occurrence.
	(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,	ii) The proposed action is not 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. In total one (1) *Eucalyptus saligna* that is reflective of BGHF may require trimming to facilitate the proposal. No BGHF trees will require removal, therefore there will be no change to composition of the CEEC. It is not expected that the proposed activity will cause the permanent loss of any structural complexity or unique floristic components of the BGHF occurrence, such that it is likely to be placed at risk of extinction.
(d) 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**	i) In total one (1) *Eucalyptus saligna* that is reflective of BGHF may require trimming to facilitate the proposal. No BGHF trees will require removal, therefore there will be no change to composition of the CEEC.
	(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	ii) BGHF adjacent to the proposal area is already severely fragmented and isolated, comprised of one (1) single tree. Trimming of the *Eucalyptus saligna* will not cause isolation or fragmentation of the CEEC.
	(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,	iii) All areas which support viable patches of BGHF are important. Potential trimming of the *Eucalyptus saligna* is not likely to risk the long-term survival of the tree, or as such, the CEEC.

NSW Biodiversity Conservation Act 2016 Test of Significance (5-part Test) for Blue Gum High Forest in the Sydney Basin Bioregions	
BC Act Status: Critically Endangered Ecological Community	
(d) whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value (either directly or indirectly),	The activity proposed is not likely to have an adverse effect on any declared area of outstanding biodiversity value, directly or indirectly.
(e) whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of a key threatening process.	The following Key Threatening Processes (KTPs) are documented to impact upon the survival of BGHF EEC: ▪ Clearing of native vegetation ▪ Loss of hollow-bearing trees ▪ Invasion and establishment of exotic vines and scramblers The proposal will exacerbate the following KTP: ▪ Clearing of native vegetation

References

NSW Government (2017) NSW Legislation: Biodiversity Conservation act 2016 No 63, Schedule 4: Key Threatening Processes https://www.legislation.nsw.gov.au/acts/2016-63.pdf

NSW Office of Environment and Heritage (2017) Blue Gum High Forest in Sydney Basin Bioregion - Profile.

NSW Government (2017) NSW Legislation: Biodiversity Conservation act 2016 No 63, Schedule 3: Key Threatening Processes https://www.legislation.nsw.gov.au/acts/2016-63.pdf

Appendix F. AHIMSs Search Results (200m radius)

Office of Environment & Heritage

AHIMS Web Services (AWS)
Search Result

Purchase Order/Reference : Carlingford - Traffic

Client Service ID : 532558

Narla Environmental

Date: 03 September 2020

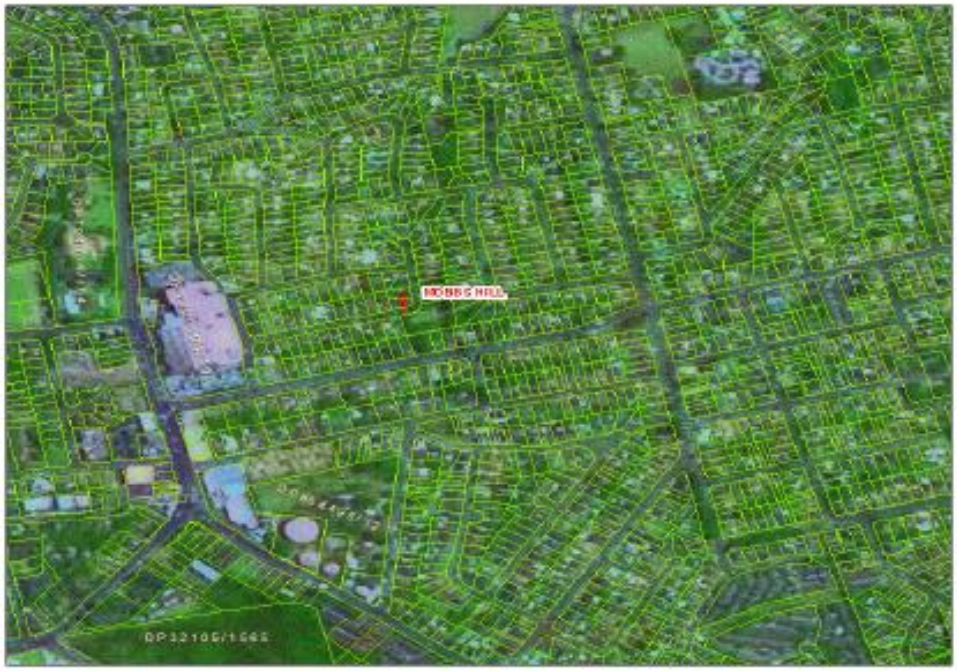
Unit 1 26-30 Tepko Road
Terrey Hills New South Wales 2084
Attention: Alexander Graham

Email: reception@narla.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lat, Long From : -33.7799, 151.0514 - Lat, Long To : -33.7726, 151.063 with a Buffer of 200 meters, conducted by Alexander Graham on 03 September 2020.

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 the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

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

NARLA

environmental

Eastern Sydney Office
2/26-30 Tepko Road
Terrey Hills
NSW 2084

Western Sydney Office
7 Twentyfifth Avenue
West Hoxton
NSW 2171

Hunter Valley Office
10/103 Glenwood Drive
Thornton
NSW 2322

Ph: 02 9986 1295
www.narla.com.au