



## **REVIEW OF ENVIRONMENTAL FACTORS**

**Halstead Drive Reconstruction (Stage 1), Casino**

A Report Prepared for  
Burchills Engineering Solutions

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## ABBREVIATIONS

Abbreviation	Description
AHIMS	Aboriginal Heritage Information Management System
AOBV	Area of Outstanding Biodiversity Value
ASIRF	Aboriginal Site Impact Recording Form
ASRF	Aboriginal Site Recording Form
BC Act	<i>NSW Biodiversity Conservation Act 2016</i>
BCR	<i>Biodiversity Conservation Regulation 2017</i>
BOS	Biodiversity Offset Scheme
DAWE	Department of Agriculture, Water and the Environment
DCP	Development Control Plan
DoPIE	NSW Department of Planning, Industry and Environment
DotE	Department of the Environment
EEC	Endangered Ecological Community
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EP&A Act	<i>Environmental Planning and Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning and Assessment Regulation 2000</i>
FM Act	<i>Fisheries Management Act 1994</i>
HE Act	<i>Heritage Act 1977</i>
LEP	Local Environmental Plan
LGA	Local Government Area
LLS Act	<i>Local Land Services Act 2013</i>
MNES	Matters of National Environmental Significance
NPW Act	<i>National Parks and Wildlife Act 1974</i>
NSW	New South Wales
OEH	NSW Office of Environment and Heritage
REF	Review of Environmental Factors
RVDCP	Richmond Valley Development Control Plan
RVLEP	Richmond Valley Local Environmental Plan
SEPP	State Environmental Protection Policy
SIS	Species Impact Statement
TEC	Threatened Ecological Community
TPZ	Tree Protection Zone

# 1 INTRODUCTION

## 1.1 Background

JWA Pty Ltd have been engaged by Burchills Engineering Solutions and on behalf of Richmond Valley Council (RVC) to complete a Review of Environmental Factors (REF) to accompany an application for the reconstruction of Halstead Drive, Casino.

It is understood that Halstead Drive suffered severe damage during the 2022 (February / March) flood. The project will be carried out in three (3) stages, of which this REF relates specifically to Stage 1 for the removal, storage and crushing of all concrete and restoring the access track for Stage 2 and 3 works.

## 1.2 Subject site and environmental context

### 1.2.1 Introduction

The subject site can be identified as two (2) distinct areas which are discussed in the following sections.

### 1.2.2 Area 1 - Halstead Drive

Area 1 comprises the damaged Halstead Drive, which is a non-gazetted road that runs along the bank of the Richmond River from Webb Park (on River Street), under the Centre Street bridge, to an end point approximately 120 m to the west of the bridge.

This area will be subject to concrete removal and restoring the access track for future stages of the project. A recent aerial photograph showing the alignment of the proposed works in Area 1 is provided in **FIGURE 1**.

Due to the damage caused by the floods, and apart from emerging groundcovers that are predominately exotic species, almost all native vegetation has been removed from the alignment proposed for the Stage 1 works and remaining adjacent vegetation is sparse or in poor condition (**PLATES 1-10**).

### 1.2.3 Area 2 - Corner of Ellangowan Road and Summerland Way

For the purposes of the proposed works, Area 2 is located in the road corridor and is proposed for temporary concrete storage and crushing for re-use. A recent aerial photograph showing the proposed location within Area 2 is provided in **FIGURE 2**.

The proposed temporary storage and crushing location is void of any native vegetation or any notable environmental features and is predominately made up of existing hard surfaces (i.e., road base / gravel) or cleared and managed grassland. The proposed location is currently being used as a stockpile area (**PLATE 11 & 12**).



### 1.3 The proposed works

The reconstruction of Halstead Drive in Casino is required due to severe damage during the 2022 (February / March) flood (PLATES 1 -10). The overall project will be carried out in the following three (3) stages:

- Stage 1 - Remove and dispose of all concrete and restore the access track.
- Stage 2 - Geotechnical assessment, survey, and design.
- Stage 3 - Reconstruct Halstead Drive.

This REF relates specifically to Stage 1.

In addition, it is proposed to transport removed concrete for temporary storage and crushing for re-use (FIGURE 2). PLATES 11 and 12 shows the proposed location chosen for storage and crushing works. The storage and crushing of concrete has also been covered as part of this REF.

A summary of the proposed methodology for Stage 1 in Area 1 is provided below<sup>1</sup>, with an estimated timeframe of five (5) weeks:

#### Preparation / safety

- All team members will be inducted into the project on site by way of a tool box meeting to talk through the requirements of the works.
- To ensure safety during works, spotters will be on site to guide trucks and excavators moving down the length of the works area, and to open / close gates as required.

#### Entrance to the works area

- Fencing will be installed at the entrance to the works area to create an access pathway from River Street for construction vehicles and machinery. Fencing will be installed to maintain public toilet use in Web Park, and will align with existing fencing and guard rail where present.
- The fenced off access curb on River Street will be appropriately covered and protected to prevent damage by vehicles and/or machinery.
- Appropriate traffic management and signage will be in place for all relevant works.

#### Works area preparation

- Orange barrier mesh will be used to border off the works area from the entrance point to the Bruxner Highway bridge (PLATES 1-7). To the west of the bridge (PLATES 8-9), flagging will be used to border off the works area.

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<sup>1</sup> Information provided by the successful contractor: Sommerville Excavator Hire

- To minimise run off into the Richmond River, a silt fence will be installed for the length of the works area on the river side. The silt fence will comprise timber stakes and green silt fence, and orange flagging and bollards will also be used to flag off the river area.
- During times when machinery is required near the water, Ecospill Silt curtain booms with one (1) metre skirts will be installed to control any sediment and/or accidental spills from entering the water.
- Following fencing installation and inspection, water barriers will be installed along the length of the works area concrete road.

#### **Initial works area clean-up for access**

- This part of the works program will be undertaken from the east (i.e., entrance point) to the far western extent of the works area.
- All sand and slipped material will be cleaned up by an excavator to make a safe passage down the length of the works area utilising existing concrete where possible.
- Where required due to damage, the works area will be topped with gravel and/or rocks and/or road base to maintain access.
- Recovered gravel from any removed Gabion baskets (**PLATES 7-8**) will be used to rebuild the access track. All wire will be disposed of in an appropriate manner.

#### **Final works area clean-up and track rebuild**

- This final part of the works program will be undertaken from the far western extent of the works area back to the entrance point.
- All concrete will be removed systematically from the works area in conjunction with re-shaping of the access track and removal of silt fencing.
- Following concrete clean-up, gravel and/or rocks and/or road base will be added to the top of the access track.
- Prior to handover, a final clean-up will be undertaken to remediate any disturbed areas and remove all site fencing.



FIGURE 1 ALIGNMENT OF THE PROPOSED RECONSTRUCTION OF HALSTEAD DRIVE (AREA 1)



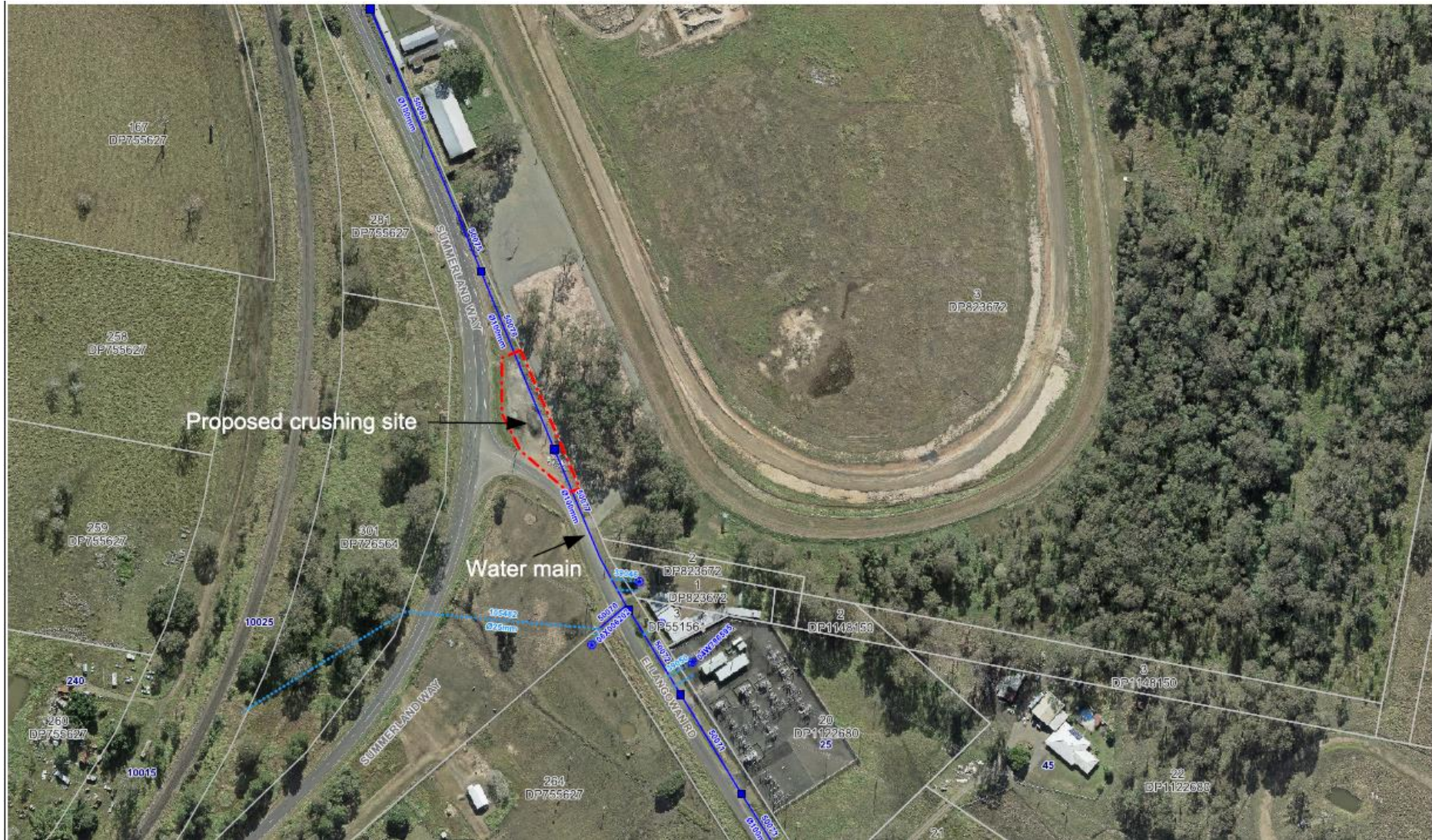


FIGURE 2 PROPOSED LOCATION FOR TEMPORARY CONCRETE CRUSHING (AREA 2). IMAGE PROVIDED BY RICHMOND VALLEY COUNCIL.





PLATE 1



PLATE 2



PLATE 3





**PLATE 4**



**PLATE 5**



**PLATE 6**





**PLATE 7**



**PLATE 8**



**PLATE 9**





**PLATE 10**



**PLATE 11**



**PLATE 12**



## 2 DATABASE SEARCHES

### 2.1 Introduction

Database searches were completed to highlight any potential state or commonwealth conservation significant vegetation communities, threatened flora and fauna, and ecologically sensitive areas on the subject site.

### 2.2 Methods

#### 2.2.1 *Commonwealth database searches*

The Protected Matters Search Tool (PMST) was used to generate a list of the following Matters of National Environmental Significance (MNES) protected under the Commonwealth EPBC Act that may occur within 10 km of the subject site:

- World heritage and national heritage areas;
- Wetlands of international significance (Ramsar wetlands);
- Threatened ecological communities (TECs);
- Threatened species; and
- Migratory species.

The PMST database incorporates information from a range of sources, including government agencies, research, and community organisations. It should be noted that there are limitations on the accuracy of some matters reported by the PMST. Database records of threatened and migratory species are based on their current known distribution and do not necessarily correlate to an actual observation. As a result, these records are an indicator of potential presence only and do not consider if suitable vegetation, geology, soil, climate, or habitat types are present to support the occurrence of a species or community.

#### 2.2.2 *State database searches*

The NSW BioNet online database is based on collated biodiversity data acquired by the NSW Government through a range of sources including specimen collections, research and monitoring programs, and community wildlife groups. A BioNet database search was used to generate a list of threatened flora and fauna species listed under the NSW BC Act that may occur within 10 km of the subject site.

### 2.3 Results

#### 2.3.1 *World or National Heritage Properties*

No World or National heritage properties listed under the EPBC Act occur on or within 10 km of the subject site.

### 2.3.2 Wetlands of International Significance (Ramsar Wetlands)

No wetlands of international significance (Ramsar wetlands) occur on or within 10 km of the subject site.

### 2.3.3 Threatened Ecological Communities (TECs)

Database searches using the Commonwealth PMST revealed that six (6) TECs listed under the EPBC Act may occur within 10 km of the subject site:

- Coastal Swamp oak (*Casuarina glauca*) forest of NSW and south east QLD ecological community - Endangered;
- Coastal swamp sclerophyll forest of NSW and south east QLD - Endangered;
- Dunn's white gum (*Eucalyptus dunnii*) moist forest in north east NSW and south east QLD;
- Grey box-grey gum wet forest of subtropical eastern Australia - Endangered;
- Lowland rainforest of subtropical Australia - Critically Endangered;
- Subtropical eucalypt floodplain forest and woodland of the NSW north coast and south east QLD bioregions - Endangered.

### 2.3.4 Threatened Flora Species

Threatened flora species detected in the database searches are listed in TABLE 1. The conservation status of each species listed in TABLE 1 is shown in accordance with the EPBC Act and BC Act.

**TABLE 1  
THREATENED FLORA SPECIES THAT MAY OCCUR WITHIN 10 KM OF THE SUBJECT SITE**

Scientific Name	Common Name	BC Act <sup>^</sup>	EPBC Act <sup>#</sup>
<i>Archidendron hendersonii</i>	White lace flower	V	
<i>Bulbophyllum globuliforme</i>	Miniature moss-orchid	V	V
<i>Clematis fawcettii</i>	Stream clematis	V	V
<i>Corchorus cunninghamii</i>	Native jute	E	E
<i>Desmodium acanthocladum</i>	Thorny pea	V	V
<i>Dichanthium setosum</i>	Bluegrass	V	V
<i>Endiandra floydii</i>	Floyd's walnut	E	E
<i>Eucalyptus glaucina</i>	Slaty Red Gum	V	V
<i>Floydia praealta</i>	Ball nut	V	V
<i>Gossia fragrantissima</i>	Sweet myrtle	E	E
<i>Grevillea hilliana</i>	White yiel yiel	E	
<i>Macadamia integrifolia</i>	Macadamia Nut		V
<i>Macadamia tetraphylla</i>	Rough-shelled Bush Nut	V	V
<i>Myrsine richmondensis</i>	Purple-leaf muttonwood	E	E
<i>Melalueca irbyana</i>	Weeping paperbark	E	
<i>Owenia cepiodora</i>	Onionwood	V	V
<i>Paspalidium grandispiculatum</i>		V	V

Scientific Name	Common Name	BC Act <sup>^</sup>	EPBC Act <sup>#</sup>
<i>Persicaria elatior</i>	Knotweed	V	V
<i>Rhodamnia rubescens</i>	Scrub Turpentine	CE	CE
<i>Rhodomyrtus psidioides</i>	Native Guava	CE	CE
<i>Rotala tripartita</i>		E	
<i>Sophora fraseri</i>	Brush sophora	V	V
<i>Thesium australe</i>	Austral Toadflax	V	V
<i>Tylophora woollsii</i>	Cryptic Forest Twiner	E	E
<sup>^</sup> NSW Biodiversity Conservation Act 2016 (BC Act) <sup>#</sup> Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) CE - Critically Endangered, E - Endangered and V - Vulnerable			

### 2.3.5 Threatened Fauna Species

Threatened fauna species detected in the database searches are listed in TABLE 2. The conservation status of each species listed in TABLE 2 is shown in accordance with the EPBC Act and BC Act.

**TABLE 2  
THREATENED FAUNA SPECIES THAT MAY OCCUR WITHIN 10 KM OF THE SUBJECT SITE**

Scientific Name	Common Name	BC Act <sup>^</sup>	EPBC Act <sup>#</sup>
<b>Amphibians</b>			
<i>Mixophyes fleayi</i>	Fleay's frog		E
<i>Mixophyes iteratus</i>	Giant barred frog	E	V
<b>Birds</b>			
<i>Anseranas semipalmata</i>	Magpie goose	V	
<i>Anthochaera phrygia</i>	Regent Honeyeater	CE	CE
<i>Botaurus poiciloptilus</i>	Australasian bittern		E
<i>Calidris ferruginea</i>	Curlew sandpiper	E	CE
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	V
<i>Carterornis leucotis</i>	White-eared monarch	V	
<i>Climacteris picumnus victoriae</i>	Brown treecreeper	V	V
<i>Coracina lineata</i>	Barred Cuckoo-shrike	V	
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's Fig-Parrot	CE	E
<i>Dasyornis brachypterus</i>	Eastern bristlebird		E
<i>Ephippiorhynchus asiaticus</i>	Black-necked Stork	E	
<i>Erythrorhynchus radiatus</i>	Red Goshawk	CE	V
<i>Falco hypoleucos</i>	Grey Falcon	V	V
<i>Grantiella picta</i>	Painted Honeyeater	V	V
<i>Haliaeetus leucogaster</i>	White-bellied Sea-Eagle	V	
<i>Hirundapus caudacutus</i>	White-throated Needle-tail		V
<i>Irediparra gallinacea</i>	Comb-crested jacana	V	
<i>Ixobrychus flavicollis</i>	Black bittern	V	
<i>Lathamus discolor</i>	Swift Parrot	E	CE
<i>Limosa limosa</i>	Black-tailed godwit	V	
<i>Melanodryas cucullata cucullata</i>	South-eastern hooded robin		E
<i>Numenius madagascariensis</i>	Eastern curlew		CE
<i>Oxyura australis</i>	Blue-billed duck	V	

Scientific Name	Common Name	BC Act <sup>^</sup>	EPBC Act <sup>#</sup>
<i>Pandion cristatus</i>	Eastern Osprey	V	
<i>Rostratula australis</i>	Australian painted snipe	E	E
<i>Stagonopleura guttata</i>	Diamond Firetail	V	
<i>Stictonetta naevosa</i>	Freckled duck	V	
<i>Turnix maculosus</i>	Red-backed button-quail	V	
<i>Turnix melanogaster</i>	Black-breasted Button-quail	CE	V
<i>Tyto longimembris</i>	Eastern Grass Owl	V	
<b>Insects/Invertebrates</b>			
<i>Argynnis hyperbius inconstans</i>	Australian Fritillary		CE
<b>Mammals</b>			
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat	V	V
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll	V	E
<i>Macropus dorsalis</i>	Black-striped wallaby	E	
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V	
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V	
<i>Notamacropus parma</i>	Parma Wallaby	V	V
<i>Nyctophilus bifax</i>	Eastern long-eared bat	V	
<i>Petauroides volans</i>	Greater Glider	E	E
<i>Petaurus australis</i>	Yellow-bellied Glider	V	V
<i>Petaurus norfolcensis</i>	Squirrel Glider	V	
<i>Petrogale penicillata</i>	Brush-tailed rock-wallaby		V
<i>Phascogale tapoatafa</i>	Brush-tailed Phascogale	V	
<i>Phascolarctos cinereus</i>	Koala	E	E
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo		V
<i>Pseudomys novaehollandiae</i>	New Holland Mouse		V
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox	V	V
<i>Scoteanax rueppellii</i>	Greater Broad-nosed Bat	V	
<i>Thylogale stigmatica</i>	Red-legged pademelon	V	
<b>Reptiles</b>			
<i>Cacophis harriettae</i>	White-crowned snake	V	
<i>Coeranoscincus reticulatus</i>	Three-toed Snake-tooth Skink	V	V
<sup>^</sup> NSW Biodiversity Conservation Act 2016 (BC Act) <sup>#</sup> Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) CE - Critically Endangered, E - Endangered and V - Vulnerable			

### 2.3.5.1 Migratory Species

Migratory species identified in database searches are listed in TABLE 3.

**TABLE 3  
COMMONWEALTH LISTED MIGRATORY SPECIES THAT MAY OCCUR WITHIN 10 KM OF  
THE SUBJECT SITE**

Scientific Name	Common Name	Status <sup>#</sup>
<i>Actitis hypoleucos</i>	Common sandpiper	M
<i>Apus pacificus</i>	Fork-tailed swift	M
<i>Calidris acuminata</i>	Sharp-tailed sandpiper	M
<i>Calidris ferruginea</i>	Curlew sandpiper	M, CE
<i>Calidris melanotos</i>	Pectoral sandpiper	M

Scientific Name	Common Name	Status <sup>#</sup>
<i>Cuculus optatus</i>	Oriental Cuckoo	M
<i>Gallinago hardwickii</i>	Latham's snipe	M
<i>Hirundapus caudacutus</i>	White-throated Needletail	M, V
<i>Monarcha melanopsis</i>	Black-faced Monarch	M
<i>Motacilla flava</i>	Yellow Wagtail	M
<i>Myiagra cyanoleuca</i>	Satin Flycatcher	M
<i>Numenius madagascariensis</i>	Eastern curlew	M, CE
<i>Pandion haliaetus</i>	Osprey	M
<i>Rhipidura rufifrons</i>	Rufous Fantail	M
<i>Symposiachrus trivirgatus</i>	Spectacled Monarch	M
<i>Tringa nebularia</i>	Common greenshank	
# Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i> (EPBC Act) CE - Critically Endangered, E - Endangered, V - Vulnerable and M - Migratory		

## 3 STATUTORY CONSIDERATIONS

### 3.1 Introduction

This section includes an assessment of the likely impacts of the proposed development with regards to relevant Commonwealth, State, and local legislation. Mitigation / management measures proposed to minimise and mitigate any impacts on the biodiversity and habitat values of the subject site have also been detailed where applicable. Assessment of compliance with relevant legislative requirements is also provided where relevant.

### 3.2 Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)

#### 3.2.1 Background

The EPBC Act provides a mechanism for assessing the environmental impact of activities and development on Matters of National Environmental Significance (MNES). A person must not, without an approval under the EPBC Act, take an action that has or will have, or is likely to have, a significant impact on any of the following MNES:

- world heritage properties or national heritage places.
- declared Ramsar wetlands.
- listed threatened species or ecological community.
- listed migratory species.
- Commonwealth marine area or Commonwealth land.

The Act also prohibits the taking, without an approval under the EPBC Act, of:

- a nuclear action; and
- an action in a Commonwealth marine area or on Commonwealth land that has or will have, or is likely to have, a significant impact on the environment.

MNES in NSW include:

- declared World Heritage areas.
- declared Ramsar wetlands.
- listed threatened species (Schedule 1 and 2 of the *Commonwealth Endangered Species Protection Act 1992*).
- listed ecological communities.
- listed migratory species (JAMBA and CAMBA).

An action includes a project, development, undertaking or an activity or series of activities. An action does not require approval if it is a lawful continuation of a use of land, sea or seabed that was occurring before the commencement of the EPBC Act. An enlargement, expansion or intensification of a use is not a continuation of a use.

A Commonwealth assessment will be required for proposed activities on the subject site if they affect a MNES. The Commonwealth Department of the Environment has prepared EPBC Act Policy Statements, including the *Matters of National Environmental Significance - Significant Impact Guidelines 1.1* (DotE 2013), which provides a self-assessment process to assist in determining whether an action should be referred to the Commonwealth for a decision on whether assessment and approval is required.

Where a project or action is believed to potentially cause a significant impact on a MNES, it is to be referred to the Australian Government Department of Agriculture, Water and the Environment (DAWE) for assessment as to whether the action is a 'controlled action' requiring Commonwealth approval for the proposed action. The proposed development has been considered against the Principal Significant Impact Guidelines for each of the MNES identified on the subject site. This assessment is provided in the following sections.

### **3.2.2 Declared world heritage areas**

There are no declared World Heritage areas located on or near the subject site.

### **3.2.3 Declared Ramsar wetlands**

There are no declared Ramsar wetlands located on or near the subject site.

### **3.2.4 Threatened Ecological Communities (TECs)**

No TECs identified in SECTION 2.3.3 are present within or directly adjacent to subject site.

### **3.2.5 Commonwealth listed threatened flora and fauna species**

#### **3.2.5.1 Significant impact criteria**

An action is likely to have a significant impact on a critically endangered, endangered, or vulnerable species if it results in the following:

- a long-term decrease in the size of a population;
- reduction in the area of occupancy of the species;
- fragments an existing population into two or more populations;
- adversely affect habitat critical to the survival of a species;
- disrupts the breeding cycle of a population;
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;
- introduces disease that may cause the species to decline; or
- interferes with the recovery of the species.

A 'population of a species' is defined under the EPBC Act as an occurrence of the species in a particular area. In relation to critically endangered, endangered or vulnerable threatened species, occurrences include but are not limited to a geographically distinct regional population, or collection of local populations, or a population, or collection of local populations that occur within a particular bioregion.

An 'invasive species' is an introduced species, including an introduced (translocated) native species, which out-competes native species for space and resources, or which is a predator of native species. Introducing an invasive species into an area may result in that species becoming established. An invasive species may harm listed threatened species or ecological communities by direct competition, modification of habitat or predation.

The suitability of the habitats on the subject site for EPBC Act listed threatened fauna species identified in **TABLES 1-3** were assessed to determine those species could potentially occur (**APPENDIX 1**). A summary of this assessment is provided below.

#### 3.2.5.2 Applicability to the subject site

##### **Flora**

No threatened flora species listed under schedules of the EPBC Act were recorded in the subject site / proposed works areas. Further, no suitable habitat was observed that could support any of the threatened flora species listed **TABLE 1**.

##### **Amphibians**

There have been no records of the Fleay's frog (*Mixophyes fleayi*) or Giant barred frog (*Mixophyes iteratus*) from within 10 km of the subject site in the NSW BioNet online database. Both species are typically found in areas of intact rainforest / wet sclerophyll forest with leaf litter for shelter. No suitable habitat is available in the subject site for these species and no impact is considered likely (**APPENDIX 1** refers).

##### **Birds**

Taking a conservative approach and given the proximity of the Richmond River, it cannot be conclusively ruled out that the following wide-ranging species may aerially traverse the area from time-to-time. Notwithstanding, the subject site and/or works area provides no suitable forage, nesting, or roosting habitat to be of value to these species.

- Grey falcon (*Falco hypoleucos*);
- Red goshawk (*Erythrotriorchis radiatus*);
- White-throated needletail (*Hirundapus caudacutus*).

Suitable forage habitat / trees for the Glossy-black cockatoo (*Calyptorhynchus lathami lathami*) and Painted honeyeater (*Grantiella picta*) were observed along the Richmond River. It is therefore considered possible that individuals would traverse the area while foraging; however, no suitable habitat is available or will be impacted within the subject site / works areas.



Although some threatened bird species are considered possible occupants of nearby areas, no suitable habitat is available in either area of the subject site to support an important population or indeed any individual. See **APPENDIX 1** for detailed habitat suitability assessments. As a result, it can be confidently concluded that no threatened bird species listed under the EPBC Act will be significantly affected by Stage 1 of the proposed works.

### ***Invertebrates***

The subject site does not contain suitable habitat (including the larval food plant *Viola betonicifolia*) to support the Australian fritillary (*Argynnis hyperbius inconstans*). See **APPENDIX 1** for detailed habitat suitability assessments.

### ***Mammals***

The subject site / works areas contain no suitable roosting or forage habitat for threatened Large-eared pied bat (*Chalinolobus dwyeri*) or hollow-bearing trees for the Greater glider (*Petauroides Volans*).

Suitable vegetation types are also absent from the area to consider any potential impact to the following terrestrial species by the proposed works:

- Brush-tailed rock-wallaby (*Petrogale penicillata*);
- Long-nosed potoroo (*Potorous tridactylus tridactylus*);
- New Holland mouse (*Pseudomys novaehollandiae*);
- Spotted-tailed quoll (*Dasyurus maculatus*);

Given the presence of Preferred Koala Food Trees (PKFTs) and suitable flowering and fruiting trees along the Richmond River, the Grey-headed flying fox (*Pteropus poliocephalus*) and koala (*Phascolarctos cinereus*) are expected to occupy / utilise habitat in the area. Notwithstanding this, no suitable vegetation for these species is located within the subject site to consider any direct impacts to individuals or their habitat.

Given a complete absence of suitable habitat across the subject site / works areas, it can be confidently concluded that no threatened mammal species listed under the EPBC Act will be significantly affected by Stage 1 of the proposed works.

### ***Reptiles***

There is no suitable habitat available in the subject site / works areas to consider the presence of, and therefore any impact to, the Three-toed snake-tooth skink (*Coeranoscincus reticulatus*) (**APPENDIX 1** refers).

## **3.2.6 Listed migratory species**

### **3.2.6.1 Significant impact criteria**

An action will require approval if the action has, will have, or is likely to have a significant impact on a listed migratory species. Note that some migratory species are also listed as

threatened species. The significant impact criteria below are relevant to migratory species that are not threatened.

An action is likely to have a significant impact on a migratory species if there is a real chance or possibility that it will:

- substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles); or
- alter hydrological cycles, destroy, or isolate an area of important habitat for a migratory species; or
- result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or
- seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.

An area of 'important habitat' for a migratory species is:

- habitat used by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or
- habitat that is of critical importance to the species at life-cycle stages; and/or
- habitat utilized by a migratory species which is at the limit of the species range; and/or
- habitat within an area where the species is declining.

Listed migratory species cover a broad range of species with different life cycles and population sizes. Therefore, the definition of what an 'ecologically significant proportion' of the population is varies with the species (each circumstance needs to be evaluated). Some factors that should be considered include the species' population status, genetic distinctiveness, and species-specific behavioural patterns (for example, site fidelity and dispersal rates).

The term 'population' in relation to migratory species, means the entire population or any geographically separate part of the population of any species or lower taxon of wild animals, a significant proportion of whose members cyclically and predictably cross one (1) or more national jurisdictional boundaries including Australia.

#### 3.2.6.2 Applicability to the subject site

Taking a conservative approach and given the proximity of the Richmond River, it cannot be conclusively ruled out that the following migratory species may aerially traverse the subject site from time-to-time and/or utilise available habitat in the Richmond River. Notwithstanding, the subject site and/or works area provides no suitable forage, nesting, or roosting habitat to be of value to these species.

- Fork-tailed swift (*Apus pacificus*);

- White-bellied sea-eagle (*Haliaeetus leucogaster*)
- White-throated needletail (*Hirundapus caudacutus*); and
- Osprey (*Pandion haliaetus*).
- Common greenshank (*Tringa nebularia*);
- Latham's snipe (*Gallinago hardwickii*).

Given the absence of habitat, the proposed works is unlikely to impact habitat critical or any migratory bird species listed in **TABLE 3**.

### **3.2.7 Requirement for Commonwealth Referral**

No suitable habitat is available in either area of the subject site to support an important population of any of the flora / fauna species listed as threatened under the EPBC Act. As a result, it can be confidently concluded that no MNES will be significantly affected by Stage 1 of the proposed works and no Commonwealth approval is considered necessary.

## **3.3 Biodiversity Conservation Act 2016 (BC Act)**

### **3.3.1 Background**

The NSW BC Act commenced on the 25<sup>th</sup> August 2017. The BC Act, together with the *Biodiversity Conservation Regulation 2017* (BCR), outlines the framework for addressing impacts on biodiversity from development and clearing. It establishes a framework to avoid, minimise and offset impacts on biodiversity from development through the Biodiversity Offsets Scheme (BOS) (addressed in **SECTION 2.3.2.2** below).

The Biodiversity Offsets Scheme (the Scheme) creates a transparent, consistent and scientifically based approach to biodiversity assessment and offsetting for all types of development that are likely to have a significant impact on biodiversity. It also establishes biodiversity stewardship agreements, which are voluntary in-perpetuity agreements entered into by landholders, to secure offset sites.

There are five key steps to participating in the Scheme for developers or landholders ('proponents') who want to undertake development or clearing.

- Step 1 - The proponent determines whether the Biodiversity Offsets Scheme applies.
- Step 2 - An accredited assessor applies the Biodiversity Assessment Method and offsetting rules to the activity.
- Step 3 - The consent authority assesses the application and determines whether to approve or refuse the application.
- Step 4 - The consent authority determines the application and sets the offset obligation.
- Step 5 - The proponent satisfies its credit obligation and can begin the approved activity.

Step 1 of this process has been completed (in the following sections) as part of this REF to determine if the Biodiversity Offsets Scheme applies to the proposed development. Additional steps (if required) will be completed separately, and in addition, to this REF.

### **3.3.2 Biodiversity Offsets Scheme (BOS)**

#### **3.3.2.1 Background**

The BOS applies to:

1. local development assessed under Part 4 of the *Environmental Planning and Assessment Act 1979* (EP & A Act) that triggers the BOS threshold or is likely to significantly affect threatened species based on the test of significance in section 7.3 of the BC Act;
2. state significant development and state significant infrastructure projects, unless the Secretary of the Department of Planning and Environment and the Chief Executive of OEH determine that the project is not likely to have a significant impact;
3. biodiversity certification proposals;
4. clearing of native vegetation in urban areas and areas zoned for environmental conservation that exceeds the BOS threshold and does not require development consent;
5. clearing of native vegetation that requires approval by the Native Vegetation Panel under the LLS Act; and
6. activities assessed and determined under Part 5 of the EP & A Act (generally, proposals by government entities), if proponents choose to 'opt in' to the BOS.

Point 6 above may apply to the proposed development.

#### **3.3.2.2 The Biodiversity Offsets Scheme Threshold**

The BOS Threshold is a test used to determine when is necessary to engage an accredited assessor to apply the Biodiversity Assessment Method (the BAM) to assess the impacts of a proposal.

It is used for local developments (development applications submitted to councils) and clearing that does not require development consent in urban areas and areas zoned for environmental conservation i.e. under the State Environmental Planning Policy (Vegetation in Non-Rural Areas) 2017 (Vegetation SEPP).

The BCR sets out threshold levels for when the BOS will be triggered. The threshold has two elements:

1. whether the amount of native vegetation being cleared exceeds a threshold area set out below; and
2. whether the impacts occur on an area mapped on the Biodiversity Values map published by the Minister for the Environment.

If clearing and other impacts exceeds either trigger, the BOS applies to the proposed development including biodiversity impacts prescribed by clause 6.1 of the BCR.

**Area Clearing Threshold**

The area threshold varies depending on the minimum lot size (shown in the Lot Size Maps made under the relevant Local Environmental Plan (LEP)), or actual lot size (where there is no minimum lot size provided for the relevant land under the LEP) as shown in **TABLE 5** below.

The area threshold applies to all proposed native vegetation clearing associated with a proposal, regardless of whether this clearing is across multiple lots. In the case of a subdivision, the proposed clearing must include all future clearing likely to be required for the intended use of the land after it is subdivided.

**TABLE 5  
BOS AREA CLEARING THRESHOLD**

Minimum lot size associated with the property	Threshold for clearing, above which the BAM and offsets scheme apply
Less than 1 ha	0.25 ha or more
1 ha to less than 40 ha	0.5 ha or more
40 ha to less than 1000 ha	1 ha or more
1000 ha or more	2 ha or more

The proposed development will not result in the removal of any native vegetation. Entry into the BOS is therefore not triggered by the area clearing threshold.

**Biodiversity Values Map Threshold**

The Biodiversity Values Map identifies land with high biodiversity value, as defined by clause 7.3(3) of the BCR. The BOS applies to all clearing of native vegetation and other biodiversity impacts prescribed by clause 6.1 of the BCR on land identified on the map.

The subject site is mapped as containing areas of high biodiversity value on the Biodiversity Values Map (i.e., associated with the Richmond River) (**FIGURE 3**). Notwithstanding this, no native vegetation will be cleared for Stage 1 of the proposed works and therefore entry into the BOS is not triggered.



FIGURE 3 BIODIVERSITY VALUES MAPPED ALONG THE RICHMOND RIVER (PURPLE)

### 3.3.2.3 Summary

With consideration of the above, further assessment under the BOS is not considered necessary for the proposed works.

### 3.3.3 *State listed threatened flora and fauna species*

#### 3.3.3.1 Test of significance

The test of significance is set out in section 7.3 of the BC Act and is used to determine if a development or activity is likely to significantly affect threatened species or ecological communities, or their habitats.

In determining the nature and magnitude of an impact, it is important to consider matters such as:

- Pre-construction, construction and occupation/maintenance phases;
- All on-site and offsite impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones;
- All direct and indirect impacts;
- The frequency and duration of each known or likely impact/action;

- The total impact which can be attributed to that action over the entire geographic area affected, and over time;
- The sensitivity of the receiving environment; and
- The degree of confidence with which the impacts of the action are known and understood.

Recovery and threat abatement plans, priorities action statements and threatened species profiles may provide further guidance on whether an action/activity is likely to be significant.

Application of the precautionary principle requires that a lack of scientific certainty about the potential impacts of an action does not itself justify a decision that the action is not likely to have a significant impact. If information is not available to conclusively determine that there will not be a significant impact on a threatened species, population or ecological community, or its habitat, then it should be assumed that a significant impact is likely.

If the activity is likely to have a significant impact or will be carried out in a declared Area of Outstanding Biodiversity Value (AOBV), the proponent must either apply the BOS or prepare a species impact statement (SIS).

An AOBV in NSW is considered as one of the following:

- Gould's Petrel - critical habitat declaration
- Little penguin population in Sydney's North Harbour - critical habitat declaration
- Mitchell's Rainforest Snail in Stotts Island Nature Reserve - critical habitat declaration
- Wollemi Pine - critical habitat declaration

The suitability of the habitats on the subject site for EPBC Act listed threatened fauna species identified in **TABLES 1 & 2** were assessed to determine those species could potentially occur (**APPENDIX 1**). A summary of this assessment is provided below.

#### 3.3.3.2 Applicability to the subject site

##### ***Flora***

No threatened flora species listed under schedules of the BC Act were recorded in the subject site / proposed works areas. Further, no suitable habitat was observed that could support any of the threatened flora species listed **TABLE 1**.

##### ***Amphibians***

As discussed in **SECTION 3.2.5.3**, no suitable habitat is available in the subject site / works areas to support the Fleay's frog or Giant barred frog. As a result, no impact is considered likely (**APPENDIX 1** refers).

##### ***Birds***

As addressed in **SECTION 3.2.7**, it cannot be conclusively ruled out that the White-bellied sea-eagle or the Osprey may aerially traverse the area from time-to-time while foraging along the Richmond River. Regardless, the subject site and/or works area provides no suitable forage, nesting, or roosting habitat to be of value to these species.

Taking a conservative approach, the following threatened species listed under the BC Act have all been recorded within 10 km of the subject site and may potentially utilise resources within the Richmond River catchment from time-to-time. Despite this, no suitable habitat is available in either area of the subject site to support an important population or indeed any individual.

- Black bittern (*Ixobrychus flavicollis*);
- Black-necked stork (*Ephippiorhynchus asiaticus*);
- Blue-billed duck (*Oxyura australis*);
- Comb-crested jacana (*Irediparra gallinacea*);
- Freckled duck (*Stricktonetta naevosa*); and

As a result, it can be confidently concluded that no threatened bird species listed under the BC Act will be significantly affected by Stage 1 of the proposed works. See **APPENDIX 1** for detailed habitat suitability assessments.

### **Mammals**

The subject site / works areas contain no suitable roosting or forage habitat for threatened microchiropteran bat species or hollow-bearing trees for the Brush-tailed phascogale (*Phascogale tapoatafa*), Squirrel glider (*Petaurus norfolcensis*), or Yellow-bellied glider (*Petaurus australis*).

Suitable vegetation types are also absent from the area to consider any potential impact to the following terrestrial species (excluding those addressed under **SECTION 3.2.5.6**) by the proposed works:

- Black-striped wallaby (*Macropus dorsalis*);
- Parma wallaby (*Notamacropus parma*);
- Red-legged pademelon (*Thylogale stigmatica*); and
- Spotted-tailed quoll (*Dasyurus maculatus*).

As discussed in **SECTION 3.2.5.6**, the Grey-headed flying fox and koala are expected to occupy / utilise habitat in the area. Notwithstanding this, no suitable vegetation for these species is located within the subject site to consider any direct impacts to individuals or their habitat.

Given a complete absence of suitable habitat across the subject site / works areas, it can be confidently concluded that no threatened mammal species listed under the EPBC Act will be significantly affected by Stage 1 of the proposed works.



### ***Reptiles***

There is no suitable habitat available in the subject site / works areas to consider the presence of, and therefore any impact to, the White-crowned snake (*Cacophis harriettae*) (APPENDIX 1 refers).

#### **3.3.3.3 Summary**

No suitable habitat is available in either area of the subject site to consider that a significant impact will occur to threatened species or their habitats due to Stage 1 of the proposed works. This will be further abated by integrating the relevant safeguards and mitigation measures discussed in **SECTION 4**.

Conversely, it is expected that in Area 1 the proposed works will ultimately yield a positive outcome by way of clean-up of damaged concrete from within the Richmond River. The proposed works will not be carried out in an AOBV.

#### **3.3.4 *Key threatening processes***

##### **3.3.4.1 Background**

A “threatening process” means a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. Key Threatening Processes (KTP) have been listed in Schedule 4 of the *BC Act (2016)*.

Key Threatening Processes (Schedule 4):

- Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners (*Manorima melanocephala*)
- Alteration of habitat following **subsidence due to longwall mining**
- **Alteration to the natural flow regimes** of rivers, streams, floodplains & wetlands
- Anthropogenic Climate Change
- **Bushrock Removal**
- **Clearing of native vegetation**
- Competition and grazing by the **feral European rabbit (*Oryctolagus cuniculus*)**
- Competition and habitat degradation by feral goats (*Capra hircus*)
- Competition from **feral honeybees (*Apis mellifera*)**
- Death or injury to marine species following capture in **shark control programs on ocean beaches**
- Entanglement in, or ingestion of **anthropogenic debris in marine and estuarine environments**
- Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners

- Habitat degradation and loss by feral horses
- Herbivory and environmental degradation caused by **feral deer**
- High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
- Importation of **Red Imported Fire Ants** (*Solenopsis invicta*)
- Infection by **Psittacine Circoviral (beak & feather) Disease** affecting endangered psittacine species and populations
- Infection of frogs by amphibian chytrid causing the disease chytridiomycosis
- Infection of native plants by *Phytophthora cinnamomi*
- Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae
- Introduction of the Large Earth Bumblebee (*Bombus terrestris*)
- Invasion and establishment of **exotic vines and scramblers**
- Invasion and establishment of Scotch Broom (*Cytisus scoparius*)
- Invasion and establishment of the **Cane Toad** (*Bufo marinus*)
- Invasion, establishment and spread of (Lantana camara)
- Invasion of native plant communities by African Olive (*Olea europaea* subsp. *cuspidata*)
- Invasion of native plant communities by *Chrysanthemoides monilifera*
- Invasion of native plant communities by **exotic perennial grasses**
- Invasion of the **yellow crazy ant** (*Anoplolepis gracilipes*)
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants
- Loss of hollow-bearing trees
- Loss and degradation (or both) of **sites used for hill-topping by butterflies**
- Predation and hybridisation by Feral Dogs (*Canis lupus familiaris*)
- Predation by *Gambusia holbrooki* (Plague Minnow or Mosquito Fish)
- Predation by the **European Red Fox** (*Vulpes vulpes*)
- Predation by the **Feral Cat** (*Felis catus*)
- Predation by the **Ship Rat** (*Rattus rattus*) on Lord Howe Island
- Predation, habitat degradation, competition and disease transmission by **Feral Pigs** (*Sus scrofa*)
- Removal of **dead wood and dead trees.**

#### 3.3.4.2 Applicability to the subject site

It is not considered that the proposed works will contribute significantly to any of the above listed Key Threatening Processes. This is particular the case with the implementation of the environmental safeguards and mitigation measures discussed in **SECTION 5**.

### **3.4 State Environmental Planning Policies (SEPPs)**

#### **3.4.1 Introduction**

This section provides a discussion on the relevant statutory and policy implications of the proposed development which require an environmental assessment under Part 5 of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

#### **3.4.1 Resilience and Hazards SEPP**

##### 3.4.1.1 Background

The *State Environmental Planning Policy (Resilience and Hazards) 2021* (Resilience and Hazards SEPP) came into effect on the 1<sup>st</sup> March 2022.

Chapter 2 - Coastal Management of the Resilience and Hazards SEPP contains planning provisions for land use planning within the coastal zone consistent with the Coastal Management Act 2016. Chapter 2 - Coastal Management gives effect to the objectives of the Coastal Management Act 2016 from a land use planning perspective, by specifying how development proposals are to be assessed if they fall within the coastal zone.

Part 2.1, Clause 2.4 of Chapter 2 - Coastal Management defines the following four (4) coastal management areas through detailed mapping and specifies assessment criteria that are tailored for each coastal management area:

- Coastal wetlands and littoral rainforests area - defined as areas with particular hydrological and ecological characteristics;
- Coastal vulnerability area - defined as the area affected by any one of seven coastal hazards;
- Coastal environment area - defined as the coastal waters of the state/ estuaries/ coastal lakes and foreshores including beaches/ dunes/ headlands and rock platforms as well as surrounding land; and
- Coastal use area - defined as land adjacent to the coast/ where development is or may be carried out.

Councils and other consent authorities must apply these criteria when assessing proposals for development that fall within one or more of the mapped areas.

##### 3.4.1.2 Applicability to the subject site

The site does not contain any mapped coastal values under the Resilience and Hazards SEPP.

### **3.4.2 Biodiversity and Conservation SEPP 2021 - Vegetation in Non-Rural Areas**

#### **3.4.2.1 Background**

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) commenced on 1st March 2022. Chapter 2 - Vegetation in Non-Rural Areas of the Biodiversity and Conservation SEPP works together with the *Biodiversity Conservation Act 2016* and the *Local Land Services Amendment Act 2016* to create a framework for the regulation of clearing of native vegetation in NSW.

Chapter 2 - Vegetation in Non-Rural Areas aims to ensure the biodiversity offset scheme (established under the Land Management and Biodiversity reforms) will apply to all clearing of native vegetation that exceeds the offset thresholds in urban areas and environmental conservation zones that does not require development consent.

Chapter 2 - Vegetation in Non-Rural Areas applies to:

- a) Land within the following local government areas: Bayside, City of Blacktown, Burwood, Camden, City of Campbelltown, Canterbury-Bankstown, Canada Bay, Cumberland, City of Fairfield, Georges River, City of Hawkesbury, Hornsby, Hunter's Hill, Georges River, Inner West, Ku-ring-gai, Lane Cove, City of Liverpool, Mosman, Newcastle, North Sydney, Northern Beaches, City of Parramatta, City of Penrith, City of Randwick, City of Ryde, Strathfield, Sutherland Shire, City of Sydney, The Hills Shire, Waverley, City of Willoughby, Woollahra.
- b) Land within the following zones under an environmental planning instrument: Zone RU5 Village, Zone R1 General Residential, Zone R2 Low Density Residential, Zone R3 Medium Density Residential, Zone R4 High Density Residential, Zone R5 Large Lot Residential, Zone B1 Neighbourhood Centre, Zone B2 Local Centre, Zone B3 Commercial Core, Zone B4 Mixed Use, Zone B5 Business Development, Zone B6 Enterprise Corridor, Zone B7 Business Park, Zone B8 Metropolitan Centre, Zone IN1 General Industrial, Zone IN2 Light Industrial, Zone IN3 Heavy Industrial, Zone IN4 Working Waterfront, Zone SP1 Special Activities, Zone SP2 Infrastructure, Zone SP3 Tourist, Zone RE1 Public Recreation, Zone RE2 Private Recreation, Zone E2 Environmental Conservation, Zone E3 Environmental Management, Zone E4 Environmental Living or Zone W3 Working Waterways.

#### **3.4.2.2 Applicability to the subject site**

The Vegetation SEPP applies to the subject site; however, no native vegetation will require clearing for Stage 1 of the proposed works.

### **3.4.3 Biodiversity and Conservation SEPP 2021 - Koala Habitat Protection 2020**

#### **3.4.3.1 Background**

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) commenced on 1<sup>st</sup> March 2022. Chapter 3 - Koala Habitat Protection 2021 of the Biodiversity and Conservation SEPP contains provisions from the Koala SEPP

2020 and, as an interim measure, applies in the NSW core rural zones of RU1, RU2 and RU3, except within the Greater Sydney and Central Coast areas. This is an interim measure while new land management and private native forestry codes are developed.

The principles of Chapter 3 - Koala Habitat Protection 2020 is to “*encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline*” -

- a) by requiring the preparation of plans of management before development consent can be granted in relation to areas of core koala habitat, and
- b) by encouraging the identification of areas of core koala habitat, and
- c) by encouraging the inclusion of areas of core koala habitat in environment protection zones.

#### 3.4.3.2 Applicability to the Subject Site

Under the Richmond Valley LEP, the corner of Ellangowan Road and Summerland Way is zoned RU1 - Primary Production. Chapter 3 - Koala habitat protection 2020 therefore applies to this part of the subject site.

Notwithstanding this, to confirm if development controls apply, assessment has been undertaken to determine whether the proposed works is likely to have any impact on koalas or koala habitat based on the following steps as per the requirements of Part 3.2 of Chapter 3 - Koala habitat protection 2020.

#### **Step 1 - is the land potential koala habitat?**

Part 3.1, Clause 3.2 of Chapter 3 - Koala Habitat Protection 2020 of the Biodiversity and Conservation SEPP “potential koala habitat” is defined as follows:

*“Potential koala habitat means areas of native vegetation where trees of the types listed in Schedule 3 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.”*

The area of the subject site comprising the corner of Ellangowan Road and Summerland Way contains no native vegetation and is therefore not considered to be potential koala habitat for the purposes of the Chapter 3 - Koala Habitat Protection 2020 of the Biodiversity and Conservation SEPP. No further assessment is necessary.

### **3.4.4 Biodiversity and Conservation SEPP 2021 - Koala Habitat Protection 2021**

#### 3.4.4.1 Background

The State Environmental Planning Policy (Biodiversity and Conservation) 2021 (Biodiversity and Conservation SEPP) commenced on 1<sup>st</sup> March 2022. Chapter 4 - Koala Habitat Protection 2021 of the Biodiversity and Conservation SEPP contains the land-use planning and

assessment framework for koala habitat within Metropolitan Sydney and the Central Coast and applies to all zones except RU1, RU2 and RU3 in the short term.

The aim of Chapter 4 - Koala Habitat Protection 2021 is to “*encourage the conservation and management of areas of natural vegetation that provide habitat for koalas to support a permanent free-living population over their present range and reverse the current trend of koala population decline*”.

Chapter 4 - Koala Habitat Protection 2021 applies to all zones in the following nine (9) LGAs - Metropolitan Sydney LGAs (Blue Mountains, Campbelltown, Hawkesbury, Ku-Ring-Gai, Liverpool, Northern Beaches, Hornsby, Wollondilly) and the Central Coast LGA. In all other identified LGAs, the provisions of Chapter 4 - Koala Habitat Protection 2021 do not apply to land zoned RU1 Primary Production, RU2 Rural Landscape or RU3 Forestry.

#### 3.4.4.2 Applicability to the subject site

The subject site is located within a relevant LGA (i.e., Richmond Valley) and KMA (i.e., North Coast) as outlined in Schedule 2 of the Biodiversity and Conservation SEPP. The subject site is also zoned as the following under the Richmond Valley LEP 2012:

- Area 1: C2 - Environmental Conservation and W1 - Natural Waterways.

Chapter 4 - Koala habitat protection 2021 therefore applies.

Notwithstanding this, to confirm if development controls apply, assessment has been undertaken to determine whether the proposed works is likely to have any impact on koalas or koala habitat as per the requirements of Part 4.2 of Chapter 4 - Koala Habitat Protection 2021.

Part 4.1, Clause 4.2 of Chapter 4 - Koala Habitat Protection 2021 of the Biodiversity and Conservation SEPP defines koala habitat and core koala habitat as:

*“Koala habitat means koala habitat however described in a plan of management under this Policy or a former Koala SEPP and includes core koala habitat.”*

*“Core koala habitat means -*

- a) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas are recorded as being present at the time of assessment of the land as highly suitable koala habitat, or*
- b) an area of land which has been assessed by a suitably qualified and experienced person as being highly suitable koala habitat and where koalas have been recorded as being present in the previous 18 years.”*

It is noted that the term **highly suitable habitat** is not defined within the Biodiversity and Conservation SEPP. However, a factsheet issued by the NSW Government provides the following definition:

***“Highly suitable habitat is where 15% or greater of the total number of trees within any Plant Community Type are the regionally relevant species of those listed in Schedule 2 of the SEPP.”***

It is also noted that Part 3.1, Clause 3.2 of Chapter 3 - Koala Habitat Protection 2020 of the Biodiversity and Conservation SEPP “potential koala habitat” is defined as follows:

***“Potential koala habitat means areas of native vegetation where trees of the types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component.”***

The subject site (including both areas) contains no native vegetation and is therefore not considered to be core koala habitat for the purposes of the Chapter 4 - Koala Habitat Protection 2021 of the Biodiversity and Conservation SEPP.

### **3.4.5 Transport and Infrastructure SEPP 2021**

#### **3.4.5.1 Background**

The State Environmental Planning Policy (Transport and Infrastructure) 2021 (Transport and Infrastructure SEPP) commenced on 1<sup>st</sup> March 2022 and repeals the provisions of the following four (4) SEPPs:

1. SEPP (Infrastructure) 2007 (Infrastructure SEPP)
2. SEPP (Educational Establishments and Childcare Facilities) 2017 (Education and Childcare SEPP)
3. SEPP (Major Infrastructure Corridors) 2020 (Corridor SEPP)
4. SEPP (Three Ports) 2013 (Three Ports SEPP).

Chapter 2 - Infrastructure of the Transport and Infrastructure SEPP contains planning rules and controls from the Infrastructure SEPP for infrastructure in NSW, such as for hospitals, roads, railways, emergency services, water supply and electricity delivery.

#### **3.4.5.2 Applicability to the Subject Site**

For the purposes of concrete recovery and temporary storage and crushing, the concrete is being recovered from a road related area, the temporary crushing plant will be in a road corridor, and the reused aggregate is being used for the construction of a road related area (road construction).

As per the definition under the *Road Transport Act 2013*, a road related area is (among other things) an area that is not a road and that is open to or used by the public for driving, riding or parking vehicles. This definition applies to Areas 1 and 2 of the subject site because both are not gazetted roads or road reserves.

Further to this and based on interrogation of Chapter 2 of the Transport and Infrastructure SEPP, the following pathway applies to the proposed works to recover and crush the concrete, making it **development permitted without consent**.

### ***Division 17 Roads and Traffic***

- ***Subdivision 1 Roads and road infrastructure facilities***
  - ***2.109 Development permitted without consent - general***
    - (1) Development for the purpose of a road or road infrastructure facilities may be carried out by or on behalf of a public authority without consent on any land.***
    - (3) In this section and section 2.112, a reference to development for the purpose of road infrastructure facilities includes a reference to development for any of the following purposes if the development is in connection with a road or road infrastructure facilities—***
      - (a) construction works (whether or not in a heritage conservation area), including—***
        - (iii) extraction of extractive materials and stockpiling of those materials, if—***
          - (A) the extraction and stockpiling are ancillary to road construction, or***
          - (B) the materials are used solely for road construction and the extraction and stockpiling take place in or adjacent to a road corridor, and***
        - (iv) temporary crushing or concrete batching plants, if they are used solely for road construction and are on or adjacent to a road corridor.***

## **3.5 ‘Additional’ relevant environmental NSW legislation**

### **3.5.1 National Parks and Wildlife Act 1974 (NPW Act)**

#### **3.5.1.1 Introduction**

The NPW Act consolidates and amends the law relating to the establishment, preservation and management of national parks, historic sites and certain other areas and the protection of certain Aboriginal objects; to repeal the *Wild Flowers and Native Plants Protection Act 1927*, the *Fauna Protection Act 1948*, the *National Parks and Wildlife Act 1967* and certain other enactments; to amend the *Local Government Act 1919* and certain other Acts in certain respects; and for purposes connected therewith.

In addition to environmental / ecological features associated with biodiversity and ecosystem processes (addresses in other areas of this REF), the NPW Act provides the basis for the legal protection and management of Aboriginal sites within NSW.



Part 6, Division 1 and 2 of the NPW Act provide statutory protection for any physical/material evidence of Aboriginal occupation of NSW and places of cultural significance to the Aboriginal community. The key principles of the Act in relation to Aboriginal heritage are the prevention of unnecessary or unwarranted destruction of Aboriginal objects, and the active protection and conservation of objects which are of high cultural significance. It is an offence to knowingly disturb an Aboriginal object, irrespective of its nature or significance.

### 3.5.1.2 Applicability to the subject site

An Aboriginal Heritage Information Management System (AHIMS) search was undertaken on 19<sup>th</sup> April 2023 and identified no Aboriginal Sites or Places registered in association with the subject site areas. Further detail on relevant management considerations provided in **SECTION 4.9**.

## 3.5.2 *Fisheries Management Act 1994 (FM Act)*

### 3.5.2.1 Introduction

The NSW FM Act aims 'to conserve, develop and share the fishery resources of the state for the benefit of present and future generations and, in particular to:

- (a) conserve fish stocks and key fish habitats, and
- (b) conserve threatened species, populations and ecological communities of fish and marine vegetation, and
- (c) promote ecologically sustainable development, including the conservation of biological diversity,

and, consistently with those objects:

- (d) promote viable commercial fishing and aquaculture industries, and
- (e) promote quality recreational fishing opportunities, and
- (f) appropriately share fisheries resources between the users of those resources, and
- (g) provide social and economic benefits for the wider community of NSW.
- (h) to recognise the spiritual, social and customary significance to Aboriginal persons of fisheries resources and to protect, and promote the continuation of, Aboriginal cultural fishing.

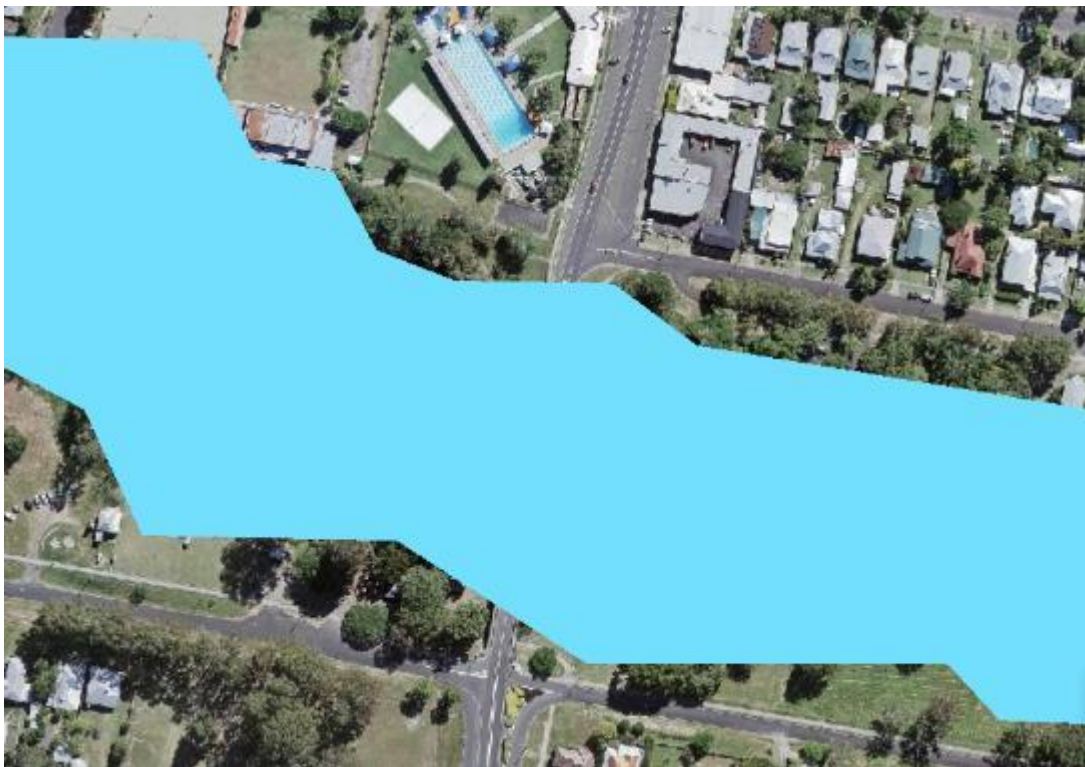
### 3.5.2.2 Applicability to the subject site

The Richmond River is mapped as containing the following under the FM Act:

- Freshwater fish community - status = good (**FIGURE 4**); and
- Key fish habitat - Northern Rivers (**FIGURE 5**).



**FIGURE 4 FRESHWATER FISH COMMUNITY MAPPING UNDER THE *FISHERIES MANAGEMENT ACT 1994* ALONG THE RICHMOND RIVER (GREEN)**



**FIGURE 5 KEY FISH HABITAT MAPPING UNDER THE *FISHERIES MANAGEMENT ACT 1994* ALONG THE RICHMOND RIVER (BLUE)**

The proposed works in Area 1 (Halstead Drive) will occur within an area mapped as Key Fish Habitat under the FM Act. Despite this, all proposed works will occur outside of aquatic habitat areas to prevent any impacts to ecosystem function, fish, or marine vegetation.

The proposed clean-up of damaged concrete and materials will improve the water quality and flow, and bank stability of this section of the Richmond River. By association, these remediation works will enhance aquatic habitats and fish passage. Appropriate environmental safeguards will be implemented (e.g., silt fencing, water barriers etc.) to ensure no indirect impacts to the aquatic values of the Richmond River occur.

A *Part 7 Fisheries Management Act* permit has been submitted to the Department of Primary Industries for assessment and approval of the proposed works in Area 1 (**SECTION 2.5.2** refers).

The FM Act does not apply to Area 2.

### **3.5.3 Heritage Act 1977 (HE Act)**

#### **3.5.3.1 Introduction**

The *Heritage Act 1977* (HE Act) provides for the conservation of items of environmental heritage in NSW. The HE Act defines heritage as items or places that are of state and/or local heritage significance and include: places, buildings, works, relics, moveable objects and precincts. As part of NSW heritage protection and management the HE Act maintains a register including an inventory and list to protect items including (i) Aboriginal place, (ii) State Heritage Register, (iii) Interim Heritage order, and (iv) LEP.

#### **3.5.3.2 Applicability to the subject site**

A search of the State Heritage Inventory<sup>2</sup> was undertaken resulting in the item in **PLATE 13** being located within proximity of the subject site (Area 1):

- Cultural feature - Platypus sculptures / carvings on the bed of the Richmond River beneath, and west of, Irving Bridge (Centre Street).

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<sup>2</sup>[https://www.hms.heritage.nsw.gov.au/App/Item/SearchHeritageItems?\\_ga=2.73410962.1480961755.1639350082-1679604799.1601431558](https://www.hms.heritage.nsw.gov.au/App/Item/SearchHeritageItems?_ga=2.73410962.1480961755.1639350082-1679604799.1601431558)





PLATE 13 - PLATYPUS SCULPTURES / CARVINGS ON THE RICHMOND RIVER BED TO THE WEST OF THE IRVING BRIDGE. PHOTO SOURCE:

<https://www.hms.heritage.nsw.gov.au/App/Item/ViewItem?itemId=2850325>

This item is outside of the proposed works area and will not be impacted.

### **3.5.4 Protection of the Environment Operations Act 1994 and Protection of the Environment Operations (Waste) Regulation 2014**

#### **3.5.4.1 Introduction**

The recovery and crushing of concrete and other materials is covered under the recovered aggregate exemption 2014 (**APPENDIX 2** refers). More specifically, this exemption:

- *is issued by the Environment Protection Authority (EPA) under clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation); and*
- *exempts a consumer of recovered aggregate from certain requirements under the Protection of the Environment Operations Act 1997 (POEO Act) and the Waste Regulation in relation to the application of that waste to land, provided the consumer complies with the conditions of this exemption.*

#### **3.5.4.2 Applicability to the subject site**

Based on the information provided in **APPENDIX 2**, the recovered aggregate from Area 1 does not require an EPA permit and is not classed as construction waste.

### 3.6 Richmond Valley Local Environmental Plan (2012) (RVLEP 2012)

#### 3.6.1 Introduction

The RVLEP 2012 currently applies to land in the Richmond Valley LGA and commenced on 21<sup>st</sup> April 2012. Among other things, the CHLEP is subject to the provisions of any SEPP that prevails over as provided by section 3.28 of the *Environmental Planning and Assessment Act 1979* (EP & A Act).

#### 3.6.2 Zoning

##### 3.6.2.1 Background

The proposed works is located within the RVLGA, in an area covered by the RVLEP 2012. The subject site areas are zoned as the following:

- Area 1: **C2 - Environmental Conservation** and **W1 - Natural Waterways** (FIGURE 6a).
- Area 2 (corner of Ellangowan Road and Summerland Way): **RU1 - Primary Production** (FIGURE 6b).



FIGURE 6a Richmond Valley Local Environmental Plan zoning (Area 1)



FIGURE 6b Richmond Valley Local Environmental Plan zoning (Area 2)

##### 3.6.2.2 C2 - Environmental Conservation

The objectives of the C2 zone are:

- To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.
- To prevent development that could destroy, damage or otherwise have an adverse effect on those values.

Stage 1 of the proposed works is considered to be consistent with this zone as it will remove concrete and other construction materials from the Richmond River and restore areas whereby the environmental values have been diminished by severe damage caused by flooding (**PLATES 1-10** refer).

#### 3.6.2.3 W1 - Natural Waterways

The objectives of the W1 zone are:

- To protect the ecological and scenic values of natural waterways.
- To prevent development that would have an adverse effect on the natural values of waterways in this zone.
- To provide for sustainable fishing industries and recreational fishing.

Assessment of the potential impacts of Stage 1 of the proposed works on the Richmond River is provided in **SECTION 2.5.2** under the FM Act. Notwithstanding this, Stage 1 of the proposed works is considered to be consistent with this zone as it will remove concrete and other construction materials from the Richmond River and improve the ecological and scenic values of the Richmond River that have been diminished due to flooding (**PLATES 1-10** refer).

#### 3.6.2.4 RU1 - Primary Production

The objectives of the RU1 zone are:

- To encourage sustainable primary industry production by maintaining and enhancing the natural resource base.
- To encourage diversity in primary industry enterprises and systems appropriate for the area.
- To minimise the fragmentation and alienation of resource lands.
- To minimise conflict between land uses within this zone and land uses within adjoining zones.
- To ensure that development does not unreasonably increase the demand for public services or public facilities.

This area is located within the road reserve on the corner of Ellangowan Road and Summerland Way. In its existing state is void of native vegetation and used as a stockpile storage (**PLATES 11-12** refer). Given these factors, the proposed temporary storage and crushing of concrete in this location will not impact on the objectives for this area.

## 3.7 Richmond Valley Development Control Plan 2021 (RVDCP)

### 3.7.1 Introduction

The RVDCP has been prepared in accordance with *Section 3.43 of the EP&A Act* and in accordance with *Part 3 of the Environmental Planning and Assessment Regulation 2000* (EP&A Regulation). The aims of the RVDCP are to:

- (1) provide detailed provisions with respect to development to achieve the purpose of the RVLEP 2012;
- (2) outline requirements for development which meets community expectations and addresses key environmental planning issues relevant to the LGA;
- (3) repeal all pre-existing DCPs as they apply within the local government area of Richmond Valley Council.

**Part H - Natural Resources and Hazards** of the DCP requires further consideration for Stage 1 of the proposed works.

Part H relates to natural hazards and natural resources and sensitivities provided for within the RVLEP 2012. It provides more detailed information to assist applicants address the requirements contained within the RVLEP 2012 in the preparation of the development application. Part H comprises the following three (3) Chapters:

- *Part H-1 Flood Planning*
- *Part H-2 Acid Sulfate Soils*
- *Part H-3 Natural Resources.*

Part H-1 is not considered relevant for Stage 1 of the proposed works; however, may require consideration for future Stages during re-construction design of Halstead Drive.

The subject site is not shown on the Acid Sulfate Soils Map, and therefore assessment is not required against Clause 6.1 of the RVLEP 2012.

The following Chapter is considered relevant to Stage 1 of the proposed works.

### 3.7.2 *Part H-3 - Natural Resources*

#### 3.7.2.1 Background

RVLEP contains the following clauses relating to management of natural resources:

- *clause 6.6 Terrestrial biodiversity*
- *clause 6.7 Landslide risk*
- *clause 6.8 Riparian land and watercourses*
- *clause 6.9 Drinking water catchments*
- *clause 6.10 Wetlands*

Based on interrogation of the relevant RVLEP 2012 Natural Resource Sensitivities (NRS) mapping, the following clauses as part of Part H-3 relate to Stage 1 of the proposed works:

3.7.2.2 H-4.3 Terrestrial Biodiversity (Clause 6.6. of the RVLEP 2012)

Introduction

(1) *The objective of this clause is to maintain terrestrial biodiversity by—*

- (a) protecting native fauna and flora, and*
- (b) protecting the ecological processes necessary for their continued existence, and*
- (c) encouraging the conservation and recovery of native fauna and flora and their habitats.*

(2) *This clause applies to land identified as “Biodiversity” on the Terrestrial Biodiversity Map.*

Under the RVLEP, the proposed works (Area 1 only) will occur within an area mapped as Biodiversity on the Terrestrial Biodiversity Map (Sheet BIO\_006) (FIGURES 7A & 7B).



**FIGURE 7A BIODIVERSITY AREAS (GREEN) MAPPED OVER AREA 1 OF THE SUBJECT SITE AS PER THE TERRESTRIAL BIODIVERSITY MAP UNDER THE RVLEP 2012.**



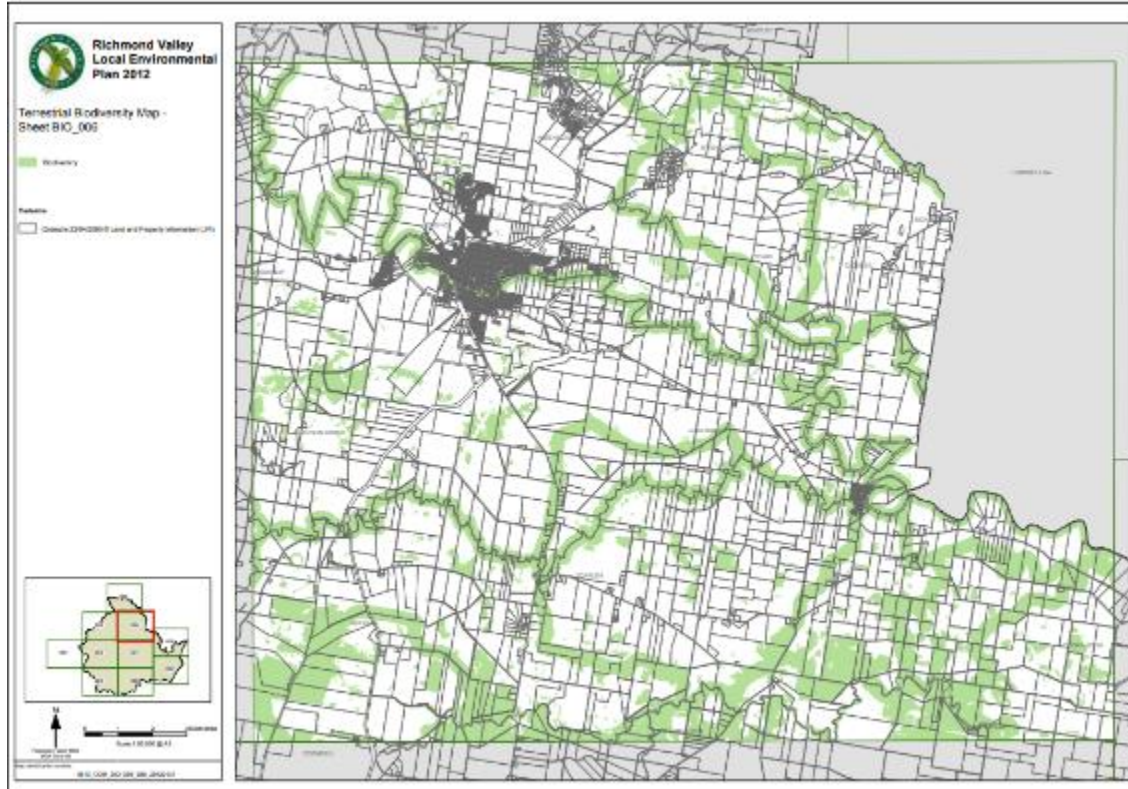


FIGURE 7B TERRESTRIAL BIODIVERSITY MAP (SHEET BIO\_006) UNDER THE RVLEP 2012.

SOURCE:

[https://eplanningdlprod.blob.core.windows.net/pdfmaps/6610\\_COM\\_BIO\\_006\\_080\\_20120131.pdf](https://eplanningdlprod.blob.core.windows.net/pdfmaps/6610_COM_BIO_006_080_20120131.pdf)

To determine whether the proposed works will impact the objectives of this clause, the following assessment applies as per the RVLEP 2012:

Clause	Assessment
<p>(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider—</p> <p>(a) whether the development—</p> <ul style="list-style-type: none"> <li>(i) is likely to have any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and</li> <li>(ii) is likely to have any adverse impact on the importance of the vegetation on the land to the habitat and survival of native fauna, and</li> <li>(iii) has any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and</li> <li>(iv) is likely to have any adverse impact on the habitat elements providing connectivity on the land, and</li> </ul>	<p>Area 1 of the subject site has been severely damaged by floods that has almost entirely removed native vegetation from the proposed works area and directly adjacent.</p> <p>The proposed Stage 1 works will not directly impact on any vegetation that could be considered important for biodiversity, nor will any impacts occur to any environmental feature more than already exists.</p> <p>Appropriate environmental safeguards will be implemented (e.g., silt fencing, water barriers etc.) to ensure no indirect impacts to the Richmond River occur.</p> <p>The proposed clean-up of damaged concrete and materials will improve the ecological function and condition of the</p>

Clause	Assessment
(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	Richmond River and provide opportunities for re-establishment of native vegetation.
<p>(4) Development consent must not be granted for development on land to which this clause applies unless the consent authority is satisfied that—</p> <p>(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or</p> <p>(b) if that impact cannot be reasonably avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or</p> <p>(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.</p>	<p>No impacts are expected to occur for Stage 1 due to the current condition of Area 1 (see response above).</p> <p>The proposed works are limited to the original alignment of Halstead Drive; however, these works are considered essential to improve the condition of the area and afford opportunities for re-construction.</p>

Applicability to the subject site

The proposed works (Area 1 only) will occur within an area mapped as Biodiversity under the RVLEP 2012. Given the current highly disturbed condition of the area due to flooding, and with the implementation appropriate environmental safeguards, Stage 1 of the proposed works will not impact or negate any of the objectives set out for this Clause under the RVLEP 2012. Conversely, the proposed clean-up of damaged concrete and materials will improve the ecological function and condition of the Richmond River and provide opportunities for re-establishment of native vegetation.

3.7.2.3 H-4.5 Riparian Land and Watercourses (Clause 6.8 of the RVLEP 2012)

Introduction

(1) *The objective of this clause is to protect and maintain the following—*

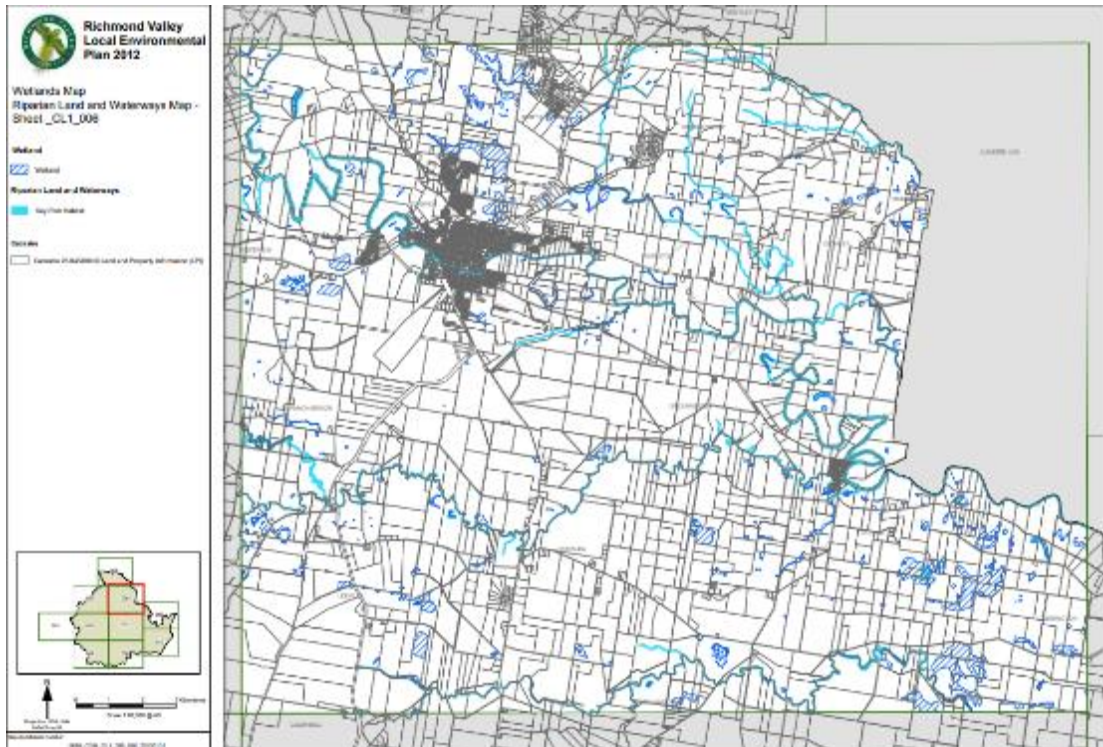
- (a) *water quality within watercourses,*
- (b) *the stability of the bed and banks of watercourses,*
- (c) *aquatic and riparian habitats,*
- (d) *ecological processes within watercourses and riparian areas.*

(2) *This clause applies to land identified as “Key Fish Habitat” on the Riparian Land and Waterways Map.*

Under the RVLEP 2012, the proposed works (Area 1 only) will occur within an area mapped as Key Fish Habitat on the Wetlands Map - Riparian Land and Waterways Map (Sheet\_CL1\_006) (FIGURES 8A & 8B).



FIGURE 8A KEY FISH HABITAT (BLUE) MAPPED OVER AREA 1 OF THE SUBJECT SITE AS PER THE WETLAND MAP UNDER THE RVLEP 2012.





**FIGURE 8B WETLANDS MAP RIPARIAN LAND AND WATERWAYS MAP (SHEET\_CL1\_006) UNDER THE RVLEP 2012. SOURCE:**

[https://eplanningdlprod.blob.core.windows.net/pdfmaps/6610\\_COM\\_CL1\\_006\\_080\\_20120131.pdf](https://eplanningdlprod.blob.core.windows.net/pdfmaps/6610_COM_CL1_006_080_20120131.pdf)

To determine whether the proposed works will impact the objectives of this clause, the following assessment applies as per the RVLEP:

Clause	Assessment
<p>(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider—</p> <p>(a) whether or not the development is likely to have any adverse impact on the following—</p> <ul style="list-style-type: none"> <li>(i) the water quality and flows within the watercourse,</li> <li>(ii) aquatic and riparian species, habitats and ecosystems of the watercourse,</li> <li>(iii) the stability of the bed and banks of the watercourse,</li> <li>(iv) the free passage of fish and other aquatic organisms within or along the watercourse,</li> <li>(v) any future rehabilitation of the watercourse and its riparian areas, and</li> </ul> <p>(b) whether or not the development is likely to increase water extraction from the watercourse, and</p> <p>(c) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.</p>	<p>The proposed clean-up of damaged concrete and materials will improve the water quality and flow, and bank stability of this section of the Richmond River. By association, these remediation works will enhance aquatic habitats and fish passage.</p> <p>Appropriate environmental safeguards will be implemented (e.g., silt fencing, water barriers etc.) to ensure no indirect impacts to the Richmond River occur.</p>
<p>(4) Development consent must not be granted for development on land to which this clause applies unless the consent authority is satisfied that—</p> <ul style="list-style-type: none"> <li>(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or</li> <li>(b) if that impact cannot be avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or</li> <li>(c) if that impact cannot be minimised—the development will be managed to mitigate that impact.</li> </ul>	<p>No impacts are expected to occur for Stage 1 due to the current condition of Area 1 (see response above).</p>

Applicability to the subject site

The proposed works (Area 1 only) will occur within an area mapped as Key Fish Habitat under the RVLEP 2012. Given the current highly disturbed condition of the area due to flooding, and with the implementation appropriate environmental safeguards, Stage 1 of the proposed works will not impact or negate any of the objectives set out for this Clause under the RVLEP 2012. Conversely, it is expected that the proposed clean-up of damaged concrete and materials will improve the water quality and flow, and bank stability of this section of the Richmond River. By association, these remediation works will enhance aquatic habitats and fish passage.

**Note:** A *Part 7 Fisheries Management Act* permit has been submitted to the Department of Primary Industries for assessment and approval of the proposed works in Area 1 (**SECTION 2.5.2** refers).

## 4 EXISTING ENVIRONMENT AND IMPACT ASSESSMENT

### 4.1 Introduction

The potential impacts of the proposed stage 1 works on relevant environmental factors have been considered and assessed below.

### 4.2 Ecology

#### 4.2.1 *Native vegetation*

Due to the damage caused by the floods, and apart from emerging groundcovers that are predominately exotic species, almost all native vegetation has been removed from area 1 (Halstead Drive). As a result, the proposed works in this area will not remove native vegetation. Safeguards and mitigation measures have been discussed in **SECTION 4.3.2** regarding potential impacts on adjacent trees / vegetation.

The proposed temporary storage and crushing locations in Area 2 are void of any native vegetation and comprises sufficient area to ensure no indirect impacts occur to any nearby native vegetation.

Weeds may be introduced during works in materials or by vehicles in each of the subject site areas. Notwithstanding this, the implementation of environmental safeguards and mitigation measures will negate any risk of this occurring (**SECTION 4.3.4** refers).

#### 4.2.2 *Flora*

There is no suitable habitat available to support threatened flora in either of the subject site areas. It can be confidently concluded that no threatened flora will be significantly affected by Stage 1 of the proposed works.

Due to the damage caused by the floods, and apart from emerging groundcovers that are predominately exotic species, almost all native vegetation has been removed from the alignment proposed for the Stage 1 works. Remaining adjacent vegetation is sparse or in poor condition but will be demarcated and fenced to ensure maximum protection during the proposed works.

The proposed temporary storage and crushing location is void of any native vegetation or any notable environmental features and is predominately made up of existing hard surfaces (i.e., road base / gravel) or cleared and managed grassland (**PLATE 11 & 12**).

#### 4.2.3 *Fauna*

The proposed works in Area 1 may result in the loss of some marginal (at best) anthropogenic sheltering habitat (i.e., damaged concrete slabs) for native fauna (see **PLATES 4-9** for examples).

Given the clean-up of the damaged Halstead Drive will require a slow and systematic approach (see **SECTION 1.3**), the risk of endangering native fauna or creating barriers to movement is very low. The use of a suitably qualified ecologist / fauna spotter-catcher during all clean-up works will further minimise the risk of adverse impacts to native fauna (**SECTION 5.4**).

Due to a complete absence of habitat, the proposed works in Area 2 (i.e., concrete storage and crushing) will have no impact on threatened or native fauna or their habitat (**PLATES 11 & 12**).

#### **4.2.4 Impacts**

With consideration of the current disturbed condition of Area 1 due to flooding, and the paucity of vegetation and environmental features across all areas, it can be confidently concluded from an ecological / environmental perspective that there will not be a significant impact on any threatened species, population, or community.

A minimal loss to potential anthropogenic shelter for native fauna by way of damage concrete slabs is considered negligible given the clean-up and restoration works will enhance the improve integrity of the Richmond River and the associate bank compared to what currently exists (**PLATES 1-10**). Impacts are further minimised by the implementation of environmental safeguards and mitigation measures (**SECTION 5**).

### **4.3 Bushfire hazard**

Both areas of the subject site occur wither within or adjacent to ‘Category 2’ bushfire prone land and/or ‘buffer’ areas (**FIGURES 9A & 9B**).

Both areas of the subject site are void of any mature vegetation and the proposed works involves (among other things) the use of construction materials that are not conducive to an increased bushfire risk. These include (as examples): concrete, gravel, asphalt, road pavements and surfacing.

With the above considered, the proposed works will not increase bushfire risk in any way.



**FIGURE 9A BUSHFIRE PRONE LAND SHOWING CATEGORY 2 (YELLOW) AND BUFFER (RED) ZONES MAPPED OVER AREA 1 OF THE SUBJECT SITE.**



**FIGURE 9B BUSHFIRE PRONE LAND SHOWING CATEGORY 2 (YELLOW) AND BUFFER (RED) ZONES MAPPED ADJACENT TO AREA 2 OF THE SUBJECT SITE.**



## 4.4 Soil and water

### 4.4.1 *Acid sulphate soils*

The subject site is not mapped on the Acid Sulfate Soils Map, and therefore potential risk is negligible.

### 4.4.2 *Erosion and sediment control*

Erosion of sediment from the work site and surrounding area may pose a risk to the receiving environment if appropriate measures are not implemented. Therefore, strict adherence to best management practices will be required to ensure the surrounds are not adversely affected.

As outlined in **SECTION 1.3**, the following will apply to works in Area 1:

- *To minimise run off into the Richmond River, a silt fence will be installed for the length of the works area on the river side. The silt fence will comprise timber stakes and green silt fence, and orange flagging and bollards will also be used to flag off the river area.*
- *During times when machinery is required near the water, Ecospill Silt curtain booms with one (1) meter skirts will be installed to control any sediment and/or accidental spills from entering the water.*
- *Following fencing installation and inspection, water barriers will be installed along the length of the works area concrete road.*

In addition to the above measures (if required), to ensure the works are undertaken with the least environmental impacts, erosion and sedimentation controls will follow the International Erosion Control Associations *Best Practice Erosion and Sediment Control* document and Council / industry best practices.

### 4.4.3 *Stormwater*

Stormwater will not be impacted by Stage 1 of the proposed works.

### 4.4.4 *Flood assessment*

Flood assessment is not considered relevant for Stage 1 of the proposed works; however, given the impact of recent floods, this will require consideration for future Stages during re-construction design of Halstead Drive.

## 4.5 Noise and air

### 4.5.1 *Noise*

Noise from the Proposal would be typical of that associated with industrial scale construction work and would result from the use of plant and machinery, work vehicles, earthworks, and infrastructure installation associated with the redevelopment.

In Area 1, the nearest residential dwellings are located approximately 60 m away from the works area. The nearest residential dwelling to the Area 2 locations is greater than 200 m. Given the scale, location, and methodology of the proposed works, it is unlikely that it would result in any persistent highly noise-affected level to any nearby residents.

Despite this, it is possible certain noisy works/plant could exceed this level depending on the activity, proximity, and equipment used.

#### **4.5.2 Air**

The subject site areas are largely open (i.e. environmental or rural) and as such are considered to have good air quality in its current state.

During the proposed works there is the potential for the generation of airborne dust emissions from ground disturbance, windblown construction materials and from construction machinery use.

In relation to Area 1, air pollutants created will consist of exhaust emissions from trucks and machinery. Despite this, such emissions would occur only intermittently and are unlikely to significantly affect air quality.

In addition to temporary exhaust emissions, the crushing of concrete in Area 2 is likely to create dust (e.g., silica dust) that will require suppression. It is expected that the successfully Contractor would prepare and submit a dust suppression plan to Council for approval prior to works.

## **4.6 Heritage**

### **4.6.1 Non-Aboriginal Heritage**

Searches were conducted of the Australian Heritage Council database (which includes the World Heritage List, the National Heritage List, the Commonwealth Heritage list and the Register of the National Estate), the State Heritage Inventory and the Coffs Harbour LEP heritage listings. The subject site does not contain or is not near any heritage item listed on any of these registers. The subject site is highly disturbed by way of flood damage and/or existing cleared and managed areas. It is therefore considered unlikely that any items of European Heritage would be found in the subject site.

### **4.6.2 Aboriginal Heritage**

An AHIMS search was undertaken on 19<sup>th</sup> April 2023 and identified no Aboriginal Sites or Places registered in association with the subject site areas. Given the disturbed and/or anthropogenic management of each area, it is considered a low likelihood for cultural material. Despite this, and as a matter of caution, relevant safeguards and mitigation measures have been provided in **SECTION 5.6** to ensure that any unlikely discovers are managed suitably.

## 5 ENVIRONMENTAL SAFEGUARDS AND MITIGATION MEASURES

### 5.1 Introduction

The following safeguards/mitigation measures would be implemented to ensure minimal environmental impact.

### 5.2 General measures

All relevant safeguards detailed in this REF should be implemented and complied with throughout all stages of the proposed works.

All construction staff and site personnel would be made aware of their environmental responsibilities and safeguard measures from the REF to minimise environmental impacts.

An onsite meeting would be held with each relevant contractor, construction staff, site personnel and project staff before the commencement of works/activities, including site establishment. The purpose of the meeting is to discuss the environmental safeguards that are required to be implemented for the relevant phase of works. The meeting would also include relevant environmental awareness and toolbox talks.

Relevant environmental aspects to be considered for environmental awareness/toolbox include the limit of works, environmentally sensitive areas (Richmond River), pollution prevention, construction methodology and hazards. The toolbox should also address who is responsible for various components; as an example: inspection and maintenance of sedimentation, erosion and water controls and safeguards along the Richmond River.

Environmental awareness/toolbox talks would commence early in the program and continue as new personnel/contractors are engaged.

### 5.3 Management of vegetation

#### 5.3.1 Background

Given that no established native vegetation is proposed for removal (i.e. no direct impacts), this section discusses specific management strategies for mitigating and/or minimising any potential indirect impacts on vegetation that may be adjacent to the subject site.

#### 5.3.2 Vegetation protection guidelines (if required)

At this stage no potential impacts to native vegetation are anticipated; however, all activities adjacent to any native tree are to be carried out in such a manner as to minimise any damage to native trees. During the proposed works, any trees that are identified as having a potential to be impacted will be demarcated and fenced prior to construction works in the vicinity. Tree protection fences (if necessary) shall be installed under the

supervision of a qualified ecologist or arborist, and in accordance with the Australian Standard AS 4970-2009 (Protection of trees on development sites).

Trees that have the potential to be impacted by the proposed works will be managed in accordance with the following tree protection guidelines. These procedures will ensure that trees adjacent to the subject site areas will survive construction works and will remain in a healthy condition. The procedures will also ensure that any activity taking place within the drip line of any retained tree will not significantly impact on the survival of the tree.

The following procedures are to be followed to protect retained vegetation (where applicable):

1. *Identifying a Tree Protection Zone (TPZ)*: All trees deemed a potential to be impacted upon by development works will be marked prior to construction works. The size and shape of a particular protection zone will vary according to individual tree species. The TPZ will remain in place until project completion.
2. *Establishing the TPZ*: The following measures will be taken to protect the tree:
  - Fencing - Temporary fencing consisting of high visibility webbing and star pickets will be installed at the edge of works line prior to construction works. Temporary fencing will remain in place until all works within or immediately adjacent to the retained vegetation have been completed.
  - Trunk protection - 1.8 m high palings strapped to the trunk.
  - Mulching - 100 mm of composted mulch cover over the ground within the TPZ to retain soil moisture and encourage microbial activity.
  - Irrigation - natural moisture levels should be maintained.
  - Drainage - the natural drainage patterns around the root zone should not be altered.
  - Signage - as follows:
    - Tree Protection zone
    - No vehicle movement
    - No storage of building materials
    - No washing of equipment
    - Contact name and number for enquires.

### **5.3.3 Stockpile locations**

All removed concrete and other suitable materials will be removed from Area 1 and stored in Area 2 for subsequent crushing. No storage or stockpiling will occur in Area 1.

### **5.3.4 Weed management protocols**

The following weed species management protocols are to be followed:

1. Soil disturbance within areas adjacent to the proposed works shall be kept to a minimum to avoid weed recruitment.
2. Machinery operations are to ensure that propagative material from cleared weeds does not spread across the subject site areas. The earthworks machinery must not introduce weed material to the site or spread such material throughout the subject site.

## 5.4 Management of fauna

Given the absence of suitable fauna habitat in the subject site areas, specific management strategies for mitigating and/or minimising the potential impacts on fauna during operations on the subject site are considered minimal. A suitably qualified ecologist / fauna spotter-catcher is recommended for all clean-up works to further minimise the risk of direct impacts to native fauna that may be using damaged concrete slabs in Area 1 as shelter.

## 5.5 Soils

To prevent soil erosion and sedimentation during the proposed works, the following mitigation measures should be implemented:

- Land disturbance will be limited to that necessary for implementation of the works.
- Erosion and sedimentation controls as outlined in **SECTION 1.3** will be implemented in Area 1 prior to the commencement of works to capture any sediment passing entering the Richmond River.
- These controls will be kept functional to the end of the works until they are removed.

## 5.6 Water quality

In addition to the management of soils, the following mitigation measures should be implemented in order to prevent adverse impacts to water quality in the Richmond River:

- Fuels, lubricants or other compounds will be located in suitably bunded areas within/adjacent to the site compound.
- Fuels and other liquids will be stored in small quantities.
- Cleaning of tools and equipment will occur at a suitable wash-down bay or away from hardstand areas.
- No cleaning of tools or equipment will occur within any drainage line, creek or river.
- All equipment will be maintained in good working order and operated according to manufacturer's specifications.

## 5.7 Noise

The proposed works will occur over a short timeframe (est. 5 weeks) and would be undertaken in accordance with the following EPA recommended standard construction hours in order to avoid and minimise any potential adverse impacts relating to noise:

- Monday to Friday 7:00 am to 6:00 pm
- Saturday 8:00 am to 1:00 pm
- No work on Sundays or public holidays.

Appropriate noise and vibration management measures should be documented in a Construction Environmental Management Plan (CEMP) and implemented to minimise the impact and ensure residents are informed of the works.

## 5.8 Air quality

Both locations in Area 2 are near a water hydrant that can be used to supply water for dust suppression. Overall, due to the temporary duration of the works the level of potential impact is not considered significant and can be managed or minimised through implementation of common safeguards and management measures. It is expected that the successful Contractor would prepare and submit a dust suppression plan to Council for approval prior to works.

## 5.9 Heritage

In the event artefact material is encountered during earthworks, all works must cease immediately in the vicinity of the find and the following 'Procedure for unexpected discovery of an Aboriginal object' is to be followed:

- STOP WORK, notify all on site crew, isolate and protect the find area and inform Council to organise confirmation that the object is an artefact.

If the above confirms the object is of cultural origin an Archaeologist is to be engaged to undertake the following:

- Recording and reporting of objects salvaged, with relevant site officers;
- Preparation of a 'Harm to Aboriginal Objects Report (Harm Report)' on completion of all earthworks;
- Reburial of the salvaged material adjacent to the previously buried capsule in the riparian corridor;
- Preparation and lodgement of revised Aboriginal Site Impact Recording Form (ASIRF) and Aboriginal Site Recording Form (ASRF);
- Harm Report to be sent by Registered mail to the stakeholders;
- Email copy of the Harm Report, ASIRF and ASRF to Heritage NSW; and
- Lodgement of the Harm Report, ASIRF and ASRF with AHIMS.

## 6 SUMMARY AND CONCLUSIONS

JWA Pty Ltd have been engaged by Burchills Engineering Solutions and on behalf of Richmond Valley Council (RVC) to complete a Review of Environmental Factors (REF) to accompany an application for the reconstruction of Halstead Drive, Casino.

It is understood that Halstead Drive suffered severe damage during the 2022 (February / March) flood. The project will be carried out in three (3) stages, of which this REF relates specifically to Stage 1 for the removal, storage and crushing of all concrete and restoring the access track for Stage 2 and 3 works.

The subject site can be identified as two (2) distinct areas.

- (1) Area 1 comprises the damaged Halstead Drive, which is a non-gazetted road that runs along the bank of the Richmond River. This area will be subject to concrete removal and restoring the access track for future stages of the project. Due to the damage caused by the floods, and apart from emerging groundcovers that are predominately exotic species, almost all native vegetation has been removed from the alignment proposed for the Stage 1 works.
- (2) Area 2 is located on the corner of Ellangowan Road and Summerland Way (in the road corridor) and is proposed as a temporary location for concrete storage and crushing for re-use. This area is void of any native vegetation or any notable environmental features and is made up of existing hard surfaces (i.e., road base / gravel).

A review of the statutory considerations for the proposed works determined that no suitable habitat is available in either area of the subject site to support an important population of any of the flora / fauna species listed as threatened under the EPBC Act or BC Act. As a result, and with the implementation of environmental safeguards and mitigation as well as specific construction methods, it can be confidently concluded from an ecological / environmental perspective that there is unlikely to be a significant impact to any threatened species. Accordingly, a Commonwealth approval and a BC Act Species Impact Statement are not considered necessary.

The subject site is mapped as containing areas of high biodiversity value on the Biodiversity Values Map (i.e., associated with the Richmond River; however, no native vegetation will be cleared for Stage 1 of the proposed works and therefore entry into the BOS is not triggered.

Assessment of the relevant SEPPs, identified the following:

- The subject site areas do not contain any mapped coastal values under the Resilience and Hazards SEPP.
- The Vegetation SEPP applies to the subject site; however, no native vegetation will require clearing for Stage 1 of the proposed works.

- The subject site areas do not contain vegetation that is considered to be potential / core koala habitat for the purposes of the Chapter 3 - Koala Habitat Protection 2020 or Chapter 4 - Koala Habitat Protection 2021 of the Biodiversity and Conservation SEPP
- The proposed works to recover and crush concrete satisfied the pathway under the Transport and Infrastructure SEPP to be classified as **development permitted without consent**.

Assessment was undertaken for the following additional relevant state legislation:

- *National Parks and Wildlife Act 1974 (NPW Act)*

An Aboriginal Heritage Information Management System search was undertaken on 19<sup>th</sup> April 2023 and identified no Aboriginal Sites or Places registered in association with the subject site areas. As a matter of caution, ongoing care and monitoring is recommended for cultural heritage safeguards, with stop-work actions and liaison with relevant contacts required if artefact material is encountered.

- *Fisheries Management Act 1994 (FM Act)*

The proposed works in Area 1 (Halstead Drive) is mapped as Key Fish Habitat under the FM Act. Despite this, all proposed works will occur outside of aquatic habitat areas to prevent any impacts to ecosystem function, fish, or marine vegetation.

The proposed clean-up of damaged concrete and materials will improve the water quality and flow, and bank stability of this section of the Richmond River. By association, these remediation works will enhance aquatic habitats and fish passage. Appropriate environmental safeguards will be implemented (e.g., silt fencing, water barriers etc.) to ensure no indirect impacts to the aquatic values of the Richmond River occur. A Part 7 Fisheries Management Act permit has been submitted for assessment.

- *Heritage Act 1997 (HE Act)*

A search of the State Heritage Inventory identified a platypus sculptures / carvings on the bed of the Richmond River. This item is outside of the proposed works area and will not be impacted.

- *Protection of the Environment Operations Act 1994 and Protection of the Environment Operations (Waste) Regulation 2014*

The recovery and crushing of concrete and other materials is covered under the recovered aggregate exemption 2014 and therefore does not require an EPA permit and is not classed as construction waste.

The proposed works is located within the RVLGA, in an area covered by the RVLEP 2012. The subject site is zoned as (i) C2 - Environmental conservation, (ii) W1 - Natural waterways, and (iii) RU1 - Primary production. The proposed works is consistent with the objectives of each zone in the relevant areas, and in some instances will enhance the values of those zones (e.g. removal of concrete and other construction materials from the Richmond River and improve the ecological and scenic values of the that have been diminished due to flooding).



Under the RVDCP, the proposed works (Area 1 only) will occur within an area mapped as Biodiversity and Key Fish Habitat under the RVLEP 2012. Given the current highly disturbed condition of the area due to flooding, and with the implementation appropriate environmental safeguards, Stage 1 of the proposed works will not impact or negate any of the objectives set out under the RVLEP 2012. Conversely, the proposed clean-up of damaged concrete and materials will improve the ecological function and condition of the Richmond River, including water quality and flow and bank stability. By association, these remediation works will enhance aquatic / terrestrial habitats and fish passage.

The proposed works will not remove native vegetation; however, safeguards and mitigation measures have been provided (if required) to minimise any potential impacts on vegetation / trees that may be adjacent to the subject site. These include (among other things), identification, demarcation and fencing in accordance with Australian Standards. Weeds may be introduced during works in materials or by vehicles in each of the subject site areas. Notwithstanding this, the implementation of environmental safeguards and mitigation measures will negate any risk of this occurring.

Given the paucity or complete absence of suitable fauna habitat in the subject site areas, potential impacts are considered low. Notwithstanding, a suitably qualified ecologist / fauna spotter-catcher is recommended for all clean-up works to further minimise the risk of direct impacts to native fauna that may be using damaged concrete slabs in Area 1 as shelter.

Soil and water disturbance will require management and safeguards by way of best practise sediment and erosion controls, and correct storage and maintenance of (as examples) fuel, liquids, and equipment / tools. It is considered unlikely that the proposed works would result in persistent noise or air pollution to impact nearby residents as it will occur over a short timeframe (est. 5 weeks) and would be undertaken in accordance with EPA recommended standard construction hours.

In addition, the level of air pollution can be easily managed or minimised through implementation of common safeguards and management measures; including, the use of nearby water hydrants to each concrete storage / crushing location to supply water for dust suppression. It is also expected that the successfully Contractor would prepare and submit a dust suppression plan to Council for approval prior to works. Appropriate air noise and vibration management measures should be documented in a Construction Environmental Management Plan (CEMP) and implemented to minimise the impact and ensure residents are informed of the works.

Notwithstanding the requirements for management plans outlined herein, this REF concludes with confidence the proposed development will have not have a significant negative impact to ecological / environmental values. This will be further abated by integrating the relevant safeguards and mitigation measures discussed in **SECTION 4**, and in area 1, the proposed clean-up of damaged concrete and materials will ultimately improve the ecological function and condition of the Richmond River.

## APPENDIX 1 - HABITAT SUITABILITY ASSESSMENTS

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
<i>Mixophyes fleayi</i>	Fleay's frog	E	E	Fleay's frog is associated with montane rainforest (Corben & Ingram 1987) and open forest communities adjoining rainforest (Hines 2001, pers. comm.). The species occurs along stream habitats from first to third order streams (i.e. small streams close to their origin through to permanent streams with grades of 1 in 50) and is not found in ponds or ephemeral pools. Adults may be found in leaf litter and along watercourses in rainforest and adjoining wet sclerophyll forests (Hines & SEQTFRT 2002).	There are no records of the Fleay's frog from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Mixophyes iteratus</i>	Giant barred frog	E	V	Giant barred frogs are found along freshwater streams with permanent or semi-permanent water, generally (but not always) at lower elevation.  Moist riparian habitats such as rainforest or wet sclerophyll forest are favoured for the deep leaf litter that they provide for shelter and foraging, as well as open perching sites on the forest floor. However, giant barred frogs will also sometimes occur in other riparian habitats, such as those in drier forest or degraded riparian remnants, and even occasionally around dams.	There are no records of the Giant barred frog from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>

Review of Environmental Factors - Halstead Drive Reconstruction, Casino

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
<b>Birds</b>						
<i>Actitis hypoleucos</i>	Common sandpiper		M	This species utilises a wide range of coastal wetlands and some inland wetlands, with varying levels of salinity, and is mostly found around muddy margins or rocky shores and rarely on mudflats. This species has been recorded in estuaries and deltas of streams, as well as on banks farther upstream; around lakes, pools, billabongs, reservoirs, dams and claypans, and occasionally piers and jetties. This species generally forages in shallow water and on bare soft mud at the edges of wetlands; often where obstacles project from substrate, e.g. rocks or mangrove roots. Birds sometimes venture into grassy areas adjoining wetlands. Roost sites are typically on rocks or in roots or branches of vegetation, especially mangroves (Dept. Environment 2012).	There are no records of the Common sandpiper from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Anseranas semipalmata</i>	Magpie goose	V		A waterbird that is mainly found in shallow wetlands, where the depth of water is less than 1 m and dense reeds and rushes are present.	There are eight (8) records of the Magpie goose from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Anthochaera phrygia</i>	Regent honeyeater	CE	CE	The Regent honeyeater is found from Dalby in QLD, south to Bendigo in Victoria, especially along the ranges and the western slopes. Its	There are no records of the Regent honeyeater from within 10 km of the subject site from the NSW BioNet online database.	<b>Unlikely</b>

Review of Environmental Factors - Halstead Drive Reconstruction, Casino

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
				distribution is extremely patchy with only a small number of known breeding sites. The estimated total population is between 350 and 400 mature individuals. Potential habitat for this species includes dry eucalypt woodland and open forest, rural and urban areas with mature eucalypts. It favours ironbark-box associations, mugga ironbark ( <i>Eucalyptus sideroxylon</i> ), white box ( <i>E. albens</i> ), and yellow box ( <i>E. melliodora</i> ). Other habitat includes swamp mahogany ( <i>E. robusta</i> ), spotted gum ( <i>Corymbia maculata</i> ), or river she-oak ( <i>Casuarina cunninghamiana</i> ) with associated needle-leaf mistletoe ( <i>Amyema cambagei</i> ). This species generally prefers wetter, more fertile sites that are reliable nectar producers (both in timing and quantity), such as creek flats, river valleys and lower slopes (OEH 2014).	No suitable habitat observed on the subject site.	
<i>Apus pacificus</i>	Fork-tailed swift		M	This is a primarily aerial species, usually occurring above dry or open habitats, but also occasionally above rainforest and wet sclerophyll forests. They have been recorded above settled areas such as farmlands, towns, and cities.	There are no records of the Fork-tailed swift from within 10 km of the subject site from the NSW BioNet online database.  This species may forage above the subject site.	<b>Possible</b>
<i>Botaurus poiciloptilus</i>	Australasian bittern		E	The Australasian bittern is widespread but uncommon in south-west and south-east Australia, generally preferring freshwater	There are no records of the Australasian bittern within 10 km of the subject site from the NSW BioNet online database.	<b>Unlikely</b>

Review of Environmental Factors - Halstead Drive Reconstruction, Casino

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
				habitats with tall, dense vegetation with bulrushes and spike rushes.	No suitable habitat observed on the subject site.	
<i>Calidris acuminata</i>	Sharp-tailed sandpiper		M	The Sharp-tailed Sandpiper prefers the grassy edges of shallow inland freshwater wetlands. It is also found around sewage farms, flooded fields, mudflats, mangroves, rocky shores and beaches. Its breeding habitat in Siberia is the peat-hummock and lichen tundra of the high Arctic.	There are no records of the Sharpe-tailed sandpiper within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Calidris ferruginea</i>	Curlew sandpiper		M, CE	It generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	There is one (1) record of the Curlew sandpiper within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Calidris melanotos</i>	Pectoral sandpiper		M	Small, migratory wader that prefers shallow fresh to saline wetlands. This species is found at coastal lagoons, estuaries, bays, swamps, lakes, inundated grasslands, saltmarshes, river pools, creeks, floodplains, and artificial wetlands.	There are no records of the Pectoral sandpiper within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Calyptorhynchus lathami lathami</i>	Glossy black cockatoo	V	V	This species is associated with woodland or open sclerophyll forests with populations of	There are two (2) records of the Glossy-black cockatoo from within 10 km of the	<b>Possible</b>



Review of Environmental Factors - Halstead Drive Reconstruction, Casino

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
				<i>Allocasuarina</i> , which comprise its exclusive diet. They require large old trees with hollows for nesting.	subject site from the NSW BioNet online database.  Very limited suitable forage habitat was noted adjacent to the subject site; however, potentially suitable nesting habitat by way of nest hollows is absent.	
<i>Carterornis leucotis</i>	White-eared monarch	V		In NSW, White-eared monarchs occur in rainforest, especially drier types, such as littoral rainforest, as well as wet and dry sclerophyll forests, swamp forest and regrowth forest.	There is one (1) record of the White-eared monarch from within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Climacteris picumnus victoriae</i>	Brown treecreeper	V		Found in eucalypt woodlands and dry open forest of the inland slopes and plains inland of the Great Dividing Range. This species mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species. It is also found in mallee and River Red Gum ( <i>Eucalyptus camaldulensis</i> ) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses. Fallen timber is an important habitat component for foraging. The Brown treecreeper has been recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains.	There is one (1) record of the Brown treecreeper from within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>

Review of Environmental Factors - Halstead Drive Reconstruction, Casino

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
				Hollows in standing dead or live trees and tree stumps are essential for nesting.		
<i>Coracina lineata</i>	Barred cuckoo-shrike	V		Found in rainforest, eucalypt forests and woodlands, clearings in secondary growth, swamp woodlands and timber along watercourses. They are usually seen in pairs or small flocks foraging among foliage of trees for insects and fruit. They are active birds, frequently moving from tree to tree.	There is one (1) record of the Barred cuckoo-shrike from within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Cuculus optatus</i>	Oriental cuckoo		M	This species is found in monsoon forests, the edges of rainforests, treed paddocks, mangroves, roadsides, and river flats (Pizzey and Knight 1999).	There are no records of the Oriental cuckoo within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's fig parrot	CE	E	Usually recorded from drier rainforests and adjacent wetter eucalypt forest but rarely seen due to its small size and cryptic habits. Also found in the wetter lowland rainforests that are now largely cleared in New South Wales.	There are no records of the Coxen's fig parrot within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Dasyornis brachypterus</i>	Eastern bristlebird		E	Habitat for central and southern populations is characterised by dense, low vegetation including heath and open woodland with a heathy understorey. In northern New South Wales the habitat occurs in open forest with dense tussocky grass understorey and sparse	There are no records of the Eastern bristlebird within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>

Review of Environmental Factors - Halstead Drive Reconstruction, Casino

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
				mid-storey near rainforest ecotone; all of these vegetation types are fire prone.		
<i>Ephippiorhynchus asiaticus</i>	Black-necked stork	E		Floodplain wetlands (swamps, billabongs, watercourses, and dams) of the major coastal rivers are the key habitat in NSW for the black-necked stork. Secondary habitat includes minor floodplains, coastal sandplain wetlands and estuaries.	There are 98 records of the Black-necked stork from within 10 km of the subject site from the NSW BioNet online database.  Given the presence of the Richmond River, the Black-necked stork is likely to occupy habitat in nearby areas; however, is unlikely to utilise habitat available on the subject site.	<b>Possible</b>
<i>Erythrotriorchis radiatus</i>	Red goshawk	CE	V	This species occupies open forests and woodlands along rivers and wetlands and rainforest fringes. In NSW favoured habitat includes <i>Melaleuca</i> forest along coastal rivers (Debus 1991, 1993).	There are no records of the Red goshawk from within 10 km of the subject site from the NSW BioNet online database.  Given the presence of the Richmond River, it cannot be conclusively ruled out that the Red goshawk may traverse the area infrequently. Notwithstanding, this species is unlikely to utilise habitat available on the subject site.	<b>Possible</b>
<i>Falco hypoleucos</i>	Grey falcon	E	V	This species is associated with arid or semi-arid environments, where it can be found in shrublands, grasslands, watercourses, and wetlands.	There are no records of the Grey falcon within 10 km of the subject site from the NSW BioNet online database.  Given the presence of the Richmond River, it cannot be conclusively ruled out that the Grey falcon may traverse the area infrequently. Notwithstanding, this species	<b>Possible</b>

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Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
					in unlikely to utilise habitat available on the subject site.	
<i>Gallinago hardwickii</i>	Latham's snipe		M	This species generally occupies flooded meadows, seasonal or semi-permanent swamps, or open waters bogs, waterholes, billabongs, lagoons, lakes, creek or river margins, river pools and floodplains. Dense fringing vegetation is preferred by this species, but it has been recorded in waterlogged paddocks.	There are no records of the Latham's snipe within 10 km of the subject site from the NSW BioNet online database.  Despite an absence of records, the presence of the Richmond River means it cannot be conclusively ruled out that the Latham's snipe occurs in the area from time-to-time. Notwithstanding, no suitable vegetation is available in the subject site.	<b>Possible</b>
<i>Grantiella picta</i>	Painted honeyeater		V	The Painted honeyeater is found in dry open forests and woodlands and is strongly associated with mistletoe. It may also be found along rivers, on plains with scattered trees and on farmland with remnant vegetation. It has been seen in urban parks and gardens where large eucalypts are available.	There are no records of the Painted honeyeater from within 10 km of the subject site from the NSW BioNet online database.  Despite an absence of records, the presence of the Richmond River means it cannot be conclusively ruled out that the Painted honeyeater occurs in the area from time-to-time. Notwithstanding, no suitable vegetation is available in the subject site.	<b>Possible</b>
<i>Haliaeetus leucogaster</i>	White-bellied sea-eagle	V	M	This species has a large distribution range, and is found in association with coasts, large rivers and estuaries and prefers to nest in large trees adjacent watercourses.	There is one (1) record of the White-bellied sea-eagle from within 10 km of the subject site from the NSW BioNet online database.	<b>Possible</b>

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<b>Amphibians</b>						
					This species is likely to aerially traverse the subject site while foraging along the Richmond River.	
<i>Hirundapus caudacutus</i>	White-throated needletail		V, M	This species is recorded in all coastal regions of QLD and NSW and almost always forages aerially. Most often, the species is recorded above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland.	There are no records of the White-throated needletail from within 10 km of the subject site from the NSW BioNet online database.  This species may forage above the subject site.	<b>Possible</b>
<i>Irediparra gallinacea</i>	Comb-crested jacana	V		Inhabit permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation.	There are 12 records of the Comb-crested jacana from within 10 km of the subject site from the NSW BioNet online database.  Given the presence of the Richmond River, it cannot be conclusively ruled out that the Comb-crested jacana occurs in the area from time-to-time. Notwithstanding, this species is unlikely to utilise habitat available on the subject site.	<b>Possible</b>
<i>Ixobrychus flavicollis</i>	Black bittern	V		Inhabits both terrestrial and estuarine wetlands, generally in areas of permanent water and dense vegetation. Where permanent water is present, the species may occur in flooded grassland, forest, woodland, rainforest, and mangroves.	There is one (1) record of the Black bittern from within 10 km of the subject site from the NSW BioNet online database.  Given the presence of the Richmond River, it cannot be conclusively ruled out that the Black bittern occurs in the area from time-	<b>Possible</b>

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Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
					to-time. Notwithstanding, this species is unlikely to utilise habitat available on the subject site.	
<i>Lathamus discolor</i>	Swift parrot	E	CE	The swift parrot migrates from its Tasmanian breeding grounds to overwinter in the box-ironbark forests and woodlands of Victoria, NSW, and southern QLD.	There are no records of the Swift parrot within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Limosa limosa</i>	Black-tailed godwit	V		In Australia, the Black-tailed Godwit has a primarily coastal habitat environment. The species is commonly found in sheltered bays, estuaries and lagoons with large intertidal mudflats or sandflats, or spits and banks of mud, sand or shell-grit; occasionally recorded on rocky coasts or coral islets. The use of habitat often depends on the stage of the tide. It is also found in shallow and sparsely vegetated, near-coastal, wetlands; such as saltmarsh, saltflats, river pools, swamps, lagoons and floodplains.	There is one (1) record of the Black-tailed godwit 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Melanodryas cucullata cucullata</i>	South-eastern hooded robin		E	This species prefers lightly wooded country, usually open eucalypt woodland, acacia scrub and mallee, often in or near clearings or open areas. It requires structurally diverse habitats featuring mature eucalypts, saplings, some	There are no records of the South-eastern hooded robin 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>



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<b>Amphibians</b>						
				small shrubs and a ground layer of moderately tall native grasses.		
<i>Monarcha melanopsis</i>	Black-faced monarch		M	This species occurs in rainforest ecosystems, including semi-deciduous vine-thickets, complex notophyll vine-forest, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and (occasionally) cool temperate rainforest. During winter or migration, this species also occurs in marginal habitats such as 20-30 years old regrowth rainforest, nearby open eucalypt forest (mainly wet sclerophyll forests), especially in gullies with a dense, shrubby understorey as well as dry sclerophyll forests and woodlands, often with a patchy understorey.	There are no records of the Black-faced monarch from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Motacilla flava</i>	Yellow wagtail		M	Inhabits open country near water, such as wet meadows. It nests in tussocks.	There are no records of the Yellow wagtail within 10 km of the subject site from the NSW BioNet online database. No suitable habitat has been observed on the subject site.	<b>Unlikely</b>
<i>Myiagra cyanoleuca</i>	Satin flycatcher		M	This species occurs in heavily vegetated gullies in eucalypt-dominated forests and taller woodlands, and on migration, occurs in coastal	There are no records of the Satin flycatcher from within 10 km of the subject site from the NSW BioNet online database.	<b>Unlikely</b>

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<b>Amphibians</b>						
				forests, woodlands, mangroves and drier woodland and open forests.	This species has not been recorded on the subject site during previous or recent targeted surveys.  Although considered less likely, it cannot be conclusively ruled out that the Satin flycatcher utilises marginal habitat on the subject site during migration.	
<i>Numenius madagascariensis</i>	Eastern curlew		CE	It generally occupies coastal lakes, inlets, bays and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats and sometimes saltmarsh of sheltered coasts. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. It forages in or at the edge of shallow water, occasionally on exposed algal mats or waterweed, or on banks of beach-cast seagrass or seaweed.	There are no records of the Eastern curlew within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat has been observed on the subject site.	<b>Unlikely</b>
<i>Oxyura australis</i>	Blue-billed duck	V		The Blue-billed Duck prefers deep water in large permanent wetlands and swamps with dense aquatic vegetation. The species is completely aquatic, swimming low in the water along the edge of dense cover. They usually nest solitarily in Cumbungi over deep water between September and February. They will also nest in trampled vegetation in	There are six (6) records of the Blue-billed duck within 10 km of the subject site from the NSW BioNet online database.  Given the presence of the Richmond River, it cannot be conclusively ruled out that the Blue-billed duck occurs in the area from time-to-time. Notwithstanding, this species is unlikely to utilise habitat available on the subject site.	<b>Possible</b>

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<b>Amphibians</b>						
				Lignum, sedges or Spike-rushes, where a bowl-shaped nest is constructed.		
<i>Pandion cristatus</i>	Eastern osprey	V	M	This species is found in littoral and coastal habitats, occasionally following large watercourses inland. It requires extensive open areas of water for foraging.	There is one (1) record of the Eastern osprey from within 10 km of the subject site from the NSW BioNet online database.  This species is likely to aerially traverse the subject site while foraging along the Richmond River.	<b>Possible</b>
<i>Rhipidura rufifrons</i>	Rufous fantail		M	In east and south-east Australia, the Rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by eucalypts such as Tallowwood ( <i>Eucalyptus microcorys</i> ), Mountain grey gum ( <i>E. cypellocarpa</i> ), Narrow-leaved peppermint ( <i>E. radiata</i> ), Mountain ash ( <i>E. regnans</i> ), Alpine ash ( <i>E. delegatensis</i> ), Blackbutt ( <i>E. pilularis</i> ) or Red mahogany ( <i>E. resinifera</i> ); usually with a dense shrubby understorey often including ferns. They also occur in subtropical and temperate rainforests; for example, near Bega in south-east NSW, where they are recorded in temperate Lilly pilly ( <i>Acmena smithi</i> ) rainforest, with Grey myrtle ( <i>Backhousia myrtifolia</i> ), Sassafras ( <i>Doryphora sassafras</i> ) and Sweet pittosporum ( <i>Pittosporum undulatum</i> ) subdominants. They occasionally occur in secondary regrowth, following logging or disturbance in forests or rainforests. When	There are no records of the Rufous fantail from within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat has been observed on the subject site.	<b>Unlikely</b>

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<b>Amphibians</b>						
				on passage, they are sometimes recorded in drier sclerophyll forests and woodlands, including Spotted gum ( <i>Eucalyptus maculata</i> ), Yellow box ( <i>E. melliodora</i> ), ironbarks or Stringybarks, often with a shrubby or heath understorey. In north and north-east Australia, they often occur in tropical rainforest and monsoon rainforests, including semi-evergreen mesophyll vine forests, semi-deciduous vine thickets or thickets of <i>Melaleuca</i> spp.		
<i>Rostratula australis</i>	Australian painted snipe	E	E	This species inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps, and clay pans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with emergent tussocks of grass, sedges, rushes or reeds, or samphire; often with scattered clumps of lignum <i>Muehlenbeckia</i> or canegrass or sometimes tea-tree ( <i>Melaleuca</i> ). Breeding habitat requirements appear to be specific and includes shallow wetlands with areas of bare wet mud, with both upper and canopy cover nearby. Nest records are predominately from or near small islands in freshwater wetlands, provided that these islands are a combination of very shallow water, exposed mud, dense	There are four (4) records of the Australian painted snipe from within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat has been observed on the subject site.	<b>Unlikely</b>

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Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
				low cover and sometimes some tall dense cover.		
<i>Stagonopleura guttata</i>	Diamond Firetail	V		The Diamond firetail is typically found in grassy eucalypt woodlands (including Box-Gum woodlands and Snow Gum Eucalyptus pauciflora woodlands), and is often found in riparian areas (rivers and creeks), and sometimes in lightly wooded farmland. It also occurs in open forest, mallee, natural temperate grassland, and in secondary grassland derived from other communities. Nests are built either in the shrubby understorey, or higher up, especially under hawk's or raven's nests. Birds roost in dense shrubs or in smaller nests built especially for roosting.	There are no records of the Diamond firetail from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat has been observed on the subject site.	<b>Unlikely</b>
<i>Stictonetta naevosa</i>	Freckled duck	V		The Freckled duck prefers permanent freshwater swamps and creeks with heavy growth of Cumbungi, Lignum or Tea-tree. During drier times they move from ephemeral breeding swamps to more permanent waters such as lakes, reservoirs, farm dams and sewage ponds. They generally rest in dense cover during the day, usually in deep water.	There are 12 records of the Freckled duck within 10 km of the subject site from the NSW BioNet online database. Given the presence of the Richmond River, it cannot be conclusively ruled out that the Freckled duck occurs in the area from time-to-time. Notwithstanding, this species is unlikely to utilise habitat available on the subject site.	<b>Possible</b>

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<b>Amphibians</b>						
<i>Symposiachrus trivirgatus</i>	Spectacled monarch		M	The Spectacled monarch prefers thick understorey in rainforests, wet gullies and waterside vegetation, as well as mangroves.	There are no records of the Spectacled monarch from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat has been observed on the subject site.	<b>Unlikely</b>
<i>Tringa nebularia</i>	Common greenshank		M	The Common greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass. Habitats include embayments, harbours, river estuaries, deltas and lagoons and are recorded less often in round tidal pools, rock-flats and rock platforms. The species uses both permanent and ephemeral terrestrial wetlands, including swamps, lakes, dams, rivers, creeks, billabongs, waterholes and inundated floodplains, claypans and saltflats. It will also use artificial wetlands, including sewage farms and saltworks dams, inundated rice crops and bores. The edges of the wetlands used are generally of mud or clay, occasionally of sand, and may be bare or with emergent or fringing vegetation, including short sedges and saltmarsh, mangroves, thickets of rushes, and dead or live trees. It was once recorded with Black-winged Stilts ( <i>Himantopus himantopus</i> ) in pasture, but	There are no records of the Common greenshank from within 10 km of the subject site from the NSW BioNet online database. Given the presence of the Richmond River, it cannot be conclusively ruled out that the Common greenshank occurs in the area from time-to-time. Notwithstanding, this species is unlikely to utilise habitat available on the subject site.	<b>Possible</b>



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Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
				are generally not found in dry grassland (Higgins & Davies 1996).		
<i>Turnix maculosus</i>	Red-backed button-quail	V		The red-backed button-quail prefers sites near water, including grasslands and sedgelands near creeks, heaths, swamps, springs, and wetlands. They usually breed in dense grass near water, and nests are made in a shallow depression sparsely lined with grass and ground litter. The species has been observed associated with the following grasses (in various vegetation formations): speargrass <i>Heteropogon</i> , Blady Grass <i>Imperata cylindrica</i> , Triodia, Sorghum, and Buffel Grass <i>Cenchrus ciliaris</i> .	There are two (2) records of the Red-backed button quail within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Turnix melanogaster</i>	Black-breasted button quail	CE	V	This species is restricted to areas mostly with 770-1200 mm rainfall per annum. They prefer drier low closed forests, particularly semi-evergreen vine thicket, low microphyll vine forest, Araucarian microphyll vine forest and Araucarian notophyll vine forest. This species may also be found in low, dense acacia thickets and in littoral areas, in vegetation behind sand dunes. An extensive dense leaf-litter layer is required for foraging and possibly also roosting. Fallen logs and a dense, heterogeneously distributed shrub layers are also considered to be important habitat characteristics for shelter and breeding.	There are no records of the Black-breasted button quail within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>

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<b>Amphibians</b>						
<i>Tyto longimembris</i>	Eastern grass owl	V		Eastern grass owls are found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains. They rest by day in a 'form' - a trampled platform in a large tussock or other heavy vegetative growth.	There is one (1) record of the Eastern grass owl from within 10 km of the subject site from the NSW BioNet online database.  Potentially suitable habitat is available on the subject site (i.e., vegetation communities 9-10).	<b>Unlikely</b>
<b>Invertebrates</b>						
<i>Argynnis hyperbius inconstans</i>	Australian fritillary	E	CE	Restricted to open, swampy, coastal areas where the larval food plant, <i>Viola betonicifolia</i> , grows as a small, ground herb in association with <i>Lomandra longifolia</i> (long leaved matrush) and grasses, especially the grass <i>Imperata cylindrica</i> (blady grass).	There are no records of the Australian fritillary within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>
<b>Mammals</b>						
<i>Chalinolobus dwyeri</i>	Large-eared pied bat	V	V	This species requires a combination of sandstone cliff/escarpment to provide roosting habitat that is adjacent to higher fertility sites, particularly box gum woodlands or river/rainforest corridors that are used for foraging. Almost all records have been found within several kilometres of cliff lines or rocky terrain. Roosting has also been observed in disused mine shafts, caves, overhangs, and disused fairy martin ( <i>Hirundo ariel</i> ) nests. The structure of primary nursery roosts appears to	There are no records of the Large-eared pied bat within 10 km of the subject site from the NSW BioNet online database.  No suitable roosting or forage habitat observed on the subject site.	<b>Unlikely</b>

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<b>Amphibians</b>						
				be very specific, <i>i.e.</i> arch caves with dome roofs (that need to be deep enough to allow juvenile bats to learn to fly safely inside) and with indentations in the roof (presumably to allow the capture of heat). These physical characteristics are very uncommon in the landscape and therefore a limiting factor to the species distribution.		
<i>Dasyurus maculatus</i>	Spotted-tail quoll	V	E	This species is recorded from a wide range of habitats, including montane rainforests, sclerophyll forests ( <i>e.g.</i> open, closed, wet), coastal heathlands, sub-alpine woodlands, and riparian forests. It prefers mature wet forests that have not been logged and require large areas of relatively intact forest for foraging. Preferred den sites include hollow logs, caves, or rocky outcrops for daytime shelter.	There are no records of the Spotted-tailed quoll from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Macropus dorsalis</i>	Black-striped wallaby	E		Preferred habitat is characterised by dense woody or shrubby vegetation within three metres of the ground. This dense vegetation must occur near a more open, grassy area to provide suitable feeding habitat. On the north coast, this species is closely associated with dry rainforest but also occur in moist eucalypt forest with a rainforest understorey or a dense shrub layer.	There are two (2) records of the Black-striped wallaby from within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>

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<b>Amphibians</b>						
<i>Micronomus norfolkensis</i>	Eastern Coastal Free-tailed Bat	V		Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range.	There are eight (8) records of the Eastern Coastal Free-tailed Bat from within 10 km of the subject site from the NSW BioNet online database.  No suitable roosting or forage habitat observed on the subject site.	<b>Unlikely</b>
<i>Miniopterus orianae oceanensis</i>	Large Bent-winged Bat	V		Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings, and other man-made structures. Hunt in forested areas, catching moths and other flying insects above the treetops.	There is one (1) record of the Large bent-winged Bat from within 10 km of the subject site from the NSW BioNet online database.  No suitable roosting or forage habitat observed on the subject site.	<b>Unlikely</b>
<i>Notamacropus parma</i>	Parma Wallaby	V		Preferred habitat is moist eucalypt forest with thick, shrubby understorey, often with nearby grassy areas, rainforest margins and occasionally drier eucalypt forest. During the day they shelter in dense cover.	There are no records of the Parma wallaby within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Nyctophilus bifax</i>	Eastern long-eared bat	V		Lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest. Coastal rainforest and patches of coastal scrub are particularly favoured. Roosts in tree hollows, the hanging foliage of palms, in dense clumps of foliage of rainforest trees, under bark and in shallow depressions on trunks and branches, among epiphytes, in the roots of strangler figs,	There is one (1) record of the Eastern long-eared bat from within 10 km of the subject site from the NSW BioNet online database.  No suitable roosting or forage habitat observed on the subject site.	<b>Unlikely</b>

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<b>Amphibians</b>						
				among dead fronds of tree ferns and less often in buildings.		
<i>Petauroides volans</i>	Greater glider	E	E	This species is found in eucalypt forests and woodlands. It prefers forests with a good diversity of eucalypt species to provide consistent forage opportunities year-round, and is found in the greatest abundance in tall, montane, moist old growth forests.	There are no records of the Greater glider within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Petaurus australis</i>	Yellow-bellied glider	V		Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils.	There are no records of the Yellow-bellied glider within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Petaurus norfolcensis</i>	Squirrel glider	V		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.	There is one (1) record of the Squirrel glider within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Petrogale penicillata</i>	Brush-tailed rock-wallaby		V	Occupy rocky escarpments, outcrops and cliffs with a preference for complex structures with fissures, caves and ledges, often facing north.	There are no records of the Brush-tailed rock-wallaby within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>

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<b>Amphibians</b>						
<i>Phascogale tapoatafa</i>	Brush-tailed phascogale	V		Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. Within their home range individuals require multiple, large hollow bearing trees (DBH >80 cm) in which to nest.	There are two (2) records of the Brush-tailed phascogale within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Phascolarctos cinereus</i>	Koala	E	E	This species inhabits a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities where suitable food trees are present. The koala is a leaf-eating specialist that feeds primarily during dawn, dusk, or night. Its diet is restricted mainly to foliage of a small selection of preferred <i>Eucalyptus</i> spp; however, it may also consume foliage of related genera, including <i>Corymbia</i> spp., <i>Angophora</i> spp., <i>Melaleuca</i> spp., and <i>Lophostemon</i> spp.	There are 28 records of the Koala from within 10 km of the subject site from the NSW BioNet online database. Suitable habitat was observed along the upper banks of the Richmond River.	<b>Possible</b>
<i>Potorous tridactylus tridactylus</i>	Long-nosed potoroo	V	V	This species inhabits coastal heath and dry and wet sclerophyll forests. Dense understorey with occasional open areas is an important habitat feature, and may consist of grasstrees, sedges, ferns, or heath, or of low shrubs of tea-trees or melaleucas. A sandy loam soil is also a common feature.	There are no records of the Long-nosed potoroo within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>



Review of Environmental Factors - Halstead Drive Reconstruction, Casino

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
<i>Pseudomys novaehollandiae</i>	New Holland mouse		V	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes.	There are no records of the New Holland mouse within 10 km of the subject site from the NSW BioNet online database. No suitable habitat observed on the subject site.	<b>Unlikely</b>
<i>Pteropus poliocephalus</i>	Grey-headed flying-fox	V	V	This species occurs in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths, and swamps as well as urban gardens and cultivated fruit crops. This species feeds on the nectar and pollen of native trees, in particular <i>Eucalyptus</i> , <i>Melaleuca</i> and <i>Banksia</i> , and fruits of rainforest trees and vines. It also feeds on commercial fruit crops and on introduced tree species in urban areas. The grey-headed flying-fox roosts in aggregations of various sizes on exposed branches. Roost sites are generally located within 20 km of a regular food source and are typically located near water, such as lakes, rivers, or the coast. Roost vegetation includes rainforest patches, stands of <i>Melaleuca</i> , mangroves and riparian vegetation, but colonies also use highly modified vegetation in urban and suburban areas. The species can maintain fidelity to roost sites for extended periods, although new sites have been colonized.	There are 324 records of the Grey-headed flying-fox from within 10 km of the subject site from the NSW BioNet online database. Suitable forage habitat by way of flowering or fruiting trees is available along the Richmond River. As a result, the Grey-headed flying-fox is likely to traverse the area while foraging; however, the subject site provides no suitable vegetation.	<b>Possible</b>

Review of Environmental Factors - Halstead Drive Reconstruction, Casino

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
<i>Scoteanax rueppellii</i>	Greater broad-nosed bat	V		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. This species predominately roosts in tree hollows; however, has been recorded using buildings.	There is one (1) record of the Greater broad-nosed bat from within 10 km of the subject site from the NSW BioNet online database.  No suitable roosting or forage habitat observed on the subject site.	<b>Unlikely</b>
<i>Thylogale stigmatica</i>	Red-legged pademelon	V		Inhabits forest with a dense understorey and ground cover, including rainforest, moist eucalypt forest and vine scrub.	There is one (1) record of the Red-legged pademelon from within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat was observed on the subject site.	<b>Unlikely</b>
<b>Reptiles</b>						
<i>Cacophis harriettae</i>	White-crowned snake	V		Favours low to mid-elevation dry eucalypt forest and woodland, particularly areas with a varied and well-developed litter layer, where their prey of small lizards may be more abundant. Also occasionally found in moist eucalypt forest and coastal heathland.	There is one (1) record of the RWhite-crowned snake from within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat was observed on the subject site.	<b>Unlikely</b>
<i>Coeranoscincus reticulatus</i>	Three-toed snake-tooth skink	V	V	This species inhabits rainforest and occasionally moist eucalypt forest, on loamy or sandy soils. This species feeds on earthworms and beetle grubs and is found in leaf litter, often immediately adjacent to fallen tree trunks.	There are no records of the Three-toed snake-tooth skink from within 10 km of the subject site from the NSW BioNet online database.  No suitable habitat was observed on the subject site.	<b>Unlikely</b>

Scientific name	Common name	BC Act*	EPBC Act#	Habitat assessment <sup>1</sup>	Records and Suitable Habitat	Likelihood of occurrence
<b>Amphibians</b>						
<p>* NSW Biodiversity Conservation Act 2016 (BC Act)</p> <p># Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)</p> <p>CE - Critically Endangered, E - Endangered, V - Vulnerable, M - Migratory (marine, terrestrial or listed)</p> <p>() listed but not found in site database search.</p> <p><sup>1</sup> Sources (including specific literature references) from:</p> <ul style="list-style-type: none"> <li>• DAWE (2022) <i>Species Profile and Threats Database</i>. Department of Agriculture, Water and the Environment (DAWE). Australian Government. Available at <a href="http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl">http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl</a>.</li> <li>• DES (2022). <i>Species Profile Search</i>. Department of Environment and Science (DES), Queensland Government.</li> <li>• DoPIE (2022). <i>Threatened biodiversity profile search</i>. Office of Environment and Heritage, Department of Planning, Industry and Environment (DoPIE), New South Wales Government.</li> </ul>						

## **APPENDIX 2 - RECOVERED AGGREGATE EXEMPTION 2014**



# **Resource Recovery Exemption under Part 9, Clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014**

## **The recovered aggregate exemption 2014**

### **Introduction**

This exemption:

- is issued by the Environment Protection Authority (EPA) under clauses 91 and 92 of the Protection of the Environment Operations (Waste) Regulation 2014 (Waste Regulation); and
- exempts a consumer of recovered aggregate from certain requirements under the *Protection of the Environment Operations Act 1997* (POEO Act) and the Waste Regulation in relation to the application of that waste to land, provided the consumer complies with the conditions of this exemption.

This exemption should be read in conjunction with 'the recovered aggregate order 2014'.

### **1. Waste to which this exemption applies**

- 1.1. This exemption applies to recovered aggregate that is, or is intended to be, applied to land for road making activities, building, landscaping and construction works.
- 1.2. Recovered aggregate is a material comprising of concrete, brick, ceramics, natural rock and asphalt processed into an engineered material. This does not include refractory bricks or associated refractory materials, or asphalt that contains coal tar.

### **2. Persons to whom this exemption applies**

- 2.1. This exemption applies to any person who applies, or intends to apply, recovered aggregate to land as set out in 1.1.

### **3. Duration**

- 3.1. This exemption commences on 24 November 2014 and is valid until revoked by the EPA by notice published in the Government Gazette.

## **4. Premises to which this exemption applies**

- 4.1. This exemption applies to the premises at which the consumer's actual or intended application of recovered aggregate is carried out.

## **5. Revocation**

- 5.1. 'The recovered aggregate exemption 2010' which commenced on 13 September 2010 is revoked from 24 November 2014.

## **6. Exemption**

- 6.1. Subject to the conditions of this exemption, the EPA exempts each consumer from the following provisions of the POEO Act and the Waste Regulation in relation to the consumer's actual or intended application of recovered aggregate to land when used for road making activities, building, landscaping and construction works at the premises:
- section 48 of the POEO Act in respect of the scheduled activities described in clauses 39 and 42 of Schedule 1 of the POEO Act;
  - Part 4 of the Waste Regulation;
  - section 88 of the POEO Act; and
  - clause 109 and 110 of the Waste Regulation.
- 6.2. The exemption does not apply in circumstances where recovered aggregate is received at the premises for which the consumer holds a licence under the POEO Act that authorises the carrying out of the scheduled activities on the premises under clause 39 'waste disposal (application to land)' or clause 40 'waste disposal (thermal treatment)' of Schedule 1 of the POEO Act.

## **7. Conditions of exemption**

The exemption is subject to the following conditions:

- 7.1. At the time the recovered aggregate is received at the premises, the material must meet all chemical and other material requirements for recovered aggregate which are required on or before the supply of recovered aggregate under 'the recovered aggregate order 2014'.
- 7.2. The recovered aggregate can only be applied to land in road making activities, building, landscaping and construction works. This approval does not apply to any of the following applications:
- 7.2.1. Construction of dams or related water storage infrastructure,
  - 7.2.2. Mine site rehabilitation,
  - 7.2.3. Quarry rehabilitation,
  - 7.2.4. Sand dredge pond rehabilitation,
  - 7.2.5. Back filling of quarry voids,
  - 7.2.6. Raising or reshaping of land used for agriculture, and
  - 7.2.7. Construction of roads on private land unless:
    - (a) the recovered aggregate is applied only to the minimum extent necessary for the construction of the road, and
    - (b) a development consent has been granted under the relevant Environmental Planning Instrument (EPI), or

- (c) it is to provide access (temporary or permanent) to a development approved by a Council, or
  - (d) the works are either exempt or complying development.
- 7.3. The consumer must keep a written record of the following for a period of six years:
- the quantity of any recovered aggregate received; and
  - the name and address of the supplier of the recovered aggregate received.
- 7.4. The consumer must make any records required to be kept under this exemption available to authorised officers of the EPA on request.
- 7.5. The consumer must ensure that any application of recovered aggregate to land must occur within a reasonable period of time after its receipt.

## **8. Definitions**

In this exemption:

**application or apply to land** means applying to land by:

- spraying, spreading or depositing on the land; or
- ploughing, injecting or mixing into the land; or
- filling, raising, reclaiming or contouring the land.

**consumer** means a person who applies, or intends to apply, recovered aggregate to land.

**processor** means a person who processes, mixes, blends, or otherwise incorporates recovered aggregate into a material in its final form for supply to a consumer.

**Manager Waste Strategy and Innovation  
Environment Protection Authority  
(by delegation)**



## Notes

The EPA may amend or revoke this exemption at any time. It is the responsibility of the consumer to ensure they comply with all relevant requirements of the most current exemption. The current version of this exemption will be available on [www.epa.nsw.gov.au](http://www.epa.nsw.gov.au)

In gazetting or otherwise issuing this exemption, the EPA is not in any way endorsing the use of this substance or guaranteeing that the substance will confer benefit.

The conditions set out in this exemption are designed to minimise the risk of potential harm to the environment, human health or agriculture, although neither this exemption nor the accompanying order guarantee that the environment, human health or agriculture will not be harmed.

The consumer should assess whether or not the recovered aggregate is fit for the purpose the material is proposed to be used for, and whether this use will cause harm. The consumer may need to seek expert engineering or technical advice.

Regardless of any exemption provided by the EPA, the person who causes or permits the application of the substance to land must ensure that the action is lawful and consistent with any other legislative requirements including, if applicable, any development consent(s) for managing operations on the site(s).

The receipt of recovered aggregate remains subject to other relevant environmental regulations in the POEO Act and the Waste Regulation. For example, a person who pollutes land (s. 142A) or water (s. 120), or causes air pollution through the emission of odours (s. 126), or does not meet the special requirements for asbestos waste (Part 7 of the Waste Regulation), regardless of having an exemption, is guilty of an offence and subject to prosecution.

This exemption does not alter the requirements of any other relevant legislation that must be met in utilising this material, including for example, the need to prepare a Safety Data Sheet (SDS).

Failure to comply with the conditions of this exemption constitutes an offence under clause 91 of the Waste Regulation.