Biodiversity Assessment

Latitude One Extension - Lot 25 DP852410, Anna Bay

Prepared for

ADW Johnson

Final / August 2021

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27 August 2021

EXECUTIVE SUMMARY

MJD Environmental has been engaged by Ingenia Communities to prepare a Biodiversity Assessment Report to accompany a planning proposal and subsequent Development Application (DA) for the proposed expansion of an existing caravan park at Lot 25 DP852410, 4473 Nelson Bay Road, Anna Bay, referred to as the 'Subject Site' (Refer to **Figure 1**). The development shall consist of 171 long-term residences in manufactured homes, with two van (short stay) sites, community facilities and ancillary development components. The objective of the assessment was to examine the likelihood of the proposal having a significant effect on any threatened species, populations or ecological communities listed under the *NSW Biodiversity Conservation Act 2016* (BC Act). This assessment recognises the relevant requirements of the *EP&A Act 1979* as amended by the *NSW Environmental Planning and Assessment Amendment Act 1997*. Preliminary assessment was also made with regard to those threatened entities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

An appraisal of the site to determine the appropriate assessment pathway under the BC Act determined the proposal on site does not trigger a Biodiversity Offset Scheme (BOS) entry threshold and on this basis, only a Test of Significance is required including application of the 5-part test.

The proposed development will require the potential removal of up to:

- 6.73ha of Exotic Vegetation, and
- 0.30ha of Native Vegetation, consisting of;
    - 0.26ha of **PCT 1644 -** Coast Tea Tree - Old Man Banksia coastal shrubland on foredunes of the Central and lower North Coast
    - 0.04ha of **PCT 1230 -** Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion

The proposal seeks to retain a large portion of vegetation to the south and east of the proposal which is to be managed and rehabilitated to act as a Koala Corridor. This area includes;

- 1.13ha of Exotic Vegetation, and
- 1.74ha of Native Vegetation, consisting of;
    - 0.56ha of **PCT 1644 -** Coast Tea Tree - Old Man Banksia coastal shrubland on foredunes of the Central and lower North Coast
    - 1.18ha of **PCT 1230 -** Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion

No threatened fauna species listed under the BC Act 2016 and EPBC Act 1999 were recorded within the development footprint, however, recent *Phascolarctos cinereus* (Koala) scats were detected at multiple trees within the retained vegetation to the south as well as *Crinia tinnula* (Wallum Froglet), which was also recorded in the adjacent lots to the north and south.

An ecological impact assessment test of significance considered whether the removal of disturbed, native vegetation on site totalling 0.30ha, would constitute a significant impact on known threatened species, populations, and ecological communities from the locality such that a local extinction may occur (5 Part Test).

The assessment concluded that the proposal was unlikely to have a significant impact on the threatened entities assessed.

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GLOSSARY OF TERMS AND ABBREVIATIONS

Term/ Abbreviation	Meaning
BC Act	Biodiversity Conservation Act 2016
BOS	Biodiversity Offset Scheme
Council	Port Stephens Council
DoEE	Commonwealth Department of the Environment and Energy
DPIE	NSW Department of Planning, Industry and Environment
DPI Water	NSW Department of Primary Industries – Water
EP&A Act	NSW Environmental Planning and Assessment Act 1979
EPBC Act	Commonwealth Environment Protection and Biodiversity Conservation Act 1999
ha	hectare
LGA	Local Government Area
OEH	NSW Office of Environment and Heritage [*former*]
PSC	Port Stephens Council

1 Introduction

MJD Environmental has been engaged by Ingenia Communities to prepare a Biodiversity Assessment Report to accompany a planning proposal and subsequent Development Application (DA) for the proposed expansion of an existing caravan park at Lot 25 DP852410, 4473 Nelson Bay Road, Anna Bay, referred to as the 'Subject Site' (Refer to **Figure 1**). The development shall consist of 171 long-term residences in manufactured homes, with two van (short stay) sites, community facilities and ancillary development components.

1.1 Description of Proposal

Ingenia Communities are seeking to expand an existing caravan park development known as Latitude One onto adjacent land described as Lot 25 DP DP852410, located at 4473 Nelson Bay Road, Anna Bay.

To facilitate this expansion, the following is proposed:

- Amendment to the Port Stephens Local Environmental Plan 2013 (PSLEP) to allow for the use of land for the purpose of a caravan park and the establishment of a conservation zone to serve as a biodiversity corridor.

  The Planning Proposal relates not only to Lot 25 DP852410 but also to the existing caravan park development located on Lots 2 and 4 DP398888, Lot 2 DP 1204319 and Lot 1 DP 1225542, to the extent that it seeks to permit caravan parks on this land, thereby regularising an existing land use that currently operates on existing use rights. The caravan park operates in accordance with DA 16-2009-257 and subsequent modifications. The RFS issued General Terms of Approval relevant to this consent, the most recent being dated 28 May 2019. As no works are proposed within the existing caravan park development, no further consideration has been given to this aspect of the planning proposal as part of this assessment.
- Notwithstanding the above, it is noted that the provision of a secondary access to Lot 25 which proposes multiple connections with the existing development, will provide an improved design outcome, further reducing bushfire risk to the existing development. The secondary access largely follows the alignment of an existing access road and required no additional clearing.
- Development Application for Alterations and Additions to the existing caravan park by way of expansion onto Lot 25 DP852410. The expansion would involve the following:
    - Site regrading and clearing of vegetation over the proposed development footprint
    - Staged establishment of 171 long term sites; 2 short term sites and internal road network
    - New community facility
    - Ancillary area for resident caravan and boat storage
    - On site stormwater management
    - New maintenance and storage shed
    - Retention and improvements to existing (secondary) access onto Nelson Bay Road
    - Establishment of a biodiversity corridor through the adoption of a Vegetation Management Plan.

A copy of the proposed Site Plan is enclosed as **Appendix 1**.

1.2 Aims & Scope

The assessment aims to examine the likelihood of the proposed development having a significant effect on any threatened species, populations or ecological communities listed under the *NSW Biodiversity Conservation Act 2016* (BC Act). This assessment recognises the relevant requirements of the EP&A Act 1979 as amended by the *NSW Environmental Planning and Assessment Amendment*

Act 1997. Preliminary assessment was also undertaken having regard to those threatened entities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The scope of this flora and fauna assessment is to:

- Determine the appropriate assessment pathway under the NSW BC Act;
- identify vascular plant species occurring within the site, including any threatened species listed under the BC Act and/or EPBC Act;
- identify and map the extent of vegetation communities within the site, including any Threatened Ecological Communities (TEC) listed under the BC Act or EPBC Act;
- identify any fauna species including threatened and migratory species, populations or their habitats, occurring within the site and are known or likely to occur within 10 km of the Site (locality);
- assess the potential of the proposed activity to have a significant impact on any threatened species, populations or ecological communities (or their habitats) identified from the site; and
- describe measures to be implemented to avoid, minimise, manage or monitor potential impacts of the proposal.

In addition to survey work within the subject site, consideration has been afforded to habitats within the site in order to appreciate the broader environmental context. This includes assessment of potential direct and indirect impacts.

1.3 Site Particulars

Locality	The site is situated at Latitude One, Nelson Bay Road, Anna Bay, NSW.
Land Title	Lot 25 DP852410
LGA	Port Stephens Council
Area	Subject Site;12.77ha (approx.) Development Footprint; 9.66ha (approx.)
Zoning	The Subject Site is currently zoned RU2 – Rural Landscape (Port Stephens LEP 2013). E2 – Environmental Conservation lies to the north of the subject site.
Boundaries	Rural properties bound the site to the South and the East, Latitude Drive to the North, on the northern side of Latitude Drive by more rural / residential properties and an area zoned E2 – Environmental Conservation, an existing caravan park development to the West and Nelson Bay Road to the East.
Current Land Use	The site currently consists of an old sand quarry covered in exotic vegetation with disturbed native vegetation to the south and east. An existing residential dwelling and ancillary structures are situated to the south-east of site.
Topography	The site slopes up to the north-west from its south-east corner and has a high point near its western boundary of ~14m ASL. The site varies from approx. 3m – 14m ASL.

1.4 Qualifications & Licencing

Qualifications

This biodiversity assessment has been prepared by Josh Smart (B. Env. Sc. & Mgmt. (Hons)), and Matt Doherty (BMLC).

Licencing

Research was conducted under the following licences:

- NSW National Parks and Wildlife Service Scientific Investigation Licence SL101684 (Valid 31 January 2022).
- Animal Research Authority (Trim File No: 16/170) issued by NSW Department of Primary Industries (Valid 8 February 2022).
- Animal Care and Ethics Committee Certificate of Approval (Trim File No: 16/170) issued by NSW Department of Primary Industries (Valid 8 February 2022).

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FIGURE 1: SITE LOCATION

Legend

- Subject Site
- Development Footprint
- Vegetation Management Plan Area
- Cadastral Boundaries
- Required Asset Protection Zone
- Proposed Environmental Management Zone (E2)

0 40 80 160

Meters

1:2,400

MJD Environmental

Aerial: NearMap (2020) | Data: MJD Environmental, ADW Johnson, Spatial Services (2020) | Datum/Projection: GDA 1994 MGA Zone 56 | Date: 26/07/2021| Version 1 | GIS\20092 - Latitude One Nelson Bay Road, Anna Bay | This plan should not be relied upon for critical design dimensions.

2 Biodiversity Assessment Pathway

The current biodiversity assessment pathway for proposed development activities requires determining the extent of native vegetation clearing with consideration of the minimum lot size (as outlined in the Local Environment Policy (LEP) for the local government area (LGA)) and whether the proposal will have a significant impact on threatened species and/or threatened ecological communities.

To determine the biodiversity assessment pathway required for the development activity, the Biodiversity Offset Scheme (BOS) threshold is used to determine whether the Biodiversity Assessment Method (BAM) is used to assess the impacts of the proposal and calculate required biodiversity credits to ensure no net loss of biodiversity occurs in the locality.

The *Biodiversity Conservation Regulation 2017* outlines when clearing of native vegetation for a development exceeds the threshold, it will trigger entry into the Biodiversity Offset Scheme and the use of the BAM method.

Thresholds for BOS entry are:

- Whether to amount of native vegetation being cleared exceeds a threshold area set out in section 7.2 (4); and/or
- Whether the impacts occur on an area mapped on the Biodiversity Values map published by the minister for the Environment.

In the cases where the extent of native vegetation clearing does not exceed the BOS entry threshold and the site is not mapped on the Biodiversity Values Map, a Test of Significance (ToS) is required to be carried in accordance with Section 7.3 of the *Biodiversity Conservation Act 2016.*

Typically, a planning proposal requires entry into the BOS and application of Stage 1 of the BAM. However, in this instance a substantial area of the site is disturbed due to historic landuse and areas of approved sand extraction.

With due regard to the BC Act and BOS entry thresholds, the proposal avoids areas mapped on the Biodiversity Values Map (BVM), specifically the existing access road on site from Nelson Bay Road, will remain as part of the proposal however there will be no native vegetation removal required as part of its retention in the mapped area on site. Secondly a small area of Asset Protection Zone (APZ) is proposed to the north east where BVM occurs, however this is in an area of existing cleared land that contains exotic pasture vegetation. Therefore, the second BOS entry threshold pertaining to the applicable area clearing threshold must be considered for the intended land zone and, where applicable, minimum lot size (MLS). We understand that the MLS of 20ha currently applying to the site will be maintained as part of the rezoning for planning purposes relating to future subdivision, thus an area clearing threshold of 0.5ha applies to the proposal.

This report details the proposed concept (including APZ will require the removal of small areas (0.3ha) of native vegetation that do not exceed the 0.5ha BOS entry threshold.

On this basis and with due regard to the site context, the proposal will be assessed under an Assessment of Significance (5 part test) and include assessment under the PSC Koala Plan of Management.

At the time this report was created, the Biodiversity Values Map could not create a BOSET report (23 July 2021), as such a snip has been provided below.

3 Methodology

Multiple field surveys were undertaken across the Subject Site and were carried out by a MJD Environmental Ecologist. The techniques employed to inform this impact assessment are described in further detail below.

3.1 Desktop Assessment

A review of ecological information was undertaken to provide context and understanding of ecological values occurring on the site. Information reviewed included:

- Online database searches involving a 10-km buffer around the site were undertaken from the NSW BioNet Atlas (Accessed 2nd July 2021);
- Commonwealth Protected Matters of National Significance online search tool initially on Accessed 2nd July 2021.

The searches provided a current list of potentially occurring threatened flora and fauna and migratory species under both the BC Act and EPBC Act.

3.2 Field Survey

Field surveys were undertaken between November 2020 and August 2021. The prevailing weather conditions during the survey are presented in a **Table 1** below.

Table 1 Prevailing Weather Conditions

Date	Min Temp (°C)	Max Temp (°C)	Rain (mm)	Wind (km/h)	Sunrise-Sunset
2nd November 2020	16.1	22.5	7.0	SSE 19km/h	0554-1921
29th June 2021	10.8	19.2	18.5	SW 11km/h – NNE 17km/h	0657 - 1657
1st July 2021	11.0	18.0	2.9	NW 4km/h - Calm	0651 - 1658
6th July 2021	7.6	15.4	0	SW 20km/h – SW 13km/h	0656 - 1700
19th August 2021	10.7	20.7	0	WSW 6km/h to E 11km/h	0626 - 1727

Sources: http://www.bom.gov.au/climate/dwo/IDCJDW0200.shtml

http://www.ga.gov.au/bin/geodesy/run/sunrisenset

3.2.1 Vegetation & Significant Flora Survey

Desktop analysis of regional mapping of the site and its surrounds was informed by large-scale vegetation mapping projects and aerial photography, including:

- Preliminary consultation of the Lower Hunter and Central Coast Regional Environment Management Strategy (LHCCREMS) Vegetation Community Map to determine the broad categorisation of the Site; and
- GIS analysis including - Aerial Photograph Interpretation (API) and consultation of topographic map (Scale 1:25,000) layers for the site.

Vegetation communities were delineated within the subject site based on the above-mentioned desktop information, coupled with ground truthing of vegetation and collection of vegetation quadrat and transect data.

The following methods where utilised within the Subject Site:

- A random meander walkover was conducted over the subject site to delineate vegetation and opportunistically record flora.
- Threatened species survey was undertaken by method of Random Meander technique similar to that of Cropper (1993) and was undertaken to:
    - Identify potential habitat for known threatened flora species.
- Targeted threatened flora species survey was completed in accordance with the Guide for Surveying threatened plants and their habitats (DPIE 2020).

Refer to **Figure 2** showing the location of all vegetation surveys. A full compilation of flora species recorded during survey is provided as **Appendix 2.**

3.2.2 Fauna Survey

A desktop assessment of the potential use of the subject site by threatened fauna species (as listed under the BC Act and EPBC Act) identified from the vicinity was undertaken prior to the commencement of field surveys (Refer to **Section 3.1**).

Fauna habitat values were assessed during flora surveys. No significant terrestrial habitat features (hollow bearing trees, nests, rock outcrops, or termite terrariums) were found during surveys.

Owing to the poor condition of terrestrial habitat and near absence of arboreal habitat, no formal arboreal mammal surveys were conducted over the subject site.

A list of fauna species observed during the site survey is provided as **Appendix 2**.

Secondary Indications and Incidental Observations

Opportunistic sightings of secondary indications (scratches, scats, diggings, tracks etc.) of resident fauna were noted. Such indicators included:

- Distinctive scats left by mammals;
- Scratch marks made by various types of arboreal animals;
- Nests made by various guilds of birds;
- Feeding scars on Eucalyptus trees made by Gliders;
- Whitewash, regurgitation pellets and prey remains from Owls;
- Auditory recognition of bird and frog calls;
- Skeletal material of vertebrate fauna; and
- Searches for indirect evidence of fauna (such as scats, nests, burrows, hollows, tracks, and diggings).

3.2.3 Habitat Survey

An assessment of the relative habitat value present within the subject site was undertaken. This assessment focused primarily on the identification of specific habitat types and resources in the subject site favoured by known threatened species from the locality. The assessment also considered the potential value of the subject site (and surrounds) for all major guilds of native flora and fauna. Habitat assessment included:

- presence, size and types of tree hollows;
- presence of rocks, logs, caves, rocky outcrops, leaf litter, overhangs and crevices;
- vegetation complexity, structure and quality;

- presence of freshwater or estuarine aquatic habitats, noting permanency;
- connectivity to adjacent areas of habitat;
- extent and types of disturbance;
- presence of foraging opportunities such as flowering eucalypts, fruits, seeds or other nectar bearing native plants; and
- presence and abundance of various potential prey species.

Habitat assessment was based on the specific habitat requirements of each threatened fauna species with regard to home range, feeding, roosting, breeding, movement patterns and corridor requirements. Consideration was given to contributing factors including topography, soil, light and hydrology for threatened flora and assemblages.

3.3 Limitations

Limitations associated with this Biodiversity Assessment report are presented herewith. The limitations have been taken into account specifically in relation to threatened species assessments, results and conclusions.

In these instances, a precautionary approach has been adopted; whereby 'assumed presence' of known and expected threatened species, populations and ecological communities has been made where relevant and scientifically justified to ensure a holistic assessment.

Seasonality & Conditions

Threatened flora species should be surveyed within their respective flowering periods to ensure accurate identification.

The flowering and fruiting plant species that attract some nomadic or migratory threatened species, often fruit or flower in cycles spanning a number of years. Furthermore, these resources might only be accessed in some areas during years when resources more accessible to threatened species fail. As a consequence, threatened species may be absent from some areas where potential habitat exists for extended periods and this might be the case for nomadic and opportunistic species.

Data Availability & Accuracy

The collated threatened flora and fauna species records provided by Bionet Species Sightings Search of NSW Wildlife are known to vary in accuracy and reliability. This is usually due to the reliability of information provided to the National Parks and Wildlife Service (NPWS) for collation and/or the need to protect specific threatened species locations. During the review of threatened species records sourced from OEH BioNet Atlas, consideration has been given to the date and accuracy of each threatened species record in addition to an assessment of habitat suitability within the site.

Similarly, EPBC Protected Matters Searches provide a list of threatened species and communities that have been recorded within 10 km of the subject site, or which have suitable habitat within the wider area, and are subject to the same inherent inaccuracy issues as the State derived databases.

In order to address these limitations in respect to data accuracy, threatened species records have only been used to provide a guide to the types of species that occur within the locality of the subject site. Consequently, habitat assessment and the results of surveys conducted within the site have been used to assess the likelihood of occurrence of threatened species, populations and ecological communities to occur therein.

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FIGURE 2: SURVEY EFFORT

Legend

- Anabat Unit
- Call Playback
- Nocturnal Survey
- Flora Transect
- Koala SATs
- Subject Site
- Development Footprint
- Vegetation Management Plan
- Cadastral Boundaries

0 25 50 100

Meters

1:1,600

MJD Environmental

N W E S

Aerial: NearMap (2020) | Data: MJD Environmental, ADW Johnson, Spatial Services (2020) | Datum/Projection: GDA 1994 MGA Zone 56 | Date: 26/07/2021| Version 1 | GIS\20092 - Latitude One Nelson Bay Road, Anna Bay | This plan should not be relied upon for critical design dimensions.

4 Results

4.1 Desktop Assessment

Using the NSW BioNet Atlas, and EPBC Act Protected Matters Search (Accessed 2nd July 2021), a list of potentially occurring threatened species, populations and ecological communities from the locality (10 km radius) has been compiled (**Table 2**). A total of 111 entities have been recorded of which 23 threatened flora species, 47 fauna species, 14 ecological community and 27 migratory species have either been detected or have the potential to occur within the locality.

Note: The EPBC Act Protected Matters Search Tool (PMST) does not provide number of records within the locality. Therefore, the record count related only to those BC Act listed species that were detected within 10 km of the site. It is also noted that due to the terrestrial nature of the site, marine species were not considered under this ecological assessment and have not been included in the list.

Table 2 Threatened Flora & Fauna Database Search Results

Scientific Name	Common Name	EPBC Act	BC Act	No. of Records	Notes & Source
Threatened Ecological Communities					
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		V	E	P[1]	Community likely to occur within area[2]
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		-	E	K[1]	-
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions		-	E	K[1]	-
Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin Bioregion		-	E	K[1]	-
Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions		-	V	K[1]	-
Lowland Rainforest of Subtropical Australia		CE	E	K[1]	Community may occur within area[2]
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion		CE	E	K[1]	
Posidonia australis seagrass meadows of the Manning-Hawkesbury ecoregion		E	E	-	Community likely to occur within area[2]
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		CE	E	K[1]	
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion			E	K[1]	
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E	E	K[1]	Community likely to occur within area[2]
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		-	E	K[1]	-
Sydney Freshwater Wetlands in the Sydney Basin Bioregion		-	E	K[1]	-
Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions		-	E	K[1]	-

Scientific Name	Common Name	EPBC Act	BC Act	No. of Records	Notes & Source
Flora					
Angophora inopina	Charmhaven Apple	-	V	1	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Asperula asthenes	Trailing Woodruff	V	V	-	Species or Species habitat may occur within area[2]
Callistemon linearifolius	Netted Bottle Brush	-	V	19	Recorded within 10km Bionet search of the Subject Site[1]
Corybas dowlingii	Red Helmet Orchid	-	E	41	Recorded within 10km Bionet search of the Subject Site[1]
Cryptostylis hunteriana	Leafless Tongue--orchid	V	V	1	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Cynanchum elegans	White-flowered Wax Plant	E	E	-	Species or Species habitat may occur within area[2]
Diuris arenaria	Sand Doubletail	-	E	270	Recorded within 10km Bionet search of the Subject Site[1]
Diuris praecox	Newcastle Doubletail	V	V	1095	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Eucalyptus camfieldii	Camfield's Stringybark	V	V	-	Species or Species habitat may occur within area[2]
Eucalyptus parramattensis subsp. *decadens*	Earp's Gum	V	V	5	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat likely to occur within area[2]
Euphrasia arguta	-	CE	CE	-	Species or Species habitat may occur within area[2]
Grevillea parviflora subsp. *parviflora*	Small-flower Grevillea	V	V	-	Species or Species habitat may occur within area[2]
Melaleuca biconvexa	Biconvex Paperbark	V	V	-	Species or Species habitat may occur within area[2]
Persicaria elatior	Knotweed	V	-	1	Recorded within 10km Bionet search of the Subject Site[1]

Scientific Name	Common Name	EPBC Act	BC Act	No. of Records	Notes & Source
					Species or Species habitat likely to occur within area[2]
Phaius australis	Lesser Swamp Orchid	E	E	-	Species or species habitat may occur within area[2]
Prostanthera densa	Villous Mint-bush	V	V	4	Recorded within 10km Bionet search of the Subject Site[1]
Pultenaea maritima	Coast Headland Pea	-	V	2	Recorded within 10km Bionet search of the Subject Site[1]
Rhizanthella slateri	Eastern Underground Orchid	E	-	-	Species or Species habitat may occur within area[2]
Rhodamnia rubescens	Scrub Turpentine	CE	CE	-	Species or Species habitat likely to occur within area[2]
Rhodomyrtus psidioides	Native Guava	CE	CE	1	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Syzygium paniculatum	Magenta Lilly Pilly	V	E	2	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Tetratheca juncea	Black-eyed Susan	V	V	1	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Thesium australe	Austral Toadflax	V	V	-	Species or species habitat may occur within area[2]
Birds					
Anthochaera phrygia	Regent Honeyeater	CE	CE	-	Foraging, feeding or related behaviour likely to occur within area[2]
Artamus cyanopterus	Dusky Woodswallow	-	V	2	Recorded within 10km Bionet search of the Subject Site[1]
Botaurus poiciloptilus	Australasian Bittern	E	E	1	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Burhinus grallarius	Bush Stone-curlew	-	E	14	Recorded within 10km Bionet search of the Subject Site[1]

Scientific Name	Common Name	EPBC Act	BC Act	No. of Records	Notes & Source
Calidris canutas	Red Knot	E	-	-	Species or Species habitat known to occur within area[2]
Calidris tenuirostris	Great Knot	CE	-	-	Roosting known to occur[2]
Calidris ferruginea	Curlew Sandpiper	CE, M, A	E	-	Species or Species habitat known to occur within area[2]
Calyptorhynchus lathami	Glossy Black Cockatoo	-	V	3	Recorded within 10km Bionet search of the Subject Site[1]
Daphoenositta chrysoptera	Varied Sittella	-	V	3	Recorded within 10km Bionet search of the Subject Site[1]
Dromaius novaehollandiae	Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	-	E	1	Recorded within 10km Bionet search of the Subject Site[1]
Ephippiorhynchus asiaticus	Black-necked Stork	-	E	3	Recorded within 10km Bionet search of the Subject Site[1]
Erythrotriorchis radiatus	Red Goshawk	V	CE	-	Species or Species habitat likely to occur within area[2]
Falco hypoleucos	Grey Falcon	E	V	-	Species or Species habitat may occur within area[2]
Glossopsitta pusilla	Little Lorikeet	-	V	10	Recorded within 10km Bionet search of the Subject Site[1]
Haematopus fuliginosus	Sooty Oystercatcher	-	V	5	Recorded within 10km Bionet search of the Subject Site[1]
Haematopus longirostris	Pied Oystercatcher	-	E	3	Recorded within 10km Bionet search of the Subject Site[1]
Haliaeetus leucogaster	White-bellied Sea-Eagle	-	V	105	Recorded within 10km Bionet search of the Subject Site[1]
Hirundapus caudacutus	White-throated Needletail	V	-	6	Recorded within 10km Bionet search of the Subject Site[1] Species or species habitat known to occur within area[2]
Lathamus discolor	Swift Parrot	CE, A	E	12	Recorded within 10km Bionet search of the Subject Site[1] Species or species habitat known to occur within area[2]
Ninox connivens	Barking Owl	-	V	2	Recorded within 10km Bionet search of the Subject Site[1]

Scientific Name	Common Name	EPBC Act	BC Act	No. of Records	Notes & Source
Ninox strenua	Powerful Owl	-	V	16	Recorded within 10km Bionet search of the Subject Site[1]
Numenius madagascariensis	Eastern Curlew	CE, M	-	4	Species or Species habitat known to occur within area[2]
Pandion cristatus	Eastern Osprey	-	V	2	Recorded within 10km Bionet search of the Subject Site[1]
Ptilinopus magnificus	Wompoo Fruit-Dove	-	V	1	Recorded within 10km Bionet search of the Subject Site[1]
Ptilinopus superbus	Superb Fruit-Dove	-	V	1	Recorded within 10km Bionet search of the Subject Site[1]
Tyto longimembris	Eastern Grass Owl	-	V	1	Recorded within 10km Bionet search of the Subject Site[1]
Tyto novaehollandiae	Masked Owl	-	V	7	Recorded within 10km Bionet search of the Subject Site[1]
Mammals					
Dasyurus maculatus maculatus	Spotted-tailed Quoll (SE mainland population)	E	V	13	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Phascogale tapoatafa	Brush-tailed Phascogale	-	V	14	Recorded within 10km Bionet search of the Subject Site[1]
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	2	Recorded within 10km Bionet search of the Subject Site[1]
Petaurus norfolcensis	Squirrel Glider	-	V	36	Recorded within 10km Bionet search of the Subject Site[1]
Phascolarctos cinereus	Koala (Combined populations of Qld, NSW and the ACT)	V	V	3185	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Pseudomys novaehollandiae	New Holland Mouse	V	-	8	Recorded within 10km Bionet search of the Subject Site[1] Species or Species habitat known to occur within area[2]
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	30	Recorded within 10km Bionet search of the Subject Site[1] Foraging, feeding or related behaviour known to occur within area[2]

Scientific Name	Common Name	EPBC Act	BC Act	No. of Records	Notes & Source
Falsistrellus tasmaniensis	Eastern False Pipistrelle		V	8	Recorded within 10km Bionet search of the Subject Site[1]
Micronomus norfolkensis	Eastern Costal Free-tailed Bat	-	V	5	Recorded within 10km Bionet search of the Subject Site[1]
Miniopterus australis	Little Bent-winged Bat	-	V	24	Recorded within 10km Bionet search of the Subject Site[1]
Miniopterus orianae oceanensis	Large Bent-winged Bat	-	V	3	Recorded within 10km Bionet search of the Subject Site[1]
Myotis macropus	Southern Myotis	-	V	2	Recorded within 10km Bionet search of the Subject Site[1]
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	-	V	2	Recorded within 10km Bionet search of the Subject Site[1]
Scoteanax rueppellii	Greater Broad-nosed Bat	-	V	10	Recorded within 10km Bionet search of the Subject Site[1]
Vespadelus troughtoni	Eastern Cave Bat	-	V	4	Recorded within 10km Bionet search of the Subject Site[1]
Herpetofauna					
Crinia tinnula	Wallum Froglet	-	V	79	Recorded within 10km Bionet search of the Subject Site[1]
Litoria aurea	Green and Golden Bell Frog	V	E	-	Species or Species habitat likely to occur within area[2]
Uperoleia mahonyi	Mahony's Toadlet	E	E	-	Species or Species habitat known to occur within area[2]
Insects					
Petalura gigantea	Giant Dragonfly	-	E	4	Recorded within 10km Bionet search of the Subject Site[1]
Listed Migratory Species					
Migratory Terrestrial Birds					
Cuculus optatus	Oriental Cuckoo	M	-	-	Species or Species habitat may occur within area[2]
Monarcha melanopsis	Black-faced Monarch	M	-	-	Species or Species habitat known to occur within area[2]
Monarcha trivirgatus	Spectacled Monarch	M	-	-	Species or Species habitat known to occur within area[2]
Myiagra cyanoleuca	Satin Flycatcher	M	-	-	Species or Species habitat known to occur within area[2]
Rhipidura rufifrons	Rufous Fantail	M	-	-	Species or Species habitat known to occur within area[2]

Scientific Name	Common Name	EPBC Act	BC Act	No. of Records	Notes & Source
Migratory Wetlands Birds					
Actitis hypoleucos	Common Sandpiper	M	-	-	Species or Species habitat known to occur within area[2]
Arenaria interpres	Ruddy Turnstone	M	-	-	Species or Species habitat known to occur within area[2]
Calidris acuminata	Sharp-tailed Sandpiper	M	-	-	Species or Species habitat known to occur within area[2]
Calidris melanotos	Pectoral Sandpiper	M	-	-	Species or Species habitat known to occur within area[2]
Charadrius bicinctus	Double-banded Plover	M	-	-	Species or Species habitat known to occur within area[2]
Charadrius mongolus	Lesser Sand Plover	E, M	-	-	Species or Species habitat known to occur within area[2]
Gallinago hardwickii	Latham's Snipe	M	-	-	Species or Species habitat likely to occur within area[2]
Gallinago megala	Swinhoe's Snipe	M	-	-	Species or Species habitat known to occur within area[2]
Gallinago stenura	Pin-tailed Snipe	M	-	-	Species or Species habitat known to occur within area[2]
Limosa lapponica	Bar-tailed Godwit	M	-	-	Species or Species habitat known to occur within area[2]
Limosa limosa	Black-tailed Godwit	M	-	-	Species or Species habitat known to occur within area[2]
Numenius minutus	Little Curlew	M	-	-	Species or Species habitat likely to occur within area[2]
Numenius phaeopus	Whimbrel	M	-	-	Species or Species habitat likely to occur within area[2]
Pandion haliaetus	Osprey	M, A	V	-	Species or Species habitat known to occur within area[2]
Pluvialis fulva	Pacific Golden Plover	M	-	-	Species or Species habitat likely to occur within area[2]
Pluvialis squatarola	Grey Plover	M	-	-	Species or Species habitat likely to occur within area[2]
Tringa brevipes	Common Greenshank	M	-	-	Species or Species habitat likely to occur within area[2]
Tringa nebularia	Common Greenshank	M, A	-	-	Species or Species habitat likely to occur within area[2]

Scientific Name	Common Name	EPBC Act	BC Act	No. of Records	Notes & Source
Tringa stagnatilis	Marsh Sandpiper	M	-	-	Species or Species habitat likely to occur within area[2]
Xenus cinereus	Terek Sandpiper	M	-	-	Species or Species habitat likely to occur within area[2]

Key:

V = Vulnerable
M = Migratory
A= Marine
E = Endangered
CE = Critically Endangered

K = Known where there are confirmed records, specimens or otherwise verified sightings in any CMA subregion overlapping the search area

P = Predicted where there is high expectation by relevant experts that a species is likely to be present in any CMA subregion overlapping the search area, based on known presence of suitable habitat and distribution with adjoining subregions

1 – NSW BioNet Atlas, Office of Environment and Heritage (Accessed 02-07-2021).
2 - Commonwealth Protected Matters Search Tool, Department of the Environment (Accessed 02-07-2021)

4.2 Flora Survey

4.2.1 Vegetation Mapping & Delineation

Vegetation observed within the development footprint is predominantly characterised by exotic, established within an area that has undergone heavy modification due to the extraction of soils. Vegetation that resides along the southern boundary of the subject site is observed to constitute coastal heath that likely existed before the sand mine was constructed. This vegetation then transitions into swamp sclerophyll due to the low elevation and high-water table. This swamp sclerophyll forest continues along the eastern border of the subject site which becomes inundated after high rainfall events. All native vegetation that occurs within the Subject Site exists within a disturbed nature with multiple high threat exotics (HTE) detected. Vegetation communities listed under Lower Hunter and Central Coast Regional Environmental Management Strategy (LHCCREMS) and Plant Community Type (PCT) were considered to be present on site.

The extant vegetation within the subject site has been described below. Refer to **Figure 3**. A summary of vegetation areas is presented in Table 3 below.

Table 3 Vegetation Community Areas

Vegetation Community	Plant Community Type (PCT)	TEC	Area (ha) within Development Footprint	Area (ha) within Vegetation Management Plan
MU 34: Coastal Sand Wallum Woodland - Heath	**1644** - Coast Tea Tree - Old Man Banksia coastal shrubland on foredunes of the Central and lower North Coast	No	0.26ha	0.56ha
MU 37: Swamp Mahogany - Paperbark Forest	**1230** - Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion	Yes, commensurate with *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*	0.04ha	1.18ha
Exotic Vegetation	N/A	No	6.73ha	1.13ha

MU 34 – Coastal Sand Wallum Woodland	
PCT ID	**1644 - Coast Tea Tree - Old Man Banksia coastal shrubland on foredunes of the Central and lower North Coast**
Vegetation Zone (VZ)	**VZ1**
Condition Class	Disturbed
Area within Development Area	0.26ha
Vegetation Formation / Class	Heathlands
Survey Effort	Detailed Walkover
Floristic Description	This mapped area entails the majority of the native vegetation within the subject site and resides within the southern portion of the site. It is considered in moderate condition as the vegetation is still intact with the exception of emerging *Pinus elliotii* (Slash Pine) and *Chrysanthemoides monilifera subsp. rotundata* (Bitou Bush) and *Lantana camara* (Lantana) within the understorey. The native canopy is comprised of *Leptospermum laevigatum* (Coastal Tea-tree) and *Banksia serrata* (Old Man Banksia). The understorey, where not disturbed, contained shrubs including *Monotoca elliptica* (Broom Heath) and *Acacia longifolia* (Sydney Golden Wattle). Groundcover is sparse and limited to *Lomandra longifolia* (Spiny Matt-rush), *Dichondra repens* (Kidney Weed), *Pomax umbellata*, *Pteridium esculentum* (Bracken) and *Themeda triandra* (Kangaroo Grass). Vines found within the vegetation community included *Parsonsia straminea* (Monkey Rope), *Kennedia rubicunda* (Dusky Coral Pea) and *Hardenbergia violacea* (False Sarsaparilla). Native orchids include *Microtis unifolia* (Common Onion Orchid), *Thelymitra spp.* (Sun Orchid) and *Chiloglottis formicifera* (Ant Orchid).
Condition within Development Site	Moderate
Justification for PCT Selection	The presence of *Leptospermum laevigatum* (Coastal Tea-tree) and *Banksia serrata* (Old Man Banksia) as the most dominant canopy species, forming a dense canopy.
Status	BC Act: Not Listed
	EPBC Act: Not Listed

MU 37 – Swamp Mahogany - Paperbark Forest	
PCT ID	**1230 - Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion**
Condition Class	VZ2 (Moderate) VZ3 (Low)
Area within Development Area	0.04ha (VZ3 only)
Vegetation Formation / Class	Forested Wetlands
Survey Effort	Detailed Walkover
Floristic Description	VZ2 is described as a small patch along the southern fence line, this area was moderately disturbed and created hostile by the surrounding weed infestation. Canopy trees include Eucalyptus robusta (Swamp Mahogany), Melaleuca quinquenervia (Broad-leaved Paperbark), Glochidion ferdinandi (Cheese Tree) and Casuarina glauca (Swamp Oak). Understory was heavily vegetated with Gahnia aspera (Tall Saw Sedge) and Blechnum indicum. Native vines are limited to Parsonsia straminea. VZ3 was observed to consist only of Eucalyptus robusta and Melaleuca quinquenervia with few Angophora costata (Smooth-barked Apple). Due to the heavily disturbed ground with exotic species such as Hydrocotyle bonariensis (American Pennywort), Lantana camara, Andropogon virginicus (Whiskey Grass) and Stenotaphrum secundatum (Buffalo Grass), only small patches of Gahnia aspera were observed regenerating.
Condition within Development Site	Both Moderate (VZ2) and Low (VZ3)
Justification for PCT Selection	VZ 2 was seen as highly intact, compromising of *Eucalyptus robusta* (Swamp Mahogany), *Melaleuca quinquenervia* (Broad-leaved Paperbark) and *Casuarina glauca* (Swamp Oak) along with associated understorey. Furthermore, the topography and geology also mirrored of what this PCT consists of. VZ 3 only of the remnant trees associated with this vegetation community within a floodplain.
Status	BC Act: Commensurate with *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions*
	EPBC Act: Not Listed

MU 37 – Swamp Mahogany - Paperbark Forest

Exotic Vegetation	
PCT ID	**N/A**
Condition Class	VZ4 (Low)
Area within Development Area	6.73ha
Vegetation Formation / Class	N/A
Survey Effort	Detailed Walkover
Floristic Description	Exotic vegetation was seen to predominantly cover the disturbed landscape within the subject site. This VZ consists mostly of the *Pinus elliotii*, *Lantana camara*, *Stenotaphrum secundatum*, *Hydrocotyle bonariensis* and *Chrysanthemoides monilifera subsp. rotundata* infestations. Due to the extraction of surface soil, the regenerating seed bank did not consist of many natives at all. The most abundant weeds included *Melinis repens* (Red Natal Grass) and *Acacia saligna* (Western Australian Golden Wattle), both likely to be brought in via heavy machinery. Other weeds that were common within the area included *Stenotaphrum secundatum*, *Verbena rigida* (Purple Top), *Verbena bonariensis* (Tall Purple Top), *Conyza canadensis* and *Hyparrhenia hirta* (Coolatai Grass).
Condition within Development Site	Low
Status	BC Act: Not Listed
	EPBC Act: Not Listed

4.3 Significant Flora Survey

A threatened species survey was conducted on the 19th of August during the predicted peak flowering period of the threatened of *Diuris praecox* (Newcastle Double-tail) following confirmation of flowering individuals at a Port Stephens reference population located at Tomaree. The survey was conducted by stratified survey traversing the entire parcel via parallel walking transects with a

distance of 5m (DPIE 2020). Areas that were not surveyed within the development footprint included areas of rubbish, earthmoving material, construction resources, recently mulched areas, Lantana/Bitou Bush thickets, low lying wetter areas that do not represent habitat and the remnant sand quarry pit as there was nothing observed growing, likely due to the instability of the remaining sand (Refer to **Figure 4**).

No individuals were detected on site during the survey period.

4495 NELSON BAY ROAD, ANNA BAY

FIGURE 3: VEGETATION

0 25 50 100

Meters

1:1,600

Legend

- Proposed Layout
- Proposed Basin
- Subject Site
- Development Footprint
- Vegetation Management Plan
- Cadastral Boundaries

Vegetation

- PCT 1644: Coast Tea Tree - Old Man Banksia coastal shrubland on foredunes of the Central and lower North Coast
- PCT 1230: Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion (Low)
- PCT 1230: Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion (Moderate)
- Exotic Vegetation
- Planted Lilly Pilly Hedge

MJD Environmental

N W E S

Aerial: NearMap (2020) | Data: MJD Environmental, ADW Johnson (2021), Spatial Services (2020) | Datum/Projection: GDA 1994 MGA Zone 56 | Date: 2/08/2021 | Version 1 | GIS\20092 - Latitude One Nelson Bay Road, Anna Bay | This plan should not be relied upon for critical design dimensions.

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FIGURE 4: DIURIS PRAECOX SURVEY

Legend

- Survey Effort
- Watercourse
- Contours (1m)
- Proposed Layout
- Proposed Basin
- Subject Site
- Development Footprint
- Vegetation Management Plan Area
- Cadastral Boundaries

0 25 50 100

Meters

1:1,600

MJD Environmental

N W E S

Aerial: NearMap (2021) | Data: MJD Environmental, ADW Johnson (2021), Spatial Services (2020) | Datum/Projection: GDA 1994 MGA Zone 56 | Date: 26/08/2021| Version 1 | GIS\20092 - Latitude One Nelson Bay Road, Anna Bay | This plan should not be relied upon for critical design dimensions.

4.4 Fauna Survey

The following section provides the fauna results from the subject site survey. A total of fourteen (14) fauna species were observed opportunistically during the survey period. A full list of the fauna species recorded within the site is provided as **Appendix 2**.

4.4.1 Avifauna

Species common to open, disturbed landscapes and urbanised areas were observed during the subject site inspection. Species observed include Noisy Miner, Magpie Lark, Magpie, Superb Fairy Wren, Rainbow Lorikeet, New Holland Honeyeater, Crested Dove, Common Bronzewing, Australian Raven, White-headed Pigeon and Laughing Kookaburra.

4.4.2 Herpetofauna

Wallum Froglet (Crinia tinnula), listed as 'Vulnerable' under the Biodiversity Conservation Act 2016, was detected within the future Vegetation Management Area as well as the adjacent lots to the north and south of the Subject Site. Under this proposal, their habitat is not to be impacted upon. Additionally, one Diamond Python (*Morelia spilota spilota*) and one Eastern Brown Snake (*Pseudonaja textilis*) were observed within the subject site.

4.5 Habitat Survey

Arboreal and Terrestrial Habitat

The fauna habitat within the subject site is marginal with a complete absence within the development footprint. Due to the heavily cleared area within the subject site, no hollows, nests, termite terrariums were detected. No arboreal habitat was detected within the adjacent vegetation that is proposed to be retained. The vegetated areas containing Myrtaceae species situated south and east (in part) of the development footprint are considered to provide foraging habitat for native species in the locality. The vegetation observed on site contains suitable Koala feed trees, namely *Eucalyptus robusta* (Swamp Mahogany) and *Melaleuca quinquenervia* (Broad-leaved Paperbark).

It should be noted that recent (<1 week old) Koala scats were located within the Swamp Forest vegetation community within the southern end of the subject site during surveys. It should be noted that this area is to be retained and will form a part of the augmented Koala Corridor. No signs of Koalas were detected within the development footprint.

Connectivity

The subject site exists within a well-vegetated area on the Tomaree Peninsula. Connectivity exists as remnant vegetation communities comprising only of canopy trees along the eastern boundary of the site. Native vegetation patches exist to the south-west as well to the north. A tenuous corridor exists on site that links the land to the south and east in a northerly direction. Generally, this connection is comprised of the larger vegetated patch situated in the south-west of site and extant scattered individual/ clumps of trees to the east and north-east. Patches of interconnecting vegetation occur on neighbouring lands to the south-west and north-east of the subject site. Semi-continuous vegetation patches occur beyond Nelson Bay Road to the south. A large continuous vegetation patch is situated to the north beyond Latitude Drive.

5 Impact Assessment

The following section provides an overview of the potential direct and indirect impacts associated with the proposal. This overview has been used to inform a likelihood of occurrence and potential for impacts to occur to threatened species, populations and ecological communities. In such instances, this has determined the need for further Test of Significance (5-part test).

5.1 Potential Impacts

Based on the ecological survey results over the subject site, the following direct and indirect impacts have been generated to inform impact assessment related to the proposal.

Direct Impacts

The proposed development footprint will require the potential removal of up to:

- 6.73ha of Exotic Vegetation, and
- 0.30ha of Native Vegetation, consisting of;
    - 0.26ha of **PCT 1644 -** Coast Tea Tree - Old Man Banksia coastal shrubland on foredunes of the Central and lower North Coast
    - 0.04ha of **PCT 1230 -** Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion

The proposal seeks to retain a large portion of vegetation to the south and east of the proposal within the subject site which is to be managed and rehabilitated to act as a Koala Corridor. This area includes;

- 1.13ha of Exotic Vegetation, and
- 1.74ha of Native Vegetation, consisting of;
    - 0.56ha of **PCT 1644 -** Coast Tea Tree - Old Man Banksia coastal shrubland on foredunes of the Central and lower North Coast
    - 1.18ha of **PCT 1230 -** Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion

No threatened fauna species listed under the BC Act 2016 and EPBC Act 1999 were recorded within the development footprint, however, recent *Phascolarctos cinereus* (Koala) scats were detected at multiple trees within the retained vegetation to the south as well as *Crinia tinnula* (Wallum Froglet), which was also recorded in the adjacent lots to the north and south.

Indirect Impacts

The proposal may result in the following indirect impacts associated with the construction of the infrastructure:

- Introduction and dispersal of exotic flora species from machinery
- Potential for increased sediment flows during construction if erosion and nutrient control devices are not installed to industry best practice and maintained for the duration of construction / soil stabilisation works.

However, it is noted that these indirect impacts will be operating within an environment with high levels of existing disturbance.

A positive outcome that can be achieved by the proposal is the strengthening of the tenuous corridor on the subject site via rehabilitation of the existing vegetation coupled with infill planting of the corridor (**Figure 5**).

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FIGURE 5: VEGETATION MANAGEMENT PLAN

0 25 50 100

Meters

1:1,600

Legend

- Proposed Layout
- Proposed Basin
- Subject Site
- Development Footprint
- Vegetation Management Plan Area
- Cadastral Boundaries
- Proposed Environmental Management Zone (E2)
- Required Asset Protection Zone
- Koala Improvement Corridor

Vegetation (LHCCREMS 2003)

- MU 34: Coastal Sand Wallum Woodland - Heath
- MU 37: Swamp Mahogany - Paperbark Forest (Low Condition)
- MU 37: Swamp Mahogany - Paperbark Forest (Moderate Condition)
- Exotic Vegetation
- Planted Lilly Pilly Hedge

MJD Environmental

N W E S

Aerial: NearMap (2020) | Data: MJD Environmental, ADW Johnson, Spatial Services (2020) | Datum/Projection: GDA 1994 MGA Zone 56 | Date: 26/07/2021| Version 1 | GIS\20092 - Latitude One Nelson Bay Road, Anna Bay | This plan should not be relied upon for critical design dimensions.

5.2 Threatened Species & Communities Likelihood of Occurrence Assessment

Threatened flora and fauna species (listed under the BC Act and/or EPBC Act) that have been gazetted and recorded within a 10 kilometres radius of the site have been considered within the assessment contained in **Table 4**. Each species / community is considered for its likelihood to occur on the site and potential for impact arising from the proposal. Where a potential for impact is considered, the entity has been nominated for further assessment under a Test of Significance (ToS) in **Appendix 3**.

'**Species / Community**' – Lists each threatened species / EEC known from the locality (10 km radius). The status and number of records along with source and notes for each threatened entity under the BC Act and the EPBC Act are also provided.

'**Habitat / Species Descriptions**' – for up-to-date threatened species profiles including habitat descriptions and other key ecological information reference is made to the following online resources:

- NSW OEH Threatened Species Profile Search - http://www.environment.nsw.gov.au/threatenedSpeciesApp/
- Commonwealth Biodiversity: Species Profile and Threats Database (SPRAT) - http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl

'**Likelihood of Occurrence on Site**' – Assesses the likelihood of each locally recorded species and EEC to occur within the Site, using knowledge of each species' habitat and lifecycle requirements and with regard the habitat types present within the Site, results of the literature review and database searches and field investigations. The location and number of records of the species (NSW Bionet Species Sightings Search were also considered in determining probability of occurrence.

'**Potential for Impact**' – Assesses the likelihood of impacts to each species / community that would result from the proposed development, considering direct and indirect short and long-term impacts.

Database searches were conducted of the NSW Bionet Atlas Species Sightings Search (02-07-2021) and Commonwealth Protected Matters Search Tool (02-07-2021).

Note: marine species (bird, reptile, fish, mammal) recorded on the Protected Matters have not been listed or assessed herewith.

Table 4 Likelihood of Occurrence and Impact Assessment

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Threatened Ecological Communities							
Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E	V	P1	This community occurs in the intertidal zone along the NSW coast.	An onsite inspection confirmed this community does not occur within the subject site.	No
Freshwater Wetlands on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E	-	K1	This community is known from along the majority of the NSW coast. Associated with coastal areas subject to periodic flooding and in which standing fresh water persists for at least part of the year in most years. Typically occurs on silts, muds or humic loams in low-lying parts of floodplains, alluvial flats, depressions, drainage lines, backswamps, lagoons and lakes but may also occur in backbarrier landforms where floodplains adjoin coastal sandplains. Generally, occur below 20 m elevation on level areas.	An onsite inspection confirmed this community does not occur within the subject site.	No
Hunter Lowland Redgum Forest in the Sydney Basin and New South Wales North Coast Bioregions		E	-	K1	Occurs between Muswellbrook, Beresfield, Mulbring and Cessnock in the Lower Hunter in the Sydney Basin and North Coast bioregions. It has been recorded from the Maitland, Cessnock, Port Stephens, Muswellbrook and Singleton LGAs, but may occur elsewhere in these bioregions. Probably less than 500 hectares of this community remains.	An onsite inspection confirmed this community does not occur within the subject site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Lower Hunter Spotted Gum Ironbark Forest in the Sydney Basin Bioregion		E	-	K1	Restricted to a range of approximately 65 km by 35 km centred on the Cessnock - Beresfield area in the Central and Lower Hunter Valley. Within this range, the community was once widespread. A fragmented core of the community still occurs between Cessnock and Beresfield. Remnants occur within the Local Government Areas of Cessnock, Maitland, Singleton, Lake Macquarie, Newcastle and Port Stephens but may also occur elsewhere within the bioregion	An onsite inspection confirmed this community does not occur within the subject site.	No
Lower Hunter Valley Dry Rainforest in the Sydney Basin and NSW North Coast Bioregions		V	-	K1	An ecological community typically occurring on Carboniferous sediments of the Barrington footslopes in the Hunter Valley. The community usually forms a closed forest 15-20m high with emergent trees 20-30m high. Vines are abundant and there is a dense shrub and ground layer. All sites are within the Sydney Basin Bioregion and NSW North Coast Bioregion. Those sites within the NSW North Coast Bioregion are in the southern part of the bioregion.	An onsite inspection confirmed this community does not occur within the subject site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Lowland Rainforest of Subtropical Australia		E	CE	K1	The ecological community primarily occurs from Maryborough in Queensland to the Clarence River (near Grafton) in New South Wales (NSW). The ecological community also includes isolated areas between the Clarence River and Hunter River such as the Bellinger and Hastings valleys. The ecological community occurs in the following Interim Biogeographic Regionalisation for Australia Version 6.1 (IBRA) Bioregions: South Eastern Queensland Bioregion and NSW North Coast Bioregion. The ecological community occurs on basalt and alluvial soils, including sand and old or elevated alluvial soils as well as floodplain alluvia. It also occurs occasionally on enriched rhyolitic soils and basaltically enriched metasediments. Lowland Rainforest mostly occurs in areas <300 m above sea level. Aspect can result in the ecological community being found at >300 m altitude on north-facing slopes, but typically 300 m defines the extent of the lowlands. In addition, Lowland Rainforest typically occurs in areas with high annual rainfall (>1300 mm).	An onsite inspection confirmed this community does not occur within the subject site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Lowland Rainforest on Floodplain in the New South Wales North Coast Bioregion		E	CE	K1	Lowland Rainforest on Floodplain generally occupies riverine corridors and alluvial flats with rich, moist silts often in subcatchments dominated by basic volcanic substrates. Major examples once occurred, and remnants remain, on the floodplains of the Tweed, Richmond, Clarence, Bellinger, Macleay, Hastings, Manning, and Hunter Rivers. Other minor river systems also support the community. This community occurs on fertile soils in lowland river valleys.	An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Posidonia australis seagrass meadows of the Manning - Hawkesbury ecoregion			E	-	This community occurs within estuaries along the eastern coast of Australia.	An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
River-Flat Eucalypt Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E	CE	K1	This community is found on the river flats of the coastal floodplains. It has a tall open tree layer of eucalypts, which may exceed 40 m in height, but can be considerably shorter in regrowth stands or under conditions of lower site quality. While the composition of the tree stratum varies considerably, the most widespread and abundant dominant trees include Eucalyptus tereticornis (forest red gum), E. amplifolia (cabbage gum), Angophora floribunda (rough-barked apple) and A. subvelutina (broad-leaved apple). Eucalyptus baueriana (blue box), E. botryoides (bangalay) and E. elata (river peppermint) may be common south from Sydney, E. ovata (swamp gum) occurs on the far south coast, E. saligna (Sydney blue gum) and E. grandis (flooded gum) may occur north of Sydney, while E. benthamii is restricted to the Hawkesbury floodplain.	An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Subtropical Coastal Floodplain Forest of the New South Wales North Coast Bioregion		E	-	K1	Subtropical Coastal Floodplain Forest is known from parts of the Local Government Areas of Tweed, Byron, Lismore, Ballina, Richmond Valley, Clarence Valley, Coffs Harbour, Bellingen, Nambucca, Kempsey, Hastings, Greater Taree, Great Lakes and Port Stephens, but may occur elsewhere in this bioregion. Occupies central or marginal parts of floodplains and sandy flats, including Pleistocene back-barrier flats; habitats where flooding is periodic and soils are rich in silt and sand, sometimes humic, and show little influence of saline ground water. Associated with clay-loams and sandy loams, on periodically inundated alluvial flats, drainage lines and river terraces associated with coastal floodplains. Generally, occurs below 50 m, but may occur on localised river flats up to 250 m elevation.	An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Swamp Oak Floodplain Forest of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E	E	K1	The Swamp Oak EEC ranges along the coast of NSW and partially inland in the Hunter to Wollongong region, from Tweed Heads to Bega Valley. Associated with grey-black clay-loams and sandy loams, where the groundwater is saline or sub-saline, on waterlogged or periodically inundated flats, drainage lines, lake margins and estuarine fringes associated with coastal floodplains. Generally, occurs below 20 m (rarely above 10 m) elevation.	An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions		E	-	K1	The Swamp Sclerophyll Forest EEC ranges along the coast of NSW, from Tweed Heads to Shoalhaven. Associated with humic clay loams and sandy loams, on waterlogged or periodically inundated alluvial flats and drainage lines associated with coastal floodplains. Generally occurs below 20 m (though sometimes up to 50 m) elevation.	An onsite inspection confirmed this community does occur within the Subject Site with a small portion of this EEC occurring within the Development Footprint.	Yes
Sydney Freshwater Wetlands in the Sydney Basin Bioregion		E	-	K1	Occurs on sand dunes and low-nutrient sandplains along coastal areas in the Sydney Basin bioregion. It is known from the Lake Macquarie, Wyong, Gosford, Pittwater, Warringah, Woollahra, Waverley, Botany, Rockdale, Randwick, Sutherland and Wollongong local government areas, but is likely to occur elsewhere within the bioregion. Largely restricted to freshwater swamps in swales and depressions on sand dunes and low nutrient sandplains such as those of the Warriewood and Tuggerah soil landscapes. Swampy areas on alluvium with a saline influence do not fall within this community.	An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Themeda grassland on seacliffs and coastal headlands in the NSW North Coast, Sydney Basin and South East Corner Bioregions		E	-	K1	Themeda Grassland on seacliffs and coastal headlands is found on a range of substrates in the NSW North Coast, Sydney Basin and South East Corner bioregions. Stands on sandstone are infrequent and small. Larger stands are found on old sand dunes above cliffs, as for example at Cape Banks and Henry Head in Botany Bay National Park, and on metasedimentary headlands, as for example at McCauleys Headland in Coffs Coast Regional Park, Look-at-me-now Headland, Dammerels Head and Bare Bluff in Moonee Beach Nature Reserve and Wilson's Headland in Yuraygir National Park. Individual stands of the community are often very small, a few square metres, but at some sites larger stands of up to several hectares or tens of hectares occur. Overall, the community has a highly restricted geographic distribution comprising small, but widely scattered patches.	An onsite inspection confirmed this species does not occur within the development footprint nor the subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Flora							
Angophora inopina	Charmhaven Apple	V	-	1	Endemic to the Central Coast region of NSW. Is lignotuberous, allowing vegetative growth to occur following disturbance. However, such vegetative reproduction may suppress the production of fruits/seeds, necessary for the recruitment of new individuals to a population, and the time between such disturbance and the onset of sexual reproduction is not known. Occurs most frequently in four main vegetation communities: (i) *Eucalyptus haemastoma–Corymbia gummifera–Angophora inopina* woodland/forest; (ii) *Hakea teretifolia–Banksia oblongifolia* wet heath; (iii) *Eucalyptus resinifera–Melaleuca sieberi–Angophora inopina* sedge woodland; (iv) *Eucalyptus capitellata–Corymbia gummifera–Angophora inopina* woodland/forest.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Asperula asthenes	Trailing Woodruff	V	V	-	The trailing woodruff occurs only in NSW. It is found in scattered locations from Bulahdelah north to near Kempsey, with several records from the Port Stephens/Wallis Lakes area. Occurs in damp sites, often along riverbanks.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site..	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Callistemon linearifolius	Netted Bottle Brush	V	-	19	Recorded from the Georges River to Hawkesbury River in the Sydney area, and north to the Nelson Bay area of NSW. Recorded in 2000 at Coalcliff in the northern Illawarra. Grows in dry sclerophyll forest on the coast and adjacent ranges.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Corybas dowlingii	Red Helmet Orchid	E	-	41	It is known from the local government areas of Cessnock, Great Lakes, Lake Macquarie and Port Stephens. Sheltered areas such as gullies and southerly slopes in tall open forest on well-drained gravelly soil at elevations of 10-200m.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Cryptostylis hunteriana	Leafless Tongue--orchid	V	V	1	The Leafless Tongue Orchid has been recorded from as far north as Gibraltar Range National Park south into Victoria around the coast as far as Orbost. It is known historically from a number of localities on the NSW south coast and has been observed in recent years at many sites between Batemans Bay and Nowra (although it is uncommon at all sites). Also recorded at Nelson Bay, Wyee, Washpool National Park, Nowendoc State Forest, Ku-Ring-Gai Chase National Park and Ben Boyd National Park. Does not appear to have well defined habitat preferences and is known from a range of communities, including swamp-heath and woodland.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Cynanchum elegans	White-flowered Wax Plant	E	E	-	Restricted to eastern NSW where it is distributed from Brunswick Heads on the north coast to Gerroa in the Illawarra region. The species has been recorded as far west as Merriwa in the upper Hunter River valley. The White-flowered Wax Plant usually occurs on the edge of dry rainforest vegetation. Other associated vegetation types include littoral rainforest.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Diuris arenaria	Sand Doubletail	E	-	270	Sand Doubletail is known from the Tomaree Peninsula near Newcastle. This species occurs in coastal heath and dry grassy eucalypt forest on sandy flats. Grows in gently undulating country in eucalypt forest with a grassy understorey on clay soil.	Unlikely. Due to the disturbance regime within the subject site, there is marginal potential habitat for this species.	Yes

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Diuris praecox	Newcastle Doubletail	V	V	1095	The Rough Doubletail is known from between Bateau Bay and Smiths Lake. Grows on hills and slopes of near-coastal districts in open forests which have a grassy to fairly dense understorey.	Unlikely. Due to the lack of native flora, lack of topographical changes and no associated PCTS within the subject area there is a low chance this species occurs. Furthermore, no individuals were detected during targeted flora surveys.	No
Eucalyptus camfieldii	Camfield's Stringybark	V	V	-	Restricted distribution in a narrow band with the most northerly records in the the Raymond Terrace area south to Waterfall. Localised and scattered distribution includes sites at Norah Head (Tuggerah Lakes), Peats Ridge, Mt Colah, Elvina Bay Trail (West Head), Terrey Hills, Killara, North Head, Menai, Wattamolla and a few other sites in Royal National Park. Occurs mostly in small, scattered stands near the boundary of tall coastal heaths and low open woodland of the slightly more fertile inland areas. Associated species frequently include stunted species of E. oblonga Narrow-leaved Stringybark, E. capitellata Brown Stringybark and E. haemastoma Scribbly Gum.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Eucalyptus parramattensis subsp. decadens	Earp's Gum	V	V	5	There are two separate meta-populations of E. parramattensis subsp. decadens. The Kurri Kurri meta-population is bordered by Cessnock—Kurri Kurri in the north and Mulbring—Abedare in the south. Large aggregations of the subspecies are located in the Tomalpin area. The Tomago Sandbeds meta-population is bounded by Salt Ash and Tanilba Bay in the north and Williamtown and Tomago in the south. Generally occupies deep, low-nutrient sands, often those subject to periodic inundation or where water tables are relatively high. It occurs in dry sclerophyll woodland with dry heath understorey. It also occurs as an emergent in dry or wet heathland. Often where this species occurs, it is a community dominant.	Unlikely. All trees within the Subject Site were identified during Koala SATs. This species was not observed.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Euphrasia arguta	-	CE	CE	-	The current known populations of Euphrasia arguta are located in the Nundle State Forest in eucalypt forest with a mixed grass and shrub understorey (D Binns pers. comm. February 2009). This area is located at the junction of the New England Tableland, NSW North Coast, and Nandewar Bioregions. here are no known occurrences of Euphrasia arguta in a conservation reserve. The majority of E. arguta plants are located in Nundle State Forest. A small part of the largest population of E. arguta is located on private land that is adjacent to the State Forest. The land is currently used for rough grazing by sheep or cattle.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Grevillea parviflora subsp. parviflora	Small-flower Grevillea	V	V	-	Grows in sandy or light clay soils usually over thin shales, often with lateritic ironstone gravels and nodules. Sydney region occurrences are usually on Tertiary sands and alluvium, and soils derived from the Mittagong Formation. Soil landscapes include Lucas Heights or Berkshire Park. Occurs in a range of vegetation types from heath and shrubby woodland to open forest. In Sydney it has been recorded from Shale Sandstone Transition Forest and in the Hunter in Kurri Sand Swamp Woodland. however, other communities occupied include Corymbia maculata - Angophora costata open forest in the Dooralong area, in Sydney Sandstone Ridgetop Woodland at Wedderburn and in Cooks River / Castlereagh Ironbark Forest at Kemps Creek.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Melaleuca biconvexa	Biconvex Paperbark	V	V	-	Biconvex Paperbark is only found in NSW, with scattered and dispersed populations found in the Jervis Bay area in the south and the Gosford-Wyong area in the north. Biconvex Paperbark generally grows in damp places, often near streams or low-lying areas on alluvial soils of low slopes or sheltered aspects.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Persicaria elatior	Knotweed	-	V	1	Tall Knotweed has been recorded in south-eastern NSW (Mt Dromedary (an old record), Moruya State Forest near Turlinjah, the Upper Avon River catchment north of Robertson, Bermagui, and Picton Lakes. In northern NSW it is known from Raymond Terrace (near Newcastle) and the Grafton area (Cherry Tree and Gibberagee State Forests). The species also occurs in Queensland. This species normally grows in damp places, especially beside streams and lakes. Occasionally in swamp forest or associated with disturbance.	Unlikely. An onsite inspection confirmed this species does not occur within the subject site. Some potential habitat does exist within the retained area, however, was not observed.	No
Phaius australis	Lesser Swamp Orchid	E	E	-	The Southern Swamp Orchid occurs in Queensland and north-east NSW as far south as Coffs Harbour. Inhabits swampy grassland or swampy forest including rainforest, eucalypt or paperbark forest, mostly in coastal areas.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Prostanthera densa	Villous Mint-bush	V	V	4	This species has been recorded from the Currarong area in Jervis Bay, Royal National Park (Marley), Cronulla, Helensburgh and Port Stephens (Nelson Bay). Prostanthera densa generally grows in sclerophyll forest and shrubland on coastal headlands and near coastal ranges, chiefly on sandstone, and rocky slopes near the sea.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Pultenaea maritima	Coast Headland Pea	V	-	2	The Coast Headland Pea ocurrs within NSW, the species has been recorded from Newcastle north to Byron Bay on 16 headlands. The species occurs in grasslands, shrublands and heath on exposed coastal headlands and adjoining low coastal heath. Found on clay or sandy loam or clay loam over sandstone at altitude 5–30 m. Associated with Banksia integrifolia and Themeda australis.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Rhizanthella slateri	Eastern Underground Orchid	-	E	-	The Eastern Underground Orchid occurs from south-east Queensland to south-east NSW. In NSW, currently known from fewer than 10 locations, including near Bulahdelah, the Watagan Mountains, the Blue Mountains, Wiseman's Ferry area, Agnes Banks and near Nowra. Habitat requirements are poorly understood, and no particular vegetation type has been associated with the species, although it is known to occur in sclerophyll forest.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Rhodamnia rubescens	Scrub Turpentine	CE	CE	-	Occurs in coastal districts north from Batemans Bay in New South Wales, approximately 280 km south of Sydney, to areas inland of Bundaberg in Queensland. Populations of R. rubescens typically occur in coastal regions and occasionally extend inland onto escarpments up to 600 m a.s.l. in areas with rainfall of 1,000-1,600 mm. Found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest usually on volcanic and sedimentary soils.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No
Rhodomyrtus psidioides	Native Guava	CE	CE	1	Occurs from Broken Bay, approximately 90 km north of Sydney, New South Wales, to Maryborough in Queensland. Populations are typically restricted to coastal and sub-coastal areas of low elevation however the species does occur up to c. 120 km inland in the Hunter and Clarence River catchments and along the Border Ranges in NSW. Pioneer species found in littoral, warm temperate and subtropical rainforest and wet sclerophyll forest often near creeks and drainage lines.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Syzygium paniculatum	Magenta Lilly Pilly	E	V	2	The Magenta Lilly Pilly is found only in NSW, in a narrow, linear coastal strip from Upper Lansdowne to Conjola State Forest. On the south coast the Magenta Lilly Pilly occurs on grey soils over sandstone, restricted mainly to remnant stands of littoral (coastal) rainforest. On the central coast Magenta Lilly Pilly occurs on gravels, sands, silts and clays in riverside gallery rainforests and remnant littoral rainforest communities.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Tetratheca juncea	Black-eyed Susan	V	V	1	Confined to the northern portion of the Sydney Basin bioregion and the southern portion of the North Coast bioregion in the local government areas of Wyong, Lake Macquarie, Newcastle, Port Stephens, Great Lakes and Cessnock. It is usually found in low open forest/woodland with a mixed shrub understorey and grassy groundcover. However, it has also been recorded in heathland and moist forest. The majority of populations occur on low nutrient soils associated with the Awaba Soil Landscape. While some studies show the species has a preference for cooler southerly aspects, it has been found on slopes with a variety of aspects. It generally prefers well-drained sites below 200m elevation and annual rainfall between 1000 - 1200mm. The preferred substrates are sandy skeletal soil on sandstone, sandy-loam soils, low nutrients; and clayey soil from conglomerates, pH neutral.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Thesium australe	Austral Toadflax	V	V	-	Austral Toadflax is found in very small populations scattered across eastern NSW, along the coast, and from the Northern to Southern Tablelands. It is also found in Tasmania and Queensland and in eastern Asia. Although originally described from material collected in the SW Sydney area, populations have not been seen in a long time. It may persist in some areas in the broader region. Occurs in grassland on coastal headlands or grassland and grassy woodland away from the coast.	Unlikely. An onsite inspection confirmed this species does not occur within the development footprint nor subject site. Furthermore, habitat constraints for this species were not detected on site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Birds							
Anthochaera phrygia	Regent Honeyeater	CE	CE	-	The Regent Honeyeater mainly inhabits temperate woodlands and open forests of the inland slopes of south-east Australia. Birds are also found in drier coastal woodlands and forests in some years. Range is between north-eastern Victoria and south-eastern Queensland. There are only three known key breeding regions remaining: north-east Victoria (Chiltern-Albury), and in NSW at Capertee Valley and the Bundarra-Barraba region. In the last 10 years Regent Honeyeaters have been recorded in urban areas around Albury where woodlands tree species such as Mugga Ironbark and Yellow Box were planted 20 years ago. The Regent Honeyeater is a generalist forager, although it feeds mainly on the nectar from a relatively small number of eucalypts that produce high volumes of nectar.	Unlikely. This species was not detected during onsite inspection. Furthermore, the proposed development will not remove any *Eucalyptus* spp. That provide seasonal bloom for this species.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Artamus cyanopterus cyanopterus	Dusky Woodswallow	-	V	2	The Dusky Woodswallow is a woodland dependant bird. It is found in woodlands and dry open sclerophyll forests, usually dominated by eucalypts, including mallee associations. It has also been recorded in shrublands and heathlands and various modified habitats, including regenerating forests. Common habitat requirements are an open understorey with sparse eucalypt saplings, acacias and other shrubs, including heath. The ground cover may consist of grasses, sedges or open ground, often with coarse woody debris. Birds are also often observed in farmland, road sides and golf courses, usually at the edges of forest or woodland or wind breaks with dead timber.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited with any forms of native flora for this species to forage from. Native flora and potential habitat resides within the subject site, in the future vegetation/fauna management area.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Botaurus poiciloptilus	Australasian Bittern	E	E	1	Favors permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (Typha spp.) and spikerushes (Eleocharis spp.). Hides during the day amongst dense reeds or rushes and feed mainly at night on frogs, fish, yabbies, spiders, insects and snails. Feeding platforms may be constructed over deeper water from reeds trampled by the bird; platforms are often littered with prey remains. Breeding occurs in summer from October to January; nests are built in secluded places in densely vegetated wetlands on a platform of reeds; there are usually six olive-brown eggs to a clutch.	Unlikely. No suitable habitat in the form of permanent freshwater wetlands with tall, dense vegetation, particularly bullrushes (*Typha* spp.) and spike rushes (*Eleocharis* spp.) occur within the subject site.	No
Burhinus grallarius	Bush Stone-curlew	-	E	14	The Bush Stone-curlew is found throughout Australia except for the central southern coast and inland, the far south-east corner, and Tasmania. Only in northern Australia is it still common however and in the south-east, it is either rare or extinct throughout its former range. Inhabits open forests and woodlands with a sparse grassy groundlayer and fallen timber.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited with any forms of native flora for this species to forage from. Native flora and potential habitat resides within the subject site, in the future vegetation/fauna management area.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Calidris canutas	Red Knot	E	-	-	The Red Knot is common in all the main suitable habitats around the coast of Australia. They mainly inhabit intertidal mudflats, sandflats and sandy beaches of sheltered coasts, in estuaries, bays, inlets, lagoons and harbours; sometimes on sandy ocean beaches or shallow pools on exposed wave-cut rock platforms or coral reefs. They move south, mostly along coasts, with some inland records from September–November and arrive in south-west Australia from September.	Unlikely. No suitable associated habitat lies within the development footprint nor the subject site.	No
Calidris tenuirostris	Great Knot	CE	-	-	The Great Knot has been recorded in Narooma, Tullakool, Armidale, Gilgandra and Griffith. Occurs within sheltered, coastal habitats containing large, intertidal mudflats or sandflats, including inlets, bays, harbours, estuaries and lagoons. Often recorded on sandy beaches with mudflats nearby, sandy spits and islets and sometimes on exposed reefs or rock platforms. Migrates to Australia from late August to early September, although juveniles may not arrive until October-November.	Unlikely. No suitable associated habitat lies within the development footprint nor the subject site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Calidris ferruginea	Curlew Sandpiper	CE, M, A	E	-	In Australia, Curlew Sandpipers occur around the coasts and are also quite widespread inland, though in smaller numbers. Records occur in all states during the non-breeding period, and also during the breeding season when many non-breeding one year old birds remain in Australia rather than migrating north. Curlew Sandpipers mainly occur on intertidal mudflats in sheltered coastal areas, such as estuaries, bays, inlets and lagoons, and also around non-tidal swamps, lakes and lagoons near the coast, and ponds in saltworks and sewage farms. They are also recorded inland, though less often, including around ephemeral and permanent lakes, dams, waterholes and bore drains, usually with bare edges of mud or sand. They occur in both fresh and brackish waters. Occasionally they are recorded around floodwaters.	Unlikely. No suitable associated habitat lies within the development footprint nor the subject site..	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Calyptorhynchus lathami	Glossy Black Cockatoo	-	V	3	The Glossy Black-Cockatoo is uncommon although widespread throughout suitable forest and woodland habitats, from the central Queensland coast to East Gippsland in Victoria, and inland to the southern tablelands and central western plains of NSW, with a small population in the Riverina. An isolated population exists on Kangaroo Island, South Australia. Inhabits open forest and woodlands of the coast and the Great Dividing Range where stands of sheoak occur. Black Sheoak (Allocasuarina littoralis) and Forest Sheoak (A. torulosa) are important foods. Inland populations feed on a wide range of sheoaks, including Drooping Sheoak, Allocasuaraina diminuta, and A. gymnathera. Belah is also utilised and may be a critical food source for some populations. In the Riverina, birds are associated with hills and rocky rises supporting Drooping Sheoak, but also recorded in open woodlands dominated by Belah (Casuarina cristata). Feeds almost exclusively on the seeds of several species of she-oak (Casuarina and Allocasuarina species), shredding the cones with the massive bill. Dependent on large hollow-bearing eucalypts for nest sites. A single egg is laid between March and May.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited with any forms of native flora for this species to forage from. Native flora and potential habitat resides within the subject area, in the future vegetation/fauna management area.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Daphoenositta chrysoptera	Varied Sittella	-	V	3	The Varied Sittella is sedentary and inhabits most of mainland Australia except the treeless deserts and open grasslands. Distribution in NSW is nearly continuous from the coast to the far west. Inhabits eucalypt forests and woodlands, especially those containing rough-barked species and mature smooth-barked gums with dead branches, mallee and Acacia woodland.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited with any forms of native flora for this species to forage from. Native flora and potential habitat resides within the subject site, in the future vegetation/fauna management area.	No
Dromaius novaehollandiae	Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	-	E	1	On the NSW north coast, Emus occur in a range of predominantly open lowland habitats, including grasslands, heathland, shrubland, open and shrubby woodlands, forest, and swamp and sedgeland communities, as well as the ecotones between these habitats. They also occur in plantations of tea-tree and open farmland, and occasionally in littoral rainforest.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited with any forms of habitat for this species to forage from.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Ephippiorhynchus asiaticus	Black-necked Stork	-	E	3	In Australia, Black-necked Storks are widespread in coastal and subcoastal northern and eastern Australia, as far south as central NSW (although vagrants may occur further south or inland, well away from breeding areas). In NSW, the species becomes increasingly uncommon south of the Clarence Valley, and rarely occurs south of Sydney. 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. Storks usually forage in water 5-30cm deep for vertebrate and invertebrate prey. Eels regularly contribute the greatest biomass to their diet, but they feed on a wide variety of animals, including other fish, frogs and invertebrates (such as beetles, grasshoppers, crickets and crayfish).	Unlikely. No suitable associated habitat lies within the subject site nor the subject site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Erythrotriorchis radiatus	Red Goshawk	V	CE	-	The Red Goshawk occurs from the north-west to north-east coast of Australia. The Red Goshawk occurs in coastal and sub-coastal areas in wooded and forested lands of tropical and warm-temperate Australia. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds), and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest, and rainforest margins. In NSW favoured habitat is mixed subtropical rainforest and Melaleuca Forest along coastal rivers, often in rugged terrain.	Unlikely. No suitable associated habitat lies within the subject site. Foraging may be carried out within the site; however, it is likely to be very limited. Furthermore, no records exist within the Bionet 10km Search.	No
Falco hypoleucos	Grey Falcon	E	V	-	The Grey Falcon is sparsely distributed in NSW, chiefly throughout the Murray-Darling Basin, with the occasional vagrant east of the Great Dividing Range. Usually restricted to shrubland, grassland and wooded watercourses of arid and semi-arid regions, although it is occasionally found in open woodlands near the coast. Also occurs near wetlands where surface water attracts prey.	Unlikely. No suitable associated habitat lies within the subject site. Foraging may be carried out within the site; however, it is likely to be very limited. Furthermore, no records exist within the Bionet 10km Search.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Glossopsitta pusilla	Little Lorikeet	-	V	10	The Little Lorikeet is distributed widely across the coastal and Great Divide regions of eastern Australia from Cape York to South Australia. NSW provides a large portion of the species' core habitat, with lorikeets found westward as far as Dubbo and Albury. Forages primarily in the canopy of open Eucalyptus Forest and woodland, yet also finds food in Angophora, Melaleuca and other tree species. Riparian habitats are particularly used, due to higher soil fertility and hence greater productivity. Isolated flowering trees in open country, e.g., paddocks, roadside remnants and urban trees also help sustain viable populations of the species.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited with any forms of native flora for this species to forage from. Native flora and potential habitat resides within the subject site, in the future vegetation/fauna management area.	No
Haematopus fuliginosus	Sooty Oystercatcher	-	V	5	Sooty Oystercatchers are found around the entire Australian coast, including offshore islands, being most common in Bass Strait. Small numbers of the species are evenly distributed along the NSW coast. Favors rocky headlands, rocky shelves, exposed reefs with rock pools, beaches and muddy estuaries. Forages on exposed rock or coral at low tide for foods such as limpets and mussels. Breeds in spring and summer, almost exclusively on offshore islands, and occasionally on isolated promontories.	Unlikely. No suitable associated habitat lies within the development footprint nor subject site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Haematopus longirostris	Pied Oystercatcher	-	E	3	The Pied Oystercatcher is distributed around the entire Australian coastline, with only small population across the NSW coast. Favors intertidal flats of inlets and bays, open beaches and sandbanks. Forages on exposed sand, mud and rock at low tide, for molluscs, worms, crabs and small fish. Nests mostly on coastal or estuarine beaches although occasionally they use saltmarsh or grassy areas. Nests are shallow scrapes in sand above the high tide mark, often amongst seaweed, shells and small stones.	Unlikely. No suitable associated habitat lies within the development footprint nor subject site.	No
Haliaeetus leucogaster	White-bellied Sea-Eagle	-	V	105	The White-bellied Sea-Eagle is distributed along the coastline (including offshore islands) of mainland Australia and Tasmania. It also extends inland along some of the larger waterways, especially in eastern Australia. The habitats occupied by the sea-eagle are characterised by the presence of large areas of open water (larger rivers, swamps, lakes, the sea and sewage ponds). Terrestrial habitats include coastal dunes, tidal flats, grassland, heathland, woodland, forest (including rainforest) and even urban areas. Breeding territories are located close to water, and mainly in tall open forest or woodland, although nests are sometimes located in other habitats such as dense forest (including rainforest), closed scrub or in remnant trees on cleared land.	Unlikely. No suitable associated habitat lies within the development footprint nor subject site. Additionally, no waterbodies for foraging nor nesting trees were detected within the site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Hirundapus caudacutus	White-throated Needletail	V	-	6	The White-throated Needletail is widespread in across the coast of eastern and south-eastern Australia, and Tasmania. White-throated Needletails only occur as vagrants in the Northern Territory and in Western Australia. In Australia, the White-throated Needletail is almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Because they are aerial, it has been stated that conventional habitat descriptions are inapplicable (Cramp 1985), but there are, nevertheless, certain preferences exhibited by the species. They are probably recorded most often 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.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited with any forms of native flora for this species to forage from. Native flora and potential habitat resides within the subject site, in the future vegetation/fauna management area.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Lathamus discolor	Swift Parrot	CE, A	E	12	The Swift Parrot breeds in Tasmania during spring and summer, migrating in the autumn and winter months to south-eastern Australia from Victoria and the eastern parts of South Australia to south-east Queensland. In NSW mostly occurs on the coast and southwest slopes. Migrates to the Australian south-east mainland between March and October. On the mainland they occur in areas where eucalypts are flowering profusely or where there are abundant lerp (from sap-sucking bugs) infestations. Favoured feed trees include winter flowering species such as Swamp Mahogany Eucalyptus robusta, Spotted Gum Corymbia maculata, Red Bloodwood C. gummifera, Mugga Ironbark E. sideroxylon, and White Box E. albens. Commonly used lerp infested trees include Inland Grey Box E. microcarpa, Grey Box E. moluccana and Blackbutt E. pilularis.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited with any forms of native flora for this species to forage from. The proposal seeks to remove a few trees. Native flora along with potential foraging habitat resides within the subject site, in the future vegetation/fauna management area.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Ninox connivens	Barking Owl	-	V	2	The Barking Owl is found throughout continental Australia except for the central arid regions and now occurs in a wide but sparse distribution in NSW. Core populations exist on the western slopes and plains (especially the Pilliga) and in some northeast coastal and escarpment forests. Sometimes extend their home range into urban areas, hunting birds in garden trees and insects attracted to streetlights. Inhabits woodland and open forest, including fragmented remnants and partly cleared farmland. It is flexible in its habitat use, and hunting can extend in to closed forest and more open areas. Sometimes able to successfully breed along timbered watercourses in heavily cleared habitats (e.g., western NSW) due to the higher density of prey on these fertile soils. Roost in shaded portions of tree canopies, including tall midstorey trees with dense foliage such as Acacia and Casuarina species.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation. The proposal seeks to remove a few native trees, none of which contain any suitable hollows for breeding. Vegetated areas that include potential foraging habitat resides within the subject site, in the future vegetation/fauna management area.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Ninox strenua	Powerful Owl	-	V	16	The Powerful Owl is endemic to eastern and south-eastern Australia, mainly on the eastern side of the Great Dividing Range, from south-eastern Queensland to Victoria. The Powerful Owl is found in open forests and woodlands, as well as along sheltered gullies in wet forests with dense understoreys, especially along watercourses. Will sometimes be found in open areas near forests such as farmland, parks and suburban areas, as well as in remnant bushland patches. Needs old growth trees to nest.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation. The proposal seeks to remove a few native trees, none of which contain any suitable hollows for breeding. Vegetated areas that include potential foraging habitat resides within the subject site, in the future vegetation/fauna management area.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Numenius madagascariensis	Eastern Curlew	CE, M	-	4	Within Australia, the Eastern Curlew has a primarily coastal distribution. The species is found in all states and rarely inland. The Eastern Curlew is most commonly associated with sheltered coasts, especially estuaries, bays, harbours, inlets and coastal lagoons, with large intertidal mudflats or sandflats, often with beds of seagrass. Occasionally, the species occurs on ocean beaches (often near estuaries), and coral reefs, rock platforms, or rocky islets. The birds are often recorded among saltmarsh and on mudflats fringed by mangroves, and sometimes use the mangroves. The birds are also found in saltworks and sewage farms.	Unlikely. No suitable associated habitat lies within the development footprint nor subject site.	No
Pandion cristatus	Eastern Osprey	-	V	2	The Eastern Osprey is mainly restricted to coastal Australia and western slopes of the Great Dividing Range, except for a few inland populations around Parkes, Lake Brewster, the Macquarie Marshes, Barraba - Bingara and Northern Canberra. Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia. They require extensive areas of open fresh, brackish or saline water for foraging.	Unlikely. No suitable associated habitat lies within the development footprint nor subject site. Additionally, no waterbodies for foraging nor nesting trees were detected within the site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Ptilinopus magnificus	Wompoo Fruit-Dove	-	V	1	Occurs along the coast and coastal ranges from the Hunter River in NSW to Cape York Peninsula. It is rare south of Coffs Harbour. Three subspecies are recognised, with the most southerly in NSW and south-eastern Queensland. It used to occur in the Illawarra, though there are no recent records. Occurs in, or near rainforest, low elevation moist eucalypt forest and brush box forests.	Unlikely. This species was not recorded during field surveys. No suitable habitat in the form of rainforest is situated within the subject area nor within the immediate surrounding area.	No
Ptilinopus superbus	Superb Fruit-Dove	-	V	1	The Superb Fruit-dove occurs principally from north-eastern in Queensland to north-eastern NSW. Inhabits rainforest and similar closed forests where it forages high in the canopy, eating the fruits of many tree species such as figs and palms. It may also forage in eucalypt or acacia woodland where there are fruit-bearing trees. Part of the population is migratory or nomadic.	Unlikely. This species was not recorded during field surveys. No suitable habitat in the form of rainforest is situated within the subject area nor within the immediate surrounding area.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Tyto longimembris	Eastern Grass Owl	-	V	1	Eastern Grass Owls have been recorded occasionally in all mainland states of Australia but are most common in northern and north-eastern Australia. In NSW they are more likely to be resident in the north-east. Eastern Grass Owl numbers can fluctuate greatly, increasing especially during rodent plagues. 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.	Unlikely. No suitable habitat in the form of vast patches of Typha spp. Or freshwater wetlands occur within the development footprint nor within the greater subject site.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Tyto novaehollandiae	Masked Owl	-	V	7	The Masked Owl extends from the coast where it is most abundant to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. There is no seasonal variation in its distribution. Lives in dry eucalypt forests and woodlands from sea level to 1100 m. A forest owl, but often hunts along the edges of forests, including roadsides. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation. The proposal seeks to remove a few native trees, none of which contain any suitable hollows for breeding. Vegetated areas that include potential foraging habitat resides within the subject site, in the future vegetation/fauna management area.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Mammals							
Dasyurus maculatus maculatus	Spotted-tailed Quoll	E	V	13	Recorded across a range of habitat types, including rainforest, open forest, woodland, coastal heath and inland riparian forest, from the sub-alpine zone to the coastline. Individual animals use hollow-bearing trees, fallen logs, small caves, rock outcrops and rocky-cliff faces as den sites.	Unlikely. This species was not opportunistically detected during the field survey period. The lack of cover, lack of proximate woodland, lack of suitable denning habitat diminishes the potential for this species to occur.	No
Phascogale tapoatafa	Brush-tailed Phascogale	-	V	14	The Brush-tailed Phascogale has a patchy distribution around the coast of Australia. In NSW it is mainly found east of the Great Dividing Range although there are occassional records west ot the divide. Prefer dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. Females are territorial over a 20-40 ha range. Nest and shelter in tree hollows with entrances 2.5 - 4 cm wide and use many different hollows over a short time span.	Unlikely. This species was not detected during onsite inspection. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation. The proposal seeks to remove a few native trees, none of which contain any suitable hollows.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Chalinolobus dwyeri	Large-eared Pied Bat	V	V	2	Found mainly in areas with extensive cliffs and caves, from Rockhampton in Queensland south to Bungonia in the NSW Southern Highlands. It is generally rare with a very patchy distribution in NSW. There are scattered records from the New England Tablelands and Northwest Slopes. Roosts in caves (near their entrances), crevices in cliffs, old mine workings and in the disused, bottle-shaped mud nests of the Fairy Martin (Petrochelidon ariel), frequenting low to mid-elevation dry open forest and woodland close to these features. Found in well-timbered areas containing gullies.	Unlikely. No suitable habitat was detected within the development footprint nor within the subject site. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation.	No
Petaurus norfolcensis	Squirrel Glider	-	V	36	The species is widely though sparsely distributed in eastern Australia, from northern Queensland to western Victoria. Inhabits mature or old growth Box, Box-Ironbark woodlands and River Red Gum Forest west of the Great Dividing Range and Blackbutt-Bloodwood forest with heath understorey in coastal areas. Prefers mixed species stands with a shrub or Acacia midstorey.	Unlikely. No suitable habitat was detected within the subject site. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation with no trees possessing potential hollows for shelter and breeding.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Phascolarctos cinereus	Koala (Combined populations of Qld, NSW and the ACT)	V	V	3185	The Koala has a fragmented distribution throughout eastern Australia from north-east Queensland to the Eyre Peninsula in South Australia. In NSW it mainly occurs on the central and north coasts with some populations in the west of the Great Dividing Range. Inhabit eucalypt woodlands and forests.	Likely. This species' scats were detected within the Subject site. It should be noted that secondary indications were found within the future vegetation/fauna monitoring area that is to be retained and managed.	Yes

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Pseudomys novaehollandiae	New Holland Mouse	V	-	8	The New Holland Mouse has a fragmented distribution across Tasmania, Victoria, NSW and Queensland. The species is now largely restricted to the coast of central and northern NSW, with one inland occurrence near Parkes. The New Holland Mouse has been found from coastal areas and up to 100 km inland on sandstone country. The species has been recorded from sea level up to around 900 m above sea level. Soil type may be an important indicator of suitability of habitat for the New Holland Mouse, with deeper topsoils and softer substrates being preferred for digging burrows (Wilson & Laidlaw 2003). In Victoria, the species has been recorded on deep siliceous podsols, sandy clay, loamy sands, sand dunes and coastal dunes. Due to the largely granivorous diet of the species, sites where the New Holland Mouse is found are often high in floristic diversity, especially leguminous perennials. The mouse is known to inhabit open heathland, open woodland with a heathland understorey and vegetated sand dunes.	Unlikely. This species was not seen opportunistically during field work as well as no suitable habitat was detected within the subject site. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation with little to no ground cover nor wood debris. This species may occur within the vegetated areas within the Subject Site; however, these areas are to be managed and rehabilitated to increase integrity under a VMP/VFMP.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Pteropus poliocephalus	Grey-headed Flying-fox	V	V	30	Grey-headed Flying-foxes are generally found within 200 km of the eastern coast of Australia, from Rockhampton in Queensland to Adelaide in South Australia. In times of natural resource shortages, they may be found in unusual locations. Occur in subtropical and temperate rainforests, tall sclerophyll forests and woodlands, heaths and swamps as well as urban gardens and cultivated fruit crops. Roosting camps are generally located within 20 km of a regular food source and are commonly found in gullies, close to water, in vegetation with a dense canopy.	Unlikely. This species was not detected during the field survey. The subject site does not contain a permanent or temporary roosting camp for this species. Foraging habitat is present on site in the form of seasonal blossom of scattered regenerating native trees. The species has a widespread distribution and is highly mobile. The few feed trees present on site are not likely to represent important seasonal forage for the local population.	No
Falsistrellus tasmaniensis	Eastern False Pipistrelle		V	8	The Eastern False Pipistrelle is found on the south-east coast and ranges of Australia, from southern Queensland to Victoria and Tasmania. Prefers moist habitats, with trees taller than 20 m. Generally, roosts in eucalypt hollows, but has also been found under loose bark on trees or in buildings.	Unlikely. No suitable habitat was detected within the subject site nor within the greater subject site. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation. The proposal seeks to remove a few native trees, none of which contain any suitable hollows.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Micronomus norfolkensis	Eastern Costal Free-tailed Bat	-	V	5	The Eastern Freetail-bat is found along the east coast from south Queensland to southern NSW. Occur in dry sclerophyll forest, woodland, swamp forests and mangrove forests east of the Great Dividing Range. Roost mainly in tree hollows but will also roost under bark or in man-made structures.	Unlikely. No suitable habitat was detected within the subject site nor within the greater Subject Site. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation. The proposal seeks to remove a few native trees, none of which contain any suitable hollows.	No
Miniopterus australis	Little Bent-winged Bat	-	V	24	East coast and ranges of Australia from Cape York in Queensland to Wollongong in NSW. Moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub. Generally found in well-timbered areas. Little Bentwing-bats roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.	This species was recorded during fieldwork.	Yes

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Miniopterus orianae oceanensis	Large Bent-winged Bat	-	V	3	Large Bentwing-bats occur along the east and north-west coasts of Australia. Caves are the primary roosting habitat, but also use derelict mines, storm-water tunnels, buildings and other man-made structures. Form discrete populations centred on a maternity cave that is used annually in spring and summer for the birth and rearing of young.	Unlikely. No suitable habitat was detected within the development footprint nor within the greater subject site. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation. The proposal seeks to remove a few native trees, none of which contain any suitable hollows.	No
Myotis macropus	Southern Myotis	-	V	2	The Southern Myotis is found in the coastal band from the north-west of Australia, across the top-end and south to western Victoria. It is rarely found more than 100 km inland, except along major rivers. Generally, roost in groups of 10 - 15 close to water in caves, mine shafts, hollow-bearing trees, storm water channels, buildings, under bridges and in dense foliage. Forage over streams and pools catching insects and small fish by raking their feet across the water surface.	Unlikely. No suitable habitat was detected within the development footprint nor within the greater subject site. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation with no open waterbodies present. The proposal seeks to remove a few native trees, none of which contain any suitable hollows.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	-	V	2	The Yellow-bellied Sheathtail-bat is a wide-ranging species found across northern and eastern Australia. In the most southerly part of its range - most of Victoria, south-western NSW and adjacent South Australia - it is a rare visitor in late summer and autumn. There are scattered records of this species across the New England Tablelands and Northwest Slopes. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory.	Unlikely. No suitable habitat was detected within the development footprint nor within the greater subject site. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation. The proposal seeks to remove a few native trees, none of which contain any suitable hollows. Potential foraging does occur, however due to the limited groundcover it is expected that area doesn't no generate significant foraging grounds for this species.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Scoteanax rueppellii	Greater Broad-nosed Bat	-	V	10	The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m. Utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings. Forages after sunset, flying slowly and directly along creek and river corridors at an altitude of 3 - 6 m. Open woodland habitat and dry open forest suits the direct flight of this species as it searches for beetles and other large, slow-flying insects; this species has been known to eat other bat species.	Unlikely. No suitable habitat was detected within the development footprint nor within the greater subject site. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation. The proposal seeks to remove a few native trees, none of which contain any suitable hollows.	No

Vespadelus troughtoni	Eastern Cave Bat	-	V	4	The Eastern Cave Bat is found in a broad band on both sides of the Great Dividing Range from Cape York to Kempsey, with records from the New England Tablelands and the upper north coast of NSW. The western limit appears to be the Warrumbungle Range, and there is a single record from southern NSW, east of the ACT. A cave-roosting species that is usually found in dry open forest and woodland, near cliffs or rocky overhangs; has been recorded roosting in disused mine workings, occasionally found along cliff-lines in wet eucalypt forest and rainforest.	Unlikely. No suitable habitat was detected within the development footprint nor within the greater subject site.. The subject site predominantly sits within an old sand mine and is extremely limited native vegetation.	No
Reptiles							

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Crinia tinnula	Wallum Froglet	-	V	79	Wallum Froglets are found along the coastal margin from Litabella National Park in south-east Queensland to Kurnell in Sydney. Wallum Froglets are found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands. They can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests. The species breeds in swamps with permanent water as well as shallow ephemeral pools and drainage ditches. Wallum Froglets shelter under leaf litter, vegetation, other debris or in burrows of other species. Shelter sites are wet or very damp and often located near the water's edge.	Likely. This species was detected within adjacent lots to the east, north and south of the Subject Site as well as within the Subject Site. It should be noted that the area where this species was detected was within the future vegetation/fauna monitoring area that is to be retained, rehabilitated, and managed. This species was not detected within the development footprint.	Yes

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Litoria aurea	Green and Golden Bell Frog	V	E	-	The Green and Golden Bell Frog main populations in NSW are located around the metropolitan areas of Sydney, Shoalhaven and mid north coast (one an island population). There is only one known population on the NSW Southern Tablelands. Inhabits marshes, dams and stream-sides, particularly those containing bullrushes (Typha spp.) or spikerushes (Eleocharis spp.). Optimum habitat includes waterbodies that are unshaded, free of predatory fish such as Plague Minnow (Gambusia holbrooki), have a grassy area nearby and diurnal sheltering sites available. Some sites, particularly in the Greater Sydney region occur in highly disturbed areas.	Unlikely. No suitable habitat occurs on site in the form of permanent water with spike and bull rushes.	No

Scientific Name	Common Name	BC Act	EPBC Act	No. of Records	Habitat Description	Likelihood of Occurrence	ToS Required
Uperoleia mahonyi	Mahony's Toadlet	E	E	-	Mahony's Toadlet is endemic to the mid-north coast of New South Wales (NSW) and to date has been found between Kangy Angy and Seal Rocks. Current observations indicate Mahony's Toadlet inhabits ephemeral and semi-permanent swamps and swales on the coastal fringe of its range. Known records occur in heath or wallum habitats almost exclusively associated with leached (highly nutrient impoverished) white sand. Commonly associated with acid paperbark swamps, Mahony's Toadlet also is known to occur in wallum heath, swamp mahogany-paperbark swamp forest, heath shrubland and Sydney red gum woodland. Recent studies suggest intact vegetation adjacent to and within water bodies is an important habitat feature for this species.	Unlikely. This species was not observed nor heard opportunistically during fieldwork. The subject site sits within old sand mine that entails exotic flora and disturbed substrates. Fieldwork was conducted shortly after a moderate rain event. No pooling water was observed within the subject site that provides preferred habitat for this species. This species may occur within the Subject Site, in particular the drainage floodplain in the east however, this area is not to be impacted upon.	No
Insects							
Petalura gigantea	Giant Dragonfly	-	E	4	The Giant Dragonfly is found along the east coast of NSW from the Victorian border to northern NSW. It is not found west of the Great Dividing Range. There are known occurrences in the Blue Mountains and Southern Highlands, in the Clarence River catchment, and on a few coastal swamps from north of Coffs Harbour to Nadgee in the south. Live in permanent swamps and bogs with some free water and open vegetation.	Unlikely. Water pools found within the Subject Site are likely to dry up in the warm seasons and is considered as not permanent.	No

Key:

V = Vulnerable	M = Migratory	A= Marine
E = Endangered	CE = Critically Endangered	P=Protected

K = Known where there are confirmed records, specimens or otherwise verified sightings in any CMA subregion overlapping the search area

P = Predicted where there is high expectation by relevant experts that a species is likely to be present in any CMA subregion overlapping the search area, based on known presence of suitable habitat and distribution with adjoining subregions

1 – NSW BioNet Atlas, Office of Environment and Heritage (Accessed 02-07-2021).
2 - Commonwealth Protected Matters Search Tool, Department of the Environment (Accessed 02-07-2021)

The following species are being assessed in **Appendix 3** under the 5 Part Test of Significance (BC Act) based on the likelihood of occurrence results contained in **Table 4**.

Flora

Diuris arenaria – Sand Doubletail

Fauna

Crinia tinnula – Wallum Froglet

Phascolarctos cinereus – Koala

Miniopterus australis – Little Bent-winged Bat

Endangered Ecological Communities

Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions

Test of Significant under the 5-part test determined that the proposal is unlikely to have a significant impact on threatened species or ecological communities such that a local extinction would occur.

5.3 Other Legislative Considerations

5.3.1 Key Threatening Processes

A Key Threatening Process (KTP) is defined in the BC Act as a process that "adversely affects threatened species or ecological communities, or it could cause species or ecological communities that are not threatened to become threatened." They are listed under Schedule 4 of the BC Act and may adversely affect threatened species, populations or ecological communities or could cause species, populations or ecological communities that are not threatened to become threatened.

Eight (8) KTP's have the potential to operate within the subject site and require consideration under the site proposal:

1. Anthropogenic Climate Change
2. Invasion of native plant communities by exotic perennial grasses
3. Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae
4. Invasion, establishment and spread of Lantana
5. Invasion of native plant communities by bitou bush and boneseed
6. Predation by the European Red Fox
7. Infection of native plants by *Phytophthora cinnamomi*
8. Clearing of native Vegetation

Anthropogenic Climate Change

Modification of the environment by humans is considered to contribute to Climate Change and as a result has been listed as a Key Threatening Process. Activities such as the construction processes which will occur because of proposed development are actions that can contribute to greenhouse gas emissions. These actions may indirectly impact upon known or potentially occurring threatened species as the distribution of these species is affected by climate.

The proposal seeks to disturb up to 6.73ha of Exotic Vegetation and 0.30ha of Native, though disturbed, vegetation. The proposal is likely to make a very minor contribution to anthropogenic climate change due to the loss of vegetation (carbon storage), coupled with increased human activities. However, the loss of vegetation within the development footprint represents an extremely small decrease in carbon storage potential, and such impacts from human activity would contribute only by small amounts and would cause little impact on locally occurring threatened species, populations or ecological communities.

Invasion of native plant communities by exotic perennial grasses

This KTP was observed to be operating within the development footprint during field surveys

This KTP is operating based on the presence of exotic grass species forming the dominant groundcover vegetation in the development footprint. The KTP was observed throughout the development footprint at high levels. The proposal seeks to disturb up to 6.73ha of Exotic Vegetation and 0.30ha of Native, though disturbed, vegetation. The removal of the vegetation in which this KTP is present, may reduce its effects. Conversely the development and associated landscaping may also provide further opportunity for this KTP to establish. However, the development is overall unlikely to cause this KTP to occur within the subject site beyond current levels.

Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae;

The exotic rust pathogen of the order *Pucciniales* spores can be dispersed by wind, water-splash, on plant material including seed, on people and their clothing and equipment and has been known to infect plants of the family Myrtaceae. There was no evidence observed of Exotic rust fungus impact within the subject site during the survey period. Given the proposal will increase vehicle/machinery movements within the subject site during construction and operations, it is possible that contamination of the subject site with the pathogen may occur. Due to this risk of contamination, it is considered the proposal has potential to contribute to this KTP, although only within an isolated, highly disturbed landscape. It is also noted that there are high levels of vehicle activity in the area surrounding the subject site due to port infrastructure, industrial developments, and high traffic roadways. The increase in risk due to the development is comparatively minor when the existing levels of disturbance and vehicle activity are accounted for.

Invasion, establishment and spread of Lantana camara (Lantana)

This species was observed within the subject site during field surveys.

The proposal seeks to disturb up to 6.73ha of Exotic Vegetation and 0.30ha of Native, though disturbed, vegetation. However, given the nature of the development and area of clearing works the proposed development will not increase the operation of this KTP within the subject site. Due to the nature of the site and the frequent management, it is likely that this species would not receive enough time to establish. On this basis it is considered that the proposal will not lead to an increase in the activity or prevalence of this KTP.

Predation by the European Red Fox

This species was observed within the development footprint during field surveys.

The proposal seeks to disturb up to 6.73ha of Exotic Vegetation and 0.30ha of Native, though disturbed, vegetation. This species was observed to be denning within the development footprint. It is recommended that pest management be carried out prior to work to allow ethical euthanisation of this species and to hinder individuals of this species to move/relocate into retained, native vegetation. This proposal will result in the removal of this KTP within the area.

Invasion of native plant communities by bitou bush and boneseed

This species was observed within the subject site during field surveys.

The proposal seeks to disturb up to 6.73ha of Exotic Vegetation and 0.30ha of Native, though disturbed, vegetation. However, given the nature of the development and area of clearing works the proposed development will not increase the operation of this KTP within the subject site. Due to the nature of the site and the frequent management, it is likely that this species would not receive enough time to establish. On this basis it is considered that the proposal will not lead to an increase in the activity or prevalence of this KTP.

Infection of native plants by Phytophthora cinnamomi.

The soil born pathogen *Phytophthora cinnamomi* spreads in plant roots and has been known to infect a number of native plants. There was no evidence observed of *P. cinnamomi* impact within the subject site during the survey period. Given the proposal will increase vehicle/machinery movements within the subject site during construction and operations, it is possible that contamination of the subject site with the pathogen may occur. Due to this risk of contamination, it is considered the proposal has potential to contribute to this KTP, although only within an isolated, highly disturbed landscape. It is also noted that there are high levels of vehicle activity in the area surrounding the subject site due to port infrastructure, industrial developments, and high traffic roadways. The increase in risk due to the development is comparatively minor when the existing levels of disturbance and vehicle activity are accounted for.

Clearing of native vegetation

The KTP final determination lists nine factors that have the potential to impact species distribution or result in extinction. These factors are:

1) destruction of habitat resulting in loss of local populations of individual species;
2) fragmentation;
3) expansion of dryland salinity;
4) riparian zone degradation;
5) increased greenhouse gas emissions;
6) increased habitat for invasive species;
7) loss of leaf litter layer;
8) loss or disruption of ecological function; and
9) changes to soil biota.

The proposal seeks to disturb up to 6.73ha of Exotic Vegetation and 0.30ha of Native, though disturbed, vegetation. This loss of vegetation will represent a small loss of poor condition habitat for potential threatened species in the area. However, the habitat lost as a result of the proposal is very unlikely to be of significance for the continued survival of threatened species in the locality.

The proposal will not affect habitat connectivity in any significant way, the development footprint lies within an already heavily modified and isolated patch of both exotic and native planted vegetation.

Perennial exotic grasses will primarily be removed during construction. It should be noted that the retained vegetation to the south and east of the subject site will form a corridor for native fauna, primarily Koalas.

The proposal will have a minor impact on increasing greenhouse gas emissions and a minor loss of ground cover vegetation due the construction of the pedestrian infrastructure.

The subject site is not directly adjacent to a riparian area and is surrounded by a heavy traffic road and a park. A floodway and culver do exist within the subject site, however, is only used during wet seasons. On this basis, the proposal will have no impact on riparian areas and will not be affect dry land salinity.

The proposal may have a minor impact on ecological function and soil biota. The development footprint's ecological function and soil biota has been heavily impacted prior to the proposal due to the subject site residing within a highly used, highly modified landscape. The proposal will only have a minor impact as the majority of the development is restricted to slashed roadside lands.

On this basis, it is not considered the KTP will be increased in the locality such that a decline and/ or extinction will occur due to reduction in habitat availability from clearing.

5.3.2 Port Stephens Council Comprehensive Koala Plan of Management (CKPoM)

An assessment has been prepared for the provisions of **Appendix 2** for rezoning and **Appendix 4** for development applications of the Port Stephens Council CKPoM. Assessment against performance criteria of each Appendix is required under the Port Stephens Council Local Environmental Plan and satisfies the State Environmental Planning Policy (Koala Habitat Protection) 2020.

A Koala Assessment Report has been produced (Refer to **Appendix 4)**.

5.3.3 Commonwealth EPBC Act

An EPBC Act Protected Matters Search (accessed 02-07-2021) was undertaken to generate a list of those Matters of National Environmental Significance (MNES) from within 10 km of the subject site. An assessment of those MNES relevant to biodiversity has been undertaken in accordance within EPBC Act Policy Statement 1.1 Significant Impact Guidelines Matters of National Environmental Significance (DoE, 2013). The Matters of National Environmental Significance protected under national environment law include:

- Listed threatened species and communities;
- Listed migratory species;
- Ramsar wetlands of international importance;
- Commonwealth marine environment;
- World heritage properties;
- National heritage places;
- The Great Barrier Reef Marine Park;
- Nuclear actions; and
- A water resource, in relation to coal seam gas development and large coal mining development.

Listed Threatened Species and Communities

A total of 80 threatened species and 5 threatened ecological communities listed under the EPBC Act have been recorded on the protected matters search. A likelihood of occurrence assessment for these MNES has been completed in **Section 5.2**.

This assessment concluded that the proposal is unlikely to impact the listed threatened species.

Listed Migratory Species

The protected matters search nominated 74 migratory species or species habitat that may occur with the 10km site buffer search area. Although migratory species may intermittently be present on site, no habitat on the site is critical to the survival of a listed migratory species. Therefore, it is unlikely that the proposal over the subject site will impact migratory species.

Wetlands of International Significance (declared Ramsar wetlands):

The subject site is not a wetland of international significance or declared Ramsar wetland, however, it is located near one wetland of international importance was nominated by the protected matters search:

- Myall Lakes

Myall Lakes support a high plant diversity with 968 species of plants and 10 threatened ecological communities. The major vegetation communities associated with Myall Lakes are swamp, swamp forest, wet heath, fringe forest and Lepironia swamp. Similarly, the animal species diversity is high and over 300 species have been recorded, with approximately two thirds being bird species. The wetlands regularly support large numbers of waterbirds and waders including ducks, swans, egrets and terns. In addition, Myall Lakes provide habitat for state-listed threatened species such as Masked Owl, Powerful Owl, Black-necked Stork, Wompoo Fruit-Dove, Turquoise Parrot, Little Tern, Little Bent-wing Bat, Tiger Quoll, Eastern Chestnut Mouse and Wallum Froglet.

However, this area is located on the northern coast of Port Stephens, on the opposite side of the Port from the subject site. It is highly unlikely the subject site has any direct nor indirect impacts upon these significant habitats.

Commonwealth Marine Areas:

No Commonwealth Marine Areas occur within the adjacent vicinity.

World Heritage Properties:

The site is not a World Heritage area and is not in close proximity to any such area.

National Heritage Places:

The site is not a National Heritage area and is not in close proximity to any such area.

Great Barrier Reef Marine Parks:

The site is not part of or within close proximity to any Great Barrier Reef Marine Park.

Nuclear Actions:

The proposal over the site is not and does not form part of a nuclear action.

Water Resources in relation to Coal Mining and CSG:

The proposal over the site is not in relation to Coal Mining or CSG.

Summary

In summary the proposed action is unlikely to have an impact to MNES assessed in this report and as such Commonwealth referral under the EPBC Act is not required.

6 Recommendations

The following recommendations have been generated with due consideration of the proposed the removal of vegetation within the subject site totalling 6.73ha of Exotic Vegetation and 0.30ha of Native, though disturbed, vegetation. The intent is to minimise the effect of clearing and potential for any indirect impacts to occur.

General Mitigation Measures for the Construction Phase

The following mitigation measures have been provided for implementation to ensure best practice environmental management throughout the construction phase, including appropriate location and management of construction materials:

- All contractors will be specifically advised of the designated work area. The following activities are not to occur outside of designated work areas to minimise environmental impacts:
  - Storage and mixing of materials;
  - Liquid disposal;
  - Machinery repairs and/or refuelling;
  - Combustion of any material; and
  - Any filling or excavation including trenching, topsoil skimming and/or surface excavation.
- All construction vehicles/machinery are to use the designated access from main roads. Speeds will be limited to reduce the potential of fauna strike and to reduce dust generation;
- Plant and machinery would be cleaned of any foreign soil and seed prior to being transported to the site to prevent the potential spread of weeds and *Phytophthora cinnamomi*;
- If machinery is transported from an area of confirmed infection of *Phytophthora cinnamomi* to the site, stringent wash down must be completed before leaving the area, removing all soil and vegetative material from cabins, trays, and under carriages;
- All liquids (fuel, oil, cleaning agents, etc.) will be stored appropriately and disposed of at suitably licensed facilities. Spill management procedures will be implemented as required;
- Rubbish will be collected and removed from the site; and
- During the creation of access tracks, erosion or sediment measures will be considered and installed as required.

Erosion and Sedimentation Control

It is recommended that construction activities in and around the ephemeral watercourses, in the case of this proposal a stormwater drainage line, occur during dry periods to minimise potential for indirect impacts (primarily erosion and sedimentation) downstream.

Erosion and sediment control measures shall be implemented in accordance with the approved Sediment and Erosion control plan to be prepared prior to commencement of civil works on site. In general, erosion and sediment control measures include:

- Identification of potential erosion areas;
- Installation and maintenance of flow, erosion, sediment and nutrient control within the site during construction ahead of pavement and kerb establishment;
- Separation of ‘dirty’ construction water from the ‘clean’ natural overland flow water;
- Coordinated work practices aimed at minimising land disturbance;
- Minimise vegetation disturbance to surrounding retained vegetation; and
- Routine site inspections of drains, channels, sediment control structures and water quality.

Vegetation Management Area/Koala Corridor Augmentation

- A Vegetation Management Plan should be prepared to advise the correct weed management and revegetation techniques are undertaken. Weed removal to occur within the proposed koala corridor, in particular, the removal of *Lantana camara* infestations within the southern vegetation. Weed monitoring/removal should be biannual and carried out by qualified ecologist/bush regenerator.
- Exotic trees such as *Pinus spp*. (Pine Trees) and *Cinnamomum camphora* (Camphor Laurel) should be removed by a professional arborist and disposed of effectively.
- Native tree plantings to be implemented throughout Vegetation Zone 3 and Vegetation Zone 4 once shrubby exotics are removed. Tree plantings should be limited to *Eucalyptus robusta* (Swamp Mahogany), *Melaleuca quinquenervia* (Broad-leaved Paperbark), *Eucalyptus resinifera* (Red Mahogany) and *Eucalyptus tereticornis* (Forest Red Gum).
- It is recommended that three (3) years after the initial tree plantings, further plantings should include, but not limited to, understorey species that are native to the remnant PCT such as;
    - Shrub species;
        - *Glochidion ferdinandi* (Cheese Tree),
        - *Acacia maidenii* (Maiden's Wattle)
        - *Leptospermum juniperinum* (Prickly Tea-Tree)
        - *Livistona australis* (Cabbage Palm)
    - Groundcover species:
        - *Gahnia aspera* (Tall Saw Sedge),
        - *Baloskion tetraphyllum*
        - *Blechnum indicum* (Swamp Water Fern)
        - *Ishaemum australe*
        - *Xanthorrhoea fulva*

7 Conclusion

MJD Environmental has been engaged by ADW Johnson to prepare a Biodiversity Assessment Report to inform the planning proposal with respect to the Latitude One extension over Lot 25 at Latitude One, Anna Bay, NSW. This assessment is to be assessed by Port Stephens Council under Part 4 (Local Development) of the EP&A Act.

The objective of the assessment was also to examine the likelihood of the proposal having a significant effect on any threatened species, populations or ecological communities listed under the *NSW Biodiversity Conservation Act 2016* (BC Act). This assessment recognises the relevant requirements of the *EP&A Act 1979* as amended by the *NSW Environmental Planning and Assessment Amendment Act 1997*. Preliminary assessment was also made with regard to those threatened entities listed under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

An appraisal of the site to determine the appropriate assessment pathway under the BC Act determined the proposal on site does not trigger a Biodiversity Offset Scheme (BOS) entry threshold and on this basis, only a Test of Significance is required including application of the 5-part test.

The proposed development will require the potential removal of up to:

- 6.73ha of Exotic Vegetation, and
- 0.30ha of Native Vegetation, consisting of;
    - 0.26ha of **PCT 1644 -** Coast Tea Tree - Old Man Banksia coastal shrubland on foredunes of the Central and lower North Coast
    - 0.04ha of **PCT 1230 -** Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion

The proposal seeks to retain a large portion of vegetation to the south and east of the proposal which is to be managed and rehabilitated to act as a Koala Corridor. This area includes;

- 1.13ha of Exotic Vegetation, and
- 1.74ha of Native Vegetation, consisting of;
    - 0.56ha of **PCT 1644 -** Coast Tea Tree - Old Man Banksia coastal shrubland on foredunes of the Central and lower North Coast
    - 1.18ha of **PCT 1230 -** Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion

No threatened fauna species listed under the BC Act 2016 and EPBC Act 1999 were recorded within the development footprint, however, recent *Phascolarctos cinereus* (Koala) scats were detected at multiple trees within the retained vegetation to the south as well as *Crinia tinnula* (Wallum Froglet), which was also recorded in the adjacent lots to the north and south.

An ecological impact assessment test of significance considered whether the removal of disturbed, native vegetation on site totalling 0.30ha, would constitute a significant impact on known threatened species, populations, and ecological communities from the locality such that a local extinction may occur (5 Part Test).

The assessment concluded that the proposal was unlikely to have a significant impact on the threatened entities assessed.

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Appendix 1 Plan of Proposal

239429(1)-PSK-001-C

REGATTA CLOSE

LATITUDE DRIVE

2 D.P.398888

21 D.P.852410

460 D.P.722273

461 D.P.722273

22 D.P.852410

23 D.P.852410

24 D.P.852410

27 D.P.852410

26 D.P.852410

4 D.P.398888

1 424.0m² | 2 430.4m² | 3 429.3m² | 4 527.8m² | 5 472.4m² | 6 420.0m² | 7 419.9m² | 8 419.9m² | 9 420.0m² | 10 420.0m² | 11 419.9m² | 12 420.0m² | 13 420.0m² | 14 420.0m² | 15 419.9m² | 16 419.9m² | 17 420.0m² | 18 420.0m² | 19 419.9m² | 20 420.0m² | 21 419.9m² | 22 420.0m² | 23 419.9m² | 24 419.9m² | 25 420.0m² | 26 420.0m² | 27 419.9m² | 28 420.0m² | 29 420.0m² | 30 420.0m² | 31 420.0m²

171 259.3m² | 149 235.2m² | 170 266.0m² | 150 266.0m² | 169 266.4m² | 151 266.0m² | 168 266.9m² | 152 266.0m² | 167 267.4m² | 153 266.0m² | 166 267.9m² | 154 266.0m² | 165 268.3m² | 155 266.0m² | 164 268.8m² | 156 266.0m² | 163 269.3m² | 157 266.0m² | 162 269.8m² | 158 267.0m² | 161 242.0m² | 160 237.4m² | 159 289.4m²

131 236.1m² | 132 237.4m² | 133 236.1m² | 148 265.9m² | 134 265.9m² | 147 265.9m² | 135 266.0m² | 146 265.9m² | 136 266.0m² | 145 265.9m² | 137 266.0m² | 144 265.9m² | 138 266.0m² | 143 265.9m² | 139 266.0m² | 142 338.5m² | 141 308.7m² | 140 276.7m²

113 236.1m² | 114 237.5m² | 115 236.1m² | 130 266.0m² | 116 265.9m² | 129 266.0m² | 117 265.9m² | 128 266.0m² | 118 265.9m² | 127 266.0m² | 119 265.9m² | 126 265.9m² | 120 265.9m² | 125 266.0m² | 121 266.0m² | 124 274.9m² | 123 275.6m² | 122 275.1m²

95 236.1m² | 96 237.5m² | 97 236.1m² | 112 265.9m² | 98 265.9m² | 111 265.9m² | 99 266.0m² | 110 265.9m² | 100 266.0m² | 109 265.9m² | 101 266.0m² | 108 265.9m² | 102 266.0m² | 107 266.0m² | 103 266.0m² | 106 275.3m² | 105 276.0m² | 104 275.4m²

77 236.1m² | 78 237.5m² | 79 236.1m² | 94 266.0m² | 80 265.9m² | 93 265.9m² | 81 265.9m² | 92 265.9m² | 82 265.9m² | 91 265.9m² | 83 265.9m² | 90 265.9m² | 84 265.9m² | 89 266.0m² | 85 266.0m² | 88 275.6m² | 87 276.3m² | 86 275.8m²

61 236.1m² | 62 237.5m² | 63 236.1m² | 76 230.4m² | 64 230.6m² | 75 266.0m² | 65 266.0m² | 74 266.0m² | 66 266.0m² | 73 266.0m² | 67 266.0m² | 72 266.0m² | 68 266.0m² | 71 236.1m² | 70 237.5m² | 69 236.1m²

45 236.1m² | 46 237.5m² | 47 236.1m² | 60 230.7m² | 48 230.7m² | 59 265.9m² | 49 265.9m² | 58 265.9m² | 50 265.9m² | 57 265.9m² | 51 265.9m² | 56 266.0m² | 52 266.0m² | 55 236.2m² | 54 237.7m² | 53 236.4m²

32 259.8m² | 33 265.9m² | 34 265.9m² | 35 265.9m² | 36 265.9m² | 37 265.9m² | 38 266.0m² | 44 259.8m² | 43 266.0m² | 42 266.0m² | 41 266.0m² | 40 265.9m² | 39 265.9m²

173 780.6m² MAINTENANCE SHED

172 7388.7m² ANCILLARY RESIDENT CARAVAN & BOAT STORAGE

2 SHORT TERM SITES

COMMUNITY FACILITY

DEMOLISH EXISTING STORAGE SHED

NEW STORAGE SHED

ACCESS FOR MAINTENANCE AND SERVICE VEHICLES ONLY / EMERGENCY EGRESS

PROPOSED STORMWATER MANAGEMENT BASIN

PROPOSED STORMWATER MANAGEMENT BASIN

PROPOSED STORMWATER MANAGEMENT BASIN

CONSTRUCTION STORAGE COMPOUND

CARAVAN STORAGE COMPOUND

BORROW PIT AREA

WATER PUMP & ELEC. SWITCH

APPROX. LINE OF 2x 0.6 Ø RCP (OUTLET LOCATION NOT FOUND)

THIS AREA NOT DETAILED AS PART OF SURVEY

THIS AREA NOT DETAILED AS PART OF SURVEY

N

adw johnson

working beyond expectations

ver.	date	comment	surveyed	drawn	checked	pm
C	07/04/2021	UPDATE BASINS	JW	RC	JS	MLOU

co-ordinate information
CO-ORDINATE SYSTEM: GDA 94
ORIGIN OF CO-ORDINATES: SSM 8717
DATE OF SURVEY 25/09/2020

level information
DATUM: A.H.D. CONTOUR INTERVAL:
ORIGIN OF LEVELS: SSM8717 (RL.3.220m) 0.2m

scale (A1 original size)
0 20.0 40.0m
SCALE: 1:800 (FULL)

page
1 OF 2

drawing title:
PROPOSED SUBDIVISION OF LOT 25 DP852410

location: NELSON BAY ROAD, ANNA BAY

council: PORT STEPHENS

dwg ref: 239429(1)-PSK-001-C

client: Ingenia COMMUNITIES

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2
D.P.398888

21
D.P.852410

460
D.P.722273

461
D.P.722273

N

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REGATTA CLOSE

LATITUDE DRIVE

2 SHORT TERM SITES

COMMUNITY FACILITY

PROPOSED STORMWATER MANAGEMENT BASIN

PROPOSED STORMWATER MANAGEMENT BASIN

BORROW PIT AREA

CONSTRUCTION STORAGE COMPOUND

CARAVAN STORAGE COMPOUND

THIS AREA **NOT** DETAILED AS PART OF SURVEY

THIS AREA **NOT** DETAILED AS PART OF SURVEY

ver.	date	comment	surveyed	drawn	checked	pm
C	07/04/2021	UPDATE BASINS	JW	RC	JS	MLOU

co-ordinate information
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ORIGIN OF CO-ORDINATES: SSM 8717
DATE OF SURVEY 25/09/2020

level information
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ORIGIN OF LEVELS: SSM8717 (RL.3.220m) 0.2m

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SCALE: 1:600 (FULL)

page
2 OF 2

drawing title:
PROPOSED SUBDIVISION OF LOT 25 DP852410

location: NELSON BAY ROAD, ANNA BAY

council: PORT STEPHENS

dwg ref: 239429(1)-PSK-001-C

client: Ingenia COMMUNITIES

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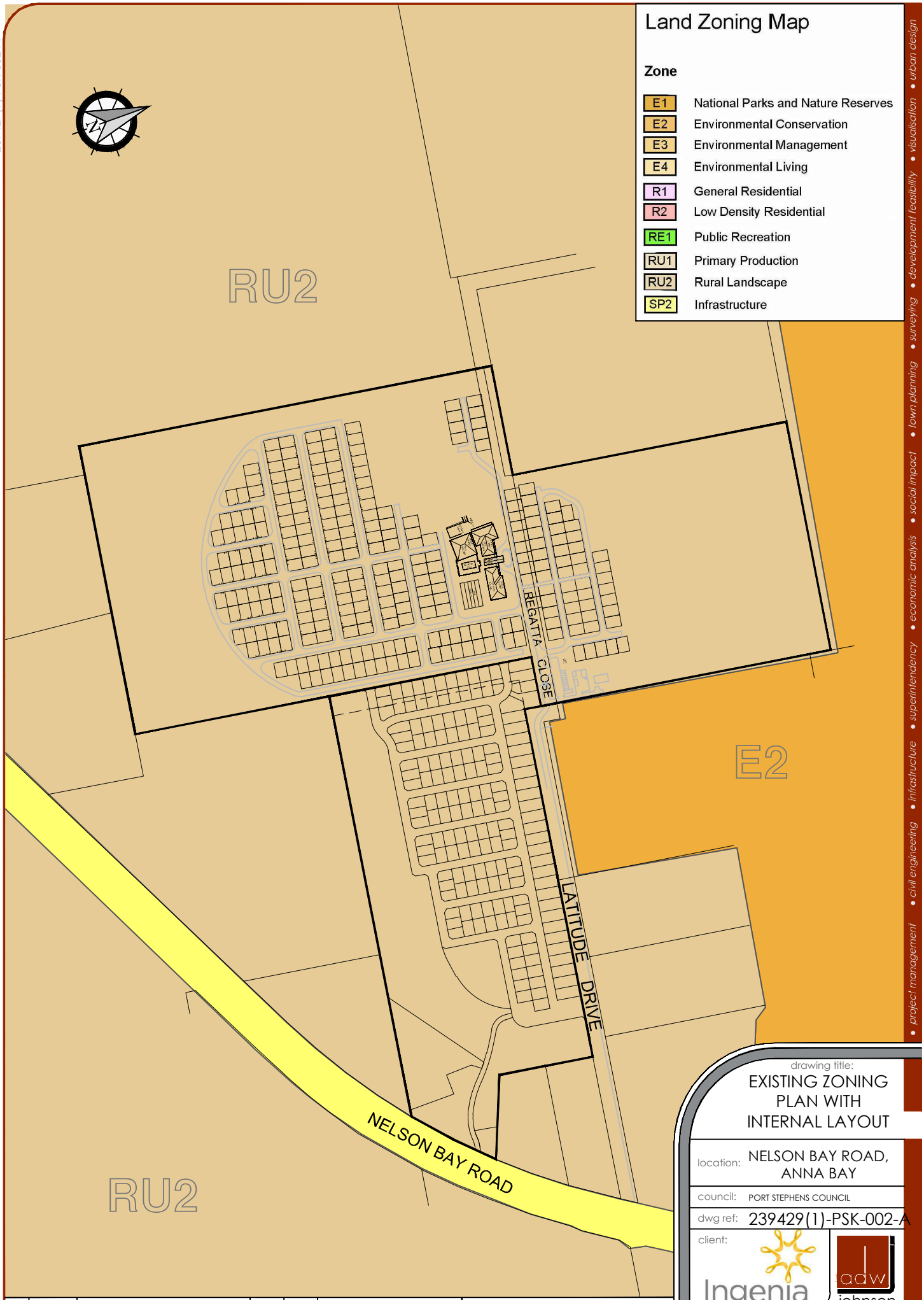

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drawing title:
EXISTING ZONING PLAN WITH INTERNAL LAYOUT

location: NELSON BAY ROAD, ANNA BAY

council: PORT STEPHENS COUNCIL

dwg ref: 239429(1)-PSK-002-A

client: Ingenia COMMUNITIES

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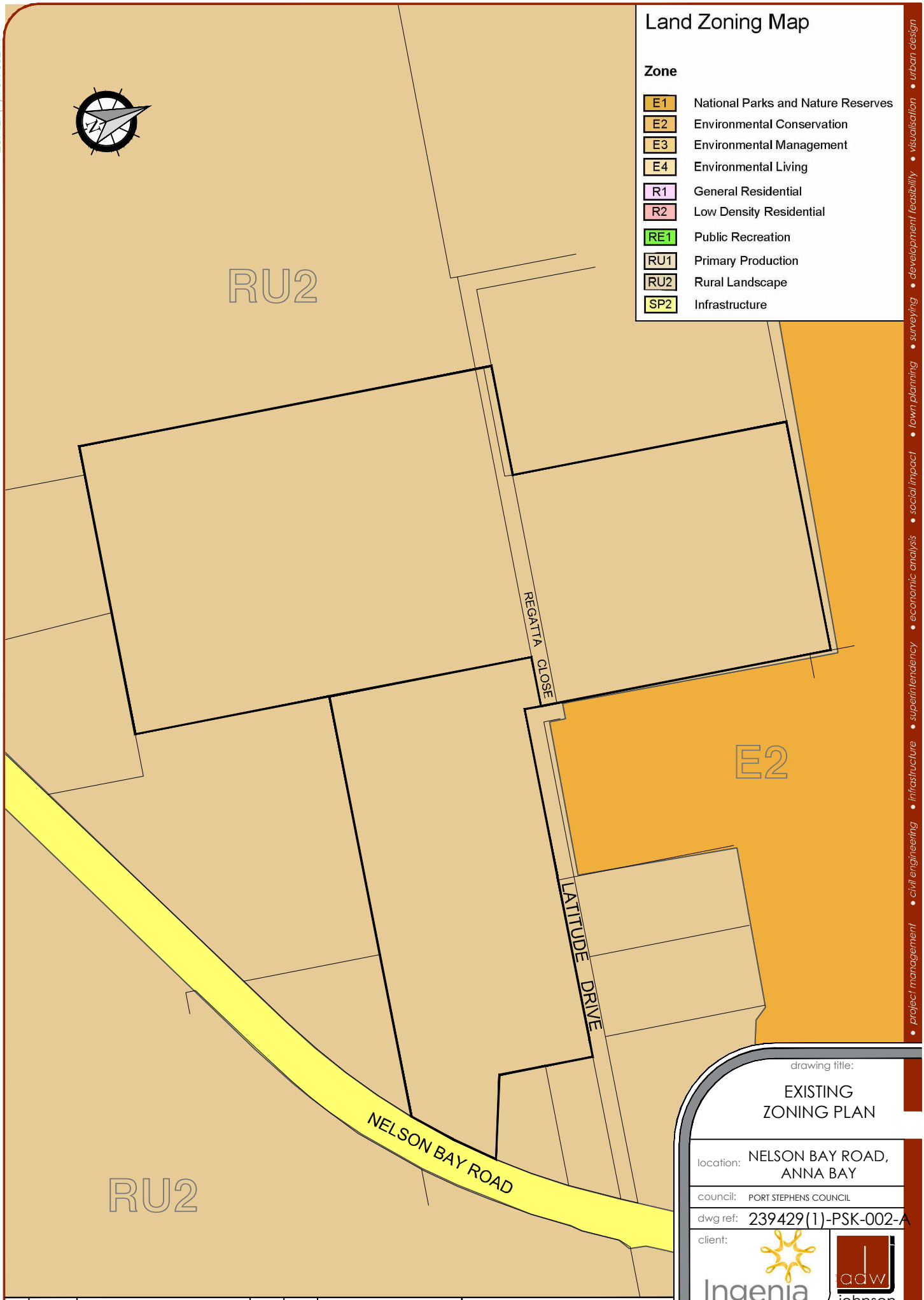

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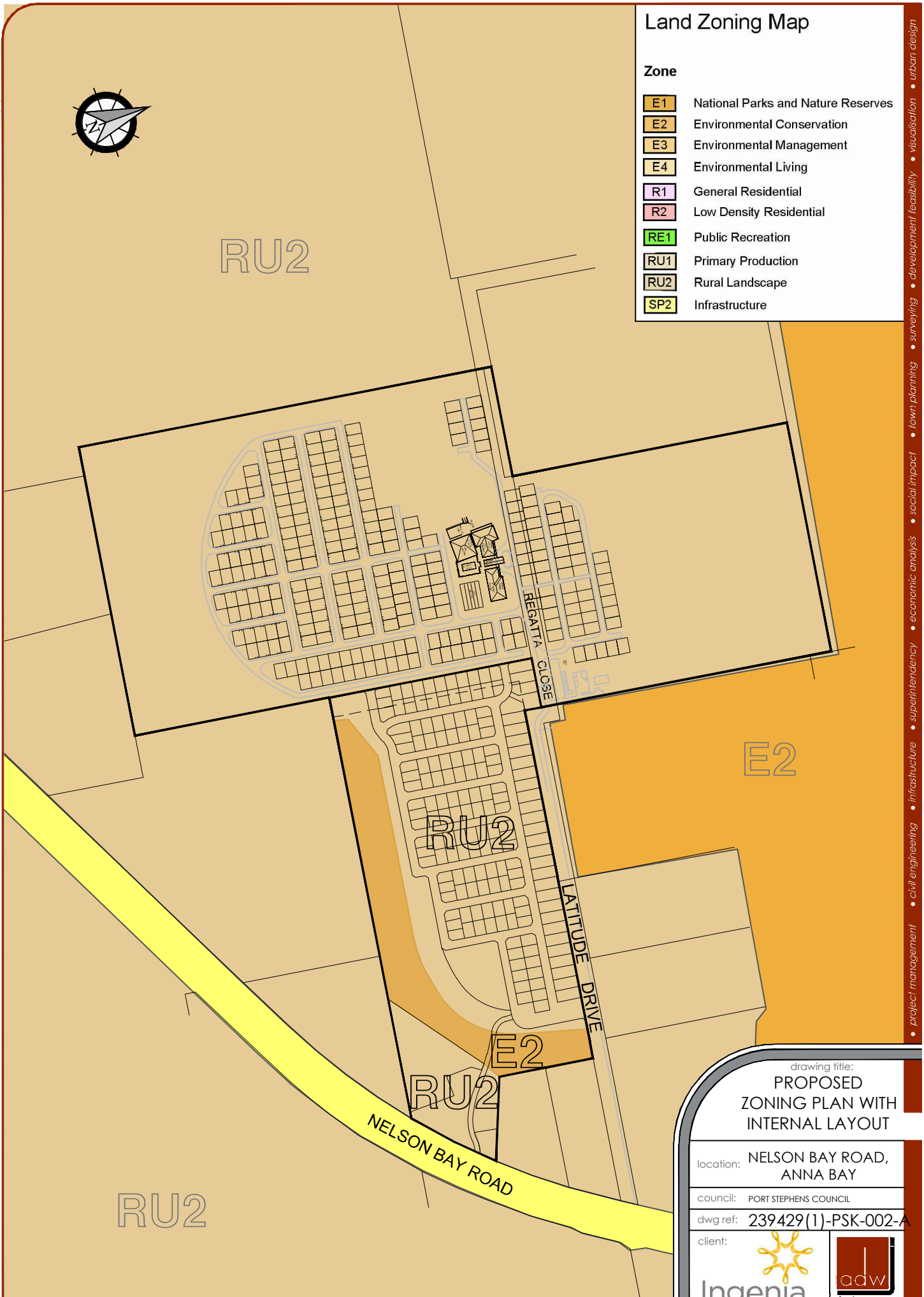

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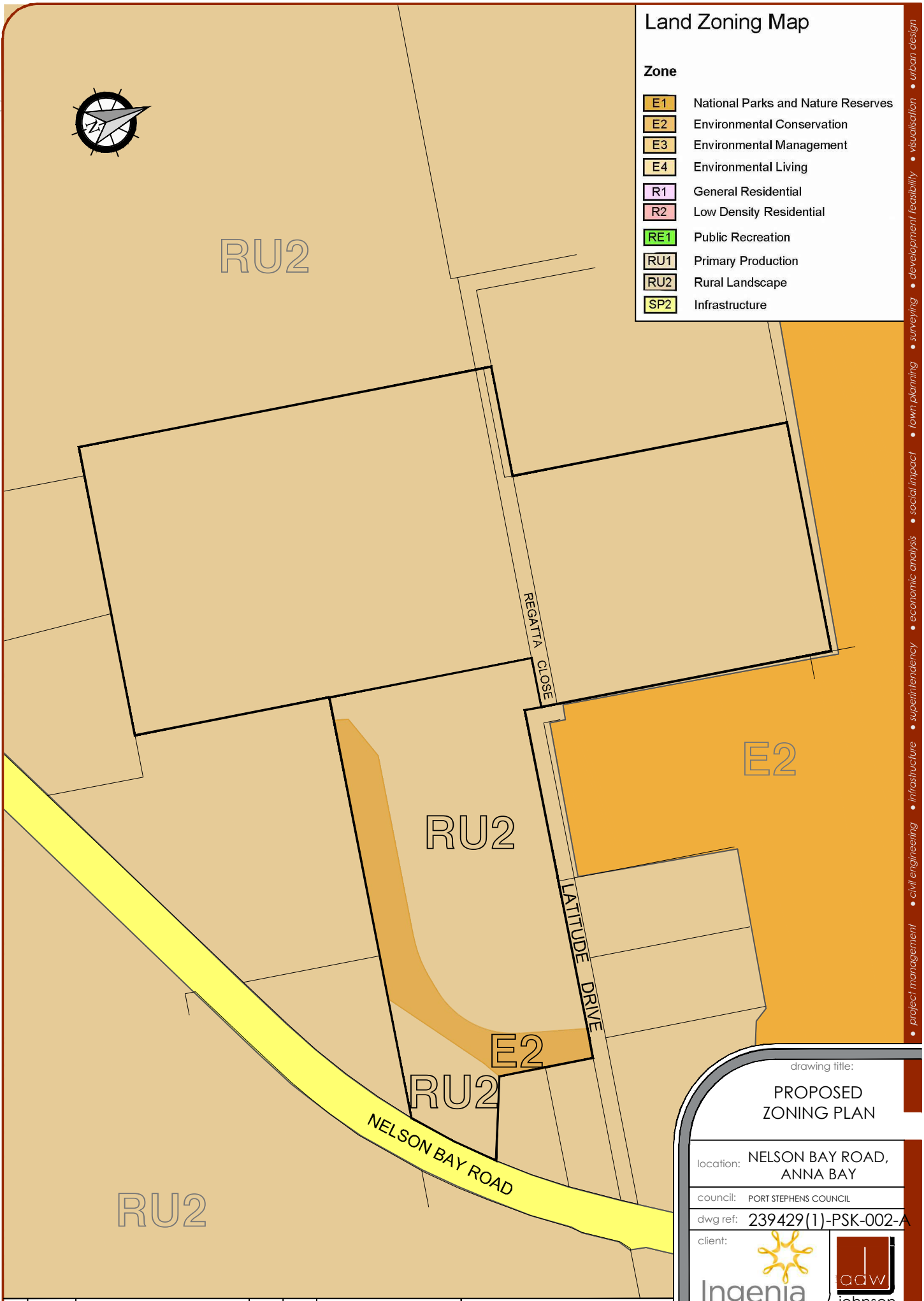

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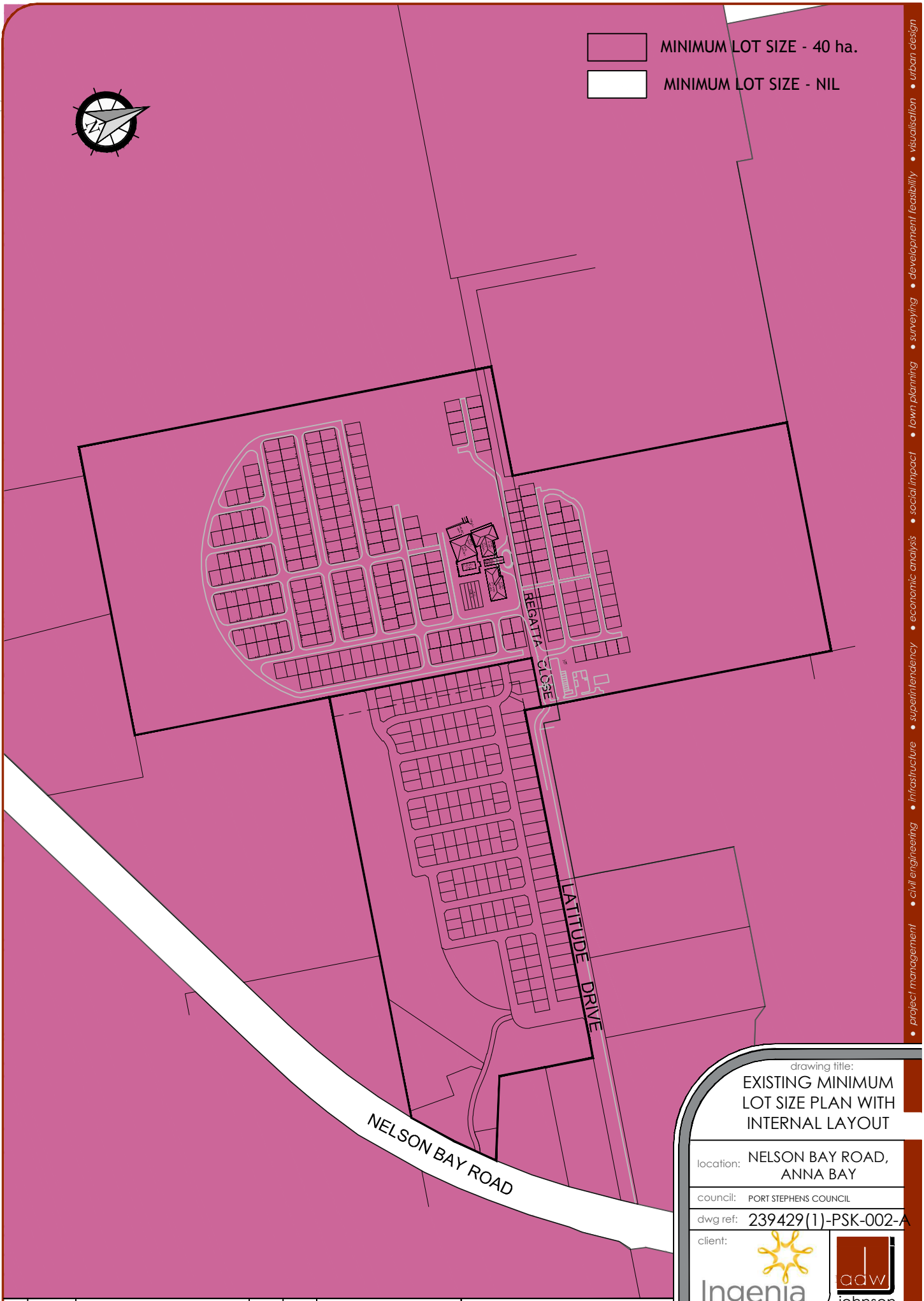

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drawing title:
EXISTING MINIMUM LOT SIZE PLAN WITH INTERNAL LAYOUT

location: NELSON BAY ROAD, ANNA BAY

council: PORT STEPHENS COUNCIL

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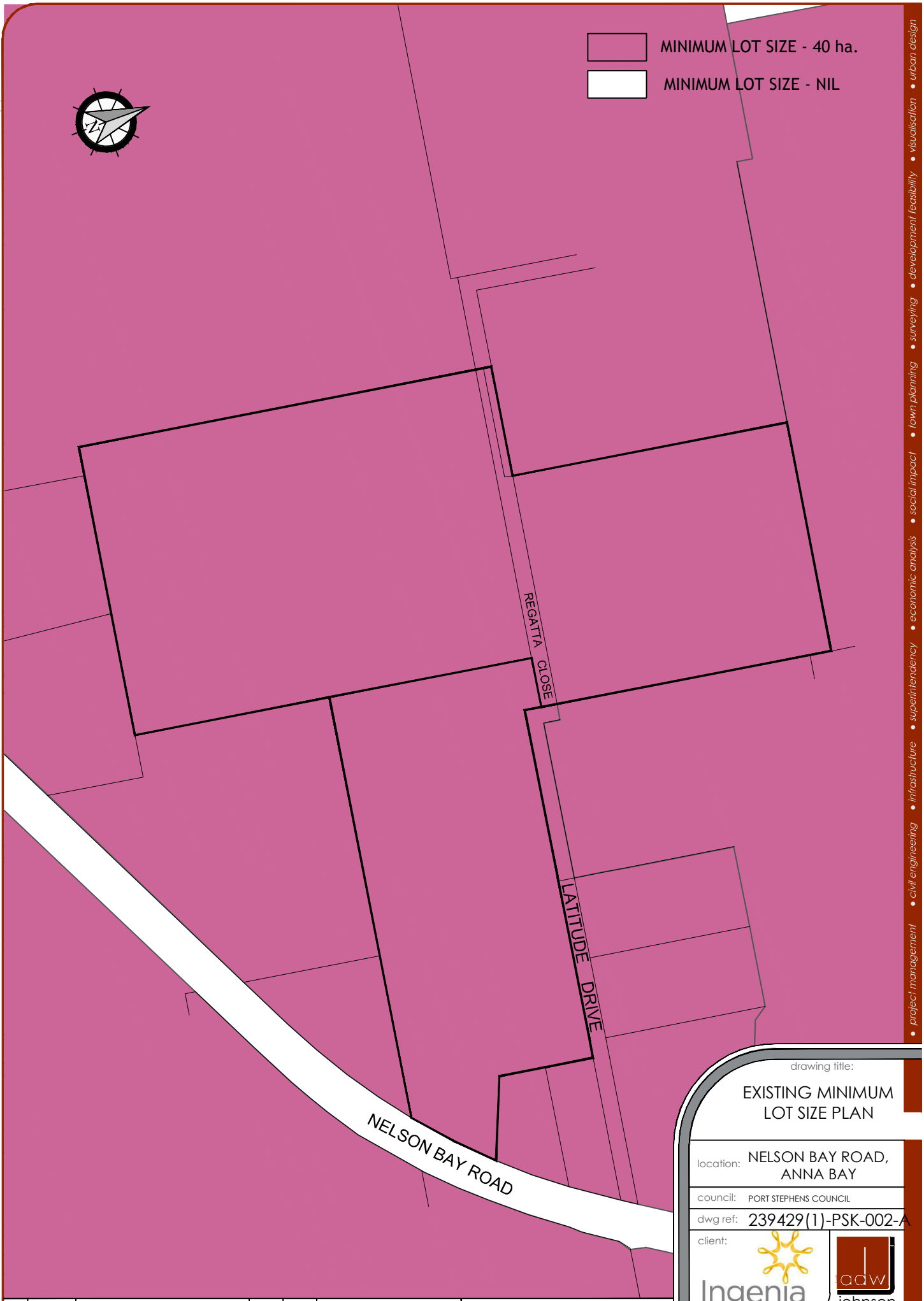

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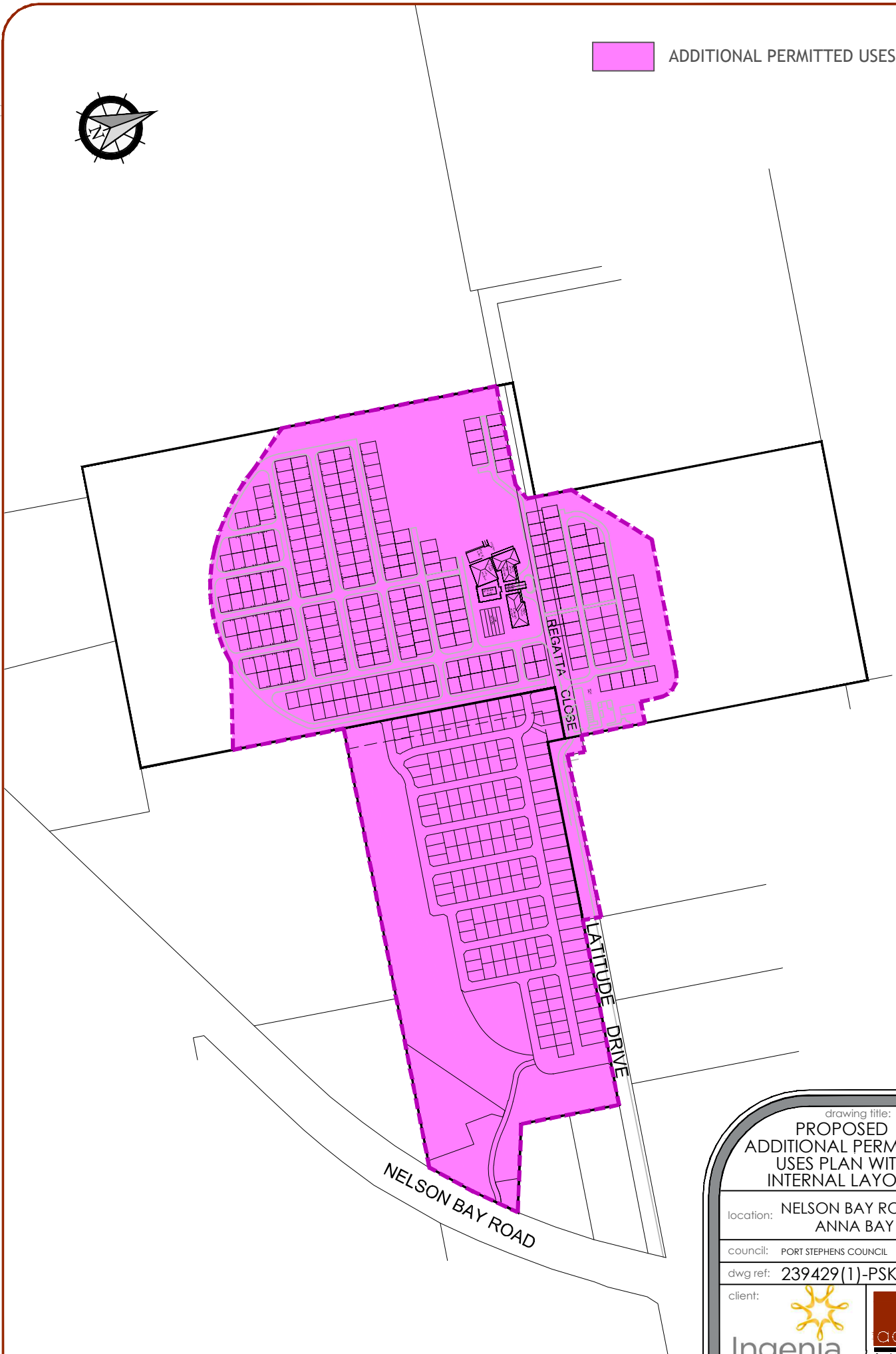

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drawing title:
PROPOSED ADDITIONAL PERMITTED USES PLAN WITH INTERNAL LAYOUT

location: NELSON BAY ROAD, ANNA BAY

council: PORT STEPHENS COUNCIL

dwg ref: 239429(1)-PSK-002-A

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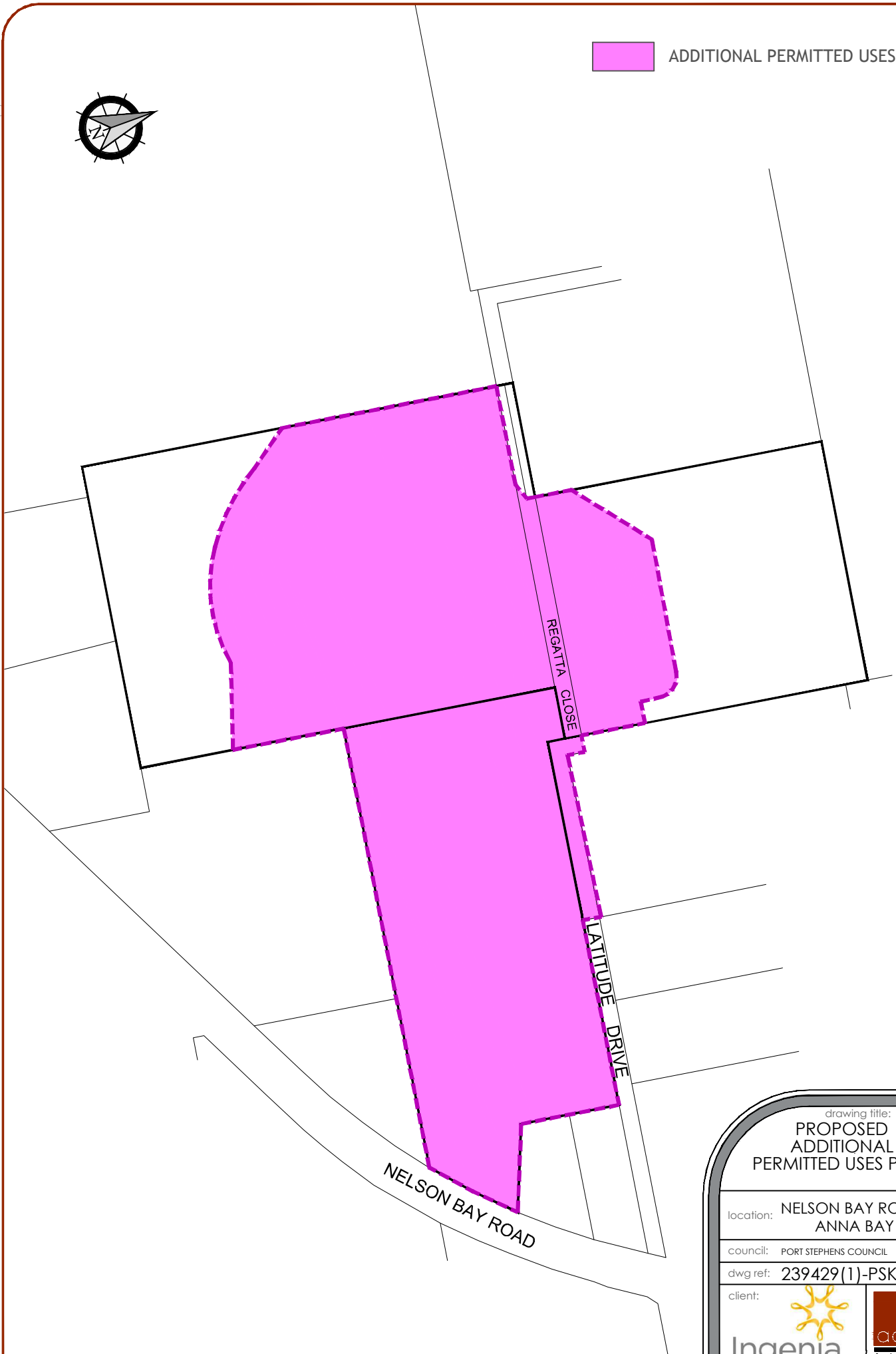

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working beyond expectations

drawing title:
PROPOSED ADDITIONAL PERMITTED USES PLAN

location: NELSON BAY ROAD, ANNA BAY

council: PORT STEPHENS COUNCIL

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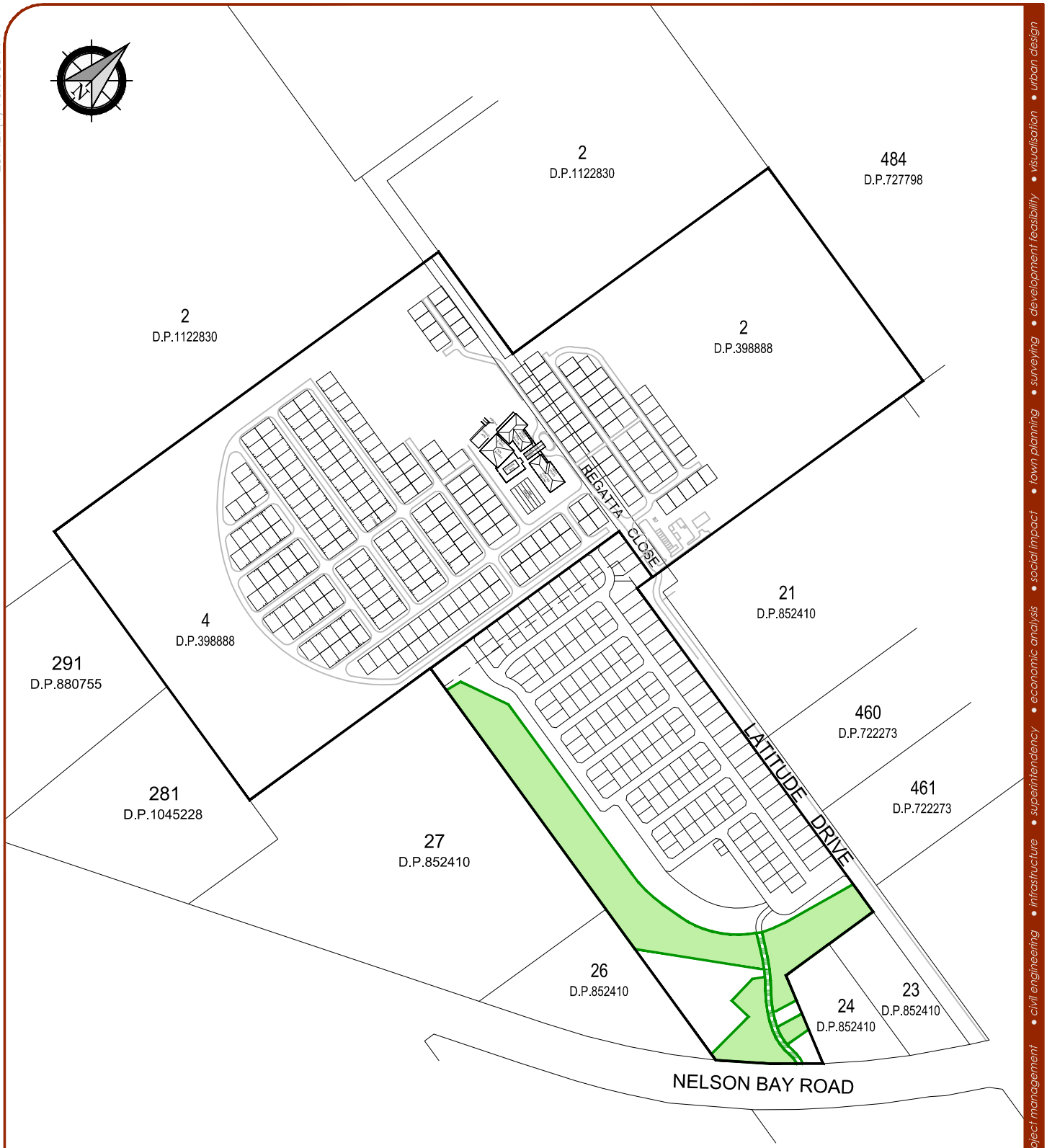

VEGETATION MANAGEMENT PLAN AREA

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A	21/04/21	INITIAL ISSUE	RC	ML	DATUM: MGA 56 (GDA94) CONTOUR INTERVAL: N/A	0 100 200 Bar Scale 1: 6000 (A4)

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drawing title:
VEGETATION MANAGEMENT PLAN AREA

location: NELSON BAY ROAD, ANNA BAY

council: PORT STEPHENS COUNCIL

dwg ref:

client: Ingenia COMMUNITIES

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Appendix 2 Flora & Fauna Species List

Fauna List	
Birds	
Columba leucomela	White-headed Pigeon
Corvus coronoides	Australian Raven
Dacelo novaeguineae	Laughing Kookaburra
Trichoglossus moluccanus	Rainbow Lorikeet
Gymnorhina tibicen	Australian Magpie
Grallina cyanoleuca	Magpie Lark
Malurus cyaneus	Superb Fairy Wren
Manorina melanocephala	Noisy Miner
Ocyphaps lophotes	Crested Pigeon
Phaps chalcoptera	Common Bronzewing
Phylidonyris novaehollandiae	New Holland Honeyeater

Herpetofauna	
Morelia spilota spilota	Diamond Python
Pseudonaja textilis	Eastern Brown Snake

Family	Scientific Name	Common Name
Apocynaceae	*Parsonsia straminea*	Common Silkpod
Araliaceae	*Hydrocotyle bonariensis*	
Asteraceae	*Chrysanthemoides monilifera subsp. rotundata*	Bitou Bush
Asteraceae	*Conyza canadensis*	
Blechnaceae	*Blechnum indicum*	Swamp Water Fern
Casuarinaceae	*Casuarina glauca*	Swamp Oak
Convolvulaceae	*Dichondra repens*	Kidney Weed
Cyperaceae	*Gahnia aspera*	Rough Saw-sedge
Dennstaedtiaceae	*Pteridium esculentum*	Bracken
Ericaceae - Epacridoideae	*Monotoca elliptica*	Tree Broom-heath
Fabaceae - Faboideae	*Hardenbergia violacea*	False Sarsaparilla
	Kennedia rubicunda	Dusky Coral Pea
Fabaceae - Mimosoideae	*Acacia longifolia*	
	Acacia saligna	Golden Wreath Wattle
Myrtaceae	*Angophora costata*	Sydney Red Gum
	Eucalyptus robusta	Swamp Mahogany
	Leptospermum laevigatum	Coast Teatree
	Melaleuca quinquenervia	Broad-leaved Paperbark
Orchidaceae	*Chiloglottis formicifera*	Ant Orchid
	Microtis unifolia	Common Onion Orchid
	Thelymitra spp.	
Phyllanthaceae	*Glochidion ferdinandi*	Cheese Tree

* = non-native species
(V) = listed as Vulnerable under the BC & EPBC Acts

Appendix 3 Test of Significance 5-Part Test

Section 7.3 of the BC Act lists five factors that must be taken into account in the determination of whether proposed development or activity is likely to significantly affect threatened species or ecological communities, or their habitats (threatened biota) listed under the BC Act. The '5-part test' is used to determine whether there is likely to be a significant effect on threatened species, populations or ecological communities, or their habitats and thus whether the Biodiversity Offset Scheme will apply to the proposed development in which case a Biodiversity Development Assessment will be required.

The significance of the impacts on those threatened species and EECs which have been recorded in the site or are likely to occur and are likely to utilise habitat to be potentially impacted by the proposal have been assessed.

The following threatened entities have been considered:

Flora

Diuris arenaria – Sand Doubletail

Fauna

Crinia tinnula – Wallum Froglet

Phascolarctos cinereus – Koala

Miniopterus australis – Little Bent-winged Bat

Endangered Ecological Communities

Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions

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

The development area itself does not entail any potential habitat in the form of shelter such as logs and hollow-bearing trees. No threatened flora species were detected during field work, the development area exists as a heavily disturbed area with little to no native seedbank remaining within the soil due to former sand extraction activities.

One threatened fauna was recorded within the subject site, namely the Wallum Froglet. However, it should be noted that threatened species were detected within the adjacent vegetation that is to be retained and managed within the future Vegetation Management Plan area. A ToS has been applied to all due to the proximity of the proposal.

Flora

Diuris arenaria – Sand Doubletail

This species was not recorded within the Development footprint during fieldwork due to fieldwork being conducted outside this species flowering period.

This species is known to occur within disturbed, sandy areas along the Tomaree Peninsula. The development footprint constitutes primarily of disturbed area, consisting of exotic vegetation, predominantly within the groundcover stratum. Due to the vast number of records for this species

within the broader landscape, it is possible this species does occur within the disturbed areas. Surveys should be conducted during this species flowering period (September) in 2021 to provide evidence of this species absence or presence within the development footprint.

Fauna

Crinia tinnula – Wallum Froglet

This species was recorded calling to the north and south of the subject site with adjacent lots as well as within the retained vegetated area that is to be managed and rehabilitated.

Wallum Froglets are found along the coastal margin from Litabella National Park in south-east Queensland to Kurnell in Sydney. Wallum Froglets are found in a wide range of habitats, usually associated with acidic swamps on coastal sand plains. They typically occur in sedgelands and wet heathlands. They can also be found along drainage lines within other vegetation communities and disturbed areas, and occasionally in swamp sclerophyll forests. The species breeds in swamps with permanent water as well as shallow ephemeral pools and drainage ditches. Wallum Froglets shelter under leaf litter, vegetation, other debris or in burrows of other species. Shelter sites are wet or very damp and often located near the water's edge.

Due to the disturbance regime within the development footprint resulting in no native vegetation as well as the remaining sediments within the area unable to constitute pools of water during heavy rainfall, it is unlikely this species occurs. Furthermore, a nocturnal walkover was undertaken following a moderate rain event with no species calling from within the development footprint.

On this basis, it is highly unlikely this species is to be impacted upon under this proposal.

Phascolarctos cinereus – Koala

Recent scats of this species were observed at multiple trees within the retained vegetation to the south of the subject site.

Due to the subject site comprising of no Koala Habitat Trees, it is unlikely this species will be impacted upon under this proposal. Furthermore, a Koala Corridor will be established within the adjacent, retained vegetation to allow this species to move easily within the area.

Miniopterus australis – Little Bent-winged Bat

This species was recorded within the subject site during fieldwork.

This species is known to inhabit moist eucalypt forest, rainforest, vine thicket, wet and dry sclerophyll forest, Melaleuca swamps, dense coastal forests and banksia scrub and are generally found in well-timbered areas. Little Bent-winged Bat's roost in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.

Due to the subject site consisting of no potential shelter areas for this species, the proposal is likely to impact this species foraging range only. The subject site constitutes of open exotic grassland that is likely used for foraging purposes. This species prefers forests which lie to the adjacent east of the subject site is proposed to be retained and rezoned to E2. It should be noted that some shipping containers as well as a maintenance shed do reside within the retained vegetation area and may constitute as potential habitat.

On this basis, it is unlikely this species will be impacted upon under this proposal.

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

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

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

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

Endangered Ecological Communities

One Endangered Ecological Community was detected within the subject site during fieldwork and has been identified as *Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and Southeast Corner Bioregions*.

The area within the subject site that was commensurate with the listed EEC was observed to be highly disturbed with multiple exotic flora species dominating the understorey. Furthermore, the area that is commensurate with this EEC to be removed under this proposal is miniscule (0.04ha) and consists primarily of the disturbed understorey., It is unlikely that the proposal will seek to remove the remnant canopy species due to the majority of the tree canopy cover, and trunk, lie within the adjacent Koala Corridor.

c) In relation to the habitat of a threatened species or ecological community:

i. the extent to which habitat is likely to be removed or modified as a result of the proposed development or activity;

The proposal seeks to remove up to 6.73ha of Exotic Vegetation and 0.30ha of Native, though disturbed, vegetation. 0.04ha of the native vegetation is commensurate with the EEC. Additionally, a further 1.18ha of the same vegetation community is to be retained within the future E2 Zone as well as the Koala Corridor/VMP area.

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

The subject site contains low condition vegetation and is surrounded by both low and moderate condition native vegetation. Although the proposal will result in the development of a highly disturbed area, only a small increase in fragmentation will occur due to the already degraded nature of the site. Furthermore, the proposal seeks to retain vegetation to the east and south and will be rehabilitated to form a fauna corridor around the proposal. On this basis, it is likely the proposal will have very small impact on habitat fragmentation.

d) Whether the proposed development or activity is likely to have an adverse effect on any declared area of outstanding biodiversity value

No declared areas of outstanding biodiversity value occur within the site or within 10km of the locality.

e) Whether the proposed development or activity is or is part of a key threatening process or is likely to increase the impact of, a key threatening process.

A Key Threatening Process (KTP) is listed under Schedule 4 of the BC Act. KTPs considered relevant to the proposal is described in **Section 5.3.1**. This assessment concluded that the proposal was unlikely to trigger KTPs currently not operating on site and/or not significantly contribute to or increase the activity of a KTP operating on the site.

Appendix 4 Koala Assessment Report

Under the PSC CKPoM for the purposes of this proposal involving the site rezoning and subsequent development requires assessment under Appendix 2 and Appendix 4. An assessment has been provided below.

Appendix 2 - Rezoning

Performance criteria (a – d) for rezoning requests apply only to circumstances where a request is made of Council to rezone land.

Consideration is to be given to the following matters when assessing rezoning requests including any amendment to the Port Stephens LEP Prior to approving any such rezoning proposal, Council is to take into consideration the likely impacts of the development made possible by the rezoning including environmental impacts on both the natural and built environment, and social and economic impacts on the locality. In particular Council should be satisfied that the rezoning would:

a) Not result in development within areas of Preferred Koala Habitat or defined Habitat Buffers;

The rezoning under this development application will result in a portion of Rural Landscape (RU2) within Lot 25 DP852410 to be rezoned as Environmental Conservation (E2) land to serve as a biodiversity corridor.

b) **Allow for only low impact development within areas of Supplementary Koala Habitat and Habitat Linking Areas;**

The proposed rezoned E2 area is situated within “Link Over Cleared”, “Buffer over Cleared” and a small portion of “Preferred” Koala Habitat. The rezoning will not lead to any impacts within the proposed E2 area, rather rehabilitate and augment into a usable corridor for native fauna to move safely through the surrounding area.

c) Minimise the removal of any individuals of preferred koala food trees, wherever they occur on the site;

The rezoning will not remove any preferred koala food trees. The only vegetation to be removed within the land to be zoned E2 includes exotic species in the form of *Pinus elliotii* (Slash Pine) as well as *Lantana camara* (Lantana).

d) Not result in development which would sever koala movement across the site. This should include consideration of the need for maximising tree retention on the site generally and for minimising the likelihood of impediments to safe/unrestricted koala movement.

The rezoning will not sever any koala movements across the site. The rezoning will create a usable, habitat corridor for koalas and allow safe movement around the proposed development to the north-west.

Appendix 4 – Development Application

Performance criteria (a – h) apply to all developments proposed on sites that contain or are adjacent to Preferred or Supplementary Koala Habitat, Habitat Buffers, or Habitat Linking Areas. Performance Criteria are as follows:

Proposed development (other than agricultural activities) must:

a) Minimise the removal or degradation of native vegetation within Preferred Koala Habitat or Habitat Buffers;

The proposed development footprint is not located within Preferred Koala Habitat or Habitat Buffers as mapped by PSC. Preferred Koala Habitat and Habitat Buffers do exist within the Subject Site; however, they are minor and mapped along the southern and eastern land area containing vegetation which is to be retained and improved under this proposal. The proposal predominantly lies within "Link over Cleared" area that constitutes as disturbed landscape with no native vegetation

b) Maximise retention and minimise degradation of native vegetation within Supplementary Koala Habitat and Habitat Linking Areas;

The proposed development area is situated within Habitat Linking Areas as mapped by PSC. As stated above mapped areas occur over vegetation to be retained and improved under the proposal to improve a corridor link for the Koala to effectively move from the south to the north of the site and connect to vegetated patches within the broader landscape.

c) Minimise the removal of any individuals of preferred koala food trees, wherever they occur on a development site. In the Port Stephens LGA these tree species are Swamp Mahogany (*Eucalyptus robusta*), Parramatta Red Gum (*Eucalyptus parramattensis*), and Forest Red Gum (*Eucalyptus tereticornis*), and hybrids of any of these species. An additional list of tree species that may be important to koalas based on anecdotal evidence is included in Appendix 8

The proposed development will not remove any native Koala Habitat Trees under this proposal. The development footprint lies within a heavily disturbed area that constitutes of little-to-no native vegetation. The proposal seeks to improve Koala habitat via undertaking weed and exotic tree species management and planting of Koala feed trees, namely *E. robusta* and *M. quinquenervia*. The rehabilitation and corridor augmentation is to be delivered under the terms of a VMP.

d) Make provision, where appropriate, for restoration or rehabilitation of areas identified as Koala Habitat including Habitat Buffers and Habitat Linking Areas Over Mainly Cleared Land. In instances where Council approves the removal of koala habitat (in accordance with dot points 1-4 of the above waive clause), and where circumstances permit, this is to include measures which result in a "net gain" of koala habitat on the site and/or adjacent land;

The proposal is located predominantly in "Link Over Cleared" as mapped by PSC. The proposal seeks to improve Koala habitat via undertaking weed and exotic tree species management and planting of Koala feed trees, namely *E. robusta* and *M. quinquenervia*. The rehabilitation and corridor augmentation is to be delivered under the terms of a VMP.

e) Make provision for long term management and protection of koala habitat including both existing and restored habitat;

The proposal seeks to improve Koala habitat via undertaking weed and exotic tree species management and planting of Koala feed trees, namely *E. robusta* and *M. quinquenervia*. The rehabilitation and corridor augmentation is to be delivered under the terms of a VMP. The land upon which the Koala Corridor is to be established will be retained under the ownership of the caravan park operator who will also be responsible for the VMP implementation and ongoing management.

f) Not compromise the potential for safe movement of koalas across the site. This should include maximising tree retention generally and minimising the likelihood that the proposal would result in the creation of barriers to koala movement, such as would be imposed by certain types of fencing. The preferred option for minimising restrictions to safe koala movement is that there be no fencing (of a sort that would preclude koalas) associated with dog free developments within or adjacent to Preferred or Supplementary Koala Habitat, Habitat Buffers or Habitat Linking Areas. Suitable fencing for such areas could include:

i) fences where the bottom of the fence is a minimum of 200 mm above ground level that would allow koalas to move underneath;

ii) fences that facilitate easy climbing by koalas; for example, sturdy chain mesh fences, or solid style fences with timber posts on both sides at regular intervals of approximately 20m; or

iii) open post and rail or post and wire (definitely not barbed wire on the bottom strand).

The subject site will be fenced including the maintenance of existing boundary fences. No fencing is proposed of the Koala Corridor and therefore not preclude the species moving across the landscape. Any improvements to fencing and/or new fencing will not use barb products.

g) Be restricted to identified envelopes which contain all buildings and infrastructure and fire fuel reduction zone. Generally, there will be no clearing on the site outside these envelopes. In the case of applications for subdivision, such envelopes should be registered as a restriction on the title, pursuant to the Conveyancing Act 1919; and

The proposed development will involve vegetation clearing only as required to encompass the development footprint, including the APZ buffer. No additional clearing will occur following the establishment of this development. No clearing or dual purpose is proposed in the Koala Corridor area.

h) Include measures to effectively minimise the threat posed to koalas by dogs, motor vehicles and swimming pools by adopting the following minimum standards.

i) The development must include measures that effectively abate the threat posed to koalas by dogs through prohibitions or restrictions on dog ownership. Restrictions on title may be appropriate.

This development occurs adjacent to Preferred Koala Habitat, Habitat Buffers and Habitat Linking Areas. This development type means that tighter control of domestic animals can be achieved given site management will be retained by a single operator. In this instance large domestic dogs are not permitted in the development. Any domestic animals are strictly controlled on leash and kept indoors. Fencing at the land holding boundaries where maintenance and/or replacement occurs should include wire on the lower fence portion to prohibit dog access however still allow for a Koala individual to climb and move across the landscape. Barb is not be used and wherever existing barb is present this is to be removed as fence maintenance or replacement occurs.

ii) The development must include measures that effectively minimise the threat posed to koalas from traffic by restricting motor vehicle speeds, where appropriate, to 40 kph or less.

Vehicle speeds in the development are as follows:

- A speed limit of 40kp applies to Latitude Drive
- A speed limit of 10kph applies to all internal roads

iii) The development must reduce the risk of koala mortality by drowning in backyard swimming pools.

All external pools are fenced with glass balustrades. The creation of any water basins should be built as such to allow the safe entrance and exit of any Koalas and to hinder any drowning. If basins are created with steep depth, it is recommended that rope infrastructure be placed in the water to assist any stranded Koalas.

Our ref: DOC21/488273
Your ref: PP_2019_PORTS_006_00

Mr Roge Kempe

Strategic Planner
Port Stephens Council

Roge.kempe@portstephens.nsw.gov.au

Dear Mr Kempe

Preliminary comments on draft Planning Proposal PP_2019_PORTS_006_00 70 Latitude Drive, Anna Bay

I refer to the meeting with the Biodiversity and Conservation Division (BCD) of the 25 June 2021 during which the draft planning proposal for 70 Latitude Drive, Anna Bay (Lot 25 DP852410) was discussed. I also refer to your email of the 30 August 2021, in which you asked for advice from BCD, as a requirement of the Gateway determination, prior to lodgement of the planning proposal.

BCD has reviewed the draft planning proposal, the Gateway Determination, the "AEP Access and KISS FFA" (flora and fauna report), the proposed zoning and internal layout, the vegetation management plan, the document called 'vegetation current' and the concept plan.

BCDs recommendations are provided in **Attachment A** and preliminary comments are provided in **Attachment B**. If you require any further information regarding this matter, please contact Karen Thumm, Senior Conservation Planning Officer, on 4927 3153 or via email at huntercentralcoast@environment.nsw.gov.au

Yours sincerely

STEVEN CRICK
Senior Team Leader Planning
Hunter Central Coast Branch
Biodiversity and Conservation Division
14 September 2021

Enclosure: Attachments A and B

Attachment A

BCD's recommendations

Preliminary comments on a draft planning proposal for 70 Latitude Drive, Anna Bay

1. BCD requests that the planning proposal is accompanied by a Stage 1 BAM assessment.

2. A koala corridor should be established within the site and restored as enhanced koala habitat. The plant community type that previously occurred at the site, which would have included koala feed trees, should be restored within the corridor.

3. The VMP was prepared under a development approval for a different development activity and should be revised.

4. BCD recommends the use of an E2 zone for Environmental Protection and another conservation mechanism, such as a Biodiversity Stewardship Agreement, over the restored vegetation and 'koala' corridor which will extend through the site.

Attachment B

BCD's preliminary comments

Preliminary comments on a draft planning proposal for 70 Latitude Drive, Anna Bay

Biodiversity

1. BCD requires the first stage of a BAM assessment to be provided so that the rezoning can be assessed

This site is partially mapped on the Biodiversity Values map and the Native Vegetation Regulatory map and the development therefore triggers the Biodiversity Offset Scheme (BOS) and the Biodiversity Assessment Method (BAM). The first stage of a BAM assessment should be provided to BCD so that the development impacts on biodiversity can be assessed. The preliminary flora and fauna report (2016, AEP) provided does not meet this requirement. For example, no targeted surveys for threatened species were carried out at the correct times of year. Surveys for threatened orchids should be carried out at the time of year specified in the Threatened Biodiversity Data Collection of the BAM.

Recommendation 1

The planning proposal should be accompanied by a Stage 1 BAM assessment.

2. A corridor should be provided for koalas

As the development will impact on preferred koala habitat mapped under the Port Stephens Council Comprehensive Koala Plan of Management, a koala corridor should be provided that connects vegetation in the north east with the vegetation in the south-west.

The koala corridor should be reinstated to be a complete functioning vegetation community with all vegetation structural layers, i.e. canopy, mid-storey and ground layer. The final vegetation community should be the equivalent of the plant community type previously on the site. The koala feed tree *Eucalyptus robusta* (swamp mahogany) should be included in the planting but the rest of the vegetation community should be restored as well.

In order for the corridor to function for wildlife movement and to not suffer from edge effects it will need to be as wide as possible. The land should be zoned E2 Environmental Protection and conserved through a Biodiversity Stewardship Agreement or other mechanism.

Recommendation 2

A koala corridor should be established within the site and restored as enhanced koala habitat. The plant community type that previously occurred at the site, which would have included koala feed trees, should be restored within the corridor.

3. The proposed Vegetation Management Plan is a consent condition for the sand extraction in the north-west portion of the site

It is noted that the documents provided to BCD include a Vegetation Management Plan (VMP) (July 2017) which was included as part of a consent approval relating to the sand extraction within Lot 25 DP852410. The sand was extracted for the development of the previous caravan park (DA consent No. 16-2009-257) adjacent to the current site. The VMP provides rehabilitation and management of Swamp Sclerophyll Forest Endangered Ecological Community (SSF EEC) and bushland vegetation, koala habitat, waterbodies,

weed management and bushfire hazard management. This VMP should be reviewed, as it was prepared at a time when no development was intended for the remainder of Lot 25 DP852410.

Recommendation 3

The VMP was prepared under a development approval for a different development activity and should be revised.

4. BCD supports the use of 'split-zones' to provide conservation outcomes

Lot 25 DP852410 should be divided into two zones, with the area earmarked for vegetation restoration including the 'koala' corridor being zoned E2 for Environmental Protection. This would provide an opportunity for positive environmental outcomes for the site. However, a second mechanism, such as a Biodiversity Stewardship Agreement will be required to ensure that the E2 zone is not only restored but also managed in perpetuity for conservation, and in particular, for the conservation of koalas on the site.

Recommendation 4

BCD recommends the use of an E2 zone for Environmental Protection and another conservation mechanism, such as a Biodiversity Stewardship Agreement, over the restored vegetation and 'koala' corridor which will extend through the site.

Our Ref: 20092 - *Diuris arenaria* Survey, Latitude One, Nelson Bay Road, Anna Bay 08-10-2021
Via: email

Date: 8th October 2021

Attn: Roge Kempe
Port Stephens Council
116 Adelaide Street
PO Box 42
Raymond Terrace NSW 2324

Dear Roge,

RE: DIURIS ARENARIA SURVEY, LATITUDE ONE, NELSON BAY ROAD, ANNA BAY

MJD Environmental were engaged by ADW Johnson on behalf of Ingenia to conduct a *Diuris arenaria* (Sand Doubletail), listed as "Endangered" under the Biodiversity Conservation Act 2016, survey over the land within Lot 25 DP852410 Nelson Bay Road, Anna Bay hereafter referred to as "Subject Site".

The survey was carried out by a qualified ecologist and field ecologist on the 22nd of September after a nearby reference population (East of the Anna Bay Water Treatment Plant (4km away from Subject Site)) was visited and was observed to be in flower on the day of survey prior to commencement.

Survey methodology was in accordance with the NSW Biodiversity Assessment Method survey guide *Surveying threatened plants and their habitats 2020*, traversing the entire habitable area with 5-10m intervals due to the highly disturbed and open environment (**Attachment 1**). Areas where the lines/tracks did not go indicate areas that were currently occupied by rubbish/construction materials or vehicles as areas that do not represent habitat for the target species.

The proposed caravan area was not surveyed as this area does not contain potential habitat. This area is highly infested with ground cover weeds such as *Stenotaphrum secundatum* (Buffalo Grass) and *Hydrocotyle bonariensis* (American Pennywort) and the area lies within a lower depression which is periodically inundated and does not represent habitat for the target species.

No *Diuris arenaria* individuals were detected during the survey. Other orchids that were detected within the subject site included *Calochilus robertsonii* (Purple Beard Orchid), *Calochilus campestris* (Copper Beard Orchid) *and Microtis parviflora* (Slender Onion Orchid).

We trust this is sufficient for your purposes, however, should you require any further information or clarification, please do not hesitate to contact the writer.

Yours sincerely

Matt Doherty
Director
MJD Environmental (Aust) Pty Ltd

Encl: **Attachment 1 – *Diuris arenaria* Survey**

LATITUDE ONE, 4495 NELSON BAY ROAD, ANNA BAY

DIURIS ARENARIA SURVEY

Legend

- Survey Effort
- Watercourse
- Contours (1m)
- Proposed Layout
- Proposed Basin
- Subject Site
- Development Footprint
- Vegetation Management Plan
- Cadastral Boundaries

0 25 50 100

Meters

1:1,600

MJD Environmental

N W E S

Aerial: NearMap (2021) | Data: MJD Environmental, ADW Johnson (2021), Spatial Services (2020) | Datum/Projection: GDA 1994 MGA Zone 56 | Date: 30/09/2021| Version 1 | GIS\20092 - Latitude One Nelson Bay Road, Anna Bay | This plan should not be relied upon for critical design dimensions.

Our Ref: 20092 - Request for Further Information - Biodiversity and Bushfire 08-11-2021
Via: email

Date: 8th November 2021

Attn: Roge Kempe
Port Stephens Council
116 Adelaide Street
PO Box 42
Raymond Terrace NSW 2324

Dear Roge,

RE: REQUEST FOR FURTHER INFORMATION - BIODIVERSITY AND BUSHFIRE, LATITUDE ONE, NELSON BAY ROAD, ANNA BAY

I refer to the above described planning proposal and note that clarification has been requested by Council in relation to the Biodiversity and Bushfire Threat Assessments provided as part of the planning proposal package. Our response is provided below.

Comment	Response
Biodiversity	
a) Some conditions of consent (DA for Lot 25 Borrow Pit) have not been met (2, 11 and 12) - the Borrow Pit VMP has not been implemented.	Whilst it is recognised that the approved VMP has not yet been implemented as required by the DA for the Borrow Pit, the planning proposal seeks to implement an alternative VMP footprint that is supported by an E2 – Environmental Management Zone over a substantial portion of the proposed VMP area. The amended VMP footprint includes some of the vegetated areas that have been retained under the Borrow Pit DA and will be further restored and managed under a new VMP. The proposed new VMP area has been identified in consultation with representatives from Port Stephens Council and aims to provide an improved biodiversity outcome through the provision of Koala corridors to the south of the subject land and across Nelson Bay Road. The Nelson Bay Road corridor was not achieved as part of the approved VMP.
b) The proposed parking area for caravans and boats is within the Borrow Pit VMP area; it will reduce the area and is not in line with the conditions of consent/VMP. Compare areas identified in the Borrow Pit VMP, Gateway Concept plan-Lot 25, and current VMP proposal from Biodiversity Assessment report (Aug 2021).	The VMP approved under the consent for Borrow Pit has not been implemented. This area currently contains exotic vegetation in the form of *Lantana camara* (Lantana), *Stenotaphrum secundatum* (Buffalo Grass) and *Hydrocotyle bonariensis* (American Pennywort). A small number of *Melaleuca quinquenervia* (Broad-leaved Paperbark) are the only remnant native vegetation within that area. This area has not been restored nor contains any native plantings under the old VMP. A new VMP is to be created which will seek to restore and maintain a forested corridor

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Comment	Response
	containing primary Koala Feed Trees and connectivity for Koala's to the south and across Nelson Bay Road. If required, the approved DA for the Borrow Pit can be modified to reflect the amended VMP footprint.
c) BCD requires a stage 1 BAM assessment for the planning proposal.	Under the Planning Proposal no native vegetation will be cleared within a Biodiversity Values mapped area, and the proposed clearing is below the applicable area clearing threshold. Refer to biodiversity scope letter provided to Council / BCD dated 25th March 2021.
d) BCD have verbally indicated that, when comparing aerial photos, there seems to be more clearing of lot 25 around the Borrow Pit than expected.	The landholder has advised that clearing activities were carried out by the landholder in accordance with the *Local Lands Service Act 2013.*
e) BCD has not yet provided comment on the Biodiversity Assessment report (August 2021). Their final recommendations may raise additional issues which could extend the planning proposal process.	A response to any issues raised by BCD can be provide upon the receipt of BCD's referral comments.
f) The orchid species *Diuris arenaria* was investigated and a separate report provided. Site visit research was done in late September while ideally it should be early September. In addition, the proposed caravan parking area was not included in the investigation. Proponent has been asked to provide further information/clarification on this matter.	Please refer to separate correspondence issued in relation to orchid surveys.
Bushfire Threat	
a) Is 1 access road (Latitude Drive) sufficient in case of an event?	Adequate ingress/ egress and the provision of defendable space are afforded in the development design with due regard to the requirements of Table 6.8b, and Appendix 3 of PBP (2019). In addition, a maintenance access will be maintained from Nelson Bay Road at the south-East corner of the site. The track will be sealed as part of this proposal and will provide a compliant alternate access for emergency services during an event. The proposal is considered to meet the performance criteria for access by providing safe operational access for emergency services personnel while residents are evacuating the site.
b) Has the proposed community facility been taken into account?	Yes, the proposed community facility is to be set behind the proposed APZ. It is however noted that aspects of the community facility such as outdoor sports areas and swimming pools can be located within the APZ. These will need to be assessed at the development application stage, when

Comment	Response
	the full extent of works associated with the community facility are known.
c) Proposal includes an area for caravan and boat parking, is that permitted in an APZ?	The caravan and boat parking area are situated to the south-east and separated from the development by the Koala corridor. No storage is proposed in the required APZ for the development that occurs on the northern side of the Koala corridor.
d) Could inclusion of additional koala corridor have altered the bushfire report's recommendations?	The future koala corridor / area to be impacted by a Vegetation Management Plan has been considered in Table 1: Vegetation Classification within the Bushfire Threat Assessment. This area is appropriately mapped as "Forest", consistent with its anticipated future revegetation for the purpose of a Koala corridor.
e) Clarification as to why the proposed Short Stay has a wider APZ requirement than dwellings	A 79m APZ has been applied around the short stay sites. The proposal has regard to Section 6.3.2 'Manufactured Home Estates' of PBP 2019. The proposal (long term sites) have been assessed as residential development for a FDI 100 area in accordance with Table 6.8a of PBP 2019. As such, the APZ has been determined using acceptable solution setbacks per PBP (2019) as follows: - For long term sites - Table A1.12.2. - For short term sites - Table A1.12.1.

We trust this is sufficient for your purposes, however, should you require any further information or clarification, please do not hesitate to contact the writer.

Yours sincerely

Matt Doherty
Director
MJD Environmental (Aust) Pty Ltd