JWA PTY LTD
Ecological Consultants
ABN 56 066 448 879

AMENDED
ECOLOGICAL ASSESSMENT

Iron Gates Drive
Evans Head NSW 2473

A Report Prepared for
Goldcoral Pty Ltd

APRIL 2019

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Client Issue

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1 INTRODUCTION

1.1 Background

JWA Pty Ltd (JWA) has been engaged by Goldcoral Pty Ltd to complete an Ecological Assessment of the road reserve leading into the Iron Gates Estate, Evans Head. Goldcoral Pty Ltd is proposing to widen the road and partially clear the road reserve in this location.

It is noted that a Development Application was lodged for the proposed works on the 17th January 2019. JWA have now completed amendments in response to relevant requests for further information from Richmond Valley Council, Mr. Malcolm Scott (Council's consulting Planner), and the NSW Department of Primary Industries (DPI). Tables detailing the further information requested, responses and the relevant Sections of the report that contain the requested additional information are provided in **APPENDIX 1**. A summary of the amendments made to the original Ecological Assessment report that accompanied the development application is contained in **APPENDIX 2**.

The assessment has involved the following:

- Mapping and ground truthing vegetation units and determining their conservation status;
- Searching for and recording Threatened plant species;
- Determining the suite of Threatened fauna that occurs in the locality;
- Assessing the habitat value of the site for Threatened species;
- Assessing habitat provided by the site in relation to adjacent habitat and making an assessment of the corridor value of the site; and
- Addressing statutory requirements including State Environmental Planning Policy No. 14 (SEPP 14) Coastal Wetlands, SEPP 44 (Koala Habitat Protection), Section 5A of the Environmental Planning & Assessment Act (1979) and the Commonwealth Environment Protection and Biodiversity Conservation Act (1999).

It is noted that the State Environmental Planning Policy (Coastal Management) 2018 (the Coastal Management SEPP), which commenced on 3rd April 2018, has repealed and replaced SEPP 14. However, for development applications that do not require an environmental impact statement (EIS), the former planning provisions of SEPP 14, SEPP 26 and SEPP 71 continue to apply to applications lodged, but not finally determined before the commencement of the Coastal Management SEPP. SEPP 14 will therefore be the applicable legislation.

Furthermore, requirements under Section 5A of the EP & A Act have been replaced with the 'test of significance' set out in Section 7.3 of the *Biodiversity Conservation Act 2016* (BC Act). However, the development application the subject of this report is covered by the statutory provisions that pre-date the BC Act i.e. there are savings/transitional provisions in clause 28 of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* which define the application as a 'pending or interim

planning application' under the savings/transitional provision. Section 5A of the EP & A Act will therefore be the applicable legislation.

1.2 Locality

The locality is defined as the area within a 10km radius of the Subject site. The locality, therefore, extends from the Bundjalung National Park in the south to Broadwater in the north, the Pacific Ocean in the east and the Pacific Highway in the west (**FIGURE 1).**

Land uses within the locality include National Park Estate (Broadwater NP and Bundjalung NP), township of Evans Head and some agricultural areas (principally cane production on the alluvial plains) and commercial fishing. A recent aerial photograph of the site is provided in **FIGURE 2.**

State Environmental Planning Policy (SEPP) 14 Wetland No. 147 is mapped as occurring on and adjacent to the road reserve as shown in **FIGURE 3**.

1.3 The Subject Site and Study Area

The Subject Site, in accordance with the definition provided in the Threatened Biodiversity Survey Assessment (TBSA) Guidelines (DEC 2004), represents areas that are directly affected by the proposed development. The Subject Site therefore represents areas of the Iron Gates Road reserve (and immediately adjacent areas) that occur outside of the mapped SEPP 14 zone, as no works will occur within the SEPP 14 zone. The Subject Site covers an area of approximately 1.75 ha as shown in **FIGURE 2**.

The Study Area includes the Subject Site along with additional adjoining areas which could potentially be affected by the proposal, either directly or indirectly. The Study Area therefore includes an approximate 20m buffer around the Subject Site and covers an area of approximately 5.87 ha. An unnamed tributary of the Evans River traverses the eastern portion of the road reserve.

1.4 Land Use Zones

The Subject Site is zoned in the Richmond Valley Council LEP 2012 (**FIGURE 4**) as follows:

- E3 – Environmental Management across the majority of the site;
- R1 – General Residential in the north-east portion of the site; and
- E2 – Environmental Conservation in some small portions along the edges of the site.

1.5 The Proposed Development

Iron Gates Drive is required to be upgraded as shown in **FIGURE 5** to obtain a Bush Fire Safety Authority (BFSA) issued under Section 100B of the *Rural Fires Act 1997* by the

SOURCE: Google Maps

SCALE: 1 : 15 000 @ A4

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FIGURE 1

PREPARED: BW
DATE: 12 February 2019
FILE: N16006_Locality.cdr

TITLE

LOCALITY PLAN

0 50m 100m

1 : 3500

SOURCE: NSW Globe Aug 2012 Aerial

SCALE: 1 : 3500 @ A3

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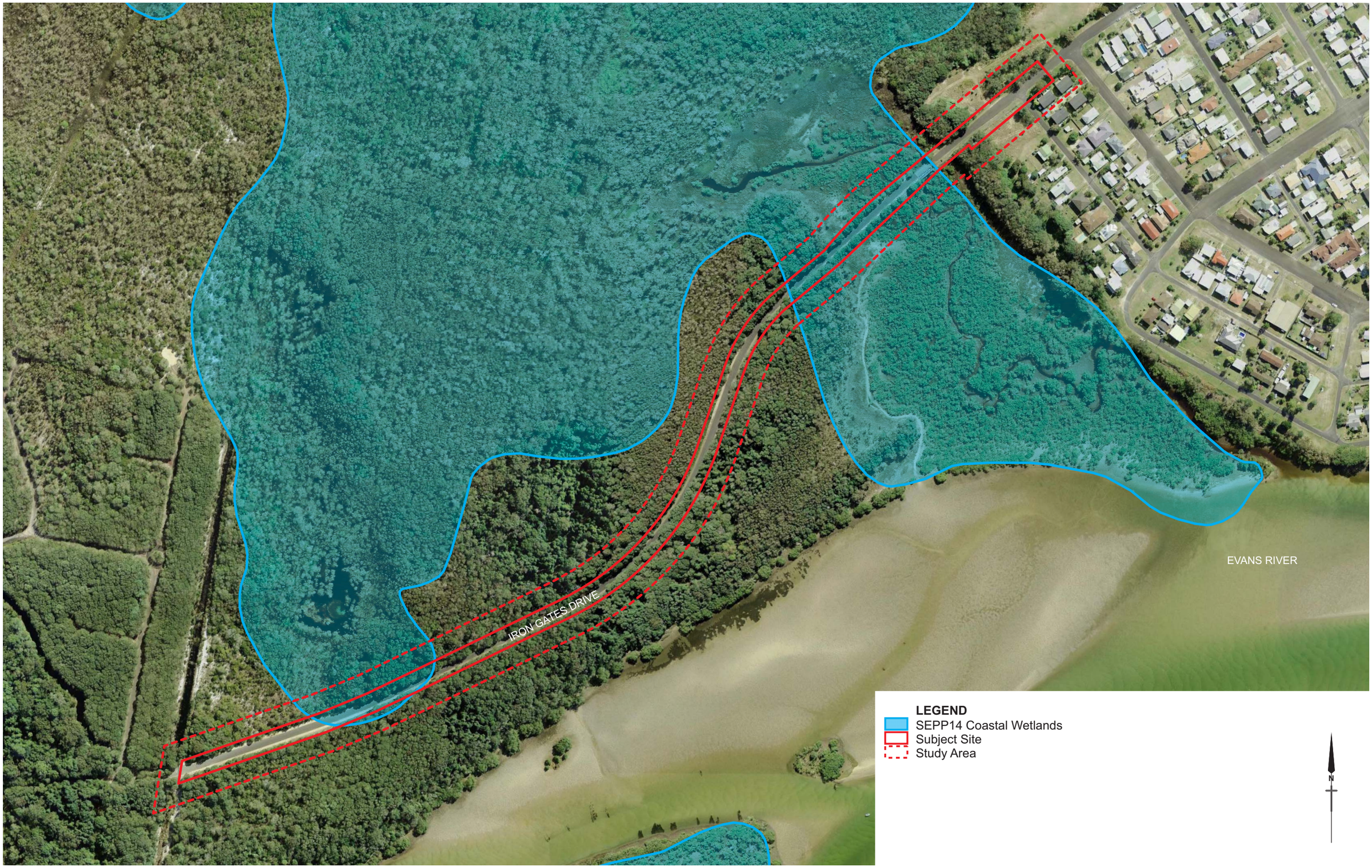
FIGURE 2

PREPARED: BW
DATE: 12 February 2019
FILE: N16006_Aerial.cdr

TITLE

AERIAL PHOTOGRAPH



0 50m 100m

1 : 3500

SOURCE: SEPP14 Coastal Wetlands; NSW Globe Aug 2012 Aerial

SCALE: 1 : 3500 @ A3

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FIGURE 3

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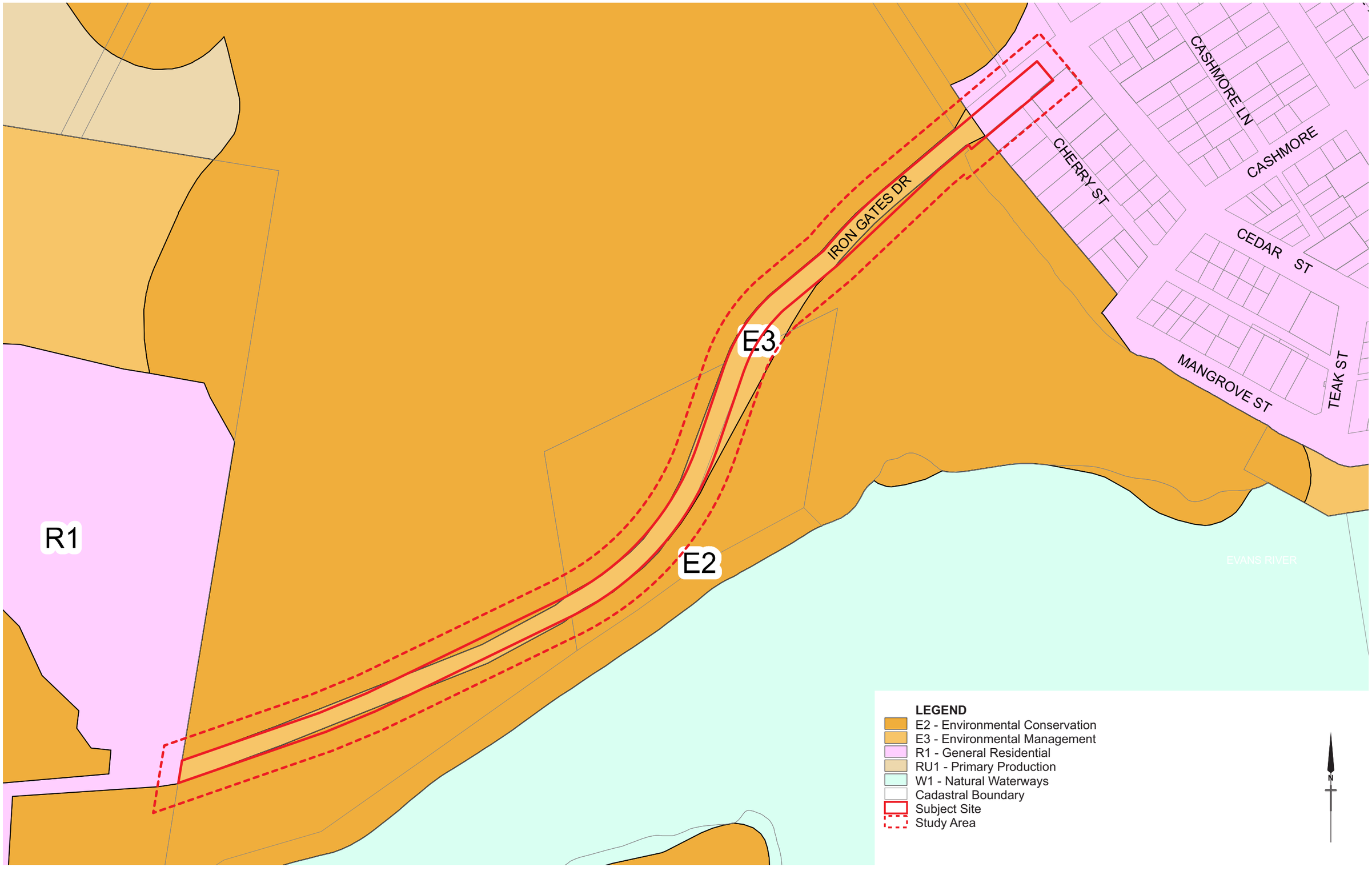
FILE: N16006_SEPP14.cdr

TITLE

SEPP14 COASTAL WETLANDS



SOURCE: Richmond Valley Council LEP 2012
Land Zoning Map Sheet LZN_010A

SCALE: 1 : 3500 @ A3

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FIGURE 4

PREPARED: BW
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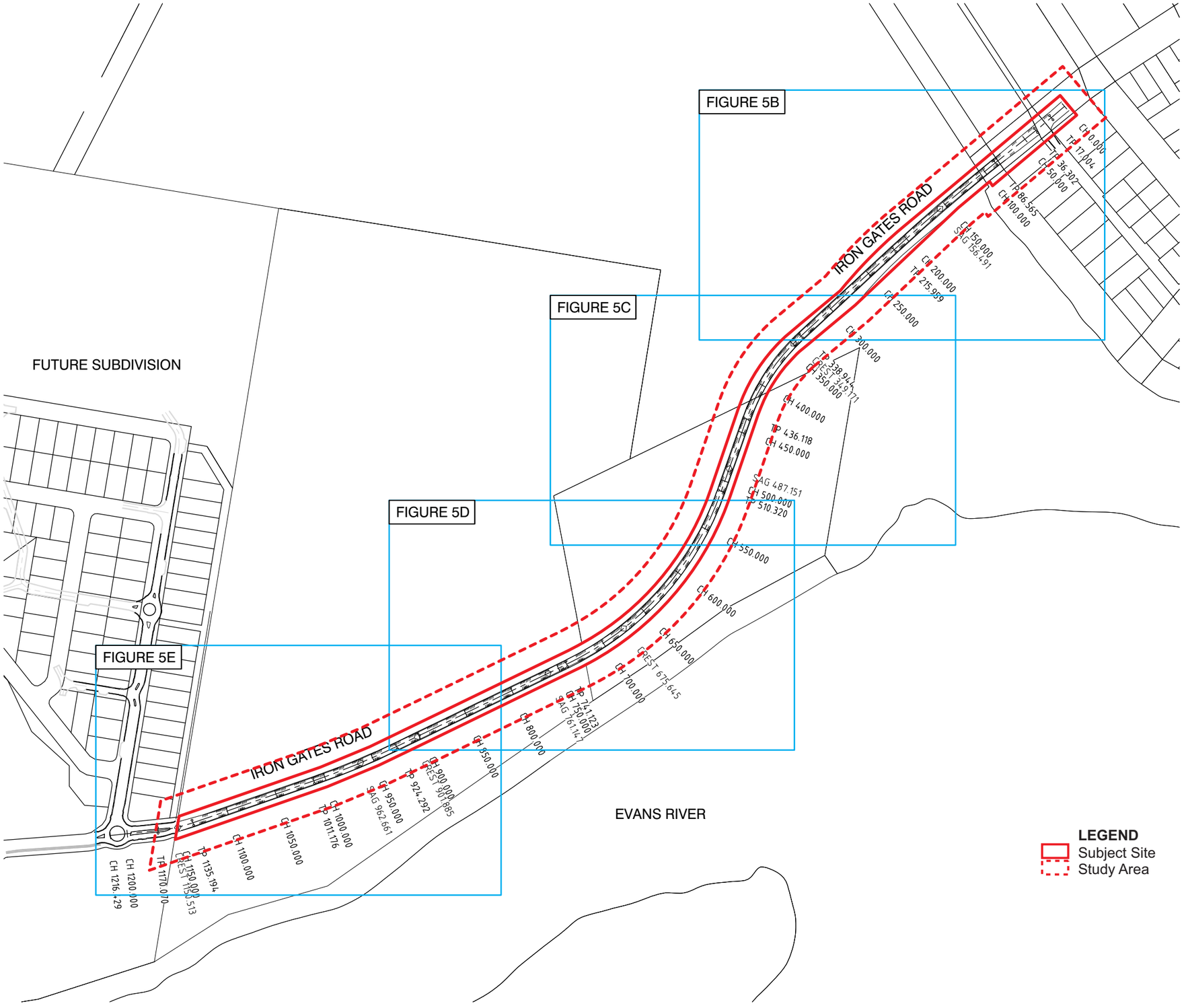
FILE: N16006_Zoning.cdr

TITLE

ZONING MAP



CONTROL LINE SETOUT - ACCESS ROAD

PT	CHAINAGE	EASTING	NORTHING	LEVEL	BEARING	RAD/SPIRAL	A.LENGTH	D.ANGLE
IP1	0.000	541423.554	6778903.755	4.543	229°14'24.26"			
TC	17.004	541410.674	6778892.653	4.383	229°14'24.26"			
IP2	26.653	541403.365	6778886.352	4.284		500.000	19.298	2°12'40.97"
CT	36.302	541395.818	6778880.339	4.167	231°27'05.22"			
	50.000	541385.104	6778871.802	3.969	231°27'05.22"			
TC	86.565	541356.507	6778849.016	3.273	231°27'05.22"			
	100.000	541346.033	6778840.603	2.991	231°00'41.74"			
	150.000	541307.624	6778808.594	1.945	229°22'28.46"			
IP3	151.262	541305.886	6778808.680	1.926		-1750.000	129.393	4°14'11.02"
	200.000	541270.145	6778775.501	2.083	227°44'15.18"			
CT	215.959	541258.383	6778764.715	2.155	227°12'54.20"			
	250.000	541233.400	6778741.592	2.309	227°12'54.20"			
	300.000	541196.705	6778707.630	2.534	227°12'54.20"			
TC	338.944	541168.123	6778681.177	2.709	227°12'54.20"			
	350.000	541160.221	6778673.447	2.739	224°02'52.33"			
IP4	387.531	541131.746	6778647.509	2.360		-200.000	97.173	27°50'17.05"
	400.000	541130.288	6778633.559	2.184	209°43'26.13"			
CT	436.118	541115.301	6778600.751	1.905	199°22'37.15"			
	450.000	541110.696	6778587.655	1.835	199°22'37.15"			
	500.000	541094.106	6778540.488	1.709	199°22'37.15"			
TC	510.320	541090.682	6778530.752	1.745	199°22'37.15"			
	550.000	541075.043	6778494.317	1.884	207°05'01.45"			
	600.000	541048.624	6778451.937	2.059	216°47'41.59"			
IP5	625.722	541050.314	6778415.972	2.149		295.000	230.803	44°49'38.29"
	650.000	541015.434	6778414.621	2.234	226°30'21.73"			
	700.000	540976.426	6778383.438	2.217	236°13'01.86"			
CT	741.123	540940.766	6778363.024	2.012	244°12'15.44"			
	750.000	540932.774	6778359.161	1.967	244°12'15.44"			
	800.000	540887.756	6778337.403	2.126	244°12'15.44"			
	850.000	540842.738	6778315.645	2.403	244°12'15.44"			
	900.000	540797.721	6778293.887	2.676	244°12'15.44"			
TC	924.292	540775.850	6778283.316	2.525	244°12'15.44"			
	950.000	540752.516	6778272.528	2.322	246°10'05.70"			
IP6	967.734	540736.693	6778264.390	2.262		750.000	86.884	6°38'14.74"
	1000.000	540706.140	6778253.864	2.407	249°59'16.69"			
CT	1011.176	540695.611	6778250.118	2.458	250°50'30.18"			
	1050.000	540658.937	6778237.376	2.633	250°50'30.18"			
	1100.000	540611.706	6778220.967	2.858	250°50'30.18"			
TC	1135.194	540578.461	6778209.417	3.055	250°50'30.18"			
	1150.000	540564.259	6778205.256	3.141	256°29'49.70"			
IP7	1152.632	540561.915	6778203.669	3.138		150.000	34.876	13°19'17.49"
CT	1170.070	540544.489	6778201.887	2.921	264°09'47.67"			
	1200.000	540514.714	6778198.844	2.399	264°09'47.67"			
IP8	1216.429	540498.370	6778197.173	NaN	264°09'47.67"			

SOURCE: Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)

SCALE: 1 : 4000 @ A3

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FIGURE 5A

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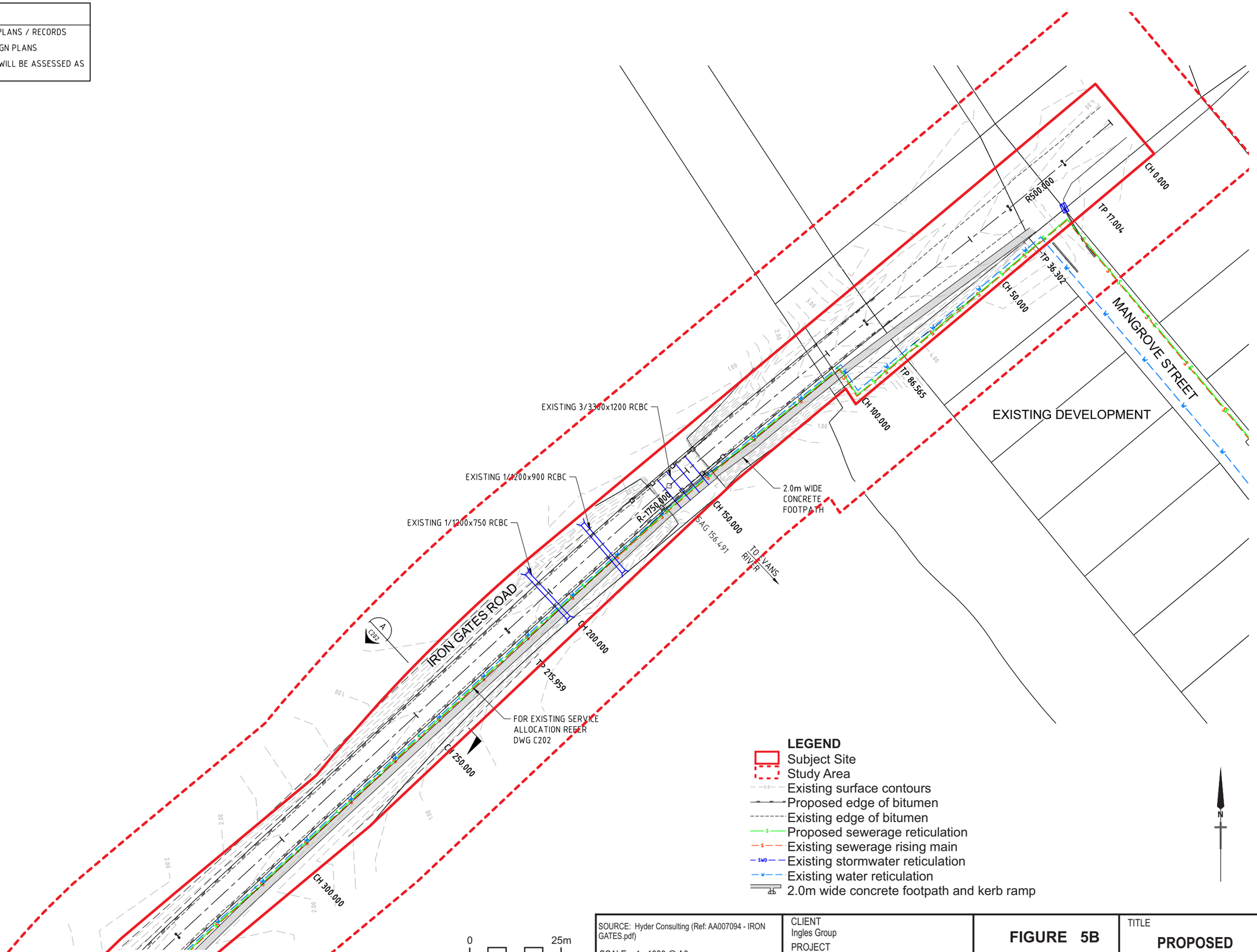
FILE: N16006_Layout.cdr

TITLE
PROPOSED DEVELOPMENT LAYOUT

NOTES

1. SERVICES PLOTTED FROM PREVIOUS PLANS / RECORDS
2. CULVERT SIZES FROM PREVIOUS DESIGN PLANS
3. CONDITION OF ALL INFRASTRUCTURE WILL BE ASSESSED AS PART OF CONSTRUCTION CERTIFICATE



LEGEND

- Subject Site
- Study Area
- Existing surface contours
- Proposed edge of bitumen
- Existing edge of bitumen
- Proposed sewerage reticulation
- Existing sewerage rising main
- Existing stormwater reticulation
- Existing water reticulation
- 2.0m wide concrete footpath and kerb ramp

N

SOURCE: Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)

SCALE: 1 : 1000 @ A3

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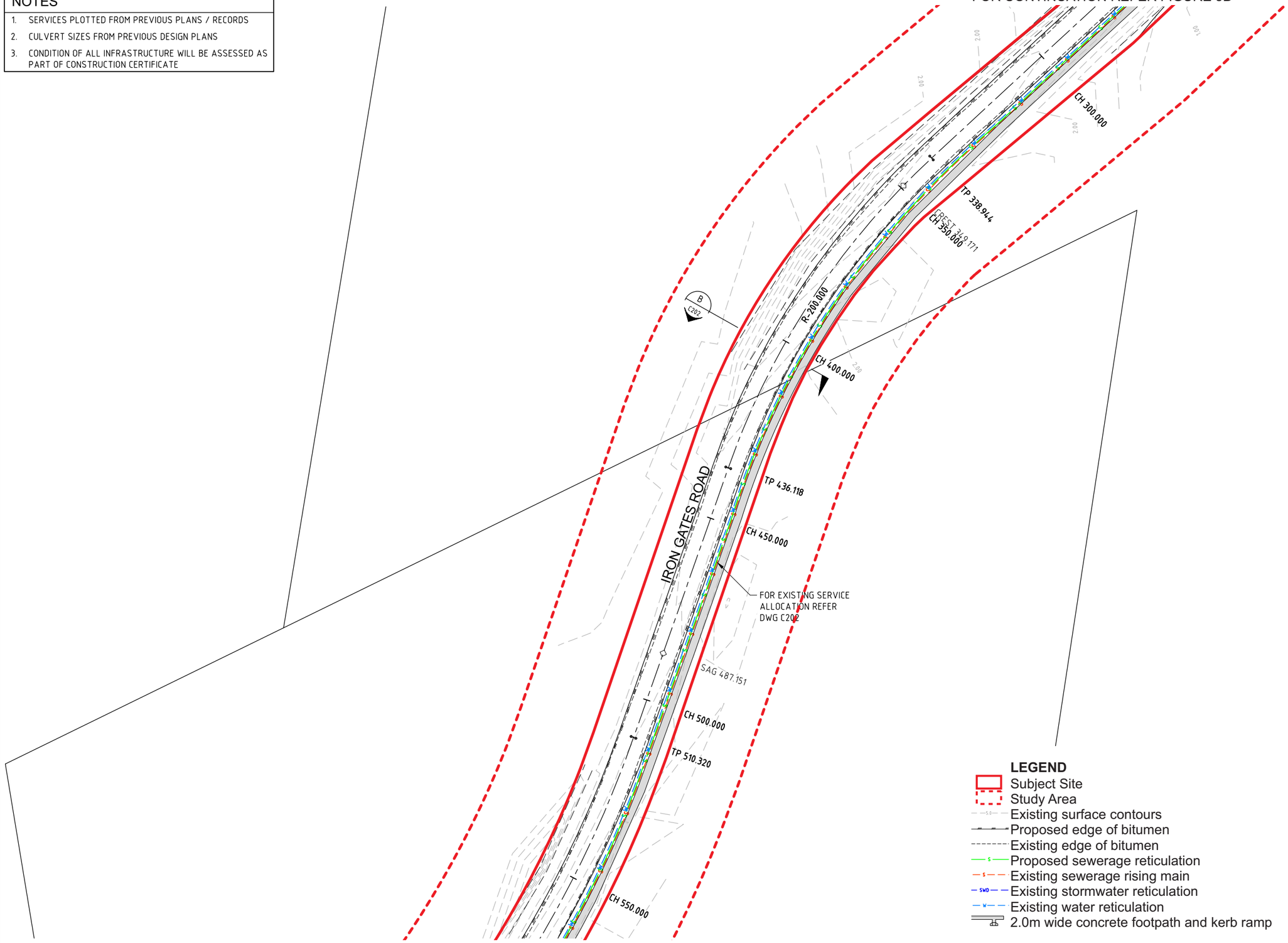
FIGURE 5B

PREPARED: BW
DATE: 12 February 2019
FILE: N16006_Layout.cdr

TITLE
PROPOSED DEVELOPMENT LAYOUT

NOTES

1. SERVICES PLOTTED FROM PREVIOUS PLANS / RECORDS
2. CULVERT SIZES FROM PREVIOUS DESIGN PLANS
3. CONDITION OF ALL INFRASTRUCTURE WILL BE ASSESSED AS PART OF CONSTRUCTION CERTIFICATE



LEGEND

- Subject Site
- Study Area
- Existing surface contours
- Proposed edge of bitumen
- Existing edge of bitumen
- Proposed sewerage reticulation
- Existing sewerage rising main
- Existing stormwater reticulation
- Existing water reticulation
- 2.0m wide concrete footpath and kerb ramp

N

SOURCE: Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)

SCALE: 1 : 1000 @ A3

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FIGURE 5C

PREPARED: BW
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FILE: N16006_Layout.cdr

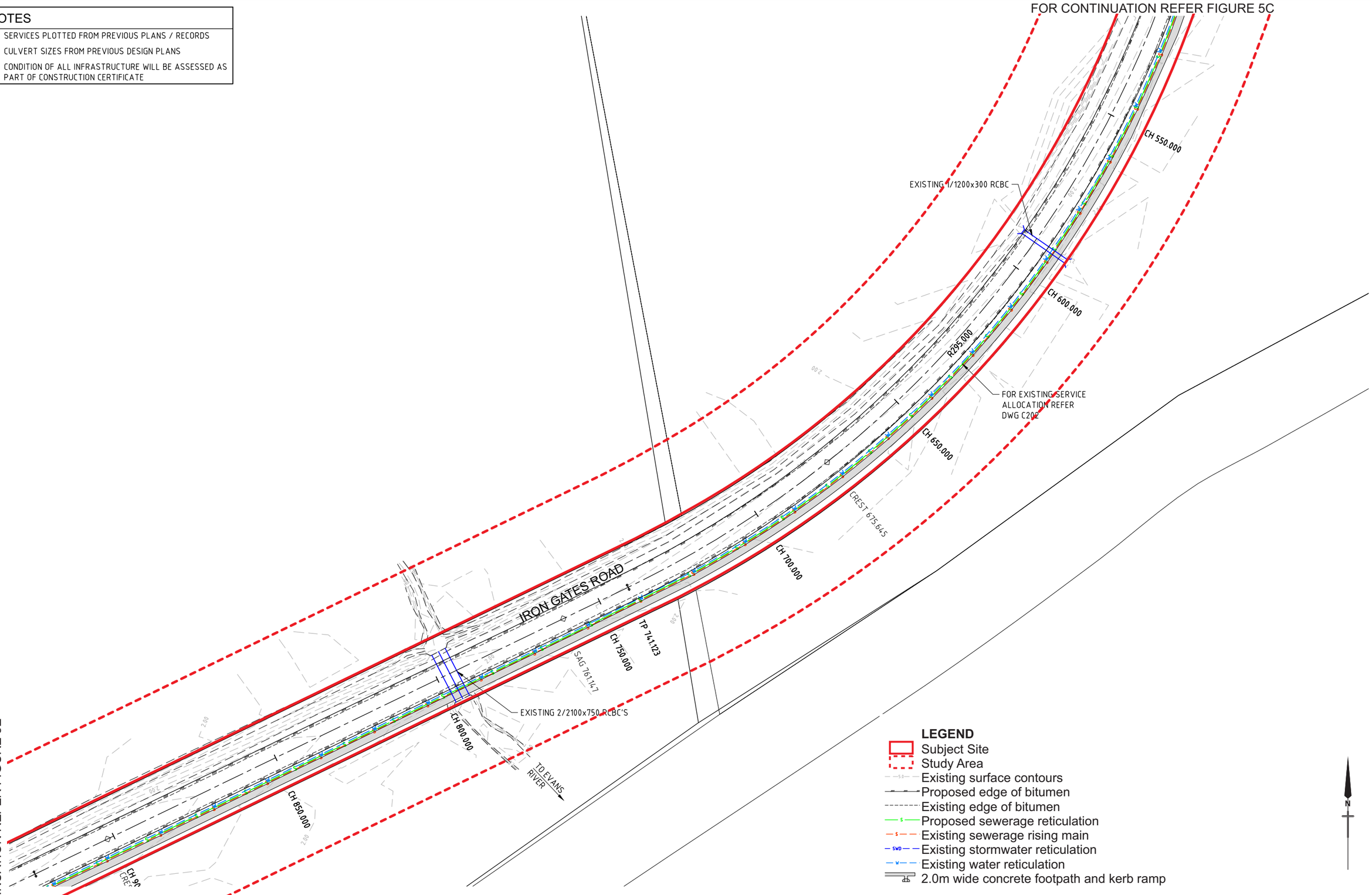
TITLE

PROPOSED DEVELOPMENT LAYOUT

NOTES

1. SERVICES PLOTTED FROM PREVIOUS PLANS / RECORDS
2. CULVERT SIZES FROM PREVIOUS DESIGN PLANS
3. CONDITION OF ALL INFRASTRUCTURE WILL BE ASSESSED AS PART OF CONSTRUCTION CERTIFICATE

FOR CONTINUATION REFER FIGURE 5C



FOR CONTINUATION REFER FIGURE 5E

LEGEND

- Subject Site
- Study Area
- Existing surface contours
- Proposed edge of bitumen
- Existing edge of bitumen
- Proposed sewerage reticulation
- Existing sewerage rising main
- Existing stormwater reticulation
- Existing water reticulation
- 2.0m wide concrete footpath and kerb ramp

N

0 25m

1 : 1 000

SOURCE: Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)

SCALE: 1 : 1000 @ A3

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FIGURE 5D

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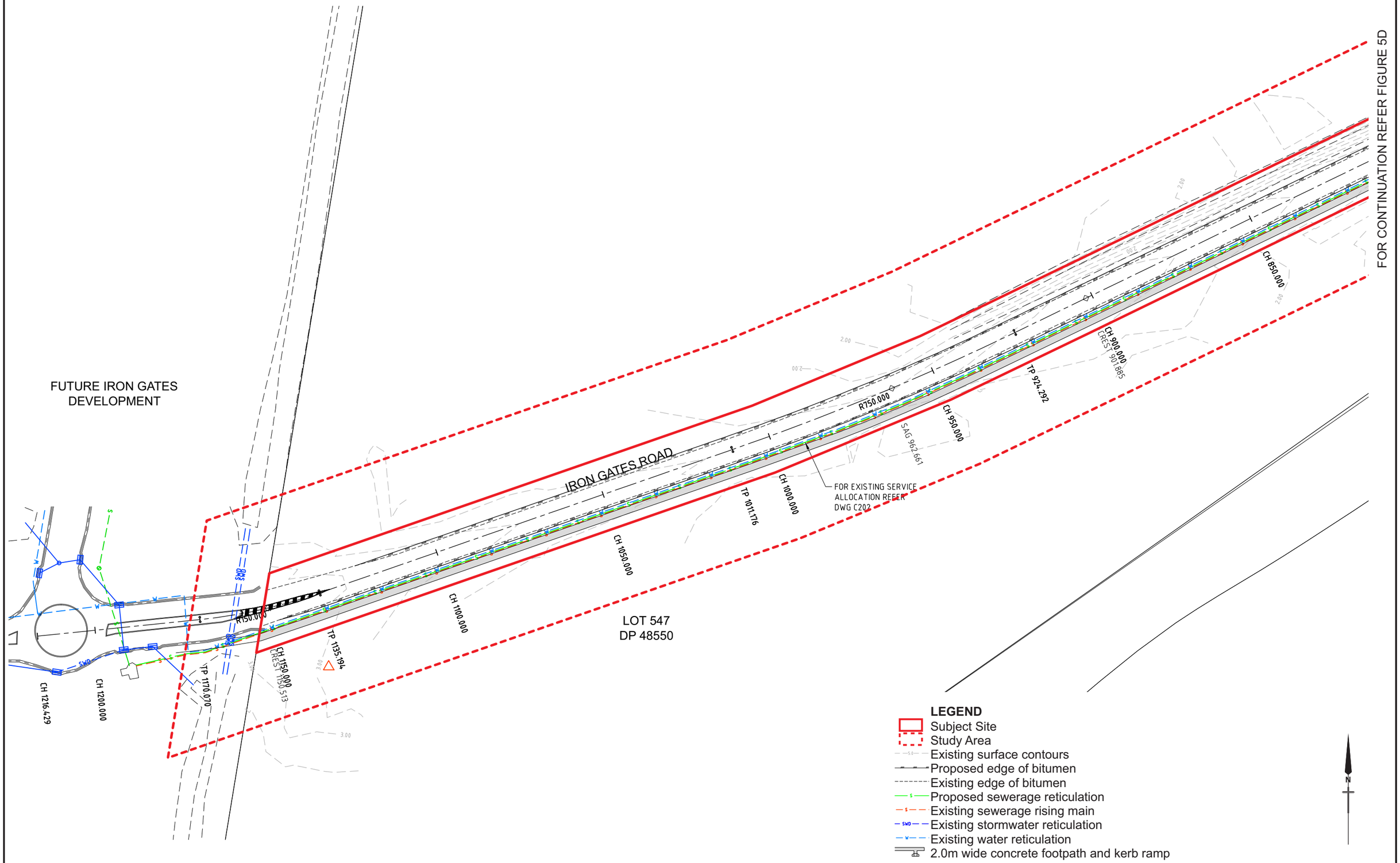
TITLE
PROPOSED DEVELOPMENT LAYOUT



LEGEND

- Subject Site
- Study Area
- Existing surface contours
- Proposed edge of bitumen
- Existing edge of bitumen
- Proposed sewerage reticulation
- Existing sewerage rising main
- Existing stormwater reticulation
- Existing water reticulation
- 2.0m wide concrete footpath and kerb ramp

N

NOTES

1. SERVICES PLOTTED FROM PREVIOUS PLANS / RECORDS
2. CULVERT SIZES FROM PREVIOUS DESIGN PLANS
3. CONDITION OF ALL INFRASTRUCTURE WILL BE ASSESSED AS PART OF CONSTRUCTION CERTIFICATE

0 25m

1 : 1 000

SOURCE: Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)

SCALE: 1 : 1000 @ A3

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FIGURE 5E

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TITLE

PROPOSED DEVELOPMENT LAYOUT

Commissioner of the NSW Rural Fire Service (NSW RFS). The work will involve (along the whole stretch of Iron Gates Drive, other than the mapped SEPP 14 wetland areas) the following:

- Clearing the full road width (20m) of vegetation/trees (generally native plants);
- Widening the existing 6m to 6.5m pavement (i.e. the carriageway for vehicles) to 8m; and
- Installing traffic management devices such as reflective road markers and (in some locations) signage.

The trimming of branches overhanging the road reserve in the SEPP 14 areas will also be completed where necessary. No mangroves or Saltmarsh vegetation is proposed to be cleared or trimmed.

2 FLORA ASSESSMENT

2.1 Introduction

The following sections describe the vegetation communities occurring within the subject site. The community descriptions follow Walker & Hopkins (1990). The conservation value of vegetation communities is also discussed. Details of threatened flora species recorded within the locality are also provided.

2.2 Methods

2.2.1 Literature review

A review of a Flora and Fauna Assessment report prepared by Planit Consulting (2014) for the proposed Iron Gates residential development was completed to find records of any threatened flora species recorded during the assessment.

2.2.2 OEH Database Search

Searches of the BioNet database were completed to find records of State and Commonwealth Threatened species[1] within 10km of the Subject Site.

2.2.3 Site Surveys

Site surveys were completed on 29th September 2016 (in conjunction with the pegging of the proposed road reserve by the project surveyors), 13th October 2016 by one (1) scientist from JWA and 12th February 2019 by one (1) scientist from JWA in the company of Mr. Krister Waern (an OEH officer).

During the 2016 surveys the Study Area was traversed on foot in accordance with the random meander technique described in DEC (2004). A plant species list was compiled and mapping of vegetation communities (including floristics, structure and vegetation boundaries) was completed using a recent aerial photograph of the site.

An assessment was also made of the conservation value of each vegetation community in accordance with the criteria set out in **TABLE 1.**

TABLE 1
CONSERVATION VALUE CATEGORIES AND CRITERIA

Conservation value	Criteria
Low	Pasture grassland, highly disturbed/exotic vegetation, crops
Low - Medium	Scattered native trees within grassland, disturbed/exotic vegetation
Medium	Disturbed and/or fragmented native vegetation with a moderate presence of weed species

[1] As listed within schedules of the *TSC Act (1995)* and *EPBC Act (1999)*.

Conservation value	Criteria
Medium - High	Native vegetation with a lower occurrence of weeds, tending to be larger and less disturbed, containing ROTAP or threatened flora species. Potential to be categorised as an Endangered Ecological Community.
High	Larger areas of native vegetation with very few weeds, containing threatened species and/or containing characteristics indicative of an Endangered Ecological Community and/or representing a community protected under the *Fisheries Management Act 1994*

During the 2019 survey, amendments were made to the vegetation mapping to be more reflective of likely pre-clearing and adjoining intact vegetation communities, to the satisfaction of OEH.

2.3 Results

2.3.1 Literature Review

One (1) threatened flora species was recorded during the surveys completed by Planit Consulting in 2014. The species was reportedly either the Lesser swamp orchid (*Phaius australis*) or the Greater swamp orchid (*Phaius tancarvilleae*). The exact species is unknown as these orchids can only be distinguished from one another by characteristics of their flowers. The Planit survey was completed outside of the flowering period of these orchids.

2.3.2 OEH Database Search

A search of the BioNet database revealed eighteen (18) Threatened Flora species records within 10km of the Subject site **(TABLE 2)**.

TABLE 2
THREATENED FLORA SPECIES WITHIN 10 KM OF THE SITE

Botanical Name	Common Name	TSC Act*	EPBC Act#
Aldrovanda vesiculosa	Waterwheel Plant	E1	-
Arthraxon hispidus	Hairy Jointgrass	V	V
Belvisia mucronata	Needle-leaf Fern	E1	-
Cryptocarya foetida	Stinking Cryptocarya	V	V
Cyperus aquatilis	Water Nutgrass	E1	-
Dendrobium melaleucaphilum	Spider orchid	E1	-
Desmodium acanthocladum	Thorny Pea	V	V
Diuris sp. aff. *chrysantha*	Byron Bay Diuris	E1	-
Gossia fragrantissima	Sweet Myrtle	E1	E

Botanical Name	Common Name	TSC Act*	EPBC Act#
Macadamia tetraphylla	Rough-shelled Bush Nut	V	V
Oberonia complanata	Yellow-flowered King of the Fairies	E1	-
Oberonia titania	Red-flowered King of the Fairies	V	-
Peristeranthus hillii	Brown Fairy-chain Orchid	V	-
Phaius australis	Southern Swamp Orchid	E1	E
Pultenaea maritima	Coast Headland Pea	V	
Rutidosis heterogama	Heath Wrinklewort	V	V
Senna acclinis	Rainforest Cassia	E1	
Syzygium hodgkinsoniae	Red Lilly Pilly	V	V

* NSW Threatened Species Conservation Act 1995 (TSC Act)
# Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act)
E1 – Endangered (state), E4 – Presumed extinct (state), E – Endangered (national), V – Vulnerable

2.3.3 Site Survey

The site surveys recorded the following ecological attributes at the subject site:

- Seven (7) broad vegetation communities;
- Three (3) Endangered Ecological Communities:
  - Swamp sclerophyll forest on coastal floodplains of the NSW North Coast Bioregion;
  - Littoral Rainforest in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions; and
  - Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions;
- Two (2) communities protected under the *Fisheries Management Act 1994* (FM Act):
  - Mangrove forest; and
  - Saltmarsh
- Eighty-two (82) flora species; and
- No threatened flora species were recorded.

The location and extent of broad vegetation communities identified in the Study Area are shown in **FIGURE 6.** Community descriptions are provided below. A complete list of flora species recorded on the subject site is provided in **APPENDIX 3.** Introduced flora species are identified by an asterisk*. Common names are utilised for plant species (where they exist) with respective taxonomic nomenclature provided in **APPENDIX 3.**

EVANS RIVER

LEGEND

- Community 1 - Tall closed/open forest (*Acacia disparrima +/- Cupaniopsis anacardiodes, Lophostemon confertus, Endiandra sieberi, Corymbia intermedia*)
- Community 2 - Tall closed forest (*Melaleuca quinquenervia*)
- Community 3 - Tall shrubland/heathland (*Leptospermum polygalifolium*)
- Community 4 - Tall closed/open forest (*Melaleuca quinquenervia / Eucalyptus robusta*)
- Community 5 - Low closed/open mangrove forest (*Avicennia marina*)
- Community 6 - Saltmarsh
- Acacia Regrowth
- Existing road
- SEPP14 Coastal Wetlands
- Subject Site
- Study Area

N

0 50m 100m

1 : 3500

SOURCE: JWA Site Investigations Feb 2019; NSW Globe Aug 2012 Aerial

SCALE: 1 : 3500 @ A3

JWA PTY LTD
Ecological Consultants

CLIENT
Ingles Group

PROJECT
Lot 7016 DP1112989, Lot 544 DP48550, Lot 408 DP755624, and Lot 547 DP48550
240 Iron Gates Drive, Evans Head NSW
Richmond Valley Council LGA

FIGURE 6

PREPARED: BW
DATE: 12 February 2019
FILE: N16006_Veg.cdr

TITLE

REVISED VEGETATION COMMUNITIES

2.3.4 Vegetation Community Descriptions

Community 1 - Tall closed/open forest (*Acacia disparrima +/- Cupaniopsis anacardiodes, Lophostemon confertus, Endiandra sieberi, Corymbia intermedia*)

Location and area

This community occurs in three (3) separate locations within the road reserve. The mapped extent of this community covers a total area of approximately 1.07 ha (**FIGURE 6**).

Description

The canopy of this community is generally comprised of a mixture of Hickory wattle, Tuckeroo, Brushbox, Hard corkwood and Pink bloodwood to a height of up to twenty (20) metres. Swamp box, Swamp mahogany and Broad-leaved paperbark occur as occasional canopy species.

The midstorey is comprised of a range of rainforest species including Satinwood, Midgen berry, Beach acronychia, Tuckeroo, Coast canthium, Hard corkwood, Rough fruit pittosporum and Cabbage tree palm. The weed species Winter senna* and Lantana* are also present in some areas, particularly disturbed areas.

The ground layer is comprised of Rough saw-sedge, Spiny-headed mat rush, Plume rush, Common bracken, Native ginger and regenerating species from the upper and mid strata. A range of vines and climbers also occur including Austral sarsaparilla, Sweet sarsaparilla, Common milk vine, Climbing guinea flower, Snake vine and Common silkpod. The composition of these species varies across the community depending on micro-climate conditions and other factors.

Conservation value

A number of rainforest elements are present throughout this vegetation community, particularly in the midstorey and ground layers, and OEH therefore consider this community to conform to the definition of the Endangered Ecological Community (EEC) – Littoral Rainforest in the NSW North Coast Bioregion, despite the fact that the canopy layer is dominated by regrowth and/or non-rainforest species.

The conservation value of this community is considered to be reduced somewhat compared to the pre-clearing vegetation which would likely have been a coastal eucalypt forest, littoral rainforest or ecotonal community to the adjacent wetland vegetation.

Community 2 - Tall closed forest (*Melaleuca quinquenervia*)

Location and area

This community occurs along a large portion of the northern and southern sides of the road reserve. The mapped extent of this community covers a total area of approximately 2.68 ha (**FIGURE 6**).

Description

The canopy of this community is dominated by Broad-leaved paperbark to a height of approximately fifteen (15) metres.

The midstorey contains minor occurrences of Swamp box. Native lasiandra and Golden shaggy pea occur on the edges of this community in some areas.

The ground layer is dominated by Rough saw-sedge with occurrences of *Baloskion* spp. Common silkpod also occurs throughout the community.

Conservation value

This vegetation community is mature and in relatively good condition (free of weeds). It is also representative of the EEC Swamp sclerophyll forest on coastal floodplains of the NSW North Coast Bioregion and by definition is of a High conservation value.

Community 3 – Tall shrubland/heathland (*Leptospermum polygalifolium*)

Location and area

This community occurs along the south-western portion of the road reserve. The mapped extent of this community covers an area of 0.89 ha (**FIGURE 6**).

Description

The upper strata of this community is dominated by Coastal teatree with occurrences of Coast banksia, Broad-leaved paperbark and Heath-leaved banksia to a height of approximately three (3) metres.

The midstorey is comprised of mixed heathland species including Rice flower, *Monotoca scoparia*, *Leucopogon pimeleoides* and Australian dodder.

The ground layer is sparse with sporadic occurrences of Spiny-headed mat-rush, Zig-zag bog-rush and the weed species Whiskey grass*.

Conservation value

The conservation value of this community is considered to be moderate due to past disturbance and occurrence of weeds.

Community 4 – Tall closed/open forest (*Melaleuca quinquenervia / Eucalyptus robusta*)

Location and area

This community occurs along the north-eastern portion of the road reserve. The mapped extent of this community covers an area of approximately 0.20 ha (**FIGURE 6**).

Description

The canopy of this community is dominated by Broad-leaved paperbark and Swamp mahogany to a height of approximately sixteen (16) metres. There are also occurrences of Hickory wattle.

The midstorey is comprised of Satinwood, Umbrella cheese tree, Blueberry ash and Lantana* with sporadic occurrences of Bangalow palm, Cocos palm* and Strangling fig.

The ground layer is comprised of *Schoenoplectus subulatus,* Harsh ground fern, Common bracken, Crofton weed*, Snake vine, Rough saw-sedge, Climbing guinea flower, Milk vine, Common silkpod, Austral sarsaparilla, Purple coral pea and Bat's wing fern.

Conservation value

This mature vegetation community is representative of the EEC Swamp sclerophyll forest on coastal floodplains of the NSW North Coast Bioregion and by definition is of a High conservation value. However, the level of disturbance and weed incursion in this community is considered to lower its conservation value to Medium-High.

Community 5 – Low closed/open mangrove forest (*Avicennia marina*)

Location and area

This community occurs in association with the Evans River and tributaries. The mapped extent of this community covers an area of approximately 0.47 ha (**FIGURE 6**).

Description

This community is dominated by Grey mangrove to a height of up to approximately three (3) metres.

Conservation value

Mangroves are protected in NSW under the *Fisheries Management Act 1994*. This vegetation community is mature and in relatively good condition (free of weeds). The conservation value of this community is therefore considered to be High.

Community 6 – Low closed/open saltmarsh (*Sporobolus virginicus, Juncus krausii +/- Sarcocornia quinqueflora, Baumea juncea*)

Location and area

This community occurs in association with the Evans River and tributaries. The mapped extent of this community covers an area of approximately 0.18 ha (**FIGURE 6**).

Description

This community is comprised of a mixture of Salt couch and Sea rush up to approximately 1 metre in height. There also scattered occurrences of Beaded samphire and Bare twig-rush.

Conservation value

This vegetation community is representative of the EEC - Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions and by definition is of a High conservation value. Saltmarsh communities are also protected in NSW under the *Fisheries Management Act 1994*. This vegetation community is mature and in relatively good condition (free of weeds). The conservation value of this community is therefore considered to be High.

Community 7 – Acacia regrowth (*Acacia disparrima*)

Location and area

A small area of Acacia regrowth occur on the existing batters of Iron Gates Drive in the north-eastern portion of the subject site. The mapped extent of this community covers an area of 0.16 ha (**FIGURE 6**).

Description

The upper strata of this community is comprised almost entirely of regrowth Hickory wattle to a height of approximately three (3) metres. The midstorey generally absent and the ground layer is sparse with sporadic occurrences of Spiny-headed mat-rush and the weed species Whiskey grass*.

Conservation value

The conservation value of this community is considered to be low due to past disturbance and occurrence of weeds.

3 FAUNA ASSESSMENT

3.1 Introduction

This section includes a description of the methods used in determining which fauna species use or are likely to use, the Study Area and a discussion of the results of the Fauna Assessment.

3.2 Methods

3.2.1 Literature review

A review of a Flora and Fauna Assessment report prepared by Planit Consulting (2014) for the proposed Iron Gates residential development was completed to find records of any threatened fauna species recorded during the assessment.

3.2.2 OEH Database Search

Searches of the BioNet database were completed to find records of State and Commonwealth Threatened species[2] within 10km of the Subject site.

3.2.3 Habitat Assessment for Significant Species

Site habitats were assessed to determine their value for native fauna species. This assessment was completed in conjunction with the flora survey. The assessment focused on identifying habitat features associated with Threatened species as well as other native fauna groups. An assessment of the corridor values of the site is also provided. Particular attention was paid to habitat features such as:

- The presence of mature trees with hollows, fissures and/or other suitable roosting/nesting places;
- The presence of Koala food trees;
- The presence of preferred Glossy black-cockatoo feed trees (Forest oak and/or Black she-oak);
- Condition, flow and water quality of drainage lines and bodies of water;
- Areas of dense vegetation;
- Presence of hollow logs/debris and areas of dense leaf litter;
- Presence of fruiting flora species;
- Presence of blossoming flora species, particularly winter-flowering species; and
- Vegetation connectivity and proximity to neighboring areas of intact vegetation

3.2.4 Site Surveys

Site surveys were completed on 29th September and 13th October 2016 by one (1) scientist from JWA. The Study Area was traversed on foot. All incidental fauna sightings

[2] As listed within schedules of the *TSC Act (1995)* and *EPBC Act (1999)*.

were recorded. Any logs, sheets of tin, cardboard, bark and leaves were overturned in search of reptiles and amphibians while traversing the site. Searches were undertaken for diggings, scats, and bones. Eucalypt trees were inspected for signs of koala activity such as scratch marks and scats. Active observation of bird and amphibian activity, both aurally and visually, was undertaken during the site visit.

An additional site survey was completed on the 12th February 2019 by one (1) scientist from JWA in the company of Mr. Krister Waern (an OEH officer). Any incidental fauna observations were noted.

3.3 Results and Discussion

3.3.1 Literature Review

A total of seven (7) threatened fauna species were recorded during the surveys completed by Planit Consulting in 2014. The species recorded and observation method/location is provided below in **TABLE 3.**

TABLE 3
THREATENED FAUNA SPECIES RECORDED BY PLANIT CONSULTING

Scientific name	Common name	Observation method
Chalinolobus nigrogriseus	Hoary Wattled Bat	Recorded via ANABAT survey
Crinia tinnula	Wallum Froglet	Recorded vocalising within man-made drainage line
Miniopterus australis	Little Bentwing-bat	Recorded via ANABAT survey
Myotis macropus	Southern Myotis	Recorded via ANABAT survey
Petaurus norfolcensis	Squirrel Glider	Recorded via spotlight survey (two individuals recorded within eucalypt forest)
Phascolarctos cinereus	Koala	Trace recorded within eucalypt forest (scratches on Blue gum and Scribbly gum)
Pteropus poliocephalus	Grey-headed Flying-fox	Recorded flying over site via spotlight

3.3.2 OEH Database Search

A search of the BioNet database revealed sixty-eight (68) Threatened fauna species records within 10km of the Subject site (**TABLE 4**).

TABLE 4
THREATENED FAUNA SPECIES WITHIN 10 KM OF THE SITE

Scientific name	Common name	TSC Act*	EPBC Act#
Amaurornis moluccana	Pale-vented Bush-hen	V	-

Scientific name	Common name	TSC Act*	EPBC Act#
Anthochaera phrygia	Regent Honeyeater	E4	CE
Arctocephalus pusillus doriferus	Australian Fur-seal	V	-
Ardenna carneipes	Flesh-footed Shearwater	V	-
Artamus cyanopterus cyanopterus	Dusky Woodswallow	V	-
Botaurus poiciloptilus	Australasian Bittern	E1	E
Burhinus grallarius	Bush Stone-curlew	E1	-
Calidris ferruginea	Curlew Sandpiper	E1	CE
Calyptorhynchus lathami	Glossy Black-Cockatoo	V	-
Caretta caretta	Loggerhead Turtle	E1	E
Carterornis leucotis	White-eared Monarch	V	-
Chalinolobus dwyeri	Large-eared Pied Bat	V	V
Chalinolobus nigrogriseus	Hoary Wattled Bat	V	-
Charadrius leschenaultii	Greater Sand-plover	V	V
Charadrius mongolus	Lesser Sand-plover	V	E
Chelonia mydas	Green Turtle	V	V
Circus assimilis	Spotted Harrier	V	-
Climacteris picumnus victoriae	Brown Treecreeper (eastern subspecies)	V	-
Coracina lineata	Barred Cuckoo-shrike	V	-
Crinia tinnula	Wallum Froglet	V	-
Daphoenositta chrysoptera	Varied Sittella	V	-
Dasyurus maculatus	Spotted-tailed Quoll	V	E
Dermochelys coriacea	Leatherback Turtle	E1	E
Dromaius novaehollandiae	Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area	E2	-
Ephippiorhynchus asiaticus	Black-necked Stork	E1	-
Erythrotriorchis radiatus	Red Goshawk	E4	V
Esacus magnirostris	Beach Stone-curlew	E4	-
Glossopsitta pusilla	Little Lorikeet	V	-
Grus rubicunda	Brolga	V	-
Haematopus fuliginosus	Sooty Oystercatcher	V	-
Haematopus longirostris	Pied Oystercatcher	E1	-

Scientific name	Common name	TSC Act*	EPBC Act#
Hieraaetus morphnoides	Little Eagle	V	-
Hoplocephalus stephensii	Stephens' Banded Snake	V	-
Irediparra gallinacea	Comb-crested Jacana	V	-
Ixobrychus flavicollis	Black Bittern	V	-
Limicola falcinellus	Broad-billed Sandpiper	V	-
Litoria olongburensis	Olongburra Frog	V	V
Lophoictinia isura	Square-tailed Kite	V	-
Macronectes giganteus	Southern Giant Petrel	E1	E
Megaptera novaeangliae	Humpback Whale	V	V
Miniopterus australis	Little Bentwing-bat	V	-
Miniopterus schreibersii oceanensis	Eastern Bentwing-bat	V	-
Myotis macropus	Southern Myotis	V	-
Ninox connivens	Barking Owl	V	-
Ninox strenua	Powerful Owl	V	-
Numenius madagascariensis	Eastern Curlew	-	CE
Nyctophilus bifax	Eastern Long-eared Bat	V	-
Pandion cristatus	Eastern Osprey	V	-
Petauroides volans	Greater Glider		V
Petaurus australis	Yellow-bellied Glider	V	-
Petaurus norfolcensis	Squirrel Glider	V	-
Pezoporus wallicus wallicus	Eastern Ground Parrot	V	-
Phascogale tapoatafa	Brush-tailed Phascogale	V	-
Phascolarctos cinereus	Koala	V	V
Planigale maculata	Common Planigale	V	-
Pomatostomus temporalis temporalis	Grey-crowned Babbler (eastern subspecies)	V	-
Pseudomys novaehollandiae	New Holland Mouse		V
Pteropus poliocephalus	Grey-headed Flying-fox	V	V
Ptilinopus magnificus	Wompoo Fruit-Dove	V	-
Ptilinopus regina	Rose-crowned Fruit-Dove	V	-
Saccolaimus flaviventris	Yellow-bellied Sheathtail-bat	V	-
Scoteanax rueppellii	Greater Broad-nosed Bat	V	-
Sternula albifrons	Little Tern	E1	-

Scientific name	Common name	TSC Act*	EPBC Act#
Syconycteris australis	Common Blossom-bat	V	-
Thalassarche cauta	Shy Albatross	V	V
Thalassarche melanophris	Black-browed Albatross	V	V
Tyto longimembris	Eastern Grass Owl	V	-
Tyto novaehollandiae	Masked Owl	V	-
* NSW Threatened Species Conservation Act 1995 (TSC Act) # Commonwealth Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) E1 – Endangered (state), E2 – Endangered Population, E4 – Critically Endangered (state), E – Endangered (national), V – Vulnerable, CE – Critically Endangered (national)			

3.3.3 Results of Fauna Survey

Fauna species recorded during the site assessment are provided in **APPENDIX 4**. In total, ten (10) native bird species were recorded. No threatened fauna species were observed.

3.3.4 Fauna Habitat Assessment

Amphibians

Amphibians occurring in the region are poikilothermic, predominantly insectivorous and generally require free water for reproduction, with the exception of two highland genera (*Assa darlingtoni* and *Philoria* spp.) The habitat requirements of most species are unlikely to be determined by forest cover or floristics, but are more strongly influenced by factors such as climate, distance to water bodies, riparian vegetation, hydrological and morphological characteristics of water bodies and the availability of suitable microhabitat for aestivation and shelter.

The majority of species that occur within the region lay eggs in or near temporary or permanent water bodies and rely on free water for larval development and metamorphosis. Of these species, only a few are dependent on forested habitats beyond the riparian zone or beyond areas of temporary inundation. These species include the Red-eyed tree frog (*Litoria chloris*), Leseuer's frog (*Litoria leseueri*), Fletcher's frog (*Lechriodus fletcheri*) and the Barred frogs of the *Mixophyes* genus.

Grasslands provide suitable habitat for a range of Amphibian species, particularly along drainage depressions and soaks. Species commonly encountered in grassland communities include the Common eastern froglet, Eastern sign bearing froglet, Striped marsh frog, Spotted grass frog, Eastern dwarf tree frog, Rocket frog, Whistling tree frog and Cane toad.

The study area is likely to provide good quality habitat for a range of common frog species, particularly in association with forested wetlands and drainage lines occurring in the area, with the exception of any tidally influenced areas in association with the unnamed tributary to Evans River in the eastern portion of the road reserve.

Reptiles

As reptiles are poikilothermic and predominantly insectivorous or carnivorous, their habitat requirements are less directly determined by vegetation species composition than other taxa which feed directly on plants. Reptile distributions are strongly influenced by structural characteristics of the vegetation, climate and other factors affecting thermoregulation such as shade and availability of shelter and basking sites (Smith *et al* 1994).

In a survey of the moist forest herpetofauna of North-eastern NSW, Smith *et al* (1989) found that few species discriminated between rainforest and wet sclerophyll forest, however, most species exhibited a response to differences in elevation and the availability of microhabitat components and other substrates.

The availability of microhabitats, of varying thermal properties is particularly important for most reptile species, as behavioural thermoregulation (regulation of body heat) is important in controlling critical body functions such as digestion, foraging activity and reproduction.

Reptile diversity and abundance is often (but not always) significantly higher in drier habitat types, particularly those with a wide variety of ground substrate microhabitats. This contrasts markedly with the distribution patterns of birds, and most mammals.

The single limiting factor in terms of species diversity in coastal vegetation is the lack of shelter sites (e.g. logs, tree hollows, and decorticating bark). Such habitat components characterise eucalypt forests and woodlands, where species diversity may be much higher, depending on disturbance factors.

Sclerophyll forests across the site are considered to provide good quality habitat for reptiles due to the presence of: the combination of shelter and basking sites; fallen logs for shelter; good canopy and leaf litter development; availability of water; dense understorey development and reliable sources of prey.

The road reserve itself provides poor quality habitat but may occasionally be used by reptiles from the adjacent forested areas (e.g. for basking).

Birds

The significance of near coastal environments of the N.S.W. Far North Coast and South-East Queensland as over-wintering habitat for migratory birds has been established by many observers and bird banders including Keast (1968), Robertson (1973), Gravatt (1974), Porter (1982) and Robertson and Woodall (1983). These patterns may be attributable to the relatively high winter temperatures and long growing season of this region compared with the rest of south-eastern Australia (Fitzpatrick and Nix 1973; Edwards 1979; Nix 1982).

Many insectivorous birds from higher latitudes and elevation reside over winter in the locality. These include species such as the Fantail cuckoo, Sacred kingfisher, Rainbow bee-eater, Noisy pitta, Tree martin, Black-faced cuckoo-shrike, Cicada bird, Golden

whistler, Rufous whistler, Rose robin, Grey fantail, White-throated gerygone, Silvereye, Olive-backed oriole and Spangled drongo.

Birds such as honeyeaters and lorikeets are Blossom nomads (*ibid.*). These birds move locally in response to variation in the availability of nectar and or pollen, important components in their diet. Porter (1982) highlights the importance of Forest red gum, Broad-leaved paperbark and Coast banksia for Scaly-breasted and Rainbow lorikeets as these species flower during the lorikeet's winter breeding period. A sequence of important nectar-bearing plants in the genera Eucalyptus, Banksia, Melaleuca, and Callistemon provide a continuity of food for nectarivorous birds.

The variety of habitats present in the study area is likely to result in a moderate to high diversity of resident and nomadic birds. The study area provides a high diversity and abundance of flowering and fruiting plant species. The subject site and adjacent areas of vegetation represent good quality habitat for frugivorous birds and moderate to high value for nectarivorous and insectivorous birds.

A small number of tree hollows were observed within vegetation community 1. These may provide nesting opportunities for owls or other hollow-dependent birds. Areas of the study site with mature forest represents good quality nesting habitat for hollow-dependent avifauna.

Mammals

Small terrestrial mammals generally occur in highest densities in association with a complex vegetation structure. A dense understorey layer, which provides shelter from predators and provides nesting opportunities, is particularly important.

In general, medium-large terrestrial mammals such as macropods select habitats which provide a dense cover for shelter and refuge and open areas for feeding. The larger species tend to occupy drier more open habitats: the smaller species, moister and more densely vegetated habitats.

All arboreal mammals that occur in the region (with the exception of the Koala) utilise tree hollows for nesting and shelter (although the Common ringtail possum is not dependent on hollows). Smith & Lindenmeyer (1988) consider that shortage of nest hollows is likely to limit arboreal mammal populations where the density of hollow-bearing trees is less than 2 to 8 trees per hectare.

Arboreal folivores (e.g. Common ringtail possum, Greater glider) are widespread and abundant but exhibit local variation in response to such factors as tree species composition, foliage protein and fiber levels, leaf toughness, toxins, forest structure and the availability of shelter sites. Arboreal folivores are expected to be most abundant in areas of high productivity, high soil fertility, and moderate climate, in conjunction with adequate shelter and suitable foraging substrate.

Arboreal nectarivore/insectivores feed on a wide variety of plant and insect exudates including the nectar of flowering eucalypts, and shrubs such as *Banksia* and *Acacia* sp.

These species also feed extensively on insects, particularly under the shedding bark of eucalypts. The distribution of nectarivore/insectivores is considered to be related to the abundance of nectar and pollen producing plants, the abundance of bark shedding eucalypts which harbour insect prey, and the occurrence of sap and gum exudate-producing trees (Sap feed trees) and shrubs (e.g. *Acacia* sp.). Arboreal nectarivores and insectivores are generally hollow-dependent species.

Insectivorous bats like insectivorous birds overlap considerably in diet and broad vegetation preferences (Hall 1981) but specialise in foraging in specific layers or substrates within the forest (Crome and Richards 1988).

The structural complexity of the Sclerophyll forests in the study area is likely to support a diversity and abundance of ground-dwelling and arboreal mammals. In addition, the study area is likely to provide forage habitat for a relatively high diversity and abundance of insectivorous bats, due to the combination of open, forested and denser areas of vegetation. The site contains native fruiting/flowering plant species and represents potential foraging habitat for frugivorous/nectarivorous bats.

The primary Koala food tree *Eucalyptus robusta* occurs within the study area and adjacent areas. However, no evidence of recent Koala activity was observed within the study area (refer **SECTION 5.3**).

3.3.5 Assessment of Corridor Values

The study area has direct connectivity with expansive areas of native vegetation to the north including Broadwater National Park (**FIGURES 1 & 2**). There is also a corridor of vegetation occurring between the study area and the Evans River that would facilitate fauna movement in an east-west direction. It is considered that the mosaic of habitat types occurring within the study area and adjacent areas would provide suitable dispersal habitat for all fauna groups.

3.3.6 Possible Occurrences of Threatened Species in the Study Area

Based on the assessment of habitats in the Study area, threatened fauna species known from the locality were assessed for the likelihood of their occurrence in the Study area **(APPENDIX 5).** A rating of *Likely* was given for those species where breeding or high-quality habitat is present in the study area; a rating of *Possible* was given for those species where suitable foraging or roosting habitat is present in the study area; and a rating of *Unlikely* was given for species where no suitable habitat occurs in the study area. A number of oceanic species will not occur in the Study area and are not considered in the table in **APPENDIX 5**.

In summary, two (2) threatened fauna species are considered likely to occur:

- Grey-headed flying-fox (*Pteropus poliocephalus*); and
- Little bent-wing bat (*Miniopterus australis*).

An additional thirty-four (34) threatened fauna species are considered possible occurrences within the Study area over time due to the availability of suitable habitat.

4 IMPACTS OF THE PROPOSED DEVELOPMENT

4.1 Introduction

This section examines the potential impacts of the proposed road widening. The possible direct and indirect impacts of the proposal are described. Mitigation measures are also proposed to ameliorate potential impacts.

4.2 Direct Impacts

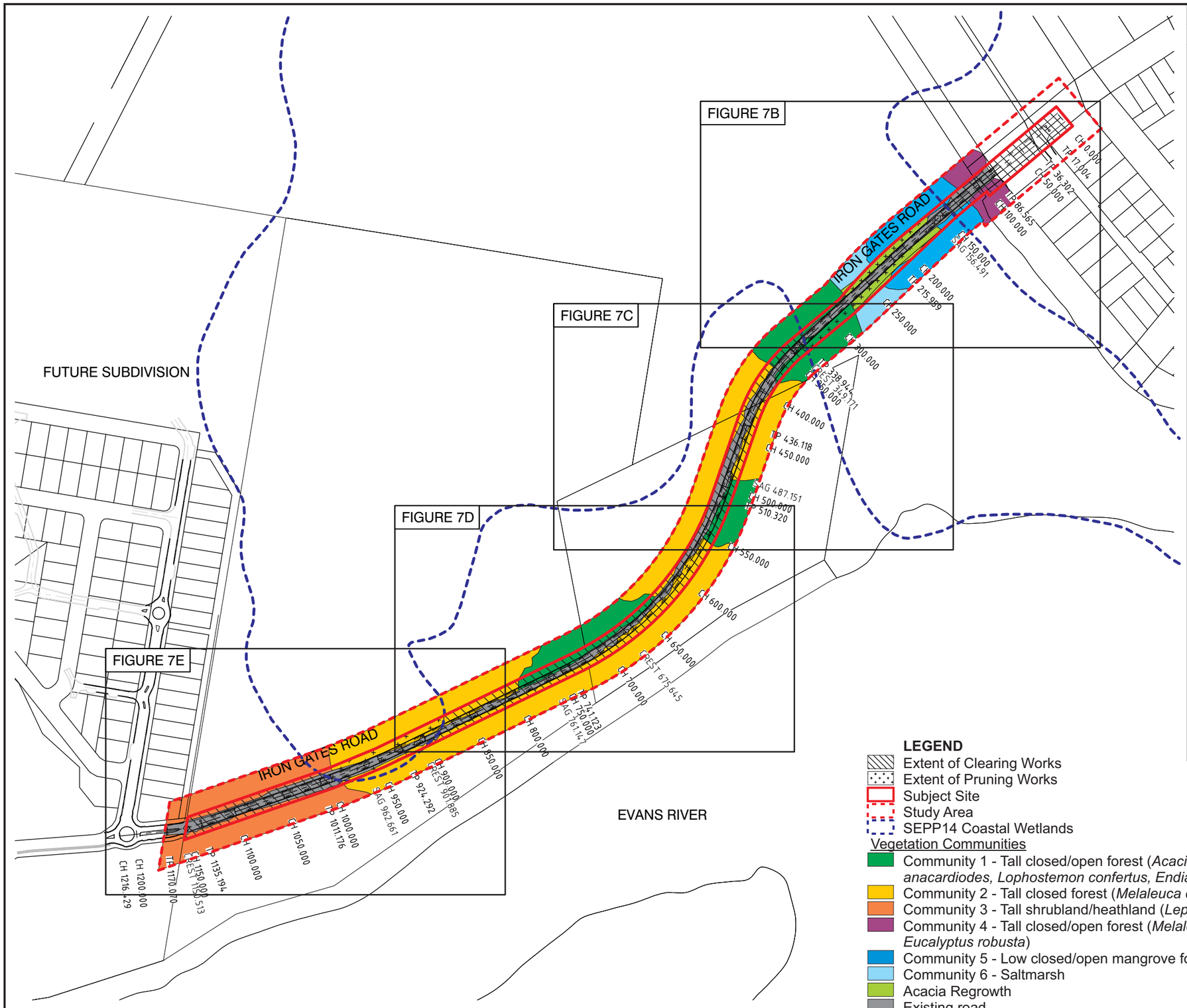
Direct impacts have been assessed on the basis of the extent of works shown in **FIGURE 7**. The proposed road widening will result in the direct removal and/or pruning of vegetation as shown in **TABLE 5.** The majority of works required within this zone will involve pruning of existing vegetation and some removal of regrowth vegetation (predominantly Hickory wattle) within the road reserve. It is expected that only a limited number of mature trees would need to be removed to accommodate the proposed road widening. No mangroves will be removed.

It should be noted that some trimming of branches overhanging the road reserve within the SEPP 14 areas is also likely to be required. However, there will be no destruction or removal of trees within the mapped SEPP 14 land.

The proposed works are not considered to represent an impact to the corridor values of the site, due to the minor nature of the works and occurrence within an existing road reserve.

TABLE 5
DIRECT IMPACTS OF PROPOSED ROAD WIDENING

Vegetation communities	Total area onsite (ha)	Impact area - Clearing works (ha)	Impact area - Pruning only (ha)
1. Tall closed/open forest (*Acacia disparrima +/- Cupaniopsis anacardiodes, Lophostemon confertus, Endiandra sieberi, Corymbia intermedia*)	1.07	0.24	0.07
2. Tall closed forest (*Melaleuca quinquenervia*)	2.68	0.48	0.13
3. Tall shrubland/heathland (*Leptospermum polygalifolium*)	0.89	0.12	0.00
4. Tall closed/open forest (*Melaleuca quinquenervia / Eucalyptus robusta*)	0.20	0.03	0.00
5. Low closed/open mangrove forest (*Avicennia marina*)	0.47	0.00	0.00
6. Low closed/open saltmarsh (*Avicennia marina*)	0.18	0.00	0.00
7. Acacia regrowth (*Acacia disparrima*)	0.16	0.00	0.15
Existing road	0.92	0.64	
Unmapped (eastern end)	0.70	0.23	
TOTAL	**7.29**	**0.89**	**0.39**



CONTROL LINE SETOUT - ACCESS ROAD

PT	CHAINAGE	EASTING	NORTHING	LEVEL	BEARING	RAD/SPIRAL	A.LENGTH	D.ANGLE
IP1	0.000	541423.554	6778903.755	4.543	229°14'24.26"			
TC	17.004	541410.674	6778892.653	4.383	229°14'24.26"			
IP2	26.653	541403.365	6778886.352	4.284		500.000	19.298	2°12'40.97"
CT	36.302	541395.818	6778880.339	4.167	231°27'05.22"			
	50.000	541385.104	6778871.802	3.969	231°27'05.22"			
TC	86.565	541356.507	6778849.016	3.273	231°27'05.22"			
	100.000	541346.033	6778840.603	2.991	231°00'41.74"			
	150.000	541307.624	6778808.594	1.945	229°22'28.46"			
IP3	151.262	541305.886	6778808.680	1.926		-1750.000	129.393	4°14'11.02"
	200.000	541270.145	6778775.501	2.083	227°44'15.18"			
CT	215.959	541258.383	6778764.715	2.155	227°12'54.20"			
	250.000	541233.400	6778741.592	2.309	227°12'54.20"			
	300.000	541196.705	6778707.630	2.534	227°12'54.20"			
TC	338.944	541168.123	6778681.177	2.709	227°12'54.20"			
	350.000	541160.221	6778673.447	2.739	224°02'52.33"			
IP4	387.531	541131.746	6778647.509	2.360		-200.000	97.173	27°50'17.05"
	400.000	541130.288	6778633.559	2.184	209°43'26.13"			
CT	436.118	541115.301	6778600.751	1.905	199°22'37.15"			
	450.000	541110.696	6778587.655	1.835	199°22'37.15"			
	500.000	541094.106	6778540.488	1.709	199°22'37.15"			
TC	510.320	541090.682	6778530.752	1.745	199°22'37.15"			
	550.000	541075.043	6778494.317	1.884	207°05'01.45"			
	600.000	541048.624	6778451.937	2.059	216°47'41.59"			
IP5	625.722	541050.314	6778415.972	2.149		295.000	230.803	44°49'38.29"
	650.000	541015.434	6778414.621	2.234	226°30'21.73"			
	700.000	540976.426	6778383.438	2.217	236°13'01.86"			
CT	741.123	540940.766	6778363.024	2.012	244°12'15.44"			
	750.000	540932.774	6778359.161	1.967	244°12'15.44"			
	800.000	540887.756	6778337.403	2.126	244°12'15.44"			
	850.000	540842.738	6778315.645	2.403	244°12'15.44"			
	900.000	540797.721	6778293.887	2.676	244°12'15.44"			
TC	924.292	540775.850	6778283.316	2.525	244°12'15.44"			
	950.000	540752.516	6778272.528	2.322	246°10'05.70"			
IP6	967.734	540736.693	6778264.390	2.262		750.000	86.884	6°38'14.74"
	1000.000	540706.140	6778253.864	2.407	249°59'16.69"			
CT	1011.176	540695.611	6778250.118	2.458	250°50'30.18"			
	1050.000	540658.937	6778237.376	2.633	250°50'30.18"			
	1100.000	540611.706	6778220.967	2.858	250°50'30.18"			
TC	1135.194	540578.461	6778209.417	3.055	250°50'30.18"			
	1150.000	540564.259	6778205.256	3.141	256°29'49.70"			
IP7	1152.632	540561.915	6778203.669	3.138		150.000	34.876	13°19'17.49"
CT	1170.070	540544.489	6778201.887	2.921	264°09'47.67"			
	1200.000	540514.714	6778198.844	2.399	264°09'47.67"			
IP8	1216.429	540498.370	6778197.173	NaN	264°09'47.67"			

LEGEND

- Extent of Clearing Works
- Extent of Pruning Works
- Subject Site
- Study Area
- SEPP14 Coastal Wetlands

Vegetation Communities

- Community 1 - Tall closed/open forest (*Acacia disparrima +/- Cupaniopsis anacardiodes, Lophostemon confertus, Endiandra sieberi, Corymbia intermedia*)
- Community 2 - Tall closed forest (*Melaleuca quinquenervia*)
- Community 3 - Tall shrubland/heathland (*Leptospermum polygalifolium*)
- Community 4 - Tall closed/open forest (*Melaleuca quinquenervia / Eucalyptus robusta*)
- Community 5 - Low closed/open mangrove forest (*Avicennia marina*)
- Community 6 - Saltmarsh
- Acacia Regrowth
- Existing road

N

SOURCE: JWA Site Investigations Feb 2019; Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)
SCALE: 1 : 4000 @ A3

JWA PTY LTD
Ecological Consultants

CLIENT
Ingles Group

PROJECT
Lot 7016 DP1112989, Lot 544 DP48550, Lot 408 DP755624, and Lot 547 DP48550
240 Iron Gates Drive, Evans Head NSW
Richmond Valley Council LGA

FIGURE 7A

PREPARED: BW
DATE: 12 February 2019
FILE: N16006_Impact Veg.cdr

TITLE
REVISED IMPACT ON VEGETATION COMMUNITIES

NOTES

1. SERVICES PLOTTED FROM PREVIOUS PLANS / RECORDS
2. CULVERT SIZES FROM PREVIOUS DESIGN PLANS
3. CONDITION OF ALL INFRASTRUCTURE WILL BE ASSESSED AS PART OF CONSTRUCTION CERTIFICATE

LEGEND

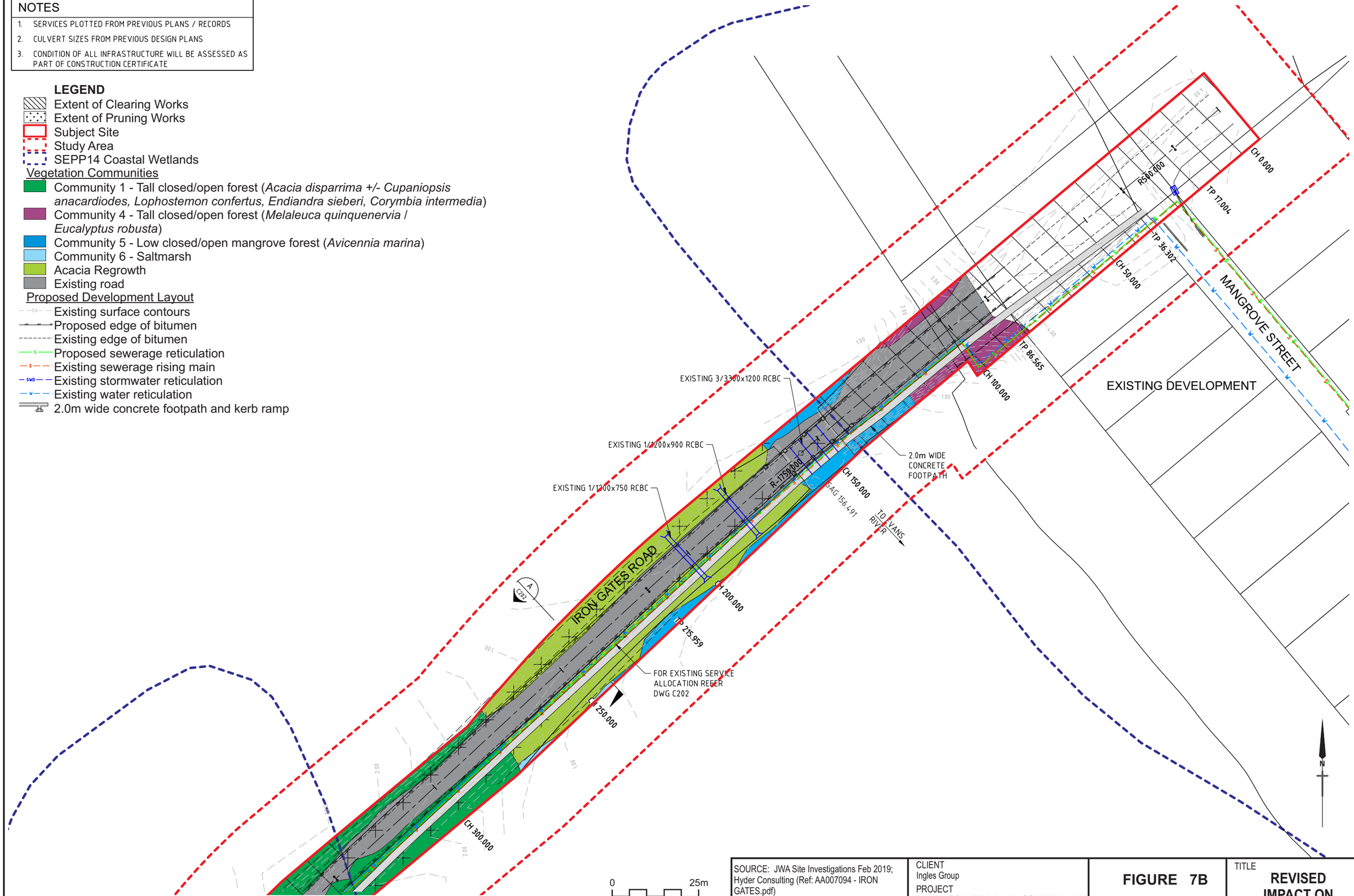
- Extent of Clearing Works
- Extent of Pruning Works
- Subject Site
- Study Area
- SEPP14 Coastal Wetlands

Vegetation Communities

- Community 1 - Tall closed/open forest (*Acacia disparrima +/- Cupaniopsis anacardiodes, Lophostemon confertus, Endiandra sieberi, Corymbia intermedia*)
- Community 4 - Tall closed/open forest (*Melaleuca quinquenervia / Eucalyptus robusta*)
- Community 5 - Low closed/open mangrove forest (*Avicennia marina*)
- Community 6 - Saltmarsh
- Acacia Regrowth
- Existing road

Proposed Development Layout

- Existing surface contours
- Proposed edge of bitumen
- Existing edge of bitumen
- Proposed sewerage reticulation
- Existing sewerage rising main
- Existing stormwater reticulation
- Existing water reticulation
- 2.0m wide concrete footpath and kerb ramp



SOURCE: JWA Site Investigations Feb 2019; Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)
SCALE: 1 : 1000 @ A3

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Ecological Consultants

CLIENT
Ingles Group

PROJECT
Lot 7016 DP1112989, Lot 544 DP48550, Lot 408 DP755624, and Lot 547 DP48550
240 Iron Gates Drive, Evans Head NSW
Richmond Valley Council LGA

FIGURE 7B

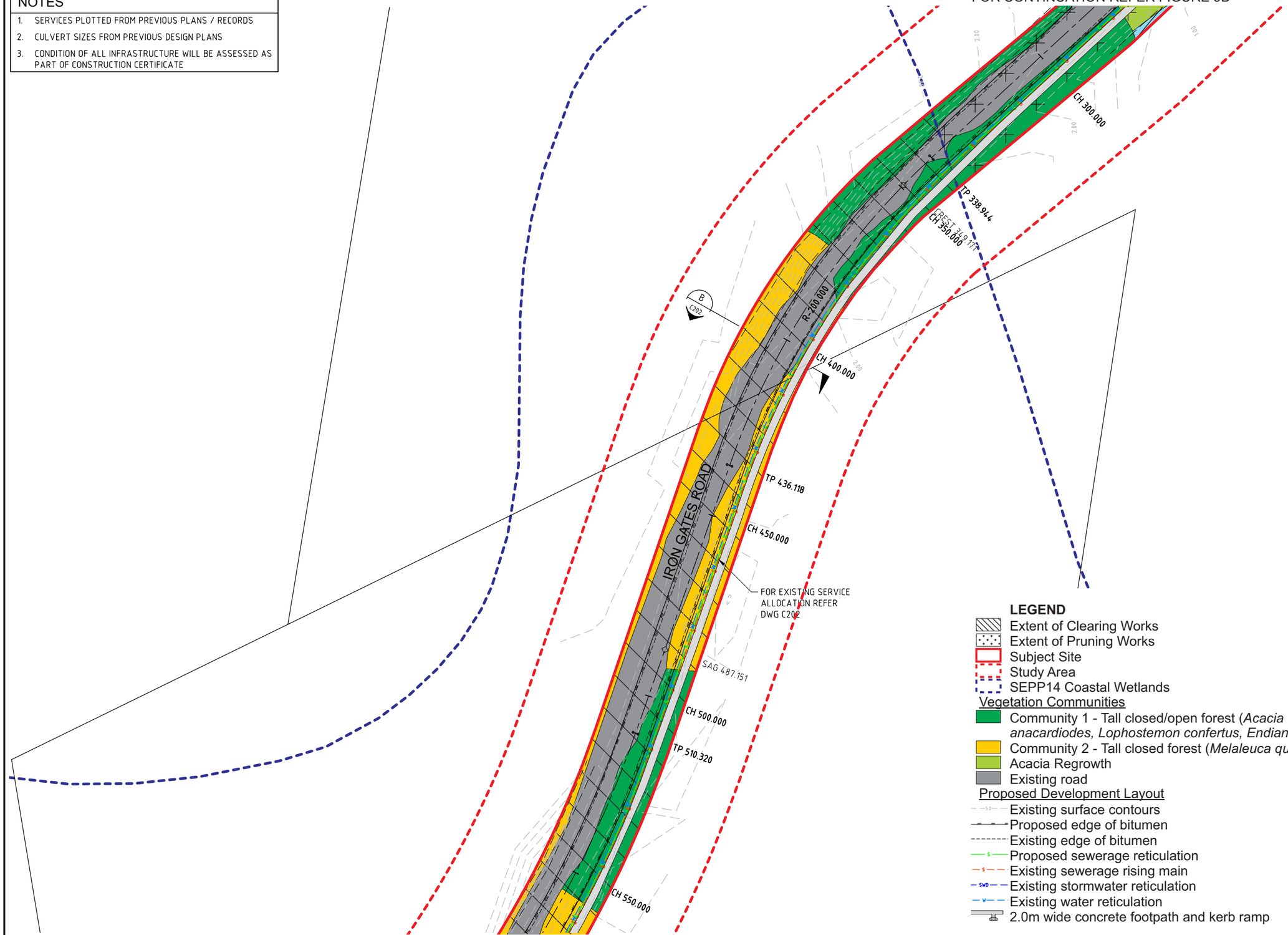
PREPARED: BW
DATE: 12 February 2019
FILE: N16006_Impact Veg.cdr

TITLE
REVISED IMPACT ON VEGETATION COMMUNITIES

NOTES

1. SERVICES PLOTTED FROM PREVIOUS PLANS / RECORDS
2. CULVERT SIZES FROM PREVIOUS DESIGN PLANS
3. CONDITION OF ALL INFRASTRUCTURE WILL BE ASSESSED AS PART OF CONSTRUCTION CERTIFICATE

FOR CONTINUATION REFER FIGURE 5B



FOR CONTINUATION REFER FIGURE 5D

0 25m

1 : 1 000

LEGEND

- Extent of Clearing Works
- Extent of Pruning Works
- Subject Site
- Study Area
- SEPP14 Coastal Wetlands

Vegetation Communities

- Community 1 - Tall closed/open forest (*Acacia disparrima +/- Cupaniopsis anacardiodes, Lophostemon confertus, Endiandra sieberi, Corymbia intermedia*)
- Community 2 - Tall closed forest (*Melaleuca quinquenervia*)
- Acacia Regrowth
- Existing road

Proposed Development Layout

- Existing surface contours
- Proposed edge of bitumen
- Existing edge of bitumen
- Proposed sewerage reticulation
- Existing sewerage rising main
- Existing stormwater reticulation
- Existing water reticulation
- 2.0m wide concrete footpath and kerb ramp

N

SOURCE: JWA Site Investigations Feb 2019; Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)
SCALE: 1 : 1000 @ A3

JWA PTY LTD
Ecological Consultants

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PROJECT
Lot 7016 DP1112989, Lot 544 DP48550, Lot 408 DP755624, and Lot 547 DP48550
240 Iron Gates Drive, Evans Head NSW
Richmond Valley Council LGA

FIGURE 7C

PREPARED: BW
DATE: 12 February 2019
FILE: N16006_Impact Veg.cdr

TITLE
REVISED IMPACT ON VEGETATION COMMUNITIES

NOTES

1. SERVICES PLOTTED FROM PREVIOUS PLANS / RECORDS
2. CULVERT SIZES FROM PREVIOUS DESIGN PLANS
3. CONDITION OF ALL INFRASTRUCTURE WILL BE ASSESSED AS PART OF CONSTRUCTION CERTIFICATE

FOR CONTINUATION REFER FIGURE 5C

FOR CONTINUATION REFER FIGURE 5E

EXISTING 1/1200x300 RCBC

EXISTING 2/2100x750 RCBC'S

FOR EXISTING SERVICE ALLOCATION REFER DWG C202

IRON GATES ROAD

TO EVANS RIVER

CH 550.000

CH 600.000

CH 650.000

CH 700.000

CH 750.000

CH 800.000

CH 850.000

CREST 675645

SAG 761147

TP 741123

R295.000

2.00

0 25m

1 : 1 000

LEGEND

- Extent of Clearing Works
- Extent of Pruning Works
- Subject Site
- Study Area
- SEPP14 Coastal Wetlands

Vegetation Communities

- Community 1 - Tall closed/open forest (*Acacia disparrima +/- Cupaniopsis anacardiodes, Lophostemon confertus, Endiandra sieberi, Corymbia intermedia*)
- Community 2 - Tall closed forest (*Melaleuca quinquenervia*)
- Existing road

Proposed Development Layout

- Existing surface contours
- Proposed edge of bitumen
- Existing edge of bitumen
- Proposed sewerage reticulation
- Existing sewerage rising main
- Existing stormwater reticulation
- Existing water reticulation
- 2.0m wide concrete footpath and kerb ramp

N

SOURCE: JWA Site Investigations Feb 2019; Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)
SCALE: 1 : 1000 @ A3

JWA PTY LTD
Ecological Consultants

CLIENT
Ingles Group

PROJECT
Lot 7016 DP1112989, Lot 544 DP48550, Lot 408 DP755624, and Lot 547 DP48550
240 Iron Gates Drive, Evans Head NSW
Richmond Valley Council LGA

FIGURE 7D

PREPARED: BW
DATE: 12 February 2019
FILE: N16006_Impact Veg.cdr

TITLE
REVISED IMPACT ON VEGETATION COMMUNITIES

FUTURE IRON GATES DEVELOPMENT

FOR CONTINUATION REFER FIGURE 5D

IRON GATES ROAD

R750.000

R150.000

CH 850.000

CH 900.000

CH 950.000

CH 1000.000

CH 1050.000

CH 1100.000

CH 1150.000

CH 1200.000

CH 1216.429

CREST 901.885

CREST 962.661

CREST 1150.513

TP 924.292

TP 1011.176

TP 1135.194

TP 1170.070

FOR EXISTING SERVICE ALLOCATION REFER DWG C202

LOT 547
DP 48550

LEGEND

- Extent of Clearing Works
- Extent of Pruning Works
- Subject Site
- Study Area
- SEPP14 Coastal Wetlands

Vegetation Communities

- Community 2 - Tall closed forest (*Melaleuca quinquenervia*)
- Community 3 - Tall shrubland/heathland (*Leptospermum polygalifolium*)
- Existing road

Proposed Development Layout

- Existing surface contours
- Proposed edge of bitumen
- Existing edge of bitumen
- Proposed sewerage reticulation
- Existing sewerage rising main
- Existing stormwater reticulation
- Existing water reticulation
- 2.0m wide concrete footpath and kerb ramp

N

NOTES

1. SERVICES PLOTTED FROM PREVIOUS PLANS / RECORDS
2. CULVERT SIZES FROM PREVIOUS DESIGN PLANS
3. CONDITION OF ALL INFRASTRUCTURE WILL BE ASSESSED AS PART OF CONSTRUCTION CERTIFICATE

0 25m

1 : 1 000

SOURCE: JWA Site Investigations Feb 2019; Hyder Consulting (Ref: AA007094 - IRON GATES.pdf)
SCALE: 1 : 1000 @ A3

JWA PTY LTD
Ecological Consultants

CLIENT
Ingles Group

PROJECT
Lot 7016 DP1112989, Lot 544 DP48550, Lot 408 DP755624, and Lot 547 DP48550
240 Iron Gates Drive, Evans Head NSW
Richmond Valley Council LGA

FIGURE 7E

PREPARED: BW
DATE: 12 February 2019
FILE: N16006_Impact Veg.cdr

TITLE

REVISED IMPACT ON VEGETATION COMMUNITIES

4.3 Indirect Impacts

The proposed road widening may contribute to the following potential indirect impacts on the study area and adjacent SEPP 14 wetlands:

- Increased opportunity for weeds to become established in adjacent vegetation communities as disturbance creates opportunities for weeds to colonise. Weeds may be introduced in construction materials or by vehicles; and
- During the construction phase of the development, the required earthworks have the potential to increase sediment loads entering downstream vegetation communities/watercourses.

4.4 Mitigation Measures

The following measures are to be implemented to mitigate the potential impacts identified above:

- Ensure appropriate weed hygiene protocols are in place in order to prevent the accidental spread of weeds (e.g. clean down protocols for vehicles and machinery entering the site, ensuring that no soil/gravel/plant material contaminated with weed propagules are imported into the site);
- It is recommended that a Vegetation Management Plan (VMP) is prepared for the site to direct vegetation clearing and pruning works;
- The VMP should also include details of any revegetation works that may be required to replace cleared native tees/shrubs/groundcovers;
- Appropriate sediment and erosion controls shall be in place prior to the commencement of any earthworks in accordance with a Sediment and Erosion Control Plan prepared by a suitably qualified firm. This is particularly important to protect the values of the adjacent SEPP 14 wetlands; and
- OEH have indicated that offsets will be applicable to the proposed vegetation clearing works. In this regard, an assessment of the subject site in accordance with the Biodiversity Assessment Methodology (BAM) has been completed and determined that the following credit obligation must be satisfied:
    - Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions = 20 credits;
    - Littoral rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions = 8 credits;
    - PCT 785 - Coastal heath on sands of the NSW North Coast Bioregion = 3 credits; and
    - An additional credit of Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions to account for the trimming of branches overhanging the road within SEPP 14 mapped areas = 1 credit.

  Calculations of offset credits and relevant correspondence with OEH are provided as **APPENDIX 6**. OEH have provided correspondence accepting this

arrangement (see **APPENDIX 7**). These credits will need to be purchased or retired as an offset for the removal of site vegetation.

5 STATUTORY CONSIDERATIONS

5.1 Introduction

This section includes assessments of the impacts of the Proposed development with regard to:

- Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).
- Section 5A of the *Environmental Planning & Assessment Act 1979* (EP&A Act);
- State Environmental Planning Policy (SEPP) No. 14 – Coastal Wetlands;
- State Environmental Planning Policy (SEPP) No. 44 – Koala Habitat Protection; and
- *Fisheries Management Act 1994* (FM Act).

As previously noted, the Coastal Management SEPP, which commenced on 3rd April 2018, has repealed and replaced SEPP 14. However, for development applications that do not require an environmental impact statement (EIS), the former planning provisions of SEPP 14, SEPP 26 and SEPP 71 continue to apply to applications lodged, but not finally determined before the commencement of the Coastal Management SEPP. SEPP 14 will therefore be the applicable legislation.

Furthermore, requirements under Section 5A of the EP & A Act have been replaced with the 'test of significance' set out in Section 7.3 of the BC Act. However, the development application the subject of this report is covered by the statutory provisions that pre-date the BC Act i.e. there are savings/transitional provisions in clause 28 of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* which define the application as a 'pending or interim planning application' under the savings/transitional provision. Section 5A of the EP & A Act will therefore be the applicable legislation.

5.2 Commonwealth Environmental Protection and Biodiversity Conservation Act 1999 (NES Matters)

5.2.1 Introduction

The *Environment Protection & Biodiversity Conservation (EPBC) Act (1999)* was passed by Commonwealth Parliament in June 1999 and came into force on 16 July, 2000. A person must not, without an approval under the Act, take an action that has or will have, or is likely to have, a significant impact on a matter of National Environmental Significance (NES). These matters are listed as:

(a) the world heritage values of a declared World Heritage property;

(b) the ecological character of a declared Ramsar wetland;

(c) a threatened species or endangered community listed under the Act;

(d) a migratory species listed under the Act; or

(e) the environment in a Commonwealth marine area or on Commonwealth land.

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

(a) a nuclear action; or

(b) an action in a Commonwealth marine area or on Commonwealth land that has or will have, or is likely to have, a significant impact on the environment.

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

The *EPBC Act (1999)* does not require Commonwealth approval for the rezoning of land. It does, however, suggest that when rezoning land, planning authorities should consider whether to allow actions that could significantly affect NES matters or the environment of Commonwealth land.

Relevant matters of NES are:

- Listed Threatened Species;
- Listed Ecological Communities in New South Wales;
- Listed migratory species (JAMBA and CAMBA).

5.2.2 Occurrence of Matters of NES on Subject Site

Background

A Commonwealth Assessment will be required for proposed activities on the subject site if they affect a matter of NES. Matters of NES in NSW were identified in the previous section. There are no declared World Heritage Areas or Ramsar Wetlands in the Locality, Study area or Subject site.

Listed Threatened species

No Commonwealth Threatened flora species were recorded in the Study Area.

Eleven (11) Commonwealth Threatened fauna species were considered possible occurrences within the Study Area based on the availability of suitable habitat:

- Curlew sandpiper (*Calidris ferruginea*) – Critically Endangered
- Eastern curlew (*Numenius madagascariensis*) - Critically Endangered
- Greater sand plover (*Charadrius leschenaultii*) - Vulnerable
- Grey-headed flying-fox (*Pteropus poliocephalus*) – Vulnerable
- Koala (*Phascolarctos cinereus*) – Vulnerable
- Lesser sand plover (*Charadrius mongolus*) - Endangered
- New Holland mouse (*Pseudomys novaehollandiae*) - Vulnerable

- Red goshawk (*Erythrotriorchis radiatus*) - Vulnerable
- Regent honeyeater (*Anthochaera phrygia*) – Critically Endangered
- Spotted-tailed quoll (*Erythrotriorchis radiatus*) – Endangered
- Wallum sedge frog (*Litoria olongburensis*) – Vulnerable

Listed Ecological Communities

– No Commonwealth Threatened Ecological Communities were recorded on the Subject site

Listed Migratory Species

The list of migratory species established under section 209 of the EPBC Act comprises:

- migratory species which are native to Australia and are included in the appendices to the Bonn Convention (Convention on the Conservation of Migratory Species of Wild Animals Appendices I and II);
- migratory species included in annexes established under the Japan-Australia Migratory Bird Agreement (JAMBA) and the China-Australia Migratory Bird Agreement (CAMBA); and
- native, migratory species identified in a list established under, or an instrument made under, an international agreement approved by the Minister, such as the Republic of Korea-Australia Migratory Bird Agreement (ROKAMBA).

Listed migratory species include Migratory Marine Birds, Migratory Marine Species (including mammals, reptiles and fish), Migratory Terrestrial Species and Migratory Wetland Species. Migratory Marine Species and the majority of Migratory Marine Birds do not occur within the study area. Migratory Terrestrial Species and Migratory Wetland Species include a range of bird species, many of which are known from the wider locality.

5.2.3 Assessment against EPBC Act Principal Significant Impact Guidelines

Background

The Assessment against the EPBC Act is made using Principal Significant Impact Guidelines 1.1 (DEH 2006). The guidelines outline a self-assessment process to assist in determining whether an action should be referred to the Department of Environment Water Heritage and the Arts (DEWHA) for a decision on whether Commonwealth assessment and approval is required under the Act. The following sections assess the proposed development (the action) against these guidelines.

Extinct in the Wild Species

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

- adversely affect a captive or propagated population or one recently introduced/reintroduced to the wild; or

- interfere with the recovery of the species or its reintroduction into the wild.

Critically Endangered or Endangered Species

An action has, will have, or is likely to have a significant impact on a critically endangered or endangered species if it does, will, or is likely to:

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

Vulnerable Species

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

- lead to a long-term decrease in the size of an important population of a species;
- reduce the area of occupancy of an important population;
- fragment an existing important population into two or more populations;
- adversely affect habitat critical to the survival of a species;
- disrupt the breeding cycle of an important population;
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat;
- introduce disease that may cause the species to decline; or
- interfere substantially with the recovery of the species.

Assessment of Proposed Action

It is considered that the proposed development will not result in any such impacts on any Commonwealth listed threatened species.

It is considered that the Study Area does not support an important population of any species listed under the *EPBC Act (1999)* and a significant impact on these species will not be incurred.

Listed Migratory Species

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

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

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

a. habitat utilised by a migratory species occasionally or periodically within a region that supports an ecologically significant proportion of the population of the species; and/or

b. habitat that is of critical importance to the species at particular life-cycle stages; and/or

c. habitat utilised by a migratory species which is at the limit of the species range; and/or

d. habitat within an area where the species is declining.

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

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

Assessment of Proposed Action

It is considered that although a number of listed migratory species are known or likely to occur occasionally in the Study Area, no area of important habitat occurs in the Study Area for listed migratory species.

5.2.4 Requirement for Commonwealth Referral

Based on the assessment provided above, Referral to the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPC) is not required. The proposed action is unlikely to result in a significant impact on any matter of NES. It is concluded that Commonwealth Assessment is not required for the proposed development of the subject site.

5.3 Assessment of Significance (Seven-Part Test)

5.3.1 Background

An Assessment of Significance (7-part test equivalence) has been undertaken for all listed species/EECs recorded on the site, including threatened fauna predicted to occur over time **(SECTION 3.3)**. Potential impacts on threatened species, populations or ecological communities, or their habitats were assessed using the *Threatened Species Assessment Guidelines: The Assessment of Significance* (DECC 2007).

The Assessment of Significance should not be considered a "pass or fail" test as such, but a system allowing proponents to undertake a qualitative analysis of the likely impacts and ultimately whether further assessment needs to be undertaken via a Species Impact Statement. All factors must be considered and an overall conclusion must be drawn from all factors in combination. Where there is any doubt regarding the likely impacts, or where detailed information is not available, a Species Impact Statement should be prepared.

Mitigating, ameliorative or compensatory measures proposed as part of the action, development or activity should not be considered in determining the degree of the effect on threatened species, populations or ecological communities, unless the measure has been proven successful for that species in a similar situation. In many cases where complex mitigating, ameliorative or compensatory measures are required, such as translocation, bush restoration, purchase of land, further assessment through the Species Impact Statement process is likely to be required.

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

- Pre-construction, construction and occupation/maintenance phases;
- All on-site and offsite impacts, including location, installation, operation and maintenance of auxiliary infrastructure and fire management zones;
- All direct and indirect impacts;
- The frequency and duration of each known or likely impact/action;
- The total impact which can be attributed to that action over the entire geographic area affected, and over time;
- The sensitivity of the receiving environment; and
- The degree of confidence with which the impacts of the action are known and understood.

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

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

5.3.2 Threatened Flora

No threatened flora species were recorded within the study area.

5.3.3 Endangered Ecological Communities (EECs)

Background

Three (3) EECs were recorded within the study area:

- Swamp sclerophyll forest on coastal floodplains of the New South Wales North Coast Bioregion;
- Littoral rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions; and
- Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions.

Factors for consideration

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

Not applicable to EECs.

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

Not applicable to EECs.

(c) In the case of an endangered ecological community or critically endangered ecological community whether the action proposed:

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

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

The proposed road widening may require some pruning, lopping and possibly the removal of a small number of sub-mature trees occurring as part of these EECs. This is not considered to represent an adverse effect or modification that would place this EEC at risk of extinction.

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

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

As discussed above, some pruning/lopping is likely to be required along the edge EEC vegetation abutting the road reserve. The removal of a small number of sub-mature trees may also be required where pruning is not sufficient to achieve the 20m wide road corridor. However, tree removal will be avoided where possible. A total of 0.51 ha of the Swamp sclerophyll EEC, and 0.24 ha of the Littoral rainforest EEC will be directly impacted as a result of the action proposed. There will be no direct or indirect impacts on the Saltmarsh EEC.

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

The proposed development will not contribute to further fragmentation or isolation of habitat.

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

The habitat to be removed and/or modified occurs immediately adjacent to an existing road reserve and is highly modified by weed incursion and other edge effects. The majority of the habitat to be affected is comprised of regrowth vegetation and/or weed species (e.g. lantana, tobacco bush, Winter senna). This vegetation is considered to be of low importance to the long-term survival of EEC vegetation on and adjoining the site.

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

Critical habitat areas listed under the Threatened Species Conservation Act (1995) currently consist of habitat for Gould's Petrel at Cabbage Tree Island, off the coast of Port Stephens, Mitchell's rainforest snail in Stott's Island Nature Reserve, habitat for

the Little penguin population in Sydney's North Harbour and habitat for the Wollemi Pine in Wollemi National Park within the Greater Blue Mountains World Heritage Area.

There will be no adverse effects on any critical habitat listed, in the Register of critical habitat in NSW, from the action proposed.

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

Not applicable.

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

A "threatening process" means a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. Key Threatening Processes have been listed in Schedule 3 of the TSC Act (1995) **(APPENDIX 8).**

The proposed development represents a minor contribution to the KTP – 'Clearing of native vegetation'.

Results of Assessment of Significance

On the basis of this assessment, it is not considered that the proposed development will result in any significant impacts on any EEC occurring on the Subject Site. A Species Impact Statement would not be required.

5.3.4 Threatened Fauna

Background

No threatened fauna species were recorded in the study area. Two (2) threatened fauna species are considered likely occurrences and a further thirty-four (34) threatened species are considered possible occurrences over time due to the availability of suitable habitat. These species have been assessed together in the following sections and include:

- Barking owl (*Ninox connivens*);
- Barred cuckoo-shrike (*Coracina lineata*);
- Black bittern (*Ixobrychus flavicollis*);
- Black-necked stork (*Ephippiorhynchus asiaticus*);
- Broad-billed sandpiper (*Limicola falcinellus*);
- Brush-tailed phascogale (*Phascogale tapoatafa*);
- Common blossom bat (*Syconycteris australis*);

- Common planigale (*Planigale maculata*);
- Curlew sandpiper (*Calidris ferruginea*);
- Eastern bent-wing bat (*Miniopterus schreibersii oceanensis*);
- Eastern curlew (*Numenius madagascariensis*);
- Eastern long-eared bat (*Nyctophilus bifax*);
- Eastern osprey (*Pandion cristatus*);
- Greater broad-nosed bat (*Scoteanax rueppellii*);
- Greater sand plover (*Charadrius leschenaultii*);
- Grey-headed flying-fox (*Pteropus poliocephalus*);
- Koala (*Phascolarctos cinereus*);
- Lesser sand plover (*Charadrius mongolus*);
- Little bent-wing bat (*Miniopterus australis*);
- Little lorikeet (*Glossopsitta pusilla*);
- New Holland mouse (*Pseudomys novaehollandiae*);
- Olongburra frog (*Litoria olongburensis*);
- Pale-vented bush-hen (*Amaurornis moluccana*);
- Pied oystercatcher (*Haematopus longirostris*);
- Powerful owl (*Ninox strenua*);
- Red goshawk (*Erythrotriorchis radiatus*);
- Regent honeyeater (*Anthochaera phrygia*);
- Rose-crowned fruit-dove (*Ptilinopus regina*);
- Southern myotis (*Myotis macropus*);
- Spotted-tailed quoll (*Dasyurus maculatus*);
- Squirrel glider (*Petaurus norfolcensis*);
- Wallum froglet (*Crinia tinnula*);
- White-eared monarch (*Carterornis leucotis*);
- Wompoo fruit-dove (*Ptilinopus magnificus*);
- Yellow-bellied glider (*Petaurus australis*); and
- Yellow-bellied sheathtail-bat (*Saccolaimus flaviventris*).

Factors for consideration

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

The Proposed development is highly unlikely to result in any significant adverse impacts on the life cycle of any threatened species considered likely or possible occurrences on the site over time.

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

Thirty-five (35) endangered populations have been identified under the *TSC Act*. The following five (5) endangered populations occur in north-eastern NSW:

- Long-nosed potoroo population, Cobaki Lakes and Tweed Heads West;
- Emu population in the NSW North Coast Bioregion and Port Stephens LGA;
- Low growing form of *Zieria smithii*, Diggers Head;
- Narrow-leaved red gum in the Greater Taree LGA;
- *Glycine clandestina* (Broad-leaf form) in the Nambucca LGA.

The proposed action will not have an adverse effect on any of these endangered populations.

(c) In the case of an endangered ecological community or critically endangered ecological community whether the action proposed:

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

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

Not Applicable for Threatened fauna.

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

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

As discussed above, some pruning/lopping and possibly the removal of a small number of sub-mature trees would be required to achieve the 20m wide road corridor. The extent to which each vegetation community is likely to be affected is provided in **SECTION 4.2 - TABLE 4.**

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

The proposed development will not contribute to further fragmentation or isolation of habitat occurring within the Study Area.

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

Areas of vegetation that may be affected by the proposed action are not considered to represent significant or meaningful habitat for any threatened fauna species in the locality. This is due to the modified/degraded condition of these areas and their occurrence immediately adjacent to an existing roadway.

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

Critical habitat areas listed under the Threatened Species Conservation Act (1995) currently consist of habitat for Gould's Petrel at Cabbage Tree Island, off the coast of Port Stephens, Mitchell's rainforest snail in Stott's Island Nature Reserve, habitat for the Little penguin population in Sydney's North Harbour and habitat for the Wollemi Pine in Wollemi National Park within the Greater Blue Mountains World Heritage Area.

There will be no adverse effects on any critical habitat listed, in the Register of critical habitat in NSW, from the action proposed.

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

Approved Recovery Plans have been prepared for the Grey-headed flying-fox, Koala, large forest owls, Red goshawk, Spotted-tailed quoll, Yellow-bellied glider and wallum dependent frog species (including Olongburra frog and Wallum froglet).

Grey-headed flying fox

The Recovery Plan for the Grey-headed flying-fox lists the following specific recovery objectives:

- to reduce the impact of threatening processes on Grey-headed Flying-foxes and arrest decline throughout the species' range;
- to conserve the functional roles of Grey-headed Flying-foxes in seed dispersal and pollination; and
- to improve the standard of information available to guide recovery of the Grey-headed Flying-fox, in order to increase community knowledge of the species and reduce the impact of negative public attitudes on the species.

It is considered that the proposed development is consistent with the objectives and actions of the Recovery Plan for the Grey-headed flying-fox.

Koala

The Recovery Plan for the Koala lists the following specific recovery objectives:

- To conserve Koalas in their existing habitat;
- To rehabilitate and restore Koala habitat and populations;
- To develop a better understanding of the conservation biology of Koalas;
- To ensure that the community has access to factual information about the distribution, conservation and management of Koalas at a national, state and local scale;
- To manage captive, sick or injured Koalas and orphaned wild Koalas to ensure consistent and high standards of care;
- To manage over-browsing to prevent both Koala starvation and ecosystem damage in discrete patches of habitat; and
- To co-ordinate, promote the implementation, and monitor the effectiveness of the NSW Koala Recovery Plan across NSW.

It is considered that the proposed development is consistent with the objectives and actions of the Recovery Plan for the Koala, particularly in relation to the rehabilitation and restoration of Koala habitat and populations (refer **SECTION 4.4.2)**.

Large forest owls

The Recovery Plan for large forest owls lists the following specific recovery objectives:

- Assess the distribution and amount of high-quality habitat for each owl species across public and private lands to get an estimate of the number and proportion of occupied territories of each species that are, and are not, protected;
- To monitor trends in population parameters (numbers, distribution, territory fidelity and breeding success) across the range of the three species and across different land tenures and disturbance histories;
- To assess the implementation and effectiveness of forest management prescriptions designed to mitigate the impact of timber harvesting operations on the three owl species and, (if necessary), to use this information to refine the prescriptions so that forestry activities on state forests are not resulting in adverse changes in species abundance and breeding success;
- Ensure the impacts on large forest owls and their habitats are adequately assessed during planning and environmental assessment processes;
- Minimise further loss and fragmentation of habitat by protection and more informed management of significant owl habitat (including protection of individual nest sites);
- To improve the recovery and management of the three large forest owls based on an improved understanding of key areas of their biology and ecology;
- To raise awareness of the conservation requirements of the three large forest owls amongst the broader community, to involve the community in owl

conservation efforts and in so doing increase the information base about owl habitats and biology; and

- To coordinate the implementation of the recovery plan and continually seek to integrate actions in this plan with actions in other recovery plans or conservation initiatives.

It is considered that the proposed development is consistent with the objectives and actions of the Recovery Plan for large forest owls.

Red goshawk

The Recovery Plan for the Red goshawk lists the following specific recovery objectives:

- Identify and map important red goshawk habitat;
- Protect and appropriately manage important habitat areas to ensure long-term survival of the red goshawk;
- Increase knowledge about the red goshawk's productive success and its survival;
- Identify important populations of red goshawks; and
- Increase community awareness about the red goshawk and the conservation of the species.

It is considered that the proposed development is consistent with the objectives and actions of the Recovery Plan for the Red goshawk.

Spotted-tailed quoll

The Recovery Plan for the Spotted-tailed quoll lists the following specific recovery objectives:

- Determine the distribution and status of Spotted-tailed Quoll populations throughout the range, and identify key threats and implement threat abatement management practices;
- Investigate key aspects of the biology and ecology of the Spotted-tailed Quoll to acquire targeted information to aid recovery;
- Reduce the rate of habitat loss and fragmentation on private land;
- Evaluate and manage the risk posed by silvicultural practices;
- Determine and manage the threat posed by introduced predators (foxes, cats, wild dogs) and of predator control practices on Spotted-tailed Quoll populations;
- Determine and manage the impact of fire regimes on Spotted-tailed Quoll populations;
- Reduce deliberate killings of Spotted-tailed Quolls;
- Reduce the frequency of Spotted-tailed Quoll road mortality;
- Assess the threat Cane Toads pose to Spotted-tailed Quolls and develop threat abatement actions if necessary;

- Determine the likely impact of climate change on Spotted-tailed Quoll populations; and
- Increase community awareness of the Spotted-tailed Quoll and involvement in the Recovery Program.

It is considered that the proposed development is consistent with the objectives and actions of the Recovery Plan for the Spotted-tailed quoll.

Yellow-bellied glider

The Recovery Plan for the Yellow-bellied glider lists the following specific recovery objectives:

- To co-ordinate the recovery of the Yellow-bellied glider in NSW;
- To encourage and assist in improving the protection and management of the Yellow-bellied glider and its habitat;
- To identify and monitor significant populations of the species;
- To facilitate strategic research into the ecology of the Yellow-bellied glider that is relevant to its conservation; and
- To increase community awareness of the Yellow-bellied glider and encourage community involvement in its conservation.

It is considered that the proposed development is consistent with the objectives and actions of the Recovery Plan for the Yellow-bellied glider.

Wallum dependent frog species

The Recovery Plan wallum dependent frog species lists the following specific recovery objectives:

- To identify areas of habitat critical to the survival of wallum frog species more accurately;
- To protect habitat critical to wallum frog survival and important wallum frog populations from threatening processes;
- To rehabilitate degraded wallum frog habitat;
- To determine population trends in areas of disturbed, undisturbed and rehabilitated habitat.

It is considered that the proposed development is consistent with the objectives and actions of the Recovery Plan for wallum dependent frog species.

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

A "threatening process" means a process that threatens, or may have the capability to threaten, the survival or evolutionary development of a species, population or ecological community. Key Threatening Processes have been listed in Schedule 3 of the TSC Act (1995) **(APPENDIX 8).**

The proposed development represents a minor contribution to the KTP – 'Clearing of native vegetation'.

Results of Assessment of Significance

On the basis of this assessment, it is not considered that the proposed development will result in any significant impacts on any threatened fauna species occurring with or adjacent to the Study Area. A Species Impact Statement would not be required.

5.4 Coastal Wetlands – SEPP 14

5.4.1 Introduction

In response to the state-wide degradation of coastal wetlands, the Department of Planning enacted the State Environment Planning Policy (SEPP) – 14 Coastal Wetlands in 1985. The policy aims to "ensure that the coastal wetlands are preserved and protected in the environmental and economic interests of the State".

5.4.2 Site assessment

SEPP 14 Wetland No. 147 is mapped as occurring on and adjacent to the Iron Gates road reserve (**FIGURE 3**). The proposed works will involve some trimming of branches overhanging the road reserve in the SEPP 14 areas. However, as the proposed trimming does not involve the destruction or removal of any native plants, as defined in clause 7(4), it is not considered that SEPP 14 will be triggered.

5.4.3 Conclusion

Generally, buffers would need to be provided to SEPP 14 land. However, as the subject site is an existing road reserve, buffers are not considered to be applicable to the proposed development. The implementation of the measures provided in **SECTION 4.4** will ensure that any potential indirect impacts on the SEPP 14 wetland are appropriately mitigated.

5.5 Koala Habitat Assessment - SEPP 44

5.5.1 Introduction

In response to the state-wide decline of Koala populations the Department of Planning has enacted SEPP-44 Koala Habitat Protection. The Policy aims to "encourage the proper conservation and management of area of natural vegetation that provide habitat for Koalas, to ensure permanent free-living populations over their present range and to reverse the current trend of population decline."

A number of criteria in the SEPP are to be addressed. These are addressed in the following section.

5.5.2 Site assessment

1. Does the policy apply?

Does the subject land occur in an LGA identified in Schedule 1?

The Subject site occurs in the Richmond Valley LGA, which is listed under Schedule 1.

Is the landholding to which the DA applies greater than 1 hectare in area?

Yes.

2. Is the land potential Koala habitat?

Does the site contain areas of native vegetation where the trees of types listed in Schedule 2 constitute at least 15% of the total number of trees in the upper or lower strata of the tree component?

Yes. The Schedule 2 species Swamp mahogany (*Eucalyptus robusta*) occurs on the subject site. Swamp mahogany constitutes > 15% of the total number of trees in the upper strata of vegetation community 4. These areas are therefore considered to represent potential Koala habitat.

3. Is there core Koala habitat on the subject land?

Under SEPP 44 core Koala habitat is defined as 'an area of land with a resident population of Koalas, evidenced by attributes such as breeding females (that is females with young) and recent sightings of and historical records of a population'.

No. Koala populations are known to occur in the locality. However, no evidence of recent Koala activity was recorded in the study area. No females with back young have been recorded within the Study Area. Core Koala habitat is not considered to occur on the site.

4. Is there a requirement for the preparation of a Plan of Management for identified core Koala habitat?

No. In accordance with this SEPP 44 assessment, a KPoM is not required for the subject site.

5.6 Fisheries Management Act (1994)

5.6.1 Introduction

The *Fisheries Management Act 1994* came into force on the 16th January 1995. The objectives of the Act are to conserve, develop and share the fishery resources of the State for the benefit of present and future generations. In particular, the objectives of the Act include:

a) to conserve fish stocks and key fish habitats; and

b) to conserve threatened species, populations and ecological communities of fish and marine vegetation; and

c) to promote ecologically sustainable development, including the conservation of biological diversity; and

consistently with those objectives :

d) to promote viable commercial fishing and aquaculture industries; and

e) to promote quality recreational fishing opportunities; and

f) to appropriately share fisheries resources between the users of those resources; and

g) to provide social and economic benefits for the wider community of New South Wales; and

h) to recognise the spiritual, social and customary significance to Aboriginal persons of fisheries resources and to protect, and promote the continuation of, Aboriginal cultural fishing.

Under the 'integrated development' provisions of the NSW EP&A Act, DPI is an 'approval body' for local development that requires one or more of the following permits under the FM Act:

- Section 144 - aquaculture permit, i.e. cultivating fish or marine vegetation for sale/commercial purposes;
- Section 201 - permit to carry out works of dredging or reclamation, i.e. any excavation within or filling of water land;
- Section 205 - permit to harm (cut, remove, damage, destroy, shade etc) marine vegetation (mangroves, seagrass and seaweeds); and
- Section 219 - permit to obstruct the free passage of fish.

Impacts to Key fish habitats and marine plants are potentially applicable to the proposed works.

5.6.2 Key fish habitats

A policy definition of the term 'Key Fish Habitat' (KFH) was developed by the Department in 2007 to guide a state-wide mapping project to define and identify KFH – those aquatic habitats that are important to the sustainability of the recreational and commercial fishing industries, the maintenance of fish populations generally and the survival and recovery of threatened aquatic species. Essentially KFH was defined to include all marine and estuarine habitats up to highest astronomical tide level (that reached by 'king' tides) and most permanent and semi-permanent freshwater habitats including rivers, creeks, lakes, lagoons, billabongs, weir pools and impoundments up to the top of the bank. Small headwater creeks and gullies (known as first and second order streams), that only flow for a short period after rain are generally excluded, as are farm dams constructed on such systems. Wholly artificial waterbodies such as irrigation channels, urban drains and ponds, salt and evaporation ponds are also

excluded except where they are known to support populations of threatened fish or invertebrates.

It is understood that the DPI has an arrangement in circumstances where the Office of Water issues controlled activity approvals for earthworks within 40 metres of a waterway. As the proposed development will not involve any works that will directly impact upon the riverbank, or land within the intertidal zone (with an elevation less than 1 metre AHD), DPI does not deem the works area to be KFH for the purposes of s.201 of the FM Act and the works will therefore not be integrated development.

5.6.3 Marine vegetation

Marine vegetation, such as saltmarsh, mangroves, seagrasses, and macroalgae (seaweeds) are protected under the FM Act. Harming of any marine vegetation will trigger integrated development under s.205 of the FM Act, irrespective of where it is located. Any development that may affect marine vegetation by cutting, removing, destroying, transplanting, shading or damaging in any way (e.g. trimming mangroves) is classed as integrated development and will require a permit from DPI.

Whilst the trimming of branches overhanging the road reserve in the SEPP 14 areas will be completed where necessary, the majority of the trees to be impacted are comprised of Hickory wattle (*Acacia disparrima*) with minor occurrences of Tuckeroo (*Cupaniopsis anacardiodes*), Brushbox (*Lophostemon confertus*), Hard corkwood (*Endiandra sieberi*), Pink bloodwood (*Corymbia intermedia*), Swamp box (*L. suaveolens*), Swamp mahogany (*Eucalyptus robusta*) and Broad-leaved paperbark (*Melaleuca quinquenervia*). No mangroves or saltmarsh vegetation, or any other marine plants, are proposed to be cleared or trimmed. These works will therefore not trigger an integrated development application.

6 SUMMARY AND CONCLUSIONS

JWA Pty Ltd has been engaged by Goldcoral Pty Ltd to complete an Ecological Assessment of the road reserve leading into the Iron Gates Estate, Evans Head. The Subject Site covers an area of approximately 1.75 ha. Iron Gates Drive is required to be upgraded to obtain a Bush Fire Safety Authority (BFSA) issued under Section 100B of the *Rural Fires Act 1997* by the Commissioner of the NSW Rural Fire Service (NSW RFS)

Seven (7) broad vegetation communities were identified in the Study Area. Three (3) Endangered Ecological Communities were recorded - Swamp sclerophyll forest on coastal floodplains of the NSW North Coast Bioregion, Littoral rainforest in the NSW North Coast, Sydney Basin and South East Corner Bioregions and Coastal Saltmarsh in the New South Wales North Coast, Sydney Basin and South East Corner Bioregions. Eighty-two (82) flora species were recorded. No threatened flora species were observed within the Study Area.

The ecological assessment included opportunistic fauna survey and an assessment of fauna habitats. Ten (10) native bird species were recorded. No threatened fauna species were observed. However, two (2) threatened species – Grey-headed flying-fox and Little bent-wing bat - are considered likely occurrences and an additional thirty-four (34) threatened fauna species are considered possible occurrences over time due to the availability of suitable habitat.

An assessment of the corridor values of the study area has found that the study area has direct connectivity with expansive areas of native vegetation to the north including Broadwater National Park. There is also some connectivity to the south in association with the riparian zone of the Evans River. It is considered that the mosaic of habitat types occurring within the study area and adjacent areas would provide suitable dispersal habitat for all fauna groups.

The proposed road widening will result in the pruning of existing vegetation and some removal of regrowth vegetation (predominantly Hickory wattle) within the road reserve. It is expected that only a limited number of mature trees would need to be removed to accommodate the proposed road widening. No mangroves or Saltmarsh vegetation will be removed.

An assessment under the Commonwealth Environment Protection and Biodiversity Conservation Act (1999) concluded that the proposed development will not have a significant impact on any matters of National Environmental Significance. Commonwealth assessment of the proposal is not required.

A Section 5A assessment was undertaken for three (3) Endangered Ecological Communities and collectively for thirty-six (36) Threatened fauna species considered as either likely or possible occurrences over time. The assessment concluded that the impacts of the proposed development would be unlikely to result in the local extinction of any of these species. A Species Impact Statement is not required.

SEPP 14 Wetland No. 147 is mapped as occurring on and adjacent to the Iron Gates road reserve. The proposed works will involve some trimming of branches overhanging the road reserve in the SEPP 14 areas. However, as the proposed trimming does not involve the destruction or removal of any native plants, as defined in clause 7(4), it is not considered that SEPP 14 will be triggered. There is no requirement to provide buffers to the SEPP 14 land as the proposed works are contained within an existing road reserve.

A Koala Habitat assessment of the site under SEPP 44 (Koala Habitat Protection) concluded that the Study Area does not comprise core Koala habitat, and a Koala Plan of Management is not required.

An assessment against the requirements of the *Fisheries Management Act 1994* has determined that the proposed development does not constitute an integrated development. No Key Fish Habitats will be impacted, and no marine vegetation will be removed or damaged.

It is recommended that a Vegetation Management Plan (VMP) is prepared for the site to direct vegetation clearing and pruning works. The VMP should also include details of any revegetation works that may be required to replace cleared native tees/shrubs/groundcovers.

Appropriate sediment and erosion controls shall be in place prior to the commencement of any earthworks in accordance with a Sediment and Erosion Control Plan prepared by a suitably qualified firm. This is particularly important to protect the values of the adjacent SEPP 14 wetlands.

OEH have indicated that offsets will be applicable to the proposed vegetation clearing works. In this regard, an assessment of the subject site in accordance with the Biodiversity Assessment Methodology (BAM) has been completed and determined that the following credit obligation must be satisfied:

- Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions = 20 credits;
- Littoral rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions = 8 credits;
- PCT 785 - Coastal heath on sands of the NSW North Coast Bioregion = 3 credits; and
- An additional credit of Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions to account for the trimming of branches overhanging the road within SEPP 14 mapped areas = 1 credit.

These credits will need to be purchased or retired as an offset for the removal of site vegetation.

With consideration of the proposed amelioration measures, including the purchase and/or retirement of applicable ecosystem credits in accordance with the NSW Biodiversity Offset Scheme, the carrying out of the proposed development is not likely to have a significant effect on threatened species, populations or ecological communities, or their habitats.

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APPENDIX 1: RESPONSES TO RELEVANT INFORMATION REQUESTS

TABLE 1 – RESPONSES TO RELEVANT RICHMOND VALLEY COUNCIL COMMENTS

Council Comment	Response	Section
4. Statement of Amendments/Variations		
Clause 55 of the EP&A Reg. requires an amended/varied application to be accompanied by a written statement outlining all the amendments/variations made to the original DA. This will include all amendments/variations made up to, and including, those of 17 January 2019.	Amendments made to the August 2014 version are detailed in **Attachment 2.**	**Attachment 2**
7. Ecological Assessment		
7.1 Species Impact Statement v Biobanking Statement		
7.1.2 Council is aware of negotiates with the NSW Office of Environment and Heritage to offset the development's biodiversity impacts by securing Biobanking credits under Part 7A of the Threatened Species Conservation Act 1995. This being the case, it is acknowledged that Part 7A does not require assessment of the development in accordance with the threatened species protection measures provided for by Parts 4 & 5 of the EP&A Act.	Noted.	
7.1.3 A Biobanking Statement must be obtained and submitted with the application for these exceptions to apply. Failing the lodgment of a Biobanking Statement it is most likely that a Species Impact Statement will be required by Council.	Offset requirements of the proposed development have been the subject of extensive negotiations with the NSW Office of Environment and Heritage (OEH) over the past 18 months and are detailed in **Section 4.4**. Relevant correspondence and calculations are provided in **Attachment 6** and **Attachment 7**.	**4.4, Attachments 6 & 7**
7.1.4 Support documents, especially those relating to ecological assessments of the development site, should be updated to reference obtaining a Biobanking Statement, and explain the exception provisions provided by Part 7A of the TSC Act.	See above response.	-

Council Comment	Response	Section
7.1.5 The body of work carried out by James Warren & Associates (JWA), including calculations of Biobanking offset credits, should also be submitted with the application.	See above response.	-
7.2 Environmental Protection and Biodiversity Conservation Act 1999 (Commonwealth) (EPBC Act)		
7.2.1 It is the responsibility of a proponent, proposing to take an action, to refer a matter to the Commonwealth Environment Minister if it will, or is likely to, have a significant impact on any of the matters of environmental significance, or other protected matters.	**Section 5.2** of the report and includes an assessment against the requirements of the EPBC Act using the Principal Significant Impact Guidelines 1.1 (DEH 2006). The assessment has determined that referral to the Commonwealth for assessment under the Act is not required. With the implementation of proposed mitigation and amelioration measures the proposed action is considered unlikely to result in a significant impact on any matter of NES.	**5.2**
7.2.2 While the Ecological Assessment references the EPBC Act throughout, it fails to provide a conclusion on whether the proposal will, or is likely to, have a significant impact.	See above response.	-

TABLE 2 – RESPONSES TO MR MALCOM SCOTT'S RELEVANT COMMENTS

Mr Malcom Scott's Comment	Response	Section
SECTION 8 – DA LEGISLATIVE PLANNING CONTROLS		
Whether or not the Commonwealth's *Environmental Protection and Biodiversity Conservation Act 1999* applies to the proposed development needs to be clarified as there is potential for adverse impact on threatened species and their habitats.	**Section 5.2** of the report and includes an assessment against the requirements of the EPBC Act using the Principal Significant Impact Guidelines 1.1 (DEH 2006). The assessment has determined that referral to the Commonwealth for assessment under the Act is not required. With the implementation of proposed mitigation and amelioration measures the proposed action is considered unlikely to result in a significant impact on any matter of NES.	**5.2**
SECTION 16 – DA ISSUES		
16.10 Ecology – Fauna and Flora		
The land contains threatened fauna and flora species and provides habitat for a range of fauna and flora threatened species.	Noted.	-
The environmental significance of the land is reflected in the E2 – environmental conservation and E3 – environmental management zones within it and the E1 – environmental national parks and nature reserves, E2 – environmental conservation and E3 – environmental management zones on adjoining land and land in the locality.	Noted.	-
An assessment of the impact of the DA on terrestrial flora and fauna has been undertaken in the Terrestrial Flora and Fauna Assessment, prepared by Planit Consulting Pty Ltd (Aug. 2014) and provided with the DA. The surveys for the Terrestrial Flora and Fauna Assessment were limited and appear only to be undertaken between 20 and 25 May 2014.	Any flora and fauna survey is likely to be of limited duration due to time and costs constraints. The Threatened Species Survey and Assessment: Guidelines for developments and activities (working draft) (DEC 2004) provides details on the minimum survey effort required for any conclusions	-

Mr Malcom Scott's Comment	Response	Section
	to be reasonably reached, however the guidelines also recognise that this level of effort may not be appropriate or necessary in all circumstances. The guidelines state that ideally, surveys would be undertaken during optimal climatic and seasonal conditions but note that in many cases this will not be possible. Therefore, to comply with legislation, consideration must also be given to the presence in the survey area (or surrounding land) of the known or likely habitat components for the species. An assessment of the habitat types available on site compared to the known habitat requirements of Threatened flora and fauna species recorded from the broader locality allows a determination of whether these species are likely, possible or unlikely to occur on the subject site.	
Many of the submissions of objection to the DA raised issues in regard the rigour of the fauna and flora assessment, potential for direct and indirect adverse impacts on the fauna and flora and threated fauna and flora species and their habitat and for alleged illegal clearing on the land to be developed.	See response above in relation to survey effort. Direct and indirect impacts of the proposed development have been discussed in **Section 4** and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
Several of the submissions were prepared by local specialist/ expert ecological consultancies and a range of environmental conservation and protection community organisations.	Noted.	-
Planit Consulting Pty Ltd provided with the 1st amendment of the DA a commentary prepared by Mr B Sargeant who prepared the Terrestrial Flora and Fauna Assessment. The commentary provided a response only to comments by the	Noted.	-

Mr Malcom Scott's Comment	Response	Section
Office of Environment and Heritage and Dept. of Primary Industries and only to the submission prepared by Mr D Milledge of Landmark Ecological Services Pty Ltd.		
Mr Milledge has extensive knowledge of the site and its history, provided a response to the commentary prepared by Mr Sargeant and recommended a Species Impact Statement (SIS) be prepared for the DA.	Noted.	-
The commentary by Mr Sargeant states that; *"The proposal involved minor filling, but no excavation works with areas immediately adjacent to the EEC which is not considered to significantly impact the drainage of these areas."*	Noted.	-
The DA proposes substantial earthworks on the land and in close proximity to the E2 zone over the central littoral rainforest and it is not readily evident how internal roads and drainage changes will impact on adjoining the endangered ecological communities with the land.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
The riparian buffer requirements of the biting midges assessment needs to be addressed in the fauna and flora assessment for the DA.	The Iron Gates Revised Biting Insect Impact Assessment (Mosquito Consulting Services Pty Ltd 2019) concludes that no specific riparian buffer requirements are necessary.	-
The Terrestrial Flora and Fauna Assessment, prepared by Planit Consulting Pty Ltd (Aug. 2014) is a very limited 'snap-shot', as a consequence of the short survey period which appears to have been undertaken in May following the alleged illegal clearing in April / May 2014.	See response above in relation to survey effort.	-
The NSW OE&H has indicated that the offset proposal has not been quantified and justified and is poorly considered, recommending further consideration to redesigning to avoid	Offset requirements of the proposed development have been the subject of extensive negotiations with OEH over the past 18 months and are provided in **Section 4.4.**	**4.4**

Mr Malcom Scott's Comment	Response	Section
direct and indirect impacts and that an offset package be prepared in accordance with accepted principles.		
There is potential for direct and indirect adverse impacts on the fauna and flora of the land and to threatened fauna and flora species and their habitats.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
Parts 7AA and/or 7A of the *Threatened Species Conservation Act 1995* will not require the development to be assessed in accordance with the threatened species protection measures provided by Parts 4 and 5 of the EP&A Act, if 'biodiversity certification' or a biobanking statement is issued by NSW OE&H. If a 'biobanking statement' is issued by NSW OE&H the development is taken, to be development that is not likely to significantly affect any threatened species, population or ecological community under this Act, or its habitat.	Offset requirements of the proposed development have been the subject of extensive negotiations with OEH over the past 18 months and details are provided in **Section 4.4**. Relevant correspondence and calculations are provided in **Attachment 6** and **Attachment 7**.	**4.4, Attachments 6 & 7**
Whether or not 'biodiversity certification' and 'biobanking statement' is sought or required is not articulated in the DA.	See above response.	-
Whether or not the Commonwealth's *Environmental Protection and Biodiversity Conservation Act 1999* applies to the proposed development needs to be clarified as there is potential for adverse impact on threatened species and their habitats.	**Section 5.2** of the report and includes an assessment against the requirements of the EPBC Act using the Principal Significant Impact Guidelines 1.1 (DEH 2006). The assessment has determined that referral to the Commonwealth for assessment under the Act is not required. With the implementation of proposed mitigation and amelioration measures the proposed action is considered unlikely to result in a significant impact on any matter of NES.	**5.2**
17 ISSUES DA DOCUMENTATION		
17.4 The 1st / 2nd Amendments to the DA		

Mr Malcom Scott's Comment	Response	Section
The following makes brief comments in regards the various reports (identified in *italics*) which potentially comprised the DA in the 1st / 2nd amendment to it. • *Annexure G – Ecological Assessment of Iron Gates Drive Evans Head, Version RW6 – JWA Pty Ltd, 5 September 2018* o As above Section 16.10, 16.11, 17.2, 17.3, 17.4 and 17.5 issues not resolved o Co-ordinate up-dated specialist fauna and flora report / potential SIS o Land description incorrect, DA plans to be up-dated.	See above responses to relevant sections of the information request.	-
17.5 The 2nd / 2nd Amendments to the DA		
• *Appendix O – Ecological Assessment – JWA Pty Ltd, September 2018* o As above Section 16.10, 16.11, 17.2, 17.3, 17.4 and 17.5 issues not resolved o Co-ordinate up-dated specialist reports fauna and flora report / potential SIS o Land description incorrect, DA plans to be up-dated.	See above responses to relevant sections of the information request.	-
18 ISSUES STATUTORY PLANNING CONTROLS		
18.1 *Environmental Protection and Biodiversity Conservation Act 1999*		
Fauna and flora / SIS assessment – insufficient information issues and considerations not resolved.	**Section 5.2** of the report and includes an assessment against the requirements of the EPBC Act using the Principal Significant Impact Guidelines 1.1 (DEH 2006). The assessment has determined that referral to the Commonwealth for assessment under the Act is not	**5.2**

Mr Malcom Scott's Comment	Response	Section
	required. With the implementation of proposed mitigation and amelioration measures the proposed action is considered unlikely to result in a significant impact on any matter of NES.	
18.2 s5A Environmental Planning and Assessment Act 1979		
Fauna and flora / SIS assessment – insufficient information issues and considerations not resolved.	Section 5A of the *Environmental Planning and Assessment Act 1979* (the '7-Part Test') is addressed in **Section 5.3.**	**5.3**
18.3 State Planning Policies		
SEPP No. 14 – Coastal Wetlands Fauna and flora / SIS assessment – insufficient information issues and considerations not resolved.	SEPP No. 14 – Coastal Wetlands is addressed in **Section 5.4.**	**5.4**
SEPP No. 44 – Koala Habitat Protection Fauna and flora / SIS assessment – insufficient information issues and considerations not resolved.	SEPP No. 44 – Koala Habitat Protection is addressed in **Section 5.5.**	**5.5**
18.4 Richmond Valley Local Environmental Plan 2012 (RVLEP 2012)		
The following commentary seeks to identify in summary key assessments required for the DA to address the relevant provisions of the RVLEP 2012. The provisions of the RVLEP 2012 have been edited to highlight relevant clauses and those are in *italics*. *Land use zones - objectives* *Zone E2 Environmental Conservation* • *To protect, manage and restore areas of high ecological, scientific, cultural or aesthetic values.* • *To prevent development that could destroy, damage or otherwise have an adverse effect on those values.* <u>Comment</u>	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
Sections of the internal road system encroach into the E2 zone adjoining the Evans River. The DA is not consistent with the objectives of the zone. Whilst ancillary to the subdivision, and roads are a permissible development (with consent) in the E2 zone, it is difficult to opine that the construction and use of an urban road protects, manages and restores areas of high ecological, scientific, cultural or aesthetic values. The implications of the issuing of a 'biobanking statement' needs to be clarified in regard road in the E2 zone.		
Land use zones - objectives *Zone E3 Environmental Management* • *To protect, manage and restore areas with special ecological, scientific, cultural or aesthetic values.* • *To provide a limited range of development that does not have an adverse effect on those values.* <u>Comment</u> Sections of the internal road system encroach into the E3 zone to the west of the SW residential area. The DA is not consistent with the objectives of the zone. Whilst ancillary to the subdivision, and roads are a permissible development (with consent) in the E3 zone, it is difficult to opine that the construction and use of an urban road protects, manages and restores areas of high ecological, scientific, cultural or aesthetic values and does not have an adverse	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
impact, particularly when it is intended to excavate approx. 6.5m – 7m within parts of the road reserve between Lot 276 DP 755624 and Lot 277 DP 755624. There will be considerable earthworks in the zone for the western and northern perimeter roads of the SW residential area. The implications of the issuing of a 'biobanking statement' needs to be clarified in regard road in the E3 zone.		
Land use zones - objectives *Zone W1 Natural Waterways* • *To protect the ecological and scenic values of natural waterways.* • *To prevent development that would have an adverse effect on the natural values of waterways in this zone.* • *To provide for sustainable fishing industries and recreational fishing.* <u>Comment</u> The engineering stormwater assessment and detailed investigation of the riparian zone and fishery habitat should demonstrate that the DA will be consistent with the objectives of the zone. It is critical that the management of potential acid sulfate soils, groundwater and the water table, stormwater and flooding be comprehensively assessed. The DA is not consistent with the objectives of the zone.	There will be no encroachment into the riparian zone and associated fish habitat of the Evans River.	-
Development standards	There will be no encroachment into the riparian zone and	-

Mr Malcom Scott's Comment	Response	Section
5.7 Development below mean high water mark *(1) The objective of this clause is to ensure appropriate environmental assessment from development carried out on land covered by tidal waters.* *(2) Development consent is required to carry out development on any land below the mean high water mark of any body of water subject to tidal influence (including the bed of any such water).* <u>Comment</u> Unknown engineering stormwater drainage and investigation of the riparian zone and fishery habitat – insufficient information issues and considerations not resolved.	associated fish habitat of the Evans River.	
Development standards *6.2 Essential services* *Development consent must not be granted for development unless the consent authority is satisfied that any of the following services that are essential for the proposed development are available or that adequate arrangements have been made to make them available when required:* *(e) suitable road access* <u>Comment</u> Legal issues, engineering assessment / traffic impact / bushfire impact / ecological impact - insufficient information issues and considerations not resolved.	See above responses to relevant sections of the information request.	-
Development standards *6.3 Earthworks*	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
(1) The objectives of this clause are as follows: *(a) to ensure that earthworks for which development consent is required will not have a detrimental impact on environmental functions and processes, neighbouring uses, cultural or heritage items or features of the surrounding land* Comment Engineering and planning assessments - insufficient information issues and considerations not resolved.	report and offsets proposed (**Section 4.4**) for any residual impacts.	
Development standards *6.3 Earthworks* (3) Before granting development consent for earthworks, the consent authority must consider the following matters: (g) the proximity to and potential for adverse impacts on any watercourse, drinking water catchment or environmentally sensitive area. Comment Engineering, acid sulfate soils, groundwater, riparian and fishery investigations / assessment and geotechnical assessments - insufficient information issues and considerations not resolved.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
Development standards *6.6 Terrestrial biodiversity* *(1) The objective of this clause is to maintain terrestrial biodiversity by:* *(a) protecting native fauna and flora, and* *(b) protecting the ecological processes necessary for their*	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts**.**	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
continued existence, and *(c) encouraging the conservation and recovery of native fauna and flora and their habitats.* Comment Engineering, bushfire, fauna and flora / SIS, riparian and fishery investigations / assessment - insufficient information issues and considerations not resolved.		
(2) This clause applies to land identified as "Biodiversity" on the Terrestrial Biodiversity Map. Comment Clause applies to the land.	Noted.	-
(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider: *(a) whether the development:* *(i) is likely to have any adverse impact on the condition, ecological value and significance of the fauna and flora on the land, and* Comment Engineering, bushfire and fauna and flora / SIS assessment - insufficient information issues and considerations not resolved. *(ii) is likely to have any adverse impact on the importance of the vegetation on the land to the habitat and survival of*	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
native fauna, and Comment Engineering, bushfire and fauna and flora / SIS assessment / Koala Plan of Management - insufficient information issues and considerations not resolved. *(iii) has any potential to fragment, disturb or diminish the biodiversity structure, function and composition of the land, and* Comment Fauna and flora / SIS assessment / Koala Plan of Management - insufficient information issues and considerations not resolved. *(iv) is likely to have any adverse impact on the habitat elements providing connectivity on the land, and* Comment Fauna and flora / SIS assessment / Koala Plan of Management - insufficient information issues and considerations not resolved.		
(b) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development. Comment Fauna and flora / SIS assessment / Koala Plan of Management	All proposed amelioration measures have been discussed in **Section 4.4.**	**4.4**

Mr Malcom Scott's Comment	Response	Section
- insufficient information issues and considerations not resolved.		
(4) Development consent must not be granted for development on land to which this clause applies unless the consent authority is satisfied that: *(a) the development is designed, sited and will be managed to avoid any significant adverse impact, or* <u>Comment</u> Insufficient information considerations not resolved. *(b) if that impact cannot be reasonably avoided by adopting feasible alternatives – the development is designed, sites and will be managed to minimise that impact, or* <u>Comment</u> Insufficient information issues and considerations not resolved. *(c) if that impact cannot be minimised – the development will be managed to mitigate that impact.* <u>Comment</u> Insufficient information issues and considerations not resolved.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
Development standards *6.8 Riparian land and watercourses* *(1) The objective of this clause is to protect and maintain the following:* *(a) water quality within watercourses,*	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
(b) the stability of the bed and banks of watercourses, *(c) aquatic and riparian habitats,* *(d) ecological processes within watercourses and riparian areas.* Comment A mapped wetland under SEPP No. 14 occurs in part of the residual allotment. Iron Gates Dr traverses the wetland. The location of the wetland long Iron Gates Dr should be accurately determined. Engineering, bushfire and fauna and flora / SIS, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved.		
(2) This clause applies to land identified as "Key Fish Habitat" on the Riparian Land and Waterways Map. Comment Land in immediately vicinity of mapped fish habitat.	Noted.	-
(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider: *(a) whether or not the development is likely to have any adverse impact on the following:* *(i) the water quality and flows within the watercourse,* Comment Engineering, bushfire and fauna and flora / SIS, riparian and	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
fishery investigation / assessments - insufficient information issues and considerations not resolved. *(ii) aquatic and riparian species, habitats and ecosystems of the watercourse,* <u>Comment</u> Engineering, bushfire and fauna and flora / SIS, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved. *(iii) the stability of the bed and banks of the watercourse,* <u>Comment</u> Engineering, bushfire and fauna and flora / SIS, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved. *(iv) the free passage of fish and other aquatic organisms within or along the watercourse,* <u>Comment</u> Riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved. *(v) any future rehabilitation of the watercourse and its riparian areas, and* <u>Comment</u> Riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved.		
(c) any appropriate measures proposed to avoid, minimise or mitigate the impacts of the development.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
Comment Engineering, bushfire, fauna and flora / SIS / Koala Plan of Management, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved.	report and offsets proposed (**Section 4.4**) for any residual impacts.	
(4) Development consent must not be granted for development on land to which this clause applies unless the consent authority is satisfied that: *(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or* Comment Engineering, bushfire, fauna and flora / SIS / Koala Plan of Management, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
(b) if that impact cannot be avoided by adopting feasible alternatives—the development is designed, sited and will be managed to minimise that impact, or Comment Engineering, planning, bushfire, fauna and flora / SIS / Koala Plan of Management, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved.	All proposed amelioration measures have been discussed in **Section 4.4.**	**4.4**

Mr Malcom Scott's Comment	Response	Section
(c) if that impact cannot be minimised—the development will be managed to mitigate that impact. Comment Engineering, planning, bushfire, fauna and flora / SIS assessment / Koala Plan of Management, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved.	All proposed amelioration measures have been discussed in **Section 4.4.**	**4.4**
Development standards *6.10 Wetlands* *(1) The objective of this clause is to ensure that wetlands are preserved and protected from the impacts of development.* Comment Engineering, planning, bushfire, fauna and flora / SIS assessment, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
(2) This clause applies to land identified as "Wetland" on the Wetlands Map. Comment Clause applies to the land.	Noted.	-

Mr Malcom Scott's Comment	Response	Section
(3) Before determining a development application for development on land to which this clause applies, the consent authority must consider: *(a) whether or not the development is likely to have any significant adverse impact on the following:* *(i) the condition and significance of the existing native fauna and flora on the land,* <u>Comment</u> Fauna and flora / SIS, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved. *(ii) the provision and quality of habitats on the land for indigenous and migratory species,* <u>Comment</u> Fauna and flora / SIS, riparian and fishery investigation / assessments - insufficient information issues and considerations not resolved. *(iii) the surface and groundwater characteristics of the land, including water quality, natural water flows and salinity, and* <u>Comment</u> Engineering, geotechnical, groundwater, fauna and flora / SIS, riparian and fishery investigation / assessment – insufficient information issues and considerations not resolved.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
(b) any appropriate measures proposed to avoid, minimise or	All proposed amelioration measures have been discussed	**4.4**

Mr Malcom Scott's Comment	Response	Section
mitigate the impacts of the development. Comment Engineering, planning, bushfire, fauna and flora / SIS, riparian and fishery investigation / assessment – insufficient information issues and considerations not resolved.	in **Section 4.4.**	
(4) Development consent must not be granted for development on land to which this clause applies unless the consent authority is satisfied that: *(a) the development is designed, sited and will be managed to avoid any significant adverse environmental impact, or'* Comment Engineering, planning, bushfire, fauna and flora / SIS, riparian and fishery investigation / assessment – insufficient information issues and considerations not resolved.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
(b) if that impact cannot be reasonably avoided—the development is designed, sited and will be managed to minimise that impact, or Comment Engineering, planning, bushfire, fauna and flora / SIS, riparian and fishery investigation / assessment – insufficient information issues and considerations not resolved.	All proposed amelioration measures have been discussed in **Section 4.4.**	**4.4**
18.5 Richmond Valley Development Control Plan 2012 (RVDCP 2012)		
The following provides summary comments in regard the	Noted.	-

Mr Malcom Scott's Comment	Response	Section
relevant parts of the RVDCP 2018.		
Part H – Environmental Sensitivity and Hazards		
The DA does not demonstrate that it reasonably complies with the requirements and recommendations of Part H relating to: • natural resources in regard to native vegetation, key fish habitat, habitat corridors and wetlands.	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**
18.7 s.79C DA Evaluation Environmental Planning and Assessment Act		
The following provides summary evaluation comments in regard the DA and s.4.15 (identified in *italics*). *(1) Matters for consideration – general in determining a development application, a consent authority is to take into consideration such of the following mattes as are of relevance to the development the subject of the development application:* *(a) the provisions of:* *(iv) the regulations (to the extent that they prescribe matters for the purposes of this paragraph),* <u>Comment</u> *NSW Government Coastal Policy 1997* The DA was lodged prior to the commencement of *SEPP – Coastal Management 2018* and as a consequence of the savings provisions of cl. 21 is still subject to the provisions of *SEPP No. 71*. I have assumed that the NSW Coastal Policy still applies to the land, though I cannot find a document that specifically repeals it, it may not apply. RVC has advised it understands that *Coastal Management Act 2016* repeals the	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
Policy, though in 2014 when the DA was lodged cl. 92 of the Environmental Planning and Assessment Regulation 2000 required consideration of it. The following (in *italics*) identifies and comments on the strategic actions of the Policy that are relevant to control of development in the coastal zone. *Natural Environment* *Clause 1.2.5 Threatened species* Fauna and flora / SIS, riparian and fishery investigation / assessments – insufficient information issues and considerations not resolved – NSW OE&H advice that surveys show that threatened species exist on the land. *Clause 1.2.7 Threatening processes* Fauna and flora / SIS, riparian and fishery investigation / assessments – insufficient information issues and considerations not resolved. *Nature Processes and climate change* *Clause 2.1.3 Physical and ecological processes* Fauna and flora / SIS, riparian and fishery investigation / assessments and engineering, stormwater and flooding assessments – insufficient information issues and considerations not resolved. *Cultural heritage*		

Mr Malcom Scott's Comment	Response	Section
Clause 4.2.3 Aboriginal heritage DA description of development, DA notification, Aboriginal cultural heritage assessment and consultation, AHIP, and investigation of the riparian zone and fishery habitat - insufficient information issues and considerations not resolved. *(b) the likely impacts of that development, including environmental impacts on both the natural and built environments, and social and economic impacts in the locality,* <u>Comment</u> Having regard to the information supplied with the DA in my opinion the development DA is likely to have an adverse impact on the natural environment. I am particularly concerned about potential for adverse direct and indirect impacts on threatened species within and adjoining the land. *(c) the suitability of the site for the development,* <u>Comment</u> Having regard to the information supplied with the DA, in my opinion the site is not suitable for the proposed development. I am particularly concerned about the provision for bushfire protection and safety having regard the bushfire threat assessments undertaken for the DA to-date, the type of		

Mr Malcom Scott's Comment	Response	Section
vegetation and its fuel loading with the land, on immediately adjoining land and in the locality and what asset protection zones are currently provided at the perimeter of Evans Head.		
18.8 Ecologically sustainable development Protection of the Environment Administration Act 1991		
The following provides summary evaluation comments in regard the DA and the principles of ecological sustainable development established by the objectives of the *Environmental Planning and Assessment Act 1979* and defined by the *Protection of the Environment Administration Act 1991* (identified in *italics*). *(2) For the purposes of subsection (1) (a), ecologically sustainable development requires the effective integration of social, economic and environmental considerations in decision-making processes. Ecologically sustainable development can be achieved through the implementation of the following principles and programs:* *(b) inter-generational equity – namely, that the present generation should ensure that the health, diversity and productivity of the environment are maintained or enhanced for the benefit of future generations,* <u>Comment</u> The DA does not demonstrate that the environment of the land will be maintained and enhanced for the benefit of future generations. *(c) conservation of biological diversity and ecological*	All direct and indirect impacts of the proposed development have been discussed in **Section 4** of the report and offsets proposed (**Section 4.4**) for any residual impacts.	**4, 4.4**

Mr Malcom Scott's Comment	Response	Section
integrity – namely, that conservation of biological diversity and ecological integrity should be a fundamental consideration, Comment The DA proposes significant and irreversible damage to the environment of the land and has the potential to have direct and indirect impact on the biodiversity of threatened species and their habitats.		
19 CONCLUSION		
Is should be determined also whether or not a Species Impact Statement and Koala Plan of Management should be prepared for the DA and whether or not the Commonwealth *Environmental Protection and Biodiversity Conservation Act 1999* applies to the proposed development.	As previously discussed in **Section 5.3** of the report, based on the results of the application of Section 5A of the *Environmental Planning and Assessment Act 1979* (the '7-Part Test') it is considered that a Species Impact Statement (SIS) is not required. As previously discussed in **Section 5.5** of the report, based on an assessment in accordance with requirements of *State Environmental Planning Policy No. 44: Koala Habitat Protection* the site does not contain core Koala habitat and a Koala Plan of Management is not required. As previously discussed in **Section 5.2** of the report, which includes an assessment against the requirements of the EPBC Act using the Principal Significant Impact Guidelines 1.1 (DEH 2006), it has been determined that referral to the Commonwealth for assessment under the Act is not required. With the implementation of proposed	**5.2, 5.3, 5.5,**

Mr Malcom Scott's Comment	Response	Section
	mitigation and amelioration measures the proposed action is considered unlikely to result in a significant impact on any matter of NES.	

TABLE 3 – RESPONSES TO PATRICK DWYER (FISHERIES) COMMENTS

Council Comment	Response	Section
Harming of any marine vegetation will trigger integrated development under s.205, irrespective of where it is located. Harm includes prune. I need confirmation of the tree species to be pruned in the SEPP14 to determine if this will trigger an Integrated Application.	Pruning of vegetation within the SEPP 14 wetland area is addressed within **Section 5.6.3**. No mangroves or saltmarsh vegetation, or any other marine plants, are proposed to be cleared or trimmed. These works will therefore not trigger an integrated development application.	**5.6.3**
Oxlyean Pygmy Perch (OPP) is a threatened fish species that is present in waterways around Evans Head. An ecologist specialising in freshwater fish should evaluate the habitat value of the open drains, and assess whether there are OPP present. A Species Impact Statement would be needed if the proposal will impact upon OPP. This is not an Integrated Development process.	The presence/absence of the Oxleyan pygmy perch has been addressed in the Terrestrial Flora and Fauna Assessment for the Iron Gates Drive Development (as amended April 2019 by JWA Pty Ltd). Survey works were completed in accordance with EPBC Act Survey Guidelines for Australia's Threatened Fishes and resulted in no Oxleyan pygmy perch being trapped. A Species Impact Statement is therefore not considered necessary.	-

APPENDIX 2: SUMMARY OF AMENDMENTS TO THE REPORT

JWA PTY LTD
Ecological Consultants
ABN 56 066 448 879

REPLY TO: BALLINA OFFICE

Ref: AM/N16006/Lw1

16th April 2019

Ingles Group
PO Box 3441
Australia Fair QLD 4215

Attention: Graeme Ingles

Dear Graeme,

RE: Amended Ecological Assessment (JWA 2019) – Iron Gates Drive upgrades, Evans Head

I refer to your proposed Iron Gates development, Evans Head and in particular to the proposed upgrades to Iron Gate Drive to obtain a Bush Fire Safety Authority (BFSA) issued under Section 100B of the Rural Fires Act 1997 by the Commissioner of the NSW Rural Fire Service (NSW RFS).

It is noted that a Development Application was lodged for the proposed works on the 17th January 2019 and was accompanied by an Ecological Assessment prepared by JWA Pty Ltd. We have now completed amendments to the Ecological Assessment in response to relevant requests for further information from Richmond Valley Council, Mr Malcolm Scott (Council's consulting Planner), and the NSW Department of Primary Industries (DPI).

The following amendments have been made:

1. **Section 2.2.3** has been amended to include details of a site inspection with Mr. Krister Waern (an OEH officer) on the 12th February 2019;
2. **Section 2.3.4, Figure 6** and **Figure 7** - amendments were made to the vegetation descriptions and mapping to be more reflective of likely pre-clearing and adjoining intact vegetation communities, to the satisfaction of OEH;
3. **Section 4.2** – impact calculations have been amended to reflect the revised vegetation mapping;
4. **Section 4.4** has been amended to address proposed biodiversity offsets in accordance with requirements of the Biodiversity Offsets Scheme (i.e. under the current *Biodiversity Conservation Act 2016*). Calculations of offset credits and relevant correspondence with

OEH are provided as **Attachment 6**. Evidence of the NSW Office of Environment and Heritage (OEH) acceptance of the proposed Biodiversity Offset Package is provided as **Attachment 7**.

5. **Section 5.3.3** - Assessments of Significance (7-part test equivalence) have been added for additional EECs recorded on the site in accordance with the Threatened Species Assessment Guidelines: The Assessment of Significance (DECC 2007).
6. A new **Section 5.6** has been added to address requirements of the *Fisheries Management Act 1994*.
7. The Summary and Conclusions of the report (**Section 6**) have been updated to include discussion of the assessment against the requirements of the EPBC Act using the Principal Significant Impact Guidelines 1.1, the proposed biodiversity offset package, and the assessment against the requirements of the *Fisheries Management Act 1994*.
8. **Appendix 1** has been added and includes responses to information requests from Richmond Valley Council, Mr Malcolm Scott (Council's consulting Planner), and the NSW Department of Primary Industries (Fisheries).
9. Minor grammatical errors/spelling mistakes have been corrected throughout the document.

Please do not hesitate to contact me if you require any further clarification with regards to the above advice.

Yours faithfully,
JWA Pty Ltd

Adam McArthur
Director / Principal Ecologist

APPENDIX 3 - PLANT SPECIES LIST

Family	Botanical Name	Common Name
Acanthaceae	*Avicennia marina*	Grey mangrove
Apocynaceae	*Marsdenia rostrata*	Milk vine
Apocynaceae	*Parsonsia straminea*	Common Silkpod
Araliaceae	*Schefflera actinophylla**	Umbrella Tree
Arecaceae	*Archontophoenix alexandrae**	Alexander palm
Arecaceae	*Archontophoenix cunninghamiana*	Bangalow palm
Arecaceae	*Livistona australis*	Cabbage tree palm
Arecaceae	*Syagrus romanzoffiana**	Cocos palm
Asparagaceae	*Asparagus aethiopicus**	Ground asparagus
Aspleniaceae	*Asplenium australasicum*	Bird's nest fern
Asteliaceae	*Cordyline stricta*	Narrow-leaved palm lily
Asteraceae	*Ageratina adenophora**	Crofton weed
Asteraceae	*Ageratum houstonianumon**	Blue billygoat weed
Asteraceae	*Bidens pilosa**	Farmer's friends
Asteraceae	*Ozothamnus diosmifolius*	Rice flower
Bromeliaceae	*Tillandsia* sp.*	Bromeliad
Chenopodiaceae	*Sarcocornia quinqueflora*	Beaded samphire
Convolvulaceae	*Cuscuta australis*	Australian dodder
Cyperaceae	*Baumea juncea*	Bare twig-rush
Cyperaceae	*Gahnia aspera*	Rough saw-sedge
Cyperaceae	*Schoenoplectus subulatus*	
Cyperaceae	*Schoenus brevifolius*	Zig-zag bog-rush
Dennstaedtiaceae	*Histiopteris incisa*	Bat's wing fern
Dennstaedtiaceae	*Hypolepis muelleri*	Harsh ground fern
Dennstaedtiaceae	*Pteridium esculentum*	Common Bracken
Dilleniaceae	*Hibbertia scandens*	Climbing guinea flower
Elaeocarpaceae	*Elaeocarpus reticulates*	Blueberry ash
Ericaceae	*Leucopogon pimeleoides*	
Ericaceae	*Monotoca scoparia*	
Ericaceae	*Trochocarpa laurina*	Tree heath
Euphorbiaceae	*Glochidion sumatranum*	Umbrella cheese tree
Euphorbiaceae	*Homalanthus nutans*	Bleeding heart
Fabaceae	*Acacia disparrima*	Hickory wattle
Fabaceae	*Hardenbergia violacea*	Purple coral pea
Fabaceae	*Oxylobium robustum*	Golden shaggy pea
Fabaceae-Caesalpinioideae	*Senna pendula var. glabrata**	Winter senna
Juncaceae	*Juncus kraussii*	Sea rush
Lauraceae	*Cinnamomum camphora**	Camphor laurel
Lauraceae	*Endiandra sieberi*	Hard corkwood
Lomandraceae	*Lomandra longifolia*	Spiny-headed mat-rush
Loranthaceae	*Amylotheca dictyophleba*	Brush mistletoe
Luzuriagaceae	*Geitonoplesium cymosum*	Scrambling lily
Melastomataceae	*Melastoma affine*	Native tibouchina
Meliaceae	*Dysoxylum fraserianum*	Rosewood
Meliaceae	*Synoum glandulosum*	Scentless rosewood

Family	Botanical Name	Common Name
Menispermaceae	*Stephania japonica*	Snake vine
Moraceae	*Ficus watkinsiana*	Strangling fig
Myrtaceae	*Acmena smithii*	Lilly pilly
Myrtaceae	*Austromyrtus dulcis*	Midgen berry
Myrtaceae	*Corymbia intermedia*	Pink bloodwood
Myrtaceae	*Eucalyptus robusta*	Swamp mahogany
Myrtaceae	*Homoranthus virgatus*	
Myrtaceae	*Leptospermum polygalifolium*	Coastal teatree
Myrtaceae	*Lophostemon suaveolens*	Swamp box
Myrtaceae	*Melaleuca quinquenervia*	Broad-leaved paperbark
Passifloraceae	*Passiflora subpeltata**	White passionflower
Phyllanthaceae	*Breynia oblongifolia*	Coffee bush
Pittosporaceae	*Pittosporum revolutum*	Rough fruit pittosporum
Pittosporaceae	*Pittosporum undulatum*	Sweet pittosporum
Poaceae	*Andropogon virginicus**	Whiskey grass
Poaceae	*Sporobolus virginicus*	Salt couch
Proteaceae	*Banksia ericifolia*	Heath-leaved banksia
Proteaceae	*Banksia integrifolia*	Coast banksia
Proteaceae	*Persoonia sp.*	Geebung
Restionaceae	*Baloskion pallens*	Pale cord rush
Restionaceae	*Baloskion tetraphyllum*	Plum rush
Rhamnaceae	*Alphitonia excelsa*	Red ash
Rubiaceae	*Cyclophyllum longipetalum*	Coast canthium
Rutaceae	*Acronychia imperforata*	Beach acronychia
Rutaceae	*Melicope elleryana*	Pink euodia
Rutaceae	*Nematolepis squamea*	Satinwood
Sapindaceae	*Cupaniopsis anacardioides*	Tuckeroo
Sapindaceae	*Cupaniopsis parvifolia*	Small-leaved tuckeroo
Scrophulariaceae	*Myoporum acuminatum*	Boobialla
Smilacaceae	*Smilax australis*	Austral sarsaparilla
Smilacaceae	*Smilax glyciphylla*	Sweet sarsaparilla
Solanaceae	*Solanum mauritianum**	Wild tobacco tree
Solanaceae	*Solanum seaforthianum**	Climbing nightshade
Verbenaceae	*Lantana camara**	Lantana
Vitaceae	*Cissus hypoglauca*	Water vine
Zingiberaceae	*Alpinia caerulea*	Native ginger

* Introduced species

APPENDIX 4 – FAUNA SPECIES LIST

Common name	Scientific name
Eastern whipbird	*Psophodes olivaceus*
Eastern yellow robin	*Eopsaltria australis*
Fan-tailed cuckoo	*Cacomantis flabelliformis*
Lewin's honeyeater	*Meliphaga lewinii*
Masked lapwing	*Vanellus miles*
Mistletoe bird	*Dicaeum hirundinaceum*
Pied currawong	*Strepera graculina*
Torresian crow	*Corvus orru*
Welcome swallow	*Hirundo neoxena*
Willie wagtail	*Rhipidura leucophrys*

APPENDIX 5 – LIKELIHOOD OF OCCURRENCE OF THREATENED FAUNA SPECIES IN THE STUDY AREA

Species	Likelihood of occurrence in the Study area	Notes
Australasian bittern (*Botaurus poiciloptilus*)	Unlikely	The Australasian bittern is widespread but uncommon in south-west and south-east Australia, generally preferring freshwater habitats with tall, dense vegetation with bulrushes and spikerushes. Suitable habitat for this species is not considered to occur within the study area.
Barking owl (*Ninox connivens*)	**Possible**	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. The study area may form part of a much larger home range for this species.
Barred cuckoo shrike (*Coracina lineata*)	**Possible**	The Barred cuckoo-shrike is generally uncommon and is rare in NSW. This species lives in rainforest, eucalypt forests and woodland, swamp woodlands and timber along watercourses, and wanders nomadically in search of fruit. Suitable forage habitat (i.e. fruiting rainforest tree species) occurs within the study area.
Black bittern *(Ixobrychus flavicollis)*	**Possible**	This species occurs in coastal and sub-coastal areas of south-western, northern and eastern Australia. It is usually found in dense vegetation fringing and in streams, swamps, tidal creeks and mudflats, particularly amongst swamp she-oaks and mangroves. Dense vegetation fringing tidal areas and mangroves may represent suitable habitat for this species within the study area.
Black-necked stork (*Ephippiorhynchus asiaticus*)	**Possible**	This species is widespread in northern Australia and sparse in coastal eastern Australia from Qld to southern NSW. It inhabits swamps, mangroves, mudflats, dry floodplains and irrigated land. It occasionally forages in open grassy woodland Small areas of suitable forage habitat associated with mangroves/mudflats occur within the study area.

Species	Likelihood of occurrence in the Study area	Notes
Broad-billed sandpiper (*Limicola falcinellus*)	**Possible**	Broad-billed Sandpipers favour sheltered parts of the coast such as estuarine sandflats and mudflats, harbours, embayments, lagoons, saltmarshes and reefs as feeding and roosting habitat. Occasionally, individuals may be recorded in sewage farms or within shallow freshwater lagoons. Broad-billed Sandpipers roost on banks on sheltered sand, shell or shingle beaches. Small areas of suitable forage habitat associated with mangroves/mudflats occur within the study area.
Brolga (*Grus rubicunda*)	Unlikely	Although this species occurs in northern and eastern Australia, it is uncommon and localised in the east. It inhabits shallow swamps and swamp margins, floodplains, grasslands and pastoral lands, usually in pairs or parties. Suitable habitat for this species is not considered to occur within the study area.
Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*)	Unlikely	Found in eucalypt woodlands (including Box-Gum Woodland) and dry open forest of the inland slopes and plains inland of the Great Dividing Range; mainly inhabits woodlands dominated by stringybarks or other rough-barked eucalypts, usually with an open grassy understorey, sometimes with one or more shrub species; also found in mallee and River Red Gum (*Eucalyptus camaldulensis*) Forest bordering wetlands with an open understorey of acacias, saltbush, lignum, cumbungi and grasses; usually not found in woodlands with a dense shrub layer; fallen timber is an important habitat component for foraging; also recorded, though less commonly, in similar woodland habitats on the coastal ranges and plains. Suitable habitat for this species is not considered to occur within the study area.

Species	Likelihood of occurrence in the Study area	Notes
Brush-tailed Phascogale (*Phascogale tapoatafa*)	**Possible**	Prefers dry sclerophyll open forest with sparse groundcover of herbs, grasses, shrubs or leaf litter. Also inhabit heath, swamps, rainforest and wet sclerophyll forest. Agile climber foraging preferentially in rough barked trees of 25 cm DBH or greater. Nest and shelter in tree hollows with entrances 2.5 - 4 cm wide and use many different hollows over a short time span. Potentially suitable habitat occurs within the study area. I.e. areas of tall forest, particularly where rough-barked and/or hollow-bearing trees occur in association with a sparse ground layer.
Bush Stone-curlew (*Burhinus grallarius*)	Unlikely	This species is rare east of the Great Divide except for isolated populations along the North Coast. It forages and breeds in open-grassed woodlands or sparsely treed rangelands, often with a non-existent shrub layer and abundant leaf litter. Suitable habitat for this species is not considered to occur within the study area.
Comb-crested jacana (*Irediparra gallinacea*)	Unlikely	Inhabit permanent freshwater wetlands, either still or slow-flowing, with a good surface cover of floating vegetation, especially water-lilies, or fringing and aquatic vegetation. Forage on floating vegetation, walking with a characteristic bob and flick. They feed primarily on insects and other invertebrates, as well as some seeds and other vegetation. Suitable habitat for this species is not considered to occur within the study area.
Common blossom bat (*Syconycteris australis*)	**Possible**	Common blossom bats occur in coastal areas of north-east NSW and eastern Qld. They often roost in littoral rainforest and feed on flowers in adjacent heathland and paperbark swamps. They have also been recorded in a range of other vegetation communities, such as subtropical rainforest, wet sclerophyll forest and other coastal forests. Suitable forage habitat (i.e. nectar and pollen producing vegetation) occurs on the subject site.

Species	Likelihood of occurrence in the Study area	Notes
Common planigale (*Planigale maculata*)	**Possible**	This species occurs in coastal north-east NSW. It occupies a wide range of habitats from rainforest, sclerophyll forest, grasslands, marshlands, rocky areas and even some suburban areas, and usually occurs close to water. Suitable habitat for this species occurs within the study area.
Curlew sandpiper (*Calidris ferruginea*)	**Possible**	This species generally occupies littoral and estuarine habitats, and in New South Wales is mainly found in intertidal mudflats of sheltered coasts. It also occurs in non-tidal swamps, lakes and lagoons on the coast and sometimes inland. Small areas of suitable forage habitat associated with intertidal mangroves/mudflats occur within the study area.
Dusky Woodswallow (*Artamus cyanopterus cyanopterus*)	Unlikely	The Dusky Woodswallow is found in open forests and woodlands, and may be seen along roadsides and on golf courses. Occurs in small flocks, hawking insects through clearings and above the canopy. Suitable habitat for this species is not considered to occur within the study area.
Eastern bent-wing bat (*Miniopterus schreibersii oceanensis*)	**Possible**	This species occurs throughout eastern Australia. It generally occupies caves and tunnels during the day, but may occasionally roost singularly or in small collectives under the bark of mature paperbark trees. Suitable habitat occurs within the study area for this species.
Eastern curlew (*Numenius madagascariensis*)	**Possible**	The eastern curlew is Australia's largest shorebird and a long-haul flyer. It is easily recognisable, with its long, down-curved bill. The eastern curlew takes an annual migratory flight to Russia and north-eastern China to breed, arriving back home to Australia in August to feed on crabs and molluscs in intertidal mudflats. It is extremely shy and will take flight at the first sign of danger. Small areas of suitable forage habitat associated with intertidal mangroves/mudflats occur within the study area.

Species	Likelihood of occurrence in the Study area	Notes
Eastern grass owl (*Tyto longimembris*)	Unlikely	Eastern Grass Owls are found in areas of tall grass, including grass tussocks, in swampy areas, grassy plains, swampy heath, and in cane grass or sedges on flood plains. They rest by day in a 'form' - a trampled platform in a large tussock or other heavy vegetative growth. Suitable habitat for this species is not considered to occur within the study area.
Eastern ground parrot (*Pezoporus wallicus wallicus*)	Unlikely	The Ground Parrot occurs in high rainfall coastal and near coastal low heathlands and sedgelands, generally below one metre in height and very dense (up to 90% projected foliage cover). These habitats provide a high abundance and diversity of food, adequate cover and suitable roosting and nesting opportunities for the Ground Parrot, which spends most of its time on or near the ground. When flushed, birds fly strongly and rapidly for up to several hundred metres, at a metre or less above the ground. Suitable habitat for this species is not considered to occur within the study area.
Eastern long-eared bat (*Nyctophilus bifax*)	**Possible**	This species occurs from Cape York through eastern Qld to the far north-east corner of NSW. It inhabits lowland subtropical rainforest and wet and swamp eucalypt forest, extending into adjacent moist eucalypt forest. Suitable habitat occurs within the study area for this species.
Eastern Osprey (*Pandion cristatus*)	**Possible**	This raptor is thinly distributed in coastal Australia. It nests in singularly overtopping, generally dead trees. The Osprey hunts in coastal rivers, estuaries and streams and may gather nesting material from nearby forests. Suitable habitat for this species occurs within the study area.

Species	Likelihood of occurrence in the Study area	Notes
Emu population in the New South Wales North Coast Bioregion and Port Stephens local government area (*Dromaius novaehollandiae*)	Unlikely	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. Suitable habitat for this species is not considered to occur within the study area.
Glossy black cockatoo (*Calyptorhynchus lathami*)	Unlikely	Found in coastal forests and open inland woodland in eastern Australia. The Glossy black-cockatoos distribution is limited to habitat which contains sufficient seed reserves of their three favoured species of food trees: *Allocasuarina littoralis*, *A. torulosa* and *A. verticillata* (Forshaw 1981) and suitable large hollow bearing trees for nesting. The general lack of favoured food tree species is likely to preclude the occurrence of this species within the study area.
Greater broad-nosed bat (*Scoteanax rueppellii*)	**Possible**	This species occurs on the coast and ranges from Qld to southern NSW. The Greater broad-nosed bat is found in a variety of habitats from Woodlands, Moist and Dry eucalypt forest, and Rainforest, roosting in tree hollows. Suitable habitat for this species occurs within the study area.
Greater glider (*Petauroides volans*)	Unlikely	The greater glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is primarily folivorous, with a diet mostly comprising eucalypt leaves, and occasionally flowers. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows. Suitable habitat for this species is not considered to occur within the study area.

Species	Likelihood of occurrence in the Study area	Notes
Greater Sand-plover (*Charadrius leschenaultii*)	**Possible**	Almost entirely restricted to coastal areas in NSW, occurring mainly on sheltered sandy, shelly or muddy beaches or estuaries with large intertidal mudflats or sandbanks. Roosts during high tide on sandy beaches and rocky shores; begin foraging activity on wet ground at low tide, usually away from the edge of the water; individuals may forage and roost with other waders. Small areas of suitable forage habitat associated with intertidal mangroves/mudflats occur within the study area.
Grey-crowned Babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*)	Unlikely	Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Woodlands on fertile soils in coastal regions. Suitable habitat for this species is not considered to occur within the study area.
Grey-headed flying-fox (*Pteropus poliocephalus*)	**Likely**	This species occurs from central eastern Qld south to Vic. In NSW they mainly occur in coastal areas and along river valleys. They typically roost in conspicuous camps in lowland rainforest and swamp forest, often in isolated remnants or on islands in rivers. They forage on fruit, nectar and pollen in rainforests and eucalypt forests. Coast banksia on the site offers suitable forage habitat for this species. Suitable forage habitat (i.e. fruit, nectar and pollen producing vegetation) occurs on the subject site.
Hoary wattled bat (*Chalinolobus nigrogriseus*)	Unlikely	In NSW the Hoary Wattled Bat occurs in dry open eucalypt forests, favouring forests dominated by Spotted Gum, boxes and ironbarks, and heathy coastal forests where Red Bloodwood and Scribbly Gum are common. Because it flies fast below the canopy level, forests with naturally sparse understorey layers may provide the best habitat. Suitable habitat for this species is not considered to occur within the study area.

Species	Likelihood of occurrence in the Study area	Notes
Koala (*Phascolarctos cinereus*)	**Possible**	The Koala occurs in eucalypt woodlands and forests throughout eastern Australia. They inhabit areas where there are appropriate food trees. The preferred food tree species Swamp mahogany (*Eucalyptus robusta*) occurs in low numbers across some areas of the study area.
Large-eared pied bat (*Chalinolobus dwyeri*)	Unlikely	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. Females have been recorded raising young in maternity roosts (c. 20-40 females) from November through to January in roof domes in sandstone caves and overhangs. They remain loyal to the same cave over many years. Suitable habitat for this species is not considered to occur on the subject site.
Lesser Sand-plover (*Charadrius mongolus*)	**Possible**	Almost entirely coastal in NSW, favouring the beaches of sheltered bays, harbours and estuaries with large intertidal sandflats or mudflats; occasionally occurs on sandy beaches, coral reefs and rock platforms. Small areas of suitable forage habitat associated with intertidal mangroves/mudflats occur within the study area.
Little bent-wing bat (*Miniopterus australis*)	**Likely**	This species occurs in coastal north-east NSW and eastern Qld. It inhabits moist eucalypt forest, rainforest and dense coastal scrub. It generally occupies caves and tunnels during the day, and may occasionally roost singularly or in small collectives under the bark of mature paperbark trees. Suitable habitat occurs within the study area for this species.
Little eagle (*Hieraaetus morphnoides*)	Unlikely	The Little Eagle is found throughout the Australian mainland excepting the most densely forested parts of the Dividing Range escarpment. It occurs as a single population throughout NSW. It is unlikely that this species would occur within the study area due to the lack of suitable habitat.

Species	Likelihood of occurrence in the Study area	Notes
Little lorikeet (*Glossopsitta pusilla*)	**Possible**	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. Potentially suitable habitat occurs within the study area for this species.
Little Tern (*Sternula albifrons*)	Unlikely	Almost exclusively coastal, preferring sheltered environments; however may occur several kilometres from the sea in harbours, inlets and rivers (with occasional offshore islands or coral cay records). It is unlikely that this species would occur within the study area due to the lack of suitable habitat.
Masked owl (*Tyto novaehollandiae*)	Unlikely	Extends from the coast where it is most common to the western plains. Overall records for this species fall within approximately 90% of NSW, excluding the most arid north-western corner. Pairs have a large home-range of 500 to 1000 hectares. They live 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. The typical diet consists of tree-dwelling and ground mammals, especially rats. Roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. Suitable habitat is not considered to occur within the study area for this species.
New Holland mouse (*Pseudomys novaehollandiae*)	**Possible**	Known to inhabit open heathlands, woodlands and forests with a heathland understorey and vegetated sand dunes. Potentially suitable habitat occurs within the study area for this species.
Olongburra Frog (*Litoria olongburensis*)	**Possible**	This species occurs in coastal areas from Fraser Island in south-east Qld to Yuraygir National Park in northern NSW. It inhabits paperbark swamps and sedge swamps of the coastal 'wallum' country. This species may occur within swampy areas of the study area.

Species	Likelihood of occurrence in the Study area	Notes
Pale-vented Bush-hen (*Amaurornis moluccana*)	**Possible**	The Pale-vented bush-hen occurs in coastal northern Australia and through eastern Qld to the NSW north coast. It inhabits a variety of coastal wetlands from mangroves, lagoons and swamps, to river margins and creeks running through rainforest. Potentially suitable habitat occurs within the study area for this species.
Pied Oystercatcher (*Haematopus longirostris*)	**Possible**	Favours intertidal flats of inlets and bays, open beaches and sandbanks. 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. Small areas of suitable forage habitat associated with intertidal mangroves/mudflats occur within the study area.
Powerful owl (*Ninox strenua*)	**Possible**	The Powerful Owl inhabits a range of vegetation types, from woodland and open sclerophyll forest to tall open wet forest and rainforest. The Powerful Owl requires large tracts of forest or woodland habitat but can occur in fragmented landscapes as well. The species breeds and hunts in open or closed sclerophyll forest or woodlands and occasionally hunts in open habitats. It roosts by day in dense vegetation comprising species such as Turpentine *Syncarpia glomulifera*, Black She-oak *Allocasuarina littoralis*, Blackwood *Acacia melanoxylon*, Rough-barked Apple *Angophora floribunda*, Cherry Ballart *Exocarpus cupressiformis* and a number of eucalypt species. Potentially suitable habitat occurs within the study area for this species.
Red goshawk (*Erythrotriorchis radiatus)*	**Possible**	This species is distributed sparsely through northern and eastern Australia and is very rare in NSW. Red goshawks inhabit open woodland and forest, preferring a mosaic of habitat types. A large population of birds are necessary as a source of food for this species. Permanent water and riparian habitats along or near watercourses or wetlands are favoured by this species. Potentially suitable habitat occurs within the study area for this species.

Species	Likelihood of occurrence in the Study area	Notes
Regent Honeyeater (*Anthochaera phrygia*)	**Possible**	The species inhabits dry open forest and woodland, particularly Box-Ironbark woodland, and riparian forests of River Sheoak. Regent Honeyeaters inhabit woodlands that support a significantly high abundance and species richness of bird species. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. Every few years non-breeding flocks are seen foraging in flowering coastal Swamp Mahogany and Spotted Gum forests, particularly on the central coast and occasionally on the upper north coast. Birds are occasionally seen on the south coast. Potentially suitable habitat occurs within the study area for this species, particularly areas containing Swamp mahogany.
Rose-crowned fruit-dove (*Ptilinopus regina*)	**Possible**	The Rose-crowned fruit-dove occurs along the coast and the ranges of Qld and eastern NSW. It occurs mainly in subtropical and dry rainforest and occasionally in moist eucalypt forest and swamp forest, where fruit is plentiful. Suitable forage habitat (i.e. fruiting trees) occurs within the study area for this speices.
Sooty Oystercatcher (*Haematopus fuliginosus*)	Unlikely	Favours 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. Suitable habitat is not considered to occur within the study area for this species.
Southern Myotis (*Myotis macropus*)	**Possible**	This species is distributed throughout eastern Australia. It forages over bodies of water ranging from rainforest streams to large lakes and reservoirs. It roosts during the day in caves, mines, tunnels, tree hollows and under bridges. Suitable forage habitat (e.g. drainage lines) occurs within the study area for this species.

Species	Likelihood of occurrence in the Study area	Notes
Spotted harrier (*Circus assimilis*)	Unlikely	The Spotted harrier occurs in grassy open woodland including *Acacia* and mallee remnants, inland riparian woodlands, grassland and shrub steppe. It is found most commonly in native grassland, but also occurs in agricultural land, foraging over open habitats including edges of inland wetlands. Suitable habitat for this species is not considered to occur within the study area.
Spotted tailed quoll (*Dasyurus maculatus*)	**Possible**	The range of the Spotted-tailed Quoll has contracted to the east coast of NSW, Tasmania, eastern Victoria and north-eastern Queensland. 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 crevices, boulder fields and rocky-cliff faces as den sites. Mostly nocturnal consuming a variety of prey, including gliders, possums, small wallabies, rats, birds, bandicoots, rabbits and insects; also eats carrion and takes domestic fowl. Suitable habitat occurs within the study area for this species.
Square-tailed kite (*Lophoictinia isura*)	Unlikely	Found in a variety of timbered habitats including dry woodlands and open forests. Shows a particular preference for timbered watercourses. In arid north-western NSW, has been observed in stony country with a ground cover of chenopods and grasses, open acacia scrub and patches of low open eucalypt woodland. Suitable habitat for this species is not considered to occur within the study area.
Squirrel glider (*Petaurus norfolcensis*)	**Possible**	The Squirrel glider is distributed widely in eastern Australia. It occupies wet and dry sclerophyll forests with open dry sclerophyll forests regarded as optimum habitat. Suitable habitat occurs within the study area for this species.

Species	Likelihood of occurrence in the Study area	Notes
Stephen's banded snake (*Hoplocephalus stephensii*)	Unlikely	Inhabits rainforest and eucalypt forests and rocky areas up to 950 m in altitude. Stephens' Banded Snake is nocturnal, and shelters between loose bark and tree trunks, amongst vines, or in hollow trunks limbs, rock crevices or under slabs during the day. Suitable habitat for this species is not considered to occur on the subject site.
Varied sittella (*Daphoenositta chrysoptera)*	Unlikely	Varied Sitellas are found in eucalypt woodlands and forests throughout their range. They prefer rough-barked trees like stringybarks and ironbarks or mature trees with hollows or dead branches. Suitable habitat for this species is not considered to occur within the study area.
Wallum froglet (*Crinia tinnula*)	**Possible**	The Wallum froglet is found in coastal areas from South-East Qld to the central coast of NSW. It is found only in acid Paperbark swamps and sedge swamps of the coastal 'wallum' country. Potentially suitable habitat (i.e. paperbark/sedge swamps) occurs within the study area for this species.
White-eared monarch (*Monarcha leucotis*)	**Possible**	This species is restricted to eastern Qld and the NSW north coast. It occurs primarily in coastal rainforest, swamp forest and wet eucalypt forest and appears to prefer forest edges. Suitable habitat occurs within the study area for this species.
Wompoo fruit dove (*Ptilinopus magnificus*)	**Possible**	This species is found along the coast and coastal ranges from Cape York to the Hunter River in NSW. It occurs in rainforests, low-elevation moist eucalypt forest and brushbox forests. They most often occur in mature forests, but are also found in remnant and regenerating forest. Suitable forage habitat (i.e. fruiting trees) occurs within the study area for this species.
Yellow-bellied glider (*Petaurus australis*)	**Possible**	Occur in tall mature eucalypt forest generally in areas with high rainfall and nutrient rich soils. Forest type preferences vary with latitude and elevation; mixed coastal forests to dry escarpment forests in the north; moist coastal gullies and creek flats to tall montane forests in the south. Suitable habitat occurs within the study area for this species.

Species	Likelihood of occurrence in the Study area	Notes
Yellow-bellied sheathtail-bat (*Saccolaimus flaviventris*)	**Possible**	Forages in most habitats across its very wide range, with and without trees; appears to defend an aerial territory. Roosts singly or in groups of up to six, in tree hollows and buildings; in treeless areas they are known to utilise mammal burrows. Suitable habitat occurs within the study area for this species.

APPENDIX 6: BIODIVERSITY OFFSET CALCULATIONS AND RELEVANT CORRESPONDENCE

Adam McArthur

From: Adam McArthur
Sent: Friday, February 15, 2019 2:39 PM
To: 'Krister Waern'
Cc: 'Graeme@inglesgroup.com.au'; 'Dimitri Young'
Subject: RE: Iron Gates - Access Road
Attachments: N16006_Fig7_Impact Veg (12.02.19).pdf

Hi Krister,

I refer to our recent site inspection at the Iron Gates development, Evans Head during which we discussed biodiversity offsets required for the vegetation clearing/trimming works required along Iron Gates Drive. In this regard, please find attached revised vegetation mapping. I am also in the process of amending the Ecological Assessment report to accompany the development application to Council. I will forward this for your review in due course.

We have re-run the BAM calculations based on the results of our site inspection and the attached revised vegetation mapping. The BAM calculator assessment has been submitted and the relevant case number is as follows: 00013094/BAAS17014/19/00013095. The results are summarised in the table below. As agreed on site, we would add 1 additional credit for PCT 1064 to offset the trimming/pruning of vegetation within the SEPP 14 wetland areas.

Please don't hesitate to contact me if you have any queries.

Plant Community Type (PCT)	Threatened Ecological Community (TEC)	Area Impacted	Credits Required
1230-Swamp Mahogany swamp forest on coastal lowlands of the NSW North Coast Bioregion and northern Sydney Basin Bioregion	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.03 ha	1
1275- Tuckeroo – Riberry – Yellow Tulipwood littoral rainforest of the NSW North Coast Bioregion	Littoral rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions	0.24 ha	8
1064-Paperbark swamp forest of the coastal lowlands of the NSW North Coast Bioregion and Sydney Basin Bioregion	Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions	0.48 ha	19
785-Coastal heath on sands of the NSW North Coast Bioregion	Not a TEC	0.12 ha	3

Regards,

Adam McArthur
Director / Principal Ecologist

T: 07 3219 9436 | **F:** 07 3423 2076 |**M:** 0467 099 119 | **E:** adam@jwaec.com.au
Suite C, Building 21, Garden City Office Park, 2404 Logan Road, Eight Mile Plains QLD 4113
www.jwaec.com.au | ABN 56 066 448 879

From: Adam McArthur
Sent: Friday, December 14, 2018 10:32 AM
To: 'Krister Waern' <krister.waern@environment.nsw.gov.au>
Cc: Graeme@inglesgroup.com.au; Dimitri Young <Dimitri.Young@environment.nsw.gov.au>
Subject: RE: Iron Gates - Access Road

Hi Krister,

The Iron Gates entry road BAM calculator assessment has been finalised and submitted - case number: 00013094.

A plan showing the impacts of the required road widening on adjoining vegetation is attached. Impacts are as follows:

DIRECT IMPACTS OF PROPOSED ROAD WIDENING

Vegetation communities	Total area onsite (ha)	Impact area (ha)
1. Tall closed/open forest (*Acacia disparrima / Corymbia intermedia +/- Melaleuca quinquenervia*)	2.83	0.70
2. Tall closed forest (*Melaleuca quinquenervia*)	0.37	0.02
3. Tall shrubland/heathland (*Leptospermum polygalifolium*)	0.86	0.12
4. Tall closed/open forest (*Melaleuca quinquenervia / Eucalyptus robusta*)	0.20	0.03
5. Low closed/open mangrove forest (*Avicennia marina*)	0.17	0.00
Existing road	0.75	0.64
Unmapped (eastern end)	0.69	0.23
TOTAL	**5.87**	**1.74**

Please do not hesitate to contact me if you require any further information.

Regards,

Adam McArthur
Director / Principal Ecologist

T: 07 3219 9436 | **F:** 07 3423 2076 |**M:** 0467 099 119 | **E:** adam@jwaec.com.au
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APPENDIX 7: OEH CONFIRMATION OF PROPOSED BIODIVERSITY OFFSET PACKAGE

Office of Environment & Heritage

NSW GOVERNMENT

Our Ref: DOC19/133546
Your Ref: Iron Gates Access Road

JWA Ecological Consultants
Suite C, Building 21, Garden City Office Park
2404 Logan Road
Eight Mile Plains QLD 4113

Attention: Mr Adam McArthur

Dear Mr McArthur

Re: Iron Gates Access Road – Amended Ecological Assessment

Thank you for your emails dated 15 and 20 February 2019 about the proposed Iron Gates subdivision access road, seeking comments from the Office of Environment and Heritage (OEH). I appreciate the opportunity to provide further input.

The OEH has reviewed Figure 7A Revised Impact on Vegetation Communities dated 12 February 2019 and the Amended Ecological Assessment dated February 2019, that were prepared following the site inspection with you, Mr Graeme Ingles and Mr Krister Waern on 12 February 2019.

Based on our review, the OEH agrees with the revised vegetation mapping and advises that this mapping and the revised credit requirements for the impacts of the proposed access road, are accurate.

The credits for the access road impacts are specified on pages 25-26 of the Amended Ecological Assessment and comprise:

- 21 Swamp Sclerophyll Forest on Coastal Floodplains of the New South Wales North Coast, Sydney Basin and South East Corner Bioregions credits,
- eight Littoral Rainforest in the NSW North Coast, Sydney Basin and South East Corner bioregions credits, and
- three Coastal Heath on Sands of the NSW North Coast Bioregion credits.

The credits should be retired as an offset prior to the removal of vegetation for the access road.

We have no further issues to raise about these matters.

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Federation House, Level 8, 24 Moonee Street
Coffs Harbour NSW 2450
Tel: (02) 6659 8200 Fax: (02) 6659 8281
ABN 30 841 387 271
www.environment.nsw.gov.au

The OEH has not assessed whether the area of impact associated with the access road is enough to establish a road to the required standard. This is a matter for the Richmond Valley Council to ascertain.

If you have any further questions about this issue, I can be contacted on 6659 8272 or at dimitri.young@environment.nsw.gov.au.

Yours sincerely

Dimitri Young 8 March 2019

DIMITRI YOUNG
Senior Team Leader Planning, North East Branch
Conservation and Regional Delivery

cc: Mr Tony McAteer – Richmond Valley Council

APPENDIX 8 – KEY THREATENING PROCESSES

*Key Threatening Processes (*Listed under *Schedule 3* of the *Threatened Species Conservation Act 1995):*

- Aggressive exclusion of birds from woodland and forest habitat by abundant Noisy Miners (*Manorima melanocephala*)
- Alteration of habitat following subsidence due to longwall mining
- Alteration to the natural flow regimes of rivers, streams, floodplains & wetlands
- Anthropogenic Climate Change
- Bushrock Removal
- Clearing of native vegetation
- Competition and grazing by the feral European rabbit (*Oryctolagus cuniculus*)
- Competition and habitat degradation by feral goats (*Capra hircus*)
- Competition from feral honeybees (*Apis mellifera*)
- Death or injury to marine species following capture in shark control programs on ocean beaches
- Entanglement in, or injestion of anthropogenic debris in marine and esturine environments
- Forest eucalypt dieback associated with over-abundant psyllids and Bell Miners
- Herbivory and environmental degradation caused by feral deer
- High frequency fire resulting in the disruption of life cycle processes in plants and animals and loss of vegetation structure and composition
- Importation of Red Imported Fire Ants (*Solenopsis invicta*)
- Infection by Psittacine Circoviral (beak & feather) Disease affecting endangered psittacine species and populations
- Infection of frogs by amphibian chytrid causing the disease chytridiomycosis
- Infection of native plants by *Phytophthora cinnamomi*
- Introduction and establishment of Exotic Rust Fungi of the order Pucciniales pathogenic on plants of the family Myrtaceae
- Introduction of the Large Earth Bumblebee (*Bombus terrestris*)

- Invasion and establishment of exotic vines and scramblers
- Invasion and establishment of Scotch Broom (*Cytisus scoparius*)
- Invasion and establishment of the Cane Toad (*Bufo marinus*)
- Invasion, establishment and spread of (*Lantana camara*)
- Invasion of native plant communities by African Olive (*Olea europaea* subsp. *cuspidata*)
- Invasion of native plant communities by *Chrysanthemoides monilifera*
- Invasion of native plant communities by exotic perennial grasses
- Invasion of the yellow crazy ant (*Anoplolepis gracilipes*)
- Loss and degradation of native plant and animal habitat by invasion of escaped garden plants, including aquatic plants
- Loss of hollow-bearing trees
- Loss and degradation (or both) of sites used for hill-topping by butterflies
- Predation and hybridisation by Feral Dogs (*Canis lupus familiaris*)
- Predation by *Gambusia holbrooki* (Plague Minnow or Mosquito Fish)
- Predation by the European Red Fox (*Vulpes vulpes*)
- Predation by the Feral Cat (*Felis catus*)
- Predation by the Ship Rat (*Rattus rattus*) on Lord Howe Island
- Predation, habitat degradation, competition and disease transmission by Feral Pigs (*Sus scrofa*)
- Removal of dead wood and dead trees