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## Teviot Brook / Riverbend EPBC Act Referral

**CELESTIN** 

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# Referral of proposed action

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## Project title: Teviot Brook / Riverbend

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### 1 Summary of proposed action

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#### 1.1 Short description

This referral pertains to the construction and operation of a master planned residential development located southwest of Brisbane City, within the Greater Flagstone Priority Development Area (designated by the Queensland **Department of Infrastructure, Local Government and Planning (DILGP)**). The proposed residential development has an approximate development footprint of 550 hectares located in one of the fastest growing residential areas in Australia. The development will result in the clearing of approximately 280.9 ha of vegetation. The site is currently used for agricultural uses.

#### 1.2 Latitude and longitude

Id	Longitude (east)	Latitude (south)	Id	Longitude (east)	Latitude (south)
1	152.986827143	-27.830127969	20	152.957619317	-27.838426746
2	152.986394182	-27.832842998	21	152.958499432	-27.833833158
3	152.986054294	-27.834716968	22	152.941341475	-27.831274323
4	152.984861530	-27.837171897	23	152.941976756	-27.830494709
5	152.984246373	-27.838508368	24	152.957686551	-27.823325217
6	152.984449595	-27.841129638	25	152.960684821	-27.823772334
7	152.983796433	-27.842606105	26	152.961241685	-27.821693644
8	152.982965291	-27.844537131	27	152.964911468	-27.820247814
9	152.983384915	-27.845603526	28	152.965991788	-27.819752105
10	152.973696448	-27.844140783	29	152.964140698	-27.829680935
11	152.974704184	-27.838570714	30	152.967660010	-27.830198772
12	152.966092199	-27.837302685	31	152.969072491	-27.822741710
13	152.966057949	-27.837481573	32	152.976455651	-27.823853247
14	152.966259502	-27.837511264	33	152.976666532	-27.824996732
15	152.965777226	-27.840080813	34	152.977060638	-27.824880630
16	152.964072488	-27.839033075	35	152.977498762	-27.827022374
17	152.963206895	-27.838701457	36	152.980093934	-27.828119911
18	152.960108317	-27.838128619	37	152.980692737	-27.828825958
19	152.958998114	-27.837739624	38	152.982378528	-27.830062188

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1.3 **Locality and property description**

The site is located on Teviot Road, approximately 40 kilometres (km) southwest of Brisbane City, and 17 km north of Beaudesert, in Queensland. The site is located within the Greater Flagstone Priority Development Area (PDA) identified by DILGP. The landscape surrounding the site contains a mixture of cleared agricultural land and vacant bushland. The majority of the adjoining land is also within the PDA. The northern and western extents of the project area are bounded by rural residential properties, cleared of most vegetation. The eastern boundary adjoins the Logan River, with rural residential lots located on the opposite bank. The southern boundary is adjoined by allotments within the PDA earmarked for future development and the provision of infrastructure and services. There are a number of roads in the surrounding area, and the Mt Lindesay Highway is approximately 4 km to the east of the site. Refer to the site context map (**Figure 1**) and site aerial (**Figure 2**).

The Greater Flagstone PDA is 7,188 ha, and incorporates land across Flagstone, Central Greenbank, and North Maclean. The PDA aims to attract 120,000 people over the next 30 years and beyond, with an associated 50,000 new homes and 30,000 local jobs. It is considered to be one of the largest growth areas in Australia and has been defined as a priority growth zone in the South-East Queensland Regional Plan 2009-2031.

The proposed development site is located on six allotments, which currently consist of cleared paddocks and vegetated areas. The majority of the vegetation is regrowth, with some patches of remnant Least Concern Regional Ecosystems, and smaller areas of Endangered and Of Concern remnant vegetation. A watercourse traverses the site in a west to east direction. The watercourse is representative of a drainage line in the western portion of the project area, and then flows into the Logan River in the eastern edge of the project site.

The referral area covers a development footprint of approximately 550 hectares. Refer to **Figure 1** for the site context and **Figure 2** for the site aerial, and **Plan 1** for the concept development layout.

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1.4 **Size of the development footprint or work area (hectares)**

The total development footprint is approximately 550 hectares.

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1.5 **Street address of the site**

Teviot Road, Jimboomba, Queensland 4280.

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1.6 **Lot description**

The referral area is made up of six allotments (refer to **Figure 2**):

Lot Number	Tenure
Lot 800 on SP247625	Freehold
Lot 101 on SP254145	Freehold
Lot 102 on SP254145	Freehold
Lot 104 on SP254145	Freehold
Lot 105 on SP254145	Freehold
Lot 106 on SP254145	Freehold

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1.7 **Local Government Area and Council contact (if known)**

EDQ – Owen Haslam (Manager, Development Assessment)

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1.8 **Time frame**

Currently, the project is completing State and Local Government approvals processes. It is anticipated that the site preparation works will be conducted in first quarter 2017, with first sales occurring before the end of 2017. It is anticipated that the development will be staged, with the first stage with rollout dependent on market forces.

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1.9	<b>Alternatives to proposed action</b>	<b>X</b>	<p><b>No.</b></p> <p>The site is located within the Greater Flagstone PDA strategically designated by DILGP. It is also zoned as Priority Development Area under the <b>Logan City Council Planning Scheme</b>. Being within the PDA, the site will be adequately serviced by roads and other proposed infrastructure such as the proposed railway line running north to south through the PDA. Currently there are a number of access roads surrounding the site, and the Mt Lindesay Highway is approximately 4 km to the east.</p> <p>The location of this proposed development meets the intent of the area under the current South East Queensland Regional Plan, and Priority Development Area designations. It also meets the Logan City Council planning intent.</p> <p>Undertaking a different scale action, or in a different location was not considered as it would not be consistent with the intent of the Greater Flagstone PDA. Further, this (or similar) action could not be completed elsewhere unless similar zoning declaration, infrastructure planning, and resource investment had occurred, of which no alternate location exists.</p>
			Yes, you must also complete section 2.2
1.10	<b>Alternative time frames etc</b>	<b>X</b>	<p><b>No.</b></p> <p>There are no alternative timeframes proposed. In keeping with the declaration of the PDA, a unified approach to planning, assessment, and approvals are required to ensure the area delivered outcomes in support of South East Queensland Regional Plan growth targets.</p>
			Yes, you must also complete Section 2.3. For each alternative, location, time frame, or activity identified, you must also complete details in Sections 1.2-1.9, 2.4-2.7 and 3.3 (where relevant).
1.11	<b>State assessment</b>	<b>X</b>	<p><b>No.</b></p> <p>The project is not subject to a state environmental impact assessment. The project is within the PDA, and therefore all applications made are assessed and approved by State Government, under a system that is mutually exclusive to the EPBC Act assessment.</p>
			Yes, you must also complete Section 2.5
1.12	<b>Component of larger action</b>	<b>X</b>	<p><b>No.</b></p> <p>The project is not being developed as part of a component of a larger action. The action forms part of the Greater Flagstone PDA, however the project proponent has no other landholdings or control within the PDA.</p>
			Yes, you must also complete Section 2.7
1.13	<b>Related actions/proposals</b>	<b>X</b>	<p><b>No.</b></p> <p>This referral is not related to any other actions in the region. It will be undertaken in accordance with the Development Scheme for the Greater Flagstone PDA, but the proponent does not have any control over other actions in the area.</p>

		Yes, provide details:
1.14	<b>Australian Government funding</b>	<input checked="" type="checkbox"/> <b>No.</b> The proponent has not received funding from the Australian Government to undertake the project.
		Yes, provide details:
1.15	<b>Great Barrier Reef Marine Park</b>	<input checked="" type="checkbox"/> <b>No.</b> The proposed action is not located inside the Great Barrier Reef Marine Park. Yes, you must also complete Section 3.1 (h), 3.2 (e)

## 2 Detailed description of proposed action

### 2.1 Description of proposed action

The proposed action is for the construction and operation of a master planned residential development within a future growth area in South East Queensland. The action consists of converting approximately 550 ha of rural residential land into a residential development, providing new homes for the region as well as supporting facilities such as schools, shopping, and commercial precincts and community open space and sporting grounds.

The site is located approximately 40 km southwest of Brisbane City, and 17 km north of Beaudesert, within the southwestern growth corridor of South East Queensland. It is within the Greater Flagstone PDA and will be developed in accordance with the Greater Flagstone Urban Development Area Development Scheme. Following the designation of the Greater Flagstone PDA, the Urban Development Area was declared in 2010. The PDA was included in the *South East Queensland Regional Plan 2009 -2031* by the State Government as a key urban development growth area, due to its potential to absorb a vast proportion of the regional area's population over a two-decade timeframe (it is estimated that 120,000 residents will need to be accommodated in over 50,000 dwellings).

The site is approximately 550 ha, over six allotments. The majority of the site is disturbed, consisting of cleared paddock land or regrowth vegetation, with some patches of remnant vegetation present. The majority of the adjoining land is also disturbed and fragmented, currently used for rural residential purposes, with the majority of surrounding land within the PDA. The eastern boundary of the site adjoins the Logan River. There are a number of roads in the surrounding area, and the Mt Lindesay Highway is approximately 4 km to the east of the site. Refer to the site context map (**Figure 1**) and site aerial (**Figure 2**). Given the designation of the PDA, there are numerous residential developments proposed and under construction within the surrounding area (**Plan 2**), which are currently in the process of applying for approvals, with several more likely to occur within the next few years, in accordance with State and Local Government planning intent for the area. It should be noted that the proposed developments surrounding the subject site limits the connectivity and vegetation values remaining within the landscape. Further, the vegetation existing on the proposed development site is largely isolated from other vegetation due to the presence of cleared rural residential properties and roads, and the presence of the Logan River. It is anticipated that with ongoing development of the PDA and surrounding areas, the vegetation on-site will become increasingly isolated. The project has been designed to provide fauna and flora connectivity with significant vegetation corridors to be provided running east west and north south through the site. In addition, sections of the Logan River adjacent to the site will be revegetated to add to regional connectivity linking rural areas to the east to the regional biodiversity corridor in the west.

The Greater Flagstone Urban Development Area Development Scheme includes provisions and guidelines for proposed developments to deliver suitably designed neighbourhoods, centres, housing diversity and affordability, employment opportunities, movement networks, community greenspace networks, community facilities, natural and cultural values, community safety and development constraints, service infrastructure and other general requirements. The development for this site will be designed and developed in accordance with this Scheme.

At this stage, the concept design of the master planned development for this site includes:

- District and Neighbourhood Centres (including community facilities, commercial, retail and entertainment areas);
- District Sports and Recreational Parks;
- Schools; and
- Transport hubs.

In terms of potential impacts on *Matters of National Environmental Significance* (MNES), the proposed action can be described as:

- a) Clearing of approximately 280.9 ha of disturbed vegetation, including approximately 124.5 ha of mapped remnant vegetation (the majority of which is Least Concern Regional Ecosystem), with the balance being regrowth and scattered trees;
- b) Removal of some Koala food trees;
- c) Earthworks linked to creating grades to support roads, infrastructure, new allotments, and drainage patterns;
- d) Establishment of hard stand areas on land which is currently used for rural purposes; and
- e) Expansion of surrounding land uses by increasing the available residential land area by approximately 452 ha, and 31.1 ha of open space / green space, which may increase the number of domestic pets and exotic/ornamental flora species in the area.

It is noted that detailed master-planning is still being undertaken for the project site which may result in minor changes to the areas identified above and shown on Plan 1. However, if any change was to occur, it is likely to result in a reduction of the clearing area.

## **2.2 Alternatives to taking the proposed action**

There are no alternatives proposed (refer to response 1.9).

## **2.3 Alternative locations, time frames or activities that form part of the referred action**

There are no alternatives proposed (refer to response 1.10).

## **2.4 Context, planning framework and state/local government requirements**

### **Context**

The proposed site is within the Greater Flagstone Priority Development Area, which was declared by the Queensland Government on 8 October 2010. The PDA covers an area of 7,188 ha, and is located west of Jimboomba in South East Queensland. The PDA is intended to provide 50,000 dwellings for 120,000 people in one of the fastest growing regions of southeast Queensland.

### **Planning Framework**

The proposed development site is located within the **Logan City Council** Local Government area, in South East Queensland. Whilst the project is within the area subject to the provisions of the *Logan City Planning Scheme 2015* and Queensland's *Sustainable Planning Act 2009 (SPA)*, it is ultimately guided by the Greater Flagstone Urban Development Area Development Scheme which was declared under the *Economic Development Act 2012*.

The Development Scheme is a regulatory document that controls land use, infrastructure planning and development in the area. The declaration of a PDA removes the affected land from the planning and development processes included in the SPA. All development applications are lodged with DILGP as the assessment manager.

### **Current Approvals**

The project is currently in the process of progressing State and Local Government approvals and is expected to obtain all relevant approvals by the end of 2016.

## **2.5 Environmental impact assessments under Commonwealth, state or territory legislation**

No environmental impact assessments are required under Commonwealth or State legislation (refer to response 1.11).

## **2.6 Public consultation (including with Indigenous stakeholders)**

**Economic Development Queensland (EDQ)** undertook consultation with the Logan City Council, the State Government, and the community during the development of the Greater Flagstone Urban Development Area Development Scheme. This included a public notification period (1 April to 20 May 2011) in accordance with the requirements of the *Urban Land Development Authority Act 2007*. **EDQ** also hosted a number of community information sessions to provide opportunities for the public to view details of the proposed scheme and have discussion with **EDQ** staff. Submissions received during the public notification period were taken into consideration before the scheme was

finalised and submitted to the Minister for approval. A Submissions Report was produced which includes a summary of key issues raised in the submissions received during the public notification period. Feedback was received from 125 submitters during consultation, with these comments incorporated into the final amendment of the Scheme. **EDQ** operate under an established policy for community consultation titled "Community Engagement Framework – Development Scheme Preparation".

For the proposed action, as part of the State and Local Government development assessment process, **Celestino** will be required to engage in public consultation, including notification of the project to seek public comment. **Celestino** will have to satisfy all public notification requirements applicable under the Greater Flagstone Development Scheme, which guides public notification requirements in the development area.

## **2.7 A staged development or component of a larger project**

**Not applicable.** Refer to response to 1.12 and 1.13.

# 3 Description of environment & likely impacts

## 3.1 Matters of national environmental significance

### 3.1 (a) World Heritage Properties

**Description**

Not applicable. Refer to Attachment 1.

**Nature and extent of likely impact**

Not applicable

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### 3.1 (b) National Heritage Places

**Description**

Not applicable. Refer to Attachment 1.

**Nature and extent of likely impact**

Not applicable

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### 3.1 (c) Wetlands of International Importance (declared Ramsar wetlands)

**Description**

Moreton Bay (a Ramsar wetland) is located approximately 46 km to the east of the Project site.

**Nature and extent of likely impact**

The proposed action is not expected to have any impacts on Moreton Bay.

The eastern boundary of the project site adjoins the Logan River, however, the proposed site layout includes the retention and rehabilitation of vegetated buffers along waterways, including a 100 m buffer along the Logan River (refer to **Plan 1**). Further, stringent management measures will be implemented to ensure any sediment erosion and stormwater runoff from the development is captured and treated before being released into local waterways (refer to Response 3.3(b)). Such management measures will also meet quality standards set by the relevant State and Local Government guidelines.

Additionally, it is unlikely that water flowing from the development site will have a significant impact on Moreton Bay. It is noted that before reaching Moreton Bay, the water flowing through the Logan River system is in a heavily developed and urbanised catchment, including through the City of Logan. In the context of the Logan River catchment, it is unlikely that the proposed action will have any notable impacts on water quality in Moreton Bay.

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### 3.1 (d) Listed threatened species and ecological communities

The Protected Matters Search Tool using a five kilometre radius from the centre of the site identified the following matters protected under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) as having potential to occur on-site:

- Three Threatened Ecological Communities (TECs);
- Six listed threatened flora species; and
- Twenty listed threatened fauna species.

**Table 1** provides a summary of these search results, with the full search results provided in **Attachment 1**.

**Table 1: EPBC Act Protected Matters Search Tool Results**

Threatened Ecological Communities		
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community may occur in the area
Swamp Tea-tree ( <i>Melaleuca irbyana</i> ) Forest of South-east Queensland	Critically Endangered	Community likely to occur in the area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may to occur in the area
Threatened Species		
Scientific Name	Common Name	Status
Birds		
<i>Anthochaera phrygia</i>	Regent Honeyeater [82338]	Critically Endangered
<i>Botaurus poiciloptilus</i>	Australasian Bittern [1001]	Endangered
<i>Dasyornis brachypterus</i>	Eastern Bristlebird [533]	Endangered
<i>Erythrotriorchis radiatus</i>	Red Goshawk [942]	Vulnerable
<i>Geophaps scripta scripta</i>	Squatter Pigeon (southern) [64440]	Vulnerable
<i>Grantiella picta</i>	Painted Honeyeater [470]	Vulnerable
<i>Lathamus discolor</i>	Swift Parrot [744]	Critically Endangered
<i>Poephila cincta cincta</i>	Black-throated Finch (southern) [64447]	Endangered
<i>Rostratula australis</i>	Australian Painted Snipe [77037]	Endangered
<i>Turnix melanogaster</i>	Black-breasted Button-quail [923]	Vulnerable
Fish		
<i>Maccullochella mariensis</i>	Mary River Cod [83806]	Endangered
Mammals		
<i>Chalinolobus dwyeri</i>	Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable
<i>Dasyurus maculatus maculatus</i> (SE mainland population)	Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered
<i>Petrogale penicillata</i>	Brush-tailed rock-wallaby [225]	Vulnerable
<i>Phascolarctos cinereus</i>	Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable
<i>Potorous tridactylus tridactylus</i>	Long-nosed Potoroo (SE mainland) [66645]	Vulnerable
<i>Pteropus poliocephalus</i>	Grey-headed Flying-fox [186]	Vulnerable
Other		
<i>Cycas ophiolitica</i>	[55797]	Endangered
Plants		
<i>Bosistoa transversa</i>	Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable
<i>Notelaea ipsviciensis</i>	Cooneana Olive [81858]	Critically Endangered
<i>Phaius australis</i>	Lesser Swamp-orchid [5872]	Endangered
<i>Phebalium distans</i>	Mt Berryman Phebalium [81869]	Critically Endangered
<i>Thesium australe</i>	Austral Toadflax, Toadflax [15202]	Vulnerable
Reptiles		
<i>Coeranoscincus reticulatus</i>	Three-toed Snake-tooth Skink [59628]	Vulnerable
<i>Delma torquata</i>	Collared Delma [1656]	Vulnerable
<i>Furina dunmali</i>	Dunmall's Snake [59254]	Vulnerable

A likelihood of occurrence assessment was conducted for threatened species, threatened ecological communities, and migratory species identified by the PMST search as having potential to occur on-site. The assessment included desktop research such as searches of relevant database and mapping tools, review of historical ecological reports for the site and region, and review of aerial photography. Detailed field surveys were also carried out including targeted searches for listed species and signs of their presence, identification of suitable habitat for listed species and review of high value site features such as waterways and remnant vegetation. The assessment is detailed in the Ecological Assessment Report (EAR) provided as **Attachment 2** to this referral. **Plan 3** shows field survey effort undertaken on the site.

The assessment of the likelihood of occurrence ruled out the potential for most listed matters to occur on-site. This was primarily due to the combined impacts on the site from:

- The disturbed and cleared nature of the majority of the site;
- Lack of niche habitat suitable for these matters across the site (such as large undisturbed waterbodies, rocky outcrops, and coastal habitats);
- Influences from surrounding rural residential properties and the increasing amount of large residential developments within the local area, in accordance with the PDA designation and planning intent;
- Fragmentation of the site by cleared lands, the Logan River, and the road network;
- Presence of weed species and introduced fauna species, such as dogs and hares on-site; and
- Disturbances caused by historic and existing agricultural practices which have resulted in the majority of the proposed development area constituting paddock with some patches of regrowth.

Overall, the assessment identified the potential for Grey-headed Flying-fox (Vulnerable), Swift Parrot (Endangered), and Koala (Vulnerable) to occur on-site due to the availability of potential habitat or food sources when eucalypts are flowering. No other listed threatened species are considered likely to occur on-site (refer to the Likelihood of Occurrence Schedule contained in **Attachment 2 – Appendix D**).

Further, of the three listed TECs, Swamp Tea-tree (*Melaleuca irbyana*) Forest of South-east Queensland was considered to have potential to occur on-site, given its known occurrence in the local area. As such, targeted surveys for this TEC and for *Melaleuca irbyana* were conducted, particularly in areas where the pre-clear mapping showed the endangered RE 12.3.3 which includes *Melaleuca irbyana* as an indicator species. A number of individual *Melaleuca irbyana* specimens were recorded on-site, however, all *Melaleuca irbyana* were located as individual scattered specimens, and did not meet the minimum threshold of the TEC. It is therefore considered that the TEC is not present on-site. Refer to **Attachment 2** (specifically Section 4.5, Plan 2, and Photos 13-16) for further details on the results of the TEC and *Melaleuca irbyana* survey.

### **Koala (*Phascolarctos cinereus*)**

#### Conservation Status

Under the EPBC Act, the Koala populations in Queensland, New South Wales, and the Australian Capital Territory are listed as Vulnerable. Koalas are also listed as Vulnerable under Queensland's *Nature Conservation Act 1992* (NCA). The proposed action is to be located within the modelled distribution of the Koala, within the 'coastal context,' as per the EPBC Act Referral Guidelines for the Vulnerable Koala.

#### Habitat

As described in the Koala SPRAT species profile, the Koala inhabits a wide range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by eucalypt species. Under the EPBC Act Koala Referral Guidelines, Koala habitat is defined as 'any forest or woodland containing species that are known Koala food trees or shrubland with emergent food trees. This can include remnant or non-remnant vegetation in natural, agricultural, urban and peri-urban environments.'

### Distribution

Koalas are endemic to Australia and have a known distribution from north-eastern Queensland to south-east South Australia. They are widespread in coastal and inland areas, with densities of Koalas being higher within coastal areas with higher average annual rainfalls. South East Queensland is known to support Queensland's highest density of Koalas.

### Threats

The three main threats to Koalas have been identified in the SPRAT profile as:

- Habitat loss and fragmentation;
- Vehicle strike; and
- Predation by domestic or feral dogs.

Further, the prevalence of disease such as the *Chlamydia* virus in many Koala populations has led to symptoms such as infections of the eyes, urinary tract, respiratory tract, and reproductive tract, with the latter having the potential to lead to infertility in females. More recently, the Koala Retrovirus (KoRV) has been found to have an increasing impact on most Queensland Koala populations. While most Koalas carry the disease, environmental stresses such as poor nutrition and overcrowding lead to conditions caused by KoRV such as leukaemia and immunodeficiency syndrome.

### Field Assessment

Field assessment at the site included surveys to determine the level of Koala usage across the site and to assess the presence and abundance of suitable habitat. The assessment involved the following methods:

- Spot Assessment Technique (SAT) developed by Phillips and Callaghan (2011);
- Site flora assessments; and
- Opportunistic searches.

### SAT Survey Results

Overall, no Koalas were observed during the survey periods, and evidence of Koala usage (in the form of scats) was calculated to represent 'Low' to 'Medium' usage across the site. Fifteen SAT surveys were carried out at the site with the locations shown on **Plan 3**, and a summary of results provided in **Table 2** (refer to **Attachment 2 - Appendix E** for full SAT data). In addition to the 15 SATs, nine meanders searching for scats were conducted, but did not find any scats (shown on **Plan 3**). The Koala activity use results are based on activity categories taken from the **Australian Koala Foundation** Koala activity level classification table by Phillips & Callaghan 2011 (**Table 3**). The East Coast (med-high) Activity Category is applicable in habitats dominated by residual, transferral or alluvial type landscapes considered medium-high nutrient soils with good water holding capacity (Steve Phillips, personal communication). Soil mapping shows chromosol soils across the majority of the site, and dermosols close to the Logan River (refer to **response 3.3(c)** and **Attachment 2 - Figure 8**). Chromosols have medium water-holding capacity and chemical fertility. Dermosols have moderate to high chemical fertility and water-holding capacity. Additionally, the presence of low-lying land associated with the two mapped waterways on-site would suggest Koala density could be medium to high in this area, supporting the activity category applied.

**Table 2: SAT Survey Results**

SAT (Spot Assessment Technique) No.	Evidence of Koala Use (%)	Koala Use (High / Medium / Low)
1	13.3	Low
2	16.6	Low
3	13.3	Low
4	6.67	Low
5	13.3	Low
6	13.3	Low
7	13.3	Low
8	10.0	Low

9	10.0	Low
10	16.67	Low
11	3.33	Low
12	3.33	Low
13	6.6	Low
14	10.0	Low
15	30.0	Medium

**Table 3: AKF Koala Activity Level Classification Table**

ACTIVITY CATEGORY	LOW USE	MEDIUM (NORMAL) USE	HIGH USE
<b>Area (density)</b>			
East Coast (low)	< 9.47%	≥ 9.47% but ≤ 12.59%	> 12.59%
East Coast (med – high)	< 22.52%	≥ 22.52% but ≤ 32.84%	> 32.84%
Western areas (med – high)	< 35.84%	≥ 35.84% but ≤ 46.72%	> 46.72%

#### Habitat Assessment Results

Queensland's Koala Habitat Values Map (see **Attachment 2 – Figure 6**) shows the majority of the project site to contain Low and Medium Value Rehabilitation Habitat, with some areas of High Value Rehabilitation Habitat and Low, Medium, and High Bushland Habitat. There are some patches of Least Concern RE 12.9-10.2 mapped on the site, and some small areas of Endangered and Of Concern vegetation, with the remainder of the site mapped as Category X non-remnant vegetation (refer to **Attachment 2 – Figure 5**). The greatest area of mapped remnant vegetation on-site is the Least Concern RE, which is not mapped as providing 'essential habitat' for the Koala or any other listed species. A few narrow tracts of vegetation around the watercourse traversing the site and along the Logan River are mapped as containing 'essential habitat' for the Koala, however all these areas will be retained and rehabilitated with the proposed project (refer to **Plan 1**). The entire site is mapped as being outside any Koala Assessable Development Area (KADA) under the SEQ Koala Conservation State Planning Regulatory Provisions (**Attachment 2 – Figure 6**).

Site assessment included observational surveys of the flora species and broad vegetation communities present on-site (refer to **Attachment 2 – Sections 4.3 and 4.4**). The flora species recorded on-site included species identified in the **Australian Koala Foundation's** National Koala Tree Protection List for the Logan City Local Government area, shown below. Species shown in bold are considered to be primary Koala Food Trees while the other listed species are Secondary Koala Food Trees. Three Eucalypt species considered to be Koala Food Trees were recorded on-site, including the primary species *E. tereticornis*, and the two secondary species *E. moluccana* and *E. siderophloia* (refer to **Attachment 2 – Section 4.3** for further detail). It is recognised that for Koalas to viably persist in a given landscape, the vegetated area should exceed 100 ha and contain more than 50% primary food tree species (McAlpine et al. 2006). The number of primary food trees (in this case, *E. tereticornis*) on-site did not contribute to 50% or higher of the vegetation on-site, therefore the site is not considered to provide critical habitat to support a viable Koala population. Consequently, it is considered that Koala activity recorded on-site is likely to be transient, and the site would not allow for a viable *in situ* Koala population.

Local Government Area	Elevation*	Scientific Name and/or subspecies	Common Name	Soil and Location
LOGAN CITY	2-800	<i>E. biturbinata</i>	Grey Gum	slopes on soils of medium fertility, annual rainfall > 1000 mm
LOGAN CITY	2-1000	<i>E. crebra</i>	Narrow-leaved red ironbark, Ironbark, Narrow-leaved ironbark	well-drained shallower or sandy/sandy clay soils of medium fertility, > 550 mm rainfall
LOGAN CITY	2-1000	<i>E. grandis</i>	Flooded Gum, Rose Gum	moist, fertile, well-drained, deep, loamy soils of alluvial or volcanic origin, 725-3500 mm
LOGAN CITY	2-850	<i>E. major</i>	Grey Gum	wet coastal forests on soils of low to medium fertility
LOGAN CITY	2-1200	<i>E. melliodora</i>	Yellow box, Honey box, Yellow ironbox	gentle slopes, foothills or on flats near watercourses. Soils include alluvials, loams and clays, frost and drought tolerant, 500-1400 mm
LOGAN CITY	2-950	<b><i>E. microcorys</i></b>	<b>Tallowood</b>	on slopes in deeper moderate to fertile soils, well-drained but moist loam soils of moderate to high fertility on coastal plains and ranges, tolerates saline soils
LOGAN CITY	2-1050	<i>E. moluccana</i>	Coastal Grey Box, Grey box, Gum-topped box	
LOGAN CITY	2-1000	<i>E. planchoniana</i>	Bastard Tallowood, Needlebark stringybark	dry sclerophyll forest or woodland on sandy soils or coastal sand
LOGAN CITY	2-850	<i>E. propinqua</i>	Small-fruited Grey Gum	wet coastal forest on soils of low to medium fertility. Drought and frost tolerant
LOGAN CITY	2-1050	<i>E. racemosa</i> ssp. <i>racemosa</i>	Scribbly Gum	shallow infertile sandy soil, coastal areas or over sandstone
LOGAN CITY	2-700	<i>E. resinifera</i> ssp. <i>hemilampra</i>	Red mahogany	sandy or well drained fertile soils, Drought and frost tolerant
LOGAN CITY	2-200	<b><i>E. robusta</i></b>	<b>Swamp Mahogany</b>	swampy, seasonally waterlogged soils, very moist fertile soils, heavy clay, sandy clay, alluvial sand soils
LOGAN CITY	2-200	<i>E. seeana</i>	Narrow-leaved Red Gum	poorly drained shallow soils, swampy sandy soils
LOGAN CITY	2-700	<i>E. siderophloia</i>	Ironbark, Broken Back Ironbark	wet forest on soils of moderate fertility
LOGAN CITY	2-800	<b><i>E. tereticornis</i> ssp. <i>tereticornis</i></b>	<b>Forest red gum, Blue gum, Red iron gum</b>	alluvial soils, 600-2500 mm, tolerates salt-laden coastal winds, tolerates saline soils, medium-heavy clays, does not tolerate waterlogged soils
LOGAN CITY	2-1100	<i>E. tindaliae</i>	Tindal's Stringbark	poorer soils in high rainfall areas, often derived from granite

**Bolded** entries indicate primary tree species

## Weeds and Disturbance

Past land clearing and past and present agricultural practices have resulted in a highly disturbed site. The site was recorded to contain a high number of introduced and weed species (45 species), including nine species declared under Queensland Government as weed species. The declared pests under the *Land Protection (Pest and Stock Route Management) Act 2002* (LPA) include five Class 2 weeds identified as *Ambrosia artemisiifolia* (Annual Ragweed), *Baccharis halimifolia* (Groundsel Bush), *Bryophyllum delagoense* (Mother-of-millions), *Senecio madagascariensis* (Fireweed), and *Sporobolus pyramidalis* (Gat Rat's Tail Grass). The other four declared pests are Class 3 weeds and identified as *Celtis sinensis* (Chinese Celtis), *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), and *Macfadyena unguis-cati* (Cat's Claw Creeper). Other disturbances included significant vegetation clearing for pastoral purposes (refer to **Figure 2**), as well as surrounding cleared rural residential properties, and road networks. Refer to **Attachment 2** for more detail.

## Summary of Findings

The key findings from the field assessment are:

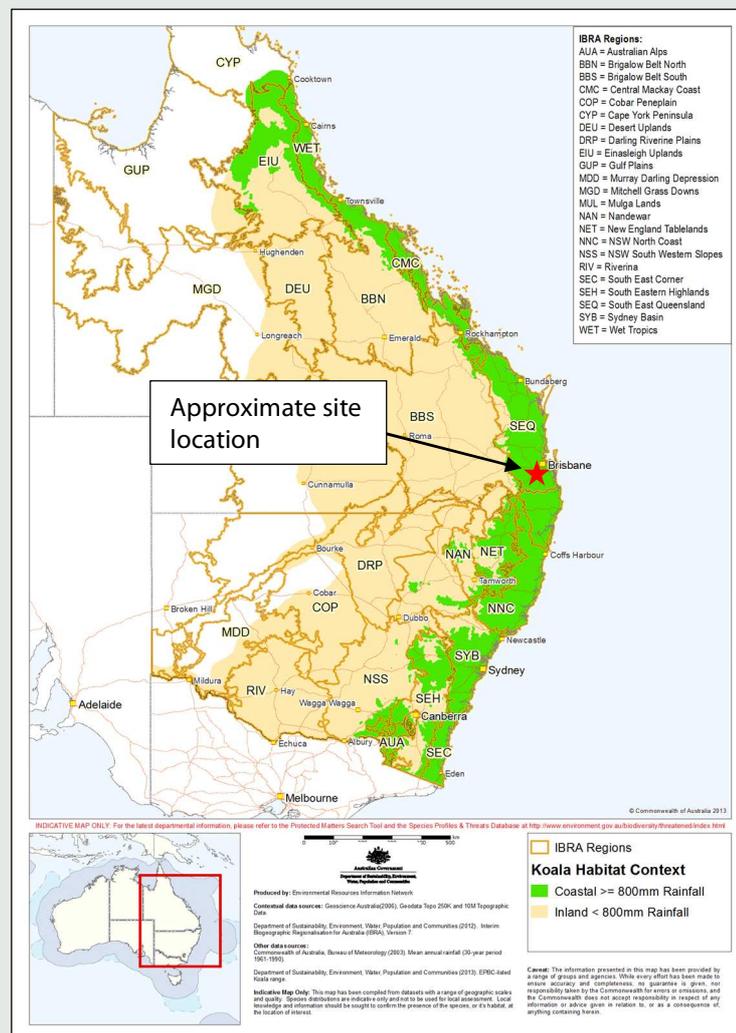
- No Koalas were observed on, or surrounding, the site;
- The results of the SAT surveys suggest Low to Medium usage throughout the proposed site;
- Flora assessment did not identify primary Koala food trees at a level considered to be required for Koala persistence, using the **AKF** guidelines;
- Overall, the site was significantly disturbed as a result of historical vegetation clearing, disturbance from ongoing grazing activities, and impacts from surrounding development (which is slated to increase in the future based on the designation of the PDA); and
- The site is not considered to provide ideal habitat for Koalas.

## Assessment against the EPBC Act Referral Guidelines for the Vulnerable Koala

### What is the geographic context of the proposal site?

A search of the EPBC Protected Matters Search Tool within a 5 km buffer lists the Koala as potentially located on-site (refer to **Attachment 1**). As per the EPBC Act Referral Guidelines for the Vulnerable Koala, the site is therefore considered to fall within the modelled distribution of the Koala.

The Koala Referral Guidelines separate the geographical context into two zones, inland and coastal, based on the 800 mm per annum rainfall isohyet. The Teviot Brook / Riverbend site is mapped within a “coastal” area as per the distribution map (below). Therefore, the coastal habitat attributes contained in the Koala Referral Guidelines are relevant when using the Habitat Assessment Tool.



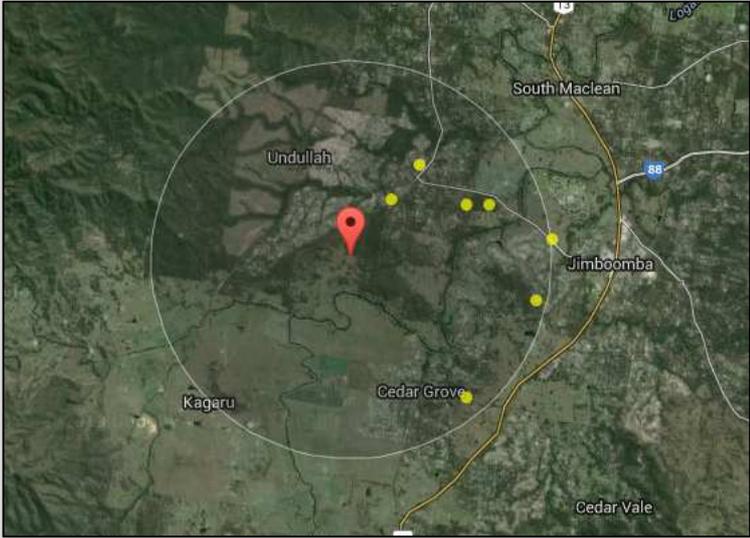
### Does the site contain habitat critical to the survival of the Koala?

The site contains disturbed vegetation which largely consists of regrowth, with some patches of Least Concern RE 12.9-10.2 and smaller patches of Endangered and Of Concern remnant vegetation. The most abundant remnant vegetation on-site is RE 12.9-10.2, with the short description *Corymbia citriodora subsp. variegata* +/- *Eucalyptus crebra* open forest on sedimentary rocks. This RE is not considered to be Essential Habitat for the Koala under the Queensland *Vegetation Management Act 1999* (VMA) (refer to **Attachment 2 - Figure 5**). Of the vegetation on-site, primary food trees (*E. tereticornis*) are present, however secondary food tree species and non-Eucalypts made up the vast majority of vegetation. It is anticipated that approximate 124.5 ha of remnant vegetation will be cleared to allow the proposed development to proceed.

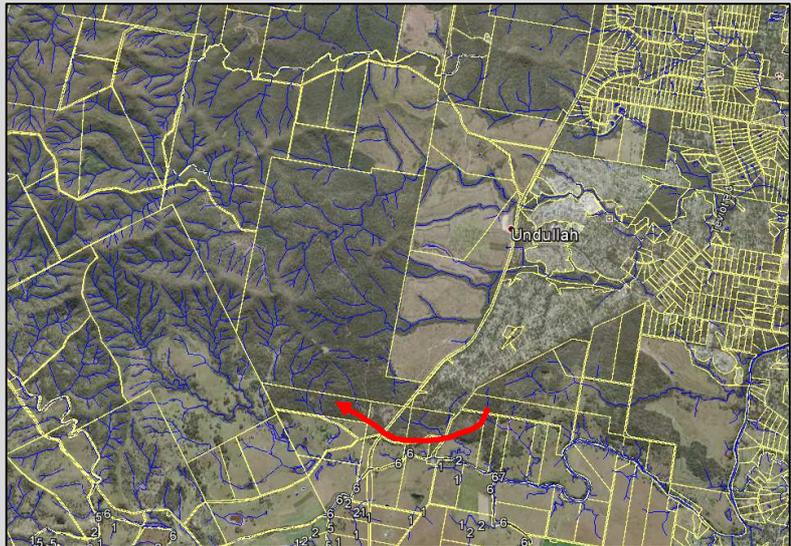
### Assessments

In accordance with the EPBC Act Referral Guidelines for the Vulnerable Koala, any habitat which receives a score of **5 or more** using the Koala Habitat Assessment Tool is considered to be critical habitat. The proposed site has scored a habitat assessment score of **7** based on the calculations and descriptions in **Table 4**.

**Table 4: Koala Habitat Assessment Tool**

Attribute	Score	Comment
Koala occurrence	+2 (High)	<p><u>Desktop</u></p> <p>A Protected Matters Search (PMST) using a buffer with a 5 km radius from the centre of the subject site identified the Koala as having potential to occur. The Species Profile and Threats Database (SPRAT) for the Koala identifies that the highest density of Koala populations within Queensland occurs within the South-East Queensland region. Population estimates have focused on the Koala Coast and Pine Rivers area, however, Koalas are known to occur within the Logan City Council area.</p> <p>A Wildlife Online point search with a 10 km buffer generated under the Queensland <i>Nature Conservation Act 1992</i> (NCA) identified 308 Koala records. The date pertaining to these observations is unknown. The Atlas of Living Australia shows seven records of the Koala within a 5 km radius of the study area (see below). Further, the majority of the site is not mapped as containing essential habitat for the Koala under the VMA, with only a few narrow tracts of vegetation along the watercourse and Logan River, which will not be cleared as part of the proposed action.</p> <p><b>Atlas of Living Australia Map (5 km radius)</b></p>  <p><u>On-ground</u></p> <p>An assessment for Koala usage was conducted during January, February, and May 2016 site surveys. No Koalas were observed on or surrounding the site. Koala scats were found on-site and 15 SAT surveys were conducted. Applying the SAT methodology (Phillips &amp; Callaghan 2011) and the east coast (med-high) population density category (<b>Table 3</b> above) due to the prevailing landscape and vegetation structure, 14 of the 15 sites where scats were found showed 'Low Use' (&lt; 22.5%) and one found 'Medium Use' (<math>\geq 22.52</math> but &lt; 32.84). Refer to <b>Table 2</b> above for full SAT results and <b>Attachment 2 – Appendix E</b>.</p> <p><b>As there is evidence of one or more Koalas within two kilometres of the site within the last five years, the 'Koala Occurrence' attribute has been given a score of +2 (High).</b></p>
Vegetation composition	+2 (High)	<p><u>Desktop</u></p> <p>The Queensland Government Vegetation Management Supporting Map (Regional Ecosystem 8.0 (RE)) identifies the study area as containing Category B (Least Concern) remnant vegetation RE 12.9-10.2 which is described as <i>Corymbia citriodora subsp. variegata</i> +/- <i>Eucalyptus crebra</i> open forest on sedimentary rocks. Further, the site is mapped as containing Of Concern composite RE 12.9-10.2/12.9-10.3 (80/20%), Of Concern RE 12.9-10.3, Endangered RE 12.3.3, and Least Concern RE 12.3.7. The</p>

		<p>remainder of the site contains non-remnant vegetation with some patches of regrowth vegetation. Site surveys confirmed the mapped REs to be accurate, with the majority of the site not considered to be remnant vegetation (refer to <b>Attachment 2</b>). Further, the proposed action will retain vegetation along, and within a buffer to, the mapped watercourse and the Logan River, which is where the Endangered RE exists.</p> <p><u>On-ground</u></p> <p>On-ground surveys confirmed the presence of the Least Concern RE 12.9-10.2, Of Concern composite RE 12.9-10.2/12.9-10.3 (80/20%), Of Concern RE 12.9-10.3, Endangered RE 12.3.3, and Least Concern RE 12.3.7. As a result, across the majority of the site, <i>Corymbia citriodora</i> (Spotted Gum) dominates the T1 layer, with scattered occurrences of <i>Eucalyptus siderophloia</i> (Northern Grey Ironbark) and <i>Eucalyptus tereticornis</i> (Forest Red Gum). The T2 layer contains various Acacia species including <i>Acacia disparrima</i> (Hickory Wattle), <i>Acacia concurrens</i> (Black Wattle) and <i>Acacia leiocalyx</i> (Early Flowering Black Wattle) as well as scattered <i>Alphitonia excelsa</i> (Red Ash). Patches within the polygon representing the Of Concern RE12.9-10.3 are dominated by <i>Eucalyptus moluccana</i> (Gum Topped Box). The RE associated with the Logan River is referred to as a narrow fringing vegetation community, with canopy species dominated by <i>Eucalyptus tereticornis</i> (Forest Red Gum) and <i>Casuarina cunninghamiana</i> (River She Oak) and a sub canopy layer dominated by <i>Melaleuca viminalis</i> (Weeping Bottlebrush). Patches of riparian species containing <i>Waterhousia floribunda</i> (Weeping Lilly Pilly), <i>Castanospermum australe</i> (Black Bean) were also observed throughout this vegetation community. Further, the site survey confirmed the amount of the REs that will be cleared as a result of the proposed development to include 108.5 ha of RE 12.9-10.2, 12.1 ha of the composite RE 12.9-10.2/12.9-10.3, and 3.9 ha of RE 12.9-10.3.</p> <p>The site survey recorded the presence of one species considered to be a primary Koala food tree species (<i>E. tereticornis</i>) and two species considered to be secondary food trees species (<i>E. moluccana</i> and <i>E. siderophloia</i>). No other species within the AKF food tree list as primary or secondary occurred on-site. The abundance of <i>E. tereticornis</i> recorded on-site is not considered to make up, or exceed, 50% of the vegetation present. Non-primary and secondary food tree species recorded on-site included <i>Corymbia citriodora</i>, <i>Corymbia intermedia</i>, <i>Corymbia tessellaris</i>, <i>Eucalyptus fibrosa</i>, <i>Eucalyptus moluccana</i>, <i>Eucalyptus siderophloia</i>, and <i>Acacia</i> spp.</p> <p><b>As the site contains forest or woodland with 2 or more known Koala food tree species in the canopy, the 'Vegetation Composition' attribute is given a score of +2 (High).</b></p>
Habitat connectivity	+2 (High)	<p>While the proposed site is isolated from vegetation on most sides, due to the presence of cleared land for rural residential purposes, and the location of the Logan River, there is connectivity currently available to the west of the site, across a road reserve (not currently a formed road but likely to be constructed in the near future), into the adjacent large area of bushland within the Flinders-Karawatha Bioregional Corridor (refer to image below). As such, and given the size of the subject site, the site is considered to be connected to a contiguous area of vegetation.</p>



It should be noted that as development increases in the area (in accordance with planning intent and the designation of the PDA), the application area will become more fragmented, and less connected to neighbouring vegetation, with connectivity values surrounding the project site further decreasing. Notwithstanding this predicted decrease in connectivity, the project layout has incorporated fauna and flora connectivity into the design and allowed for major linkages running east west and north south through the site.

**The site is considered to be part of a contiguous landscape of  $\geq 500$  ha, and as such, the 'Habitat Connectivity' attribute is given a score of +2 (High).**

Key existing threats

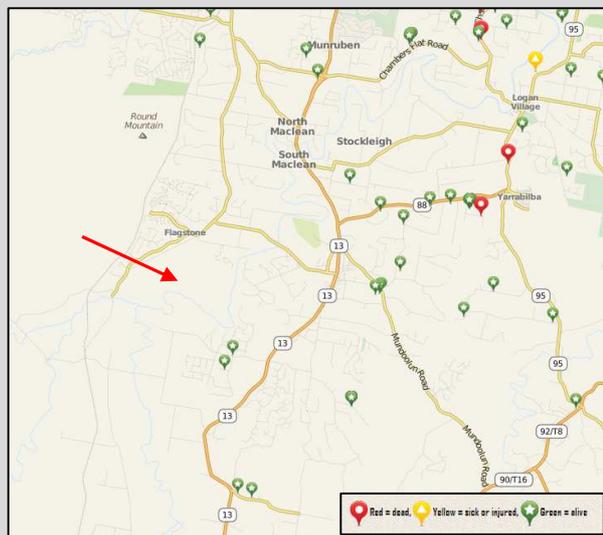
+1 (Medium)

Desktop

There are a number of threats to the survival of the Koala on and around the proposed development site, including vehicle strikes and dog attacks. These are generally associated with the presence of the nearby road network, and existing and increasing residential development in the local area. These threats will increase as the Greater Flagstone PDA is further developed.

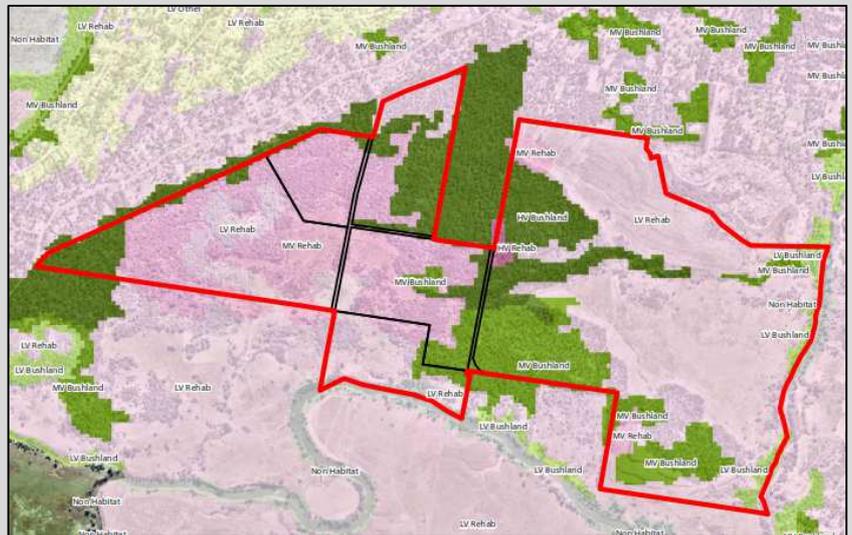
**Koala Tracker** is a crowd sourced National Koala sighting record. Records from the Koala Tracker National Koala Map (insert below) show two records of live Koala sightings 2-3 km south of the site and three approximately 6 km east (across the Teviot River). In the wider area, approximately 15 km from the site there are a number of records of sick and injured by car and disease.

**Koala Tracker Map**



		<p><u>On-ground</u></p> <p>The proposed development site is surrounded by cleared rural residential land and a road network, including the Mt Lindesay Highway approximately 4 km to the east. The presence of these roads suggests high vehicle usage in the area, which is expected to increase as development within the PDA increases. Evidence of dogs was observed on-site, as well as in the surrounding residential lots in the nearby vicinity, which may also increase with increased population in the area. Data provided within the <b>Ipswich Koala Protection Society (IKPS)</b> newsletters indicate that dog attacks and vehicle strikes on Koalas are frequent within the areas around Ipswich, such as Amberley and Willowbank. Similarly, the area surrounding the proposed action site is considered to contain a number of existing threats which diminish the value of the habitat on the site. It is anticipated that as the area continues to develop (in accordance with the PDA intent), vehicle strikes could be more prevalent if Koalas are drawn close to the major road networks and residential areas.</p> <p>In addition, disease appears to be prevalent in the Ipswich Koala population, with many Koalas listed in <b>IKPS</b> newsletters as suffering from pneumonia, diseased ovaries and uterus, cystitis, conjunctivitis, and kidney failure. The Koala Tracker map shows death by disease also in the vicinity of the project site.</p> <p><b>As there is evidence of infrequent or irregular Koala mortality from vehicle strike or dog attack at present in areas that score 1 or 2 for Koala occurrence, the “Key Existing Threats” attribute has been given a score of +1 (Medium).</b></p>
Recovery value	0 (Low)	<p>It is unknown whether the vegetation on the referral site is important in achieving the Interim Recovery Objectives for the coastal context given its foundation on the ability to protect and conserve large connected areas of Koala habitat. Koala Context Attributes listed under Interim Recovery Objectives in Table 1 of the Guidelines for coastal areas are to:</p> <ol style="list-style-type: none"> <li>1. Protect and conserve large, connected areas of Koala habitat, particularly large connected areas that support Koalas that are: <ul style="list-style-type: none"> <li>▪ of sufficient size to be genetically robust or operate as a viable sub-population, or;</li> <li>▪ are free of disease or have a low incidence of disease, or;</li> <li>▪ are breeding.</li> </ul> </li> <li>2. Maintain corridors and connective habitat that allow movement of Koalas between large areas of habitat.</li> </ol> <p>The site is located within the Greater Flagstone PDA, as designated by State Government and reflected in Local Government zoning. The PDA has been designated for future development to cater for predicted future population growth. As the area has been slated under state and regional planning for urban development, it is expected that the subject site does not represent an important conservation or recovery value.</p> <p>The site was confirmed to be relatively disturbed with the majority of the site consisting of cleared lands used for agricultural purposes, with 45 introduced and weed species recorded on-site. The site is linked to the Flinders-Karawatha Bioregional Corridor to its west, and therefore has the potential to provide for tenuous connectivity throughout the mostly disturbed broader landscape. The area surrounding the site, including to the west, is slated for development, so will fragment the site from the Bioregional Corridor. Notwithstanding, the proposed development includes the retention and rehabilitation of vegetation on-site, including along the east-west waterway, the Logan River, and providing north-south connectivity through the site.</p>

The site is mapped under Queensland's Koala Habitat Values Mapping (below, refer to **Attachment 2 – Figure 6**) identifies the majority of the project site as containing Low and Medium Value Rehabilitation Habitat, with some areas of High Value Rehabilitation Habitat and Low, Medium, and High Bushland Habitat. Mapping suggests that the site is generally fairly isolated from other habitat areas and therefore maintains compromised value in terms of movement opportunities and connectivity in the broader landscape.



**Koala Habitat Values Map**

Site surveys did not observe any Koala individuals, nor record any evidence of breeding on-site. The local Koala population is not considered genetically distinct from other Koala populations in South East Queensland. While the health of local Koalas is unknown, diseases such as Chlamydia and KoRV are known to be extremely prevalent amongst South East Queensland Koalas.

It is generally understood that conservation areas and corridors provide most effective habitat value and connectivity when edge effects are minimised (Hill & Curran 2003). The subject site is surrounded by a network of arterial roads and rural and urban development and so is expected to suffer from increasingly debilitating edge effects. As such, within the broader landscape the survey area is considered to contain compromised value for Koala dispersal, recovery, and persistence.

As has been previously noted the site is within the Greater Flagstone PDA and as a result has been earmarked for significant urban development by the Queensland State government. The PDA extends north, south and west of the site covering an area of 7,188 ha and planning intent to house 120,000 people. The overall planning intent of this area indicates it is not considered important to the regional recovery strategy for the Koala.

In summary, the recovery value of the proposed development site is compromised by its PDA designation, the expansion of development within the local area, and existing disturbances from historical clearing and agricultural land uses.

**Given the uncertainty as to whether the habitat present on-site is important for achieving the interim recovery objectives for the relevant context, the "Recovery Value" attribute has been given a score of 0 (Low).**

<b>Total</b>	<b>7</b>	<b>As the habitat score is five or more, this site is considered to provide Critical Habitat for the Koala.</b>
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### **Will the action adversely affect habitat critical to the survival of the Koala?**

The above assessment concludes that the site contains areas of critical habitat for Koala as defined by the EPBC referral guidelines. The Koala Referral Guidelines also require the adversity of impacts to be assessed. This process follows a “yes/no” flowchart as shown in the Guidelines, with responses provided below:

**1. Does your impact area contain habitat critical to the survival of the koala (habitat score  $\geq 5$ ).**

Yes. The proposed development area contains habitat that received a habitat score 7 (refer to **Table 4** and **Plan 4**).

**2. Does the area proposed to be cleared contain known Koala food trees?**

Yes. Habitat assessments conducted across the site found that site canopy trees contain species that are considered to be Secondary Koala Food Trees with some Primary Koala Food Trees.

**3. Are you proposing to clear  $\leq 2$  hectares of critical habitat?**

No. The action requires the clearing of approximately 280.9 ha of habitat including some defined as critical habitat by the koala referral guidelines (refer to **Plan 4**).

**4. Are you proposing to clear  $\geq 20$  hectares of habitat that scored  $\geq 8$ ?**

No. The action requires the clearing of approximately 280.9 ha of habitat, including some defined as critical habitat that scored 7.

**5. Assessment on Characteristics**

While the action triggers the requirement for referral the on-ground impacts to Koalas are expected to be minimal. No Koalas were observed on-site during extensive targeted EPBC Act surveys. The SAT surveys results suggested Low Usage in 14/15 sites, and Medium in one. This low usage across the site is likely a result of existing disturbance through vegetation clearing and agricultural activities, and threats to Koala survival. Continuing and increasing fragmentation throughout the region as urbanisation expands will further reduce the site’s ability to achieve the interim recovery objectives for coastal areas which is based upon protecting large, connected areas of Koala habitat.

Further to this, the Greater Flagstone Urban Development Area Development Scheme facilitates development within the Flagstone area, in order to meet the projected housing demand in Queensland. The result of this will be a significant expansion of urban development surrounding the project site. Most of the land within the PDA is already under development, or within approvals stages which will result in further clearing throughout the region impacting on connectivity. The Teviot Brook and Riverbend sites will provide for fauna movement through vegetation corridors along waterways and drainage areas traversing east west and north south through the site. In addition, sections of the Logan River adjacent to the site will be revegetated to add to regional connectivity linking rural areas to the east to the regional biodiversity corridor in the west (see **Plan 1**). These works will be in line with rehabilitation works proposed in the greater PDA, and will be guided by an approved rehabilitation plan to re-establish the natural ecological function of the creek corridors and vegetation on-site. The Rehabilitation Plan will be comprised of two main components, being weed management, and revegetation. The natural vegetation structure will be enhanced through extensive weed management, selective infill planting, ground stability measures, and natural regeneration.

Vegetation on-site was found to be heavily disturbed by past clearing and past and current agricultural practices which have reduced the quality of available habitat. The result of these practices is that the majority of the site consists of cleared paddock area, or regrowth vegetation, with only patches of remnant vegetation on-site.

### **Could the action interfere substantially with the recovery of the Koala?**

In addition to considering adverse impacts on critical habitat, the potential for the action to interfere with the recovery of the Koala must also be considered as per the Koala Referral Guidelines. Possible impacts listed in the guidelines that must be considered include:

- Introducing or increasing Koala fatalities due to dog attacks;
- Introducing or increasing the risk of vehicle strike;
- Facilitating the introduction or spread of disease and pathogens;
- Creating a barrier to movement; and
- Degrading critical habitat due to hydrological changes.

These impacts, as well as mitigation measures to address impacts, are discussed in **Table 5**.

**Table 5: Potential Impacts**

Dog Attack
<p>The construction of a residential development is likely to increase the number of dogs entering the area. However, evidence of dog activity was observed on the subject site during field surveys, and dogs also exist on surrounding properties. The proposed Teviot Brook / Riverbend development will implement appropriate governance and guidance regarding dog ownership to new home buyers, ensuring interaction between dogs and Koalas is mitigated. Such measures would include the use of signs in public spaces to inform of Koala presence and the need to restrain dogs, lots neighbouring reserves to have limits on pet ownership, and general education. While the increased urbanisation of the area will increase the risk of dog attack the low Koala usage observed on site and implementation of the above management measures are expected to result in minimal impact to the species.</p> <p><b>Risk of impact to koalas will increase as a result of the development however no residual impacts are expected to occur.</b></p>
Vehicle Strike
<p>Vehicle activity will increase in the area and through the site as a result of the development as well as the general increase in urbanisation in the PDA. However, given the site is surrounded by a road network, including a nearby highway, as well as various forms of urban development, and no Koalas being were recorded on-site, interaction between vehicles and Koalas is considered unlikely to increase significantly as a result of the development. Road design, signage, and the imposition of a low vehicle speed will help mitigate any potential risks to Koalas.</p> <p><b>Risk of impact to Koalas will increase as a result of the development however no residual impacts are expected to occur.</b></p>
Disease and Pathogens
<p>Most of South East Queensland's Koala populations are known to have a high prevalence of <i>Chlamydia</i> infection and KoRV. The symptoms of these diseases are often observed within Koala populations undergoing environmental stresses, such as overcrowding and poor nutrition. The project is unlikely to cause pressure on a local Koala population (noting that no Koalas were recorded on-site despite targeted surveys) to the point where these diseases manifest. Further, the project is extremely unlikely to introduce or spread disease or pathogens into any Koala habitat areas.</p> <p><b>No residual impacts are identified.</b></p>
Barriers to Dispersal
<p>The proposal will restrict Koala movement through the site, however, given that the majority of vegetation existing on-site is already largely isolated and fragmented from any high value vegetation due to surrounding roads and cleared rural residential, it is arguable that this development will not result in impacts to dispersal. In terms of connectivity, the site is constrained by factors associated with encroaching development to the north, east and south, and is not expected to retain significant connectivity to other patches. The proposed layout includes the retention and rehabilitation of the vegetation along the waterway traversing the site, surrounding the Logan River, and a north-south corridor. It is envisaged that these rehabilitated areas will continue to provide connectivity values comparable to those currently present given the relatively degraded state of habitat values currently on-site.</p> <p>Further fragmentation will occur within the surrounding area, including the proposed expansion of residential developments in the local area pursuant to the Greater Flagstone Priority Development Area Development Scheme. As such, the impacts from potential barriers to dispersal caused by the development are considered to be minimal.</p> <p><b>No residual impacts are identified.</b></p>
Hydrological change

There will be an increase in hardstand areas across the site, due to the establishment of a residential development. This increase in hardstand areas has the potential to affect the hydrology of the site, however management plans will be implemented to address the requirements of State and Local government guidelines to ensure that impacts are minimised. The proposed development will retain and enhance vegetated corridors along the watercourse traversing the site, and adjoining the Logan River which will assist to minimise changes to hydrology in these areas. It is anticipated that the project is unlikely to result in hydrological changes that will further degrade the site or impact neighbouring areas of potential Koala habitat.

**No residual impacts are identified.**

Field and desktop assessments against the Referral Guidelines for the Vulnerable Koala were utilised for the following Significant Impact Assessment (**Table 6**) based on the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*.

**Table 6: Significant Impact Assessment – Koala**

Significant Impact Criteria	Description	Impact
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>		
1. Lead to a long term decrease in the size of an important population of a species.	<p>The site contains habitat assessed to be critical habitat for the Koala, with a score of 7, which is a mid-range score on the scale. Of relevance, the proposed location for the referred action is within the Greater Flagstone PDA, which means that the site will become more fragmented from the surrounding landscape due to current and future urban development. In addition, despite targeted searches, field assessments failed to locate the Koala on-site, with only evidence of Low to Medium Koala usage, recorded in the form of scats. As such, it is considered that Koalas utilising the site would be transient, and more likely to inhabit more optimal habitat to the west of the site.</p> <p>It is considered unlikely that an important population is present on-site, and so the action is not expected to decrease the size of an important population.</p>	<b>No significant impact likely</b>
2. Reduce the area of occupancy of an important population.	<p>An important population is not considered present on the subject site for the following reasons:</p> <ul style="list-style-type: none"> <li>▪ No Koalas have been recorded on-site, or immediately adjacent to the site (only evidence of their activity has been recorded);</li> <li>▪ The site contains critical habitat scored as the mid-range quality, with more optimal habitat in the Bioregional Corridor to the west of the site;</li> <li>▪ Vegetation on the site is fragmented by cleared rural land and a road network, and increasing encroaching development in the wider landscape; and</li> <li>▪ Koala records in the vicinity of the site include specimens carrying disease.</li> </ul> <p>Therefore, it is not considered that the project would result in a reduction of the occupancy of an important population. Further, the inclusion of vegetated areas throughout the development site will provide ongoing suitable habitat on-site.</p>	<b>No significant impact likely</b>
3. Fragment an existing important population into two or more populations.	<p>The action is proposed to occur on a site which is already relatively fragmented from surrounding high value habitat, with PDA designation resulting in high fragmentation from surrounding habitat (<b>Plan 2</b>). Vegetation on the subject site adjoins some vegetation to the west of the site, which connects to the Flinders – Karawatha Bioregional Corridor, however, the development within the PDA will fragment this connection. Notwithstanding, no Koalas were observed on the subject site, and the site is not considered to contain an important population of the Koala. Therefore, it is not anticipated that the proposed development would fragment an existing important population into two or more populations. The retention and rehabilitation of vegetated corridors through the site will allow for ongoing movement and connectivity in the area.</p>	<b>No significant impact likely</b>
4. Adversely affect habitat critical to the survival of a species.	<p>While the proposed action will result in the removal of Koala habitat, the majority of this habitat is disturbed by historical clearing and current agricultural grazing activities. It is also subject to edge effects from the surrounding road network and increasing urban development. The habitat on-site is not considered to be</p>	<b>Impacts to Koala habitat will occur however</b>

	<p>unique or of special value (refer to <b>Attachment 2</b>). The retention and enhancement of vegetated corridors through the site will ensure that areas with the potential to provide connectivity value are protected, and not developed. Given the disturbed nature of the majority of the site and the designation of the PDA, the habitat on-site is not considered of importance to the interim recovery objectives for the Koala. Although it is acknowledged that 280.9 ha of critical habitat for the Koala (score of 7) as assessed under the Guidelines will be cleared, the site habitat is not considered to constitute high or unique value, and, given the extent of more optimal habitat in the surrounding landscape (particularly in the Flinders – Karawatha Bioregional Corridor), it is considered that the extent of potential loss will not adversely affect the survival of the species. However, it is recognised a large area of low quality potential koala habitat will be removed by the development therefore there will be an impact on available habitat for the koala. Impact to potential Koala habitat are required to be offset under the Development Scheme, which is addressed further in <b>Section 5</b> of this referral. The implementation of management measures will minimise any impact on Koalas at the site and the provision of offsets will provide an overall benefit to the species in the region.</p>	<p><b>significant impacts are unlikely as a result of on ground management measures and offsets</b></p>
<p>5. Disrupt the breeding cycle of an important population.</p>	<p>Targeted surveys of the site did not observe any breeding Koalas. Evidence of Koala activity on-site was recorded in the form of scats, however, no individuals were recorded. As such, it is considered most likely that the site would support transient individuals unlikely to constitute a breeding population or an important population. The development layout includes retention and rehabilitation of vegetated corridors throughout the site, and as a result it is expected that current connectivity values for potential dispersal will remain. It is considered unlikely that the breeding cycle of an important population will be disrupted by the proposed action.</p>	<p><b>No significant impact likely</b></p>
<p>6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.</p>	<p>The habitat on this site was not observed to contain any special or unique values. The removal of site habitat is unlikely to have a significant impact on the availability of habitat throughout the broader landscape, given the vast quantity of Koala habitat to the west within the Flinders – Karawatha Bioregional Corridor. Individuals utilising the proposed development site are considered to be transient and not part of an important population. Further, the retention of vegetated corridors throughout the site provide continued connectivity values to the Koala, if present. As such, the proposal is not considered likely to lead to species decline.</p>	<p><b>No significant impact likely</b></p>
<p>7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.</p>	<p>Domestic dogs have the potential to become feral, and are considered a major threat to Koala survival. Evidence of dogs was recorded on-site, and dogs are known to be present in the surrounding landscape. The proposed action is expected to result in an increase in the density of domestic dogs in the area, however, their potential to increase impacts on Koalas will be mitigated by effective governance (refer to <b>Table 5</b>). Other proposed residential developments within the PDA will also result in an increase in the number of dogs in the area. Invasive <i>Lantana camara</i> was recorded on-site and is a recognised hindrance to Koala dispersal. Rehabilitation activities undertaken as part of the development will include weed management, and therefore will suppress this weed. It is unlikely that the proposal will augment invasive species impacts already present in the area.</p>	<p><b>No significant impact likely</b></p>
<p>8. Introduce disease that may cause the species to decline.</p>	<p>Most of South East Queensland's Koala population is recorded as having a high prevalence of Chlamydia infection and KoRV. Sick and dead by disease Koalas have been recorded in the vicinity of the referral area. The project is considered unlikely to place pressure on the local Koala population to the point where these diseases manifest. Further, the project is extremely unlikely to introduce or spread disease or pathogens into Koala habitat areas.</p>	<p><b>No significant impact likely</b></p>
<p>9. Interfere substantially with the recovery of the species.</p>	<p>Assessment has concluded that the proposed action is unlikely to interfere substantially with the recovery of Koala (refer to <b>Tables 4 and 5</b>), primarily due to the relatively disturbed nature of the site, its current level of fragmentation, encroaching development (in line with State and Local Government planning intent) and the lack of records of the Koala utilising the site, or areas immediately adjacent.</p>	<p><b>No significant impact likely</b></p>

### **Koala summary**

Targeted field surveys (as per EPBC Act guidelines) were conducted across the referral site and resulted in no Koala observations. In addition, 15 SAT transects were performed and found Low (in 14) to Medium (in one) Koala usage levels for the site (refer to **Table 2** and **Plan 3**). An additional nine meander scat searches did not find any Koala scats (refer to **Plan 3**). These results suggest that the site has a low usage by Koalas, corresponding with the isolated and disturbed nature of the majority of the vegetation on-site. Flora assessment on-site concluded that the vegetation is dominated by species that are not identified as primary Koala Food trees (refer to sections above and **Attachment 2**). The critical habitat on the site was given a habitat assessment score of 7 using the Koala Referral Guidelines (refer to **Table 4**).

As discussed above, a number of factors diminish the adversity of impacts caused by the proposed clearing of 280.9 ha for score 7 critical habitat as defined by the koala referral guidelines. These factors are largely based on the disturbed nature of the vegetation on-site, with current and historical agricultural practices resulting in open paddock areas, and regrowth vegetation. The surrounding area contains a road network, and cleared rural residential properties. Further, the State Government designation of the Greater Flagstone PDA suggests the area is not critical to the long-term viability and survival of the Koala. The proposed development includes the retention and rehabilitation of vegetated corridors throughout the site (**Plan 1**) which will provide continued habitat for any Koalas traversing the site. Additionally, all vegetation clearing will be undertaken sequentially under the guidance of a fauna spotter-catcher. This will ensure that the potential for injury or death to Koalas, if present, as a result of clearing is minimised.

While the clearing will have some impact on low value, low usage habitat for the koala the implementation of management measures will minimise any impact on koalas at the site level and the proposed offsets will provide an overall benefit to the species in the region.

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

*Pteropus poliocephalus* (Grey-headed Flying-fox) requires foraging resources and roosting sites to persist. The species is known to use a wide variety of habitats including subtropical and temperate rainforests, tall sclerophyll forest and woodlands, heaths, swamps and also urban and agricultural areas where food trees have been cultivated. The species is highly adaptive with its diverse native diet, which it can supplement with introduced species and is known to forage within a variety of habitats and locations as each resource does not consistently produce food throughout the entire year.

Some of the referral site is mapped as containing remnant vegetation communities, with the majority of the site consisting of non-remnant vegetation (in the form of cleared paddocks and regrowth areas). The Grey-headed Flying Fox was not recorded during site surveys. The habitat characteristics of the site are considered to provide only marginal foraging resources for this species, as follows:

- The majority of regrowth and remnant vegetation patches on-site are dominated by *Corymbia citriodora* (Spotted Gum) with *Eucalyptus siderophloia* (Northern Grey Ironbark) and *Eucalyptus tereticornis* (Forest Red Gum), and a T2 layer of various Acacia species.
- It is considered likely that foraging by Grey-headed Flying Fox could occur on the application site at various times throughout the year, depending on flowering. The dominant flora species observed throughout the application site are shown below with the period that species is expected to flower:
  - Corymbia citriodora* (Spotted Gum) – July to September
  - Corymbia intermedia* (Pink Bloodwood) – December to May
  - Eucalyptus tereticornis* (Forest Red Gum) – June to November.
- Adjoining the site is the Flinders-Karawatha Bioregional Corridor which is an area of 56,350 ha of land and incorporates the largest remaining remnant Eucalyptus woodland in South East Queensland.

- There is an abundance of winter flowering resources in the broader landscape resulting in the habitat provided by the proposed site representing only a small proportion of these available resources. It is therefore considered unlikely that individuals would be exclusively reliant on the resources supported by the subject site.

A Draft EPBC Act Policy Statement – camp management guidelines for the Grey-headed and Spectacled Flying-fox (Draft Guidelines) is available and summarises the decision process in considering the likelihood of a significant impact on the Grey-headed Flying-fox or Spectacled Flying-fox schematically. The Draft Guidelines are specifically for the assessment of impacts on Flying-fox camps. No roosting sites are known to be on-site or in the near vicinity. Further, no roosting sites were recorded during field surveys. It is therefore considered highly unlikely that the proposed action will involve impacts to the Grey-headed Flying-fox as per the Draft Guidelines. However, the Draft Guidelines also state that:

- Maintaining a network of flying-fox camps and foraging habitat across both species' national range is important for their recovery.
- Actions that will impact on the foraging habitat of EPBC Act listed flying-foxes may also result in a significant impact. This is beyond the scope of this policy.

As the site contains known potential foraging habitat for the Grey-headed Flying-fox, an assessment against the *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* was performed (see **Table 7**) to ascertain whether or not the action could potentially impose a significant impact on the species.

**Table 7: Significant Impact Assessment – Grey-headed Flying-fox**

Significant Impact Criteria	Description	Impact
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>		
1. Lead to a long term decrease in the size of an important population of a species.	The proposed referral site contains potential foraging habitat for the Grey-headed Flying-fox, however, no individuals or roost camps were seen on or adjoining the site during field works in January, February, and May of 2016. Further, there are no recorded roost camps on or in close proximity to the site. South East Queensland has a permanent and relatively abundant population of Grey-headed Flying-foxes, with available habitat (flowering eucalypts) relatively abundant throughout the region. It is noted that the Grey-headed Flying-fox has potential to visit the site for foraging, however it is recognised that their nightly commuting distance spans up to 20 km, and as a result, includes a vast area of suitable habitat within the surrounding landscape. The site is not considered to support an important population of the species and, subsequently, the proposed action is not considered to lead to a long-term decrease in the size of any local or important populations of the Grey-headed Flying-fox.	<b>No significant impact likely</b>
2. Reduce the area of occupancy of an important population.	No roost camps were observed on-site, and none are known on, or in proximity to, the site. While the proposed action will remove some potential foraging habitat, given the abundant availability of flowering eucalypts in the surrounding landscape (including within the Flinders-Karawatha Bioregional Corridor), the development proposal is unlikely to have a significant impact on the area of occupancy of the species, or of the occupancy of an important population of the species.	<b>No significant impact likely</b>
3. Fragment an existing important population into two or more populations.	The SPRAT species profile outlines that, while there are spatially structured colonies of Grey-headed Flying-fox, there are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout the species' geographic range. In addition, the species is considered highly mobile and capable of foraging over relatively vast distances. Due to the lack of a roosting camp on or adjacent to the subject site, it is not considered to contain an important population of the Grey-headed Flying-fox. It is not expected that the proposed action will fragment an important population into two or more populations.	<b>No significant impact likely</b>
4. Adversely affect habitat critical to the survival of a species.	While the removal of some potential foraging habitat will occur as a result of the proposed action, this habitat has been historically disturbed by clearing, currently used grazing, is isolated from other vegetation by roads and cleared rural residential land, and is subject to edge effects from surrounding	<b>No significant impact likely</b>

	development. Further, this habitat is not considered to be unique or of special value. The South East Queensland landscape provides abundant eucalypt and similar genera, available for Grey-headed Flying-fox foraging. Of note, the proposed development incorporates the retention and rehabilitation of vegetated corridors throughout the site, which will maintain foraging resources post-development. Given the relatively disturbed nature of the vegetation on-site, potential foraging habitat to be cleared is not considered to be critical habitat to the survival of the Grey-headed Flying-fox.	
5. Disrupt the breeding cycle of an important population.	Site field works did not identify any evidence of breeding Grey-headed Flying-fox. Mating normally occurs within autumn, and females generally give birth in October, when they carry their young to feeding sites for four to five weeks after giving birth. No individuals or roosting camps were observed on-site or on adjoining properties, and as such, the proposed action is unlikely to disrupt the breeding cycle of an important population.	<b>No significant impact likely</b>
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat on-site did not contain any special or unique values. The removal of this habitat is unlikely to have a significant impact on the availability of habitat throughout the broader landscape, given the vast quantity and availability of eucalypts in the surrounding area. It is not expected that the removal of this site habitat will be of an extent that the species is likely to decline.	<b>No significant impact likely</b>
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The proposed action will be governed by the Greater Flagstone Priority Development Area Development Scheme, and will require a number of management plans, including for invasive species. The action is unlikely to result in the introduction of invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	<b>No significant impact likely</b>
8. Introduce disease that may cause the species to decline.	The proposed project is considered unlikely to introduce disease into the area that may cause the species to decline.	<b>No significant impact likely</b>
9. Interfere substantially with the recovery of the species.	Recovery of the Grey-headed Flying-fox has specifically targeted broad-scale culling. In addition, conservation efforts for the species have led to the protection of known roosting sites and associated important habitat. The subject site has not been identified as an important habitat or containing a roosting site. The action is considered unlikely to interfere with the recovery of the species.	<b>No significant impact likely</b>

As per the assessment against the *Significant Impact Guidelines 1.1* (**Table 7**), the proposed action is considered unlikely to have a significant impact on the Grey-headed Flying-fox.

In summary, it is considered that an abundance of suitable foraging habitat for the Grey-headed Flying-fox exists in the surrounding landscape, particularly in the Flinders-Karawatha Bioregional Corridor, and the retention of vegetated corridors throughout the project site would likely mitigate any potential negligible impact on Grey-headed Flying-fox.

### **Swift Parrot (*Lathamus discolor*)**

*Lathamus discolor* (Swift Parrot) is considered very distinctive. It undertakes the longest migration of any parrot species in the world, with breeding occurring only in Tasmania, and migration to mainland Australia occurring within the wintering months to the box-ironbark forests and woodlands as far north as southeast Queensland. This species has been recorded within woodland and forest patches containing *Eucalyptus crebra* (Narrow Leaf Ironbark), *Eucalyptus tereticornis* (Forest Red Gum) as well as yellow box forests, and it feeds mostly on nectar and mainly from eucalypts. Although records of this species have come from the Gold Coast, Noosa, Toowoomba, Warwick and Lockyer Valley, a search of Wildlife Online for species records did not result in any observations of *Lathamus discolor* within a ten kilometre radius of the site.

There is Least Concern, Of Concern, and Endangered remnant vegetation mapped on the subject site. The remainder of the site consists of non-remnant vegetation (cleared paddock areas and patches of regrowth). No Swift Parrot individuals were recorded during site surveys in January, February, and May of 2016. Based on the availability of *Eucalyptus tereticornis* (Forest Red Gum), the site is considered to provide marginal foraging resources for this species.

As the site contains known foraging habitat for the Swift Parrot, an assessment against *the Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* was conducted (refer to **Table 8**) to ascertain whether or not the action could potentially impose a significant impact on the species.

**Table 8: Significant Impact Assessment – Swift Parrot**

Significant Impact Criteria	Description	Impact
<b>An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:</b>		
1. Lead to a long term decrease in the size of an important population of a species.	While the site contains some potential foraging habitat for the Swift Parrot, no individuals were seen during the site surveys. The available foraging habitat on-site is relatively abundant throughout the region, given the high prevalence of eucalypts. Of particular note is the nearby Flinders-Karawatha Bioregional Corridor which incorporates the largest remaining remnant Eucalyptus woodland in South East Queensland. Whilst Swift Parrots have potential to visit the site for foraging, they are highly mobile and their regular commuting activities include a relatively vast area. The site is not considered to support an important population of the species, and subsequently, the proposed action is considered unlikely to lead to a long-term decrease in the size of any Swift Parrot populations.	<b>No significant impact likely</b>
2. Reduce the area of occupancy of an important population.	No Swift Parrot individuals (or evidence of) were observed on-site, and it is not considered that an important population exists on-site or in close proximity. The proposed action will remove some potential foraging habitat, however, given the abundance of flowering eucalypts in the surrounding landscape and within the greater region, the proposed action is unlikely to have a significant impact on the area of occupancy of the species, or on the area of occupancy of an important population.	<b>No significant impact likely</b>
3. Fragment an existing important population into two or more populations.	The SPRAT species profile outlines that the Swift Parrot population occurs as a single population, although it migrates annually. The population is not considered to be fragmented, or separated. During non-breeding times, their movements cover hundreds of kilometres. No important population is considered to exist on, or adjacent to, the project site, and consequently, the proposed action is considered unlikely to fragment a population into two or more populations.	<b>No significant impact likely</b>
4. Adversely affect habitat critical to the survival of a species.	While the proposed action will result in the removal of potential foraging habitat for the Swift Parrot, the majority of the habitat on-site is relatively disturbed due to past clearing and current agricultural practices. It is subject to edge effects from surrounding residential development. The habitat on-site is not considered to be unique or of special value. The SPRAT species profile states that while the Swift Parrot habitat is fragmented, this has not caused the populations to fragment, due to their highly mobile lifestyles. The South East Queensland landscape provides abundant eucalypt and similar species, which are available as food sources for the Swift Parrot. Additionally, the retention of vegetated corridors throughout the property will maintain foraging resources for this species on-site. Given its relatively disturbed nature, potential foraging habitat to be cleared is not considered to be critical habitat for the survival of the Swift Parrot.	<b>No significant impact likely</b>
5. Disrupt the breeding cycle of an important population.	The Swift Parrot breeds in Tasmania, and no individuals were observed on-site. Therefore, the proposed action will have no impact on the breeding cycle of an important population.	<b>No significant impact likely</b>
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	The habitat on-site was not considered to contain any special or unique values. The removal of some vegetation as required for the development is unlikely to have a significant impact on the availability of habitat for the Swift Parrot throughout the broader landscape, given the vast quantity and availability of eucalypts in the surrounding area. The removal of a small area of foraging habitat on-site is not likely to lead to species decline.	<b>No significant impact likely</b>
7. Result in invasive species that are harmful to a vulnerable species becoming	The proposed action is unlikely to result in the introduction of invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat. Further, the project will be carried out in accordance with the Greater Flagstone Priority Development Area Development Scheme and	<b>No significant impact likely</b>

established in the vulnerable species' habitat.	management plans which will include measures to avoid establishment of invasive species in the area.	
8. Introduce disease that may cause the species to decline.	The project is unlikely to introduce disease into the area that may cause the species to decline.	<b>No significant impact likely</b>
9. Interfere substantially with the recovery of the species.	Recovery of the Swift Parrot has specifically focused on identifying extent and quality of habitat; managing habitat at the landscape scale; reducing incidents of collision; population and habitat monitoring; community education and information; and managing the recovery process. The subject site has not been identified as an important habitat or population and the action is considered unlikely to interfere with the recovery of the species.	<b>No significant impact likely</b>

As per the assessment against the *Significant Impact Guidelines 1.1* (see **Table 8**), the proposed action is considered unlikely to have a significant impact on the Swift Parrot.

In summary, it is considered that the abundance of foraging habitat in the surrounding landscape suitable for the Swift Parrot, and the retention and rehabilitation of vegetated corridors within the development layout would likely mitigate any potential negligible impact on Swift Parrot.

### **Nature and extent of likely impact**

Other than the recorded evidence of Koala activity (in the form of scats), no EPBC Act listed threatened species were observed on or in areas adjoining the site. As stated above, it is considered that the abundance of suitable foraging habitat in the surrounding landscape indicates that the retention of vegetated corridors throughout the development site would likely mitigate any potential negligible impact on these species, should they visit the site. As discussed above, a number of factors diminish the adversity of impacts caused by the proposed clearing of 280.9 ha of critical habitat vegetation. These factors can be summarised as:

- Overall, critical habitat on-site was given a mid-level score of 7 using the Habitat Assessment Tool;
- Areas of vegetated corridors, particularly focused around waterways and providing north-south connectivity through the site are to be retained and rehabilitated (refer to **Plan 1**);
- The site is increasingly fragmented from other vegetation patches;
- No Koalas were observed on-site despite targeted searched, and SAT assessments indicated Low Koala Usage in 14/5 sites across the project area; and
- Vegetation clearing will be undertaken sequentially, under the guidance of a fauna spotter-catcher to ensure that potential injury or death to Koalas as a result of clearing are minimised.

Whether or not the proposal will result in a 'significant impact' on the Koala needs to be considered against the following factors:

1. The site is considered to be infrequently visited or used by the Koala;
2. No Koalas were located during targeted site surveys in support of this referral;
3. Relatively Low Usage levels in the form of scats were detected, with only one result of Medium Usage;
4. Vegetated corridors will be retained throughout the project site;
5. The clearing areas are not within any existing or future proposed corridor or linkage area forming part of a landscape corridor essential for dispersal of Koalas – the proposed site is within a designated PDA;
6. Regional Ecosystems on-site that will be cleared in order to establish the development remain in high abundance in the nearby Flinders-Karawatha Bioregional Corridor protected from future development by legislation;
7. Vegetated areas to be retained within the project site are considered substantial enough to continue to provide a role in future Koala use and movement despite the incoming residential land uses;
8. The use of fauna spotter-catchers and sequential stage by stage clearing will safeguard future works from direct impacts on Koalas should they be present on-site during construction;

9. The rehabilitation activities proposed for the corridors will include weed removal and revegetation, and therefore will enhance the potential use of this area;
10. A number of operational measures as outlined in **Section 5** of this referral will contribute towards the ongoing management of impacts with the increase in residential development;
11. For the amount of clearing of critical habitat, the proponent will contribute offsets for the protection, enhancement, and support of Koalas in the region, as required under EDQ and conditioned as part of site approvals.

Based on these management and mitigation factors (including conditioned offsets) and detailed consideration against the Significant Impact Guidelines for Vulnerable Species and the specific Referral Guideline, the proposal is considered unlikely to result in a 'significant impact' on the Vulnerable-listed Koala species. **However; given the project will result in the clearing of large areas of 'critical habitat' as defined by the EPBC Act koala referral guidelines and offsets cannot be taken into consideration at the referral stage the project has been referred as a controlled action.**

### 3.1 (e) Listed migratory species

#### Description

An EPBC Act Protected Matters Search Tool using a five kilometre radius from the centre of the subject site identifies 14 migratory species as having potential to occur on-site (**Attachment 1**). During the field survey, four migratory species were observed on-site (Fork-tailed Swift, Rainbow Bee-eater, Cattle Egret, and Great Egret - refer to **Attachment 2**). These species are considered common within the local area and are generalist species that utilise a broad range of habitats. The site would provide some low value foraging habitat for these species, however the habitat and vegetation values would present are not considered to provide any significant or unique ecological values for these species. It is not expected the proposed development would impact upon these species.

#### Nature and extent of likely impact

The proposed action is not considered to have a significant impact on migratory species given the lack of significant habitat on-site, and abundance of habitat in the surrounding landscape, particularly within the Flinders-Karawatha Bioregional Corridor.

### 3.1 (f) Commonwealth marine area

(If the action is in the Commonwealth marine area, complete 3.2(c) instead. This section is for actions taken outside the Commonwealth marine area that may have impacts on that area.)

#### Description

**Not applicable.** Refer to Attachment 1.

#### Nature and extent of likely impact

**Not applicable**

### 3.1 (g) Commonwealth land

(If the action is on Commonwealth land, complete 3.2(d) instead. This section is for actions taken outside Commonwealth land that may have impacts on that land.)

**Description**

**Not applicable.** Refer to Attachment 1.

**Nature and extent of likely impact**

**Not applicable**

**3.1 (h) The Great Barrier Reef Marine Park**

**Description**

**Not applicable.** Refer to Attachment 1.

**Nature and extent of likely impact**

**Not applicable**

**3.1 (i) A water resource, in relation to coal seam gas development and large coal mining development**

**Description**

**Not applicable.** Refer to Attachment 1.

**Nature and extent of likely impact**

**Not applicable**

**3.2 Nuclear actions, actions taken by the Commonwealth (or Commonwealth agency), actions taken in a Commonwealth marine area, actions taken on Commonwealth land, or actions taken in the Great Barrier Reef Marine Park**

<b>3.2 (a)</b>	<b>Is the proposed action a nuclear action?</b>	<b>X</b>	No
			Yes (provide details below)

**If yes, nature & extent of likely impact on the whole environment**

<b>3.2 (b)</b>	<b>Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?</b>	<b>X</b>	No
			Yes (provide details below)

**If yes, nature & extent of likely impact on the whole environment**

<b>3.2 (c)</b>	<b>Is the proposed action to be taken in a Commonwealth marine area?</b>	<b>X</b>	No
			Yes (provide details below)

**If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))**

<b>3.2 (d)</b>	<b>Is the proposed action to be taken on Commonwealth land?</b>	<b>X</b>	No
			Yes (provide details below)

**If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(g))**

3.2 (e)	Is the proposed action to be taken in the Great Barrier Reef Marine Park?	X	No
			Yes (provide details below)

If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(h))

### 3.3 Other important features of the environment

#### 3.3 (a) Flora and fauna

The following provides a brief description of other flora and fauna values found on-site during desktop and field surveys (further information is contained within **Attachment 2**).

##### Flora

The subject site is highly modified due to past and present land use, including vegetation clearing and agricultural grazing practices (refer **Response 3.3(g)**). Forty-five exotic flora species were recorded throughout the site. Although historically disturbed, the application area contains patches of remnant Regional Ecosystem communities, including along the Logan River and the mapped watercourse which traverse the site. The majority of the watercourse stretches were observed to be reasonable degraded with erosion and cattle access, vehicle crossings, and weed species. The Regulated Vegetation Management Map shows the site to contain Least Concern RE 12.9-10.2, Of Concern composite RE 12.9-10.2/12.9-10.3 (80/20%), Of Concern RE 12.9-10.3, Endangered RE 12.3.3, and Least Concern RE 12.3.7. Site survey confirmed these REs. Additionally, the site contains regrowth vegetation, and cleared paddock areas. Refer to **Attachment 2** for full details on site flora. Fifty-two native flora species were observed on-site.

One species listed under the NCA was recorded on-site – *Melaleuca irbyana*, however it was recorded as isolated specimens scattered across the site and did not meet the minimum thresholds for the associated TEC. Clearing of this species will require relevant approvals under State legislation.

##### Fauna

Seventy-two fauna species were observed on-site, consisting of 55 bird species, six mammal species, nine reptile species, and two amphibian species (see **Attachment 2 - Table 8**). No threatened species listed under the EPBC Act or NCA were observed on-site. Given a large proportion of the site is cleared paddocks and regrowth vegetation, and the neighbouring land uses have resulted in surrounding land being cleared of remnant vegetation and used for rural residential purposes, utilisation of the site is generally limited to fauna that can adapt to a highly modified and disturbed landscape. A variety of common avi-fauna were observed utilising the site as part of a broader home range.

Refer to **Attachment 2** for further details on flora and fauna identified within the project area.

#### 3.3 (b) Hydrology, including water flows

The Logan River runs along the eastern boundary of the site, and to the south of the site. A watercourse is mapped as traversing the site from the west to the east where it flows into the Logan River. The watercourse traversing the site was assessed by the Ecologists, and is discussed in detail in **Attachment 2 – Section 4.6**. Generally, the majority of the banks on-site along the Logan River and along the watercourse are disturbed and impacted, with erosion and evidence of cattle access, and minimal true riparian vegetation. The proposed development includes the retention and rehabilitation of these watercourses, and associated vegetated corridors. Any overland flow across the site due to soil saturation during high rainfall events is likely to run into the west to east drainage features, or the Logan River. Any existing vegetation in these areas will be retained, and infilled, to allow for natural function and to minimise the potential for hydrological changes to impact watercourses.

##### Stormwater Management Plan

As per approval requirements, all works will be carried out and completed in accordance with a Stormwater Management Plan which will be developed and approved. The implementation of the Stormwater Management Plan will ensure that water quality standards set by State and Local governments are achieved, including that required under the Greater Flagstone PDA Development Scheme.

### **3.3 (c) Soil and Vegetation characteristics**

Vegetation values across the majority of the site are limited due to previous clearing for grazing purposes. Remaining vegetation is a mixture of remnant vegetation and regrowth of compromised habitat value. Site survey confirmed the remnant vegetation to be a combination of Least Concern RE 12.9-10.2, Of Concern composite RE 12.9-10.2/12.9-10.3 (80/20%), Of Concern RE 12.9-10.3, Endangered RE 12.3.3, and Least Concern RE 12.3.7. **Section 4.4 of Attachment 2** describes in detail the broad vegetation communities observed on-site.

The Australian Soil Resource Information System (ASRIS) maps the site as containing mostly Chromosols, with Dermosols associated with the Logan River. Both soil types are considered a component of Land Zone 9-10 Regional Ecosystems which is mapped on-site. Chromosols have a strong contrasting texture. They are not strongly acidic or sodic in the upper B horizon. The parent material of Chromosols ranges from highly siliceous, siliceous to intermediate in composition. These soils are found in imperfectly drained and well-drained sites. These soils have moderate agricultural potential with moderate chemical fertility and water-holding capacity. They can be susceptible to soil acidification and soil structure decline.

Dermosols do not have strong texture contrast. They have a well-structured B2 horizon containing low levels of free iron. The parent materials of dermosols range from siliceous, intermediate to mafic in composition. These soils are found in imperfectly drained sites (yellow and grey dermosols) with rainfall between 550 mm and 1350 mm and in well-drained sites with rainfall between 450 mm and 1200 mm. Dermosols generally have high agricultural potential with good structure and moderate to high chemical fertility and water-holding capacity with few problems.

Refer to **Attachment 2 – Figure 6** and **Section 3.8**.

### **3.3 (d) Outstanding natural features**

No outstanding natural features were identified on the referral site. The site's proximity to surrounding rural residential development has fragmented it from other habitat areas in the greater landscape (refer to **Plan 2**). The designation of the Greater Flagstone PDA also reflects the lack of outstanding natural features on-site. Previous disturbances in the wider landscape have significantly reduced any ecological value of the site and its immediate surrounds, resulting in no outstanding natural features identified.

### **3.3 (e) Remnant native vegetation**

The site contains patches of mapped Least Concern RE 12.9-10.2, Of Concern composite RE 12.9-10.2/12.9-10.3 (80/20%), Of Concern RE 12.9-10.3, Endangered RE 12.3.3, and Least Concern RE 12.3.7. these are discussed in detail in **Attachment 2 – Section 4.4**. These REs were confirmed during site assessment.

### **3.3 (f) Gradient (or depth range if action is to be taken in a marine area)**

The site contours vary by approximately 50 metres (from 20 to 70 m), from watercourses in the lower portions of the site, to a peak in the west.

### **3.3 (g) Current state of the environment**

The site was found to be relatively disturbed as a result of historical clearing, and past and present agricultural practices, invasion from exotic weed species, and impacts from domestic and feral animals. The majority of the vegetation on-site is regrowth, with large areas of cleared land (refer to **Figure 2**). The site contained a number of pest weeds including nine that are declared pests under the Queensland *Land Protection (Pest and Stock Route Management) Act 2002* (LPA) - *Ambrosia artemisiifolia* (Annual Ragweed), *Baccharis halimifolia* (Groundsel Bush), *Bryophyllum delagoense* (Mother-of-millions), *Senecio madagascariensis* (Fireweed), *Sporobolus pyramidalis* (Gat Rat's Tail Grass), *Celtis sinensis* (Chinese

Celtis), *Lantana camara* (Lantana), *Lantana montevidensis* (Creeping Lantana), and *Macfadyena unguis-cati* (Cat's Claw Creeper). All LPA declared weeds must be managed accordingly.

Refer to **Attachment 2** for further results of the site assessment.

### **3.3 (h) Commonwealth Heritage Places or other places recognised as having heritage values**

**Not applicable.** Refer to Attachment 1.

### **3.3 (i) Indigenous heritage values**

There are no known cultural heritage values on the site.

### **3.3 (j) Other important or unique values of the environment**

The site is not located near other notable environmental features that are likely to be affected by the proposed action. The site is located near the Flinders-Karawatha Bioregional Corridor which is recognised for its significant biodiversity, rural production, cultural heritage, scenic amenity and outdoor recreation values. The Bioregional Corridor is approximately 56,350 ha and extends 60 km from Karawatha Forest in Brisbane's outer suburbs to south of Ipswich at Flinders Peak and on to the Wyaralong Dam near Boonah. The proposed development is not expected to have any impact on the Bioregional Corridor.

### **3.3 (k) Tenure of the action area (eg freehold, leasehold)**

The entire site is freehold land.

### **3.3 (l) Existing land/marine uses of area**

The site is currently rural residential land, used for grazing. The dominant surrounding land use is rural residential, with increasing residential development planned in accordance with the PDA designation.

### **3.3 (m) Any proposed land/marine uses of area**

The proposed use of the land is for a residential development as per the Greater Flagstone PDA designation.

## 4 Environmental Outcomes

The referred action is for the construction and operation of a residential development within the Greater Flagstone PDA, near Jimboomba, Queensland. The action will result in the removal of some Koala habitat trees from the site area to establish the development. As highlighted throughout this referral, the majority of the vegetation on-site is impacted by previous and current land uses and proposed developments, including being largely isolated from other vegetation due to roads, the Logan River, and cleared rural residential properties surrounding it. While site investigations did record evidence of Koala usage across the site, any Koala habitat on-site is limited by the expansion associated with the PDA, in keeping with State and Local Government intent. Based on this context, while the property contains some Habitat defined as critical for the Koala by the referral guidelines, this is fragmented and isolated and will become more so with increased urbanisation in the area. the planned encroaching development.

A number of environmental management plans will be developed as part of the required approvals and will include mitigation measures to be implemented. These plans are discussed in **Section 5**. Implementation of the plans are expected to minimise any potential impacts to koalas at the local scale. In addition, offsets for the clearing of koala habitat will be required in accordance with *ULDA Implementation Guideline 17 – Remnant Vegetation and Koala Habitat Obligations in Greater Flagstone and Yarrabilba UDAs*. These offsets will provide an overall benefit to the species in the region further negating any impacts on koala habitat on site.

The proposed development layout (refer to **Plan 1**) incorporates the retention and rehabilitation of vegetated corridors through the site, in an east-west direction and north-south. A vegetated buffer along the Logan River is also proposed for the site. The east-west corridor captures the mapped watercourses on the site, and will undergo rehabilitation activities. It is considered that these corridors will provide continuation (and enhancement) of the compromised environmental values and functions on-site and in the surrounding area.

A Rehabilitation Plan will be developed for the vegetated corridors and will be presented to Council during the approvals process. The overarching purpose of this Plan will be to protect and retain existing vegetation, and enhance these areas where required. All rehabilitation works will be conducted in accordance with best management practices, including assisting to stabilise and reverse negative effects of habitat fragmentation. Proposed rehabilitation works will include weed management and replanting of native species consistent with mapped Regional Ecosystems for the site. These activities aim to strengthen ecological values and maintain connectivity. Additional strategies such as propagule sourcing and installation of fauna habitat components (i.e. nest boxes) and fauna awareness signage will also be implemented as required during the stages of the development.

It is proposed that a set of outcomes based conditions based on the management measures outlined in **Section 5** will be prepared in consultation with DoE and in accordance with DoE's draft Outcomes-based Conditions Policy 2015 and Outcomes-based Conditions Guidance 2015 as part of the controlled action assessment process.

# 5 Measures to avoid or reduce impacts

It is anticipated that the primary impact on the natural environment that will occur as a result of the project is the clearing of 280.9 ha of native trees (both mature and regrowth) within non-remnant and remnant vegetation. A number of management measures will be employed during the construction and ongoing development of the project that firstly avoid environmental impacts, and if not avoidable, reduce, minimise, and mitigate any environmental impacts. Many of these measures are mandatory and based on Local and State legislation or embedded in the Material Change of Use approval for the site. Development measures to be employed are outlined in this section.

## 1. Site Selection for Development

The allotments included in this application have been consistently earmarked over the last decade by the State Government as being suitable for future urban development. There are very few sites in Queensland with direct connection to existing transport facilities and major infrastructure, that can permit such a large development outcome (population base) with relatively limited environmental, economic, and social impacts.

It is acknowledged in this referral and supporting documents that a number of areas within the project site will be incorporated in the development to retain Remnant Vegetation and other habitat features. Further, in order to implement the development, the following core impacts do not occur:

1. No impacts on Remnant Endangered Regional Ecosystems;
2. Minor clearing of Of Concern Remnant Regional Ecosystems;
3. No Threatened Ecological Communities located on-site or to be impacted;
4. 72.1 ha of the site is to be retained and rehabilitation, with an additional 31.1 ha to be used for open space;
5. No development proposed in Coastal Management or Hazard areas; and
6. The site is not located within a Priority Koala Assessable Development Area or Koala Assessable Development Area of the Koala SPRP.

## 2. Site Design

The proposed Land Use Plan will guide the development layout and reduce potential impacts by concentrating development in degraded land and lower value habitat areas, with a focus on retaining higher value ecological features and site habitat opportunities. Only relatively small areas of site remnant vegetation communities mapped as Of Concern will be disturbed. The vast majority of clearing will occur in non-remnant and Least Concern remnant communities due to their abundance remaining within the immediate bioregion. The proposal also includes the retention and rehabilitation of the waterway corridors.

## 3. Volume of Open Space

**Plan 1** shows the extent of various conservation and open space areas that provide habitat values and connectivity throughout the site.

## 4. Further Assessment, Studies, and Pre-Clearance Surveys

The assessment and approval process outlined by **EDQ** requires the submission and review of multiple stages of applications prior to the commencement of works. The existing approval over the referral site is an overarching Material Change of Use. Prior to commencement of any works on-ground, the following sequential submissions must be lodged and approved:

- 1) Whole of Site Strategies (including a site strategy specifically written for Natural Environment);
- 2) Infrastructure Master Plans;
- 3) Lodge and receive approval of Site Context Plans (more detailed information provided at the precinct scale);
- 4) Lodge and receive approval for Plans of Development (similar to Plans of Subdivision or reconfiguration); and
- 5) Operational Works or Compliance Assessment Approval (Actual Works approvals, roads, tree clearing, landscaping, etc.).

Each of these submissions and approvals require differing environmental surveys, studies, constraint planning, and reporting, based on the smaller area to which the application applies. At the Operational Works / Compliance Assessment phase, detailed reporting and mapping is converted into management and rehabilitation plans protecting environmental values during construction and establishing operational measures to ensure enhancement.

As a legislative requirement of the **EDQ** Priority Development Area application and approval process, the proponent at a minimum will need to complete the following detailed ecological surveys and reporting:

#### *Natural Environment Site Strategy*

Establishes the broad environmental objectives of the entire project and includes maps of key conservation and environmental protection areas. Condition 25 of the Material Change of Use approval for the site lists the requirement for this strategy and states that it is to include:

- Outline measures to conserve and enhance the site's biodiversity values;
- Identify strategies for the protection of remnant endangered vegetation;
- Identify management plans to be provided to address clearing;
- Identify rehabilitation strategies for corridors of native vegetation to improve habitat extent and wildlife movement;
- Identify any buffering to areas of environmental significance which have conservation, biodiversity, habitat or scenic amenity;
- Identify strategies for flora and fauna management of the site, and determine corridors, proposed road crossing designs for expected species utilisation and rehabilitation areas (such as for Koala habitat);
- Detail how and when Koala habitat obligations as detailed in Guideline 17 will be delivered;
- Identify strategies to prevent land degradation;
- Identify strategies to rehabilitate major drainage lines;
- Identify strategies for bushfire management;
- Identify strategies for weed management;
- Identify strategies for monitoring of rehabilitation; and
- Identify strategies for rehabilitation of stream banks to create riparian stability for major creek corridors.

#### *Biodiversity Values Assessment Reports*

With the submission of each application for Context Plan, the proponent must include a detailed Biodiversity Values Assessment of the development area prepared in accordance with ULDA Implementation Guideline 14 – Environmental Values and Sustainable Resource Use. This guideline specifies that the proponent must complete robust field surveys, plans and reports including detailed information on the following values within the Context Plan Application area:

- Significant Biodiversity Values;
- Ecological Connectivity;
- Sustainable Landscape Practices;
- Bushfire Risk Management; and
- Wetlands, Waterways, and Water Quality.

Multiple reports will be required over the referral site over a period of time enabling ongoing assessment of ecological values and tweaking of the plan of development and detailed design. These ongoing Significant Biodiversity Values Assessments assist in negating potential time lag between initial environmental surveys (completed now) and future impacts which may be decades away from occurring.

#### *Pre-Clearance Surveys*

Once approvals for actual on-ground works have been issued (Operational Works / Compliance Assessment) pre-clearance surveys for flora and fauna are required in advance of any clearing. These surveys form part of the extensive management plans provided in support of final approvals.

## **5. Detailed Design Considerations (Roads)**

At the Plan of Development Scale (Subdivision Design), tweaking of road locations, setbacks, and earthworks will occur to ensure the environmental values outlined in the Site Strategy and Context Plan are protected and enhanced. This is particularly the case where roads traverse and adjoin conservation and environmental protection areas. As committed to in the overarching Natural Environment Site Strategy, all new roads will be designed in accordance with the Queensland Department of Transport and Main Roads Fauna Sensitive Road Design Manual (Volumes 1 and 2). Some of the aspects and practices outlined in this manual and to be incorporated into the proposal include:

## **6. Safe Passage Road Fauna Movement Solutions**

Where internal roads within the project are required to cross watercourses, bridges and or specific fauna movement culverts will be incorporated into the design. These structures will be designed and sized to cater for the movement of native fauna anticipated to utilise the watercourse corridor. Fauna underpasses will be exclusively designed for fauna, and separate to hydrology devices. The safe crossing movement solutions will be augmented by directional fauna exclusion fencing to ensure animals are funnelled away from vehicle conflicts and into safe passage areas. Where required, additional large tree plantings will be installed either side of a constructed road crossing to reinstate as quickly as possible a closed canopy over the new road infrastructure. Where considered necessary, rope tunnels and other canopy linking structures will be provided to cater for the time lag between clearing and the re-establishment of suitable vegetation.

At a smaller scale, the design of roads near environmental areas will adopt traffic calming and reduced speed signage to control vehicles adjoining sensitive areas.

## **7. Detailed Design Considerations (Stormwater and Landscaping)**

Importantly, the EDQ sequential application process requires the consideration of Stormwater treatment and Landscape outcomes upfront and as separate to areas designated to conservation and environmental protection.

## **8. Management Measures**

In addition to mitigation outcomes incorporated in the design process, a number of management measures are proposed to ensure impacts are avoided and or minimised through the construction and operational phases. These include:

### **a) Stormwater and Flooding Master Plan**

A site Stormwater and Flooding Master Plan Strategy will be prepared to specifically comply with the following approval conditions and standards applied to the project due to its size and diversity of land uses:

- Include a flooding report as per Logan Interim Flood Response 2011;
- Include a stormwater management report detailing measures to be implemented to ensure the integrity and values of waterways is maintained and enhanced;
- Demonstrate how creek stability is to be achieved and sustained;
- Include an assessment of the inter-relationship between existing groundwater conditions and proposed development design; and
- Demonstrate how the proposed infrastructure and other actions will contribute towards the achievement of an overarching site strategy for TWCM (condition 20 of the MCU approval).

### **b) Confirmation and Pre-Clearance Surveys**

As a result of the expected time delay from the preparation of assessment reports to approvals and then again through the sequencing of development precincts and clearing works, it is a requirement that a system of pre-clearance surveys is conducted prior to each stage of actual site clearing. These surveys can also be used to safeguard the site against changing Commonwealth, State, and Local government species listings and inform management plans relative to the natural features in each Context Plan and Plan of Development.

### **c) Vegetation Clearing and Management Plan**

A Vegetation Clearing and Management Plan (VC&MP) will form part of a broader management document submitted which each stage of the operational works package. The VC&MP will be critical to limit vegetation clearing to only what is required within each stage of works to help control erosion and sediment control risks and provide for the long term sequencing of clearing over the application area. The likely contents of each VC&MP include:

- Clearly show all trees to be removed and retained;
- Include details of all civil works likely to impact on existing vegetation;
- Temporary and permanent exclusion and protection fencing for riparian corridors and parklands;
- Roles and responsibilities for site contractors, developer and the consultant group;
- Stockpiling and site access locations;
- A clearing sequencing plan showing the commencement of clearing and direction of removal (this should be in conjunction with the Fauna Management Plan to allow for the appropriate flushing of fauna towards surrounding safe haven areas);
- Links to weed management and revegetation proposals;
- The stock piling and reuse of cleared vegetation;
- Specific details on the removal of previously identified potential fauna habitat trees; and
- Where trees are shown to be retained within disturbance zones they should be accompanied by necessary arborist specifications incorporated into the VC&MP.

### **d) Fauna Management Plan**

A Fauna Management Plan (FMP) should be prepared for the impacts of the construction phase covering for the loss of vegetated areas, isolated trees and barriers and impediments to dispersal. The FMP should link closely with the VC&MP and include details on:

- Summary of species surveyed as using the site and which of those are likely to be impacted by works occurring within each stage of works;
- List relevant State and Federal legislation constraints and controls for the above listed fauna;
- A plan showing existing habitat opportunities and locations;
- Detail the threats for existing fauna species;
- Include clearing sequencing plan from VC&MP;
- Specify management and mitigation measures – could include temporary use of fauna exclusion fencing;
- Details of fauna spotter role and contacts and certification;
- Specific fauna management procedures for potential or known habitat trees;
- Commitment to the early installation of nest boxes to surrounding bushland areas to be retained; and
- Commitment to the early rehabilitation of proposed strategic corridors to minimise lag time between clearing and the functioning of future corridors.

### **e) Fauna Spotter Roles and Reporting**

The Fauna Management Plan will be implemented by a Queensland Parks and Wildlife Services registered wildlife spotter-catcher. This role is mandated for any clearing of native vegetation in Queensland both within and external to PDAs. Within **EDQ**, the role of the fauna spotter-catcher is to complete an assessment of the works area no more than two weeks prior to the works actually occurring and present a report to **EDQ** on the findings and how the proposed clearing is to be managed. The fauna spotter-catcher is required at the pre-start meeting and to be on-site during all times of construction. Under the *Nature Conservation Act 1992*, registered fauna spotter-catchers must complete a return of operations report to the Queensland Government stating all fauna encountered and the specific management measures used to ensure the safety of native animals.

### **f) Stormwater Quality Management Plan / Erosion and Sediment Control plans**

Further to the whole of site Master Plan, a detailed Stormwater Quality Management Plan and Erosion Sediment Control Plan will be prepared covering both the construction and operational phases for each stage of works. The plan will

contain details on the exact location of stormwater treatment systems, including structural and surface treatment devices. The plan will include details on:

- Objectives, monitoring, reporting, actions for non-compliance;
- Identification of possible sources of water pollution including nutrients and contaminants;
- Details on management and quality devices proposed; and
- Erosion and Sediment Control Plan.

## **9. Operational Measures**

The proposal is a large scale residential project and at completion will include many variable precincts and land uses over the tenure of the project. Development densities increase with proximity to local centres with built environments containing medium density development. Areas away from centres are expected to be less dense and in areas integrated within environmental values surrounding the PDA. Within some of these stages, a number of potential operational awareness tools and, in some areas, specific regulations are likely to be applied.

### **a) Lifestyle Guidelines – New Residents Awareness**

As part of the release of new Plan of Development Areas which adjoin or are in close proximity to sensitive receiving environments, the proponent will prepare a lifestyle guideline document to help promote a range of ecological sustainable living principles. Development areas directly adjoining conservation and environmental protection areas will be targeted for a tailored lifestyle guidelines document. The guidelines should be used to directly educate and raise awareness of a large audience towards the management of surrounding creeks, bushland, and other conservation areas.

Topics within the education documents will include:

- Appropriate plant selection on allotments;
- Inappropriate planting species (known local or declared weed species);
- Management of household scale run-off;
- Protection of native animals and the types residents could expect to see;
- Understanding storm water devices;
- Appropriate management of domestic animals;
- Location of dog on-lead and off-leash areas; and
- Key local and state phone numbers to contact if distressed or orphaned fauna is located.

Through raising awareness, the lifestyle guidelines will help new residents take direct ownership of the local streetscapes, immediate creek corridors and open space infrastructure maximising the outcomes promoted through the Natural Environment Site Strategy.

### **b) Detailed Landscape Submissions**

A non-invasive, locally endemic species palette will be adopted throughout all project areas providing the following ecological benefits:

- Additional native trees, shrubs, and ground covers for native fauna known to adapt to fringing urban environments;
- Reduce the potential for non-native and exotic landscape species invading retained bushland and waterway areas;
- Reduce maintenance and fertiliser requirements;
- Provide an in-ground example to future residents of a practical suite of working native plants for incorporation into private gardens; and
- Help establish a more sustainable and robust connected link along the Logan River and site tributaries.

### **c) Cat and Dog Restrictions**

The variability of the proposed development areas within the proposal do not feasibly support wholesale cat and/or dog restrictions on private allotments. For the bulk of the project area, a broad non-mandated animal control scheme will be proposed which is likely to include the following features:

- Broad resident education on responsible domestic animal ownership within the area;
- Dog on-lead areas within and adjoining designated conservation areas – supported by notification and education signage;
- Specific dog off-leash areas in support of controls in other locations; and
- Logan City Council Animal Control Local Law which requires registration, vaccinations, etc. will apply throughout the project.

In a limited number of locations, more stringent private allotment animal controls will be applied, where environmental areas dictate. In these locations, controls will vary from complete prohibition to limiting the number and size of animals allowable on individual allotments. These controls are regulated through the application of a covenant on the created allotment prescribing the prohibition or restriction on the allotment title making purchasers aware up-front and allowing the controls to apply in perpetuity.

### **d) Building Envelopes / Vegetation Protection / Covenants**

Based on the required development densities prescribed in the Greater Flagstone Urban Development Area Development Scheme, the average allotment size created will be approximately 400 m<sup>2</sup>. In the precincts surrounding the local centres allotments and densities will be more intense. Based on the type of development required to comply with **EDQ** planning controls, there are very few opportunities where existing native trees can be safely retained and protected in private property. The exception is where allotments form part of the environmental protection buffer and where steep grades substantially limit the ability to create smaller allotments. These locations present an opportunity to establish larger allotments where vegetation is retained and protected through building location envelopes. Again, where these controls are considered appropriate, covenants will be used to enforce the controls on allotment titles.

### **e) Offset Planting and Financial Contributions**

**EDQ** operates a specifically designed offset obligation for projects resulting in impacts in the Greater Flagstone Priority Development Area. The governing controls are specified in ULDA Implementation Guideline 17 – Remnant Vegetation and Koala Habitat Obligations in Greater Flagstone and Yarrabilba UDAs. As titled, the guideline specifies offset requirements for the clearing of non-viable Endangered Remnant Vegetation and Koala Habitat. The proposal does not impact on any Endangered Remnant Vegetation, however, does trigger Koala offsets. Two types of Koala habitat offsets will apply to the site:

1. A clearing contribution listed at \$15,000 per hectare of Bushland Habitat cleared containing defined non-Juvenile Koala Habitat trees (NJKHT) and \$5,000 per hectare (or \$920 per tree) for clearing of NJKHT in open areas mapped Medium and High Value Rehabilitation under the Koala State Planning Policy; and
2. An operational tax of \$150 per created dwelling.

Although providing the opportunity for land owners to undertake direct offset planting, Guideline 17 provides a preference for a financial contributions supported by a less challenging process for approval. The overarching goal of Guideline 17 is to generate a total figure of \$30 million through Koala obligations contributions. The operational tax applied to dwellings occurs for all allotments within the PDA regardless of clearing or even location relative to Koala habitat. This levy is applied to contribute towards the incorporation of fauna sensitive outcomes of external infrastructure, such as roads and rail, which **EDQ** will upgrade to support the growth of the PDA. The types of infrastructure this dwelling charge will contribute towards include the retrofitting of fauna crossing solutions, fauna friendly and exclusion fencing and local replanting of Koala Food Trees.

The clearing costs linked to financial contributions which make up the balance of the total of the financial obligation generated are to be spent directly on the west in the Flinders–Karawatha Bioregional Corridor. Although not directly

itemised, the justification for creation of Guideline 17 was to provide funds for the purchasing, securing and enhancing of allotments within the bioregional corridor.

The offset contributions imposed by EDQ achieve objectives within the EPBC Act Environmental Offsets Policy as they will deliver an overall conservation outcome that maintains Koala habitat within South East Queensland. By contributing to a larger pool of funds, EDQ will be able to buy and protect strategic habitat areas which have the highest conservation value for South East Queensland Koalas.

In addition to providing approximately 103.2 ha of vegetated and open space primarily for conservation outcomes within the project area, a preliminary calculation of the financial contributions mandated through Guideline 17 has been carried out using State Koala Bushland habitat mapping and the preliminary development area as shown on **Plan 1** and **Plan 4**. The offset contribution will be approximately:

Clearing	\$2,250,000
Operational	\$1,650,000
Total	\$3,900,000

We note that the financial contribution will vary depending on the final clearing area and number of dwellings. Under Implementation Guideline 17 and Queensland Government Legislation, these funds must be paid to the State Government who, under legislative obligation, must deliver an offset for the affected matter (in this instance the Koala). If the same financial contribution was invested directly by the proponent in the approved Queensland Trust for Nature advanced offset site in the Flinders-Karawatha Bioregional Corridor, it would yield approximately 371 ha of offset land.

## 6 Conclusion on the likelihood of significant impacts

### 6.1 Do you THINK your proposed action is a controlled action?

- |                                     |                           |
|-------------------------------------|---------------------------|
| <input type="checkbox"/>            | No, complete section 6.2  |
| <input checked="" type="checkbox"/> | Yes, complete section 6.3 |

### 6.2 Proposed action IS NOT a controlled action.

Not applicable

### 6.3 Proposed action IS a controlled action

The construction and operation of the proposed residential development at Teviot Brook / Riverbend is considered to have a low risk of resulting in a significant impact on a Matter of National Environmental Significance (MNES), specifically koala habitat. While the risk of a significant impact to the species and critical habitat to its survival is considered minimal the proponent has decided to refer the action as 'controlled' to ensure all potential concerns are addressed to the satisfaction of the Commonwealth Government.

As detailed in this referral, a number of factors identified through detailed site assessment are considered to reduce the potential for any impacts to the koala. In particular:

- No Koalas were observed on-site;
- Evidence of Koala activity was Low to Medium usage across the site;
- The site is largely isolated from surrounding bushland areas due to the presence of roads and cleared rural residential land;
- Vegetation is to be preserved and rehabilitated throughout the development site in the corridors running east-west and north-south, and along the Logan River;
- Critical habitat on the site achieved a habitat score of 7 which is a mid-range score for critical habitat using the Koala Referral Guidelines Habitat Assessment Tool;
- Multiple characteristics that reduce adverse effects to habitat critical to the survival of the Koala are evident; and
- The site is within the designated Greater Flagstone PDA, therefore slated for development and not considered to reflect habitat necessary for survival of species.

A thorough and vast array of management measures will be imposed upon the proposed referral (as documented in **Section 5**) which will ensure that injury to Koalas, if present, as a result of vegetation clearing is avoided or minimised. This will include the use of a fauna spotter-catcher during all stages of clearing and the implementation of sequential clearing to allow fauna to disperse away from clearing areas. Offsets will also be required under the relevant State legislation resulting in an overall benefit to the species at a regional level.

Given the detailed assessment already carried out at the site including desktop assessment of previous studies and publically available data and targeted and general field surveys, it is considered that any potential for significant impacts at the site have been identified and management measures put in place to minimise and avoid these impacts as much as possible. Offsets will be required through the applicable State implements to address any residual impact to koala habitat. As such it is requested that the controlled action assessment process is carried out via assessment on referral documentation or preliminary information with outcomes based conditions utilised to ensure any potential to impact on MNES is addressed under the EPBC Act.

## 7 Environmental record of the responsible party

	Yes	No
<p><b>7.1 Does the party taking the action have a satisfactory record of responsible environmental management?</b></p> <p><b>Provide details</b>  <b>Celestino</b> is a relatively new company and has a satisfactory environmental record.</p>	<b>X</b>	
<p><b>7.2 Has either (a) the party proposing to take the action, or (b) if a permit has been applied for in relation to the action, the person making the application - ever been subject to any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources?</b></p> <p><b>If yes, provide details</b></p>		<b>X</b>
<p><b>7.3 If the party taking the action is a corporation, will the action be taken in accordance with the corporation's environmental policy and planning framework?</b></p> <p><b>If yes, provide details of environmental policy and planning framework</b>  <b>Celestino</b> is a relatively new company and is currently in the process of developing their environmental policy and planning framework.</p>	<b>X</b>	
<p><b>7.4 Has the party taking the action previously referred an action under the EPBC Act, or been responsible for undertaking an action referred under the EPBC Act?</b></p> <p><b>Provide name of proposal and EPBC reference number (if known)</b>            2014/7119: Residential development/Box Hill North. Currently undergoing controlled action assessment by preliminary documentation.</p>	<b>X</b>	

## 8 Information sources and attachments

(For the information provided above)

### 8.1 References

- **Australian Koala Foundation**, *The Spot Assessment Technique: determining the importance of Habitat Utilised by Koalas (Phascolarctos cinereus)*, available online <https://www.savethekoala.com/sites/default/files/docs/conserve/The%20Spot%20Assessment%20Technique.pdf>
- **Australian Koala Foundation** 2012, *National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat*.
- **Australian Soil Resource Information System**, <http://www.asris.csiro.au/>
- **McAlpine, Callaghan, Lunney, Bowen, Rhodes, Mitchell & Possingham** 2006, *Conserving Southeast Queensland Koalas: How much habitat is enough? In: Biodiversity Conference Proceedings (eds G. Siepen and D. Jones), pp 11-17, University of Queensland, Gatton*.
- **Phillips & Callaghan** 2011, *The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus. Australian Zoologist 35(3): 774-780*.
- **Urban Land Development Authority** 2011, *Greater Flagstone Urban Development Area Development Scheme*, available online <http://www.dsdip.qld.gov.au/resources/plan/pda/greater-flagstone-development-scheme.pdf>

### 8.2 Reliability and date of information

Refer to response at 8.1

### 8.3 Attachments

		✓ attached	Title of attachment(s)
<b>You must attach</b>	figures, maps or aerial photographs showing the project locality (section 1)	✓	<ul style="list-style-type: none"> <li>- Project locality – Figures 1 &amp; 2</li> <li>- GIS file</li> <li>- Plan 1 – Proposed Layout</li> <li>- Plan 2 – Fragmentation map</li> </ul>
	GIS file delineating the boundary of the referral area (section 1)		
	figures, maps or aerial photographs showing the location of the project in respect to any matters of national environmental significance or important features of the environments (section 3)	✓	<ul style="list-style-type: none"> <li>- Project locality - Figures 1 &amp; 2</li> <li>- Plan 2– Fragmentation map</li> </ul>
<b>If relevant, attach</b>	copies of any state or local government approvals and consent conditions (section 2.5)	N/A	
	copies of any completed assessments to meet state or local government approvals and outcomes of public consultations, if available (section 2.6)	N/A	
	copies of any flora and fauna investigations and surveys (section 3)	✓	<ul style="list-style-type: none"> <li>- Attachment 1 – Protected Matters Search Results</li> <li>- Attachment 2 – Ecological Assessment Report</li> <li>- Plan 3 – Field Survey Effort</li> </ul>
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 5)	✓	<ul style="list-style-type: none"> <li>- Attachment 2 – Ecological Assessment Report</li> <li>- Plan 2– Fragmentation map</li> <li>- Plan 3 – Field Survey Effort</li> <li>- Plan 4 – Potential Koala Habitat</li> </ul>
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)	N/A	

## 9 Contacts, signatures and declarations

### Project title: Teviot Brook / Riverbend Residential Development

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#### 9.1 Person proposing to take action

1. Name and Title: **Lloyd Gomez** -- Development Manager
2. Organisation: **Celestino Pty Limited**
3. EPBC Referral Number: **N/A**
- 4: ACN / ABN: **74 165 629 783**
5. Postal address: **PO Box 438 Pendle Hill NSW 2145**
6. Telephone: **02 9842 1219**
7. Email: **lloyd.gomez@celestino.net.au**
8. Name of designated proponent (if not the same person at item 1 above): **As above**
9. ACN/ABN of designated proponent (if not the same person named at item 1 above): **As above**
- I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am: **N/A**
- If you are small business entity you must provide the Date/Income Year that you became a small business entity: **N/A**
- I would like to apply for a waiver of full or partial fees under Schedule 1, 5.21A of the EPBC Regulations. Under sub regulation 5.21A(5), you must include information about the applicant (if not you) the grounds on which the waiver is sought and the reasons why it should be made: **N/A**

I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.  
I understand that giving false or misleading information is a serious offence.  
I agree to be the proponent for this action.  
Declaration I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature



Date 10 JUNE 2016

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**9.2 Person preparing the referral information (if different from 9.1)**

Name **Sam Maynard**

Title **Senior Environmental Scientist**

Organisation **Saunders Havill Group Pty Ltd**

ACN / ABN (if applicable) **24 144 972 9434**

Postal address **9 Thompson Street, Bowen Hills, QLD 4006**

Telephone **(07) 3251 9434**

Email **sammaynard@saundershavill.com**

Declaration I declare that to the best of my knowledge the information I have given on, or attached to this form is complete, current and correct.  
I understand that giving false or misleading information is a serious offence.

Signature



Date 10 June 2016