Greater Flagstone Project

EPBC Act Referral Submission

Mirvac
7598
20 October 2016

surveying town planning urban design environmental management landscape architecture

Referral of proposed action

Proposed action title:	Mirvac Greater Flagstone Project - Master Planned Development

1 Summary of proposed action

1.1 **Short description**

Use 2 or 3 sentences to uniquely identify the proposed action and its location.

The proposed action involves the development of **Mirvac Queensland Pty Limited's (Mirvac's)** Greater Flagstone Project; a master planned residential community located within Logan's western growth corridor and the *Greater Flagstone Priority Development Area*. The site covers approximately 482 hectares, approximately 410 hectares of which are the subject of this referral. Main uses include detached and attached dwellings, low and medium density residential, a neighbourhood centre, a school and open space and conservation areas. The development will be generally in accordance with the proposed Context Plan and relevant regulatory planning controls.

1.2 **Latitude and longitude**

Latitude and longitude details are used to accurately map the boundary of the proposed action. If these coordinates are inaccurate or insufficient it may delay the processing of your referral.

Site ID	Longitude	Latitude
1	153°0'39.05"E	27°44'0.003"S
2	153°0'26.762"E	27°45'6.662"S
3	152°59'37.585"E	27°44'59.388"S
4	152°59'23.03"E	27°44'43.909"S
5	152°59'28.308"E	27°44'35.293"S
6	152°59'30.454"E	27°44'34.365"S
7	152°59'35.846"E	27°44'34.726"S
8	152°59'40.138"E	27°44'31.373"S
9	152°59'39.906"E	27°44'29.618"S
10	152°59'33.759"E	27°44'27.709"S
11	152°59'29.701"E	27°44'21.518"S
12	152°59'30.223"E	27°44'20.022"S
13	152°59'32.774"E	27°44'19.919"S
14	152°59'34.919"E	27°44'21.209"S
15	152°59'38.399"E	27°44'20.125"S
16	152°59'38.515"E	27°44'18.165"S
17	152°59'23.787"E	27°44'14.759"S
18	152°59'20.424"E	27°44'12.488"S
19	152°59'17.989"E	27°44'9.444"S
20	152°59'20.309"E	27°44'3.872"S
21	152°59'17.873"E	27°44'3.047"S
22	152°59'15.612"E	27°44'0.57"S
23	152°59'13.119"E	27°44'0.931"S
24	152°59'5.988"E	27°43'57.577"S
25	152°59'5.002"E	27°43'53.655"S
26	152°59'10.395"E	27°43'52.676"S
27	152°59'11.671"E	27°43'45.728"S
28	152°59'13.488"E	27°43'46.003"S
29	152°59'13.604"E	27°43'45.315"S
30	152°59'23.925"E	27°43'46.898"S
31	152°59'24.311"E	27°43'44.388"S
32	152°59'57.708"E	27°43'49.411"S
33	152°59'57.244"E	27°43'51.612"S
34	153°0'7.565"E	27°43'53.228"S
35	153°0'7.952"E	27°43'54.604"S
36	153°0'15.683"E	27°43'55.739"S
37	153°0'15.567"E	27°43'56.53"S

1.3 **Locality and property description**

Provide a brief physical description of the property on which the proposed action will take place and the project location (eg. proximity to major towns, or for off-shore projects, shortest distance to mainland).

Contextually, the referral site is located within South East Queensland approximately 30km south of Brisbane and 10km west of Logan Village, within the suburb of Greenbank. The site makes up 482 hectares of the 7,188 hectare *Greater Flagstone Priority Development Area* (PDA) as identified by the Queensland **Department of Infrastructure, Local Government and Planning**. The western Logan area has experienced notable expansion over recent years with the development of Greater Flagstone, Undullah, Teviot Downs and North McLean.

The site is bound by Greenbank Road (high order Collector Road) to the south and Teviot Road (Sub-Arterial Road) to the west, both of which ultimately connect to Mount Lindesay Highway, approximately 1.7km to the east. The site remains one of the last large rural properties in the immediate landscape which is predominately comprised of rural residential development. The site adjoins Wearing Park, a Council Reserve, to the immediate east and is located approximately 1.5km southeast of Greenbank Military Camp. The location of the future Greenbank Railway Station is proposed in close proximity to the site, on the existing Brisbane – Sydney Railway west of the subject property. Community services within the immediate vicinity of the site include Greenbank Shopping Centre (which includes a Woolworths, petrol station, specialty shops and services) and Greenbank Community Centre which are located on the western side of Teviot Road. An infrastructure easement traverses the site parallel to the northern boundary.

The site currently contains an existing residence and is used for cattle grazing. Approximately 72 hectares of the western extent has been cleared while the remainder of the site is dominated by disturbed woodland and traversed by a number of access tracks. Refer to **Figure 1** for site context and **Figure 2** for site aerial.

1.4	**Size of the development footprint or work area (hectares)**	482 ha (whole of site) ▪ 410 ha (referral assessment area) ▪ 72 ha (cleared land not included in referral)
1.5	**Street address of the site**	138-168 Teviot Road, 456-522 Greenbank Road & 96-102 Brightwell Street, Greenbank QLD 4124

1.6 **Lot description**

Describe the lot numbers and title description, if known.

Lot 205 on RP845844

Lot 434 on RP845844

Lot 9 on S312355

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

If the project is subject to local government planning approval, provide the name of the relevant council contact officer.

The site is located within **Logan City Council** but lies within the *Greater Flagstone Priority Development Area* and as such is governed by **Economic Development Queensland** (EDQ). **EDQ** has a strategic planning function within the Queensland **Department of Infrastructure, Local Government and Planning,** and is a key regulator of development within *Priority Development Areas*. As such, **EDQ** have jurisdiction for the implementation and enforcement of development applications in relation to the referral site.

EDQ Contact:

Tom Barker

Planner – Economic Development Queensland

Department of Infrastructure, Local Government and Planning

Level 5. 63 George Street, Brisbane QLD 4000

e. tom.barker@dilgp.qld.gov.au

1.8	**Time frame** Specify the time frame in which the action will be taken including the estimated start date of construction/operation.		**Mirvac** is in the process of obtaining all necessary State (and Local where relevant) Government approvals. Construction within the land subject of this referral is expected to commence on resolution of the planning approvals, and upon resolution of this referral (and receipt of State/Local planning approvals) and continue in accordance with development demand.
1.9	**Alternatives to proposed action** Were any feasible alternatives to taking the proposed action (including not taking the action) considered but are not proposed?	**X**	**No** There are no feasible alternatives to the proposed action. The site is located within the *Greater Flagstone Priority Development Area* which was declared by the State Government to cater for increased population growth in the greater Brisbane area. The proposed development is consistent with the *Greater Flagstone Urban Development Area Development Scheme* prepared by the State planning authority, **Economic Development Queensland.** Any alternatives would extend beyond the ownership boundaries of the proponent and would be in conflict with strategic planning intent. The proposed action is required to achieve the State mandated outcomes of the Priority Development Area.
			Yes, you must also complete section 2.2
1.10	**Alternative time frames etc.** Does the proposed action include alternative time frames, locations or activities?	**X**	**No** No alternative timeframes are proposed.
			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	**Commonwealth, State or Territory assessment** Is the action subject to a state or territory environmental impact assessment?	**X**	**No** The project is not subject to a State environmental impact assessment.
			Yes, you must also complete Section 2.5
1.12	**Component of larger action** Is the proposed action a component of a larger action?	**X**	**No** The project is not being developed as part of a component of a larger action. While the action occurs within the *Greater Flagstone Priority Development Area*, the proponent has no control or influence over surrounding parcels of land within the balance of the PDA area. This action is confined to the parcels under the control of **Mirvac**.
			Yes, you must also complete Section 2.7
1.13	**Related actions/proposals** Is the proposed action related to other actions or proposals in the region (if known)?	**X**	**No** The action is not related to other proposals in the area. Development approvals exist surrounding the development, however they are the subject of different uses, separate approvals and different land ownership.
			Yes, provide details:

1.14	**Australian Government funding** Has the person proposing to take the action received any Australian Government grant funding to undertake this project?	**X**	**No** The proponent has not received Commonwealth Government funding for the project.
			Yes, provide details:
1.15	**Great Barrier Reef Marine Park** Is the proposed action inside the Great Barrier Reef Marine Park?	**X**	**No** The proposed action is not located inside or adjoining to the Great Barrier Reef Marine Park.
			Yes, you must also complete Section 3.1 (h), 3.2 (e)

2 Detailed description of proposed action

NOTE: It is important that the description is complete and includes all components and activities associated with the action. If certain related components are not intended to be included within the scope of the referral, this should be clearly explained in section 2.7.

2.1 Description of proposed action

This should be a detailed description outlining all activities and aspects of the proposed action and should reference figures and/or attachments, as appropriate.

The proposed development is a residential master planned community supporting medium and low density residential uses, a school, a neighbourhood centre and integrated open space and conservation areas, consistent with the planning controls under the *Greater Flagstone Urban Development Area Development Scheme*.

In 2009, Greater Flagstone was identified under the *South East Queensland Regional Plan 2009 -2031* (SEQRP) by the State Government as a key urban development growth area because of its potential to absorb a vast proportion of the regional area's population over the two-decade timeframe. Further to the intent of the SEQRP, Greater Flagstone was declared a Priority Development Area (PDA) by the State Government in 2010. The *Greater Flagstone Urban Development Area Development Scheme* (PDA Development Scheme) provides for a significant population influx to the region with projections of 120,000 residents accommodated in more than 50,000 dwellings.

The proposed master planned residential development (refer **Plan 1)** is generally consistent with the PDA Development Scheme and seeks to deliver numerous land uses including:

- Approx. 3, 300 residential lots at a density of approx. 15dw/ha (approx. 220ha)
- Approx. 40 'southern interface' residential lots at a density of approx. 2.5dw/ha (approx. 17ha)
- Approx. 13 'northern interface' residential lots at a density of approx. 0.5dw/ha (approx. 25ha)
- Approx. 70 'eco' residential lots at a density of approx. 1dw/ha (approx. 75ha)
- A neighbourhood centre node encompassing health, retail and commercial uses (approx. 5ha)
- A school (approx. 7ha)
- Conservation (approx. 89ha)
- Regional sport and recreational parks (approx. 25ha combined)
- Neighbourhood and local parks (approx. 13ha)
- Stormwater management (quality treatment and detention)
- Trunk and non-trunk roads
- Utility Services (e.g. water, sewer, electricity, communications, etc.)
- Provision for a temporary or permanent wastewater treatment plant (if required)

The alignment of major roads and conservation areas is generally consistent with the PDA Development Scheme. Interface and Residential Eco Lots have been strategically designed to adjoin existing rural residential to allow for the transition of development product required within the PDA (refer **Plan 2**). New allotments will be serviced by local roads and trunk roads with the majority of new traffic being directed to the existing road network via Greenbank Road and Teviot Road

The vision for the project is to provide a vibrant mixed use development for the growing Greater Flagstone community and incorporates educational, commercial and recreational centres.

The site is anticipated to be developed in stages over a 15 – 20 year timeframe.

Construction within the land subject of this referral is expected to commence upon resolution of this referral (and receipt of planning approvals) and continue in accordance with development demand.

It is noted that through pre-referral discussions with the Commonwealth **Department of the Environment and Energy**(DEE), it was proposed and acknowledged that degraded and active farming portions of the subject land holding would be excluded from the referral to allow ongoing works while an EPBC determination is being assessed (refer **Figure 2**). This 72 ha area is devoid of vegetation and reflects regularly maintained grass paddocks disturbed by pastoral uses, an existing residence, ancillary infrastructure and artificially created farm dams. Detailed site assessment confirmed this area and immediate proximity did not contain any MNES nor would works within this area result in a significant impact on MNES.

The key statistics for the proposal are:

Allotment Area on which Referral occurs	=	482 hectares
Referral Area for Assessment	=	410 hectares
Residential/ School/ Retail	=	280 hectares
Open Space (Sport & Recreation)	=	38 hectares
Eco Lots	=	75 hectares
Conservation	=	89 hectares

Potential impacts on MNES for this action are summarised as:

- Clearing of approx. 270.6 hectares of remnant and regrowth vegetation retaining a number of known Koala food trees and foraging habitat for Grey-headed Flying-fox.
- New roads and trunk infrastructure through an isolated bushland fragment.
- Increase in domestic animals (although controls will be implemented - refer to **Section 5**).
- Increase in hardstand and stormwater run-off in close proximity to existing site drainage lines.

2.2 Feasible alternatives to taking the proposed action

This should be a detailed description outlining any feasible alternatives to taking the proposed action (including not taking the action) that were considered but are not proposed (note, this is distinct from any proposed alternatives relating to location, time frames, or activities – see section 2.3).

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

If you have identified that the proposed action includes alternative time frames, locations or activities (in section 1.10) you must complete this section. Describe any alternatives related to the physical location of the action, time frames within which the action is to be taken and alternative methods or activities for undertaking the action. For each alternative location, time frame or activity identified, you must also complete (where relevant) the details in sections 1.2-1.9, 2.4-2.7, 3.3 and 4. Please note, if the action that you propose to take is determined to be a controlled action, any alternative locations, time frames or activities that are identified here may be subject to environmental assessment and a decision on whether to approve the alternative.

There are no alternative locations, timeframes or activities proposed. Refer to **Response 1.10.**

2.4 Context, including and relevant planning framework and state/local government requirements

Explain the context in which the action is proposed, including any relevant planning framework at the state and/or local government level (e.g. within scope of a management plan, planning initiative or policy framework). Describe any Commonwealth or state legislation or policies under which approvals are required or will be considered against.

The site is located within the south-western growth corridor of South East Queensland and within the *Greater Flagstone Priority Development Area* (refer **Figure 1**). The Greater Flagstone PDA was declared by the former **Department of State Development, Infrastructure and Planning** (now **DILGP**) on 8 October 2010 and covers a total area of 7,188ha west of Jimboomba in South East Queensland. The Greater Flagstone PDA is intended to provide 50,000 dwellings for 120,000 people in one of Queensland's fastest growing regions.

The *Greater Flagstone Urban Development Area Development Scheme* (PDA Development Scheme) is the primary planning instrument for development of the site. Future applications will be assessed against the provisions contained within this scheme. **Economic Development Queensland** is the applicable authority for all subsequent development applications in the PDA.

The site is zoned Urban Living (refer *Map 8 – Zones* in the PDA Development Scheme) and is subject to a prescribed minimum density of 15 dwellings/ha (except where prevented by site constraints). The Land Use Plans within the PDA Development Scheme require the provision for a Regional Sports Park, Regional Recreation Park, Primary School and a Neighbourhood/Community Health Centre.

The preliminary Structure Plan (refer **Plan 1**) has been prepared in accordance with planning scheme intent and on ground constraints, including environmental considerations, to provide detailed planning provisions for the site. A whole of site Context Plan will accompany planning applications and will incorporate a number of Overarching Site Strategies (OSS) including an OSS for Natural Environment. The Context Plan is in the process of being prepared and is anticipated to be conditioned with the first approval on site to become the principal planning document by which planning and environmental outcomes are achieved.

Importantly the PDA designation and associated guidelines have established a level of environmental regulation by the Queensland Government, particularly for the provisions of Environmental Obligations and Commitments in relation to species impacts and habitat removal (refer **Section 4 and 5** of this referral).

2.5 Environmental impact assessments under Commonwealth, state or territory legislation

If you have identified that the proposed action will be or has been subject to a state or territory environmental impact statement (in section 1.11) you must complete this section. Describe any environmental assessment of the relevant impacts of the project that has been, is being, or will be carried out under state or territory legislation. Specify the type and nature of the assessment, the relevant legislation and the current status of any assessments or approvals. Where possible, provide contact details for the state/territory assessment contact officer.

Describe or summarise any public consultation undertaken, or to be undertaken, during the assessment. Attach copies of relevant assessment documentation and outcomes of public consultations (if available).

The project is not subject to an environmental impact assessment required under Commonwealth or State legislation. Refer to **Response 1.11.**

2.6 Public consultation (including with Indigenous stakeholders)

Your referral must include a description of any public consultation that has been, or is being, undertaken. Where Indigenous stakeholders are likely to be affected by your proposed action, your referral should describe any consultations undertaken with Indigenous stakeholders. Identify the relevant stakeholders and the status of consultations at the time of the referral. Where appropriate include copies of documents recording the outcomes of any consultations.

The development proposal is generally consistent with the *Greater Flagstone Urban Development Area Development Scheme*.

During the preparation of the *Greater Flagstone Urban Development Area Development Scheme*, **Economic Development Queensland** (EDQ) consulted with **Logan City Council** (LCC), the State Government and the community. The development scheme was publically notified from the 1st of April to the 10th of May 2011, in accordance with the requirements of the *Urban Land Development Authority Act 2007* (Qld). In addition, **EDQ** hosted a number of community information sessions to provide opportunities for the public to view details of the proposed development scheme and speak with **EDQ** staff. Submissions were received during the public notification period in regards to the proposed development scheme, which were taken into consideration before the scheme was submitted to the minister for approval.

The Greater Flagstone Submissions Report includes a summary of key issues raised in the submissions received during the public notification of the development scheme. Feedback was provided to the 125 submitters during consultation,

with these comments incorporated into the final amendment of the development scheme. **EDQ** operate under an established policy for community consultation titled 'Community Engagement Framework – Development Scheme Preparation'. The core principles of this framework are:

- Integrity – **EDQ** undertake genuine community engagement to achieve the best planning outcomes possible
- Tailored – There is no one-size-fits-all community engagement plan. **EDQ** development programs relevant to individual communities
- Timely – **EDQ** engages when it counts, to directly feed into planning milestones and development
- Responsive – **EDQ** will be flexible and responsive to community feedback
- Two-way Community – **EDQ** will tell the community how their input was used
- Clarity – **EDQ** will be clear about what can be influenced
- Inclusion – **EDQ** plan for all members of the community

The *Greater Flagstone Urban Development Area Development Scheme* outlines notification requirements for **EDQ** development applications and provides an opportunity for people to make submissions on the same. In deciding a PDA development application, **EDQ** must consider any submissions made to it about the application during the submission period. The proposal is in accordance with the PDA Development Scheme which was informed by community consultation.

2.7 A staged development or component of a larger project

If you have identified that the proposed action is a component of a larger action (in section 1.12) you must complete this section. Provide information about the larger action and details of any interdependency between the stages/components and the larger action. You may also provide justification as to why you believe it is reasonable for the referred action to be considered separately from the larger proposal (eg. the referred action is 'stand-alone' and viable in its own right, there are separate responsibilities for component actions or approvals have been split in a similar way at the state or local government levels).

The proposed action is not part of a staged development or a component of a larger project. Refer to **Responses 1.12 and 1.13**.

2.8 Related actions

If you have identified that the proposed action has related actions (in section 1.13), please complete this section. Please provide information about the related actions including, as appropriate:

- the nature, scope and location of the related action;
- the nature and scope of the assessment under the relevant legislation;
- a statement confirming how the action relates to the Proposed Action;
- the key documents produced as part of the assessment, by whom and when (using active statements), and the extent to which the assessment of the action is relevant to the assessment of the impacts of the Proposed Action on the matters protected by the Controlling Provisions of the EPBC Act and the related findings of this Report. Please cross reference to the analysis of the impacts of the Proposed Action below;
- public consultation during the assessment including the extent (i.e. duration and means) and results; and
- if available, the conclusion of the assessment and final decision following assessment, i.e. approval, approval subject to conditions or refusal.

The proposed action is not related to another action. Refer to **Responses 1.12 and 1.13**.

3 Description of environment & likely impacts

3.1 Matters of national environmental significance

Describe the affected area and the likely impacts of the proposal, emphasising the relevant matters protected by the EPBC Act. Refer to relevant maps as appropriate. The interactive map tool can help determine whether matters of national environmental significance or other matters protected by the EPBC Act are likely to occur in your area of interest.

Your assessment of likely impacts should refer to the following resources (available from the Department's web site):

- specific values of individual World Heritage properties and National Heritage places and the ecological character of Ramsar wetlands;
- profiles of relevant species/communities (where available), that will assist in the identification of whether there is likely to be a significant impact on them if the proposal proceeds;
- *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*; and
- associated sectoral and species policy statements available on the web site, as relevant.

Your assessment of likely impacts should consider whether a bioregional plan is relevant to your proposal. The Minister has prepared four marine bioregional plans (MBP) in accordance with section 176. It is likely that the MBP's will be more commonly relevant where listed threatened species, listed migratory species or a Commonwealth marine area is considered.

Note that even if your proposal will not be taken in a World Heritage area, Ramsar wetland, Commonwealth marine area, the Great Barrier Reef Marine Park or on Commonwealth land, it could still impact upon these areas (for example, through downstream impacts). Consideration of likely impacts should include both direct and indirect impacts.

3.1 (a) World Heritage Properties

Description

Not applicable. The site is not located within close proximity of a World Heritage Property.

Nature and extent of likely impact

Address any impacts on the World Heritage values of any World Heritage property.

No impact.

3.1 (b) National Heritage Places

Description

Not applicable. The site is not located with close proximity of a National Heritage Place.

Nature and extent of likely impact

Address any impacts on the National Heritage values of any National Heritage place.

No impact.

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

Description

The site is within 30 km of Moreton Bay, which is a declared Ramsar wetland.

Nature and extent of likely impact

Address any impacts on the ecological character of any Ramsar wetlands.

Moreton Bay, a declared Ramsar wetland is located approximately 30km east of the site. Tributaries of Norris Creek traverse the site which continues east into Logan River and ultimately Moreton Bay.

The proposed action is **highly unlikely** to have a significant impact on Moreton Bay given that:

- Erosion and Sediment Control Plans and Stormwater Management Plans will be developed in accordance with State Government (and Local Government where relevant) water quality/quantity objectives, controls and management requirements.
- The relevant river system flows through a heavily degraded and urbanised catchment which includes industrial suburbs of Browns Plains and Beenleigh. Run off from the site would firstly flow through this highly urbanised system before reaching Moreton Bay.
- The nature of impacts on water quality associated with the development is expected to be negligible given the existing matrix of residential development within the Logan River catchment.

3.1 (d) Listed threatened species and ecological communities

Description

MNES Desktop Assessment

A Protected Matters Search Tool using a 2 kilometre radius around the site identified the following matters protected under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) as having potential to occur on site:

- Three (3) Threatened Ecological Communities (TECs):
  - *Lowland Rainforest of Subtropical Australia* (Critically endangered) – community may occur
  - *Swamp Tea-tree (Melaleuca irbyana) Forest of South-east Queensland* (Critically endangered) – community may occur
  - *White Box-Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland* (Critically Endangered) – community may occur
- Seven (7) Listed Threated Flora Species
- Eighteen (18) Listed Threated Fauna Species

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

MNES Assessments

A number of desktop and field assessments have been undertaken across the application site between February 2015 and May 2016 to assess ecological values including the potential presence and impacts to MNES. These assessments and methodologies are detailed in the Greenbank Technical Ecological Assessment Memo (refer **Attachment B**) and include:

- Review of Commonwealth, State and Local Government environmental overlays and databases including:
  - Australian Soils Resources Information System Mapping
  - Atlas of Living Australian Searches
  - Australian Koala Foundation Map
  - Koala Tracker Mapping
  - Australian Government PMST Mapping

- Queensland Government Wildlife Online Database for the study area and surrounds
- Queensland Government Environmental Overlay Mapping including Regulated Vegetation Management and Essential Habitat, South East Queensland Koala Habitat Values, Protected Plants, Wetland Protection Areas, Fish Habitat Areas, Coastal Protection and Matters of State Significance.
- Development Scheme Documents and Maps

- General Searches and Species Identification
- Quadrat and Sampling Units for vegetation communities
- Ground-truthing vegetation to inform a certified Property Map of Assessable Vegetation
- Specific surveys for Threatened plants in accordance with EPBC Act Guidelines
- Observational surveys for migratory birds and diurnal and crepuscular systematic surveys for bird activity
- Waterway assessments and ground-truthing of mapping
- Opportunistic fauna species survey using generic methods in accordance with the Queensland Government's **Department of Science Technology, Innovation and the Arts** Terrestrial Vertebrate Fauna Specific Guidelines of Queensland
- Nocturnal surveys including spotlighting and ultrasonic bat detection surveys.
- Species specific surveys for Grey Headed Flying Fox, Swift Parrot and Collared Delma
- Spot Assessment Technique Habitat Assessments for Koala
- Identification of habitat values for potential terrestrial fauna species present
- Habitat Tree Plot within the Eco-Lot Residential Precinct
- Deployment of infrared camera traps

The results of these assessments have been used to inform the Likelihood of Occurrence Schedule (refer **Table 2**) and the site comments in this referral.

Table 1: PMST Likelihood of Occurrence Schedule

Listed Threatened Ecological Communities					
Name	**Status**	**Type of Presence**	**Description of Community**	**Likelihood of Occurrence**	**Site**
Lowland rainforest of Subtropical Australia	Critically Endangered	This Threatened Ecological Community is listed as a community that may occur within the area.	Typically there is a relatively low abundance of species from the genera *Eucalyptus, Melaleuca* and *Casuarina.* Buttresses are common as is an abundance and diversity of vines. This community is usually associated with Regional Ecosystems 12.3.1, 12.5.13, 12.8.3, 12.8.4, 12.8.13, 12.11.1, 12.11.10, 12.12.1, and 12.12.16.	No species representing these characteristics or vegetation communities were observed within the assessment area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community. **TEC is unlikely to occur.**	Not recorded
Swamp Tea-tree (Melalecua irbyana) Forest of South-East Queensland	Critically Endangered	This Threatened Ecological Community is listed as a community that may occur within the area.	This ecological community is recognised under the Queensland *Vegetation Management Act 1999* as two endangered Regional Ecosystems 12.3.3c and 12.9-10.11 *Melaleuca irbyana* Low Open Forest	A number of scatted *Melaleuca irbyana* specimens were recorded throughout remnant vegetation within the eastern extent of the site. These scattered stands did not constitute the characteristics of the threatened ecological community. **TEC is unlikely to occur.**	Not recorded
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	This Threatened Ecological Community is listed as a community that may occur within the area.	In Queensland the ecological community is a primary component of the following Regional Ecosystems: 11.8.2a, 11.8.8, 11.9.9a, 13.3.1, 13.11.8, 13.12.8 and 13.12.9. It can also be a smaller component of the following regional ecosystems: 11.3.23, 12.8.16 (only at the far western edge of the bioregion), 13.3.4, 13.11.3 and 13.11.4. These regional ecosystems range in conservation status from 'not of concern at present' to 'endangered'.	No species representing these characteristics or vegetation communities were observed within the assessment area. The site is not mapped as containing any regional ecosystem communities associated with this ecological community. **TEC is unlikely to occur.**	Not recorded

Birds						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Anthochaera phrygia	Regent Honeyeater	Endangered	82338	Regent Honeyeaters mostly occur in dry Box-Ironbark Eucalypt woodland and dry sclerophyll forest associations in areas of low to moderate relief, wherein they prefer moister, more fertile sites. These areas are generally associated with creek flats and river valleys and foothills. These woodlands have significantly large numbers of mature trees, high canopy cover and abundance of mistletoes. They are a generalist forager, which mainly feed on nectar from a wide range of eucalypts and mistletoes.	The Regent Honeyeater has been recorded at 15 sites across Queensland, primarily south of the Sunshine Coast and Chinchilla. These records have been on Bribie Island and in the Granite Belt. Regular records in the Gore-Karara area suggest a small breeding population may have been present in the mid-1990s. The Regent Honeyeater is also known as a visitor to the Sundown National Park. Given the disturbed nature of the site and the lack of specific recordings of the species in the	Not observed

					surrounding area, it is unlikely to occur on site. **The species is unlikely to occur.**	
Botaurus poiciloptilus	Australasian Bittern	Endangered	1001	The Australasian Bittern occurs in terrestrial wetlands and, rarely, estuarine habitats, mainly in the temperate southeast and southwest. It favours wetlands with tall dense vegetation, where it forages in still, shallow water up to 0.3 m deep, often at the edges of pools or waterways, or from platforms or mats of vegetation over deep water. It favours permanent and seasonal freshwater habitats, particularly those dominated by sedges, rushes and / or reeds or cutting grass growing over muddy or peaty substrate.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Dasyornis brachypterus	Eastern Bristlebird	Endangered	533	The Eastern Bristlebird inhabits low dense vegetation in a broad range of habitat types including sedgeland, heathland, swampland, shrubland, sclerophyll forest and woodland, and rainforest. It occurs near the coast, on tablelands and in ranges. The Eastern Bristlebird is found in habitats with a variety of species compositions, but is defined by a similar structure of low, dense, ground or understorey vegetation.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Erythrotriorchis radiatus	Red Goshawk	Vulnerable	942	A wide ranging and highly mobile species generally observed over eucalypt habitats. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds) and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest and rainforest margins. Habitat has to be open enough for fast attack and manoeuvring in flight, but provide cover for ambushing of prey.	While some aspects of its habitat occurs on site not all requirements to be considered critical habitat for the species were identified. The species was not recorded during field surveys. **Species is unlikely to occur.**	Not observed
Geophaps scripta scripta	Squatter Pigeon (southern)	Vulnerable	64440	This species inhabits open grasslands and woodlands typically with a native understorey although may occur in artificial pasture.	No confirmed local records. The species is now very rarely observed in southern Queensland. Not expected onsite and no direct impact from proposed actions. **Species is unlikely to occur.**	Not observed
Grantiella picta	Painted Honeyeater	Vulnerable	470	The species inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Lathamus discolour	Swift Parrot	Critically Endangered	744	Swift Parrots breed in Tasmania during spring to early summer. During autumn and winter the species migrates to the mainland where it follows a nomadic existence linked to the availability and timing of flowering of trees in various locations.	Site trees provide some aspects of required critical habitat for the species, particularly during flowering and fruiting events. No local records were identified and the	Not observed

					species were not recorded during site surveys. **Species has low potential to occur**.	
Peophila cincta cincta	Black-throated Finch (southern)	Endangered	64447	The Black-throated Finch (southern) occurs mainly in grassy, open woodlands and forests, typically dominated by Eucalyptus, Corymbia and Melaleuca, and occasionally in tussock grasslands or other habitats (for example freshwater wetlands), often along or near watercourses, or in the vicinity of water. It has been absent from Brisbane and its surrounds since the 1930s.	Due to a lack of records within the local area, it is unlikely that this species will occur. **Species is unlikely to occur.**	Not observed
Rostratula australis	Australian Painted Snipe	Endangered	77037	The Australian Painted Snipe is usually found in shallow inland wetlands, either freshwater or brackish, that are either permanently or temporarily filled. The species has a scattered distribution throughout many parts of Australia, with a single record from Tasmania.	While some aspects of its habitat occurs on site not all requirements to be considered critical habitat for the species were identified. The species was not recorded during field surveys. **Species is unlikely to occur.**	Not observed
Turnix melanogaster	Black-breasted Button-quail	Vulnerable	923	Typical habitat occurs in dry rainforest and vegetation immediately adjacent to rainforest. However the species has also been recorded in a variety of low coastal heathlands around Frazer Island and nearby mainland. Deep leaf litter in which the species can forage appears to be particularly favoured.	Little to no suitable habitat for this species occurs and it has not been recorded in the area. **Species is unlikely to occur.**	Not observed
Mammals						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable	183	The Large-eared Pied Bat roosts on sandstone cliffs and fertile woodland valley habitat within close proximity of each other. However in South-east Queensland habitat includes rainforest and moist eucalypt forest habitats at high elevations.	No confirmed local records of this uncommon species. Inhabits mesic vegetation and the species was not recorded in any of the site surveys Not expected to occur and no impact expected. **Species is unlikely to occur.**	Not observed
Dasyurus maculatus maculatus	Spot-tailed Quoll	Endangered	75184	The Spot-tailed Quoll has a preference for mature wet forest habitat. Unlogged forest or forest that has been less disturbed by timber harvesting is also preferable. This predominantly nocturnal species rests during the day in dens. Habitat requirements include suitable den sites such as hollow logs, tree hollows, rock outcrops or caves. Individuals require an abundance of food such as birds and small mammals, and large areas of relatively intact vegetation through which to forage.	While the site contains a large amount of disturbances and lack of suitable rocky outcrops, and no suitable habitat was observed throughout the assessment area, due to reported sightings for the species in the North McLean area, there is potential for the species to occur on site. **Species has potential to occur.**	Not observed

Petauroides volans	Greater Glider	Vulnerable	254	The Greater Glider is an arboreal nocturnal marsupial, largely restricted to eucalypt forests and woodlands. It is typically found in highest abundance in taller, montane, moist eucalypt forests with relatively old trees and abundant hollows	No individuals were observed throughout the assessment area or located within close proximity to the site. Suitable habitat was recorded in portions of the site however due to dominance or regrowth it is considered to have low potential to occur. **Species has low potential to occur.**	Not observed
Petrogale penicillata	Brush-tailed Rock-wallaby	Vulnerable	225	This species prefers rocky habitat, including loose boulder-piles, rocky outcrops, steep rocky slopes, cliffs, gorges and isolated rock stacks. Although rocky outcrops are crucial, vegetation structure and composition is also considered to be important. This species appears closely associated with dense arboreal cover, especially fig trees however dense rainforest, wet sclerophyll forest, vine thicket, dry sclerophyll forest and open forests are important.	No suitable habitat or evidence was observed throughout the assessment area. Species was not observed or recorded in historical or contemporary field surveys. **Species is unlikely to occur.**	Not observed
Phascolarctos cinereus	Koala	Vulnerable	85104	They are found in a range of habitats, from coastal islands and tall eucalypt forests to low woodlands inland. The species is known from the surrounding area and evidence has been recorded on-site.	The species is known to occur in broader Logan area. Recent survey confirmed the presence of koalas on site as well as evidence of scats across the referral area. **Species confirmed.**	Evidence of Koalas in the form of sighted individuals and recorded scats.
Pteropus poliocephalus	Grey-headed Flying Fox	Vulnerable	186	Species generally roosts in camps in trees adjacent to larger permanent watercourse. The Grey-headed flying fox requires foraging resources and roosting sites. It is a canopy-feeding frugivore and nectarivore, which utilises vegetation communities including rainforests, open forests, closed and open woodlands, Melaleuca swamps and Banksia woodlands. It also feeds on commercial fruit crops.	No roosting camps were observed throughout the assessment area or located within close proximity to the site. Suitable feeding and roosting habitat was recorded on site. This species is highly likely to occur when the Eucalypts are in flower. Individuals were observed. **Species has potential to occur.**	Observed
Other						
Cycas ophiolitica	-	Endangered	55797	*Cycas ophiolitica* grows on hills and slopes in sparse, grassy open forest at altitude ranges from 80–400 m above sea level. Although this species reaches its best development on red clay soils near Marlborough, it is more frequently found on shallow, stony, infertile soils, which are developed on sandstone and serpentinite, and is associated with species such as *Corymbia dallachiana, C. erythrophloia, C. xanthope* and *Eucalyptus fibrosa. Cycas ophiolitica* has also been found on mudstone in association with *Corymbia dallachiana, C. erythrophloia* and *Eucalyptus crebra,* and on alluvial loams with *Corymbia intermedia, Eucalyptus drepanophylla* and *E. tereticornis.*	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded

Plants						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Bosistoa transversa	Three-leaved Bosistoa	Vulnerable	16091	The Three-leaved Bosistoa is conserved within Mt Warning National Park, Numbinbah Nature Reserve, Limpinwood Nature Reserve and Whian State Forest. While population information is unavailable, it is thought to be common in its range. It generally grows in wet sclerophyll forest, dry sclerophyll forest and rainforest up to 3oo meters in altitude. It is commonly associated with *Argyrodendron trifoliolatum, Syzygium hodgkinsoniae, Endiandra pubens, Dendrocnide photinophylla, Acmena ingens, Diploglottis australis* and *Diospyros mabacea*.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Notelaea ipsviciensis	Cooneana Olive	Critically Endangered	81858	The Cooneana Olive survives as an understorey plant in degraded, eucalypt dominated dry sclerophyll vegetation communities. Soils in the area are of low fertility, depauperate and sandstone-based. This species prefers open woodland communities with open canopies. The known population is adjacent to subdivided, modified and developed land.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Phaius australis	Lesser Swamp Orchid	Endangered	5872	The Lesser Swamp-orchid is commonly associated with coastal wet heath/sedgeland wetlands, swampy grassland or swampy forest and often where Broad-leaved Paperbark or Swamp Mahogany are found. Typically, the Lesser Swamp-orchid is restricted to the swamp-forest margins, where it occurs in swamp sclerophyll forest (Broad-leaved Paperbark/Swamp Mahogany/Swamp Box (Lophostemon suaveolens), swampy rainforest (often with sclerophyll emergent), or fringing open forest. It is often associated with rainforest elements such as Bangalow Palm (Archontophoenix cunninghamiana) or Cabbage Tree Palm (Livistona australis).	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Phebalium distans	Mt Berryman Phebalium	Critically Endangered	81869	Mt Berryman Phebalium is found in semi-evergreen vine thicket on red volcanic soils, or in communities adjacent to this vegetation type. Geology of the area in which this species occurs is deeply weathered basalt with undulating to hilly terrain. Soils range from red-brown earths to brown clays (derived from siltstone and mudstones), and lithosols to shallow, gravelly krasnozems (very dark brown loam), derived from the Main Range Volcanics of the Tertiary period.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Plectranthus habrophyllus	-	Endangered	64589	*P. habrophyllus* is restricted to south east Queensland, near Ipswich and near Ormeau, south of Beenleigh (Queensland Herbarium 2008); has a distributional range of approximately 40 km and is known from only six locations in south-east Queensland	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded

Thesium australe	Austral Toadflax	Vulnerable	15202	Austral Toadflax is semi-parasitic on roots of a range of grass species notably Kangaroo Grass (*Themeda triandra*) (Scarlett et al. 1994). It occurs in subtropical, temperate and subalpine climates over a wide range of altitudes. It occurs on soils derived from sedimentary, igneous and metamorphic geology on a range of soils including black clay loams to yellow podzolics and peaty loams	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not recorded
Reptiles						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Delma torquata	Collared Delma	Vulnerable	1656	The Collard Delma inhabits eucalypt-dominated woodlands and open-forests in Land Zones 3 (Alluvium), 9 (undulating country or fine-grained sedimentary rocks), 10 (sandstone ranges). Common Regional Ecosystems (RE) include RE 11.3.2, RE 11.9.10, RE 11.10.1 and RE 11.10.4. These REs are located in Bioregion 11 (Brigalow Belt), located to the north and west of South East Queensland. The species is also known in the Toowoomba Ranges in habitats associated with exposed rocky outcrops on ridges or slopes in vegetation communities dominated by Narrow-Leaf Ironbark (*Eucalyptus crebra*). Other areas where the species has been recorded is the Mt Crosby and Moggill State Forest sites, as well as Anstead and Pinjarra Hills.	Important populations of the species are associated with important habitats found in the Brigalow Belt (Bioregion 11). Larger population records of the species west of Brisbane include Kenmore, Pinjarra Hills, Anstead, Mt Crosby, Lake Manchester and Karana Downs. As the sire contains Land Zone 9. There is potential for this species to occur. **Species has low potential to occur.**	Not observed
Furina dunmalli	Dunmall's Snake	Vulnerable	59254	Dunmall's Snake has been found in a broad range of habitats, including forests and woodlands on black alluvial cracking clay and clay loams dominated by Brigalow (*Acacia harpophylla*), other Wattles (*A. burowii*, *A. deanii*, *A. leioclyx*), native Cypress (*Callitris* spp.) or Bull-oak (*Allocasuarina luehmannii*). Various Blue Spotted Gum (*Corymbia citriodora*), Ironbark (*Eucalyptus crebra* and *E. melanophloia*), White Cypress Pine (*Callitris glaucophylla*) and Bulloak open forest and woodland associations on sandstone derived soils .	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Saiphos reticulatus	Three-toed Snake-tooth Skink	Vulnerable	88328	Found mostly in closed forest and possibly open layered Eucalyptus forest. Generally recorded in moist layered forest on loamy basaltic soils, but also found in closed forest overlying silica sand dunes at Cooloola. Within forests, this species is found in well-mulched, loose, friable rainforest soil in leaf litter, often immediately adjacent to fallen tree trunks. Much of the lowland closed forest within its range has been cleared for agriculture and grazing, pasture improvement, crop production, tropical fruit production, and native forest logging. Suitable habitat has generally been reduced to patches, especially in lowland areas.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed

MNES Threatened Species and TECs Assessment

A review of specific habitat niches and distribution of these listed flora and fauna species and TECs using the SPRAT database, Queensland's Wildlife Online Search Tool, previous reporting in the local area and Queensland's Regional Ecosystem and Essential Habitat mapping ruled out the potential for most of these listed matters to occur. This was primarily due to combined impacts from:

- Lack of suitable niche habitat across the site, such as rocky outcrops and coastal habitats.
- Influences from surrounding development, particularly expanding residential developments, roads and the railway line, as well as surrounding major developments in the local area.
- Evidence of exotic weeds throughout the site.
- Evidence of site usage by domestic dogs from surrounding residential areas.
- Evidence of unlawful land uses including motorbikes and 4wd.
- Consistent disturbances caused by pastoral practices and routine land management.
- Regular maintenance clearing for access tracks and understory fire management.

An assessment of the likelihood of occurrence was conducted for the threatened species in **Table1**. This assessment was based on database interrogations, presence or absence of suitable habitat, site features, results of the field surveys and professional judgement. Overall, desktop and field surveys identified the potential for five (5) threatened fauna species or occur on site due to the availability of potential habitat and records for the species in the local area:

- *Dasyrus maculatus maculatus* (Spot-tailed Quoll) – Endangered,
- *Delma torquate* (Collared Delma) - Vulnerable,
- *Lathamus discolour* (Swift Parrot) – Endangered,
- *Phascolarctos cinereus* (Koala) –Vulnerable, and
- *Pteropus poliocephalus* (Grey-headed Flying-fox) – Vulnerable.

It is noted that the site is mapped as containing Essential Habitat for *Phascolarctos cinereus* (Koala) (based on mapped Queensland's regional ecosystems) and *Dasyurus maculatus macultas* (Spotted-tailed Quoll) (based on a record in the area) under Queensland's Regulated Vegetation Management Mapping (refer **Section 3.3** for further detail).

Assessment of Occurrence and Field Survey Results

Extensive ecological assessment of the site has been undertaken by ecologists from **SHG** between February 2015 and May 2016 as part of ongoing ground-truth survey and ecological constraints mapping as part of the Structure Plan design (refer to **Attachment B** for the Greenbank Ecological Technical Assessment Memo. While there was no specific focus on MNES for these additional assessments (i.e. waterway assessment, PMAV, habitat tree plot etc.) consideration of ecological features to support MNES were noted.

A MNES assessment of occurrence survey was undertaken by two (2) Senior Ecologists from **SHG** over the application site for ten (10) survey days (i.e. 2 x 5 day/4 night) periods in July 2015 with conditions mostly fine and sunny. Field assessments across the site included survey for MNES flora as well as potential habitat for MNES fauna. The results of this assessment is contained within the Greenbank Ecological Technical Assessment Memo in **Attachment B** and included the following methods:

- Searches & Species Identification
- Quadrant and Sampling Units (24 units across the site)
- Observational Survey (specifically targeting MNES and migratory species)
- Opportunistic Searches (specifically targeting Collared Delma (*Delma torquata*))
- Spot Assessment Technique (SAT) and Koala habitat assessments
- Specific surveys for Swift Parrot (*Lathamus discolor*), Grey-headed Flying-fox (*Pteropus poliocephalus*) and *Dasyrus maculatus maculatus* (Spot-tailed Quoll)
- Durnal and crepuscular systematic surveys for bird activity

- Spotlighting and ultrasonic bat detection surveys
- Infrared Camera Traps (Cameras deployed continuously prior to, during, and post the official 14 days survey period (4 cameras x 28 days at 24 hours recording - TOTAL = 2,688 hours of camera surveys). N.B. Camera locations were moved mid-point to coincide with locations where evidence of koala use was recorded on-site.)

Overall, the site was found to be disturbed as a result of cattle grazing with approximately 72 hectares reflecting maintained grassed paddocks. The remainder of the site, while vegetated, was noted to contain a high proportion of regrowth and heavily infested with weeds. A number of access tracks / fire trails traverse the site and are regularly maintained as part of ongoing property management. Survey noted evidence of a number of unlawful disturbances such as motorbike and four wheel drive impacts, weed infestations, evidence of dogs and dumping of domestic rubbish across the site. With consideration of MNES species with the potential to occur on site, the results of desktop and field assessment have been summarised below.

Spot-tailed Quoll (*Dasyurus maculates maculatus*)
The South East Mainland sub-species of Spot-tailed Quolls is listed as Endangered under the EPBC Act and Vulnerable under Queensland's *Nature Conservation Act 1992* (NCA). It is also considered of 'high' priority under the **Queensland's Department of Environment and Heritage Protection** (EHP) Back-on-Track species prioritisation framework.

Ecology and Habitat
Spot-tailed Quolls are solitary animals, except during mating season, and are predominately nocturnal and partly aboreal. Spot-tailed Quolls occur in a wide variety of habitats including rainforests, wet and dry sclerophyll forests, coastal heath, scrub and sometimes Red Gum forests along inland rivers. They are found from sea-level to sub-alpine and shelter in rock caves, boulder piles and hollow logs or trees, with basking sites usually nearby. Males occupy overlapping and undefended home ranges whereas females appear to defend exclusive territories. Home range size is generally greater for males than females, averaging 783 hectares to 1,202 hectares over five (5) days for males in the Granite Belt of South East Queensland. The species feeds on a variety of prey including small and medium-sized mammals, birds, large arthropods, carrion and food scraps, however mammals constitute approximately 80% of its diet.

Studies from north-east New South Wales indicate that mating occurs from May to June with young born in July and August. During the mating season, males range widely in search of oestrus females. Quolls defecate at specific points within their home range called latrines. Peak latrine use only occurs during breeding season, suggesting they are used to communicate presence and reproductive status. Young leave the pouch after 10-12 weeks, and are weaned after 16-18 weeks. Females breed at one year of age but do not usually breed beyond their second year. Life expectancy in the wild is approximately three years although a very few individuals survive into their fourth year.

Distribution
The South East Mainland sub-species was formerly distributed throughout coastal and sub-coastal regions of eastern Australia from the Berserker Range in the Rockhampton area to the north in Chinchilla in west Queensland and extended south to south-east South Australia and Tasmania. However, the species has undergone a range contraction in Queensland and is now rare in most areas. Remaining populations are concentrated around the Blackall/Conondale Ranges, southern Darling Downs, Main Range, Lamington Plateau and McPherson/Border Ranges. However, it probably still occurs in very low numbers in the mountain country from Gympie south to the Queensland boarder.

Threats
The primary reason for the decline of Spot-tailed Quolls is habitat loss and fragmentation through clearing for primary production and urbanisation. Most clearing in Queensland occurred in the early and mid-1990's, but is still continuing. Other current threats include competition with foxes, dingoes/wild dogs and feral cats, predation by foxes and dogs, persecution at poultry yards and poisoning by Cane Toads (*Rhinella marina*). Death from vehicle strike is probably only a significant threat where heavily used roads bisect quoll habitat. Concerns have been raised in the past over the potential for 1080 poisoning (intended for wild dogs/foxes) of Spot-tailed Quolls, however a number of studies show this is not the case and that reduction of candid populations through 1080 baiting is much more likely to aid quoll populations.

Regional Population Status

It has been suggested that the South East Mainland sub-species is probably locally extinct in Brisbane, although historical records indicate it would have potential to occur if provided with appropriate habitat and safe movement opportunities from adjacent bushland areas.

In 2011, the **Wildlife Preservation Society of Queensland** (WPSQ) received support through the EnviroGrants program for **Logan City Council** (LCC) to undertake a three (3) year study – 'Looking out for Quolls in Logan 2011-2014'- to confirm the presence of Spot-tailed Quolls in the **LCC** region. Despite a number of community sighting records, no Quolls have been recorded during their study despite targeted camera surveys and trapping in the Greenbank Area. (Alina Zwar, WPSQ, pers. comm).

Notwithstanding the above, the results of a search of **EHP's** Wildlife Online Database indicate that there have been a total of fifteen (15) unconfirmed observations on the sub-species within 10km of the project site.

Field Survey Results

Due to unconfirmed community sightings of the species in the area, field assessment was undertaken by **SHG** in July 2015 across the site for Spot-tailed Quoll presence. No Quolls were sighted during the survey. Spot-tailed Quoll were not captured during targeted surveys using cage traps. Both infra-red camera to record cage trap shy fauna and selectively located individually baited cameras, left across the site over the two (2) week period in July 2015, did not detect Spot-tailed Quoll. Likewise, extensive targeted camera surveys throughout the broader Logan area have not detected Quolls

Survey identified that referral site supports some of the preferred habitat requirements for Spot-tailed Quoll, namely eucalypt woodland and forest providing foraging habitat with good availability of frogs, birds and medium-sized mammals that Spot-tailed Quoll prey on. The study area, however generally lacked the following important habitat features for Spot-tailed Quoll:

- Large hollow logs were sparse;
- Large, hollow bearing trees were limited; and
- Suitable denning habitat in the form of rock caves or boulder piles does not occur.

Other features that reduce the suitability of the study area for Spot-tailed Quoll include:

- Abundant evidence of dogs (domestic and/or wild) in the form of tracks across the area, which may prey on Spot-tailed Quoll;
- Proximity of the study area to unsuitable cleared areas, regrowth vegetation and urban development; and
- Isolation of the site from large areas of protected vegetation by surrounding major roads, rail and residential.

Quoll Detection Dog

Due to and a number of unconfirmed reports of Quoll in the locality, technical experts **OWAD Environmental** were commissioned by **Mirvac** to undertake a two (2) day survey in August 2016 to detect the presence of Spot-tailed Quoll with using Taz, a trained Spot-tailed Quoll scent detection dog. A 1,000m x 1,000m grid-based survey was completed over the entire referral area using timed searches. The tracks of the detection dog were recorded with a GPS unit fitted collar.

A total of 28 transects were conducted over the referral area and a total of 17km actively search by the professional detection dog. No evidence of Spot-tailed Quoll was recorded. Refer to Greenbank Ecological Technical Assessment Memo in **Attachment B** for further detail and a copy of the **OSWAD Environmental** report.

Table 2: Significant Impact Assessment – Endangered Spot-tailed Quoll

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on an endangered species if there is a real chance or possibility that it will:		
1. Lead to a long term decrease in the size of a population.	While the site does contain potential foraging habitat for the Spot-tailed Quoll, particularly along creek tributaries and within eucalypt forest / woodland no individuals were observed on site and no known breeding areas were seen on or near the site. While unconfirmed sightings have been reported by the community in the area, no Quolls were detected during the three year study period during the **WPQS** and **LCC** study. Importantly, no evidence of Quoll presence was recorded by contemporary, site specific surveys by technical experts **OWAD Environmental**. Due to heavy disturbance of the site and lack of rocky outcrops and hollow logs for denning, combined with lack of evidence recorded during field studies, the site is not considered to support a Quoll population and the proposed action is unlikely to lead to a long term decrease in the size of any local Spot-tailed Quoll population.	**No significant impact**
2. Reduce the area of occupancy of the species.	No dens or individuals were observed across the site. The project will not have a significant impact on any population of the species. While the proposed action will remove available foraging habitat, given the abundant availability of eucalypts in the surrounding landscape and the greater SEQ region, the development proposal is unlikely to have a significant impact on the area of occupancy of the species.	**No significant impact**
3. Fragment an existing population into two or more populations.	Given that targeted survey found no evidence of quolls using the site, and that the site does not contain suitable habitat for the species, the proposed action is unlikely to fragment a population into two or more populations.	**No significant impact**
4. Adversely affect habitat critical to the survival of a species.	While the proposed action results in the removal of potential foraging habitat, this habitat is highly disturbed and subject to edge effects from current land use and surrounding development. Further, this habitat is not considered to be unique or of special value. Further south-west, SEQ landscape provides more suitable habitat for the species (i.e. hills and rock outcrops) within the broader Flagstone –Logan area, which does not occur on site. The habitat on site is not considered to be critical to the survival of the Spot-tailed Quoll.	**No significant impact**
5. Disrupt the breeding cycle of a population.	The site surveys did not identify any evidence of dens of potential breeding sites for Spot-tailed Quoll. Mating and births normally occur over the winter months (June-August) and following a 21day gestation, litters are born between late July and mid-August. Young remain within their mother until 21 weeks. As no dens were observed on or near the site, the proposed action is unlikely to disrupt the breeding cycle of an important population.	**No significant impact**
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 for the Spot-tailed Quoll. Its removal is unlikely to have a significant impact on the availability of habitat in the landscape, given the quantity and availability of suitable habitat in the surrounding area, particularly south-west within the broader Flagstone –Logan area.	**No significant impact**
7. Result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat.	The proposed action is unlikely to result in the introduction of invasive species.	**No significant impact**
8. Introduce disease that may cause the species to decline.	The project is unlikely to introduce disease into the area.	**No significant impact**
9. Interfere substantially with the recovery of the species.	While no formal recovery plan is in place, the SPRAT database lists a number of research, survey and conservation methods including the protection of known	**No significant impact**

	populations and breeding sites. The site has not been identified as containing important habitat or breeding sites and the action is unlikely to interfere with the recovery of the species.	

The above assessment against the *EPBC Significant Impact Guidelines 1.1* indicates the proposed action is unlikely to have a significant impact on the Spot-tailed Quoll. This is primarily due to lack of evidence of Spot-tailed Quoll during site specific surveys by technical experts **OWAD Environmental** as well in broader regional camera and trapping surveys.

Collared Delma (*Delma torquata*)
The Collared Delma is listed as Vulnerable under the EPBC Act and Vulnerable under the NCA. Despite targeted searches, the species was not recorded during field surveys.

Distribution and Population
Collard Delma inhabits eucalypt-dominated woodlands and open-forests in land zones 3(Alluvium), 9 (undulating country or fine-grained sedimentary rocks) and 10 (sandstone ranges). Common Regional Ecosystems include RE 11.3.2, RE 11.9.10, RE 11.10.1 and RE 11.10.4. Important populations of the species are associated with important habitats found in the Brigalow Belt (Bioregion 11). Larger population records of the species west of Brisbane include Kenmore, Pinjarra Hills, Anstead, Mt Crosby, Lake Manchester and Karana Downs.

While the species has not been recorded on, or in close proximity to the site, the species has been recorded in the western regions of Brisbane. Typical mid-story for the Brisbane populations consists of Red Ash (*Alphitonia excelsa*), Wattles including Brisbane Wattle (*Acacia fimbriata*), Hickory Wattle (*A. concurrens*), Brush Box (*Lophostemon confertus*), Hovea (*Hovea longifolia*), and Lantana (*Lantana camara*) (Peck 2003). The ground cover is predominantly native grasses such as Kangaroo Grass (*Themeda triandra*), Barbed-wire Grass (*Cymbopogon refractus*), Wiregrass (*Aristida* sp) and Lomandra (*Lomandra* sp).

Threats
The Collared Delma has undergone decline in the past few decades. A number of factors that may contribute to this decline have been identified including habitat loss through clearing for agriculture, habitat degradation by overgrazing by stock, removal of rocks, course woody debris and ground litter, use of agricultural chemicals, predation by feral Cats (*Felis catus*) and Foxes (*Vulpes vulpes*) and weed invasion.

Field Survey Results
Stratified log, leaf litter and habitat searches during the ten (10) day survey period did not result in evidence of or potential habitat for *Delma torquata* (Collared Delma).

Given the absence of potential habitat, the proposed action is highly unlikely to have a significant impact on the Collared Delma.

Swift Parrot (*Lathamus discolor*)
Lathamus discolor (Swift Parrot) is listed as Endangered under the EPBC Act and Endangered under the NCA. Despite targeted searches, the species was not recorded during field surveys.

Distribution and Population
The 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 feeds mostly on nectar and mainly from eucalypts.

Threats

Key threats to the species include habitat loss through land clearance for agriculture, plantation development and urban and coastal subdivisions. Throughout the winter range of the Swift Parrot, increasing fragmentation of box-ironbark habitat has seen an increase in the abundance and range of the aggressive and invasive (but native) Noisy Miner (*Manorina melanocephala*). Noisy Miners could potentially be a threat to Swift Parrots as they are known to aggressively defend territories and exclude other nectarivorous birds from sources of nectar (Grey et al. 1998).

Field Survey Results

Records of this species have come from the Gold Coast, Noosa, Toowoomba, Warwick and Lockyer Valley. A search of **EHP's** Wildlife Online for species records does include *Lathamus discolour* as being observed within ten (10) kilometre radius of the site.

Targeted bird surveys as per EPBC Act guidelines have been conducted at various locations in association with potential habitat features. These surveys included temporally stratified dusk and dawn samples. In addition, opportunistic bird searches were conducted throughout the entire survey period. All bird surveys included assessments of different vegetation types that provide potential foraging resources for threatened species, which encapsulates the dominant flowering canopy species on-site. No evidence of *Lathamus discolour* (Swift Parrot) was observed throughout all site assessments.

Given no evidence for the species was recorded on site, the proposed action is highly unlikely to have a significant impact on the Swift Parrot. It is noted that suitable foraging habitat for the species will be retained within the Conservation Parkland should the species infrequently visit the site.

Grey-headed Flying-fox *(Ptreopus poliocephalus*)

The Grey-headed Flying-fox is listed as Vulnerable under the EPBC Act. Two (2) Grey-headed Flying-foxes were recorded on vegetation adjoining the central artificial dam. No roosting camps were observed. Due to the availability of eucalypts and suitable foraging habitat for the species during flowering events, this species is considered to utilise the site as part of a broader home range It is noted that suitable foraging habitat is widespread throughout the Greater Flagstone – Logan region. Subsequently, the project area is not considered likely to support an 'important population' of Grey-headed Flying-fox.

Overall, this is a common, highly mobile species that is able to utilise foraging resources over a large area. Given the wide spread distribution of the species across SEQ and the availability of habitat throughout the greater area, the project is considered unlikely to have a significant impact on the Grey-headed Flying-fox.

Distribution and Population

The Grey-headed Flying-fox occurs between Rockhampton in Queensland to Melbourne in Victoria. The species will usually selectively forage where food is available and as such, its patterns of occurrence and relative abundance vary between seasons and years. There are no separate or distinct populations due to the constant genetic exchange and movement between camps throughout its geographic range.

Threats

The primary threat to the Grey-headed Flying-fox is shooting and culling to protect commercial fruit farms. In addition, habitat loss and fragmentation creates competition for food sources and the loss of roosting camps is also considered to be a threat.

Field Survey Results

Given the availability of eucalypts throughout the site, the western portion of the site is considered likely to provide suitable foraging habitat infrequently or seasonally to the Grey-headed Flying-fox as part of its greater home range. No individuals were observed on-site and, more importantly, no roosting camps were observed during 2015 field survey.

Significant Impact Assessment

The *Draft EPBC Act Policy Statement – camp management guidelines for the Grey-headed and Spectacled Flying-fox* summarise 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 mentioned above are specifically for the assessment of impacts on Flying-fox camps. Given

no roosting sites are located on-site or in the near vicinity, it is highly unlikely that the action will involve impacts on the Grey-headed Flying-fox according to 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.*

To determine whether the proposed action is likely to have a significant impact on the Grey-headed Flying-fox, an assessment against the *EPBC Significant Impact Guidelines 1.1* is provided in **Table 3.**

Table 3: Significant Impact Assessment – Vulnerable Grey-Headed Flying-Fox

Significant Impact Criteria	Description	Impact
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that it will:		
1. Lead to a long term decrease in the size of an important population of a species.	While two Grey-headed Flying-foxes were observed on site and potential foraging habitat for the species was recorded by field survey, no roost camps were seen on or near the site nor are any known to or recorded in the general area. Subsequently, individuals observed on site are considered infrequent visitors and utilise the site as part of a broader home range. SEQ has a permanent and abundant population of Grey-headed Flying-fox and available habitat is spread throughout the region given the high prevalence of eucalypts. The site is not considered to support an important population of the species and the proposed action is unlikely to lead to a long term decrease in the size of any local Grey-headed Flying-fox populations.	**No significant impact**
2. Reduce the area of occupancy of an important population.	While two individuals were observed, no roost camps were recorded across or in the immediate vicinity of the site. The project will not have a significant impact on any population of the species. While the proposed action will remove available foraging habitat, given the abundant availability of eucalypts in the surrounding landscape and the greater SEQ region, the development proposal is unlikely to have a significant impact on the area of occupancy of the species.	**No significant impact**
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, given the high mobility of the species, the proposed action is unlikely to fragment a population into two or more populations.	**No significant impact**
4. Adversely affect habitat critical to the survival of a species.	While the proposed action results in the removal of potential foraging habitat, this habitat is highly disturbed and subject to edge effects from surrounding development. Further, this habitat is not considered to be unique or of special value. The SEQ landscape provides abundant eucalypt and similar genera which are available for foraging. The habitat on site is not considered to be critical to the survival of the Grey-headed Flying-fox.	**No significant impact**
5. Disrupt the breeding cycle of an important population.	The site surveys did not identify any evidence of breeding Grey-headed Flying-fox. Mating normally occurs within autumn, and females generally give birth in October, where they carry their young to feeding sites for four to five weeks after giving birth. As no roosting camps were observed on or near the site, the proposed action is unlikely to disrupt the breeding cycle of an important population.	**No significant impact**
6. Modify, destroy, remove or isolate or decrease the availability or quality of habitat	The habitat on site did not contain any special or unique values. Its removal is unlikely to have a significant impact on the availability of habitat in the landscape, given the vast quantity and availability of eucalypts in the surrounding area.	**No significant impact**

to the extent that the species is likely to decline.		
7. Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat.	The proposed action is unlikely to result in the introduction of invasive species.	**No significant impact**
8. Introduce disease that may cause the species to decline.	The project is unlikely to introduce disease into the area.	**No significant impact**
9. Interfere substantially with the recovery of the species.	Recovery of the species has specifically targeted the broad scale culling of the species. In addition, conservation efforts have led to the protection of known roosting sites and important habitat. The site has not been identified as an important habitat or roost site and the action is unlikely to interfere with the recovery of the species.	**No significant impact**

The above assessment against the *EPBC Significant Impact Guidelines 1.1* indicates the proposed action is unlikely to have a significant impact on the Grey-headed Flying-fox. It is noted that suitable foraging habitat for the Grey-headed Flying-fox will be retained within the proposed Conservation Parkland allowing visitation by the species to continue to occur.

Koala (*Phascolarctos cinereus*)

Conservation Status

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

Habitat

As described in the Koala SPRAT species profile, Koalas inhabit a wide range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by eucalypt species. Under the Koala Referral Guidelines (p.5), 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 and non-remnant vegetation in natural, agricultural, urban and peri-urban environments. Koala habitat is defined by the vegetation community present and the vegetation structure; koalas do not necessarily have to be present*".

Distribution

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

Threats

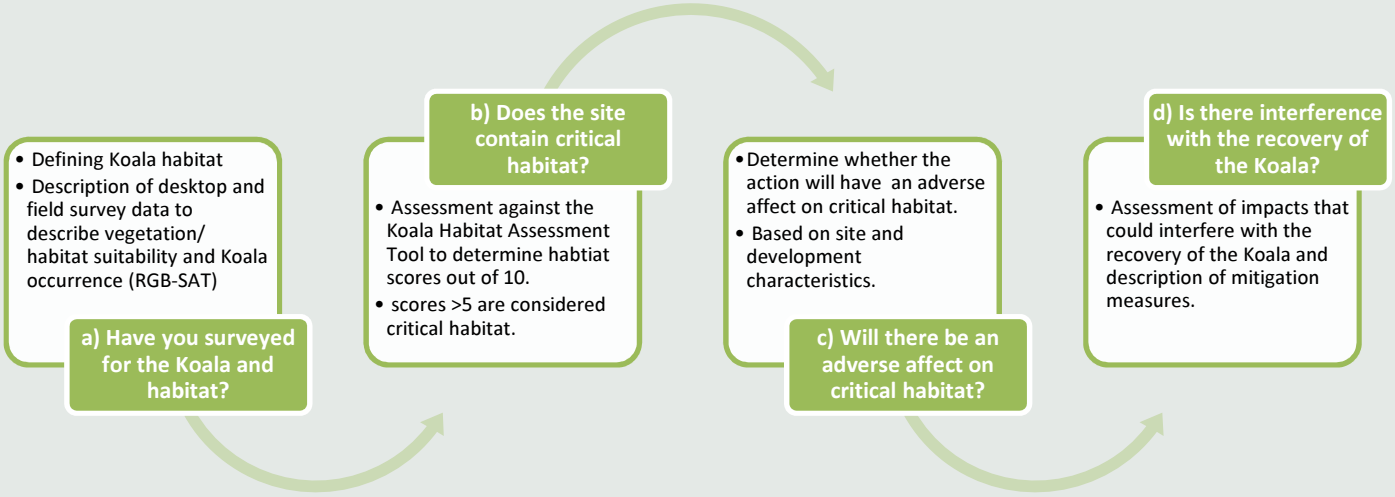
The three (3) main threats to Koala have been identified within the SPRAT profile as:

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

In addition, 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, repertory tract and reproductive tract, with the later having the potential to head to infertility in females. More recently, Koala Retrovirus (KoRV) has had an increasing impact on most of Queensland's 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.

Assessment Against the EPBC Act Referral Guidelines for the Vulnerable Koala

The referral site is located within the Koala Referral Guidelines modelled distribution as 'known/likely to occur' and within the 'coastal context'. As stated above, South East Queensland is known to support Queensland's highest density of Koalas. Further the species has been recorded within the broader Logan area. As such, the following provides a detailed assessment against the Koala Referral Guidelines to determine whether the proposed action will have a significant impact on the Koala or Koala habitat. The Koala Referral Guidelines provides an assessment approach using the following processes displayed in the flow chart below:



Flow Chart: EPBC Koala Assessment Process

- **Koala Occurrence and Habitat Surveys**

Over ten (10) survey days (2 x 5day/4night), between 20th July 2015 and 31st July 2015, two (2) Senior Ecologists from **SHG** attended the application site with conditions mostly fine and sunny. The purpose of the survey was to determine the level of Koala usage across the site and to assess the availability of suitable Koala habitat. The assessment involved the following methods (refer to **Attachment B** – Greenbank Ecological Assessment Technical Memo for full methodology):

- Spot Assessment Technique (SAT) development by Philips and Callaghan (2011)
- Opportunistic Searches
- Quadrat and Sampling Units

SAT Survey Results

The SAT method is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage. The SAT involves identifying a non-juvenile tree of any species within the site that is either observed to have a Koala or scats or known to be food trees or otherwise important for Koalas and recording any evidence of Koala usage (including any Koalas, identifiable scratches, or scats). The nearest non-juvenile tree is then identified and the same data recorded. The next closest non-juvenile tree to the first tree is then assessed and so on until 30 trees have been recorded. The number of trees showing evidence of Koalas is expressed as a percentage of the total number of trees sampled to indicate the frequency of Koala usage. Assessment of each tree involves a systematic search for Koala scats beneath the tree within 1 m radius of the trunk. After approximately 1 minute of searching for scats, the base of the trunk is observed for scratches.

Site specific searches observed the presence of four (4) Koalas on site (two pairs of mother and joey) within the northern- central portion of the site. It is noted that each pair were recorded on separate days and only once (i.e. one recorded for each pair) over the ten (10) day survey period. Scats were also located in several locations over the site, primarily along gully lines.

Thirty-one (31) SAT surveys were conducted across the application area, as shown by the Field Survey Effort presented in **Plan 3** and summarised in **Table 4**. While SAT surveys traditionally rely on the identification of a scat to complete the assessment, two (2) of the thirty-one (31) SAT surveys were conducted at random to ensure a thorough assessment of the entire referral site was undertaken. In most locations (23 of the 31), SAT surveys recorded evidence consistent with the "low" use category for Koala (>22.52% of trees with scats) in coastal regions as defined by the **Australian Koala Foundation's** Koala Activity Level Classification Table, extracted below as **Table 5.** This assessment has been based using the East Coast (med-high) Density Area, which is applicable in habitats dominated by residual, transferral or alluvial type landscapes considered med-high nutrient soils with good water holding capacity (Steve Phillips, personal communication). Chromosols dominate the application area and this soil type, along with vegetation structure, suit this landscape description (refer **Response 3.3** for further detail).

Further, five (5) of the SATs r recorded evidence consistent with the "medium" use category (≥22.52% but ≤32.84% of trees with scats) while three (1) SAT recorded evidence consistent with the "high" use category (≥>32.84% of trees with scats).

Table 4: SAT Survey Results

SAT Survey	Scats	%of Trees with Scats	Usage Level
SAT 1	Yes	3.3	Low
SAT 2	Yes	13.3	Low
SAT 3	Yes	6.7	Low
SAT 4	Yes	23.3	Medium
SAT 5	Yes	26.7	Medium
SAT 6	Yes	6.7	Low
SAT 7	Yes	20	Low
SAT 8	Yes	6.7	Low
SAT 9	Yes	6.7	Low
SAT 10	Yes	16.7	Low
SAT 11	Yes	3.3	Low
SAT 12	Yes	6.7	Low
SAT 13	Yes	20	Low
SAT 14	Yes	40	High
SAT 15	Yes	10	Low
SAT 16	Yes	20	Low
SAT 17	Yes	16.7	Low
SAT 18	Yes	30	Medium
SAT 19	Yes	6.7	Low
SAT 20	Yes	13.3	Low
SAT 21	Yes	6.7	Low
SAT 22	Yes	26.7	Medium
SAT 23	Yes	16.7	Low

SAT 24	Yes	13.3	Low
SAT 25	Yes	23.3	Medium
SAT 26	Yes	20	Low
SAT 27	Yes	6.7	Low
SAT 28	Yes	3.3	Low
SAT 29	Yes	16.7	Low
SAT 30	Nil	-	No Use
SAT 31	Nil	-	No Use

Table 5: AKF Koala Activity Level Classification Table

ACTIVITY CATEGORY	LOW USE	MEDIUM (NORMAL) USE	HIGH USE
Area (density)			
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%

Flora and Koala Habitat Results

Under the 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 and non-remnant vegetation in natural, agricultural, urban and peri-urban environments. Koala habitat is defined by the vegetation community present and the vegetation structure; koalas do not necessarily have to be present".*

Queensland's Koala Habitat Values Map (refer **Figure 3)**, shows the site has been identified as containing areas of Medium and Low Value Bushland and Medium and Low Value Rehabilitation. The western dam is mapped a Non-Habitat for Koala.

Queensland's Regulated Vegetation Management Mapping shows the site as containing Category X (non-remnant) and Category B (remnant vegetation) (refer **Figure 4**). Category X vegetation is not regulated under the VMA. The Vegetation Management Supporting Map (refer **Figure 5**) shows that approximately half of the subject site is mapped as containing remnant vegetation consisting of Endangered and of Concern regional ecosystems and essential habitat for Spotted Tailed Quoll, Koala and Tusked Frog. This mapping is reflected of a certified Property Map of Assessable Vegetation (PMAV) over the site.

A detailed field survey to support a PMAV over the eastern and northern portions of the site was undertaken by senior ecologists from **SHG** during February and March 2015. The results of this assessment proposed no changes to the extent of mapped remnant areas on the application site but proposed changes to the mapped regional ecosystem polygons due to the absence of key indicator species *Eucalyptus seeana* (Narrow Leaf Red Gum) for Endangered RE12.9-10.12. A PMAV (2015/004538) was certified by the **Department of Natural Resources and Mines** (NRM) and shows mapping of Of Concern composite RE 12.9-10.2/12.9-10.7 and Endangered RE12.9-10.12 over the northern and eastern portions of the site (refer **Figure 6**). It is noted that a site visit from the **NRM** and the Queensland Herbarium as well as representatives from **SHG** was undertaken as part of the PMAV assessment process.

Based on on-site feedback from the Queensland Herbarium during the assessment of the northern area PMAV, additional transects, mapping refinement and a second PMAV Application for part of the south-eastern quarter of the site has been made to **NRM** (refer **Figure 6**). At the time of drafting this referral a final certified determination had not been issued.

Overall, the site is dominated by Eucalypt Woodland/Open Forest which is considered suitable habitat for the Koala. Field surveys confirmed the site was found to be relatively disturbed by historical clearing, pastoral practices and regular maintenance resulting in a very high density of Acacia regrowth and abundance of introduced species, including evidence of feral animals and weeds declared under the *Land Protection (Pest and Stock Route Management) Act 2002*. Broadly the site can be separated into three (3) distinct vegetation areas (refer **Plan 4**). Within each of these areas there remain sub-areas and ecotonal changes which alter the balance of features based on factors including topography, drainage, aspect, level of ongoing maintenance, nexus to tracks and other weed access points):

- Area 1 - Unmaintained Regrowth Areas (Non-Remnant)
- Area 2 – Waterbodies and Drainage Lines
- Area 3 – Remnant Vegetation Areas (Other)
- Area 3A – Remnant Vegetation (Endangered)

Area 1: Unmaintained Regrowth Areas (Non-Remnant)

The majority of the mapped non-remnant area contains open paddocks with some scattered mature specimens dominated by a number of Eucalypt and Corymbia species including *Eucalyptus siderophloia* (Grey Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia citriodora* (Spotted Gum), and the occasional *Corymbia intermedia* (Pink Bloodwood). The remaining portion of the mapped non remnant area contains some regrowth vegetation dominated by a number of Acacia species including *Acacia concurrens* (Black Wattle), *Acacia leiocalyx* (Early Flowering Black Wattle), and *Acacia disparrima* (hickory Wattle). In general, while containing Koala food trees, these areas were not considered to provide ideal habitat for the Koala.

Area 2: Waterbodies and Drainage Lines

The site is located towards the top of a catchment area and is mapped as containing five (5) stream order 1 and two (2) stream order 2 waterway under the *Vegetation Management Act 1999*. This is based on the method outlined by Strahler (1952). These waterways are located within both mapped remnant vegetation and non-remnant vegetation areas with the heads of each waterway being dammed for the properties rural uses. The portion of the waterways located within the mapped remnant area are generally associated with a composite Regional Ecosystem including Of Concern RE12.3.11 and Least Concern RE 12.3.6

Disturbance levels throughout the waterways are associated with vegetation clearing, cattle grazing pressures, cleared site access tracks and the construction of major contours which cover the majority of the mapped non remnant area of the site. These contours have been in place for the prevention of erosion as well as to capture water for the two larger constructed dams located on site. The dams are not considered to provide habitat for the Koala.

The central waterway which runs west to east contained greater diversity of flora species as well as a number of semi-permanent water holes or billabongs. Although the other waterways contained some of these characteristics, greater disturbances were recorded throughout each of these areas. The central waterway provides suitable habitat for the Koala.

Area 3 & 3A: Remnant Vegetation Communities

The twenty-four (24) vegetation transects completed as part of the PMAV survey throughout all remnant polygons within the application site resulted in sixteen (16) indicating elements of an Of Concern Regional Ecosystem community and eight (8) indicating elements of an Endangered Regional Ecosystem community. Certified PMAVs across the site identify the referral area contains five (5) regional ecosystem communities across two (2) land zones including:

- Endangered Regional Ecosystem 12.9-10.12.
- Of Concern Regional Ecosystem 12.9-10.7a.
- Least Concern Regional Ecosystem 12.9-10.2
- Least Concern Regional Ecosystem 12.3.6.
- Of Concern Regional Ecosystem 12.3.11.

Remnant areas are considered to provide the greatest Koala habitat values across the site due to availability of food trees and vegetation structure.

Summary of Findings

The key findings from the assessment are:

- Four (4) Koalas (2 x mother and joey pairs) were recorded within the northern-eastern portion of the site. Each pair was only sighted once during the ten (10) day SAT survey period indicating that it is not confined or solely dependent on the application site and likely to use the site as part of a movement corridor.
- Scats were observed in several locations across the application area, with twenty-three (23) of the thirty-one (31) SAT surveys recording 'Low' use, five (5) recording 'Medium Use) and one (1) recording 'High' use. Areas of high and medium use were generally associated with drainage lines.
- The site is dominated by species considered Koala food trees under the Koala Referral Guidelines including *Eucalyptus tereticornis* (Forest Red Gum), *Eucalyptus siderophloia* (Grey Ironbark), *Eucalyptus crebra* (Narrow Leaf Ironbark), *Corymbia intermedia* (Pink Bloodwood) and *Corymbia citriodora*.
- Overall, the site was found to be relatively disturbed by historical clearing, pastoral practices and regular maintenance activities resulting in a very high density of Acacia regrowth and an abundance of introduced weed species. Although historically disturbed, the application area contains a mix of remnant Regional Ecosystem communities and non-remnant areas. The dominant vegetation assemblage in remnant and regrowth areas is the mature and semi-mature canopy forming the ecologically dominant layer. As typically found in open forest and woodland structures, very few shrub species were recorded with the ground layer dominated by a mix of native and exotic grass species.

- **Does the site contain critical habitat to the survival of the Koala?**

In accordance with the Koala Referral Guidelines, habitat which receives a score of **5 or more** using the Koala Habitat Assessment Tool is considered to be critical habitat. As assessment of the site using the Koala Habitat Assessment Tool has been undertaken in **Table 6** which indicates the site has been given a **critical habitat score of 7** and therefore is considered to be critical habitat for Koala.

Table 6: Koala Habitat Assessment Tool

Attribute	Score	Comment
Koala occurrence	+2	The EPBC Act Protected Matters Search Tool identified the Koala as having potential to occur on site. A search of Queensland's Wildlife Online Search Tool using a 10 kilometre radius found 474 records of the Koala, while 33 sightings had been recorded within a 2 kilometre radius of the site. A search of the Atlas of Living Australia indicates 48 records for the species within a 5km radius of the site which included three (3) records on Teviot Road, although no records for Koala on the referral site (refer **Figure 7**) Recent survey observed four (4) Koalas (two (2) pairs of mother and joey) on two (2) separate days of the ten (10) day SAT survey period. Koalas were recorded on baited motion sensor cameras deployed continuously prior to, during, and post the official survey period. In addition, scats were observed in several locations across the site however these were concentrated to gully lines. Overall use of the site for the species is considered to be "Low". **As there is evidence of Koala occurrence is the previous two years, this attribute has been scored 2.**

Vegetation composition	+2	A detailed description of the vegetation composition on site is provided in **Response 3.1**, and further comments are based on the results of the 2015 ecological field survey which included detailed vegetation survey as part of a PMAV. Large portions of the site are cleared of vegetation and regularly maintained as a result of pastoral practices. Aerial imagery dating back to 1965 indicates approximately two-thirds of the project site has been historically cleared as part of broad scale clearing practices and consequently much of the central portion of the site, while vegetated, contains regrowth and is mapped (and ground-truthed) as Category X (non-remnant) vegetation. Of the 482ha site approximately 410ha is vegetated (i.e. the referral area). Habitat transects conducted across the site identified the property is dominated by species that achieve the definition of 'woodland' and 'forest' as referenced in the Koala Referral Guidelines. Ecological survey of the site shows the referral area is predominately dominated by Eucalyptus and Corymbia species. Specifically, these species included *Eucalyptus tereticornis* (Forest Red Gum), E*ucalyptus siderophloia* (Grey Ironbark), *Corymbia intermedia* (Pink Bloodwood), *Corymbia citriodora* (Spotted Gum), *Eucalyptus seeana* (Narrow Leaf Red Gum). Survey noted non-remnant and some remnant areas contained regrowth vegetation dominated by a number of Acacia species including *Acacia concurrens* (Black Wattle), *Acacia leiocalyx* (Early Flowering Black Wattle), and *Acacia disparrima* (hickory Wattle) as well as a number of declared weed species. As vegetation composing of canopy species on site is made up of more than two species considered to be Koala food trees, this attribute has been given a score of 2. **Two or more Koala food trees were identified in the canopy, resulting in an attribute score of 2.**
Habitat connectivity	+1	Contextually, the site is bound by Teviot Road to the west (Sub-Arterial Road) and Greenbank Road to the south (high order Collector Road), and is encompassed by rural residential and urban land uses. Review of aerial imagery shows broad connectivity values of raw vegetation extends over 600ha however when considering remnant mapping of vegetation communities scheduled to support the Koala, connectivity of vegetation suitable for the species extends over approximately 269ha (refer **Plan 6**) A primary barrier to dispersal between the site and bushland to the south-west is the Brisbane – Sydney Railway Line. Train movements along the track poses threats of injury or death to dispersing Koalas. Further, development of Greenbank and its location within Greater Flagstone is only anticipated to increase in future with approved major developments including Teviot Downs, Flagstone City and Undullah not only increasing residential density but also major linear infrastructure. Major upgrades of Teviot Road by **LCC** are anticipated, as well as upgrades to Mount Lindesay Highway by the Queensland **Department of Transport and Main Roads** as part the broader Mount Lindesay Network Strategy are planned. Within the Greater Flagstone PDA, zoning for Environmental Protection Zones has been identified to the west where the PDA adjoins the Flinders-Karawatha Bioregional Corridor. No areas of Environmental Protection are located within or directly adjoining the project site. Within the site, areas identified as containing vegetation values and Potential Greenspace have generally been retained as part of the proposal. It is noted that these

		areas are to be incorporated into the development and retain ecological values within open space and parks. While the site currently forms part of a >600ha connected area of vegetation, when conserving connected vegetation which supports the Koala and when all roads and approved residential development outcomes are considered complete, the site forms part of a vegetated area <300ha. However, as the site forms part of a broader area of connected vegetation considered to support the Koala, this attribute has been scored a 1. **The site forms part of vegetated landscape considered to support the Koala, resulting in an attribute score of 1.**
Key existing threats	+1	A number of existing threats pose risk to survival of local Koala populations. These include: **<u>Vehicle Strike:</u>** A review of the **Australian Koala Foundation** Koala map shows a number of verified sightings for Koala within close proximity to the site were made along major roads including Greenbank Road (80kph), Teviot Road (80kph) and Mount Lindesay Highway (100kph). The location of these sightings, indicates the risk of vehicular strike is considerably high. While, the **Ipswich Koala Protection Society** has not released a newsletter in 2015, review of local records indicates a high percentage of deaths from vehicular strike in the Greenbank and Greater Flagstone areas. Additionally, it is noted that anticipated growth and planned upgrades to Teviot Road and Mount Lindesay Highway will result in increased traffic flows. **<u>Dog Attack:</u>** The **Ipswich Koala Protection Society** holds substantial records for both frequent and regular koala mortality from vehicle strike and dog attack within the immediate proximity of the project site. **LCC** states on their website that on average, approximately 110 Koalas are attacked and killed by dogs each year. Further, between 1997 and 2008, **EHP's** Moggill Koala Hospital and the Australian Wildlife Hospital at Beerwah admitted around 1400 Koalas that had been attacked by dogs. Dog ownership in rural residential areas is considerably high, with properties >600m^2 allowed to keep 2 dogs without or up to 4 dogs with Council approval. As the site is within a rural residential context and fragmented from other major tracts of vegetation by local and State roads, existing threats are perceived as a 1. **Due to the existence of key threats, the attribute has been scored 1.**
Recovery value	+1	The interim recovery objective for coastal areas is based upon protecting and conserving large, connected areas of Koala habitat, particularly where Koalas are genetically diverse/ distinct, free of disease or have a low incidence of disease or where there is evidence of breeding. None of these attributes are considered to occur on site. The referral site is fragmented from areas of broad conservation and connectivity associated with the Flinders-Karawatha Bioregional Corridor to the south-west by existing and urban development, major roads and rail. This connectivity is anticipated to be further fragmented when future approvals within the Greater Flagstone PDA are implemented. Further, future development will result in an increase of key threats to the species including road upgrades, new roads, and increases in domestic pet ownership.

		It is however noted that in the absence of a recovery plan, it is the Department's position to score this attribute a 1. **In the absence of a recovery plan, the attribute has been scored 1.**
Total	**7**	**Critical Habitat**

- **Will there be adverse impacts on critical habit?**

The above assessment concludes that the site contains critical habitat for the Koala as defined by the Koala Referral Guidelines as the site achieves a **habitat assessment score of 7** (i.e. >5). Potential impacts to the species under the Koala Referral Guidelines therefore have been considered through the "yes/no" flowchart provided within the Koala Referral Guidelines as Figure 2 to determine if the action will adversely affect habitat critical to the survival of the Koala:

i. **Does your impact area contain critical habitat to the survival of the koala (habitat score ≥ 5)?**
   - Yes, the habitat on site has been given a score of 7 (refer **Plan 6**).

ii. **Does the area proposed to be cleared contain known Koala food trees?**
   - Yes. Overall, the site was found to be dominated by species that achieve the definition of 'woodland' and 'forest' as referenced in the Koala Referral Guidelines. Ecological survey of the site shows the referral area is predominately dominated by Eucalyptus and Corymbia species. Specifically, these species included *Eucalyptus tereticornis* (Forest Red Gum), E*ucalyptus siderophloia* (Grey Ironbark), *Corymbia intermedia* (Pink Bloodwood), *Corymbia citriodora* (Spotted Gum), and *Eucalyptus seeana* (Narrow Leaf Red Gum).

iii. **Are you proposing to clear ≤2 hectares of critical habitat containing known Koala food trees in an area with a habitat score of 5?**
   - No. The action requires clearing 270.6 hectares of vegetation with a critical habitat score of 7.

iv. **Are you proposing to clear ≥20 hectares of critical habitat containing known Koala food trees with a habitat score of ≥8?**
   - No. The action requires clearing 270.6 hectares which varies in condition. Approximately 113 hectares of the clearing areas is mapped as remnant vegetation, 48.1 hectares of which is associated with 'essential habitat' for the Koala. The remaining impact is made up of 157.6 hectares of non-remnant vegetation. This vegetation was assessed using the Habitat Assessment Tool to achieve a score of 7.

Assessment on Characteristics

- There are a number of characteristics of the referral site that reduce the adversity of impacts caused by the clearing of vegetation. These include:

  - The site is highly disturbed, located within a rural residential context and bound by major arterial roads to the west and south.
  - Large portions of the site have been historically cleared with approximately one quarter of the site devoid of vegetation and regularly maintained. As a result, non –remnant areas contain a very high density of Acacia regrowth and an abundance of introduced species, including weeds and feral animals.
  - The site is segregated from large intact vegetated parcels to the west and south west associated with Flinders-Karawatha Bioregional Corridor by Teviot Road and the Brisbane-Sydney Railway Line.
  - Development (including adjacent development) will result in increased risks to the species including the creation of and upgrades to major roads and increases in dog ownership.

- The project proposes considerable retention of approximately 88.9ha as Conservation Parkland of which contains 88.3 ha of critical habitat for the survival of the species and maintains connectivity for Koala movement along Norris Creek and to Wearing Park to the east. Rehabilitation works will be guided by an approved Rehabilitation Plan comprised of two main components: Weed Management and natural ecological function and hydrology of waterways.
- The *Greater Flagstone Urban Development Area Development Scheme* facilitates development within the Greater Flagstone area in order to meet Queensland's housing demand, which will see greater expansion of urban development surrounding the site. Approvals over properties to the immediate west and south-west, once implemented, will result in further urban expansion and clearing of remaining large connected patches of vegetation which provide some connectivity for Koalas to the referral site.

Overall, while the site is recognised as containing critical habitat for the Koala, considerable retention of this vegetation is proposed within the 88.9ha of Conservation Parkland which maintains connectivity for the species along Norris Creek and Wearing Park to the east. Rehabilitation works including weed management and replanting along the creek corridor is proposed to maintain connectivity and wildlife movement. Vegetation removed as a result of the development is considered to be highly degraded and heavily infested with weeds as a result of pastoral practices. Existing barriers to Koala dispersal to and from the site coupled with current Local, State and Commonwealth approvals around the referral area significantly influence the long term ecological function of the site within the broader landscape.

i. 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;
- Creating a barrier to movement;
- Degrading critical habitat due to hydrological changes;
- Increasing the risk of high intensity fires; and
- Facilitating the introduction or spread of disease

These impacts as well as mitigation measures to address these impacts are discussed in **Table 7**. In summary, the project is considered unlikely to interfere substantially with the recovery of the species.

Table 7: Potential Impacts

Impact	Likelihood	Comments
Dog attack	Potential	While the proposed action introduces residential uses across the site, this will consist of a mix of low and medium density dwellings, which on average have a lower rate of dog ownership compared to surrounding rural and rural residential. There is however potential for the proposal to increase dog ownership in the area and the prevalence of dog attacks. As such, appropriate interface treatments are proposed where urban uses adjoin the conservation land to minimise the risk of dog attacks. Off-leash dog park(s) will also be provided to minimise risk of uncontrolled dogs in greenspace and conservation areas. Eco-lots will have strict controls on pet ownership and all domestic animals will be required to be kept within approved building envelopes. Lifestyle Guidelines will be prepared and distributed to new buyers to provide information on the role they play in contributing to biodiversity and environmental values of the development.

		No residual impacts are identified.
Vehicle Strike	Potential	The development will result in an increase in vehicle usage on the newly created residential roads which includes trunk roads. Given the already high level of vehicle usage on Teviot Road and Greenbank Road, and expected increases in the future with planned upgrades external to the site, risk of vehicle strike in the area is already high. Nevertheless, an increase in vehicle usage adjacent to bushland areas does create the potential for vehicle strikes. These impacts will be mitigated through road design principles and signage techniques encouraging high visibility and low speed limits. Fauna friendly crossings, supportive of Koala movement, will be constructed where road crossings of conservation areas pose a risk to safe passage. **No residual impacts are identified.**
Barriers to Dispersal	Potential	The site is already fragmented from other habitat areas as a result of existing barriers to dispersal including Teviot Road and Greenbank Road and more broadly Mount Lindesay Highway and Brisbane –Sydney Railway Line. However, it is known that Koalas utilise the site as part of a broader home range and thus development of the site may potentially create new barriers. Further, retention of the 88.9 ha Conservation Parkland and 75ha Eco-Lot Precinct (163.9ha) adjoining Wearing Park and Norris Creek will maintain connectivity for Koalas to move within the broader Logan landscape. **No residual impacts are identified.**
Hydrological change	Potential	Norris Creek and its tributaries traverse the eastern portion of the site. Hydrological modelling has been undertaken in conjunction with concept layout design and as such the proposal primarily retains theses waterways to maintain ecological and hydrological function. The two dams on site will be decommissioned as part of the development, however these have been artificially constructed for pastoral land use and are heavily degraded and are not considered natural wetlands. While the development will result in an increase in impervious surfaces, detailed hydrological modelling, Bulk Earthworks Plans, Stormwater Management Plans and Erosion and Sediment Control Plans will be prepared to manage and mitigate impacts associated with run-off from the development to maintain water quality in accordance with State (and Local where relevant) water quality objectives and standards. Potential changes to hydrology are extremely unlikely to result in the degradation of critical habitat elsewhere. **No residual impacts are identified.**
Fire	Unlikely	The project is extremely unlikely to increase the frequency or intensity of bushfires as it primarily results in the removal of fuel load from the east. A Bushfire Management Strategy will be prepared to manage and mitigate bushfire risk. **No residual impacts are identified.**
Spread of Disease	Unlikely	One of the primary threats to Koalas is the spread of disease, with disease making up a significant proportion of overall mortality in Koalas. South East Queensland Koalas are known to carry Koala Retrovirus (KoRV), which is spread by transmission of genetics from parent to offspring, and by close contact between Koalas. Almost

			half of South East Queensland's Koala population has been estimated to carry reproductive diseases that can lead to infertility caused by the *Chlamydia* virus. Again, this is passed on by Koala to Koala contact. Given the already high prevalence of disease and its transmission by close Koala to Koala contact, the proposed action is extremely unlikely to result in the spread of disease or pathogens into the existing Koala population. **No residual impacts are identified.**	

Nature and extent of likely impact

Address any impacts on the members of any listened threatened species (except a conservation dependent species) or any threatened ecological community, or their habitat.

The proposed action has potential impacts to Koala resulting from the direct clearing of approximately 270.6 hectares of vegetation which is considered critical habitat for Koala (Habitat Assessment Tool score of +7).

- Koala
  - The site scored +7 using the Habitat Assessment Tool score of which indicates that the vegetation to be cleared is of a mid-range value to the species;
  - While the site has a critical habitat score of +7, it is not considered that a Koala population permanently resides on site, but rather utilise the land as a movement corridor for local individuals within the broader Logan area. Individuals were sighted on two separate occasions during the 10 day SAT survey, but were not observed again during the formal survey timeframe, or during multiple flora /habitat assessments between February 2015 and May 2016.
  - The site is already subject to significant barriers to dispersal, being primarily Teviot Road, Greenbank Road, Mount Lindsay Highway, and the Sydney-Brisbane rail line;
  - Future development within proximity to the site will create further barriers, resulting in greater fragmentation of potential habitat;
  - The abovementioned barriers are likely to prevent the site from achieving the interim recovery objectives for coastal areas, even if the proposed action did not occur;
  - The development proposal seeks to retain approximately 88.9ha of Conservation Parkland adjoining Norris Creek and Wearing Park, providing for potential habitat and connectivity within the broader landscape;
  - The development proposal seeks to retain a further 37ha (approx.) of vegetation within the Eco Lot precinct, providing further habitat and connectivity;
  - Rehabilitation works will be guided by an approved Rehabilitation Plan which will include weed management and revegetation works to maintain and enhance conservation areas and waterway corridors;
  - Vegetation clearing will be guided by an approved Vegetation Management Plan which will require clearing to be undertaken under the guidance of a fauna spotter-catcher, ensuring that impacts from clearing are minimised; and
  - Importantly, the value of the site's features for Koala habitat have already been recognised by the State Government. This in turn results in the mandatory regulation of clearing of Koala trees and a committed land owner obligation to provide works and financial resources towards a net gain in Koala habitat for the region. These mandated outcomes already in place, regardless of the EPBC assessment, provide significant mitigation towards the loss of critical habitat.

3.1 (e) Listed migratory species

The EPBC Act Protected Matters Search Tool using a 2km radius of the site identified a number of migratory species as having potential to occur. **Table 8** provides a description of the habitat requirements of each of these species and assess their likelihood of occurrence:

Table 8: Likelihood of Occurrence Schedule (Migratory Species)

Migratory Marine Birds						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Apus pacificus	Fork-tailed Swift	Migratory	678	This species is almost exclusively aerial and mostly occur over inland plains but sometimes above foothills or in coastal areas.	Possible as a fly over species however no impact to this species is likely to occur. **Species is unlikely to occur.**	Not observed
Migratory Terrestrial Species						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Cuculus saturatus	Oriental Cuckoo, Horsfield's Cuckoo	Migratory	86651	The Oriental Cuckoo mainly inhabits coniferous, deciduous and mixed forest. It feeds mainly on insects and their larvae, foraging for them in trees and bushes as well as on the ground. It is usually secretive and hard to see.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Hirundapus caudacutus	White-throated Needletail	Migratory	682	The White-throated needletail is almost exclusively aerial. This species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows. The species breeds in wooded lowlands and sparsely vegetated hills, as well as mountains covered with coniferous forests.	Low potential to occur on site within roosting periods. **Species is unlikely to occur.**	Not observed
Monarcha melanopsis	Black-faced Monarch	Migratory	609	The Black-faced Monarch mainly occurs in rainforest ecosystems, including semi-deciduous vine thickets, complex notophyll vine forests, tropical (mesophyll) rainforest, subtropical (notophyll) rainforest, mesophyll (broadleaf) thicket/shrubland, warm temperate rainforest, dry (monsoon) rainforest and occasionally cool temperate rainforest.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Monarcha trivirgatus	Spectacled Monarch	Migratory	610	The Spectacled Monarch's natural habitats are subtropical or tropical moist lowland forests, subtropical or tropical mangrove	No suitable habitat was observed throughout the assessment area.	Not observed

				forests, and subtropical or tropical moist montane forests. Its preference is for thick understorey areas.	**Species is unlikely to occur.**	
Motacilla flava	Yellow Wingtail	Migratory	644	The Yellow Wingtail occurs in a variety of damp or wet habitats with low vegetation, from rushy pastures, meadows, hay fields and marshes to damp steppe and grassy tundra. Outside of the breeding season it is also found in cultivated areas. The Yellow Wingtail typically forages in damp grassland and on relatively bare open ground at edges of rivers, lakes and wetlands, but also feeds in dry grassland and in fields of cereal crops.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Myiagra cyanoleuca	Satin Flycatcher	Migratory	612	Satin Flycatchers inhabit heavily vegetated gullies in eucalypt dominated forests and taller woodlands, and on migration occur in coastal forests, woodlands, mangroves and drier woodlands and open forests.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Rhipidura rufifrons	Rufous Fantail	Migratory	592	The Rufous fantail mainly inhabits wet sclerophyll forests, often in gullies dominated by Eucalypts such as Eucalyptus microcorys, Eucalyptus pilularis, Eucalyptus resiniferia and a number of other Eucalyptus species	Habitat available on site due to the presence of Eucalypts. Species was not recorded during field survey. **Species has potential to occur.**	Not observed
Migratory Wetland Species						
Species	**Common Name**	**Status**	**EPBC Code**	**Description of Community / Habitat**	**Likelihood of Occurrence**	**Site**
Gallinago hardwickii	Latham's Snipe	Migratory	863	Latham's Snipe occurs in permanent and ephemeral wetlands. They usually inhabit open, freshwater wetlands with low, dense vegetation.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Pandion haliaetus	Osprey	Migratory	952	Eastern Ospreys occur in littoral and coastal habitats and terrestrial wetlands of tropical and temperate Australia and offshore islands. They are mostly found in coastal areas but occasionally travel inland along major rivers, particularly in northern Australia.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur.**	Not observed
Tringa nebularia	Common Greenshank, Greenshank	Migratory	832	The Common Greenshank is found in a wide variety of inland wetlands and sheltered coastal habitats of varying salinity. It occurs in sheltered coastal habitats, typically with large mudflats and saltmarsh, mangroves or seagrass.	No suitable habitat was observed throughout the assessment area. **Species is unlikely to occur**	Not observed

Description

A search using the EPBC Act Protected Matters Search Tool with a 2 kilometre radius, identified eleven (11) migratory species as having potential to occur on site (refer **Table 8**).

Field surveys undertaken in 2015 did not record the presence of listed migratory species within the referral area.

Importantly, the limited available habitat was not considered to represent an important area of habitat for migratory species. This is primarily because the site does not contain marine and riparian systems such as shorelines, mudflats, sandflats, mangroves, major rivers of seagrass.

Nature and extent of likely impact

Address any impacts on the members of any listed migratory species, or their habitat.

The proposed action is not considered to have a significant impact on migratory species given the lack of important habitats on site, surrounding urban development, and distance from coastal resources, wetlands and rocky outcrops.

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. The site is not located within close proximity to a Commonwealth Marine Area.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth marine area.

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

If the action will affect Commonwealth land also describe the more general environment. The Policy Statement titled *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* provides further details on the type of information needed. If applicable, identify any potential impacts from actions taken outside the Australian jurisdiction on the environment in a Commonwealth Heritage Place overseas.

Not applicable. The action is not on Commonwealth land.

Nature and extent of likely impact

Address any impacts on any part of the environment in the Commonwealth land. Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

Not applicable.

3.1 (h) The Great Barrier Reef Marine Park

Description

Not applicable. The site is not located in or within close proximity to the Great Barrier Reef Marine Park.

Nature and extent of likely impact

Address any impacts on any part of the environment of the Great Barrier Reef Marine Park.

Not applicable.

Note: If your action occurs in the Great Barrier Reef Marine Park you may also require permission under the *Great Barrier Reef Marine Park Act 1975* (GBRMP Act). If so, section 37AB of the GBRMP Act provides that your referral under the EPBC Act is deemed to be an application under the GBRMP Act and Regulations for necessary permissions and a single integrated process will generally apply. Further information is available at www.gbrmpa.gov.au

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

If the action is a coal seam gas development or large coal mining development that has, or is likely to have, a significant impact on water resources, the draft *Policy Statement Significant Impact Guidelines: Coal seam gas and large coal mining developments—Impacts on water resources* provides further details on the type of information needed.

Not applicable. The action is not for coal related development.

Nature and extent of likely impact

Address any impacts on water resources. Your assessment of impacts should refer to the draft *Significant Impact Guidelines: Coal seam gas and large coal mining developments—Impacts on water resources*.

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

You must describe the nature and extent of likely impacts (both direct & indirect) on the whole environment if your project:

- is a nuclear action;
- will be taken by the Commonwealth or a Commonwealth agency;
- will be taken in a Commonwealth marine area;
- will be taken on Commonwealth land; or
- will be taken in the Great Barrier Reef marine Park.

Your assessment of impacts should refer to the *Significant Impact Guidelines 1.2 - Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies* and specifically address impacts on:

- ecosystems and their constituent parts, including people and communities;
- natural and physical resources;
- the qualities and characteristics of locations, places and areas;
- the heritage values of places; and
- the social, economic and cultural aspects of the above things.

3.2 (a)	**Is the proposed action a nuclear action?**	**X**	**No**
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (b)	**Is the proposed action to be taken by the Commonwealth or a Commonwealth agency?**	**X**	**No**
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment		

3.2 (c)	**Is the proposed action to be taken in a Commonwealth marine area?**	**X**	**No**
			Yes (provide details below)
	If yes, nature & extent of likely impact on the whole environment (in addition to 3.1(f))		

3.2 (d)	**Is the proposed action to be taken on Commonwealth land?**	**X**	**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 Description of the project area and affected area for the proposed action

Provide a description of the project area and the affected area, including information about the following features (where relevant to the project area and/or affected area, and to the extent not otherwise addressed above). If at Section 2.3 you identified any alternative locations, time frames or activities for your proposed action, you must complete each of the details below (where relevant) for each alternative identified.

3.3 (a) Flora and fauna

Ecological surveys were undertaken by **SHG** between February and September 2015 and again in May 2016 to identify existing ecological values. MNES flora and fauna specific surveys were undertaken over ten (10) survey days (i.e. 2 x 5 day/4 nights) in July 2015. The survey effort is shown as **Plan 3**. The survey was carried out to address all MNES, however a focus was placed on the *Phascolarctos cinereus* (Koala), *Pteropus poliocephalus* (Grey-headed Flying Fox) and *Dasyurus maculates maculatus* (Spot-tailed Quoll), *Delma torquata* (Collared delma) and *Lathamus discolor* (Swift Parrot) as these species are known to occur in the region and have been recorded previously within close proximity to the site (refer **Table 1**). The following provides a brief description of flora and fauna values found on site based on historical and contemporary field surveys:

Flora

Queensland's Regulated Vegetation Management Mapping shows the site as containing Category X (non-remnant) and Category B (remnant vegetation) (refer **Figure 4**). Category X vegetation is not regulated under the VMA. The Vegetation Management Supporting Map (refer **Figure 5**) shows that approximately half of the subject site is mapped as containing remnant vegetation consisting of Endangered and of Concern regional ecosystems.

A detailed field survey to support a Property Map of Assessable Vegetation (PMAV) over the eastern and northern portions of the site was undertaken by senior ecologists from **SHG** on 11th of February and again on 24th, 25th 26th and 30th March 2015. The results of this assessment proposed no changes to the extent of mapped remnant areas of the application site but proposed changes to the mapped regional ecosystem polygons. Indicator species for each regional ecosystem community were identified for each mapping polygon. *Eucalyptus seeana* (Narrow Leaf Red Gum) which is a key species in identifying the Endangered RE12.9-10.12 was only dominant within the far-eastern portion of the site. Subsequently, the certified PMAV (2015/004538) shows remapping of remnant vegetation along the northern and central portions of the site from Endangered RE12.9-10.12 to Of Concern composite RE 12.9-10.2/12.9-10.7 (refer **Figure 6**). It is noted that regional ecosystems associated with essential habitat for Spotted Tailed Quoll, Koala, Wallum Froglet and Tusked Frog remain present on site. A site visit with the **NRM** and the Queensland Herbarium as well as representatives from **SHG** was undertaken as part of the assessment process, and the PMAV was certified on 19 November 2015 (PMAV2015/004538).

A description of these REs is described below:

- **Endangered RE12.9-10.12/12.9-10.7**
  - 12.9-10.12: *Corymbia intermedia, Angophora leiocarpa, Eucalyptus seeana +/- E. siderophloia, E. tereticornis, E. racemosa subsp. racemosa, C. citriodora subsp. variega*ta woodland to open forest. *Lophostemon suaveolens* is often present as a sub-canopy or understorey tree. Occasional *Melaleuca quinquenervia* on lower slopes. Does not include areas dominated by *Eucalyptus racemosa subsp. racemosa*. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g).

- 12.9-10.7: *Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E.* melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c).

- **Of Concern RE12.3.11/12.3.6**
  - 12.3.11: *Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia* open forest to woodland. *Corymbia tessellaris, Lophostemon suaveolens* and *Melaleuca quinquenervia* frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include *Angophora leiocarpa, E. exserta, E. grandis, C. trachyphloia, C. citriodora subsp. variegata, E. latisinensis, E. tindaliae, E. racemosa* and *Melaleuca sieberi. E. seeana* may be present south of Landsborough and *Livistona decora* may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c)
  - 12.3.6: *Melaleuca quinquenervia* +/- Eucalypt*us tereticornis, Lophostemon suaveolens, Corymbia intermedia* open forest to woodland with a grassy ground layer dominated by species such as *Imperata cylindrica*. *Eucalyptus tereticornis* may be present as an emergent layer. Occurs on Quaternary floodplains and fringing drainage lines in coastal areas. (BVG1M: 22a)

- **Of Concern RE12.9-10.2/12.9-10.7**
  - 12.9-10.2: *Corymbia citriodora subsp. variegata* open forest or woodland usually with *Eucalyptus crebra.* Other species such as *Eucalyptus tereticornis, E. moluccana, E. acmenoides* and *E. siderophloia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b).
  - 12.9-10.7: *Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E.* melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c).

It is noted that a separate PMAV has been completed over the south-eastern portion of the site which propose changes of mapping which reduce areas of Endangered RE12.9-10.12/12.9-10.7a to Of Concern RE 12.3.11/12.3.6 and 12.9-10.2/12.9-10.7a (refer **Figure 6**). This PMAV is in the process of being certified by **NRM**.

Under Queensland's *State Planning Policy 2014* (SPP), the site has been identified as containing the following Matters of State Environmental Significance (refer **Figure 8**):

- Wildlife Habitat (Koala) - reflective of **EHP's** South-east Queensland Koala Habitat Values Mapping
- Regulated Vegetation - reflective of **NRM's** Regulated Vegetation Management Mapping.
- Regulated Vegetation Intersecting a Watercourse - reflective of **NRM's** Regulated Vegetation Management Mapping.

The following general flora observations were recorded throughout field survey across the proposed development site:

- Seven (7) threatened plants and three (3) listed Threatened Ecological Community (TEC) described as *Lowland Rainforest of Subtropical Australia* and *Subtropical and Temperate Coastal Saltmarsh* were considered to have potential to occur on-site (i.e. within in 2km radius) (refer **Table 2**). None of these protected matters were recorded on or in vicinity to the site, likely due to historical broad scale clearing and pastoral land use of the site and broader area.

- Three (3) listed threatened plants protected under the *Nature Conservation Act 1992* (Qld) (NCA) were considered to have potential to occur across the site (i.e. within a 10km radius). No specimens were recorded at the time of assessment.

- At the State level, the Swamp Tea-tree (*Melaleuca irbyana*) is listed as Endangered under the *Nature Conservation Wildlife Regulation, 2009,* and was recorded on-site. Swamp Tea-tree occurred only as individual specimens or isolated small stands and did not constitute the critically endangered Threatened Ecological Community, Swamp Tea-tree (*Melaleuca irbyana*) Forest of South-east Queensland, listed under the EPBC Act as a MNES

- Ninety (90) native flora species were identified on site throughout the field assessment along with fifty-three (53) exotic weeds, eleven (11) of which are considered Class2 and Class 3 weed species under the *Land Protection (Pest and Stock Route Management) Act 2002* (LPA).

- Ecological survey of the site shows the referral area is predominately dominated by Eucalyptus and Corymbia species. Specifically, these species included *Eucalyptus tereticornis* (Forest Red Gum), E*ucalyptus siderophloia* (Grey Ironbark), *Corymbia intermedia* (Pink Bloodwood), *Corymbia citriodora* (Spotted Gum, *Eucalyptus seeana* (Narrow Leaf Red Gum). Survey noted non-remnant and some remnant areas contained regrowth vegetation dominated by a number of Acacia species including *Acacia concurrens* (Black Wattle), *Acacia leiocalyx* (Early Flowering Black Wattle), and *Acacia disparrima* (hickory Wattle) as well as a number of declared weed species.

- The majority of the mapped non-remnant area contains open paddocks with some scattered mature specimens dominated by a number of Eucalypt and Corymbia species including *Eucalyptus siderophloia* (Grey Ironbark), *Eucalyptus tereticornis* (Forest Red Gum), *Corymbia citriodora* (Spotted Gum), and the occasional *Corymbia intermedia* (Pink Bloodwood). The remaining portion of the mapped non remnant area contains some regrowth vegetation dominated by a number of Acacia species including *Acacia concurrens* (Black Wattle), *Acacia leiocalyx* (Early Flowering Black Wattle), and *Acacia disparrima* (hickory Wattle).

- Flora species dominated within the lower portion of the site outside of mapped waterways and gullies contained a mix of regional ecosystems comprising species identified above however also contained evidence of the Endangered Regional Ecosystem 12.9-10.12, described as *Eucalyptus seeana, Corymbia intermedia, Angophora leiocarpa woodland on sedimentary rocks*.

- Overall the site has been subject to historical disturbances. Vegetation clearing has resulted in habitat fragmentation and loss, which has led to decreased species abundance, changes to community dynamics and a decline in ecosystem function. The remaining patches of vegetation within this broader context have also undergone a variety of changes. The balance area within this application site has been subject to the impacts of selective clearing regimes, the establishment of access roads and the construction of high powered electricity easements

Fauna

A fauna assessment was conducted by **SHG** in July 2015 in conjunction with the vegetation assessment over the application site. The purpose of the survey was to identify habitat opportunities, observations of species presence and activity, and undertake targeted searches for actual usage by threatened and significant fauna species. A summary of fauna observations based on this contemporary fauna survey has been provided below:

- Eighteen (18) threatened fauna listed under the provisions of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) are considered to have potential to occur within the vicinity of the application site (i.e. within a 2km radius) (refer **Table 2**).

- Of these species, the Koala, Grey-headed Flying-fox and Spot-tailed Quoll were considered to have the potential to occur on site based on local records in the area.
-
- Field survey confirmed that the site contained suitable habitat for the Grey-headed Flying-fox and Koala with two pairs of Koalas (2x mother and joey) recorded on the site.

- Despite local community records no evidence of or suitable habitat for Spot-tailed Quoll (i.e. large hollow logs, potential rock dens) was recorded on site.

- Nine (9) threatened fauna species listed under the *Nature Conservation Act 1992* (NCA) are considered to have potential to occur within the vicinity of the site (i.e. within a 10km radius).

    - Regulated Vegetation Management Mapping identified the site as containing Essential habitat for four (4) listed threatened fauna species protected under the *Nature Conservation Act 1992* being *Phascolarctos cinereus* (Koala), *Crinia tinnula* (Wallum Froglet), *Dasyurus maculatus maculatas* (Spotted-tailed Quoll) and *Adelotus brevis* (Tusked Frog).

    - Despite specific searches, none of these species, with the exception of the Koala, were considered likely to occur.

- The site's ability to support listed threatened fauna species which are generally highly sensitive, specialised and require particular habitat features is highly unlikely for the majority of the listed EPBC Act or NCA protected species.

- Koala surveys were carried out during the field assessment, specifically the Spot Assessment Technique (SAT) which is an assessment of Koala activity involving a search for any Koalas and signs of Koala usage (scats). Thirty-one (31) SAT surveys were carried out at the site with the locations shown on **Plan 3**. Evidence of koala was observed in all but two (2) of the SAT searches, with the majority (i.e. 23 of the 31 SATs) recording results consistent with the "Low" use category for Koala. Only one (1) SAT recorded results considered with "High" use and was located in close proximity to the broad gullies.

- Feral mammal species, such as *Canis lupus* (Dog/Dingo), *Equus caballus* (Horse), *Mus musculus* (House Mouse), *Sus scrofa* (Wild Pig) and *Vulpes vulpes* (Red Fox) were also recorded on-site. Dogs, Dingos and Foxes are considered threats to the Koala and other native species. Further, the noxious amphibian *Rhinella marina* (Cane Toad) was very common on-site, and is considered a significant threat to Spot-tailed Quoll survival as they prey on the poisonous.

- Cattle was identified on site as part of current pastoral land use. Trampling of waterway banks and disturbance of waterbodies was evident.

- Of note, Infrared camera surveys identified only common or feral fauna utilising the site and ultrasonic bat detection and targeted potential roost habitat surveys did not record the calls or evidence of any listed microbat species (refer **Attachment B**).

3.3 (b) Hydrology, including water flows

Norris Creek is an ephemeral tributary of the Logan River and provides connectivity values throughout the immediate landscape. Mapped watercourse tributaries connecting to Norris Creek traversing the eastern portion of the site, are likely to drain overland flow to soil saturation during high rainfall events. The referral area contains the upper reaches

of Norris Creek and is devoid of permanent aquatic habitat features. Mapped drainage lines (refer **Figure 5**) were identified as highly disturbed as a result of historical clearing and cattle grazing and heavily infested with weeds.

Context Plan

A site *Stormwater and Flooding Master Plan Strategy* will be prepared as part of the Context Plan and will address the following:

- 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
- Demonstrate how the proposed infrastructure and other actions will contribute towards the achievement of an overarching site strategy for total water catchment management

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

3.3 (c) Soil and Vegetation characteristics

The site is mapped by the *Australian Soil Resource Information System* as containing primarily Chromosols (refer **Figure 9**). Regional Ecosystem mapping (refer **Figure 4 & 5**) and ground-truthed PMAV (refer **Figure 6**) shows the site contains areas of Land Zones 3 and 9, which are described below.

Land zone 3

Short description: recent Quaternary alluvial systems

General term: alluvial river and creek flats

Recent Quaternary alluvial systems, including closed depressions, paleo-estuarine deposits currently under freshwater influence, inland lakes and associated wave built lunettes. Excludes colluvial deposits such as talus slopes and pediments. Includes a diverse range of soils, predominantly Vertosols and Sodosols; also with Dermosols, Kurosols, Chromosols, Kandosols, Tenosols, Rudosols and Hydrosols; and Organosols in high rainfall areas.

Land zone 9

Short description: fine grained sedimentary rocks

General term: undulating country on fine grained sedimentary rocks

Fine grained sedimentary rocks, generally with little or no deformation and usually forming undulating landscapes. Siltstones, mudstones, shales, calcareous sediments, and labile sandstones are typical rock types although minor interbedded volcanics may occur. Includes a diverse range of fine textured soils of moderate to high fertility, predominantly Vertosols, Sodosols, and Chromosols.

Extract: Land Zone Definitions, Source: Queensland Government

3.3 (d) Outstanding natural features

The site has not been identified as containing outstanding natural features. As previously stated, the site has been disturbed and retains isolated and fragmented ecological values in terms of biodiversity and habitat availability. While the site remains vegetated with predominately native species, disturbance to the ground layer, particularly around access tracks, significantly restricts vegetation regeneration. In addition, the site contains notable weed infestation, particularly around property boundaries and access tracks.

3.3 (e) Remnant native vegetation

Queensland's Regulated Vegetation Management Mapping shows the site as containing Category X (non-remnant) and Category B (remnant vegetation) (refer **Figure 4**). Category X vegetation is not regulated under the VMA. The Vegetation Management Supporting Map (refer **Figure 5**) shows that approximately half of the subject site is mapped as containing remnant vegetation consisting of Endangered and of Concern regional ecosystems. A detailed field survey to support a Property Map of Assessable Vegetation (PMAV) over the eastern and northern portions of the site was undertaken by senior ecologists from **SHG** during February and March 2015. The results of this assessment proposed no changes to the extent of mapped remnant areas of the application site but proposed changes to the mapped regional ecosystem polygons. Subsequently, the certified PMAV (2015/004538) shows remapping of remnant vegetation along the northern and central portions of the site from Endangered RE12.9-10.12 to Of Concern composite RE 12.9-10.2/12.9-10.7 (refer **Figure 6**). Further, a second PMAV has been lodged with **NRM** which proposes a changes to mapped Endangered RE12.9-10.12/12.9-10.7 over the south-eastern portion of the site to Of Concern RE12.3.11/12.3.6 and Re12.9-10.2/12.9-10.7.

A description of these REs is provided below:

- **Endangered RE12.9-10.12/12.9-10.7**
  - 12.9-10.12: *Corymbia intermedia, Angophora leiocarpa, Eucalyptus seeana +/- E. siderophloia, E. tereticornis, E. racemosa subsp. racemosa, C. citriodora subsp. variega*ta woodland to open forest. *Lophostemon suaveolens* is often present as a sub-canopy or understorey tree. Occasional *Melaleuca quinquenervia* on lower slopes. Does not include areas dominated by *Eucalyptus racemosa subsp. racemosa*. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 9g).
  - 12.9-10.7: *Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E.* melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c).

- **Of Concern RE12.3.11/12.3.6**
  - 12.3.11: *Eucalyptus tereticornis +/- E. siderophloia and Corymbia intermedia* open forest to woodland. *Corymbia tessellaris, Lophostemon suaveolens* and *Melaleuca quinquenervia* frequently occur and often form a low tree layer. Other species present in scattered patches or low densities include *Angophora leiocarpa, E. exserta, E. grandis, C. trachyphloia, C. citriodora subsp. variegata, E. latisinensis, E. tindaliae, E. racemosa* and *Melaleuca sieberi. E. seeana* may be present south of Landsborough and *Livistona decora* may occur in scattered patches or low densities in the Glenbar SF and Wongi SF areas. Occurs on Quaternary alluvial plains and drainage lines along coastal lowlands. Rainfall usually exceeds 1000mm/y. (BVG1M: 16c)
  - 12.3.6: *Melaleuca quinquenervia* +/- Eucalypt*us tereticornis, Lophostemon suaveolens, Corymbia intermedia* open forest to woodland with a grassy ground layer dominated by species such as *Imperata cylindrica*. *Eucalyptus tereticornis* may be present as an emergent layer. Occurs on Quaternary floodplains and fringing drainage lines in coastal areas. (BVG1M: 22a)

- **Of Concern RE12.9-10.2/12.9-10.7**
  - 12.9-10.2: *Corymbia citriodora subsp. variegata* open forest or woodland usually with *Eucalyptus crebra.* Other species such as *Eucalyptus tereticornis, E. moluccana, E. acmenoides* and *E. siderophloia* may be present in scattered patches or in low densities. Understorey can be grassy or shrubby. Shrubby understorey of *Lophostemon confertus* (whipstick form) often present in northern parts of bioregion. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 10b).
  - 12.9-10.7: *Eucalyptus crebra +/- E. tereticornis, Corymbia tessellaris, Angophora leiocarpa, E.* melanophloia woodland. Occurs on Cainozoic and Mesozoic sediments. (BVG1M: 13c).

Essential habitat for four (4) listed threatened fauna species protected under the *Nature Conservation Act 19992* being *Phascolarctos cinereus* (Koala), *Crinia tinnula* (Wallum Froglet), *Dasyurus maculatus maculatas* (Spotted-tailed Quoll) and *Adelotus brevis* (Tusked Frog) is associated with mapped REs and local records.

Refer to the Greenbank Ecological Technical Assessment Memo in **Attachment B** for further detail.

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

The site is relatively flat with ridgelines extending along the west down to gullies associated with Norris Creek over the east. Contours range from 79m above sea level to 15m above sea level (refer **Figure 10**).

3.3 (g) Current state of the environment

Include information about the extent of erosion, whether the area is infested with weeds or feral animals and whether the area is covered by native vegetation or crops.

While the site remains vegetated, predominately with native species, surrounding land uses have diminished the site's ecological value. Disturbance from historical clearing, pastoral practices, weed invasion, creation of access tracks and feral animals have left the site devoid of notable ecological features. Further, the site is fragmented from large habitat areas within the broader Greater Flagstone Area.

Over 37% of the flora species recorded on site were identified as exotic weeds, eleven (11) of which are considered Class2 and Class 3 weed species under the *Land Protection (Pest and Stock Route Management) Act 2002*. Further, feral mammal species, such as *Canis lupus* (Dog/Dingo), *Equus caballus* (Horse), *Mus musculus* (House Mouse), *Sus scrofa* (Wild Pig) and *Vulpes vulpes* (Red Fox) were also recorded on-site. Dogs, Dingos and Foxes are considered threats to the Koala and other native species. Further, the noxious amphibian *Rhinella marina* (Cane Toad) was very common on-site, and is considered a significant threat to Spot-tailed Quoll survival as they prey on the poisonous.

Refer to the Greenbank Ecological Technical Assessment Memo in **Attachment B** for further detail.

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

There have been no Commonwealth Heritage Places or other heritage places identified across the site.

3.3 (i) Indigenous heritage values

There are no known places of indigenous heritage of value located across the site.

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

Describe any other key features of the environment affected by, or in proximity to the proposed action (for example, any national parks, conservation reserves, wetlands of national significance etc).

The site is not located near other notable environmental features that are likely to be affected by the proposed action.

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

The entire extent of the site is freehold land.

3.3 (l) Existing land/marine uses of area

The site is currently used for pastoral purposes. Surrounding land uses range from residential, retail, community, transport (rail and bus) and roads (refer **Figures 1 & 2).**

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

The proposed use of the land is for residential, commercial, education, recreation, open space areas and conservation (refer **Plan 1**)

4 Environmental outcomes

Provide descriptions of the proposed environmental outcomes that will be achieved for matters of national environmental significance as a result of the proposed action. Include details of the baseline data upon which the outcomes are based, and the confidence about the likely achievement of the proposed outcomes. Where outcomes cannot be identified or committed to, provide explanatory details including any commitments to identify outcomes through an assessment process.

If a proposed action is determined to be a controlled action, the Department may request further details to enable application of the draft *Outcomes-based Conditions Policy 2015* and *Outcomes-based Conditions Guidance 2015* (http://www.environment.gov.au/epbc/consultation/policy-guidance-outcomes-based-conditions), including about environmental outcomes to be achieved, details of baseline data, milestones, performance criteria, and monitoring and adaptive management to ensure the achievement of outcomes. If this information is available at the time of referral it should be included.

General commitments to achieving environmental outcomes, particularly relating to beneficial impacts of the proposed action, CANNOT be taken into account in making the initial decision about whether the proposal is likely to have a significant impact on a matter protected under the EPBC Act. (But those commitments may be relevant at the later assessment and approval stages, including the appropriate level of assessment, and conditions of approval, if your proposal proceeds to these stages).

The proposed development will result in the clearing of vegetation which is considered to provide habitat for MNES, specifically Koala. As highlighted throughout this referral document this vegetation has been subject to historical broad scale clearing and more recently pastoral practices, regular maintenance activities and edge effects from surrounding rural residential and roads. While evidence of Koala on-site was located during the site survey, it is considered that the species utilises the site as part of a broader home range and does not exclusively occupy the site.

In accordance with the specifications and definitions in the Koala Referral Guideline the proposed action will result in a 270.6 ha impact to habitat defined as Critical for the Koala as outlined and detailed in this referral (and discussed in detail in **Section 5**). Within the context of the Commonwealth **Department of the Environment and Energy** guides and policies (e.g. Part 7 of the EPBC Act), assessment of this Controlled Action Status referral is limited to the negative impacts of the action. We understand that positive outcomes such as site design, mitigation measures, management plans and offsets cannot be considered in this process. Thus, this application focusses on providing detailed information on MNES and potential negative impacts. As such, and in accordance with the relevant guides and policies, the proposal will result in a significant impact on Koala.

However, in practice a number of positive outcomes will be implemented. While it is acknowledged that departmental staff will not be able to consider the following in their controlled action assessment, a brief summary of such positive outcomes has been provided below:

- As a result of site design and State Government regulations, the following obligations are imposed though **EDQ's** PDA Guideline 17 to ensure a net gain in Koala habitat in the region:
    - A financial contribution made to the State Government for investment in creating a net gain in Koala Habitat of $3,311,000

    (Refer Section 5 of this referral for Environmental Offset Explanation)

    In combination, these State Government mandated Koala and revegetation obligations combined with the onsite environmental offset outcome exceed the requirements of the *EPBC Act Environmental Offset Policy*. It is noted that the approval provided for EPBC2014/7206 the decision report acknowledges obligations of PDA Guideline 17 as achieving the calculations and policy outcomes of the EPBC Act Environmental Offset Policy. Additional detail on how and when monetary offsets are provided and how they will be invested to ensure a net gain in koala conservation will be documented through the full assessment process completed under the EPBC Act.

- Broadly it is anticipated that the following environmental management mitigation measures will be committed to as part of the ongoing approvals process (refer response at **Section 5** for further information):

  - Context Plan which incorporates the Natural Environment Overarching Site Strategy
  - EPBC Fauna Management Plan
  - Stage specific Vegetation Management Plans
  - Stage specific Stormwater Management Plan
  - Stage specific Erosion and Sediment Control Plan

- On a local scale, the retention and rehabilitation of 88.9 hectares of Conservation Parkland adjoining Norris Creek and Wearing Park is proposed as part of the development. In accordance with best practice management, restoration and rehabilitation works will seek to stabilise and reverse the negative effects of ongoing habitat fragmentation. The intent is for managed areas of rehabilitation and restoration to rectify canopy gaps and restore bare or denuded areas to provide additional habitat and refugia within the lower strata to maintain connectivity with external approval corridors and improve terrestrial corridor viability.

  The primary objectives recommended for the Conservation area and eastern waterway corridors rehabilitation include:

  - Retain significant floral species and vegetation communities
  - Retain and enhance fauna habitat values
  - Remove and manage processes potentially threatening the viability of existing habitats
  - Increase the extent of vegetation communities and potential fauna habitat over time.

  Rehabilitation works within the Conservation area and waterway corridors will include weed management and replanting with native species consistent with mapped Regional Ecosystems to augment ecological values and enhance connectivity.

  - Additional operational measures will be implemented in association with the clearing of each development stage including:

    - Installation of fauna habitat components within the Conservation area (i.e. nest boxes)
    - Fauna awareness signage along the Conservation area and Lifestyle Guidelines to new residents
    - Roadway crossings over the Conservation area and eastern waterway corridors will be designed so as to be fauna friendly to promote continued fauna dispersal
    - Cat and dog restrictions in the Eco Lot precinct
    - Building envelopes / vegetation protection/ covenants within the Eco Lot Precinct

- Overall, the preservation and rehabilitation of the Conservation area and waterway corridor under the proposal is considered to provide a noteworthy environmental outcome for *Matters of National Environmental Significance* that may infrequently utilise the site as part of a broader home range.
-

Given the detailed survey and assessment works completed on-site and known requirements of EDQ, pre-referral dialogue with the **Department of the Environment and Energy** it is considered that details on the impact, mitigation, management and offset for the project is well established. These known attributes also suggest the project is well placed to be approved via outcomes based conditions. To assist in early analysis of outcomes a preliminary set of outcomes based conditions for the project is included in **Attachment D** of this referral.

5 Measures to avoid or reduce impacts

Note: If you have identified alternatives in relation to location, time frames or activities as part of the proposed action at sections 1.10 and 2.3 please complete this section in relation to each of the alternatives identified.

Provide a description of measures that will be implemented to avoid, reduce, manage or offset any relevant impacts of the action. Include, if appropriate, any relevant reports or technical advice relating to the feasibility and effectiveness of the proposed measures.

For each proposed measure, specify:

- a concise description of the nature, scope, work plan and consequence of the measure for the relevant impact and any statutory or policy basis for the measure;
- in doing so, include analysis and findings on whether each measure is likely to achieve the environmental outcomes for the matters protected by the EPBC Act which are likely to be affected by the proposed action, including noting:
    - the likely effectiveness of the measure in avoiding or mitigating the relevant impact on the matters protected by the EPBC Act;
    - the level of commitment by the person proposing to take the action to achieve the proposed environmental outcomes and implement the proposed mitigation measures. For example, identify if the measures are preliminary suggestions only that have not been fully researched, or are dependent on a third party's agreement (e.g. council or landowner);
    - any likely residual impacts (being, impacts likely to occur having implemented mitigation and/or avoidance measures) and, if such impacts will or are likely to occur, the measure available to compensate or offset these residual impacts. Please consider the Department's *EPBC Act, the EPBC Environmental Offsets Policy* (October 2012) (and *How to use the Offsets Assessment Guide*) and the *draft Policy Statement on EPBC Act Advanced Environmental Offsets*;
    - the likely consequences for the matters protected by the EPBC Act should the measure not be effective; and
    - any other likely consequences of the measure including both adverse and beneficial, such as efficiency, cost and cost-effectiveness and public acceptability (noting however, beneficial consequences of the measure will not be considered in deciding whether or not the proposed action is likely to have a significant impact on the matters protected by the EPBC Act).

Examples of relevant measures to avoid or reduce impacts may include the timing of works, avoidance of important habitat, specific design measures, or adoption of specific work practices.

Note, the Minister may decide that a proposed action is not likely to have significant impacts on a protected matter, as long as the action is taken in a particular manner (section 77A of the EPBC Act). The particular manner of taking the action may avoid or reduce certain impacts, in such a way that those impacts will not be 'significant'. More detail is provided on the Department's web site.

For the Minister to make such a decision (under section 77A), the proposed measures to avoid or reduce impacts must:

- clearly form part of the referred action (e.g. be identified in the referral and fall within the responsibility of the person proposing to take the action);
- be must be clear, unambiguous, and provide certainty in relation to reducing or avoiding impacts on the matters protected; and
- must be realistic and practical in terms of reporting, auditing and enforcement.

A number of pre-referral meetings and discussions were held between **Mirvac**, the **Department of the Environment and Energy** and the **Saunders Havill Group**. At these meetings the rationale behind site design, mitigation measures, approaches to managing impacts and financial and planting offsets were discussed. Within these forums the Department advised that many of these items would not be considered as part of the referral assessment due to the restrictions placed within Part 7 of the EPBC Act and the need for the determination to be based on the potential impacts of the project only. Although unable to be considered in the determination of this referral and not specifically considered or included relative to particular Matters of National Environmental Significance (MNES), a number of design, construction and management measures are noted in terms of reducing the overall environmental impact of the project. Many of these are mandatory based on Local and State based legislation. The preliminary Structure Plan provides details on likely development opportunity for the site. The factors considered as part of the Concept Plan and overall development intent of the site by **Mirvac** are briefly outlined below. It's noted that a number of these factors and items which contribute the positive outcomes for the project cannot be considered as part of this assessment under the EPBC Act.

1. Site Selection for Development

The subject site has been consistently earmarked over the last decade by the State Government as a suitable site for future urban development. There are very few sites in Queensland with direct connection to transport facilities and major infrastructure that can result in such a large development outcome (population base) with relatively manageable environmental, economic and social impacts.

It is acknowledged in this referral and the Greenbank Ecological Technical Assessment Memo (refer **Attachment B**) that the site retains remnant vegetation and other habitat features. Importantly, to implement the development the following core impacts do not occur:

1. No Threatened Ecological Communities are located on site.
2. A high proportion of the vegetated parts of the site (approximately 83.3 hectares) will be retained within 88.9 ha of Conservation Parkland with an additional 38 hectares retained for open space
3. No development proposed in Coastal Management or Hazard areas
4. No development proposed in Wetlands
5. The site is not located within an assessable area of the Koala SPRP
6. No clearing of Viable Endangered Remnant Regional Ecosystem Communities

2. Site Design (Proposed Plan of Development)

The proposed Structure Plan (refer **Plan 1**) further reduces impacts by concentrating development in cleared and lower value vegetation areas to the west with a focus on retaining primary ecological features and higher value site habitat opportunities in the east. All areas on-site mapped and confirmed as retaining Viable Endangered Remnant Vegetation Communities are proposed for retention and enhancement. The vast majority of clearing occurs in lower order remnant, regrowth and selectively vegetated communities with a state classification below the Endangered threshold due to the volume of the same vegetation types remaining within the immediate bioregion.

Other key features of the site design considered to minimise impacts include:

- Retention of ground truthed waterways and buffers
- Retention of highest value vegetation areas in 88.9 ha of Conservation Parkland adjoining Wearing Park.
- In built buffers to the retained vegetated land west of the site external to the Priority Development Area.
- Retention of Viable Endangered Remnant Regional Ecosystem Vegetation Communities
- Esplanade Road frontage to designated conservation parklands – creates a holistic management edge for bushfire control and fauna fencing.

3. Volume of Open Space

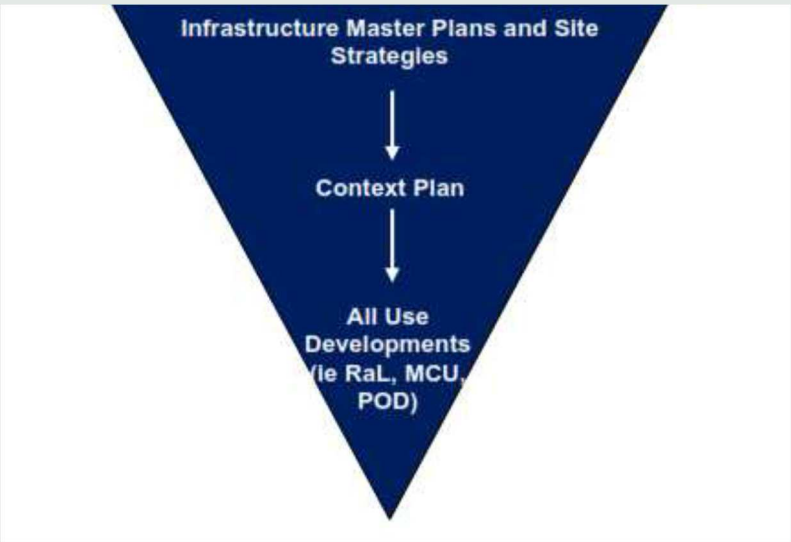
Approximately 88.9 ha will be retained within Conservation Parkland with an additional 38ha dedicated as open space/recreation. **Plan 1** shows the extent of various conservation and open space areas located over the site based on the proposed Master Plan.

4. Further Assessment, Studies and Pre-clearance Surveys

The assessment and approval process outlined by **EDQ** requires submission and review of multiple stages of applications prior to the commencement of works. Prior to commencement of any actual works on the ground the following sequential submissions must be lodged and approved (refer diagram below):

1. Context Plan incorporating Whole of Site Strategies (including a site strategy specifically written for Natural Environment) and Infrastructure Master Plans
2. Lodge and receive approval of Site Context Plans (more detailed information provided at the precinct scale)
3. Lodge and receive approval for Plans of Development (similar to Plans of Subdivision or reconfiguration)

4. 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 in 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 **Mirvac** as a minimum will need to complete the following detailed ecological surveys and reporting:

Natural Environment Site Strategy (incorporated into the whole of site Context Plan)
Establishes the broad environmental objectives of the entire project and includes maps of key conservation and environmental protection areas which will:

- 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 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

Biodiversity Values Assessment Reports
With the submission of each application under the Context Plan, **Mirvac** 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 **Mirvac** 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
- Wetlands, Waterways and Water Quality

Ongoing ecological reporting will be required over the referral area as part of the approval process over the life of the development enabling continual revision and assessment of ecological values and tweaking of the detailed design and development layouts. These Significant Biodiversity Values Assessments assist in warranting against potential time lag from 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 Context Plan are protected and enhanced. This is particularly the case where roads are adjacent to conservation and environmental protection areas. 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)* where adjacent to environmental values. Some of the aspects and practices outlined in this manual and to be incorporated into the project include:

Safe Passage Road Fauna Movement Solutions

Where internal roads within the project are required to cross waterways bridges and or specific fauna movement culverts will be incorporated into the design. These structures will be specifically selected designed and sized to cater for the movement of native fauna anticipated to utilise these creek corridors. Fauna underpasses will be exclusively designed for fauna and separate to hydrology devices. The safe crossing movement solutions will be supported by directional fauna exclusion fencing to ensure animals are funnelled away from vehicle conflicts and into the safe passage areas. Where required additional large tree planting 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 replacement vegetation.

On smaller scale the design esplanade roads running adjacent to waterways and Conservation areas will adopt traffic calming and reduced speed signage to control vehicles adjoining sensitive areas.

Detailed Design Considerations (Storm Water and Landscaping)

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

6. 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 Flood Management Master Plan

A Stormwater and Flood Management Master Plan will be prepared to comply with the following standards:

- Queensland Water Quality Guidelines (DERM 2009)
- ANZECC Guidelines (2000)
- Urban Stormwater Planning Guidelines (DERM 2010)
- State Planning Policy for Healthy Waters (SPP 4-10)

b) Confirmation and Pre-Clearance Surveys

As a result of the likely time delay from preparation of assessment reports to approvals and again through the sequencing of development precincts and clearing works it is a requirement that a system of preclearance surveys are conducted prior to each stage of actual site clearing. These surveys will be used to inform management plans relative to the natural features in the 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 operational works package. The VCMP 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 VCMP 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 tor 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
- 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) will be prepared for the impacts of the construction phase covering for the loss of vegetated areas, isolated trees and barriers and impediments to the existing open semi-rural areas. 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

- 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 an **EHP** registered wildlife spotter / catcher. This role is mandated for any clearing of native vegetation in Queensland both within and external to Priority Development Areas. Within **EDQ** the role of the Fauna Spotter is to complete an assessment of the works area no more than 2 weeks prior to the works actually occurring and present a short 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 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 State Government stating all fauna encountered and the specific management measures used to ensure the safety of native animals.

f) Rehabilitation and On-Going Management Plan

Mirvac have committed to major weed removal, control and revegetation as part of the overall objective of enhancing the 88.9 ha Conservation Parkland and waterway corridors. Detailed Rehabilitation Plans will be prepared and issued to **EDQ** for assessment.

g) Stormwater Quality Management Plan / Erosion and Sediment Control plans

Further to the whole of site Master Plan already prepared 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 should contain details on the exact location of stormwater treatment systems, including structural and surface treatment devices. The plan should include details on:

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

7. 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. **Mirvac's** land is proposed to provide an urban growth hub incorporating residential, commercial, education and recreational land uses within close proximity to rail and road services. Development densities within the site will vary with lower density interface lots adjoining existing rural residential and the 75 hectare Eco Lot precinct providing covenanted lots at a density in the order of 1 dwelling/hectare. 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

Residence of the Eco-Lots and development areas which adjoin or are in close proximity to sensitive receiving environments will receive lifestyle guideline documentation prepared by **Mirvac** to help promote a range of ecological sustainable living principles. 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 included within the education documents include:

- Appropriate plant selection on allotments
- Inappropriate planting species (known local or declared weed species)
- Management of house hold scale run off
- Protection of native animals and the types of native animals residents could expect to see

- Understanding storm water devices
- Appropriate management of domestic animals
- Location of dog on lead and off-leash areas
- 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 the local streetscapes, immediate creek corridors and open space infrastructure maximising the outcomes promoted through the proposed Context Plan.

b) Detailed Landscape Submissions

The proposal includes an abundance of open space, buffers, new streetscapes and storm water treatment areas, conservation corridors, scenic amenity areas and general tree protection zones. A non-invasive, locally endemic species palette will be adopted throughout all these 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.

c) Cat and Dog Restrictions

The size, tight density and locality of most of the proposed development areas within the project does not support wholesale cat and or dog restrictions on private allotments. For the bulk of the project area a broad non-mandated animal control scheme is proposed which is likely to include the following features:

- Broad resident education on responsible domestic animal ownership
- 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
- **Logan City Council** Animal Control Local Law which requires registration, vaccinations, etc. will apply throughout the project.

More stringent private allotments animal controls will be applied within the Eco-Lot Precinct. Controls may vary from complete prohibition to limit the number and size of animals allowable on individual allotments and will be determined as part of detailed design. 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 (Ecological Allotment Precincts)

Based on the required development densities prescribed in the **EDQ** Greater Flagstone Urban Development Area Development Scheme the average allotment size created will be approximately 450 square metres over the majority of the Urban Designated land. The primary exception to this is the creation of the Ecological Allotment Precinct which will include the following restrictive requirements:

1. The lot layout, road locations and modelled earthworks outcomes through the Ecological Allotment Precinct are based on the findings or detailed site survey including an individual tree survey noting tree types, sizes, habitat values and health condition.

2. While subject to further investigation, detailed design and planning approval, **Mirvac** intends to retain at least 50% (37.5ha) of existing vegetation within the 75ha Eco Lot precinct. The average allotment size through the Ecological Allotment precinct is anticipated to be approximately 10,000 square metres, although individual lots may be much larger where warranted by the environmental values. It is intended that each allotment will be assigned a pre-designated Development area (building envelope) of approximately 2,500 square metres. The balance 7,500 – 2,500 square metres of vegetated land will be restricted from clearing via Statutory Covenant created on the title of the new allotment. Building Envelope locations will be purposely selected to allow for the aggregation and connection of ecological areas through covenant restricted portions of the allotments.
3. Fencing to allotment boundaries will be limited to fauna friendly fencing types around the boundary.
4. Domestic animals will be restricted to either complete prohibition or constrained to the Building Envelope via exclusion fencing.
5. All roads through the allotment precinct will be low scale residential streets with fauna movement solutions at all corridor and waterway crossing points.

There have been numerous unsuccessful attempts to create and integrated ecological development precinct. Traditionally these occur on allotments 2,000-4,000 square metres with a 50% remove / retain outcome. Allotment sizes in the Eco Lot Precinct are substantially larger with a target 75% retain to 25% removal ratio. **Mirvac** have developed this private conservation ownership concept recognising ecological values which required protection in an area where **LCC** have indicated that they would not accept transfer of the land as a conservation asset.

e) Replanting and Financial Contributions

The **Mirvac** Greater Flagstone project site retains a number of known State and Local Government Constraint layers and features and as a result the proposal is assessed against highly regulated Queensland Government environmental controls. These assist significantly with the avoidance, reduction and offsetting of environmental impacts. The project site design commences and is concentrated in the western portions of the land holding where nil or low environmental values have been located, before progressing through slightly improved ecological values and transitioning to retain the highest conservation values located on site. In addition to these site design and sequencing benefits an extensive volume of management plans and measures are required as outlined in this referral. It is acknowledged that despite these obligations resulting in significant environmental offset outcomes for the protected matter that these beneficial aspects of the project will not be assessed in accordance with Part 7 of the EPBC Act and the controlling provisions within this referral assessment.

<u>Environmental Obligations:</u>

In addition to these outcomes it's important to note that the project occurs within the jurisdiction of the *PDA Guideline 17, Remnant Vegetation and Koala Offset Obligations in Greater Flagstone and Yarrabilba PDAs* (Guideline 17) included as **Attachment C**). Guideline 17 mandates two different environmental obligation requirements for the site based on:

1) Clearing of Koala Habitat and Establishment of Housing in Koala Habitat

Within the Guideline two separate applicable charges apply to the project for the management of koala matters. These include:

1) Clearing offset contributions listed as:
    a. $15,000 per ha of clearing of mapped Bushland Layers (High, Medium and Low)
    b. $5,000 per ha of clearing of mapped Suitable for Rehabilitation layers (High and Medium)
2) A charge of $150 per dwelling established on the project site.

Koala habitat values mapping overlayed with the likely clearing footprint is included in **Figure 11** and shows the following volumes of clearing and charges applicable to the project under Guideline 17:

1. Clearing of Koala Habitat Bushland equals 148.4 ha x $15,000 = total charge of $2,226,000
2. Clearing of Koala Suitable for Rehabilitation Habitat 118 ha x $5,000 = total charge of $590,000
3. $150 per dwelling charge multiplied by Master Plan Yield of 3,300 equals $495,000

Total cost of environmental offset for Koala on the site Equals = $3,311,000*
** Note – Assumes clearing of 50% (37.5ha) of koala habitat within the Eco Lot Precinct at $15,000 / hectare. This precinct is subject to further investigation and the extent of clearing will be confirmed in due course, but will not be greater than 37.5ha.*

Guideline 17 notes the purpose of charging the financial obligation is to ensure the project contributes to a net gain in Koala habitat in the region. On the 30th of October 2014 the **DoE** made the determination on the Greater Flagstone Project (EPBC 2014/7206). This project area retained the applicable charges from Guideline 17. Within this referral and approval the **DoE** acknowledged and conditioned the Guideline 17 costs as meeting the requirements of the *EPBC Act Environmental Offset Policy*.

"*The proponent is under obligation by EDQ, to contribute financially towards a fund that will purchase and protect habitat areas that have the highest conservation value for south-east Queensland koalas. This fund is underpinned by the offset framework known as ULDA Guideline 17, Remnant vegetation and koala offset obligations in Greater Flagstone and Yarrabilba UDAs (2012)….*"

The Department notes that the proposed financial contribution meets the requirements of the EPBC Act environmental offset policy, and as such, the ***Department should not impose additional and duplicative offsets*** *on the proponent. This strategic approach is in line with the current memorandum of understanding between the Commonwealth of Australia and the Queensland State Government.*

(Extracts from Draft Recommendations Report – EPBC 2014/7206 – Attachment B – Page 7 of 14 Section 3.6 Offsets – Underlining and bolding provided by **Saunders Havill Group**)

Overall, the project will result in a 270.6 ha of impact to habitat defined under the Koala Referral Guideline as Critical for the koala species as outlined and detailed in this referral.

As a result of responsive site design and State Government regulations the following potential environmental obligation provisions will be applied to this impact through EDQ Implementation Guideline 17:

1. A financial contribution made to the State Government for investment in creation a net gain in Koala Habitat of $3,311,000

It is noted that within the context of this Controlled Action Status referral, Part 7 of the EPBC Act prevents the Department Officers from considering these beneficial attributes for the project and offset solutions. Regardless the suite of measures and offsets in built for the project and State Government legislation substantially reduce, manage and offset the proposed impacts of the development to a level which balances environmental and priority development outcomes. Within the context of a Controlled Action Assessment these items will be fully documented and assessed against the controlling provisions of the EPBC Act. Where based on preliminary assessment it will be demonstrated that the measures will achieve and exceed the EPBC Act Environmental Offset Policy requirements.

6 Conclusion on the likelihood of significant impacts

Identify whether or not you believe the action is a controlled action (ie. whether you think that significant impacts on the matters protected under Part 3 of the EPBC Act are likely) and the reasons why.

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

	No, complete section 5.2
X	Yes, complete section 5.3

6.2 Proposed action IS NOT a controlled action.

Specify the key reasons why you think the proposed action is NOT LIKELY to have significant impacts on a matter protected under the EPBC Act.

6.3 Proposed action IS a controlled action

Type 'x' in the box for the matter(s) protected under the EPBC Act that you think are likely to be significantly impacted. (The 'sections' identified below are the relevant sections of the EPBC Act.)

	Matters likely to be impacted
	World Heritage values (sections 12 and 15A)
	National Heritage places (sections 15B and 15C)
	Wetlands of international importance (sections 16 and 17B)
X	Listed threatened species and communities (sections 18 and 18A)
	Listed migratory species (sections 20 and 20A)
	Protection of the environment from nuclear actions (sections 21 and 22A)
	Commonwealth marine environment (sections 23 and 24A)
	Great Barrier Reef Marine Park (sections 24B and 24C)
	A water resource, in relation to coal seam gas development and large coal mining development (sections 24D and 24E)
	Protection of the environment from actions involving Commonwealth land (sections 26 and 27A)
	Protection of the environment from Commonwealth actions (section 28)
	Commonwealth Heritage places overseas (sections 27B and 27C)

Specify the key reasons why you think the proposed action is likely to have a significant adverse impact on the matters identified above.

Beneficial outcomes of the project such as mandated offsets, State Government regulations and site design will minimise, mitigate, and offset negative attributes to a level where Significant Impacts on Matters of National Environment Significance are avoided. However, it is understood that the legislative context of this Part 7 Referral Assessment prevents Departmental Officers from considering such beneficial outcomes in their assessment of the project and in determining the Controlled Action status of the application. The majority of positive outcomes for the project have not been detailed in this referral with a focus on identifying matters and the impacts linked to these matters. On assessment the proposal is considered a Controlled Action for Koala (only) when reviewed administratively against the legislative provisions of EPBC Act and the Koala Referral Guideline. Two core considerations in the making of this Controlled Action recommendation include:

1) The relatively broad "catch all" definition for Critical Habitat for the Koala and low clearing thresholds adopted in the Koala Referral Guideline; and
2) The inability for Departmental Officers to consider the existing mandated Koala Offset requirements and other beneficial outcomes (created dedicated conservation land, weed management, revegetation, and education) within the legislative context of a Part 7 referral assessment.

If the positive factors were considered in this referral, the project is assessed to minimise, mitigate and offset impacts on protected matters through site design, management plans and a large financial contribution towards creating a net gain in koala habitat within the region.

The project is considered a Controlled Action on administrative grounds with the full provisions of the Act requiring triggering to enable the positive aspects of the proposal to factor in the overall assessment.

The identification, proposed management and proposed offsetting of the impact is considered acceptable based on the detailed information included in this referral as summarised as:

Assessment and Impact Certainty

- Detailed site survey has been completed over a 12-month period utilising methods espoused by the **Department of the Environment and Energy** in the searching for threatened species and communities as noted as having the potential to occur and or have relevance to the site.
- The collected site data and the use of the site by specifically scheduled species has been identified, mapped and described in accordance with the Departmental requirements.
- Impacts have been noted, analysed and assessed in accordance with Departmental Guidelines, criteria and practice notes.
- Plans, notes, schedules, the proposal and its impacts were provided to the Department and discussed in a pre-referral context, inclusive of meetings in Canberra well in advance of this referral application.
- The matters and the impacts to these matters through the site proposal are well known and quantified in accordance with Departmental metrics.

Site Context, Infrastructure and Planning Framework

- The application site is predominantly surrounded by a modified landscape of rural residential land uses and while providing habitat for specific matters (Koala) is not pristine or crucially located for the local survival of the species.
- The land occurs within a declared and gazetted Priority Development Area (PDA) forecasted to provide housing needs predicted for the region.
- The development designation is supported by large scale commitments to future Local and State Government infrastructure for roads, sewer, water and electricity.

Site Design of the Proposal

- Site ecological surveys and results were completed during the initial Due Diligence phase of the project to ensure constraints were known, quantified and mapped prior to the commencement of site layout design.
- The proposal logically concentrates development (and importantly the commencement of development) along the western portion of the land holding where land has been previously cleared and transitions into higher quality environmental features in the east.
- The best area of vegetation recording the highest diversity of both MNES and other fauna attributes and habitat is retained in the north east corner in an 88.9 ha primarily conservation designated allotment. This area triples the size of an adjoining off-site Council parkland preserved primarily for tree retention.

- A large format Eco Lot Precinct is proposed where land containing ecological values worth preservation has been identified, and such land is unlikely to be accepted by the local authority as a conservation asset. It is intended that this product will comprise of low density development in the form of approximately 1 dwelling/hectare with specific controls for vegetation clearing, house locations, cat and dog ownership regulations and permeable fauna movement solutions.

Mitigation, Management and Environmental Offsets

- The site proposal will be constructed over a long currency period (up to 20 years) with commencement occurring within the cleared portions of the site before transitioning into the semi vegetated areas and ultimately removing areas of lower order remnant vegetation. The impact will be gradual by comparison to mitigation measures and offsets and allows for the establishment of conservation outcomes and time lag controls for enhancing long term koala habitat areas.
- Vegetation, Fauna, Stormwater, Sediment and Erosion Control issues will all be managed through a mandatory need to deliver management plans to the State Government for assessment, approval and implementation.
- The site exists within a heavily regulated environmental offset area and must deliver a total financial investment for the koala species of $3,311,000. These funds are to contribute towards the persistence of the koala locally and under State Government Legislation must in part be used to establish and increase Koala Habitat with the region.

This referral, and the pre-referral process completed prior to lodgement, acknowledges the site's constraints and outlines impacts in accordance with assessment methods documented within Commonwealth **Department of the Environment and Energy** guidelines and advice notes. The site occurs within an area where environmental features, assessment, impacts and offsets are heavily regulated by the Queensland State Government. The outcomes of State Government environmental constraints and regulation for identical species exceed the controls that would be employed by the Commonwealth Government, however in accordance with the EPBC Act are not contemplated in this referral.

Within the Greater Flagstone Priority Development Area (PDA) the Department has previously made determinations which acknowledge and seek not to duplicate the Queensland Government Environmental Assessment and Approval process, particularly in relation to offsets. To enable a similar outcome to be applied this project must be assessed as a Controlled Action. The information contained within this referral, discussed during pre-referral conferences and other decisions made by the Department in the PDA logically advocate the project towards Assessment on Referral Information. To assist with this consideration **Attachment D** includes a schedule of preliminary Draft Outcome Conditions deemed relevant to the project and as previously adopted by the Department in Controlled Action Approvals.

7 Environmental record of the responsible party

NOTE: If a decision is made that a proposal needs approval under the EPBC Act, the Environment Minister will also decide the assessment approach. The EPBC Regulations provide for the environmental history of the party proposing to take the action to be taken into account when deciding the assessment approach.

		Yes	No
7.1	**Does the party taking the action have a satisfactory record of responsible environmental management?**	X	

Yes.

Note that **Mirvac Queensland Pty Limited** is a subsidiary of the **Mirvac Group** ("Mirvac").

In addition to its significant non-residential activities, **Mirvac's** residential development division delivered over 2,200 residential lots in FY15.

The company has long been at the forefront of green building and sustainable development. Its sustainability commitment has been recognised internationally, with a listing on the Dow Jones Sustainability World Index, the Australian SAM Sustainability Index (AuSSI) and FTSE4Good.

In 2014, **Mirvac** was recognised as Regional Leader in the diversified sector under the Global Real Estate Sustainability Benchmark (GRESB), which pointed to the strength of our strategy, operations across the business and transparent public reporting.

Further environmental accomplishments include:

- Australia's first solar suburb at Newington's Olympic Village, NSW
- 6-leaf EnviroDevelopment accreditation for numerous projects including Mulataga WA, Highland Reserve WA, Tullamore Vic.
- UDIA NSW Concept Design Award winner 2011 – 'recognised environmental initiatives as a key part of project achievements' for the Googong master-planned township
- Googong township is targeting a Green Star rating under the new Communities Pilot tool
- WA's first planned built-form community at The Peninsula Burswood showcasing the widest array of housing choices WA had ever seen and an innovative seven-lake storm-water treatment system
- Innovative, integrated sustainability at Green Square Town Centre, NSW, encapsulated in the Life—Space—Buildings design and operations methodology.
- First Australian developer to build a carbon neutral home at Harmony9 at Waverley Park, Victoria

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?**		X
	If yes, provide details No, although **Mirvac (WA) Pty Ltd** (Mirvac WA), a subsidiary of **Mirvac Limited**, is currently negotiating terms of a Deed of Settlement (Deed) with the **Department of the Environment and Energy** in relation to a contravention of Particular Manner under the EPBC Act (EPBC Reference 2009/5261). Under the Deed **Mirvac WA** has voluntarily agreed to undertake works pursuant to an offset proposal agreed to with the Department (Works). Upon completion of the Works to the Department's satisfaction the Department has agreed not to pursue further action against **Mirvac WA,** or to perform and exercise any statutory and / or discretionary powers under the EPBC Act. This breach related to an incident in early 2012.		
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?**	X	

If yes, provide details of environmental policy and planning framework

The action will be taken through project level initiatives which align with **Mirvac's** Sustainability Policy and Sustainability Strategy outlined below. Note that the policy and strategy documents consider the performance of **Mirvac** as a whole. While the subject project will contribute towards the goals of the **Mirvac Group** Sustainability Policy & Strategy, it is not intended that targets, approaches and methodology outlined below will be achieved by the project in isolation.

Sustainability Policy

Extract - *"Our commitment to sustainability is outcomes-based, innovative and founded on the belief that we have a wider responsibility for our contribution to have a lasting impact.* ***Mirvac*** *strives for sustainability excellence in all our operations to build a lasting legacy for the planet and for our people. We recognise the increasing relationship between sustainability performance and company performance. Through sustainable building practices* ***Mirvac*** *seeks to deliver value to investors, as well as the wider community"*

Sustainability Strategy

Mirvac's sustainability strategy, 'This Changes Everything', informs our approach to development providing a framework for place making, design, construction, post-occupancy operation, community building and economic development. **Mirvac** strives for sustainability excellence in all operations, an approach that is clearly outlined in the four areas of focus underpin the strategy, Re-Imagining Resources, Shaping the Future of Place, Smarter Thinking and Enriching Communities.

Mirvac wide missions outlined within these areas include:

- becoming net positive and zero waste by 2030;
- creating a framework for the future of place by 2015;
- creating the first smart portfolio by 2020; and
- demonstrating community investment within and beyond our boundaries by 2018.

Our approach is grounded in a rich history of achievements that demonstrate our team's capability to deliver. This Changes Everything provides a holistic approach to sustainability and is directly applicable to meet all of the project objectives. We will do this by applying an integrated methodology that is;

- Multi-disciplinary and promotes a way of problem solving that recognises the interconnected nature of things; and
- Collaborative and empowering, enabling all stakeholders to be part of the decision making and consequently have "ownership" in the physical, economic and social plans for the Greenbank community. We call this Integrated Participatory Design and it is a departure from the traditional "Design and Defend" approach adopted by many of our competitors.

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?**		
	Provide name of proposal and EPBC reference number (if known) 2001/335 - Mirvac Homes Pty Ltd/Urban developments/Kellyville/NSW/Lots 24 & 25 Kierle Road Residential Subdivision, Kellyville 2002/711 - Mirvac Homes NSW Pty Ltd/Urban and commercial new development/Bateau Bay/NSW/Residential Development 2003/995 - Mirvac Projects Pty Limited/Tourism, recreation and conservation management/The Entrance North/NSW/Magenta Shores Integrated Tourist Facility and golf course 2003/1136 - Mirvac Homes/Urban and commercial new development/The Poplars, Queanbeyan/NSW/North and South Poplars Residential Development 2004/1378 - Mirvac/Urban and commercial new development/Breakfast Creek/NSW/Residential development at Doonside Crescent Woodcroft, Blacktown LGA 2004/1913 - Western Australian Beach and Golf Resort Pty Ltd/Mirvac Fini/Urban and commercial new development/Port Kennedy/WA/Multipurpose development stage 1 within 340ha 2005/2181 - Mirvac Homes/Urban and commercial new development/Spring Farm/NSW/Realignment of Link Road and residential development adjacent to Camden Bypass 2008/3984 - Mirvac (WA) Pty Ltd/Residential Development/Part Lot 9002 Sticks Blvd, Bridgewater Nth,Erskine, Mandurah/WA/Proposed Urban Development 2009/5046 - Mirvac (WA) Pty Ltd/Residential development/Lots 195, 304, 9003 Lakes Parade, Binningup/WA/Binningup Beach Residential Development, Lots 195, 304, 9003 Lakes Parade, Binningup WA 2009/5261 - Mirvac (WA) Pty Ltd/Residential development/Jane Brook, City of Swan, approx. 25 km NE of Perth CBD/WA/Rural/Residential Subdivision at Lot 502 Jane Brook Drive 2010/5693 - Mirvac (WA) Pty Ltd/Commercial development/4km NE of Mandurah and 60km south of Perth/WA/Parklands West Estate Development 2011/5819 - Mirvac Projects Pty Ltd/Natural resources management/Hoxton Park Airport redevelopment site, Sydney/NSW/construction of a regional scale stormwater detention basin, spillway and outlet 2011/6103 - Mirvac Homes (NSW) Pty Ltd/Residential development/Hoxton Park/NSW/Hoxton Park Residential development 2013/6751 - Mirvac Pacific Pty Ltd/Residential development/Pimpama/QLD/Clearing of vegetation for the Gainsborough Greens residential subdivision 2013/7022 - Mirvac (WA) Pty Ltd/Commercial development/Port Kennedy, Rockingham/WA/Kennedy Bay Urban Development, PortKennedy, Rockingham, WA 2014/7122 - Mirvac (WA) Pty Ltd/Residential development/Port Kennedy Drive, Port Kennedy/WA/Kennedy Bay urban development, Port Kennedy, WA	X	

8 Information sources and attachments

(For the information provided above)

8.1 References

- List the references used in preparing the referral.
- Highlight documents that are available to the public, including web references if relevant.

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/

Dique DS, de Villiers DL and Preece HJ 2003, *Evaluation of line-transect sampling for estimating Koala abundance in the Pine Rivers Shire, south-east Queensland.' **Wildlife Research 30:** 127-133.*

Hill & Curran 2003, *Area, shape and isolation of tropical forest fragments: effects on tree species diversity and implications for conservation. **Journal of Biogeography, 30:** 1391-1403.*

Phillips S & Callaghan J 2011, *The Spot Assessment Technique: a tool for determining localised levels of habitat use by Koalas Phascolarctos cinereus. **Australian Zoologist 35(3)**: 774-780.*

Saunders Havill Group 2015, *Ecological Assessment Report EPBC Act Referral* commissioned by **Mirvac Pty Ltd**

8.2 Reliability and date of information

For information in section 3 specify:

- source of the information;
- how recent the information is;
- how the reliability of the information was tested; and
- any uncertainties in the information.

Refer to **Section 8.1 References**.

8.3 Attachments

Indicate the documents you have attached. All attachments must be less than three megabytes (3mb) so they can be published on the Department's website. Attachments larger than three megabytes (3mb) may delay the processing of your referral.

		✓ attached	Title of attachment(s)
You must attach	figures, maps or aerial photographs showing the project locality (section 1)	✓	Included at the end of this referral.
	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	✓	Included at the end of this referral.

	environmental significance or important features of the environments (section 3)		
If relevant, attach	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)	✓	*Greater Flagstone Urban Development Area Development Scheme* *PDA Guideline 17, Remnant Vegetation and Koala Offset Obligations in Greater Flagstone and Yarrabilba PDAs* (**Attachment C**)
	copies of any flora and fauna investigations and surveys (section 3)	✓	Greenbank Ecological Technical Memo – MNES Flora and Fauna by SHG (**Attachment B**).
	technical reports relevant to the assessment of impacts on protected matters that support the arguments and conclusions in the referral (section 3 and 4)	✓	Greenbank Ecological Technical Memo – MNES Flora and Fauna by SHG (**Attachment B**)
	report(s) on any public consultations undertaken, including with Indigenous stakeholders (section 3)		N/A

9 Contacts, signatures and declarations

NOTE: Providing false or misleading information is an offence punishable on conviction by imprisonment and fine (s 489, EPBC Act).

Under the EPBC Act a referral can only be made by:

- the person proposing to take the action (which can include a person acting on their behalf); or
- a Commonwealth, state or territory government, or agency that is aware of a proposal by a person to take an action, and that has administrative responsibilities relating to the action[1].

Proposed action title: Mirvac Greater Flagstone Project - Master Planned Development

9.1 Person proposing to take action

This is the individual, government agency or company that will be principally responsible for, or who will carry out, the proposed action.

If the proposed action will be taken under a contract or other arrangement, this is:

- the person for whose benefit the action will be taken; or
- the person who procured the contract or other arrangement and who will have principal control and responsibility for the taking of the proposed action.

If the proposed action requires a permit under the Great Barrier Reef Marine Park Act[2], this is the person requiring the grant of a GBRMP permission.

The Minister may also request relevant additional information from this person.

If further assessment and approval for the action is required, any approval which may be granted will be issued to the person proposing to take the action. This person will be responsible for complying with any conditions attached to the approval.

If the Minister decides that further assessment and approval is required, the Minister must designate a person as a proponent of the action. The proponent is responsible for meeting the requirements of the EPBC Act during the assessment process. The proponent will generally be the person proposing to take the action[3].

1. Name and Title:	
2. Organisation (if applicable):	**Mirvac Queensland Pty Limited** **Contact Person: Mark Clancy – Development Manager**
3. EPBC Referral Number (if known):	
4: ACN / ABN (if applicable):	**24 060 411 207**
5. Postal address	**PO Box 10047, Adelaide Street** **BRISBANE QLD 4000**
6. Telephone:	**(07) 3859 5888**
7. Email:	**mark.clancy@mirvac.com**
8. Name of designated proponent (if not the	

[1] *If the proposed action is to be taken by a Commonwealth, state or territory government or agency, section 8.1 of this form should be completed. However, if the government or agency is aware of, and has administrative responsibilities relating to, a proposed action that is to be taken by another person which has not otherwise been referred, please contact the Referrals Gateway (1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

[2] *If your referred action, or a component of it, is to be taken in the Great Barrier Reef Marine Park the Minister is required to provide a copy of your referral to the Great Barrier Reef Marine Park Authority (GBRMPA) (see section 73A,* EPBC Act*). For information about how the GBRMPA may use your information, see http://www.gbrmpa.gov.au/privacy/privacy_notice_for_permits.*

[3] *If a person other than the person proposing to take action is to be nominated as the proponent, please contact the Referrals Gateway(1800 803 772) to obtain an alternative contacts, signatures and declarations page.*

same person at item 1 above and if applicable):

9. ACN/ABN of designated proponent (if not the same person named at item 1 above): **As above**

COMPLETE THIS SECTION ONLY IF YOU QUALIFY FOR EXEMPTION FROM THE FEE(S) THAT WOULD OTHERWISE BE PAYABLE

I qualify for exemption from fees under section 520(4C)(e)(v) of the EPBC Act because I am:

□ an individual; OR

□ a small business entity (within the meaning given by section 328-110 (other than subsection 328-119(4)) of the *Income Tax Assessment Act 1997*); OR

□ not applicable.

If you are small business entity you must provide the Date/Income Year that you became a small business entity:

Note: You must advise the Department within 10 business days if you cease to be a small business entity. Failure to notify the Secretary of this is an offence punishable on conviction by a fine (regulation 5.23B(3) *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth)).

COMPLETE THIS SECTION ONLY IF YOU WOULD LIKE TO APPLY FOR A WAIVER

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:

□ not applicable.

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.
I agree to be the proponent for this action.
I declare that I am not taking the action on behalf of or for the benefit of any other person or entity.

Signature

Date 15/11/16

SIGNED BY WARWICK JAMES BIBLE AND PAUL CHRISTOPHER SANDERS AS DIRECTORS OF MIRVAC QUEENSLAND PTY LIMITED (ACN 060 411 207)

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

Name	**Murray Saunders**
Title	**Director**
Organisation	**Saunders Havill Group Pty Ltd**
ACN / ABN (if applicable)	**24 144 972 949**
Postal address	**9 Thompson Street, Bowen Hills, QLD 4006**
Telephone	**(07) 3251 9415**
Email	murraysaunders@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 29/09/2016

REFERRAL CHECKLIST

NOTE: This checklist is to help ensure that all the relevant referral information has been provided. It is not a part of the referral form and does not need to be sent to the Department.

HAVE YOU:

- ❑ Completed all required sections of the referral form?
- ❑ Included accurate coordinates (to allow the location of the proposed action to be mapped)?
- ❑ Provided a map showing the location and approximate boundaries of the project area?
- ❑ Provided a map/plan showing the location of the action in relation to any matters of NES?
- ❑ Provided a digital file (preferably ArcGIS shapefile, refer to guidelines at Attachment A) delineating the boundaries of the referral area?
- ❑ Provided complete contact details and signed the form?
- ❑ Provided copies of any documents referenced in the referral form?
- ❑ Ensured that all attachments are less than three megabytes (3mb)?
- ❑ Sent the referral to the Department (electronic and hard copy preferred)?

Attachment A

Geographic Information System (GIS) data supply guidelines

If the area is less than 5 hectares, provide the location as a point layer. If the area greater than 5 hectares, please provide as a polygon layer. If the proposed action is linear (eg. a road or pipeline) please provide a polyline layer.

GIS data needs to be provided to the Department in the following manner:

- Point, Line or Polygon data types: ESRI file geodatabase feature class (preferred) or as an ESRI shapefile (.shp) zipped and attached with appropriate title
- Raster data types: Raw satellite imagery should be supplied in the vendor specific format.
- Projection as GDA94 coordinate system.

Processed products should be provided as follows:

- For data, uncompressed or lossless compressed formats is required - GeoTIFF or Imagine IMG is the first preference, then JPEG2000 lossless and other simple binary+header formats (ERS, ENVI or BIL).
- For natural/false/pseudo colour RGB imagery:
    - If the imagery is already mosaiced and is ready for display then lossy compression is suitable (JPEG2000 lossy/ECW/MrSID). Prefer 10% compression, up to 20% is acceptable.
    - If the imagery requires any sort of processing prior to display (i.e. mosaicing/colour balancing/etc) then an uncompressed or lossless compressed format is required.

Metadata or 'information about data' will be produced for all spatial data and will be compliant with ANZLIC Metadata Profile.
(http://www.anzlic.org.au/policies_guidelines#guidelines).

The Department's preferred method is using ANZMet Lite, however the Department's Service Provider may use any compliant system to generate metadata.

All data will be provide under a Creative Commons license
(http://creativecommons.org/licenses/by/3.0/au/)