Appendix H – Ecological Assessment

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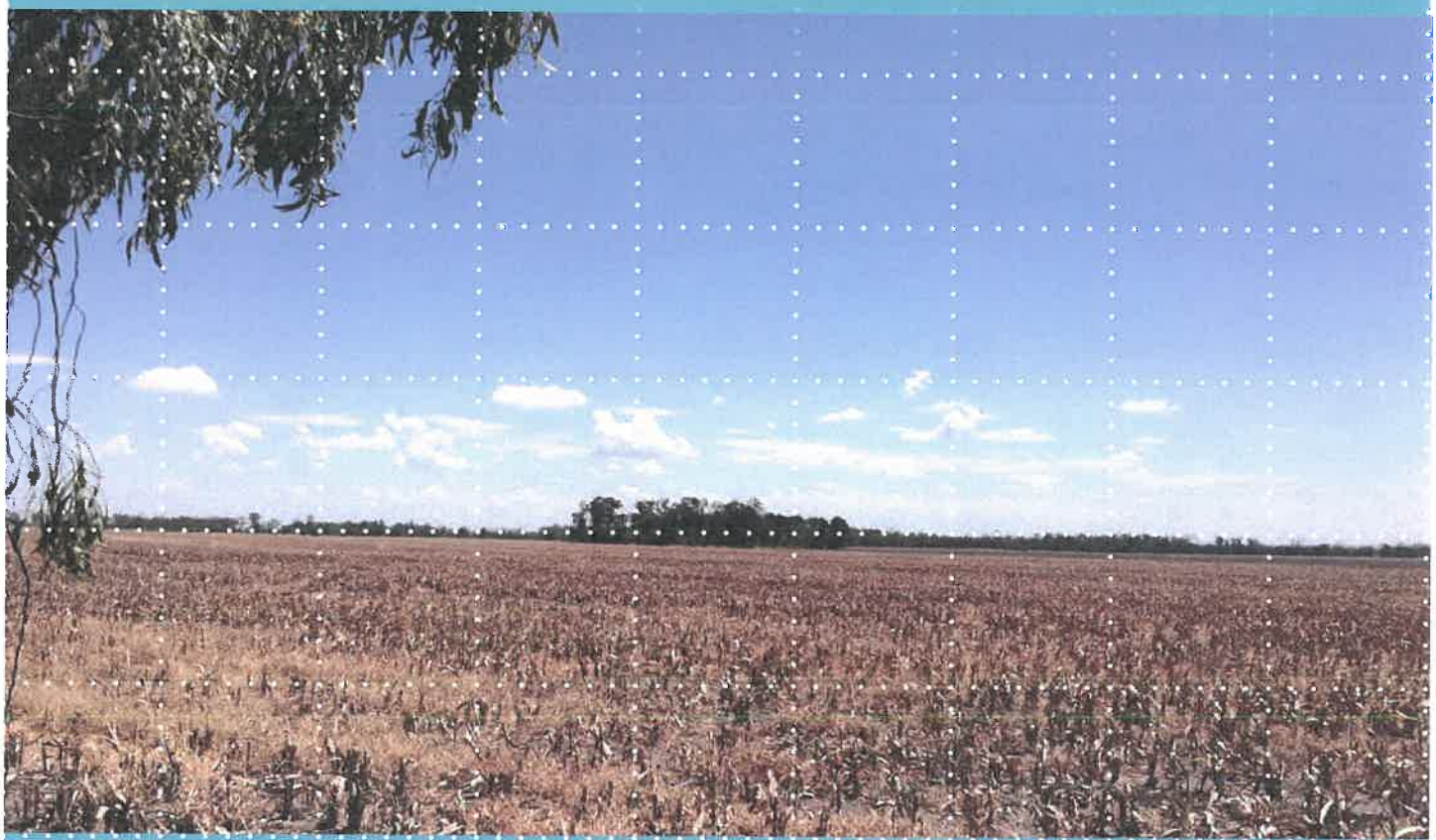
Final Report

Ecological Assessment of the Proposed Yarranlea Solar Project, Yarranlea, Queensland

Prepared for

Yarranlea Solar Pty Ltd

April 2016



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GLOSSARY

Acronym	Description
DNRM	Queensland Department of Natural Resources and Mines
DEHP	Queensland Department of Environment and Heritage Protection
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EO Act	*Environmental Offsets Act 2014*
EVNT	Endangered, Vulnerable and Near Threatened. Relates to the classification of species under the NC Act and EPBC Act.
EAR	Ecological Assessment Report
LP Act	*Land Protection (Pest and Stock Route Management) Act 2002*
NC Act	*Nature Conservation Act 1992*
NES	National Environmental Significance
TRC	Toowoomba Regional Council
RE	Regional Ecosystem
SES	State Environmental Significance. Listed under the EO Act.
SMP	Species Management Program under the NC Act.
SPRP	State Planning Regulatory Provisions
TEC	Threatened Ecological Community. Listed under the EPBC Act.
TPS	Toowoomba Planning Scheme
VM Act	*Vegetation Management Act 1999*

SUMMARY

Introduction

Ecology and Heritage Partners Pty Ltd was engaged by Yarranlea Solar Pty Ltd to conduct an Ecological Assessment Report (EAR) of a proposed solar utility farm (the proposed development) within several properties on Yarranlea Road, Yarranlea, Queensland. The purpose of the EAR is to provide a description of the existing environment within the properties and to identify any ecologically significant areas that may be impacted by the construction and operation of the proposed development.

The proposed development is located on rural land approximately 44 kilometres south-west of Toowoomba and 10 kilometres west of Pittsworth township. The study area is bound by Yarranlea Road to the west and rural properties to the north, east and south. The study area is located within intensive cropping areas on the fertile plains of the Condamine River Floodplain. This region has been farmed over a long period of time, which has resulted in the loss of much of the historical vegetation coverage. Remnant and regrowth vegetation exists in small patches on hills and rises in the east and along road reserves. The natural waterways within the study area have been cleared of riparian vegetation and exist as channelized drainage lines.

Yarranlea Solar is proposing to construct a Utility Scale Photovoltaic (PV) Solar farm. The PV Facility is estimated to generate up to 100 megawatts (MW) of energy and have an operational life of 30 years. The project will have a connection to the Queensland Electricity Market through an Ergon substation and will have on-site battery storage. The PV Facility is proposed to eventually cover up to 250 hectares of land and will be developed over four stages. The proposed development will be assessed under the Toowoomba Regional Planning Scheme.

Methods

A desktop assessment and site inspection was completed by Dave Fleming (Principal Ecologist) to identify the vegetation communities and flora and fauna values (e.g. potential occurrence of threatened species) within the study area, and to confirm the vegetation mapping at the local and State government levels. The extent of the study area was inspected and the overall condition of vegetation and potential fauna habitat noted. A modified quaternary vegetation assessment was completed to assess the mapped remnant vegetation within the study area in terms of structure and dominant species and whether they were consistent with Regional Ecosystem (RE) types in the Regional Ecosystem Description Database. Given that a portion of the study area is mapped as a High Risk Area for protected plants on the flora survey trigger map, a survey in accordance with the Flora Survey Guidelines was completed. Several random meanders (Cropper 1993) were completed within the mapped area to search for significant flora species. Random meanders were also completed within other potential habitats.

The field assessment included a visual fauna assessment of the study area, with all observed fauna species recorded and the overall habitat condition noted. Birds and frogs vocalisations were noted, and searches were undertaken for other signs of fauna such as nests, remains of dead animals, droppings and footprints. Habitat features, including ground cover and vegetation composition and structure, and the presence of hollows and fallen ground debris were also noted.

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Results

Desktop analysis of remnant native vegetation within the study area and surrounds showed a highly modified landscape with large areas cleared for agricultural purposes (predominately cropping), and residual, small, fragmented remnants of vegetation scattered throughout the landscape. One patch of remnant RE vegetation was identified within the study area and is mapped as regulated vegetation under the VM Act. This RE is sometimes included as in the Brigalow (*Acacia harpophylla* dominant and co-dominant) Threatened Ecological Community under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). However, in this case the community is not consistent due to the absence of Brigalow.

One threatened flora species was detected within the study area (Belson's Panic *Homopholis belsonii*) which is listed as endangered under the Queensland *Nature Conservation Act 1992* and vulnerable under the EPBC Act. Twelve discrete patches were identified within the patch of RE 11.9.5 within the southern portion of study area, and one patch was identified adjacent to the eastern boundary of the study area within the Yarranlea-Murlaggan Road reserve. Each discrete patch covered an approximate area of several meters squared, and these areas were most often at the base of canopy trees and were in shaded areas created by shrubs.

Several significant flora and fauna species potentially occur within the study area, including Austral Cornflower, *Rhaponticum australe,* King Bluegrass *Dichanthium queenslandicum*, Condamine Earless Dragon *Tympanocryptis condaminensis*, Painted Honeyeater *Grantiella picta*, Five-clawed Worm-Skink *Anomalopus mackayi*, and Grey-headed Flying Fox *Pteropus poliocephalus*.

Potential impacts and mitigation measures

The development is proposed over four stages and will involve almost complete coverage of the study area in solar PV panel arrays. Whilst the development will result in the disturbance of cropped areas, the small patch of RE 11.9.5 located within Stage 1 is not proposed to be impacted by the proposed development. Vegetation along Yarranlea-Murlaggan Road will not be impacted, although a small number of remnant trees and other vegetation may be trimmed or cleared for duplication of the powerline along Yarranlea Road.

Overall, the ecological values of the study area are limited and, the implementation of appropriate mitigation measures (e.g. retention and protection of RE 11.9.5 and Belson's Panic population) and will ensure that the proposed development will not lead to a significant impact(s) on ecological within the study area..

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1 INTRODUCTION

1.1 Background

Ecology and Heritage Partners Pty Ltd was engaged by Yarranlea Solar Pty Ltd to undertake an Ecological Assessment of a proposed solar utility farm (the proposed development) within several properties on Yarranlea Road, Yarranlea, Queensland.

The purpose of the assessment is to provide a description of the existing environment within the properties and to identify any ecologically significant areas that may be impacted by the construction and operation of the proposed development. The proposed development is located within the Toowoomba Regional Council (TRC) area and will be assessed under the Toowoomba Regional Planning Scheme 2015. Planning Scheme Policy No. 1 – Development Application Requirements: Appendix 1 Preparation of Ecological Assessment report (ERA) identifies the requirements for EAR. Further information regarding the EAR structure is provided below (Section 2).

This report presents the results of the desktop and site assessment, and discusses the potential ecological and legislative implications associated with the proposed development. Several recommendations to avoid, minimise or mitigate impacts associated with the proposed development are provided (Section 5).

1.2 Study Area

The proposed development is located on rural land approximately 44 kilometres south-west of Toowoomba and 10 kilometres west of Pittsworth township (Figure 1). The study area is described as Lot 2 on RP7475, Lot 2 on RP18249, Lot 3347 on A341649 and part of Lot 2 on A34925 and is bound by Yarranlea Road to the west and rural properties to the north, east and south. A connection to an Ergon Substation on the corner of Yarranlea Road and the Millmerran Branch Rail Line is also required and will traverse Lot 2 on RP120604 to the south of the study area.

The study area is located within intensive cropping areas on the fertile plains of the Condamine River Floodplain, and is currently used to grow crops (e.g. sorghum), which is the primary land use across the broader region (i.e. historically been farmed). This has resulted in the loss of remnant native vegetation across the study area. However, remnant and regrowth vegetation exists in small patches on hills and rises in the east and along road reserves. Most natural waterways have been cleared of riparian vegetation and exist as channelized drainage lines. .

The study area is flat to gently sloping towards the west, and contains several buildings and infrastructure, including a homestead and sheds. A small patch of remnant native vegetation is located within the central southern portion of the study area.

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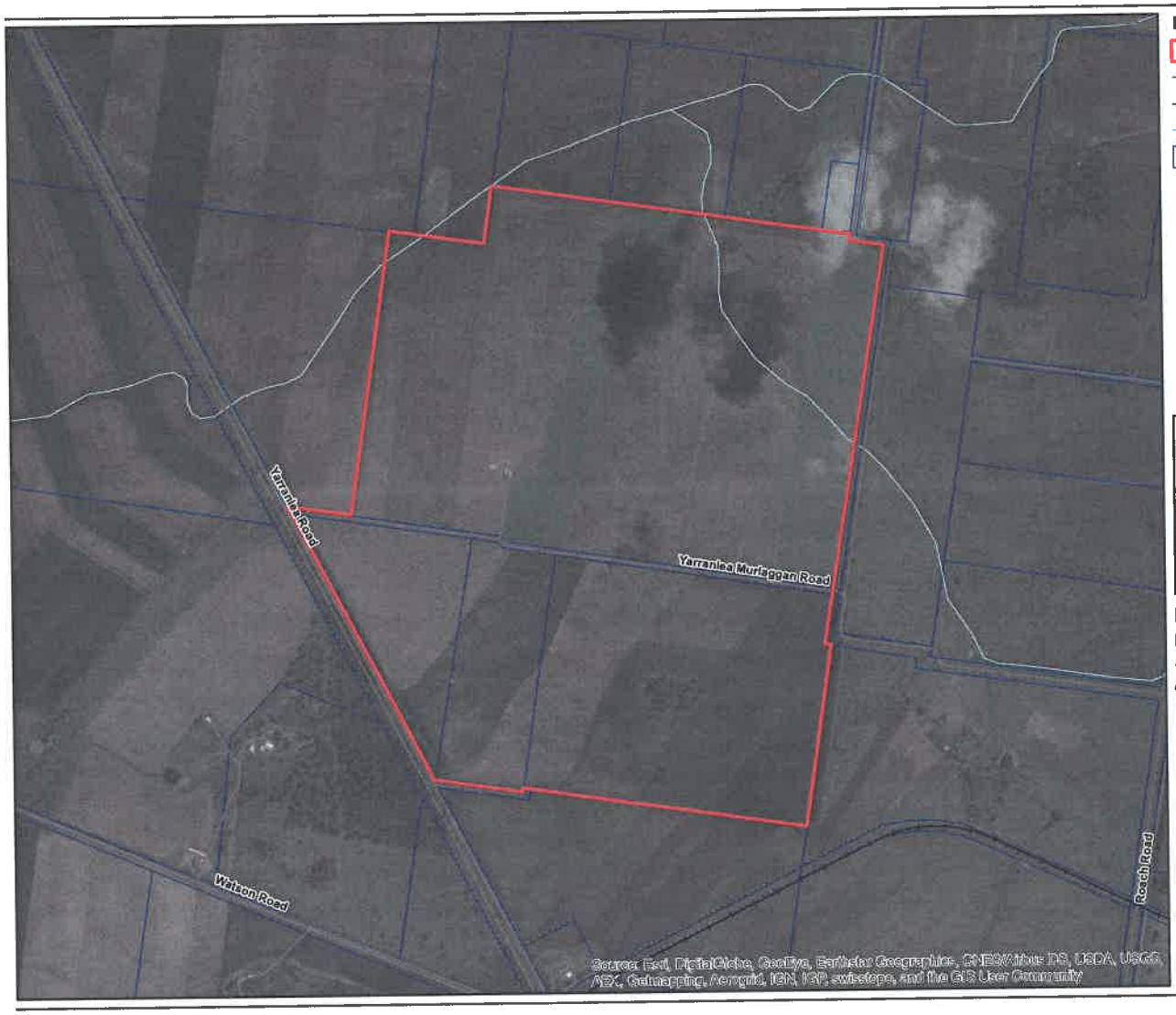


Legend

- Study Area
- Roads and tracks
- Railway
- Minor watercourse
- Property boundaries

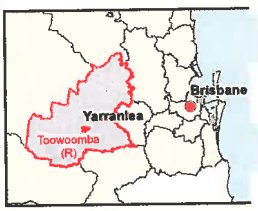
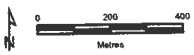


Figure 1
Location of Study Area
Ecological Assessment for the proposed Yarranlea Solar Farm, Yarranlea



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1.3 Proposed Development

Yarranlea Solar is proposing to construct a Utility Scale Photovoltaic (PV) Solar farm at Yarranlea. The PV Facility is estimated to generate up to 100 megawatts (MW) of energy and have an operational life of 30 years. The project will have a connection to the Queensland Electricity Market through an Ergon substation and may have on-site battery storage. The PV Facility is proposed to eventually cover up to 250 hectares of land and will be developed over four stages:

- Stage 1 – Installation of Solar PV panels to generate approximately 40MW over 100 ha. A Battery Storage Building, and Operations and Maintenance Building will also be constructed to support the operation. Connection to Ergon Substation will be completed at this stage via a new 1.5 kilometre powerline. Located in the southern half of the study area;
- Stage 2 – Generate approximately 20MW. Site coverage of 50 hectares. Located in the north-east portion of the study area;
- Stage 3 – Generate approximately 20MW. Site coverage of 50 hectares. Located in the northern portion of the study area; and
- Stage 4 – Generate approximately 20MW. Site coverage of 50 hectares. Located in the north-western portion of the study area.

The proposed layout of the PV facility is shown below (Figure 2).

The PV Facility comprises several interlinked and integral components for the operation of the equipment and generation of electricity from solar radiation. These components include: solar modules, steel mounts for the modules, electrical transformers and inverters, electrical wiring, telecommunication equipment and electrical control enclosures. It is also likely that the PV Facility will include a battery/electrical storage enclosure, which would include batteries.

The panels utilised in the facility are similar to those used for domestic power generation purposes and will be supported on steel frames. The frames may operate under a solar tracking system to increase power generation through tracking the movement of the sun. An underground reticulation system will be used to collect the power to an internal substation which will transform the power voltage to 110 kV, compatible with the nearby Ergon Energy transmission infrastructure. Power will be connected to the grid, approximately 600m from the southern boundary of the development area using either an underground or overhead transmission line within the Yarranlea Road reserve and terminating at the existing Ergon Substation.

The solar panel arrays will be surrounded by informal grassed internal access ways which are designed to provide access to the inverter/transformer equipment pads located at the centre of the array blocks. A gravel access track shall be provided to the perimeter of the Stage 1 block and the block comprising Stages 2 to 4. This will act as a fire break and will be accessed from the western end of Yarranlea-Murlaggen Road. This track is proposed to be located inside of a 2.4 metre high chain wire security fence. Project site, substation, and other areas requiring controlled access will be appropriately restricted to private access during construction and operations.

The facility will be managed from a control building, located adjacent to the substation which will include formalised staff and visitor parking, and this will be accessed off Yarranlea-Murlaggen Road. The compound will also house an electrical switchroom and battery storage building. The access

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driveway and parking will comprise a bitumen sealed surface. Permanent motion sensitive, directional security lights will also to be installed to provide adequate illumination around the substation area and points of ingress/egress. All lighting will be directed downward to minimise the potential for glare or spill-over onto adjacent properties. Lighting is proposed to be used from dusk to dawn once the facility is operational.

Stage 4 will require the removal of three existing farm buildings and these are to be replaced by a farm storage shed, located opposite the Operations and Maintenance facility on the northern side of Yarranlea-Murlaggen Road.

Appropriate landscaping is to be provided along the western boundary of the site, using native shrub specifies with a mature height of 4 – 5 metres, to assist in reducing any potential visual impacts of the PV Facility. The proposed landscaping treatment will be intensified in the vicinity of the Operations and Maintenance facility due to the taller structures which will be required in this part of the development.

The PV Facility has been designed in such as manner as to minimise the extent of civil works required to occur on the site. All existing overland drainage flow paths are intended to be maintained where practical so as to minimise the impact on the surrounding land uses. No formalised internal roads are envisaged to be provided between panels and the level of sealing required has been kept to a minimum. The existing soil will be retained and re-seeded with an appropriate blend of pasture grass and legume species, to provide vegetation coverage over the site. Grasses will be maintained through periodic slashing and potential grazing opportunities. Accordingly, it is intended that the facility will have minimal impact when decommissioned as the development components do not require substantial disturbance to the landscape.

Construction Phase Schedule

For each stage of the project, construction is to proceed in the manner outlined below. However, it should be noted that the Substation and 110 kV connection installation components will only occur as part of Stage 1, and will not be required in subsequent stages.

- Site Preparation, Substation and Grid Connection Installation (52 to 60 weeks in duration).
- Photovoltaic Panel System Installation (26 to 30 weeks in duration, beginning mid-way through the site preparation phase).
- Inverters, Transformers, and Electrical Collector System Installation (12 to 20 weeks, beginning mid-way through the PV System Installation Phase).

Site Preparation, Substation and Grid Connection Installation

A construction laydown area is to be established near the main site entrance and a second area to the east of the site, and equipment mobilised to the site. The site is then cleared, grubbed, graded, and compacted, with the on-site informal roadway system staked and established. Roads would be treated to create a durable, dust minimising surface to ensure minimisation of dust emissions, and security fencing would be installed around the site perimeter.

The substation facility would incorporate a number of concrete foundations for the electrical plant including the main transformer, Neutral Earth Transformer, Reactive Plant, Switchroom, Operations and Maintenance Building and Battery Storage Building. Following construction of these foundations,

the plant and structures would be installed in readiness for commissioning when the first of the PV modules have been installed in readiness for first power. During the construction of the substation facility the 110kV connection to the existing ergon substation will be installed as will the connection works by Ergon at the Yarranlea Substation. This 110kV line will be either direct buried underground, or alternately a traditional overhead line connecting the development to the existing Ergon Infrastructure.

It is expected that the Site Preparation, Substation and Grid Connection Phase will require the use of heavy equipment including: bulldozers, water trucks, graders, flatbed trucks, skid steers, front end loaders, roller compactors, trenchers, backhoes, gravel trucks, water buffaloes, cranes, and aerial lifts. However, it should be noted that the design of the facility is such that, where possible and practicable, on-site levelling and grading will be minimised.

Photovoltaic Panel System Installation

Approximately 401,500 solar panels are to be installed in the development arranged in solar arrays consisting of linear strings of mounted modules organised into blocks of approximately two megawatts capacity. The solar panels are to be positioned 1.2 metres above ground level and mounted on monopole structures. These monopole structures are approximately 1.5 metres long and 1.5 metres high, and are connected in strings of 100 metres, with a seven metre gap between centres. The monopole structures will be supported on either steel screw piles, steel driven piles or FRP Composite Drive Piles, to a depth of between 2 – 3 metres below the existing ground surface level. These foundations will be readily removable at the end of life of the facility to enable the land to be restored to cultivated agricultural activities.

Inverters, Transformers, and Electrical Collector System Installation

Each power block is to include a central skid mounted inverter/transformer station that will convert the direct current (DC) energy into grid-compatible alternating current (AC) energy. Foundations for the inverter stations shall be similar screw pile or driven pile technology to the solar panel supports and removable at the end of the life of the project. The Medium Voltage, (33kV), collector system will be installed by direct burying to a depth of 1.0 metre below ground level. At the end of the project the cable metals will be recovered for recycling.

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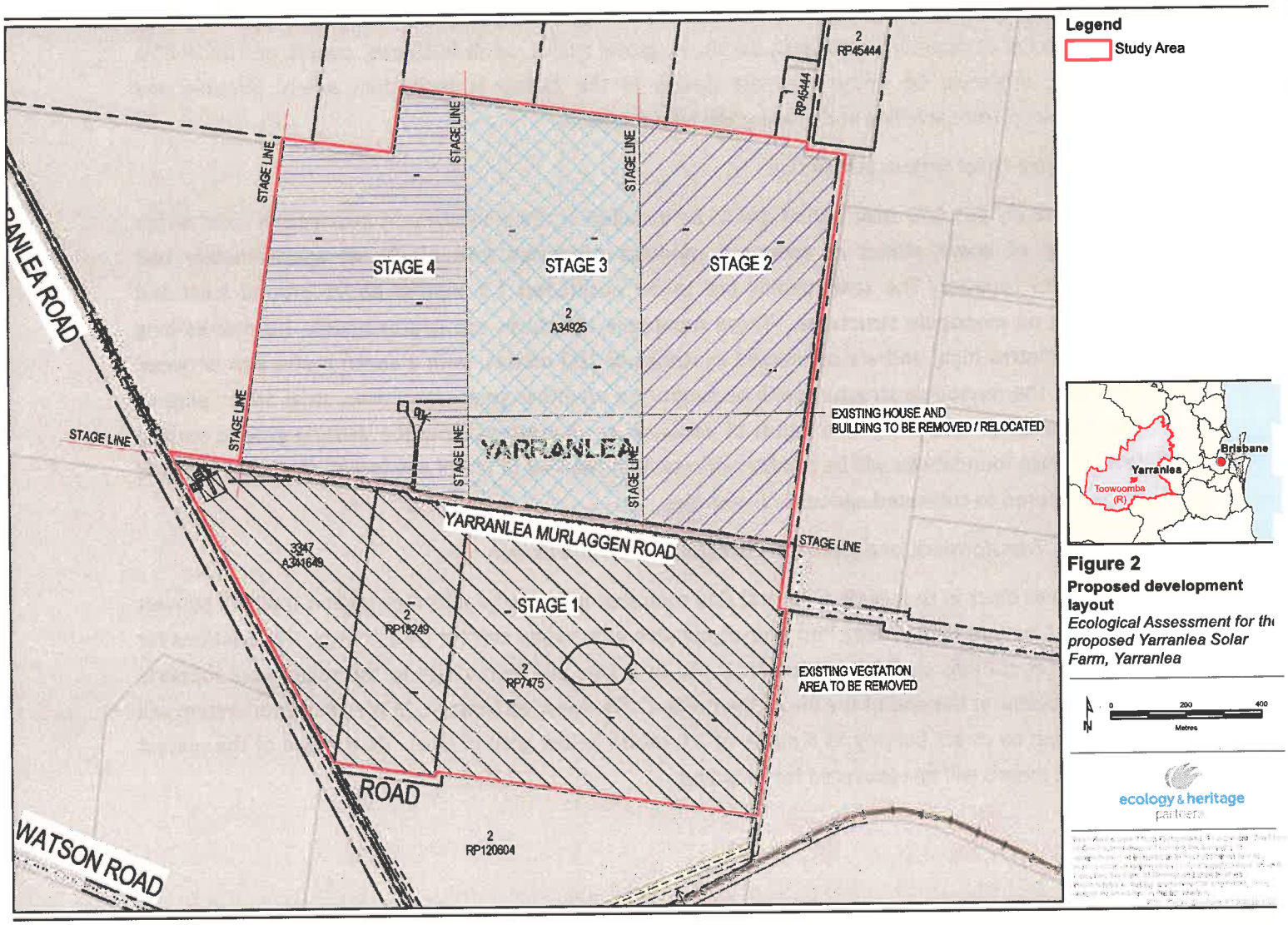

Figure 2

Proposed development layout

Ecological Assessment for th proposed Yarranlea Solar Farm, Yarranlea

1.4 Objectives

The objectives of the assessment follows the requirements for an EAR in Planning Scheme Policy 1 – Appendix 1, which includes:

- Describe the location and extent of the proposed study area;
- Describe the physical characteristics of the study area;
- Outline the existing use of the study area and any previous uses;
- Outline the existing environment of the study area, including areas of ecological significance;
- Provide an overview of the proposed project;
- Identify the potential impacts of the proposed project on the existing environment;
- Outline other planning scheme codes, overlays and policies which apply to the site;
- List references used in the desktop assessment; and
- Include appendices for any additional supporting information.

1.5 Legislation

This section identifies biodiversity policy and legislation relevant to the proposed development, principally:

- *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Commonwealth), administered by the Department of the Environment (DoE);
- *Nature Conservation Act 1992* (NC Act) (Queensland), administered by the Department of Environment and Heritage Protection (DEHP);
- *Vegetation Management Act 1999* (VM Act) (Queensland), administered by the Department of Natural Resources and Mines (DNRM);
- *Land Protection (Pest and Stock Route Management) Act 2002* (Queensland), administered by the Department of Agriculture and Fisheries (DAF);
- *Environmental Offsets Act 2014* (EO Act) (Queensland), administered by DEHP;
- *Water Act 2000* (Queensland), administered by DNRM; and
- Toowoomba Regional Planning Scheme 2015, administered by Toowoomba Regional Council (TRC).

Background information on the above is provided in Appendix 1.

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2 METHODS

This section identifies the methods used to identify the ecological values occurring or likely to occur within the study area.

2.1 Nomenclature

Common and scientific names of vascular plants follow the Queensland Herbarium Census of the Queensland Flora (Bostock and Holland 2010). The following sources were used for names of fauna species:

- Reptiles and Frogs – Cogger (2014) Reptiles and Amphibians of Australia. Seventh Edition;
- Birds – Christidis and Boles (2008) Systematics and Taxonomy of Australian Birds; and
- Mammals – Van Dyck and Strahan (2008) The Mammals of Australia. Third Edition.

2.2 Desktop Assessment

The following resources were reviewed prior to undertaking the field assessment:

- Queensland Herbarium Regional Ecosystem Description Database (REDD) version 9.0 – April 2015 (DEHP 2016a);
- Current Regional Ecosystem (RE) mapping (Queensland Herbarium 2016);
- Regulated Vegetation Management Map and essential habitat map (DNRM 2016) under the *Vegetation Management Act 1999* (VM Act);
- Protected Plants Flora Survey Trigger Map (DEHP 2016b);
- Relevant flora and fauna databases (Qld Herbarium HERBRECS, Queensland Museum, Wildlife Online [WildNet], Atlas of Living Australia and Birds Australia Atlas [1998-2008]);
- Commonwealth EPBC Act Protected Matters Search Tool (DoE 2016);
- Current aerial photography of the study area (Queensland Globe 2016);
- Toowoomba Regional Planning Scheme; and
- Relevant federal and state legislation and policies.

2.3 Field Assessment

A field assessment was conducted by Dave Fleming (Principal Ecologist, Ecology and Heritage Partners) on 16 February 2016 to identify the vegetation communities, and flora and fauna values (e.g. potential occurrence of significant species) within the study area, and to confirm the vegetation mapping at the local and State government levels. The entire the study area was assessed and the overall condition of vegetation and potential fauna habitat noted.

A modified quaternary vegetation assessment (Neldner *et al.* 2012) was completed to assess the mapped remnant vegetation within the study area in terms of structure and dominant species and whether they were consistent with RE types (Sattler and Williams 1999) in the Regional Ecosystem (RE) Description Database (REDD). A vegetation transect was completed within the mapped patch of RE 11.9.5, and this transect involved:

- Laying out a 50 metre tape measure (a 100 metre transect could not be completed due to the small size of the patch);
- Measure the distance that the tree or shrub cover intercepted the tape if the cover was projected onto the ground;
- Estimate the height of each tree or shrub that intercepted the transect;
- Estimate the relative dominance of trees, shrubs and ground covers within 10 metres either side of the transect centreline;
- Estimate the relative abundance of native and exotic groundcovers, litter, bare ground and coarse woody debris within 1 metre by 1 metre quadrats spaced alternatively every 10 metres along the transect centreline.

The boundary of the patch was also mapped using a hand held GPS unit.

As a portion of the study area is mapped as a High Risk Area for protected plants on the flora survey trigger map, a survey in accordance with the Flora Survey Guidelines was completed. Several random meanders (Cropper 1993) were completed within the mapped area to search for significant flora species. Random meanders were also completed within other potential habitats.

The site assessment included a visual fauna assessment of the study area, with all observed fauna species recorded and the overall habitat condition noted. Birds and frogs vocalisations were noted and searches were made for other signs of fauna such as nests, remains of dead animals, droppings and footprints. Habitat features, including ground cover and vegetation composition and structure, and the presence of hollows and fallen ground debris were also noted.

In addition, as fauna species are mobile, a visual assessment of the surrounding landscape was made to determine whether there was suitable habitat (principally for threatened species) in the immediate area, and to determine the likelihood that any of these species would either reside within the study areas for extended periods of time, or whether the sites contributed to a larger home range of a significant species.

3 RESULTS

3.1 Matters of National Environmental Significance

The Protected Matters Search Tool identified several matters of National Environmental Significance (MNES) that are known to or are likely to occur within the study area and surrounds. These include:

- Four Wetlands of International Importance (Ramsar sites);
- Five listed Threatened Ecological Communities;
- 24 listed threatened species;
- 12 migratory species; and
- 15 marine species.

3.1.1 Wetlands of International Importance

The study area is located within the catchment of four Ramsar sites with the sites themselves located between 400 kilometres and 1,500 kilometres downstream of the study area.

3.1.2 Threatened Ecological Communities

The desktop assessment identified five EPBC Act-listed Threatened Ecological Communities (TEC) with the potential to occur within the study area. These communities are:

- Brigalow (*Acacia harpophylla* dominant and co-dominant);
- Coolibah – Black Box Woodland of the Darling River Plains and the Brigalow Belt South Bioregions;
- Natural Grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland;
- Weeping Myall Woodlands; and
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland, listed as critically endangered.

One TEC was mapped as potentially occurring within the study area, namely Brigalow (*Acacia harpophylla* dominant and co-dominant) TEC. The field survey found that the vegetation was consistent with RE 11.9.5, however was dominated by Belah *Casuarina cristata* and Poplar Box *Eucalyptus populnea* and Brigalow was absent. To be considered part of the Brigalow TEC, Brigalow must be dominant or co-dominant within the vegetation community, therefore the Brigalow TEC does not occur within the study area. Similarly, areas of mapped RE 11.9.5 along Yarranlea Road adjacent to the study area are dominated by Belah and Poplar Box and therefore are not considered part of the TEC.

No other TECs were identified within or adjacent to the study area.

3.2 Vegetation Communities

3.2.1 Regional Ecosystems

Desktop analysis of remnant vegetation within the study area and surrounds showed a highly modified landscape with large areas cleared for agricultural purposes (predominately cropping) and residual, small, fragmented remnants of vegetation scattered throughout the landscape (Figure 3). One patch of remnant RE vegetation was identified within the study area and is mapped as regulated vegetation under the VM Act:

- RE 11.9.5 (VM Status - Endangered) - *Acacia harpophylla* and/or *Casuarina cristata* open forest on fine-grained sedimentary rocks.

This RE is included in the description of the Brigalow TEC listed under the EPBC Act (DoE, 2016), however field investigations showed that it is dominated by Belah and hence excluded from the Brigalow TEC listed community.

The patch of RE 11.9.5 mapped within the southern portion of the study area was assessed to confirm its remnant status and whether it met the listing criteria for the Brigalow TEC. A summary of the results of the vegetation transect and assessment are included below (Table 1). Transect photographs are included in Plates 1, 2, 3 and 4. The Queensland Herbarium maintains technical descriptions of the normal range of vegetation structure and floristic compositions of REs and are used to compare disturbed REs with their 'undisturbed' state. The technical description for RE 11.9.5 has not yet been made available by the Herbarium. However, an alternative resource, the BioCondition Benchmarks provide some compatible metrics for comparison with the RE 11.9.5 patch within the study area. The relevant BioCondition benchmarks are is provided (Table 1).

Table 1 Vegetation structure and composition of RE 11.9.5 patch

Variable	Value	BioCondition Benchmarks
Area (hectares)	0.93	N/A
Dominant species	Canopy (T1 layer) - Belah, Poplar Box Sub-canopy (T2 layer) – Weeping Pittosporum *Pittosporum angustifolium*, Belah Tall Shrub (S1 layer) – Velvety Tree Pear *Opuntia tomentosa*, Wilga *Geijera parviflora*	Canopy (T1 layer) – Brigalow, Belah Sub-canopy (T2 layer) – Brigalow, Belah Tall Shrub (S1 layer) – Wilga, Smooth-barked Ironwood *Gossia bidwillii*, False Sandalwood *Eremophila mitchellii*, Ellangowan Poison Bush *E. deserti*.
Median height of the canopy (T1) Median height of sub-canopy (T2)	18 metres 5 metres	25 metres 8 metres
Average canopy (T1) cover Average sub-canopy (T2) cover	57.4% cover 3%	59% 48%
Other species present	Trees - Sally Wattle *Acacia salicin* Native groundcovers - Small Saltbush *Atriplex eardleyae*, Mueller's Saltbush *Atriplex muelleri*, Currant Bush *Carissa ovata*, Ruby Saltbush *Enchylaena tomentosa*, Exotic groundcovers - Flax –leaf Fleabane *Conyza bonariense*, Mayne's Pest *Verbena aristigera*, Cobblers Pegs *Bidens pilosa*,	Ground covers - Brigalow Grass *Paspalidium caespitosum* Exotic species – Velvety Tree Pear, Prickly Pear *Opuntia stricta*

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	Native grasses – Slender Chloris *C. divaricata*, Fairy Grass *Sporobolus caroli*, Curly Windmill Grass *Enteropogon acicularis*, Brigalow Grass *Paspalidium caespitosum*, Slender Bottlewashers *Enneapogon gracilis*, Exotic grasses - Rhodes Grass *Chloris gayana*,	
Percentage weed cover	13% (averaged over 50 metre transect)	0%
Average ground cover	Native grasses – 23.2% Exotic grasses – 0% Native herbs and forbs – 1% Exotic herbs and forbs – 6% Native shrubs – 1% Exotic shrubs – 6.8% Litter – 36% Coarse woody debris – 7% Bare ground – 18%	Native grasses – 4% Litter – 66%

Plate 1 – Transect looking north

Plate 2 – Transect looking east

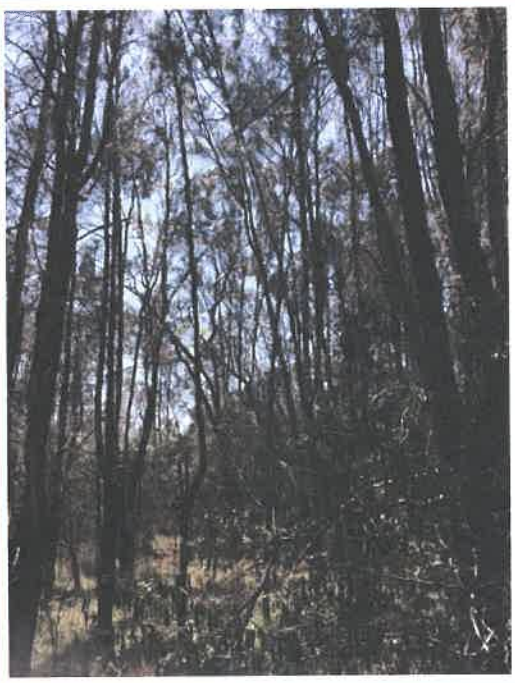

Plate 3 – Transect looking south

Plate 4 – Transect looking west

To be considered remnant vegetation, the height of the canopy layer of the vegetation must be 70% or greater than the canopy height of an undisturbed community and must have 50% of the canopy cover of the undisturbed community. The vegetation must also include species that are generally found within the canopy of the undisturbed community. Using the BioCondition benchmarks, the undisturbed median canopy height is 25 metres and therefore 70% is 17.7 metres and the undisturbed canopy cover is 59% and therefore 50% is 29.5%. The vegetation also contains some species that are found in the undisturbed community benchmark. The small patch of vegetation just meets the canopy height requirement and easily meets the cover requirement and is therefore considered remnant vegetation.

Several small patches of remnant vegetation are mapped adjacent to the study area on the western side of Yarranlea Road, including:

- RE 11.9.5; and
- RE 11.3.2 (VM Status of Concern) - *Eucalyptus populnea* woodland on alluvial plains.

A larger patch of RE 11.3.2 is mapped adjacent to the north-eastern corner of the study area. This community is sometimes included in the Weeping Myall Woodlands TEC if patches of Weeping Myall *Acacia pendula* form monotypic stands. No Weeping Myall was identified within this community during the survey.

There are no vegetated connections to the mapped remnant vegetation from the study area.

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<u>RE 11.9.5 and 11.3.2 along Yarranlea Road</u>

Several patches of RE 11.9.5 and 11.3.2 are mapped on both sides of the Yarranlea Road reserve with extensive areas occurring on the western side of the road. The patches on the eastern side, and adjacent to the study area, were inspected although formal transects were not completed. This vegetation exists predominantly as a single line of trees with an exotic grassy understorey. The canopy is dominated entirely by Poplar Box with Belah forming a sub-canopy with Wilga and False Sandalwood. The ground cover is dominated by exotic grasses and herbs that are common along

roadsides in the Darling Downs. Species include Rhodes Grass, Purple Pigeon Grass *Setaria incrassata*, Flax-leaf Fleabane, Balloon Cotton Bush *Gomphocarpus physocarpus*, Cobblers Pegs, Maynes Pest, Velvety Tree Pear, Spear Thistle *Cirsium vulgare* and Moth Vine *Araujia hortorum*. Native ground covers include Queensland Bluegrass *Dichanthium sericeum*, Curly Windmill Grass, Barb Wire Grass *Cymbopogon refractus*, Native Millet *Panicum decompositum* and Ellagowan Poison Bush.

Plate 5 Mapped RE 11.9.5 and 11.3.2 along Yarranlea Road reserve

3.2.2 Non-remnant Communities

The study area is located within a highly disturbed agricultural landscape where native vegetation exists as small patches within paddocks or linear strips within road reserves. A small patch of mapped RE 11.9.5 occurs within the southern portion of the study area and other patches of mapped RE 11.9.5 and 11.3.2 occur along Yarranlea Road (Figure 3). Isolated clumps of trees and shrubs occur along Yarranlea – Murlagan Road which traverses the centre of the study area. While isolated stands of Brigalow occur in the far north-east portion of the study area within a road easement, these do not form large enough patches to be considered part of the Brigalow TEC.

Non-remnant Roadside Vegetation

Several isolated patches of vegetation existing within the road reserve of Yarranlea Murlaggan Road which transects the study area. This vegetation exists as a single canopy tree or up to three trees with surrounding shrubs and grasses. Poplar Box is the dominant canopy species with Sally Wattle and Weeping Pittosporum also present. Ground covers generally include exotic grasses and herbs including Rhodes Grass, Cobblers Pegs, Mayne's Pest and Flax-leaf Fleabane.

Cropping Land

The majority of the study area is used for cropping of a variety of crops including sorghum, cotton and chickpeas. The southern portion of the study area had been recently harvested at the time of the survey although some crops were growing within the northern portion.

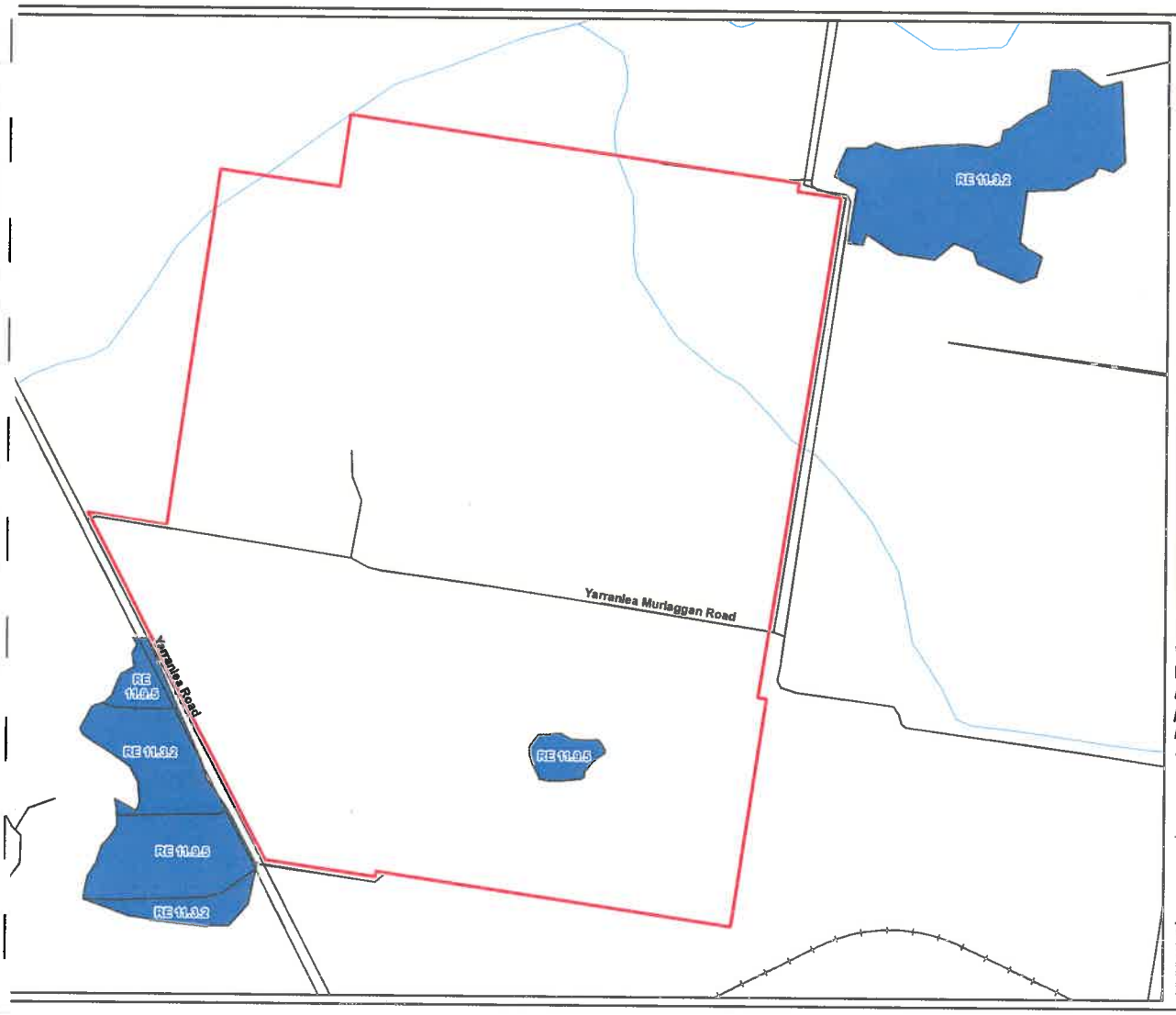

Figure 3
Vegetation Management Map
Ecological Assessment for the proposed Yarranlea Solar Farm, Yarranlea

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3.3 Significant Flora Species

The database searches identified nine threatened flora species that have been previously recorded or likely to occur within 10 kilometres of the study area (Table 2) and these are shown below (Figure 4). The potential occurrence of each species within the study area was assessed based on the criteria described in Appendix 2. Two species have been assessed to have a moderate likelihood of occurrence within the study area; Austral Cornflower *Rhaponticum australe* and King Bluegrass *Dichanthium queenslandicum*, and one species was detected within the study area; Belson's Panic *Homopholis belsonii*.

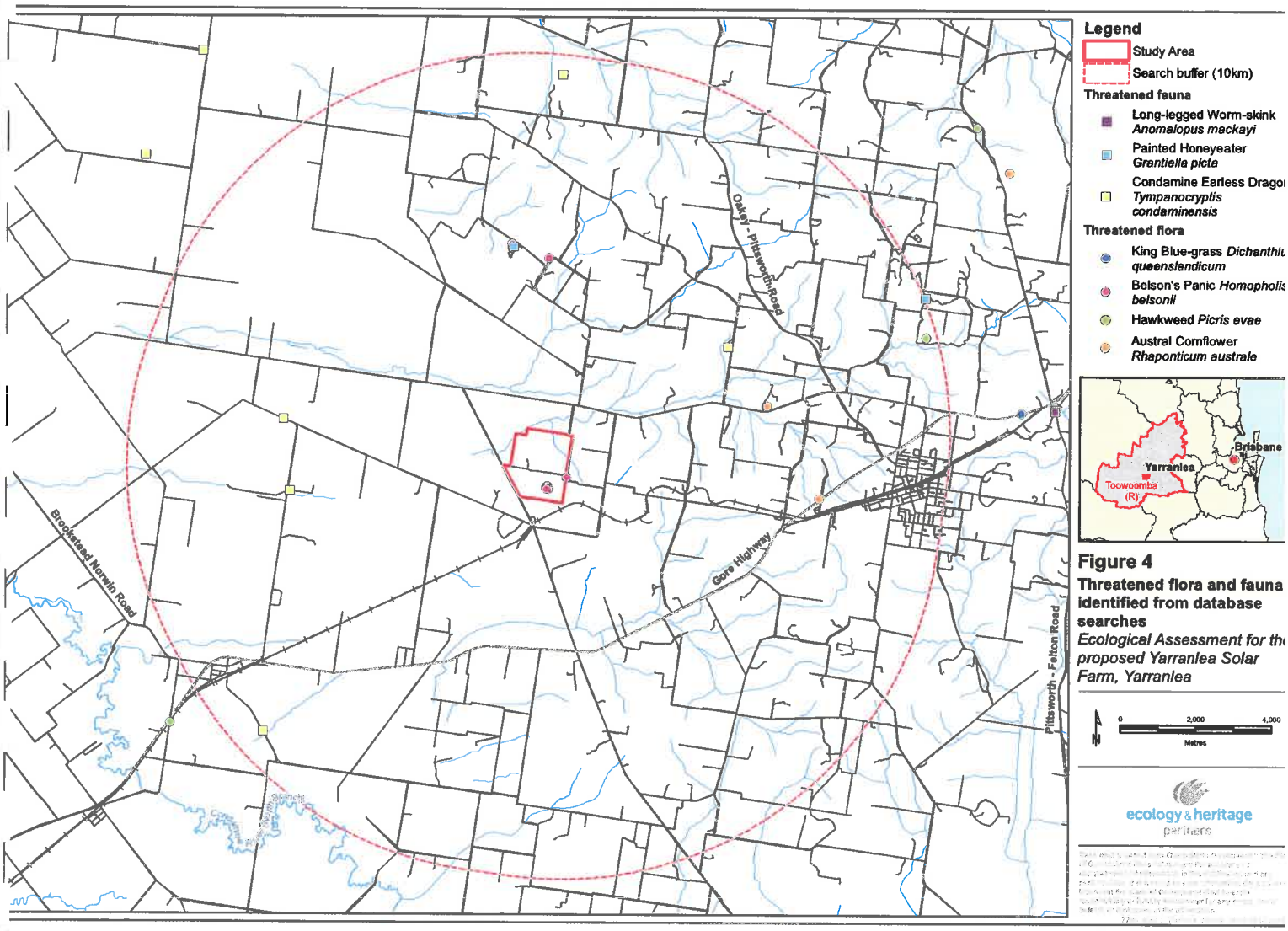

Figure 4

Threatened flora and fauna identified from database searches

Ecological Assessment for the proposed Yarranlea Solar Farm, Yarranlea

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Table 2 Threatened flora species identified from database searches

Species Name	Common Name	EPBC Status	NC Act Status	Preferred Habitat	Likelihood of Occurrence
Rhaponticum australe	Austral Cornflower	V	V	Heavy black or red-brown clays or clay-loams derived from basalt (land zone 8). Known from roadsides and cultivation headlands. Restricted to southern Qld.	Moderate. Most records are located to the east of the study area with the closest being 6km away. Habitat occurs within the study area, however the dominance of Rhodes Grass may preclude use of this habitat.
Picris evae	Hawkweed	V	V	Occurs in open grassy eucalypt woodlands on clay-loams and medium clay soils. Found in the Darling Downs region of Qld as well as NSW.	Low. Most records are from the east and preferred habitat occurs to the north-east of the study area within RE 11.3.2.
Picris barbarorum		0	V	Occurs on riverbanks and floodplains (land zone 3) in southern Qld and central western NSW.	Unlikely. The study area does not occur on a floodplain and suitable habitat is not present.
Clematis fawcettii	Stream Clematis	V	V	Occurs in semi-evergreen vin thicket and vine forests of high altitude areas such as Bunya Mtn and Lamington National Park.	Unlikely. Not records from within 10km and suitable habitat does not occur within the study area.
Digitaria porrecta	Finger Panic Grass		NT	Occurs in native grasslands and open woodlands on soils derived from basalt (land zone 8). Known from southern and central Qld.	Unlikely. No records from within 10km of the study area and preferred habitat does not occur.
Homopholis belsonii	Belson's Panic	V	E	Occurs in a variety of habitats including woodlands on poor quality soils, rocky hills, in Wilga woodland and in Poplar Box communities.	**Known**. Occurs within the small patch of RE 11.9.5 within the southern portion of the study area and a small population within the road reserve of Yarranlea-Murlaggan Road.
Dichanthium queenslandicum	King Bluegrass	E	E	Known from native grasslands and grassy eucalypt woodlands in central and southern Qld.	Moderate. Most records are from Bowenville approx.. 40km to the north of the study area, although a recent record is from just east of Pittsworth.
Lepidium peregrinus	Wandering Peppercress	E	LC	Occurs in riparian open forests in disjunct populations in southern and south-east Qld. Also NSW.	Unlikely. No records from within 10km of the study area and suitable habitat does not occur.
Thesium australe	Austral Toadflax	V	V	Is semi-parasitic on the roots of native grasses including Kangaroo Grass *Themeda australis*. Occurs in a range of habitats and shows a preference for damp sites.	Low. No records from within 10km of the study area and habitat is marginal.

One threatened flora species was detected within the study area, Belson's Panic *Homopholis belsonii*, which is listed as endangered under the Queensland NC Act and vulnerable under the EPBC Act. Twelve discrete patches were identified within the patch of RE 11.9.5 within the southern portion of study area and one patch was identified adjacent to the eastern boundary of the study area within the Yarranlea Murlaggan Road reserve (Table 3, Figure 5). Each discrete patch covered an approximate area of several meters squared, and these areas were most often at the base of canopy trees and were in shaded areas created by shrubs..

Table 3 Locations of Belson's Panic populations

Projected Coordinates (GDA, Zone 56J)		Geographic Coordinates (GDA)	
Easting	Northing	Latitude	Longitude
355510	6933562	-27.71451	151.53439
355514	6933567	-27.71447	151.53443
355513	6933547	-27.71465	151.53442
355518	6933564	-27.7145	151.53447
355522	6933575	-27.7144	151.53451
355534	6933589	-27.71428	151.53463
355542	6933588	-27.71429	151.53472
355546	6933583	-27.71433	151.53475
355584	6933542	-27.71471	151.53513
355574	6933525	-27.71486	151.53502
355567	6933516	-27.71494	151.53495
355519	6933524	-27.71486	151.53447
356225	6934864	-27.70284	151.54179

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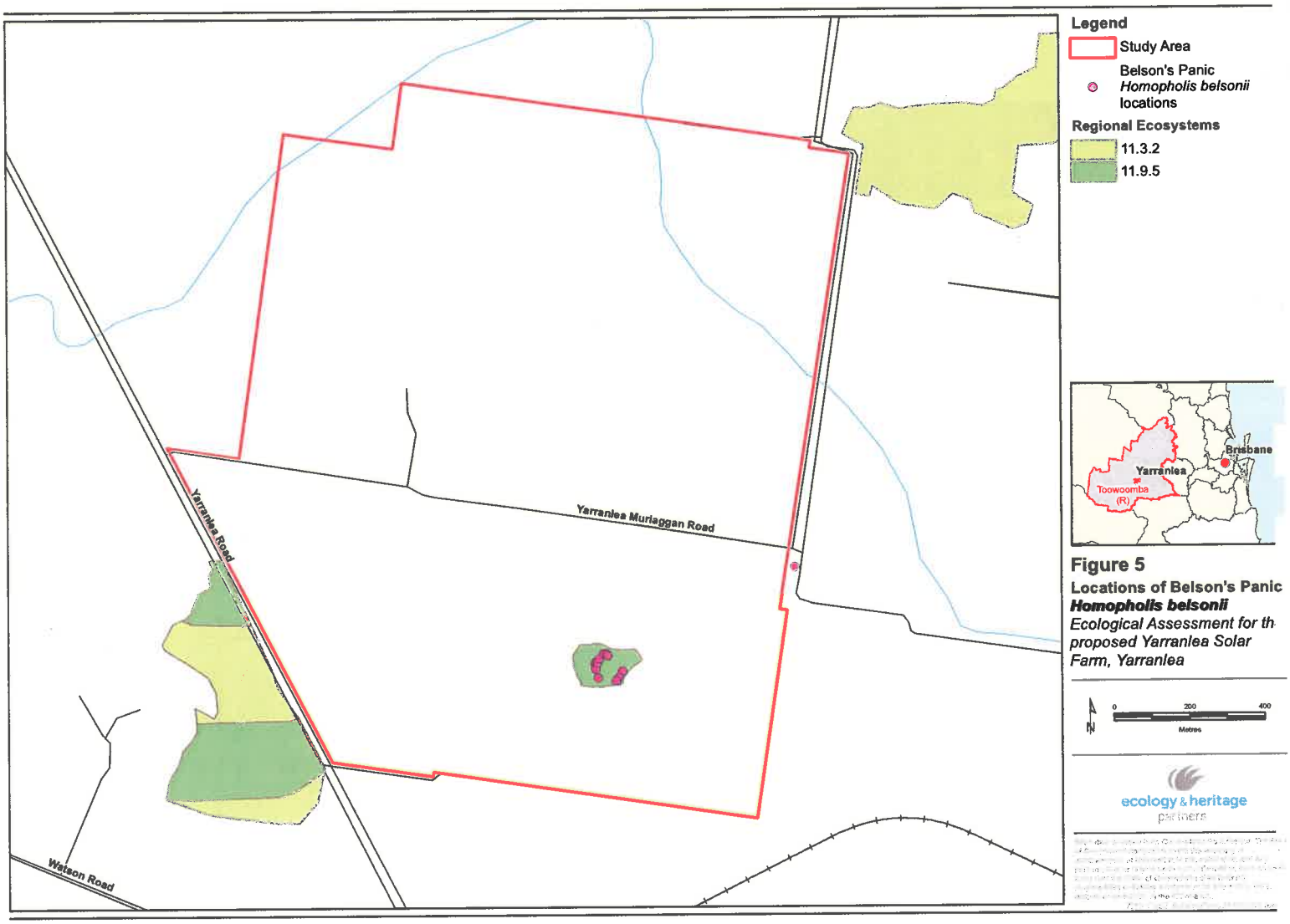

Figure 5

Locations of Belson's Panic *Homopholis belsonii*

Ecological Assessment for th proposed Yarranlea Solar Farm, Yarranlea

Plate 1 Small patch of Belson's Panic growing underneath Belah

The Flora Survey Trigger Map (DEHP 2016c) was reviewed for the study area and surrounds. A High Risk Area for threatened flora species is mapped within the extreme north-eastern corner of the study area. A random meander transect was completed within this area, as well as within 100 metres of the study area boundary in neighbouring properties. No significant flora species were found within the high risk area during the random meander despite a total flora survey effort of 40 minutes (Table 4). One individual of Lobed Bluegrass *Bothriochloa biloba* was identified along a fenceline along the northern boundary of the study area. Lobed Bluegrass was previously listed as threatened under the EPBC Act, however was removed from the list in 2013. The species is listed as Least Concern under the NC Act.

Table 4 Flora survey effort within mapped High Risk Area

Transect	Easting	Northing	Time
Start	356228	6934854	20 minutes
Stop	356181	6934554	
Start	356181	6934554	20 minutes
Stop	356181	6934554	

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3.4 Significant Fauna Species

The desktop review indicated that 21 significant fauna species and nine special least concern species have been previously recorded or are predicted to occur within 10 kilometres of the study area (Appendix 2) and are shown on Figure 4. This comprises one fish, five reptiles, nine birds and six mammals threatened species. Additionally, 12 bird species are listed as migratory under the EPBC Act

and consequently as special least concern under the NC Act. These are shown separately in Appendix 2.

A likelihood of occurrence assessment was completed to determine the suite of threatened and conservation significant species that may potentially occur within the study area. The assessment is included in Appendix 3 and the species with a high or moderate potential to occur within the study area are presented below.

Condamine Earless Dragon

Condamine Earless Dragon *Tympanocryptis condaminensis* is listed as endangered under the NC Act. The Condamine Earless Dragon was recently separated taxonomically from the related Grassland Earless Dragon *T. pinguicolla*, which is listed under the EPBC Act and occurs in NSW and the ACT. As the population of Earless Dragons in the Darling Downs was previously listed under the EPBC Act, it is likely that the Condamine Earless Dragon will eventually be listed under that Act. There are several records of this species along Saal Road and Watson Road to the west of the study area and further to the north and east (DEHP 2016). The dragon is known to inhabit cropping lands and native grasslands along roadsides and is therefore a high potential occurrence within the study area. Very little is known about the breeding and egg laying habits of the species, but anecdotal evidence suggests that the dragon escapes into adjacent grasslands during harvesting operations (Ashdown 2014).

Painted Honeyeater

Painted Honeyeater *Grantiella picta*, listed as vulnerable under the NC Act and EPBC Act. The Painted Honeyeater is known from the Irongate Conservation Park, approximately 10 kilometres to the north of the study area and north of Pittsworth (DEHP 2016). The honeyeater occurs in a variety of woodland and open forest communities and shows a preference for mistletoe. This species is considered a moderate potential occurrence within the study area.

Five-clawed Worm-Skink

Five-clawed Worm-Skink *Anomalopus mackayi*, listed as endangered under the NC Act and vulnerable under the EPBC Act. The Five-clawed Worm-Skink is known from several records approximately 13 kilometres to the east of the study area, near Pittsworth (DEHP 2016). The worm-skink prefers sites on heavy cracking clay soils and with coarse woody debris. Although the study area contains cracking clay soils preferred by this species, the majority of the soils are used for cropping and are continually disturbed. The skink may inhabit road reserves such as Yarranlea-Murlaggan Road and Yarranlea Road as well as the patch of RE 11.9.5.

Grey-headed Flying Fox

The Grey-headed Flying Fox is listed as vulnerable under the EPBC Act. The species is a highly mobile forager across a variety of vegetation communities and may travel up to 30 kilometres from camps. The study area contains some plant species that provide foraging resources within in flower and which may be utilised by the flying fox, although due to the small extent of such species the study area is unlikely to provide sufficient resources to maintain a population of Grey-headed Flying Fox.

Echidna

The Echidna is listed as special Least Concern fauna under the NC Act as it is considered culturally significant. The Echidna occurs in a variety of habitats throughout Queensland and may occasionally traverse the study area.

3.5 Other Fauna and Habitats

Due the disturbed nature of the study area and low diversity of plant species present, the existing habitat for fauna is in poor condition. The study area provides habitat and resources for open country species that can tolerate high levels of habitat modification such as common birds. Common species sighted included Australian magpie *Gymnorhina tibicen*, Pied Butcherbird *Cracticus nigrogularis*, Grey Butcherbird *Cracticus torquatus,* Pale-headed Rosella *Platycercus adscitus*, Torresian crow *Corvus orru,* Crested Pigeon *Ocyphaps lophotes* and Magpie-lark *Grallina cyanoleuca*. An European Rabbit *Oryctolagus cuniculus* was observed within the patch of RE 11.9.5.

Several large eucalypts occur within the study area, primarily within the road reserves and several were observed to contain hollows of various sizes, which are suitable for hollow-nesting birds and mammals such as possums.

The study area is unlikely to provide suitable habitat for a diversity of reptile species due to the agricultural land use and lack of fallen woody debris. Reptile diversity is likely to be limited to common skinks and snakes, particularly Eastern Brown Snakes *Pseudonaja textilis*, which frequent cropping lands. Similarly, the study area is unlikely to provide habitat for frogs due to the absence of ponds or dams and the diversion drain at the northern boundary of the study area does not hold water.

The study area is also unlikely to provide habitat for a diversity of native mammal species due to the absence of vegetation cover.

3.6 Weeds and Pest Animals

The declared weed velvety tree pear *Opuntia tomentosa* was recorded prolifically within the RE 11.9.5 patch and throughout the road reserves. The study area also contains the suite of herbaceous and grassy weed species that are expected within an agricultural property in southern Queensland.

European Rabbit was observed within the patch of RE 11.9.5 within the southern portion of the study area. Rabbits would be expected to be relatively common within the surrounding landscape and their presence within the study area is not unexpected.

Tree pear and European Rabbit are listed as class 2 declared pests under the *Land Protection (Pest and Stock Route Management) Act 2002*.

3.7 Essential Habitat

No essential habitat as mapped by DRNM (2016) is located within or adjacent to the study area.

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3.8 Wetlands and Watercourses

No referrable wetlands, or wetland protected areas were identified within the study area during the desktop assessment, nor during the current field assessment.

Two watercourses are identified as occurring within the study area on the Vegetation Management Map (DNRM 2016c) in the northern portion of the study area. One watercourse traverses the north-western corner of the study area and is identified as a stream of order 4 and one watercourse traverses the north-eastern corner and is identified as a stream of order 1. Both watercourses have been significantly disturbed and diverted from its mapped path and currently do not resemble natural features due to the absence of a defined banks or channel and absence of riparian or aquatic vegetation.

4 LEGISLATIVE AND POLICY IMPLICATIONS

4.1 Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

4.1.1 Wetlands of international significance

The study area occurs within the catchment of four Ramsar sites that occur many hundreds of kilometres downstream. These sites are unlikely to be impacted as each is situated a considerable distance from the proposed action. Provided management practices and construction techniques are consistent with current industry standards, the project is unlikely to affect the ecological character of any Ramsar wetland.

4.1.2 Threatened species and ecological communities

Flora: One threatened flora species, Belson's Panic was detected from within the patch of RE 11.9.5 and within the Yarranlea-Murlaggan Road reserve adjacent to the study area. There is a moderate likelihood of other threatened flora species being present, although these would be confined to vegetation along road reserves. No other threatened flora species were identified during the field survey.

Fauna: No fauna species listed under the EPBC Act were recorded within the study area during the field assessment. There is suitable habitat within the study area for five fauna species listed under the EPBC Act (Condamine Earless Dragon, Five-clawed Worm-skink, Grey-headed Flying Fox and Painted Honeyeater), however the habitat is generally restricted to vegetation within the patch of RE 11.9.5 and road reserves due to the active cropping activities occurring within the study area.

The Condamine Earless Dragon is a high likelihood within road reserves adjacent to the study area and adjacent cropping areas. This species is regularly found within actively cropped areas and does not seem to be impacted by regular harvesting or planting of crop species. Although it would appear to have lost a significant percentage of its native grassland habitat prior to agricultural development, the nature of the black cracking clay soils upon which it is dependent has not changed and continues even after ploughing (Richardson 2006). The proposed solar farm will not significantly change the soil profile or cracking characteristics and therefore it is unlikely that the development will have a significant impact on this species.

Grey-headed Flying-fox is a dietary generalist which forages across a wide area. It is likely to continue to utilise the site post development and forage in landscaped areas. There will be no impact on roost sites as a result of the proposed development. This species is highly unlikely to be significantly impacted by the removal of individual trees in the short or long term.

Communities: No ecological communities listed under the EPBC Act were recorded within the study area.

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4.1.3 Migratory species

Several migratory species are likely to occur in or fly over the study area. However, the study area would not be classed as an 'important habitat' as defined under the EPBC Act Policy Statement 1.1 Principal Significant Impact Guidelines (DEWHA 2009) for any of these species and no further assessment is warranted.

4.1.4 Implications

The proposed action is unlikely to have a significant impact on any matter of NES. As such, a referral to the Commonwealth Environment Minister is unlikely to be required regarding matters listed under the EPBC Act.

4.2 Nature Conservation Act 1992 (Queensland)

4.2.1 EVNT Flora

One threatened flora species (Belson's Panic) was recorded within the study area during the survey. The species was found within the patch of RE 11.9.5 within the southern portion and a small population within the road reserve of Yarranlea-Murlaggan Road. No plants of this species will be impacted by the proposal development.

The Flora Survey Trigger map was downloaded on 12/2/2016 and a small area of high risk area is mapped within and adjacent to the study area in the north-east portion. This map is valid for 12 months from the date of download and will need to be re-downloaded if construction is likely to commence more than 12 months from this date.

4.2.2 EVNT Fauna

Although several EVNT and SLC fauna species are likely to occur within the study area (Condamine Earless Dragon, Grey-headed Flying-fox, Echidna), no specific licensing or approvals are required to take (e.g. damage or destroy) potential habitat for those species in this instance. However, under section 332 of the Nature Conservation (Wildlife Management) Regulation 2006 a person must not, without a reasonable excuse, tamper with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring. Tampering with an animals breeding place under an approved Species Management Program (SMP) is a reasonable defence against a charge under Section 332.

4.2.3 Implications

The Condamine Earless Dragon is considered a likely occurrence within the study area within cropping lands and adjacent grassy areas within Yarranlea-Murlaggan Road. Although breeding places for this species are not well understood, the grassy areas along Yarranlea-Murlaggan Road are considered to be habitat for the dragon. No impacts are proposed within these area, and as such, an SMP for this species is not required. In addition, no other least concern or special least concern species are known to breeding within the proposed development area or would be impact by the development and as such an SMP is not required.

4.3 Vegetation Management Act 1999

The proposed development does not trigger the VM Act given that the patch of RE 11.9.5 will be retained and protected.

However, should regulated vegetation be impacted along Yarranlea Road, the VM Act may apply. Given the activity is for the construction of a powerline, the trimming may be exempt under the VM Act if the activity is under section 101 or 112A of the *Electricity Act 1994* or section 17 of the *Electricity Regulation 2006*.

4.4 Land Protection (Pest and Stock Route Management) Act 2002

Declared pests, being certain animal and plant species, are declared under the *Land Protection (Pest and Stock Route Management) Act 2002*. Declared pests can be assigned into one of three Classes that regulate how the species is managed and can apply to restricting sale, introduction, possession or transport of the species.

Landowners must take reasonable steps to keep their land free of Class 1 and 2 declared pests. Landholders are not required to control Class 3 plants unless their land is adjacent to an environmentally significant area and they are issued with a pest control notice.

Velvety tree pear and European Rabbit are declared class 2 pests and landowners are legally responsible to take reasonable steps to remove and destroy these pests.

4.5 Water Act 2000

The watercourse map was reviewed for the study area (via the Vegetation Management category globe within the Queensland Globe). The map shows that two waterways have been identified as occurring within the study area. However, both waterways have been disturbed and diverted from their original courses and only a drainage feature remains.

Construction activities can be undertaken within the drainage features without the need for a permit or approval under the Water Act.

4.6 Toowoomba Planning Scheme

The study area is captured by the Environmental Significance Overlay Map and therefore the Environmental Significance Overlays Code is triggered. An assessment is provided against Table 8.5.1.1 below (Table 5).

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Table 5 Environmental Significance Overlay Code – for assessable development

Performance outcomes	Acceptable outcomes	Proposed Development
Areas of Ecological Significance		
PO_1 Vegetation disturbance or other impacts on areas of ecological significance shown on the Environmental Significance Overlay maps, is avoided or where disturbance cannot be avoided the loss or decrease of values is minimised.	$AO_{1.1}$ Impacts are avoided by locating development wholly outside mapped areas of ecological significance and areas of ecological significance buffer identified on the Environmental Significance Overlay maps. OR Where impacts on areas of ecological significance shown on the Environmental Significance Overlay Maps cannot be avoided, they are minimised by: (a) minimising the total footprint within which activities, buildings, structures, driveways and other works or activities are contained; (b) avoiding further fragmentation of areas of ecological significance and strengthening linkages where possible; I utilising areas of lesser importance in terms of biodiversity values so that areas of higher value are conserved to the greatest extent practicable; and (d) maintaining areas of ecological significance in patches of greatest possible size and with the smallest possible edge to area ratio.	The proposed solar farm infrastructure will be located outside of all areas mapped as Areas of Ecological Significance. The boundary the patch of RE 11.9.5 within the study area has been modified to accurately reflect the vegetation boundary.
PO_2 Optimise biodiversity outcomes by prioritising the location of environmental offsets within identified biodiversity corridors.	$AO_{2.1}$ Biodiversity offsets designed to counterbalance development impacts on areas of ecological significance are delivered consistent with the Queensland Government Environmental Offsets Policy 2008 and other applicable biodiversity / environmental offset policies.	No offsets are proposed to be completed for this project as no significant residual impacts to significant ecological values are proposed.

Performance outcomes	Acceptable outcomes	Proposed Development
PO_3 Landscaping complements biodiversity values through incorporating the following elements into the landscaping design: (a) native plants of local origin; or (b) known food and habitat trees and shrubs; or l replication of adjacent healthy remnant habitats, including understorey vegetation; and (d) no declared noxious plants, weeds or invasive plants likely to displace native flora species or degrade fauna habitat.	No acceptable outcome is nominated.	Landscaping will be complimentary to the species found within proximity to the study area and will include: (a) native plants of local origin; or (b) known food and habitat trees and shrubs; or l replication of adjacent healthy remnant habitats, including understorey vegetation; and (d) no declared noxious plants, weeds or invasive plants likely to displace native flora species or degrade fauna habitat.
PO_4 Movement of fauna is facilitated within and through the site, particularly along identified biodiversity corridors by: (a) ensuring that development and associated activities do not create barriers to the movement of fauna along and within biodiversity corridors; (b) directing fauna to locations where wildlife infrastructure has been created, to enable wildlife to safely negotiate a development area; and l separating fauna from potential hazards.	No acceptable outcome is nominated.	The study area comprises an agricultural land use and does not provide vegetated connections to other habitat area. Therefore, movement of fauna will not be facilitated through the proposed development.
PO_5 Identified biodiversity corridors on the Environmental Significance Overlay maps and their role to potentially connect areas of ecological significance (through rehabilitation or enhancement) are not compromised by development.	No acceptable outcome is nominated.	No Biodiversity Corridors are identified on the Environmental Significance Overlay Map within or adjacent to the study area.
Waterways and Wetlands		
PO_6 Development is not carried out within a mapped waterway or wetland identified on the Environmental Significance Overlay maps.	$AO_{6.1}$ Development is located outside the mapped boundary of a waterway or wetland identified on the Environmental Significance Overlay maps.	Two mapped waterways are identified within the northern portion of the study area. Both waterway area have been significantly modified from their natural state and are not identifiable as waterways.

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Performance outcomes	Acceptable outcomes	Proposed Development
PO_7 Development provides a buffer which protects the ecological, hydrological and water quality values of the wetland or the waterway.	$AO_{7.1}$ Development provides a buffer area which is vegetated with native plants endemic to the area. $AO_{7.2}$ Buildings, structures and works are not carried out within the buffer area identified on the Environmental Significance Overlay maps.	Natural waterways do not occur within or immediately adjacent to the study area. The drainage line is not proposed to be vegetated.
PO_8 Development retains the existing hydrological regime or re-establishes the previous naturally occurring regime.	$AO_{8.1}$ Existing flows of surface and ground water are not altered through construction of channelled flows or the redirection or interruption of flows.	The proposed development will not modify the existing drainage patterns or profile of the study area.

5 POTENTIAL IMPACTS AND MITIGATION MEASURES

5.1 Proposed Impacts

The proposed development is proposed to be staged over four stages and will involve almost complete coverage of the study area in solar PV panel arrays. While the development will involve the loss of all currently cropped areas, the small patch of RE 11.9.5 located within Stage 1 will not be cleared for the development. Vegetation along Yarranlea-Murlaggan Road will not be impacted, however some trees and other vegetation may be trimmed or cleared for duplication of the powerline along Yarranlea Road.

Potential impacts to ecological values associated with the PV Facility will be limited to those during construction. Construction activities will involve:

- A construction laydown area will be established at the western end of Yarranlea-Murlaggan Road and a second area at the eastern end. The areas will be cleared, grubbed, graded and compacted;
- Construction of an informal internal road system, treated to minimise dust creation;
- Construction of a gravel access track from the western end of Yarranlea-Murlaggan Road and around the perimeter of the Stage 1 block and stages 2-4 blocks;
- Erecting a 2.4 metre high chain wire link security fence around the perimeter of the study area;
- Construction of a control building and substation on the corner of Yarralean Road and Yarranlea-Murlaggan Road;
- Construction of an Operations and Maintenance Facility and farm storage shed on the northern side of Yarranlea-Murlaggan Road;
- Installing a 110 kV powerline to the existing Ergon substation by directly trenching and burying the line or by overhead powerline; and
- Installation of solar PV panels on monopoles supported by screw piles or similar that are driven into the ground.

Operational activities will be minimal and be largely restricted to use of the control building and operations and maintenance facility by staff. As the PV array frames have a minimal footprint on the ground surface, the soil will be seeded with an appropriate grass mix. Slashing of the grass would occur as appropriate and grazing would be considered.

Decommissioning activities would involve the removal of the panel arrays including monopole structures. The disturbance to the soil profile will be minimal and will able to be returned to an agricultural land use.

The patch of RE 11.9.5 will be retained as will the populations of Belson's Panic within this patch. No native woody vegetation is proposed to be cleared within the study area.

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There may be some trimming of regulated vegetation along Yarranlea Road adjacent to the existing powerline.

5.2 Mitigation Measures

Mitigation measures follow the impact mitigation hierarchy of avoid, minimise and mitigate (including offsets). This section identifies how the proposed development will mitigate impacts to ecological values.

5.2.1 Avoidance

No clearing of woody vegetation will occur within the study area and no impacts to grassland or woody vegetation will occur within the Yarranlea-Murlaggan Road reserve.

The existing stand of remnant vegetation (RE11.9.5) will be retained and improvements made to remove all noxious and exotic species and enhance the biodiversity of this part of the development site. The patch of vegetation will be demarcated with temporary fencing during the construction phase of the project to ensure that unintentional impacts do not occur.

Although the proposed development will not result in extensive ground disturbance, which may impact on the Condamine Earless Dragon, some ground disturbance may occur. To avoid impacts to the dragon, any crops remaining within the study area prior to construction commencing should be harvested and any other standing biomass (eg. grasses, weeds) should be slashed. This is to provide a disturbance stimulus to any dragons residing within the study area to retreat to existing habitats within adjacent road reserves.

5.2.2 Minimisation

Some clearing or trimming of regulated vegetation may be required along Yarranlea Road for the construction of an electricity connection to the Yarranlea Substation. Clearing will be limited to the minimise width necessary to safely construct and operate the electricity connection. Where possible, trees will be trimmed rather than felled.

Recommended measures to minimise impacts to terrestrial values present within the study area include:

- The extent of ground disturbance will be the minimum necessary to construct the access tracks, buildings and install the solar PV arrays;
- Construction stockpiles, machinery and other infrastructure should be wholly contained outside of the drainage channels to minimise the risk of sediments and pollutants being mobilised downstream; and
- Declared Class 2 weed species (i.e. velvety tree pear) must be treated prior to the activity commencing. This is to ensure that weed propagative material is not spread to other areas. A weed control contractor who is licenced to use herbicides should be engaged to treat weed infestations.

5.2.3 Mitigation measures

Recommended measures to mitigate impacts on terrestrial values present within the study area include:

- Ensure that best practice sedimentation and pollution control measures are undertaken at all times to prevent offsite impacts to downstream receiving environments. The Best Practice Erosion and Sediment Control Guidelines (Witheridge, 2014) should be referred to; and
- As native plants provides valuable habitat and food resources for fauna, it is recommended that any landscape plantings that are undertaken as part of the proposed development are completed using 90% native species that are found within the surrounding area, provided that commercial quantities of seedlings/seed are available.

The proposed development will result in the retention and protection of the patch of RE 11.9.5 vegetation along with Belson's Panic, within the southern portion of the study area and will manage the area as a conservation area. In addition, the proponent proposes to complete removal of weed species from the patch to support the resilience of the community and Belson's Panic population in the long-term.

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6 CONCLUSION AND FURTHER REQUIREMENTS

This ecological assessment has been prepared to identify the flora and fauna values within the study area, define and identify features of significance at the Commonwealth, State and local level, and to provide and assessment of the proposed development in consideration of relevant biodiversity legislation and government policy. The study area contains ecological values that are expected within an agricultural landscape with a common suite of species occurring within the limited habitat available. The small patch of RE 11.9.5 meets the definition of remnant vegetation and will be retained and protected as part of the proposed development. The population of Belson's Panic within the study area will also be retained and protected. Overall, given the ecological values of the study area are limited and, with the mitigation measures outlined above, the proposed development is not likely to significantly impact any ecological values at a Commonwealth, State or local level.

Further requirements associated with proposed development are provided below (Table 6).

Table 6. Further requirements associated with development of the study area

Legislation	Description of Values	Action Required
Environment Protection and Biodiversity Conservation Act 1999	The proposed action is unlikely to have a significant impact on any matter of NES. As such, a referral to the Commonwealth Environment Minister is unlikely to be required regarding matters listed under the EPBC Act.	No further action required.
Vegetation Management Act 1999	Regulated vegetation (i.e. RE 11.9.5) was identified within the study area. This vegetation will be retained and protected.	No further action required
Nature Conservation Act 1992	A small population of Belson's Panic was recorded within the patch of RE 11.9.5. This population will be retained and protected as part of the proposed development. No threatened fauna species were recorded within the study area; however Condamine Earless Dragon was considered a likely occurrence.	No breeding places for EVNT, special least concern or least concern species is expected. Therefore, an SMP is not required.
South East Queensland koala Conservation State Planning Regulatory Provisions (SPRP)	The study area is not located within a koala assessable development area.	No further action required.
Land Protection (Pest and Stock Route Management) Act 2002	Class 2 and class 3 declared plant pests have been identified within the study area.	Class 2 declared plants, velvety tree pear must be removed and destroyed from the study area prior to construction commencing.
Water Act 2000	The creekline and tributaries within the study area are defined as a drainage features under the Water Act.	No further action required.
Toowoomba Planning Scheme	The Environmental Significance Overlay identifies an Area of Ecological Significance and Waterways within the study area. The Area of Ecological Significance will be retained and	The performance outcomes of the Environmental Significance Overlay Code have been met.

Legislation	Description of Values	Action Required
	protected and the waterways do not occur within the study area.	
Electricity Act 1994 and *Electricity Regulation 2006*	An exemption may apply for impacts to regulated vegetation for activities under section 101 or 112A of the Electricity Act of 17 of the Electricity Regulation.	The potential exemption should be investigation further once the design has progressed.

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APPENDIX 1 – LEGISLATION (BACKGROUND)

A1.1. Environment Protection and Biodiversity Conservation Act 1999 (Commonwealth)

The EPBC Act establishes a Commonwealth process for the assessment of proposed actions (i.e. project, development, undertaking, activity, or series of activities) that are likely to have a significant impact on matters of national environmental significance (NES), or on Commonwealth land. An action, unless otherwise exempt, requires approval from the Commonwealth Environment Minister if it is considered likely to have an impact on any of the following matters of NES:

- World Heritage properties;
- National heritage places;
- Ramsar wetlands of international significance;
- Threatened species and ecological communities;
- Migratory and marine species;
- Commonwealth marine area;
- Nuclear actions (including uranium mining);
- Great Barrier Reef Marine Park; or,
- Water resources impacted by coal seam gas or mining development.

A1.2. Nature Conservation Act 1992 (Queensland)

The *Nature Conservation Act 1992* (NC Act) provides for the conservation of nature through protection of all native plants and animals in Queensland. Protection is provided under the NC Act through conservation of land as protected areas and wildlife protection outside of protected areas. Actions impacting on protected native flora and fauna are regulated under the NC Act. Permits for disturbance to native flora and fauna can be administered under the NC Act. The Queensland Nature Conservation (Wildlife) Regulation 2006 lists flora and fauna species considered to be extinct in the wild, endangered, vulnerable, near threatened or special least concern in Queensland.

Protected Plants

In Queensland, all plants that are native to Australia are "protected plants" under the NC Act. The DEHP administer this Act to ensure that protected plants and their parts are not illegally removed from the wild or traded. The take and use of protected plants (including whole plants, plant parts and propagating material) from the wild is regulated by a licensing system. People who wish to take protected plants from the wild, for any reason, may be required by law to obtain a licence, permit or authority from the Department of Environment and Heritage Protection (DEHP). This will be the case unless the activity is specifically exempt under a regulation or conservation plan under the Act (such as for timber harvesting of common species). Whether the activity is bound by, or exempt from,

provisions of the Act, the clearing of native vegetation may also require development approval under other legislation such the *Vegetation Management Act 1999* (VM Act).

The Protected Plants Flora Survey Trigger Map (DEHP 2015) shows high risk areas for protected plants and is used to help determine flora survey and clearing permit requirements for a particular location. Areas shown on the map as high risk are subject to particular requirements under the NC Act.

Protected Animal Breeding Places

Section 332 of the Nature Conservation (Wildlife Management) Regulation 2006 (Wildlife Management Regulation) governs tampering with animal breeding places. Under the Wildlife Management Regulation, Section 332(1), it is an offence to tamper with an animal breeding place that is being used by a protected animal to incubate or rear the animal's offspring.

Section 332(2) states that an animal breeding place is being used by a protected animal to incubate or rear the animal's offspring if:

- the animal is preparing, or has prepared, the place for incubating or rearing the animal's offspring; or
- the animal is breeding, or is about to breed, and is physically occupying the place; or
- the animal and the animal's offspring are physically occupying the place, even if the occupation is only periodical; or
- the animal has used the place to incubate or rear the animal's offspring and is of a species generally known to return to the same place to incubate or rear offspring in each breeding season for the animal.

Section 332(5) defines tamper (with an animal breeding place) as "damage, destroy, mark, move or dig up the breeding place".

Section 332(1) does not apply if the removal or tampering is part of an approved Species Management Program (SMP) for animals of the same species (section 332(4)). Section 332(5) defines an approved SMP, for a species of animal, as "a program about managing the population and habitat of the species of animal that is approved by the chief executive".

If a breeding place for a protected animal is likely to be disturbed by construction activities, an SMP is required to be prepared and approved by DEHP.

A1.3. Vegetation Management Act 1999

The VM Act provides a framework for the regulation of woody, terrestrial native vegetation located outside of protected areas. The stated purpose of the Act is to regulate the clearing of native vegetation in a way that:

- Conserves remnant vegetation that is an endangered, of concern or least concern RE
- Conserves vegetation in declared areas
- Ensures clearing does not cause land degradation
- Prevents biodiversity loss

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- Maintains ecological processes
- Manages the environmental effects of the clearing to ensure the above purposes are obtained.

The Act provides for the establishment and mapping of REs that encompass vegetation community descriptions within a geological and bioregional context, and for the creation and use of clearing codes (among other things). In addition, it provides a process for RE mapping changes by the public, and for the investigation and prosecution of clearing offences. Details on what clearing activities require assessment against the various regional clearing codes authorised under the VM Act are provided by the *Sustainable Planning Act 2009* (SP Act).

A1.4. Environmental Offsets Act 2014

The *Environmental Offsets Act 2014* (EO Act) was recently enacted in Queensland to streamline the offsets process for proponents and developers. The EO Act and subordinate Environmental Offsets Regulation 2014 and Environmental Offsets Policy replaced the Queensland Government Environmental Offsets Policy and four specific-issue policies for vegetation management, koala habitat, fish habitat and biodiversity values.

The EO Act amended other Acts to provide consistency for when offsets are triggered and how they should be delivered. The EO Act does not trigger offsets directly, but is indirectly involved through existing approval pathways under the SP Act, NC Act, VM Act and Fisheries Act 1994. Offsets can be imposed by an authority when a prescribed activity will have a significant residual impact on a prescribed environmental matter.

Offsets can be delivered by a proponent driven offset (land-based offset) or financial settlement offset depending upon the activity and the matter(s) involved.

If the proposed development is shown to have a significant residual impact on a matter of State environmental significance (SES), then an environmental offset is likely to be conditioned onto the project approval.

A1.5. Water Act 2000

The *Water Reform and Other Legislation Amendment Act 2014* was passed on 26 November 2014. The Act includes a number of changes to the Water Act 2000 and other resource related legislation. Amongst the changes, a new watercourse identification map has been prepared to show watercourses and drainage features as described in the Water Act.

A1.6. Toowoomba Regional Planning Scheme

The study area lies within the Toowoomba Regional Council area and will be assessed under the Toowoomba Planning Scheme 2012 (amended October 2015). The following overlays are relevant to the study area.

Environmental Significance Overlay

The Environmental Significance Overlay identifies eight significant features throughout the Beaudesert area. These include:

(a) Areas of Ecological Significance;

(b) Areas of Ecological Significance Buffer;

(c) Waterways and Wetlands; and

(d) Biodiversity Corridors.

The study area is captured by the Areas of Ecological Significance, buffers and Waterways and Wetlands overlay and corresponds with the mapped remnant vegetation within and adjacent to the study area and the mapped waterways within the northern portion.

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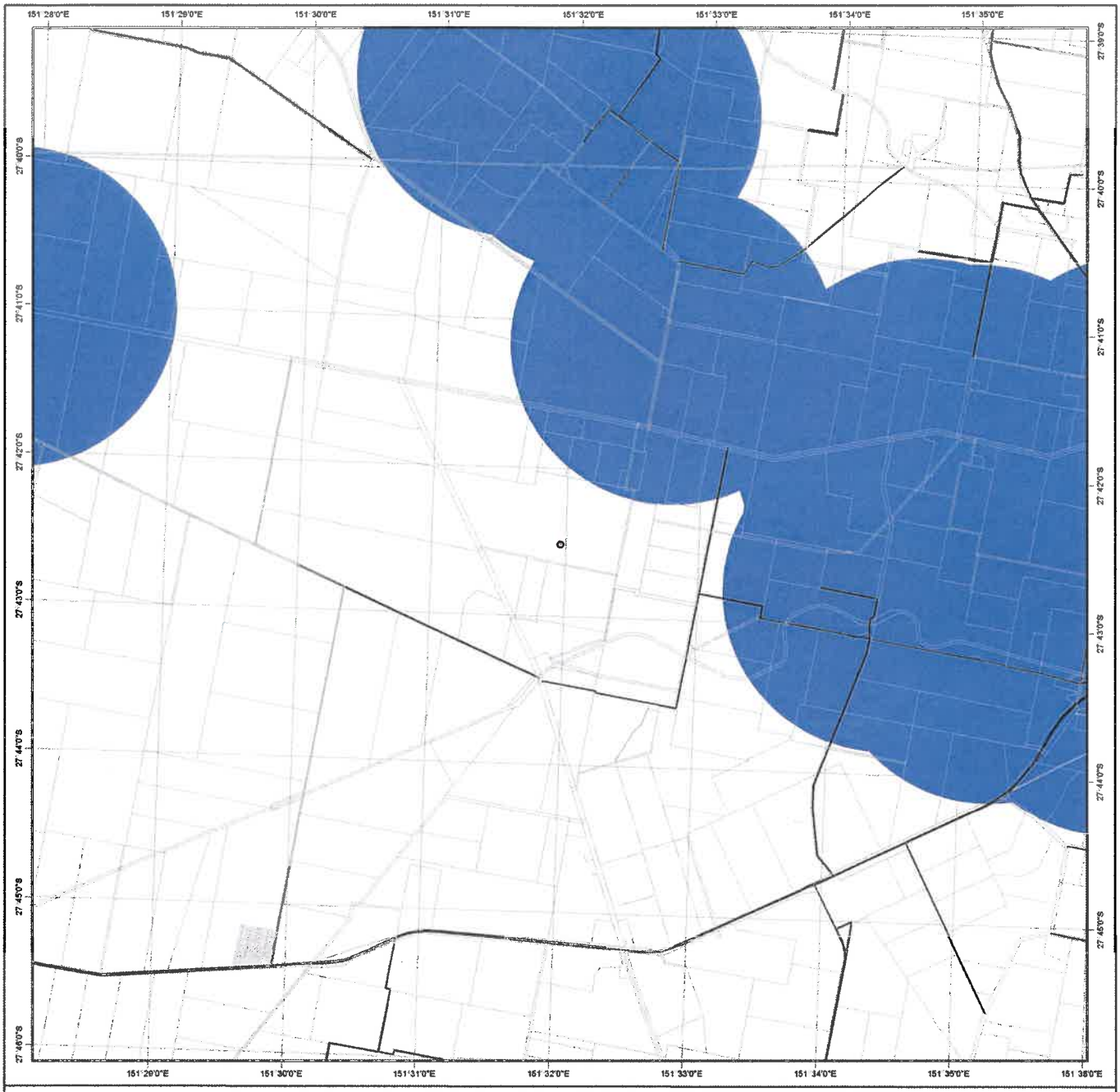
APPENDIX 2 – FLORA SURVEY TRIGGER MAP

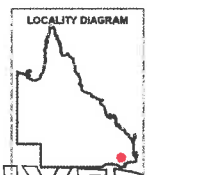
12/02/2016 10:38:22
Longitude: 151.5327 Latitude: -27.7085



Protected Plants Flora Survey Trigger Map

Legend

- Coordinates
- High risk area
- Cadastral line
  Property boundaries shown are provided as a locational aid only
- Freeways / motorways / highways
- Secondary roads / streets



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0 490 980 1,470 1,960 2,450 m

This product is projected into:
GDA 1994 Queensland Albers

This map shows areas where particular provisions of the Nature Conservation Act 1992 apply to the clearing of protected plants.

This map is produced at a scale relevant to the size of the area selected and should be printed as A4 size in portrait orientation.

For further information or assistance with interpretation of this product, please contact the Department of Environment and Heritage Protection at palm@ehp.qld.gov.au

Disclaimer:
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APPENDIX 3 – SIGNIFICANT FAUNA ASSESSMENT

Table 7 Significant Fauna Species within 10km of the Study Area

Scientific Name	Common Name	Qld	EPBC	Source	Habitat Requirements and Distribution	Likelihood of Occurrence Assessment
INSECTS						
Phyllodes imperialis smithersi	Pink Underwing Moth	LC	E	PMST	The moth occurs in undisturbed lowland rainforest where its food plant the vine Carronia multisepalea occurs. The moth occurs from Nambour into northern NSW.	Unlikely. Required habitat does not occur within the study area.
FISH						
Maccullochella mariensis	Mary River Cod	LC	E	PMST	The Mary River cod is endemic to the Mary River system in northern South East Queensland. It has been translocated to many impoundments in SEQ, including Wivenhoe, Baroon Pocket and Maroon Dam.	Unlikely. A translocated population occurs within 10km of the study area, however the waterway within the study area does not contain the required habitat for the species.
FROGS						
Mixophyes iteratus	Giant Barred Frog	LC	E	PMST	The Southern Barred Frog occurs in uplands and lowlands in rainforest and wet sclerophyll forest, including farmland. Populations have been found in disturbed areas with vegetated riparian strips on cattle farms and in regenerated logged areas. Many sites where the Southern Barred Frog is known to occur are the lower reaches of streams which have been affected by major disturbances such as clearing, timber harvesting and urban development in their headwaters.	Unlikely. Required habitat does not occur within the study area.
REPTILES						
Coeranoscincus reticulatus	Three-toed Snake-tooth Skink	LC	V	PMST	The Three-toed snake-tooth skink is known from subtropical rainforests in McPherson, Main and Conondale Ranges north to Fraser Island. It is absent from apparently suitable habitat in the D'Aguilar Range. It mainly occurs in elevated areas although Fraser Island and adjacent Cooloola region	Unlikely. Required habitat does not occur within the study area.

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Scientific Name	Common Name	Qld	EPBC	Source	Habitat Requirements and Distribution	Likelihood of Occurrence Assessment
					are lowland sites.	
Delma torquata	Collared Delma	V	V	PMST	The collared delma is known from rocky areas associated with dry open forests and from briglow associations. Within these habitats the presence rocky substrates (with small rocks which act as shelter sites) is an essential microhabitat element.	Unlikely. Required habitat does not occur within the study area.
Furina dunmalli	Dunmall's snake	V	V	PMST	Poorly known, so that preferred habitats are uncertain. Open dry sclerophyll forests and woodlands, especially brigalow, with fallen timber and ground litter on floodplains of cracking clay soils. In Queensland, the snake occurs almost exclusively within the Brigalow Belt bioregion.	Unlikely. The snake does not occur east of Toowoomba.
BIRDS						
Anthochaera phrygia	Regent Honeyeater	E	CE	PMST	The regent honeyeater is usually associated with box-ironbark vegetation types and the wetter more fertile sites within these associations such as creek flats, broad valleys and foothills. The species has undergone a significant range contraction and is now rarely sighted in Queensland.	Unlikely. Required habitat does not occur within the study area.
Botaurus poiciloptilus	Australasian Bittern	LC	E	PMST	The Australasian Bittern requires shallow water, less than 30 cm deep with medium to low density reeds, grasses or shrubs for foraging (Pickering 2013). It needs deeper water with medium to high density reeds, rushes or sedges for nesting (Pickering 2013). It is largely recorded in freshwater wetlands and, rarely, in estuaries or tidal wetlands.	Unlikely. Required habitat does not occur within the study area.
Cyclopsitta diophthalma coxeni	Coxen's Fig-Parrot	E	E	PMST	Coxen's fig parrot occurs in lowland subtropical rainforest, dry rainforest, littoral and developing rainforest, riparian areas in woodland and cleared areas with fig trees. It feeds on figs but also eats the fruit of other native and exotic trees and insect	Unlikely. Required habitat does not occur within the study area.

Scientific Name	Common Name	Qld	EPBC	Source	Habitat Requirements and Distribution	Likelihood of Occurrence Assessment
					larvae. In Queensland it now appears to be largely restricted to the greater Bundaberg area, Main Range National Park, Blackall Range and the western side of Lamington National Park.	
Dasyornis brachypterus	Eastern Bristlebirds	E	E	PMST	The northern population, occurs in south-eastern Queensland and north-eastern NSW, and consists of extant local populations at Conondale Range National Park, Main Range National Park, Mount Barney National Park, Lamington National Park, Border Ranges National Park, Grady's Creek and Gibraltar Range National Park. It is not known outside of these reserves and adjacent private lands.	Unlikely. Required habitat does not occur within the study area.
Erythrotriorchis radiatus	Red Goshawk	V	V	PMST	The red goshawk is generally found in open woodland, the edges of rainforest, and in dense riverine vegetation of coastal and subcoastal forests. This species is known to have a large home range but nests in tall trees usually within 1km of a waterway or wetland.	Unlikely. Required habitat does not occur within the study area.
Geophaps scripta scripta	Squatter Pigeon (southern)	V	V	PMST	This species is known from tropical dry, open sclerophyll woodlands and sometimes savanna. It appears to favour sandy soil dissected with low gravely ridges and is less common on heavier soils with dense grass cover. It is nearly always found in close association with permanent water. This species is now rarely recorded in southern Queensland and northern NSW.	Unlikely. Required habitat does not occur within the study area and no recent records from within 10km radius of the study area.
Grantiella picta	Painted honeyeater	V	V	PMST	Forests, woodlands and dry scrublands, dependent on mistletoe berries. Widespread throughout Queensland but rare in inland Australia.	Unlikely. Required habitat does not occur within the study area and no recent records from within 10km radius of the study area.

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Scientific Name	Common Name	Qld	EPBC	Source	Habitat Requirements and Distribution	Likelihood of Occurrence Assessment
Lathamus discolor	Swift Parrot	E	E	PMST	This species only breeds in Tasmania and migrates to the mainland to feed each year mainly on the inland slopes of the Great Dividing Range particularly in Victoria and NSW with a small number of birds reaching as far as south east Queensland. This species is considered to have a moderate potential to occur within the study area during its winter, non breeding period. However, this would be expected to be a rare occurrence. While it has been recorded historically from Chinchilla, recent records tend to be from coastal Queensland.	Unlikely. Required habitat does not occur within the study area and no recent records from within 10km radius of the study area.
Ninox strenua	Powerful Owl	V		Wildnet	The powerful owl occurs mostly on the coastal side of the Great Dividing Range and adjacent inland slopes. Powerful Owls are sedentary within home ranges of about 1,000 ha within open eucalypt, Casuarina or Callitris pine forest and woodlands, often utilising exotic pine plantations. They nest in tree hollows often in large eucalypts and often roost in denser vegetation including rainforest. Prey items are medium sized mammals such as possums and gliders but also take birds, flying-foxes, rats and insects.	Unlikely. Required habitat does not occur within the study area.
Poephila cincta cincta	Black-throated Finch (southern)	E	E	PMST	The Black-throated Finch (southern) historically occurred from far south-eastern Queensland, near the Queensland-NSW border, through eastern Queensland north to the divide between the Burdekin and Lynd Rivers. The subspecies is now extinct at most sites south of Burdekin River, and is confined to a very few remaining 'pockets' of suitable habitat.	Unlikely. Required habitat does not occur within the study area and no recent records from within 10km radius of the study area.

Scientific Name	Common Name	Qld	EPBC	Source	Habitat Requirements and Distribution	Likelihood of Occurrence Assessment
					It has been absent from Brisbane and its surrounds since the 1930s or 1940s, and appears to have become extinct around most of Rockhampton during the early to mid 1970s, despite having been numerous there during the 1950s.	
Rostratula australis	Australian Painted Snipe	V	E	PMST	This species occurs in shallow, vegetated temporary or infrequently filled wetlands, sometimes with trees or shrubs where it feeds at the water's edge on seeds and invertebrates.	Unlikely. Required habitat does not occur within the study area and no recent records from within 10km radius of the study area.
Turnix melanogaster	Black-breasted Button-quail	V	V	PMST	The black-breasted button-quail is most commonly associated with vine thicket rainforest with greater than 800mm rainfall, deep leaf litter and a closed canopy but also occur in softwood scrubs in the Brigalow Belt, vine scrub regrowth and mature hoop pine (Araucaria cunninghamii) particularly with a lantana understorey. They also occur in dry sclerophyll forest adjacent to rainforest and acacia and Austromyrtus scrubs on sandy coastal soils (Inskip Point) (Garnett & Crowley 2000).	Unlikely. Required habitat does not occur within the study area and no recent records from within 10km radius of the study area.
MAMMALS						
Chalinolobus dwyeri	Large-eared Pied Bat, Large Pied Bat	V	V	PMST	This species is uncommon in dry and wet Eucalypt forests from Blackdown Tableland in Central Queensland to near Wollongong. Primarily a cave rooster, this species inhabits sclerophyll forests and woodlands throughout much of its range. It is however, primarily associated with Dry Sclerophyll Woodlands throughout its range, and these habitats are relatively restricted in the study area. This species is considered unlikely to be present in the study area	Unlikely. Required habitat does not occur within the study area and no recent records from within 10km radius of the study area.
Ornithorhynchus	platypus	SL		Wildnet	Freshwater rivers and creeks in eastern Australia,	Unlikely. Required habitat does not

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Scientific Name	Common Name	Qld	EPBC	Source	Habitat Requirements and Distribution	Likelihood of Occurrence Assessment
anatinus					from tropical rainforest in n Qld to mountains of Tasmania and SE Aust. Feed in both slow-moving and rapid (riffle) parts of streams, but appear to prefer coarser bottom substrates (e.g. gravel). Construct short burrows in the banks, often hidden by overhanging vegetation.	occur within the study area.
Petrogale penicillata	brush-tailed rock-wallaby	V	V	Wildnet, PMST	In Queensland, occurs on rocky slopes and gorges of the Great Dividing Range.	Unlikely. Required habitat does not occur within the study area.
Phascolarctos cinereus	koala	V	V	Wildnet, ALA, PMST	koalas naturally inhabit a range of temperate, sub-tropical and tropical forest, woodland and semi-arid communities dominated by Eucalyptus species. koala habitat can be broadly defined as any environment containing koala food trees species or shelter trees, which may be used by koalas for roosting, sheltering or breeding, and which is sufficiently connected. The distribution of this habitat is largely influenced by land elevation average, annual temperature and rainfall patterns, soil types and the resultant soil moisture availability and fertility. Preferred food and shelter trees are naturally abundant on fertile clayey soils.	Low likelihood. Food trees are present within the study area, however no signs of koala usage was recorded.
Potorous tridactylus tridactylus	Long-nosed Potoroo (SE mainland)	C	V	PMST	In Queensland, the potoroo utilises a variety of habitats such as rainforest and coastal heaths and scrubs and seems to favour habitat with dense understorey. It occurs in scattered populations within Queensland.	Unlikely. Required habitat does not occur within the study area and no recent records from within 10km radius of the study area.
Pteropus poliocephalus	grey-headed flying-fox	LC	V	Wildnet, PMST	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	Low likelihood. The flying fox may forage within the study area when mature eucalypts are flowering, however the resources provided are insufficient to support a

Scientific Name	Common Name	Qld	EPBC	Source	Habitat Requirements and Distribution	Likelihood of Occurrence Assessment
					and Banksia woodlands. It also feeds on commercial fruit crops and on introduced tree species in urban areas. The primary food source is blossom from Eucalyptus and related genera but in some areas it also utilises a wide range of rainforest fruits. None of the vegetation communities used by the Grey-headed Flying-fox produce continuous foraging resources throughout the year. As a result, the species has adopted complex migration traits in response to ephemeral and patchy food resources. The Grey-headed Flying-fox roosts in aggregations of various sizes on exposed branches. Roost sites are typically located near water, such as lakes, rivers or the coast. Roost vegetation includes rainforest patches, stands of Melaleuca, mangroves and riparian vegetation, but colonies also use highly modified vegetation in urban and suburban areas. The species can maintain fidelity to roost sites for extended periods, although new sites have been colonised.	population of the species.
Tachyglossus aculeatus	short-beaked echidna	SL		Wildnet	Occurs in a wide range of habitats, from alpine and cold-temperate areas to deserts and tropical regions. Appears to have no specific habitat requirements beyond a food supply of ants and termites.	High likelihood. Echidnas are ubiquitous throughout the region and may occur on the study area.
Dasyurus maculatus maculatus	Spotted-tail Quoll	E	E	PMST	The Spot-tailed Quoll occurs in south-east Queensland: coastally from Bundaberg to the border and inland to Monto and Stanthorpe. Occurrences from five broad geographic areas are known: four from coastal ranges and the Great Dividing Range from the NSW border to Gladstone.	Unlikely. Required habitat does not occur within the study area.

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Scientific Name	Common Name	Qld	EPBC	Source	Habitat Requirements and Distribution	Likelihood of Occurrence Assessment
					The fifth is centred on the eastern Darling Downs-Inglewood Sandstone provinces of the Brigalow Belt South Bioregion. Unconfirmed reports suggest the subspecies may occur in the Clarke and Conway Range areas, eastern Queensland. Historical locations include the D'Aguilar Range west of Brisbane and coastal areas from Coolangatta to Bundaberg. The species is now believed to be extinct in these regions.	

Table 8 Migratory Species within 10km of the Study Area

Scientific Name	Common Name	Qld	EPBC	Source
Acrocephalus australis	Australian Reed-warbler	SL	Mi	Wildnet, ALA
Apus pacificus	Fork-tailed Swift	SL	Mi	EPBC
Ardea alba	Great Egret	SL	Mi	EPBC
Ardea alba modesta	Eastern Great Egret	SL	Mi	Wildnet, ALA
Ardea ibis	Cattle Egret	SL	Mi	Wildnet, ALA, EPBC
Coracina tenuirostris	Cicadabird	SL	Mi	Wildnet, ALA
Gallinago hardwickii	Latham's snipe	SL	Mi	Wildnet, ALA, EPBC
Hirundapus caudacutus	White-throated Needletail	SL	Mi	Wildnet, ALA, EPBC
Merops ornatus	Rainbow Bee-eater	SL	Mi	Wildnet, ALA, EPBC
Monarcha melanopsis	Black-faced Monarch	SL	Mi	EPBC
Monarcha trivirgatus	Spectacled Monarch	SL	Mi	EPBC
Myiagra cyanoleuca	Satin Flycatcher	SL	Mi	EPBC
Pandion 59haliaetus	Osprey	SL	Mi	EPBC
Plegadis falcinellus	Glossy Ibis	SL	Mi	Wildnet, ALA

Rhipidura rufifrons	Rufous Fantail	SL	Mi	EPBC

Notes: 1) Listed as Critically Endangered (CE), Endangered (E), Vulnerable (V), Special Least Concern (SL) or Migratory (Mi) under the EPBC Act
3) Likelihood of occurrence:

1	High Likelihood	• Known resident in the Study area based on site observations, database records, or expert advice; and/or, • Recent records (i.e. within five years) of the species in the local area (VBA 2011); and/or, • The Study area contains the species' preferred habitat.	2	Moderate Likelihood	• The species is likely to visit the Study area regularly (i.e. at least seasonally); and/or, • Previous records of the species in the local area (DSE 2011b); and/or, • The Study area contains some characteristics of the species' preferred habitat.
3	Low Likelihood	• The species is likely to visit the Study area occasionally or opportunistically whilst en route to more suitable sites; and/or, • There are only limited or historical records of the species in the local area (i.e. more than 20 years old); and/or, • The Study area contains few or no characteristics of the species' preferred habitat.	4	Unlikely	• No previous records of the species in the local area; and/or, • The species may fly over the Study area when moving between areas of more suitable habitat; and/or, • Out of the species' range; and/or, • No suitable habitat present.

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Appendix I – PMAV

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Queensland Government

Department of Natural Resources and Mines

Author: Carmen Goulding
Ref number: 2016/002201

15 June 2016

Mr Nick Canto
icubed Consulting
PO Box 878
Toowoong QLD 4066

Dear Mr Canto

Certification of a Property Map of Assessable Vegetation on Lot 2 RP7475 - Toowoomba Regional Council

This is to advise you that a Property Map of Assessable Vegetation (PMAV) has been certified—consistent with your agreement—by the Department of Natural Resources and Mines (DNRM) on 13 June 2015. A copy of the certified map is attached for your records.

Please be aware that the government introduced into Parliament the *Vegetation Management (Reinstatement) and Other Legislation Amendment Bill 2016* (the Bill) on 17 March 2016 which proposes to amend the vegetation management laws in Queensland.

If passed by Parliament, the Bill may affect the extent of the category X areas shown on this PMAV due to:

- the reinstatement of category C areas on freehold and indigenous land which will regulate the clearing of vegetation within these areas ; and
- the introduction of additional category R areas which will regulate the clearing of vegetation within 50 meters of a watercourse and drainage feature in the Burnett-Mary and Fitzroy Great Barrier Reef catchments.

Should the Bill commence, DNRM may remake your PMAV, free of charge, showing these areas as category C areas or category R areas as appropriate.

You may still clear proposed category C areas and category R areas if the clearing is undertaken in accordance with an exemption or the relevant existing self-assessable vegetation clearing code for Managing Category C regrowth vegetation or Managing Category R regrowth vegetation. Under these codes, you are required to notify DNRM prior

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ABN 59 020 847 551

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to clearing. The codes and further information on exemptions can be located via the link below:
www.qld.gov.au/environment/land/vegetation/management/.

The ability to clear native vegetation under the Vegetation Management Framework does not authorise the clearing of any vegetation under other legislation. Other Commonwealth, State and/or local government legislation may affect the management of native vegetation on your property.

Should you have any further enquiries, please do not hesitate to contact Amy MacCartie on telephone (07) 45291433 quoting the above reference number.

Yours sincerely

Carmen Goulding
Administration Officer

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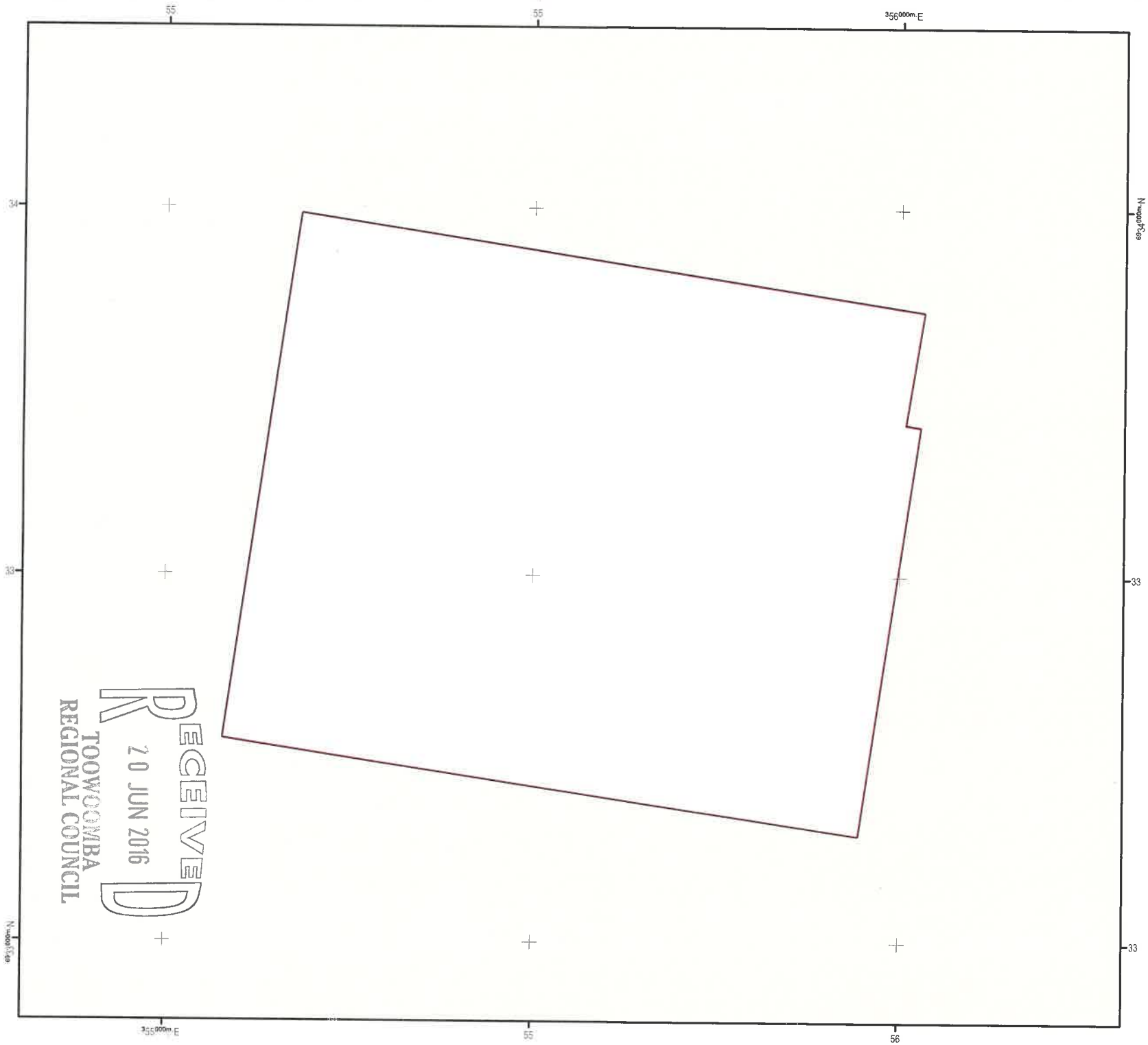

Property Map of Assessable Vegetation

Sheet 1 of 1

PMAV 2016/002201

LOT on PLAN
2RP7475

Queensland Government

0 100 200 300 400
m

LEGEND

Subject Lot(s)
Area to which the PMAV does not apply

Scale: 1:5000
(original size A3)

Vegetation Category Area
Category X area

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Notes:
Property boundary provided by Department of Natural Resources and Mines
The property boundaries shown on this plan are approximate only.
They are not an accurate representation of the legal boundaries.

Map Information:
Horizontal Datum: GDA 1994
Projection: Universal Transverse Mercator - Zone 56

This PMAV has been made under Section 20C(3) of the Vegetation Management Act 1999

Signed for the Chief Executive of the Department of Natural Resources and Mines by:

Name: Michael Gordon
Title: Senior Natural Resource Management Officer
Signature:
Date: 13/06/2016

Map Prepared by: ALM
Department of Natural Resources and Mines
PO Box 318, Toowoomba, Qld, 4350

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Map Preparation Date:03/06/2016