

ECOLOGICAL ASSESSMENT REPORT

19 & 23 Adele Crescent, Bahrs Scrub, QLD 4207
For PacificCorp (Adele) Pty Ltd

August 2022



W O L T E R
consulting group

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1. INTRODUCTION

1.1. BACKGROUND

Wolter Consulting Group (WCG) was engaged by PacificCorp (Adele) Pty Ltd (hereafter referred to as 'the client') to undertake an Ecological Assessment Report for the proposed development located at 19 and 23 Adele Cr Bahrs Scrub. The site is comprised of two land parcels formally described as Lot 28 and 27 on SP169807 hereafter referred to collectively as the subject site. Lot 28 is approximately 3.47 hectares in area and Lot 27 is 3.85 ha in area comprising a total of 7.33ha. The site is located within the Logan City Council (LCC) Local Government Area, approximately 33km south of Brisbane's Central Business District and 12.5km from Logan Central.

1.2. PURPOSE OF THE REPORT

This Ecological Assessment Report (EAR) has been formulated to guide the client in development planning and to assist regulatory authorities in the assessment of the site's ecological value and potential impacts of the development proposal. The report provides a description of the ecological values identified within the subject site based on desktop reviews and a targeted ecological field investigation to assess the flora and fauna species, vegetation communities, bio-condition assessment of vegetation communities, habitat values and assess areas / features / processes of heightened ecological significance.

1.3. OBJECTIVES OF THE ASSESSMENT

This EAR identifies the ecological constraints and opportunities inherent in the site associated to the proposed development. The objectives of the assessment report are:

- To guide the client in development planning through identification of potential ecological constraints.
- Develop a flora catalogue for the subject site.
- Develop a fauna catalogue for the subject site.
- Identify vegetation community types on the subject site.
- Assessment and analysis of vegetation communities present on the subject site.
- Assess habitat value, including the presence and absence of fauna on the subject site.
- Assess areas / features / processes of heightened ecological significance on the subject site.
- Develop a fauna species inventory list for the subject site; and
- To formulate and document mitigation measures required to alleviate potential negative impacts of the proposed development on the ecological context of the site and locality.

1.4. KEY DEFINITIONS

The **subject site** is defined as Lots 27 and 28 on SP169807. The subject site is approximately 7.33ha in area.

The **study area** is defined as the area subject to development (i.e. development footprint).

The **impact area** is land located within approximately 100m of the development footprint.

The **locality** is land located within an approximate 2km radius of the subject site.

1.5. OUTLINE OF THE ASSESSMENT

The EAR has been structured to provide information consistent with the requirements of the Brisbane City Plan 2014, the Vegetation Management Act

1999, the Nature Conservation (Wildlife) Act 1992 (NC Act 1992) and Nature Conservation (Wildlife) Regulation 2006 (NCWR 2006), the Biosecurity Act 2014 and the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act 1999).

The EAR is structured as follows:

- Subject site environmental setting overview.
- Description of the development proposal.
- Study methodology.
- Study results.
- Discussion.
- Recommendations and Mitigation measures; and
- Conclusion.

2. SITE ANALYSIS

2.1. SITE LOCATION AND CHARACTERISTICS

The subject site is located at 19 & 23 Adele Crescent in Bahrs Scrub. The site is irregular in shape with an approximate total frontage width of 87.9m and a total area of 73,340m². The site is over two lots with both lots gaining access from Adele Crescent. The site is currently improved with a dwelling house and ancillary domestic outbuildings on each lot.

The pre-development lot currently houses two private residences and associated infrastructure within curtilage areas. The balance of the site is un-improved and houses a mosaic of natural bushland, regrowth areas, open pasture and maintained landscaping areas. A waterway is located generally along the north-western site boundary and traverses the site running in a southerly to northern direction. Two dams are present, one located to the west of the existing driveway on Lot 27 near to the site frontage and the other located towards the rear of Lot 28.

2.2. SITE TOPOGRAPHY

The subject site grades from the highest point at the southern boundary (85m ASL) to the north-eastern boundary (35m ASL) and again towards the north-western boundary (45m ASL) resulting in what can generally be described as a central ridge running south to north. The north-eastern boundary is characterised by steep slopes of a grade that is considered inaccessible. Topography of this degree when generalised across the site can be defined as rolling low hills (Speight, 2009).

Figure 1 illustrates the topography of the study area.

Figure 1: Subject site topography



2.3. SOILS AND GEOLOGY

Desktop analysis of available geology data for the site indicates the site and surrounding area's dominant surface geology as Devonian to Carboniferous period sedimentary rocks of the Neranleigh-Fernvale rock unit. Geology of this type conforms to the Department of Environment and Science (DES) descriptions of Land Zone 11 – Hills and Lowlands on metamorphic rocks (Wilson and Taylor, 2012).

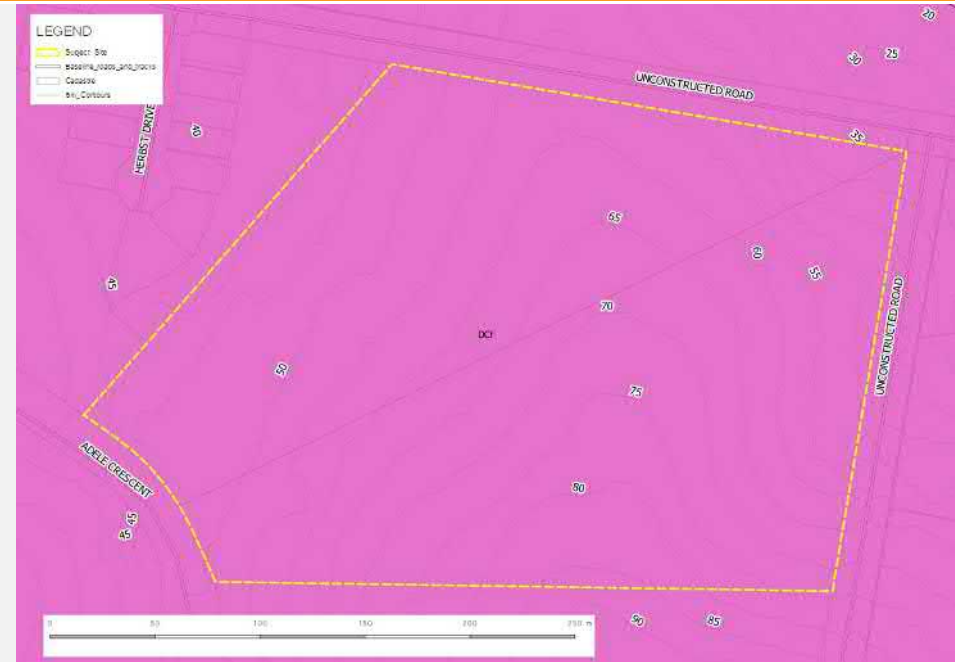
Figure 2 below demonstrates the extent of this.

2.4. CURRENT LAND USES

Currently the site is being utilised for lower density rural type residential land uses. The site currently houses two private residences and associated infrastructure within curtilage areas. The balance of the site is un-improved and houses a mosaic of natural bushland, regrowth areas, open pasture and maintained landscaping areas. It appears that historical land uses include agricultural and grazing activities based on residual retained vegetation species and communities.

An aerial image of the subject site and study area is provided in **Figure 3** below.

Figure 2: Surface geology for the locality of the subject site



LEGEND

Subject Site

Baseline_roads_and_tracks

Cadastre



FIGURE ONE: AERIAL IMAGE AND SURROUNDS

19 & 23 Adele Crescent, Bahrs Scrub, QLD, 4207

Description

Local Authority

Lots 27 & 28 on RP169807

Logan City Council

CLIENT

Pacificcorp (Adele) Pty Ltd



DRAWING NO.	VERSION
Figure One	A
DATE DRAWN	SHEET NO.
12-08-2022	1 OF 1

3. DEVELOPMENT PROPOSAL

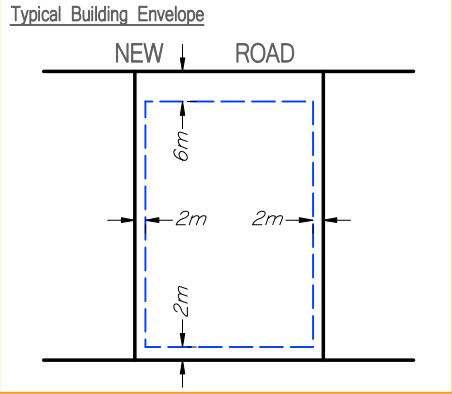
The proposed development is for a reconfiguring a lot and operational works for a subdivision of 2 lots in to 11 lots plus new road, drainage reserve and subsequent native vegetation clearing.

The proposed development will provide lot sizes that ranges between 2,600m² to 9,200m². However, due to the site constraints such as biodiversity and waterway corridors, reduced building envelopes are proposed. A new 120m width road connection is also included in the proposal, from which the new lots will gain access from.

The lot layout design has been heavily informed by the existing contours on the site to minimise the extent of any required cutting or filling (for both the new public road proposed and each individual lot).

Refer to **Figure 4** to view the Development Proposal.

LEGEND	
	Site Boundary
	Building Location Envelope
	Indicative Effluent Disposal
	Wildlife Movement Area
	Existing Buildings to be Retained



1. SITE COVER
- The maximum area covered by all buildings and structure roofed with impervious materials, does not exceed 40% of the lot area or 2000m², whichever is lesser.
2. EFFLUENT
- Final effluent disposal areas must be located within the approved building envelope areas and in accordance with all required setbacks as per the Queensland Plumbing and Wastewater Code and AS/NZS 1547.



CLIENT

PACIFICCORP

(Adele) Pty Ltd

SITE ADDRESS

19 & 23 Adele Crescent,
Bahrs Scrub

RPD:
Lots 27 & 28
Plan RP169807
Locality Bahrs Scrub
Local Authority Logan City
Level Datum PSM150950
Co-ord System MGA2020
Origin AHD 48.640 via CORs
Meridian MGA2020 plane scale around PSM

- Notes
- Any licence, express or implied, to use this document for any purpose whatsoever is restricted to the terms of the agreement or implied agreement between Wolter Consulting Group and the instructing party.
 - Design subject to local authority approval & detailed engineering requirements, areas and dimensions are approximate only and are subject to survey. Therefore this drawing is not to be used for engineering design.
 - Lot layout data supplied by others and is approximate only.
 - This note is an integral part of this plan. This plan may not be reproduced without this notation being included.

SCALE at A3

1:1250

DESIGN

GS

DRAWN

JC

CHECKED

GS

DRAWING TITLE:

Building Envelope Plan

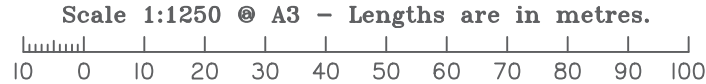
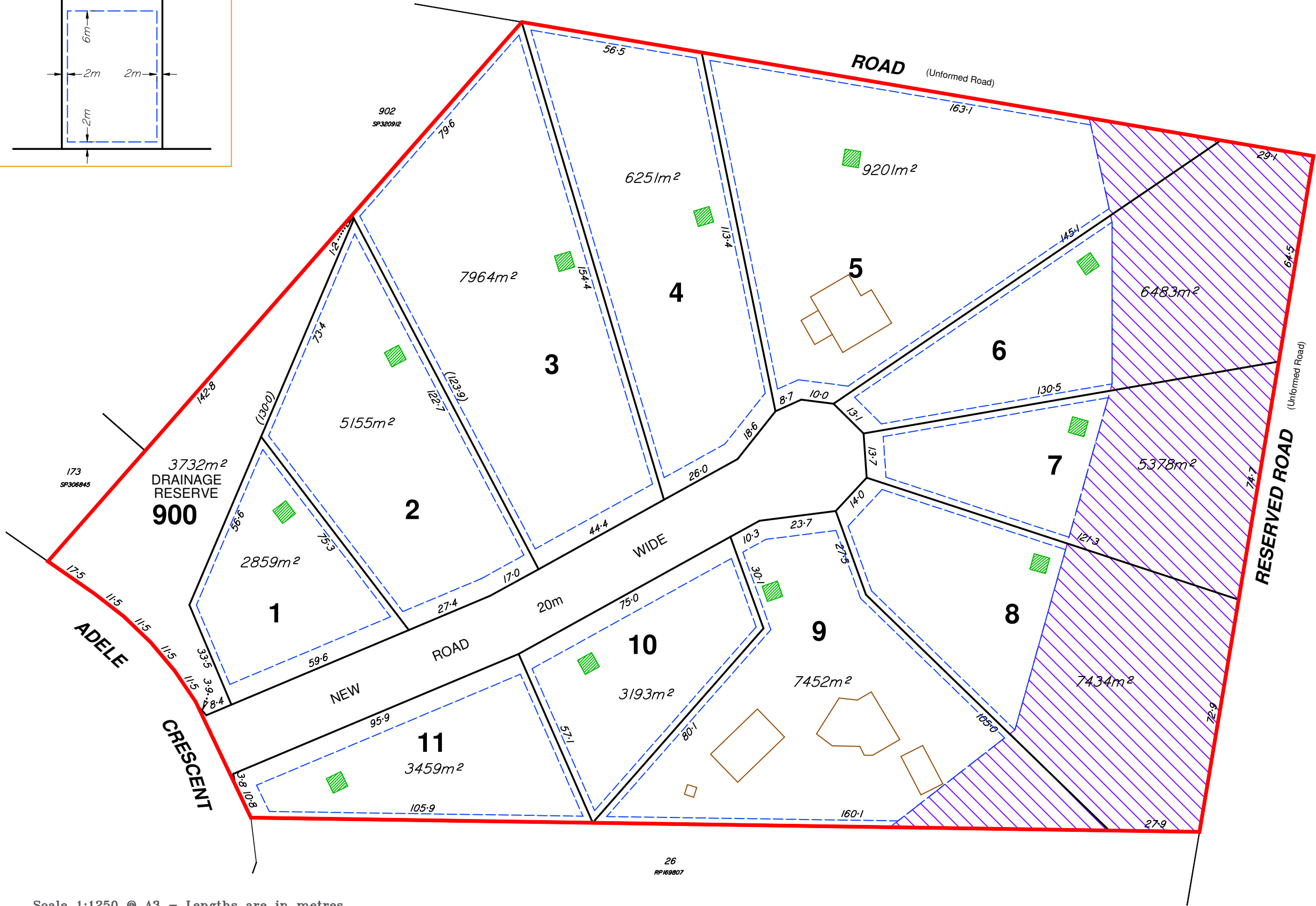


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DATE DRAWN 18-08-2022

SHEET NO. 1 of 1



4. STATUTORY REQUIREMENTS

4.1. COMMONWEALTH

Environmental regulation at the federal government level is driven by the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act). The EPBC Act deals mainly with matters of national environmental significance (protected matters) including:

- World Heritage places.
- National Heritage places.
- RAMSAR wetlands (Wetlands of international importance).
- Nationally threatened species and ecological communities.
- Migratory species.
- Commonwealth marine areas.
- Nuclear actions; and
- Water resources.

Any actions likely to have a 'significant impact' on any of these protected matters may require that a development application is referred to the Commonwealth as part of a separate assessment process.

The Commonwealth Government's EPBC Act Protected Matters Search Tool was used to identify the likely occurrence of protected matters such as potential habitats for migratory or threatened species (DAWE 2021). The results of a search of the EPBC Protected Matters Search Tool database for the subject site are given in **Appendix A**.

4.2. STATE

Various state-based legislation and planning policies were reviewed to identify relevance to the site, together with environmental assessment and compliance requirements as per below:

- The DoR Remnant Regional Ecosystems (RE) mapping indicates the study area contains Category X vegetation (Non-Remnant) and Category C vegetation (High Value Regrowth Vegetation) of least concern.

Figure 5: Vegetation Management — Regional Ecosystem Mapping for the study area.



- The study area includes VMA Essential Habitat overlays specifically indicating that essential habitat for the following EVNT floral species may be present on-site.
 - *Marsdenia coronata* (Slender Milkvine)
 - *Fontainea venosa*
 - *Croton mamillatus* (Bahrs Scrub Croton)

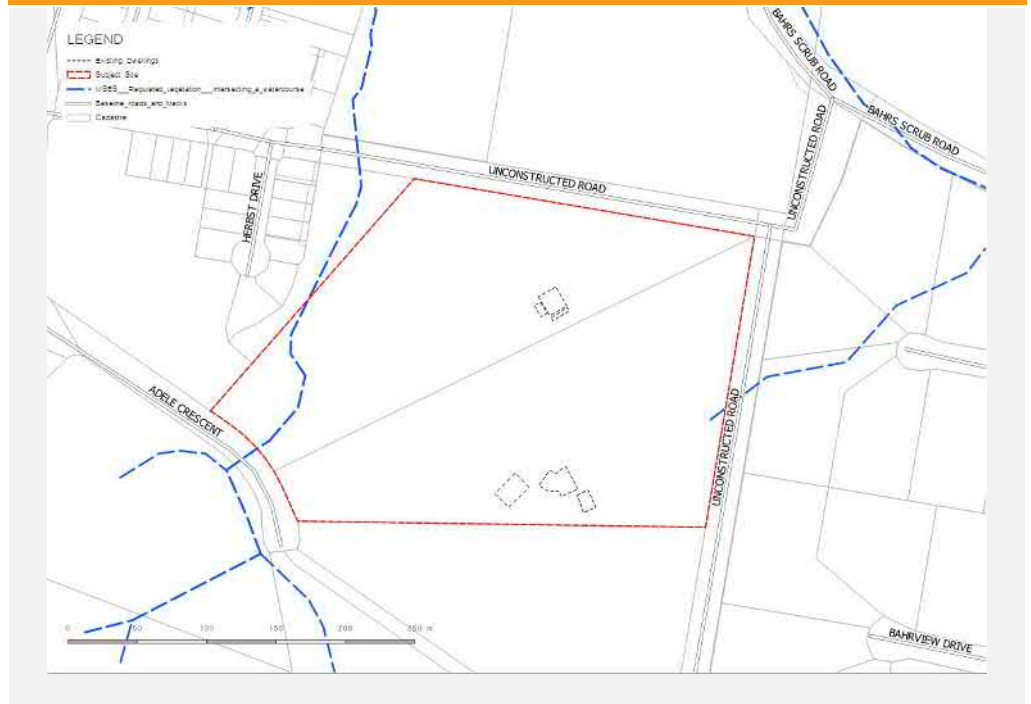
Figure 6: Vegetation Management – Essential Habitat Mapping



- The DoR Vegetation Management Watercourse and Drainage Features mapping indicates a watercourse in the general location of the south-western corner of the site intersecting regulated vegetation. The

watercourse is described as a non-perennial watercourse or drainage line of the second order.

Figure 7: Vegetation Management – Regulated Vegetation Intersecting a Watercourse



- All regulated vegetation areas within the study area are mapped within a 'High Risk' area for Endangered, Vulnerable and Near Threatened Plants under the Nature Conservation Act 1992. As such, development within the High Risk area will require that a protected plants survey be conducted.

Queensland's DEHP Wildnet records (2km site radius) for species listed under the Nature Conservation Act 1992 indicates confirmed records of two (2) EVNT

fauna species and eleven EVNT flora species previously identified in the locality (i.e. 2km) of the site. The details of these confirmed records are:

- 33 confirmed records of Koala (*Phascolarctos cinereus*) since 1980.
- Three (3) confirmed records of the Powerful Owl (*Ninox strenua*) since 1980.
- Four (4) confirmed records of *Leichhardtia coronata* since 1980.
- Five (5) confirmed records of Bahrs Scrub Croton (*Croton mamillatus*) since 1980.
- Eleven confirmed records of *Fontainea venosa* since 1980;
- One (1) confirmed records of the Plunkett Mallee (*Eucalyptus curtisii*) since 1980.
- One (1) confirmed record of *Gossia gonoclada* since 1980.
- Two (2) confirmed records of the Rib-Fruited Malletwood (*Rhodamnia dumicola*) since 1980.
- Six (6) confirmed records of Macadamia Nut (*Macadamia integrifolia*) since 1980.
- One (1) confirmed record of the Small Leaved Tamarind (*Diploglottis campbellii*) since 1980.
- Two (2) confirmed records of the *Planchonella eerwah* since 1980.
- Three (3) confirmed records of *Solanum mentiens* since 1980, and;
- Three (3) confirmed record of the Hairy Hazelwood (*Symplocos harroldii*) since 1980.

Refer to **Appendix A** for WILDNET Search Results.

4.3. LOCAL

The site is located within the Logan City Council (LCC) local government area and is subject to the provisions of the Logan Planning Scheme 2015 (LPS2015). The

information below outlines the current planning scheme zoning and environmental overlays which apply to the site.

From a local ecological planning context, it is noted that:

- The LCP2015 Biodiversity Overlay Code (s.8.2.2) indicates Primary Vegetation Management Areas (PVMA) with numerous polygons distributed across the land parcels. Where PVMA are not mapped the balance of the site is considered as Secondary Vegetation Management Area (SVMA). Refer **Figure 8**.
- Further to the vegetation management areas indicated under the Biodiversity Overlay Code, areas mapped as PVMA are also nominated as Locally Significant Vine Forest. Refer **Figure 9**.
- The Waterway Corridors and Wetlands Overlay Code indicates a waterway corridor located in the south-west corner of the subject site. The Waterway Corridor mapping is located in a differing configuration to that on the State mapping. Refer **Figure 10**.
- The Bahrs Scrub Local Development Area Plan (LPS v8.1, Dec 2012) provides the desired development pattern for the local area. Within this plan desired environmental linkages are designated are classified as Wildlife Movement Areas (WiMA). The eastern boundary of the subject site is nominated with a WiMA area.

Figure 8: LCP2015 Biodiversity Overlay Code Vegetation Management Areas OM2.01 V8.0

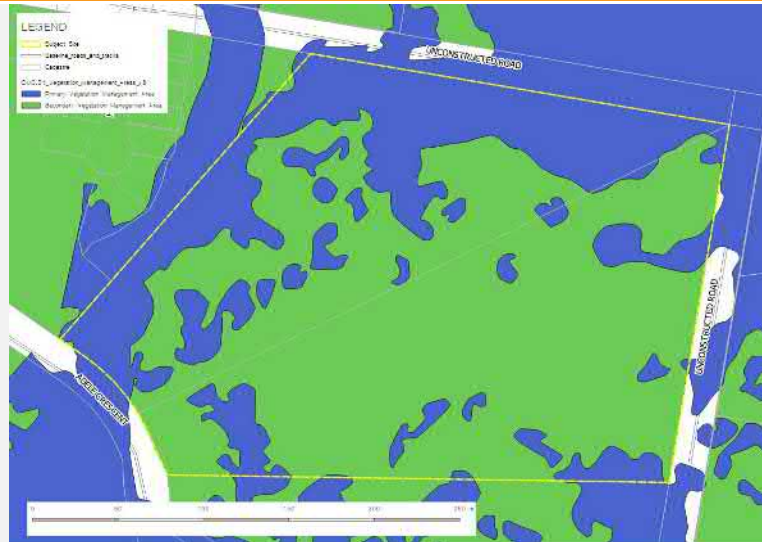


Figure 9: LCP2015 Biodiversity Overlay Code Locally Significant Vine Forest OM2.03

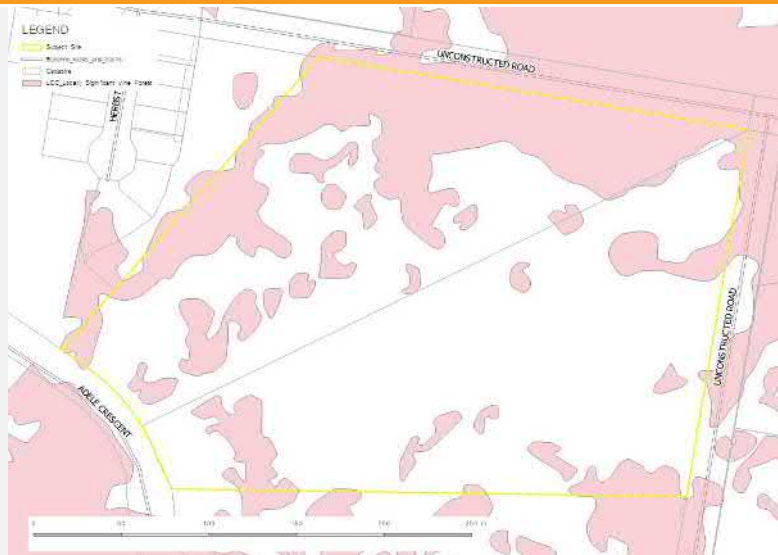


Figure 10: LCP2015 Waterway Corridor and Wetlands Overlay Code OM13.01



5. STUDY METHODOLOGY

5.1. BOTANICAL SURVEY

A botanical survey, including a floral survey and vegetation community assessment, of the study site and impact area, a focus on the proposed development footprint, was undertaken by an ecologist on the 21st of June 2022. A total survey effort of 10 hours was employed for flora surveys.

It is to be noted that any short-term survey will only provide a list of plants detected during a brief interval of time (DEC 2004). The total species list of an area is usually much greater than can be detected in a short time and it can be influenced by factors such as: size of the property, fire history, time since disturbance, flowering season (particularly orchids), and presence of reproductive material (DEC 2004).

5.1.1. VEGETATION COMMUNITIES

A general baseline botanical survey was undertaken within the site boundaries during the field component of the EAR. Analysis of an aerial photograph of the site provided preliminary stratification of vegetation types (analogous to vegetation communities) based on diagnostic features such as colour, texture, crown architecture, site geology and topographic position. Basic vegetation types were compared to mapped communities on the DoR RE mapping.

Ground-truthing of the vegetation communities was conducted across the entire Subject Site, using methods in accordance with Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Neldner et al. 2020).

5.1.2. EVNT PROTECTED PLANTS SURVEY

WCG undertook a desktop review of relevant database searches pertaining to potential EVNT Flora presence on the Subject Site. This review was undertaken to provide a comprehensive understanding of the Subject Site's environmental legislative triggers, project opportunities and constraints and target EVNT Flora species.

In reference to section 6.2.2 Timed Meander Survey in 'Flora Survey Guidelines- Protected Plants NC Act 1992' two random meander surveys were undertaken by a suitably qualified person in each habitat type given the CIA being less than

10ha but greater than 2ha in area. Given the area of the CIA random meanders were conducted until the entire habitat areas were surveyed.

The proposed development requires earthworks and subsequent vegetation clearance of a 3.3ha area generally central to the subject site. This 3.3ha area (the study site) non-inclusive of a 100m buffer area has been defined as the Clearing Impact Area (CIA). The north-western 100m extension of the CIA is composed of steep slopes that were inaccessible for survey. Additionally, dense Lantana located in various areas across the CIA prevented thorough survey, however, given the dominance of the invasive species it is not expected that EVNT flora would be capable of persisting in these areas. No-access to available properties was available at the time of survey.

A master flora catalogue, combining tree flora species and all other observed flora species was compiled, and provides a comprehensive species list of botanical species located on the Subject Site.

Refer **Appendix B** for Study Area species lists.

5.2. FAUNA SURVEY

An opportunistic fauna survey of the subject site was undertaken in conjunction with the botanical survey by an ecologist on the 21st of June 2022. A survey effort of 10 hours was employed for fauna surveys.

Fauna detectability is known to be limited by seasonal, behavioural or lifecycle characteristics of each species, and even by habitat variations (e.g., flowering periods), which can occur within a year, between years, decades, etc. (DEC 2004).

To counter these limitations, qualitative and quantitative habitat evaluation was used as well as a suite of standard ecological field survey techniques to assess

the site's significance to threatened species. Habitat evaluation conservatively assesses the potential occurrence of threatened species based on potentially suitable habitat and local records, providing a prediction of the likelihood of a threatened species occurring in the study area. It relies on the ecologist's knowledge, literature review and observation skills, and hence any assessment must be objective and justified.

In consideration of the threatened species recorded in the locality, available habitats on site, and potentially occurring species: the following fauna survey methods were employed:

- Qualitative and quantitative habitat assessment.
 - Physical searches of habitat e.g., leaf litter, etc.; and
 - Opportunistic sightings; and
- Scratch, Trace and scat survey

5.2.1. POTENTIAL OCCURRENCE ASSESSMENT

Potential occurrence assessment of threatened fauna species was conducted to determine the potential range of conservation significant fauna that have potential to utilise the subject site. The potential occurrence assessment utilised the following factors to determine the likelihood of a given species occurrence on the subject site:

- Presence/absence of suitable habitat.
- Condition and disturbance history of habitat.
- Local and regional records.
- Location of site within known distribution of the species.
- Connectivity with habitat where species is known to occur.

5.2.2. FAUNA TRAVERSE SEARCHES

A fauna search was undertaken throughout all habitats within the site. During each traverse, specific attention was given to searching unique / niche environments that may provide habitat for Threatened Species known to occur or potentially occur on the Site.

5.2.3. HABITAT ASSESSMENT

A fauna habitat assessment was undertaken on the site, based on the habitats present on the subject site, the Threatened Species known to occur or potentially occurring within the area and the occurrence of specific habitat features appropriate for these Threatened Species. Habitats were defined according to parameters such as:

- Structural and floristic characteristics of the vegetation e.g., understorey type and development, crown depth, groundcover density, etc.
- Degree and extent of disturbance e.g., fire, logging, weed invasion, modification to structure and diversity, etc.
- Soil type and suitability e.g., for digging and burrowing.
- Presence of water in any form e.g., dams, creeks, drainage lines, soaks.
- Size and abundance of hollows and fallen timber.
- Availability of shelter e.g., rocks, logs, hollows, undergrowth.
- Wildlife corridors, refuges, and proximate habitat types; and
- Presence of mistletoe, nectar, gum, seed, sap, etc. sources.

5.2.4. AVIAN SURVEYS

Bird surveys were undertaken on the site, through incidental listening and visual observations throughout the duration of field investigations.

6. RESULTS

6.1. BOTANICAL SURVEY RESULTS

6.1.1. FLORA SPECIES

A botanical assessment was completed on 21st of June 2022. The following provides a summary of the findings.

A total of 155 species were recorded within the areas surveyed. Of the flora species identified, 31.5% (30) are considered as non-native, invasive or naturalised species.

A master flora catalogue, combining vegetation community data and all observed flora species has been compiled, and provides a comprehensive species list of all botanical species located on the subject site (see **Appendix B**).

6.1.2. EVNT FLORA SURVEY RESULTS

EVNT Flora species are those holding Endangered, Vulnerable or Near Threatened status under the NC(P)R 2020, or Extinct in the Wild, Critically Endangered, Endangered, Vulnerable or Conservation Dependent status under the EPBC Act 1999. Prior to field investigation, a desktop review of the DES WILDNET and the Commonwealth Department of Agriculture, Water and Environment (DAWE) Protected Matters Search Tool identified target EVNT Flora species. Refer to **Appendix A** for database results.

Site works were conducted on 21st of June 2022. Conditions were dry with a maximum daytime temperature of 22.7°C with some light rain (3.4mm) (BOM, 2022). Recorded conditions were considered as appropriate for the survey of EVNT target specimen(s). Site works were completed in compliance with “Flora

Survey Guidelines- Protected Plants” (DES 2020) within the Clearing Impact Area (CIA) represented by a 100m buffer from proposed earthworks area.

The CIA was thoroughly surveyed for the presence/ absence for EVNT species. A detailed flora species list of flora identified within the CIA is provided in **Appendix B**.

Three (3) specimens of the Macadamia Nut (*Macadamia integrifolia*) were identified within the study area. *M. integrifolia* is a species listed as Vulnerable pursuant to the QLD Nature Conservation (Plants) Wildlife Regulation 2020. We note that no impact to these specimens will occur under the proposed development.

No other floral species with Vulnerable, Threatened or Near Threatened status under the NCWR 2006 and / or EPBC Act 1999, were recorded throughout the CIA.

6.1.3. GROUND TRUTHED VEGETATION COMMUNITIES

As the result of the vegetation community assessment, three (3) distinct vegetation communities were observed within the study area. These communities are described as:

- **High Value Regrowth Vegetation 12.11.10 with codominant native and exotic species – Category C Vegetation.** Vegetation which meets the floristic definition so some degree of RE12.11.10. Some areas only hold species commonly occurring in numerous regional ecosystems and / or exotic landscape associated species. These communities hold a VM classification of Category C (of least concern) pursuant to the VMA 1999.

Review of historical aerial photography (NEARMAP, 2009¹, Department of Resources, 2021) has enabled further refinement of the community boundaries relevant to the time since clearing (i.e. >15years).

- **Non-Regulated Vegetation Community 1 – Category X** This community is identified as generally native regrowth co dominated with exotic species but that has been cleared since to 2007 thus does not conform to the requirements to achieve Category C vegetation but is however more structurally advanced than Non-Regulated Vegetation Community 1. This vegetation community is currently mapped by the DoR regional ecosystem mapping as Category X. No challenge to this designation is proposed.
- **Non-Regulated Vegetation Community 2 – Category X.** Managed and unmanaged grasslands with isolated emergent trees. Areas dominated with Lantana with occasional emergent trees that do not satisfy speciation of regional ecosystems and areas associated with existing dwelling curtilage. Remnant Mango Orchards. The composition is generally ground covers dominated by exotic species with occasional single isolated mature tree specimens native in origin (e.g. *Flindersia collina* & *Acacia disparrima* subsp. *disparrima*). Some areas are characteristic of dense impenetrable Lantana thickets particular around the south-eastern waterway. Also included within this vegetation area is landscaped and maintained areas associated with the existing residential curtilages and remnants of a historical agricultural land use of Mango orchards.

This vegetation community is currently mapped by the DoR regional ecosystem mapping as Category X. No challenge to this designation is proposed.

Further detail is provided below in **Section 6.1.4 – 6.1.6.**

¹ Available Historical aerial imagery was limited to the years 2009 and 2002. At the date of development of this report, imagery from 2007 would represent a 15-year period of no vegetation clearing in order to

conform to Category C definitions. It is considered that the records from 2009 suggest vegetative growth in excess of 2 years thus the 2009 imagery is deemed as appropriate. This assumption is supported with review of the 2002 imagery.

LEGEND

Subject Site

Baseline_roads_and_tracks

Cadastre

Vegetation Communities

DAM

VC1 - HVRV RE12.11.10

VC2 - Non Regulated Regrowth

VC3a - Lantana Dominated with Isolated Emergents

VC3b - Managed Grasslands with Isolated Emergents

VC3c - Un-managed Grasslands with Isolated Emergents

VC3d - Vegetation Associated with House Curtilage

VC3e - Mango Orchard

An aerial photograph of a property in Bahrs Scrub, QLD, with various vegetation communities mapped over it. The property is bounded by Adele Crescent to the west and two unconstructed roads to the north and east. The mapped areas include several patches of VC1 (teal), a large area of VC2 (purple) in the southeast, and various patches of VC3a-e (grey) covering most of the central and northern parts of the property. Two dams are shown as blue areas. The map is overlaid with a red dashed line indicating the subject site boundary.

WOLTER

consulting group

Planning

Urban Design

Landscape

Environment

Surveying

Brisbane, Level 3, 3 Breaker Creek Road, Newcastle, QLD 4006 Phone: (07) 5606 5200

SCALE BAR

0

15

30

45

60

75 m

FIGURE ELEVEN - VEGETATION COMMUNITIES

19 & 23 Adele Crescent, Bahrs Scrub, QLD, 4207

Description

Local Authority

Lots 27 & 28 on RP169807

Logan City Council

CLIENT

Pacificcorp (Adele) Pty Ltd

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6.1.4. VC-1: REGULATED VEGETATION COMMUNITY 1 - HVRV 12.11.10

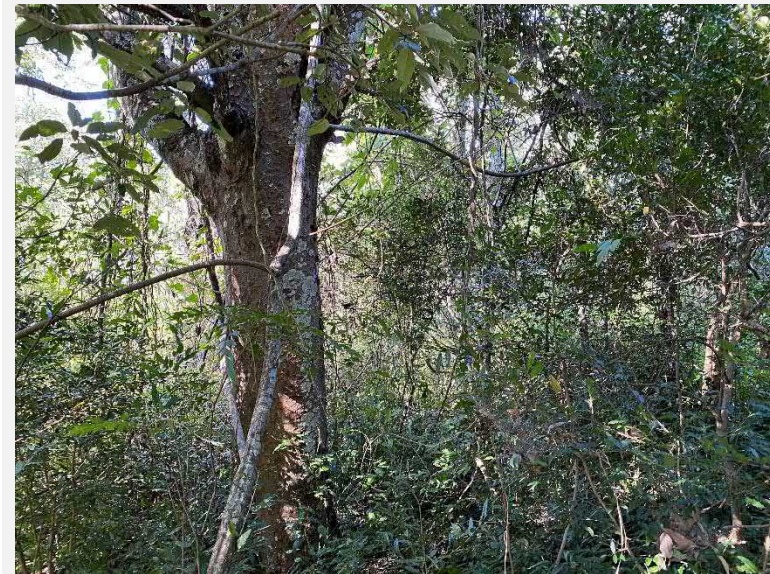
Vegetation Community	Regrowth vine forest	
VMA class	Category C (High Value Regrowth Vegetation – Of Least Concern)	
RE Equivalent	RE12.11.10	
Location	Two general variants. Area to be retained at northern boundary on steeply sloping generally inaccessible land. The second in the southern area to be impacted by earthworks,. Figure 11 demonstrates this location.	
Description	This vegetation community is generally analogous with the floristic description of RE12.11.10 however is co dominant with a wide range of non-climax and exotic species distributed evenly throughout the mapped polygons. Southern variant T1 height to 10m with canopy density approx. 80%. Northern variant T1 height to max 18m with canopy density approx. 80%.	
Condition	Highly degraded with exotic species observed throughout all stratum. Native canopy representation fluctuates greatly.	
Threatened plants	None observed	
Fauna Habitat Features	- Juvenile and non-juvenile tree specimens. - Woody debris and ground litter. - Large, retained stag trees. - Termitarium with access hollows. - Understory vegetation	
Images	Photo Plate 1: Southern variant to be impacted by earthworks See over	Photo Plate 2: Internal view of southern variant to be impacted by earthworks. See over



Photo Plate 3: Northern variant to be retained



Photo Plate 4: Northern variant to be retained internal view



6.1.5. VC2 - NON-REGULATED VEGETATION COMMUNITY 1

Vegetation Community	Regrowth vegetation (non-regulated) with co-dominant native and exotic species cleared post 2007.	
VMA class	Category X	
Regional Ecosystem Equivalent	None	
Location	South-eastern corner of subject site The location of this vegetation community is demonstrated within Figure 11.	
Description	A co-dominant T1 canopy of residual native species (e.g. <i>Flindersia australis</i>) with exotic species (e.g. <i>Jacaranda mimosifolia</i>). Native species are generally characteristic of RE12.10.11 however the community has been widely cleared post 2007 thus HVRC status cannot be applied.	
Condition	Canopy co-dominated with invasive species co existing with residual isolated native specimens, Weed inundation prevalent in understory with some native recruitment present. Considered to be residual of previous landscaped/maintained areas recently abandoned.	
Threatened plants	None	
Fauna Habitat Features	▪ Mature tree specimens. ▪ Stag trees with hollows. ▪ Woody Debris ▪ Ground litter and ground stratum vegetation ▪ Dense vine thickets ▪ Established weeded ground coverage	

Photo Plate 5: Internal view of Vegetation Community



Photo Plate 6: Internal view of Vegetation Community



6.1.6. VC3: NON-REGULATED VEGETATION COMMUNITY 2

Vegetation Community	Maintained and unmaintained pasture areas and vegetation associated existing dwelling curtilage or previous land uses.
VMA class	Category X
Regional Ecosystem Equivalent	N/A - Non-remnant vegetation
Location	In, around and adjoining the existing dwellings and areas associated with the use of the dwellings. The location of these vegetation community is demonstrated within Figure 12.
Description	VC3a: Lantana dominated with isolated emergents generally associated with areas adjoining maintained vegetation and the south-western waterway VC3b: Managed pasture and grass areas with isolated emergents. VC3c: Unmanaged pasture and grass areas with isolated emergents. VC3d: Landscaped areas and areas directly associated with house curtilage. VC3e: Remnant Mango orchards from previous land uses
Condition	Dominated by exotic grasses and weed species substantially reducing resilience and capacity for natural regeneration.
Threatened plants	Macadamia integrifolia x 3 in VC3d.
Fauna Habitat Features	- Isolated mature specimens. - Anthropogenic structures - Aquatic habitat – dams - Dense exotic shrub stratum

Photo Plate 7: VC3a Lantana Dominated with Isolated Emergents



Photo Plate 8: VC3a Lantana Dominated with Isolated Emergents. VC3c at right of frame



Photo Plate 9: VC3b



Photo Plate 10: VC3b



Photo Plate 11: VC3c



Photo Plate 12: VC3c



Photo Plate 13: VC3d



Photo Plate 14: VC3d



Photo Plate 15: VC3e



Photo Plate 16: VC3e



6.1.7. NATIVE TREES

Trees which meet the definition of 'Native Trees' as per the LCC Planning scheme² have been identified within the development footprint of the subject site. In total, 15 specimens of LCC 'Native Trees' will be impacted by the development. Refer **Table A** for details of Native Trees impacted by the development. The locations of these specimens are provided within **Figure 12**.

Table A: LCC 'Native Trees' impacted by works

Latin Nomenclature	Common Name	Ref No
Mallotus philippensis	Red Kamala	TR6
Mallotus philippensis	Red Kamala	TR7
Ficus obliqua	Small Leafed Fig	TR12
Acacia disparrima subsp. disparrima	Hickory Wattle	TR22
Eucalyptus crebra	Narrow Leaved Iron Bark	TR27
Eucalyptus major	Grey Gum	TR31
Eucalyptus major	Grey Gum	TR32
Eucalyptus major	Grey Gum	TR33
Eucalyptus major	Grey Gum	TR34
Acacia disparrima subsp. disparrima	Hickory Wattle	TR39

² A tree, whether dead or alive, that is indigenous to Australia; that is greater than four meters in height or has a trunk circumference of 31.5cm or greater measured at 1.3m from the ground

Acacia disparrima subsp. disparrima	Hickory Wattle	TR40
Flindersia australe	Australian Teak	TR46
Syzygium australe	Scrub Cherry	TR47
Acacia disparrima subsp. disparrima	Hickory Wattle	TR50
Melaleuca quinquenervia	Broad Leaved Paper Bark	TR62

6.1.8. NATIVE HABITAT TREES

Trees which meet the definition of 'Native Habitat Trees' pursuant to the LPS2015³ have been identified within the development footprint of the subject site. In total, two (2) native habitat trees will be impacted by the development footprint as detailed in **Table B**.

The locations of these specimens are provided within **Figure 12**.

Table B: LCC 'Native Habitat Trees' impacted by works.

Latin Nomenclature	Common Name	Criteria (C)	Ref No
Flindersia collina	Leopard Ash	<80cm C	TR13
Flindersia collina	Leopard Ash	<80cm C	TR14

³ A tree, whether dead or alive, that is indigenous to Australia; that has a trunk circumference of 220cm or more measured at 1.3m measured above ground level, or that contains a hollow.

LEGEND

- Subject Site
- Drainage Features
- Confirmed LCC Locally Significant Vine Forest
- Baseline_roads_and_tracks
- Cadastre
- Earthworks_CUT
- Earthworks_FILL

- Tree Points
- EXOTIC TREE
 - NATIVE HABITAT TREE
 - NATIVE TREE

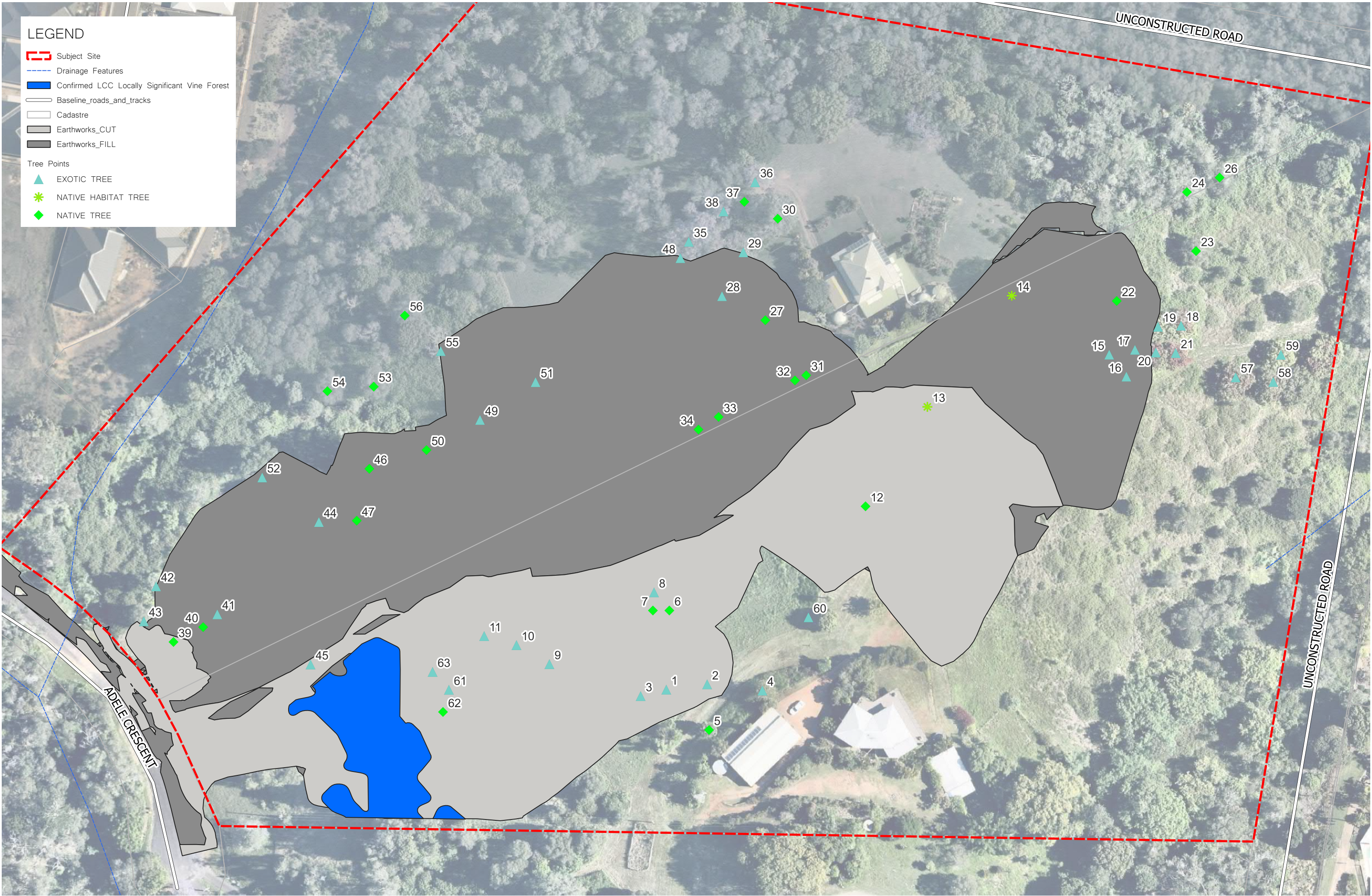


FIGURE TWELVE: TREE SURVEY PLAN

19 & 23 Adele Crescent, Bahrs Scrub, QLD, 4207

Description
Local Authority

Lots 27 & 28 on RP169807
Logan City Council

CLIENT
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6.1.9. LCC LOCALLY SIGNIFICANT VINE FOREST

Each area of mapped polygon representing LCP2015 Locally Significant Vine Forest was inspected for relevancy and accuracy during data collection activities.

Of the mapped SVF polygons, 17 will be impacted by the proposed development footprint. The following table provides a summary of the ground truthed speciation of the SVF polygons to be impacted from the development. Typical species associated with numerous vegetation communities and exotic species are not considered as representative of vine forest definitions. In addition, the presence of singular tree specimens is not considered to constitute locally significant vine forest.

Figure 13 provides the location of the referenced polygons.

Table C: LCC Significant Vine Forest polygons (impacted polygons only)

Reference No	Observed species	Confirmed SVF
2	Weedy ground covers, 2 x <i>Jagera pseudorhus</i> , 1 x <i>Melaleuca viminalis</i> 1 x <i>Spathodea campanulata</i> *. Landscaped area.	No
6	<i>Flindersia collina</i> . Single tree in decline	No
8	<i>Flindersia collina</i> . Single tree	No
9	7 x <i>Mangifera indica</i> *, 1 x <i>Acacia disparrima</i> subsp. <i>disparrima</i>	No
13	Exotic trees*, <i>Brachychiton rupestris</i> , <i>Flindersia australis</i> , <i>Mallotus philippensis</i> , <i>Ficus watkinsiana</i> , <i>Brachychiton acerifolius</i>	Yes
14	<i>Jacaranda mimosifolia</i> * - Landscaped	No
15	3 x <i>Acacia disparrima</i> subsp. <i>disparrima</i>	No
16	<i>Jacaranda mimosifolia</i> *, <i>Acacia disparrima</i> subsp. <i>disparrima</i>	No

Reference No	Observed species	Confirmed SVF
17	<i>Jacaranda mimosifolia</i> * - Landscaping	No
18	1 x <i>Acacia disparrima</i> subsp. <i>disparrima</i> , 1 x <i>Eucalyptus torelliana</i> *, 1 x <i>Syzygium australe</i> 1 x <i>Grevillia cultivar</i> *	No
19	1 x <i>Eucalyptus crebra</i> , 1 x <i>Grevillea robusta</i> , 1 x <i>Jagera pseudorhus</i> , 1 x <i>Flindersia collina</i> . with weedy* understory	No
20	<i>Jacaranda mimosifolia</i> *, <i>Eucalyptus torelliana</i> *, <i>Ailanthus altissima</i> *	No
21	1 x <i>Acacia disparrima</i> subsp. <i>disparrima</i> , <i>Psidium guajava</i> * and <i>Sphagneticola trilobata</i> * dominated understory	No
23	<i>Eugenia uniflora</i> *, <i>Acacia disparrima</i> subsp. <i>disparrima</i> and 2 x <i>Eucalyptus major</i> – maintained/landscaped area	No
24	2 x <i>Acacia disparrima</i> subsp. <i>disparrima</i> , <i>Lantana camara</i>	No
25	2 x <i>Acacia disparrima</i> subsp. <i>disparrima</i> , <i>Lantana camara</i>	No
26	<i>Lantana camara</i>	No

6.1.10. TREE SURVEY PLOT

Refer to the **Vegetation Management Plan** including location and species of trees within the development footprint. (Refer Appendix C).

LEGEND

Subject Site

Baseline_roads_and_tracks

Drainage_Features

Cadastre

Earthworks_FILL

Earthworks_CUT

Confirmed LCC Locally Significant Vine Forest_Exemption Applied

LCC Locally Significant Vine Forest Subject Site

Tree_Points

EXOTIC TREE

NATIVE HABITAT TREE

NATIVE TREE

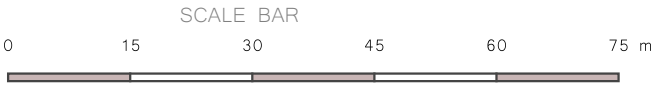
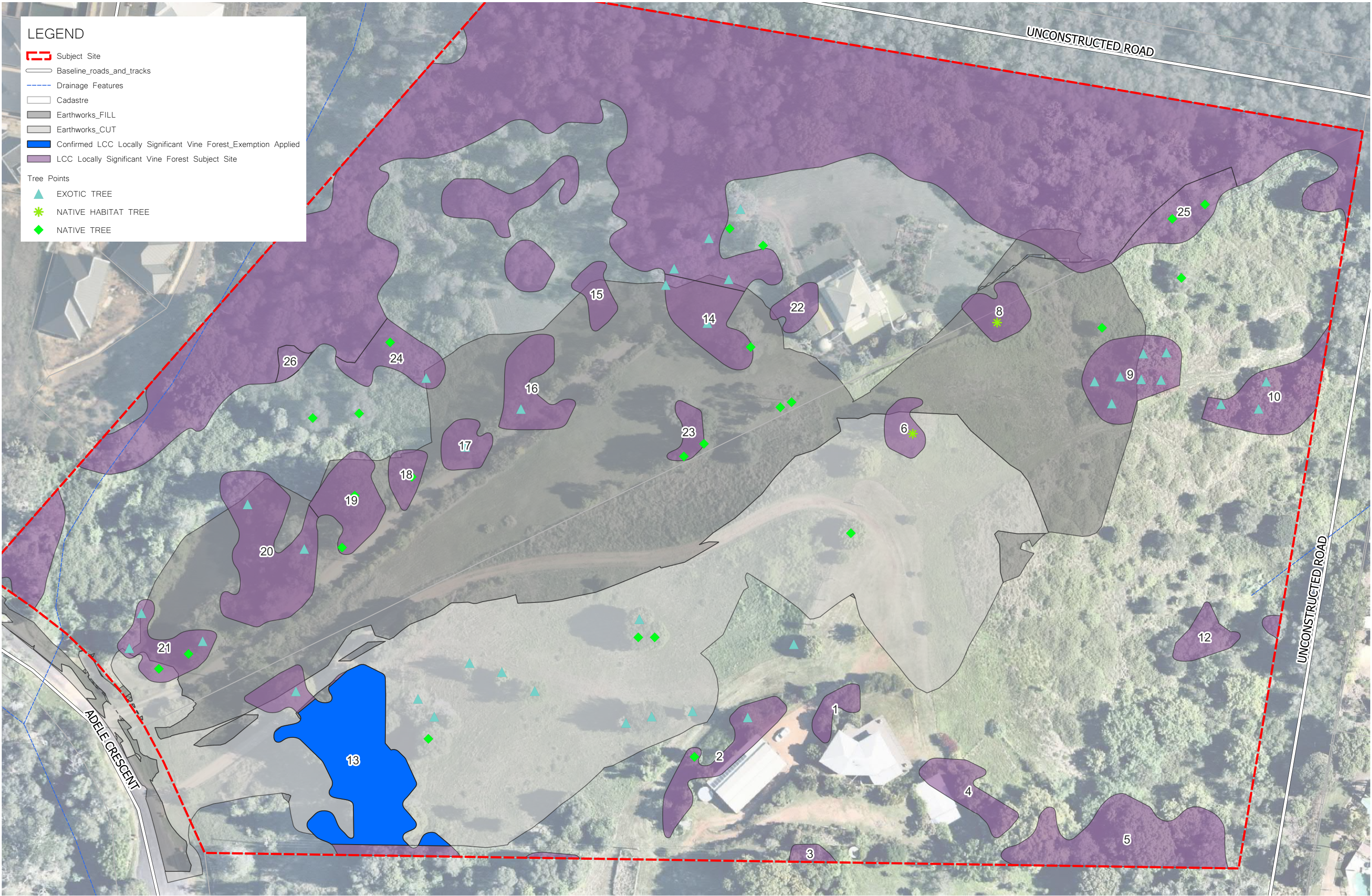


FIGURE THIRTEEN: LSVF GORUND TRUTHING

19 & 23 Adele Crescent, Bahrs Scrub, QLD, 4207

Description

Local Authority

Lots 27 & 28 on RP169807

Logan City Council

CLIENT

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6.2. FAUNA SURVEY RESULTS

The fauna assessment of the subject site observed a total of 17 species that were observed (directly or by trace / scat) on site. Of the 17 observations, nine (9) were represented by avian species, four (4) reptiles, three (3) mammals and one (1) amphibian species.

Species identified within the subject site are identified in **Table D**.

Table D: Fauna Observations.

Latin Nomenclature	Common Name	Observation Method	Classification
Cacatua roseicapilla	Galah	Call recognition	Bird
Cacatua galerita	Sulphur-crested Cockatoo	Observed	Bird
Corvus orru	Torresian Crow	Observed	Bird
Ctenotus robustus	Eastern Striped Skink	Observed	Reptile
Ctenotus taeniolatus	Copper Tailed Skink	Observed	Reptile
Cryptoblepharus virgatus	Wall Skink	Observed	Reptile
Diporiphora nobbi	Nobby Dragon	Observed	Reptile
Gymnorhina tibicen	Australian Magpie	Observed	Bird
Geophaps lophotes	Crested Pidgeon	Observed	Bird
Cracticus torquatus	Grey Butcherbird	Observed	Bird
Entomyzon cyanotis	Blue-faced Honeyeater	Direct	Bird

Latin Nomenclature	Common Name	Observation Method	Classification
Rhinella marina*	Cane Toad*	Observed	Amphibian
Vulpes vulpes*	Fox*	Trace	Mammal
Macropus rufogriseus	Red-necked Wallaby	Observed	Mammal
Manorina melanocephala	Noisy Miner	Observed	Bird
Trichoglossus moluccanus	Rainbow Lorikeet	Observed	Bird
Psophodes olivaceous	Eastern Whipbird	Call Recognition	Bird
Alectura lathami	Scrub Turkey	Observed	Bird
Centropus phasianinus	Pheasant Coucal	Observed	Bird
Dacelo novaeguineae	Laughing Kookaburra	Observed	Bird

6.3. SUBJECT SPECIES (FAUNA) (ASSESSMENT OF SIGNIFICANCE)

A list of EVNT fauna species considered to potentially occupy or utilise the site in some capacity has been compiled from the three desktop searches and is available in **Table F**. **Table F** also provides details of the species preferred habitat and an assessment of the likelihood of the species utilising resources in the study area. An indicative 1-5 scale used by the author to indicate the likelihood of the species to potentially occur in the habitat on or in the vicinity of the study site is as follows (**Table E**):

Table E: Likelihood of Occurrence Scale

Rating	Likelihood	Description
0	Unlikely	<1% probability. no potentially suitable habitat; too disturbed; or habitat is very poor. No or few records in region or records/site very isolated e.g. by pastoral land, urbanisation, etc.
1	Low	1-10% - few minor areas of potential habitat; highly modified site/habitat; or few habitat parameters present, but others absent or relatively insignificant (sub-optimum habitat). Usually very few records in locality.
2	Fair	11-25% - some significant areas of potential habitat, but some habitat parameters limited. Potential for occasional foraging e.g. from nearby more optimal areas or known habitat. Records at least within 10-15km radius of site.
3	Good	26-50% - significant abundance of habitat parameters/areas of habitat, and more locally e.g. adjacent. Potential part of larger territory, but probably unable to support breeding in isolation. Recorded within 10km in similar habitat/environs.
4	Moderate	51-75% - quite good potentially suitable habitat on and adjacent to the site, and/or good quality and abundance of some vital habitat parameters. Records within <10km, or adjacent to site, or adjacent to high quality habitat where species likely to occur.
5	High	>75% - very good to optimum habitat occurring on or adjacent to the site (support breeding pair or population). Recorded within 5-10km of site in same or similar habitat.
6	Confirmed	100% – Observed on the subject site.

The “Assessment of Significance” column is based on consideration of the habitat on-site, likelihood of occurrence, and consideration of the DAWE Significant Impact Guidelines 1.1. Recognising that some species with very large ranges or varying tolerances to habitat modification, some species which may have low potential to occur in the study area and will obviously not be significantly affected by the proposal will not be formally assessed to avoid production of superfluous information (e.g. Listed Marine Species).

Queensland’s DEHP Wildnet records (2km site radius, confirmed records since 1980) for species listed as Endangered, Vulnerable or Near Threatened (EVNT) under the NC Act 1992 indicated two (2) EVNT fauna species and 11 flora species historically recorded in the locality of the subject site.

A search of the EPBC Act 1999 Protected Matters records (2 km site radius) indicated 57 Listed Threatened species, 15 Listed Migratory species and three (3) Listed Threatened Ecological Communities may occur in the locality of the subject site. Additionally, one (1) wetland of international importance is also highlighted.

A process of consolidating results from the Wildnet database search and the EPBC Act 1999 Protected Matters records results in 30 species subject to further assessment. Note that marine and migratory marine bird species were excluded from the potential fauna species list, due to the absence of suitable habitat to support these organisms.

With consideration to the “Precautionary Principle” (EPAct 1994), threatened species considered to have a ‘Fair’ to ‘Good’ likelihood of presence at the subject site are subject to detailed assessment and where necessary an assessment versus the EPBC significant impact guidelines undertaken.

Appendix A provides the Wildnet and EPBC Protected Matters database search results. Refer **Table F** for the Assessment of Significance.

Table F: Fauna Subject Species Likelihood of Occurrence

Zoological Name	Common Name	NCA Status	EPBC Status	Preferred Habitat	Likelihood of Presence
<i>Anthochaera phrygia</i>	Regent Honeyeater	E	CE	Distribution is extremely patchy, with limited known breeding sites. Generally, habitat consists of dry eucalypt woodland and open forest, rural and urban areas with mature eucalypts. Though, it favors ironbark-box associations, <i>E. robusta</i> or spotted gum. There is a notable preference for wetter, more fertile sites (creek flats, river valleys and lower slopes), as they mainly feed of nectar, arthropods and fruit. Recently observed in Northern New South Wales. Nomadic, requires reliable and ample nectar supplies to support semi-permanent (core breeding) habitat. Breeds in pairs or small colonies in open woodland/forest and occasionally more disturbed woodland near housing and farmland, depending on food availability, from August-January. Breeding less likely to occur if nectar flows are low or unreliable, or heavy competition with more aggressive honeyeaters e.g. Noisy Miner, Red Wattlebirds and Noisy Friarbirds.	Low – Whilst dry eucalypt forest and Iron Bark is present within the study area, the site would not be considered as topographical preferable for the species. Further, the site is home to number of aggressive avian species that would be likely to discourage habitation. As a result, it is not anticipated that the subject site provides habitat potential for the Honeyeater
<i>Argynnis hyperbius inconstans</i>	Australian Fritillary	E	CE	Recorded in scattered locations across south-eastern Queensland and north-eastern New South Wales. The subspecies appears to have had a core distribution between Gympie in Queensland and Port Macquarie in NSW, although there are historical records which extend beyond this range. The subspecies has been recorded as far north as Mt Bellenden Ker in Queensland, and as far south as the Hunter Valley in NSW (Sands & New 2002). Reported to be abundant around Gympie at intervals between 1977 and 1994, and around Port Macquarie in 1977, 1985 and 1994. Restricted to areas where its larval food plant, <i>Viola betonicifolia</i> (the arrowhead violet), occurs. The arrowhead violet is widespread throughout Queensland and NSW, at both high and low altitudes. However, the Australian fritillary appears to only occupy lower altitude sites (<600m), and in these lower altitude regions there has been significant clearing for urban expansion.	Unlikely – No recent or locally based records. Larval food plant not recorded in area.

				The arrowhead violet is a small perennial herb which usually grows in damp niches in open habitats. It often grows beneath grasses and other plants, often in association with <i>Lomandra longifolia</i> (long leaved mat rush) and <i>Imperata cylindrica</i> (blady grass).	
<i>Botaurus poiciloptilus</i>	Australasian Bittern	C	E	Inhabits estuarine and freshwater wetlands, generally with permanent water and dense vegetation of sedges, rushes and reeds, particularly Bullrush and Spikerush. Solitary or groups up to 12. Usually, sedentary. Roosts in reeds by day, forages in shallow water at dusk/night for frogs, fish, invertebrates, fruit, leaves. Tramples reeds, sedges to make a foraging platform. Nests in dense vegetation over water. (NSW NPWS 2000)	Unlikely – Habitat requirements not present.
<i>Calidris ferruginea</i>	Curlew Sandpiper	SL	CE	Occupies littoral and estuarine habitats, non-tidal swamps, lakes and lagoons on the coast. Forages on the edge of shallow waters and occasionally on exposed algal mats / waterweed. Roosts on shell or sand beaches, spits, islets on the coast or in wetlands, sometimes in salt marsh or on rocky shores.	Unlikely – Habitat requirements not present.
<i>Chalinolobus dwyeri</i>	Large Eared Pied Bat	-	V	Found in moderately wooded habitats such as dry sclerophyll forest, tall open eucalypt forests, woodlands, and sub-alpine woodlands, edge of rainforest and wet sclerophyll forest. Roosts in caves, mines and abandoned bottle-shaped mud nests of Fairy Martins. In caves and mines, tend to roost in twilight sections near entrance. Insectivorous but habits poorly known. Fly relatively slowly, direct and manoeuvrable, low to ground or 6-10m above ground.	Low – Areas of suitable foraging habitat present with a distinct lack of preferred roosting requirements. No records in the locality.
<i>Cyclopsitta diophthalma coxeni</i>	Coxen's Fig Parrot	E	E	Small parrot predominantly found in lowland rainforest but recorded in various rainforest types. Mainly feeds on figs but also seeds and occasionally, nectar and lichen. Distribution recorded from Gympie (potentially as far as Rockhampton) in the north to Richmond River in the south.	Unlikely – Whilst precursors for appropriate habitat may be considered as present, no dominant preference habitat is definable. The area of impact will retain the higher percentage of these marginal habitats.
<i>Dasyurus maculatus</i>	Spotted-tailed Quoll (southern subspecies)	V	E	Distribution is largely fragmented, distributed mainly in coastal areas and adjacent ranges throughout south-eastern Australia, in densely vegetated areas. Habitat preference pertains mainly to mature wet forest habitat (especially where annual rainfall is generally 600mm/year), unlogged or forests that have experienced limited	Unlikely- Reduced likelihood of occurrence owing to species preference for mature, undisturbed wet forest habitat.

				disturbance. Owing to nocturnal tendencies, suitable den sites (hollow logs, tree hollows or caves) are required for day time resting. Small mammals, insects, frogs, fish, plant material and birds form the basis of food requirements, alongside the need for relatively intact vegetation for foraging purposes.	
Dasyornis brachypterus	Eastern Bristlebird	-	E	Mostly occur in dense, coastal vegetation. Occurs in three distinct populations in which the Northern-Southern QLD/Northern NSW population is relevant. Habitat preference in this population is characterized by open forest with dense tussock grass understory and sparse mid-story near rainforest ecotones. Feeds on insects particularly ants. Nests are elliptical dome on or near the ground amongst dense vegetation.	Unlikely- Whilst the precursor for rainforests ecotones are present, likelihood is substantially compromised by the non-remnant and substantially disturbed vegetation structural configuration. As such, habitat parameters are not present.
Delma torquata	Adorned Delma	V	V	Occurs in south-eastern Queensland, Australia, and was previously restricted to 13 localities including areas in the Brigalow Belt. Currently only known from four locations; Mount Crosby, Lake Manchester, Karana Downs and the Bunya Mountains. Lives under rocks and in soil cracks.	Unlikely – given known populations the site is unlikely to house the species.
Erythroriorchis radiatus	Red Goshawk		V	Found in tropical open woodland, taller woodland, open forests, rainforest edges and dense riparian vegetation of coastal and subcoastal drainages. Territorial and utilise same nest. Breeding territories estimated 50-220km ² . Preys on bird especially Honeyeaters, parrots, kookaburras and slight waterbirds, as well as some mammals, reptiles and large insects. No recent records south of Clarence.	Low – potential foraging habitat as a component of greater habitat area. Low potential to represent breeding habitat. No observations of suitable nesting sites.
Falco hypoleucos	Grey Falcon	E	CE	Found in tropical open woodland, taller woodland, open forests, rainforest edges and dense riparian vegetation of coastal and subcoastal drainages. Territorial and utilise same nest. Breeding territories estimated 50-220km ² . Preys on bird especially Honeyeaters, parrots, kookaburras and slight waterbirds, as well as some mammals, reptiles and large insects. No recent records (post 1980) south of Clarence.	Low – potential foraging habitat as a component of greater habitat area. Low potential to represent breeding habitat. No records in locality significantly limits potential for presence. No observations of suitable nests.

Furina dunmalli	Dunmall's Snake	V	V	Found in open forest and woodland, particularly brigalow Acacia harpophylla forest and woodland growing on floodplains of deep-cracking black clay and clay loam soils. Behavioural ecology knowledge of the species is limited. Observations of captive specimens suggest it is docile, terrestrial and nocturnal. Active on the surface at night and likely to shelter under fallen timber and possibly in leaf litter and earth cracks. It is assumed that the diet consists of small skinks and geckos.	Unlikely – Landscape position and soil types inappropriate for species
Geophaps scripta scripta	Squatter Pidgeon	V	V	Known to occur within South East and West Queensland, habitat requirements range from open-forest to woodland communities. Mostly dominated by Eucalyptus, Corymbia, Acacia or Callitris species with patchy, tussock-grassy understories that support the subspecies' foraging and breeding requirements. Seasonal or permanent access to nearby water bodies or courses is required, with preference given to bare ground, gently sloping water sources. Access is particularly important as breeding occurs generally within 1km of a suitable waterbody. Well-draining soils are a habitat requirement for nesting purposes. Diet is mainly comprised of seeds sourced from low vegetation.	Low – Sub optimal habitat present only with preferred habitat characteristics only minimal on site. Requirement for access to breeding sites not available. No records in locality.
Grantiella picta	Painted Honeyeater	V	V	Inhabits mistletoes in eucalypt forests/woodlands, riparian woodlands of black box and river red gum, box-ironbark-yellow gum woodlands, acacia-dominated woodlands, paperbarks, casuarinas, Callitris, and trees on farmland or gardens. The species prefers woodlands which contain a higher number of mature trees, as these host more mistletoes. It is more common in wider blocks of remnant woodland than in narrower strips (Garnett et al., 2011), although it breeds in quite narrow roadside strips if ample mistletoe fruit is available Sparsely distributed from south-eastern Australia to north-western Queensland and eastern Northern Territory. The greatest concentrations and almost all records of breeding come from south of 26°S, on inland slopes of the Great Dividing Range between the Grampians, Victoria and Roma, Queensland. seasonal north-south	Unlikely – Known distribution in QLD limited to the Brigalow Belt. Additionally, Mistletoe was not observed on site. No records in the vicinity of the site.

				movements governed principally by the fruiting of mistletoe, with which its breeding season is closely matched	
Hirundapus caudacutus	White-throated Needletail	V	V	Breeds in Asia, from central and south-eastern Siberia and Mongolia, east to the Maritime Territories of Russia, Sakhalin and the Kuril Islands and south to northern Japan and north-eastern China. The species spends the non-breeding season in Australasia, mainly in Australia, and occasionally in New Guinea and New Zealand. In eastern Australia, it is recorded in all coastal regions of Queensland and NSW, extending inland to the western slopes of the Great Divide and occasionally onto the adjacent inland plains. Almost exclusively aerial, from heights of less than 1 m up to more than 1000 m above the ground. Although they occur over most types of habitat, they are probably recorded most often above wooded areas, including open forest and rainforest, and may also fly between trees or in clearings, below the canopy, but they are less commonly recorded flying above woodland. When flying above farmland, they are more often recorded above partly cleared pasture, plantations or remnant vegetation at the edge of paddocks. The species has been recorded roosting in trees in forests and woodlands, both among dense foliage in the canopy or in hollows though the number of references to Needleetails roosting in trees possibly over-emphasizes such occurrences (Higgins 1999).	Low – potential foraging habitat as a component of greater habitat area. No confirmed records in vicinity of site.
Lathamus discolor	Swift Parrot	E	CE	Dry sclerophyll forests and woodlands, suburban parks and gardens and flowering fruit trees. Breeds in Tasmania and migrates north to south-eastern Australia. Key tree species utilized for foraging purposes include; Eucalyptus microcarpa, Eucalyptus melliodora, Eucalyptus robusta and Eucalyptus tereticornis.	Low – Sub Optimal habitat only. Whilst the broad vegetation community is present, specific species of flora are lacking or in very low density. No records present in locality.
Macroderma gigas	Ghost Bat	-	V	Roosts in caves, tunnels and deep fissures in rock walls. Colonial but generally in only small numbers. Distributed widely but in patchy configuration with extant QLD populations known in North Western QLD south of the Gulf Of Carpentaria, Cape York, the wet and dry tropics and the central QLD coastal and hinterland regions.	Unlikely – Geographically out of context and no preferred roosting habitat present.
Mixophyes fleayi	Fleay's Frog	E	E	Intranational; naturally occurs in QLD and interstate. Distributed along the foothills and ranges of the Great Divide from	Unlikely – Sub Optimal habitat only. With the highly degraded nature of site waterways

				Conondale Range to the New South Wales border. Stream associated and forest dependent with adults found in leaf litter and along watercourses in rainforest and adjoining wet sclerophyll forests. Reproduction occurs via egg laying in shallow riffle zones of streams. Threats include water quality and degradation of habitat by feral animals, domestic stock and weeds.	likelihood of occurrence is substantially compromised. No pool and riffle complexes are present thus breeding sites are not present and likelihood of movement is not considered as possible.
Mixophyes iteratus	Giant Barred Frog	E	E	Distributed from Belli Creek (QLD) south to Warrimoo (NSW). Species is stream associated and forest dependent. In south-east Queensland, scattered locations include downstream areas of the Mary River catchment, Maroochy River, Upper Stanley River, Caboolture River, Burpengary Creek and Coomera River. Occur in shallow rocky streams in rainforest, wet Sclerophyll forest or deep, slow moving streams with steep banks in lowland areas.	Unlikely – Sub Optimal habitat only. With the highly degraded nature of site waterways likelihood of occurrence is substantially compromised. No pool and riffle complexes are present thus breeding sites are not present and likelihood of movement is not considered as possible. Overall landscape position is considered as non-conductive to support population.
Ninox strenua	Powerful Owl	V	-	Wet and dry sclerophyll forests. Nests in tree hollows. Requires high diversity and abundance of medium-sized arboreal prey. Very large territory. Prey includes possums, flying foxes and other birds. Nesting occurs in old growth trees with large hollows. One to two eggs are laid between June and September. Sighted in Karawatha Forest Park approximately 4.5km from site in 1997.	Low – Vegetation present represents appropriate marginal habitat however no hollows present would be of adequate size to represent nesting potential. Species of arboreal mammals present as food source, however, the diversity of prey is very limited thus contradicting habitat requirements.
Numenius madagascariensis	Eastern Curlew	CE	E	Found on sheltered coasts, mangrove swamps, bays, harbours and lagoons that contain mudflats and sandflats, often with beds of seagrass. At high tide, when their feeding habitat becomes inundated, they move to saltpans, sand dunes and other open areas where they roost above the high water. For this reason, the eastern curlew needs two types of habitat in order to survive, one within the tidal zone, and one above it.	Unlikely – Appropriate habitat is not present.
Petauroides volans	Greater Glider	-	E	Wide range of habitats including tall open woodland, eucalypt forests and low woodlands Locally common in wet sclerophyll forests on the ranges and coastal plains. The species prefers high elevation and moist eucalypt forests. Diet primarily consists of eucalyptus foliage	Unlikely – Appropriate habitat is not present.

				and prefers leaves with high levels of foliar nutrients Spotted (C. citriodora) and Red Forest gums (E tereticornis).	
Petaurus australis australis	Yellow-Bellied Glider	-	V	Moist and dry mature eucalypt forest and woodland, dry sclerophyll open forest containing smooth barked eucalypts that shed their bark in strips, has a moderate rainfall (650-1200 mm). Tree hollows, diversity of winter-flowering and suitable sap-feeding eucalypt species required. Large territory. Diet primarily consists of plant and insect exudates (eucalypt sap, nectar, honeydew and manna). Spotted gum (C. citriodora), forest red gum (E tereticornis) and the locally occurring grey gum (E. propinqua) are preferable species.	Unlikely – Appropriate habitat is not present and preferred species present in only isolated occurrence thus unlikely to attract species.
Petrogale penicillata	Brush Tailed Rock Wallaby	-	V	The range of the Brush-tailed Rock-wallaby extends from south-east Queensland to the Grampians in western Victoria, roughly following the line of the Great Dividing Range. Inhabits rocky escarpments, outcrops and cliffs with a preference for northerly aspects. Home range can extend approximately 15ha in area.	Unlikely – Appropriate habitat is not present.
Phascolarctos cinereus (combined populations of QLD, NSW and ACT)	Koala	V	E	Eucalypt forest. Areas where preferred food species occur in sufficient concentrations and diversity with suitable edaphic conditions and presence of other Koalas.	Unlikely – Only minor presence of Eucalypt and other Koala habitat tree species present on site.
Potorous tridactylus	Long Nosed Potoroo	V	V	Occurs across a range of vegetation types from subtropical and warm temperate rainforest through tall open forest with dense understorey to dense coastal heaths. Requires thick groundcover for protection and nesting material and prefers light for foraging. The home range size of the long-nosed potoroo varies from 2-5 ha, and it is often influenced by habitat quality	Low – vegetation types present on site however no records in locality.
Pseudomys novaehollandiae	New Holland Mouse	V	V	Fragmented distribution across QLD with habitat preference to open heathlands, woodlands and forests with heathland understorey and vegetated sand dunes.	Unlikely – Appropriate habitat is not present No records locally
Pteropus poliocephalus	Grey-headed Flying Fox	C	V	Variety of habitats including rainforests, woodlands and swamps, coastal range of south-eastern Australia. Nomadic frugivore and nectivores on rainforest, eucalypt, melaleuca and Banksia. Recorded	Low – Winter flowering Eucalyptus not observed on site. No roosts/camps observed

				flying up to 45km from roost (generally max. of 20km). Roosts colonially with short term individual or small groups. Spring or Summer roosts are maternity sites. Dependent on winter flowering species eg E. robusta and E. tereticornis.	but site may act as a foraging resource as part of a larger home range.
Rostratula australis	Australian Painted Snipe	V	E	Mostly recorded in south-eastern Australia particularly in the Murray Darling Basin. In SEQ it is known from Conondale Ranges and Clarence lowlands. Its range is only predicted in the Gold Coast to Sunshine Coast region. Prefers fringes of swamps, dams and marshlands where there is adequate cover of grasses, low scrub or open timber. Forages nocturnally on mud-flats and in shallow water. Nests in scrapes in the ground lined with leaves and grasses.	Unlikely – Habitat requirements absent from site.
Turnix melanogaster	Black Breasted Button Quail	V	V	Normally prefers drier low closed forests, including dry rainforests, vine forest and vine thickets, often in association with Hoop Pine. Understory may be dense or sparse, but a deep, moist leaf-litter layer is important for foraging.	Low – Marginal habitat conditions occur on site, however, no recent records in site vicinity. Further, the higher percentage of marginal habitat will be retained in the sites north west.

Given the results provided in **Table F** above it is considered that the site does not provide a likelihood greater than “LOW” to represent appropriate habitat for the identified EVNT fauna taxa.

6.4. CORRIDOR POTENTIAL OF THE SITE

Fauna corridors can be defined as contiguous or semi-contiguous patches of vegetation or wildlife habitat (of any shape or size) that provide a conduit of movement for fauna typically between relatively large, vegetated areas (core breeding habitats). Corridors are important for maintaining gene flow and genetic diversity among populations / subpopulations and provide means of refuge for fauna during stochastic events.

In most highly urbanised areas, land use patterns result in substantial fragmentation of remnant vegetation communities and associated wildlife corridors. Retained areas of natural environment are generally minimised resulting in comparably narrow, linear corridors generally associated with waterway corridors or undevelopable lands. In areas with larger land parcels contiguous areas of habitat providing connectivity are more commonly encountered as is the case with the subject site. Notwithstanding, substantial barriers to movement, particularly for terrestrial species, still occur in the form of major road networks, large expanses of grasslands and pastures, monocultural environments and rural land use activities that are non-conductive to survival of native fauna.

From the desktop perspective, the subject site holds direct connection to a Wildlife Movement Area (WiMA) designated under strategic framework of the Bahrs Scrub Local Development Area Plan (LPS v8.1) providing a north-south conduit along the eastern site boundary to areas of greater vegetation retention to the north and south. Also providing some benefit to faunal movement is the western riparian corridor nominated under the LPS2015. Whilst representing a

narrow movement corridor, with enhancement, riparian corridors are often favoured by many faunal species.

6.4.1. STUDY AREA AND LOCALISED CONNECTIVITY

Pursuant to the LPS2015 and the Bahrs Scrub Local Development Area Plan (Dec 2012) the strategic Wildlife Movement patterns with respect to development area have been mapped and formalised to seal movement potential for fauna species into the future. These mapped areas will remain functionally active post development of the site with enhancement under the framework of a site-based rehabilitation plan proposed.

An extract of this plan is provided in **Figure 14**.

- Site Boundary
- Environmental management area - EMA (Existing use rights remain)
- Constrained land (Existing use rights remain)
- Wildlife movement area -WIMA
- Waterway management area and buffer - WMA
- No change (Retain existing zoning)
- Approved and undecided development application
- Townhouse precinct (20 - 40dw/ha)
- Suburban / Small lot precinct (15 - 20dw/ha)
- Small acreage precinct 2000m² + (5dw/ha)
- ▨ Subject to site based environmental assessment
- ▨ Non serviceable water supply area
- Bahrs Scrub local centre
- Bahrs Scrub neighbourhood centre
- ⋯ Fauna sensitive wildlife crossing infrastructure
- ⬅ Proposed public transport corridor
- Upgraded urban arterial road
- Upgraded urban collector road
- Future urban collector road
- Indicative future urban access road
- ↔ Indicative cycle link
- ↔ Proposed recreational cycle path
- ↔ Terrestrial wildlife link
- ▭ Cadastre
- ⋯ Logan LGA boundary

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7. POTENTIAL IMPACTS

7.1. DIRECT IMPACTS

To adequately construct the proposed development, direct impacts are unavoidable. The following impacts will result from the construction of the proposed development:

- Removal of 1,219m² of ground truthed PVMA also considered as Locally Significant Vine Forest (LPS2015) and Least Concern HVRV RE12.11.10.
- Impacts to 28,131.67m² of area mapped as Secondary Vegetation Management Area (SVMA) pursuant to the LPS2015. This area is recognised as non-regulated vegetation community VC3 in this report.
- In areas considered as SVMA, removal of 15 Native Trees and two (2) Native Habitat Trees as per the definitions under the LPS2015 outside of areas ground truthed as PVMA.
- Filling of existing dam to the south-east.

7.2. INDIRECT IMPACTS

The impacts listed in **Table G** below are generally associated with the removal of native vegetation as a result of developing any given subject site. Evaluation of the impact associated with this proposal has been undertaken and is discussed in context to the identified impact.

Table G: Indirect Impacts

Threat	Detail	Assessment of Proposal
Direct mortality via clearing and habitat destruction	Animals within hollows and fallen logs, as well as dense vegetation and leaf litter may be killed during clearing of these structures. This risk increases during breeding seasons (generally spring to late autumn), and cooler season when mammals and reptiles enter torpor.	Direct mortality is considered a minimal risk which can be mitigated with the presence of appropriately qualified fauna spotters during clearing activities. Where practicable timing of vegetation clearing should aim to avoid peak breeding seasons for fauna. No specific breeding places associated with EVNT fauna species have been identified.
Fragmentation and Landscape change	Fragmentation and the associated landscape changes at all scales is a major factor in the decline of biodiversity, the modification of ecosystems, and alteration of ecosystem processes. Its effects vary with factors such as distance of fragments from similar habitat, their position in the landscape, the forms of habitat modification of isolates that occurs (e.g., due to edge effects), and types of surrounding land uses in the matrix, the ecology of the species affected, and how these factors influence the movement of organisms between the isolates and larger areas of habitat	The proposed development will retain the greater portion of intact vegetation within the subject site. This intact vegetation provides vegetated connectivity to vegetation present within adjoining lots. The proposed development footprint does not require the implementation of infrastructure within this retained vegetation. As a result, it is not considered that the proposed development will fragment the vegetation present within the subject site, and it is considered that the development retains the dominant ecological features identified within the site. Substantial wildlife movement corridor potential is retained under the proposal in the form of designated wildlife movement areas and retention and enhancement of waterway corridors nominated under the LCP2015.
Erosion and Sedimentation	Sedimentation and erosion impacts can occur at both the construction and operational phases of any given development. Erosion/sedimentation may occur via entrainment of unconsolidated or exposed substrate and negatively affect downstream environments.	Construction phase Environmental Management Plans are to be designed in consultation with appropriately qualified erosion control specialists and the construction phase of the proposal is to be undertaken in accordance with these designs to prevent sediment movement from the construction footprint.
Fencing	Fences have potential to obstruct the movement of threatened fauna across the site and additionally, can cause mortality or severe injury to some species.	It is recommended that no fence capable of inflicting injury is (e.g., barb wired fence) to be erected (temporary or permanent) at any time. Fencing between land parcels that will be located within potential fauna movement areas are to be fauna friendly in design to ensure no distribution to faunal movement potential.
Noise, Vibration and Anthropogenic Disturbances	Noise effects on fauna in Australia are relatively poorly studied. Most evidence presented is anecdotal, but suggests most fauna have at least a fair degree of tolerance and adaptation at least to residential noise depending on species, situation, habitat/lifecycle stage affected, habitat significance, etc.	Noise generated by the proposal is unlikely to disturb fauna occurring on or near the site, with species expected to have a substantial tolerance to the current level of noise generated by anthropogenic inhabitation of the area. A minor increase in population activity would be negligible.

Threat	Detail	Assessment of Proposal
Weed Invasion	Disturbance of soil provides a significant catalyst for weed germination. Weed propagules may also be introduced to the site via anthropogenic movement during the construction and operational phase of the development.	The introduction of weed propagules to the site will be generally limited to the construction phase of the development and further, limited to the development footprint where exposed soils will be intensively managed. It is unlikely that the operational phase of the proposal will introduce any weed vectors beyond that already present on the subject site.
Introduction of feral/introduced species	Urban, industrial and rural developments are often associated with the introduction of non-native species i.e., rodents, cats and dogs accidentally and intentionally e.g. via creating habitat for such species (e.g. rats, Indian Myna) or as pets. Feral cats and foxes are significant predators of native species (NSWSC 2000a, Dickman 1996, May and Norton 1996, OEH 2015b), and domestic dogs are significant threats to species such as the Koala (Wilkes and Snowden 1998, Port Stephens Council 2001, Connell Wagner 2000b, OEH 2015b). The mere presence of these predators has also been shown to affect fauna behaviour e.g., avoidance and range contraction. Rodents compete with native species but also form a component of native species prey (OEH 2015b, Debus 1993).	Given the nature of the proposal it is highly unlikely that the introduction of pests and feral species will occur beyond that already characteristic to the area.

8. DISCUSSION

8.1. MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The provisions of the EPBCA 1999 require determination of whether the proposal has, will or is likely to have a significant impact on a “matter of national environmental significance”. The following discussion provides an assessment of the findings of this report in the context of requirements under the EPBCA 1999.

8.1.1. LOWLAND RAINFOREST OF SUBTROPICAL AUSTRALIA

This study has identified areas of the site that are mapped under the Vegetation Management Act 1999 framework as High Value Regrowth Vegetation (HVRV, Category C) RE12.11.10 Notophyll and notophyll/microphyll vine forest +/- *Araucaria cunninghamii*. This regional ecosystem, in its remnant complexity, is listed under the DCCEE Threatened Species Scientific Committee (TSSC) Commonwealth Listing Advice on Lowland Rainforest of Subtropical Australia (2011) as being representative of the Critically Endangered Threatened Ecological Community described as Lowland Rainforest of Subtropical Australia.

Notwithstanding the general conformance of the Regional Ecosystem present on the subject site and to a minor degree within the development footprint, the Listing Advice provides further detail on the diagnostic characteristics that define the eligibility of vegetation community as the TECC Lowland Rainforest of Subtropical Australia. Of relevance are the following key diagnostic characteristics of the listed ecological community.

- The structure of the ecological community is typically a tall (20m-30m) closed forest often with multiple canopy layers. Comment: No ecological community on the subject site has a predominant canopy exceeding 20m in height.

- High species richness of at least 30 woody species specifically listed in the advice. Comment: No ecological community on the site has the required species richness present.

Further to the key diagnostic characteristics, the listing advice details that legal protection under the EPBC framework focuses on patches of the TECC that are most functional, relatively natural, and relatively good condition. We note that the patches are considered as high value regrowth pursuant to the State classification and site review and inspection has highlighted the degraded and, in some cases, incorrect classification of the identified polygons. As such, and with the acknowledgement that some basic level of precursor may be present, we do not consider the areas of HVRV RE12.11.10 to meet the diagnostic characteristics required to conform to TSSC listing advice for the Lowland Rainforest of Subtropical Australia pursuant to the EPBCA 1999 and referral of the proposal to DCCEE is not required in this respect.

8.1.2. ENVIRONMENT PROTECTION & BIODIVERSITY CONSERVATION ACT 1999

This assessment has provided an analysis of the potential for MNES to occur within the study area and has identified that no MNES were identified and no requirement for regulatory assessment by Commonwealth referral agencies will be necessary to remove vegetation enabling development of the study area.

Given the above it is not considered that the proposal presents a potentially significant impact to MNES and as such, referral of the action under the EPBC Act is **not required**.

8.2. MATTERS OF STATE ENVIRONMENTAL SIGNIFICANCE

8.2.1. REGULATED VEGETATION

Review of DoR Regional Ecosystem database and Regulated Vegetation database indicates the study area as holding the following vegetation communities.

- RE12.11.10 (HVRV) – Notophyll vine forest ± *Araucaria cunninghamii* (Of Least Concern).
- Category X non-regulated vegetation.

The polygons associated with these communities are also nominated as Essential Habitat for:

- *Marsdenia coronata* (Slender Milkvine)
- *Fontainea venosa*
- *Croton mamillatus* (Bahrs Scrub Croton)

The categorisation of the communities as Category C (High Value Regrowth Vegetation) is not challenged nor is the nomination of the communities as Essential Habitat. However, the extent of the mapped community has been refined where areas nominated as RE12.11.10 do not hold appropriate speciation to confirm the presence of the regulated vegetation community. These areas are nominated as VC3a and VC3b pursuant to the findings of this report and hold dominant *Lantana camara* with only occasional isolated native emergents generally represented by *Acacia* species that commonly occur throughout numerous regional ecosystems.

Other communities observed on the site reflect the DoR data as Category X vegetation.

Schedule 10 Part 3 section 4 of the Planning Regulation 2017 prohibits the clearing of native vegetation where all the following conditions are true:

- Where clearing is not for a relevant purpose as detailed in section 22A of the Vegetation Management Act 1999.

- Where clearing is not exempt clearing work pursuant to Schedule 21 of the Planning Regulation 2017.
- Where clearing is not accepted development under Schedule 7, part 3, section 12 of the Planning Regulation 2017.

Under the proposed development, it is considered that the relevant purpose condition can be achieved. Whilst the clearing does meet the condition under the VMA1999 for 22A(2)(d), section 22A(2B) states that where clearing is in a Category C area, the section does not apply removing the relevance of the relevant purpose designation from the proposed development (due to clearing of Category C vegetation).

However, the relevant purpose condition can be demonstrated in relation to vegetation clearing as it meets the condition for Schedule 21 exempt clearing work conditions. Schedule 21, Part 2 (Freehold Land) Section 2(g(i)) provides conditions where the clearing is for an urban purpose (i.e. residential land parcels) in an urban area (i.e. zoned as emerging community under the LPS2015) and is for clearing regulated regrowth vegetation and as such this condition can be achieved and the relevant purpose condition is demonstrated.

As the proposed vegetation clearing satisfies the requirements for exempt clearing work it is excluded from being either prohibited development or assessable development under Schedule 10 Part 3, sections 4 and 5 of the Planning Regulation 2017, and **will not** require a development permit for the clearing of regulated vegetation.

Further, the application of exempt clearing work under Schedule 21 of the Planning Regulation 2017 also results in it being unnecessary to determine a relevant purpose under section 22A(2)(d) of the VMA 1999 due to it being considered as exempt clearing work.

Notwithstanding the above, it is noted that, as each land parcel associated with the subject site does not exceed 5ha in total area, the proposed development will not trigger referral to the State Assessment Referral Agency (SARA). As such, assessment of this development application in relation to the proposed impacts to vegetation will be devolved to Logan City Council under the local categorising instrument being the LPS2015.

8.2.2. NATURE CONSERVATION ACT

The study area is nominated as a protected plants survey trigger area pursuant to the Nature Conservation Act 2004 and as such a suitably qualified person has undertaken a protected plants survey in accordance with the Flora Survey Guidelines - Protected Plants. The survey effort observed three (3) specimens of the Macadamia Nut (*Macadamia integrifolia*) a species nominated as Vulnerable under the Nature Conservation (Plants) Regulation 2020.

None of the specimens occur within the area subject to operational works and as such will not be affected by the development. Additionally, the three (3) specimens are all located within the landscaped areas of the site or within managed vegetation and as such all are considered to be nursery propagated and do not meet the 'In the Wild' criteria⁴ detailed under the DEHP Operational policy released 16/11/2015. As such, permits usually required to impact protected plants are not applicable in this circumstance.

Notwithstanding, notification to the department of clearing within the trigger area within ten (10) days of clearing activity will also be required should the site be developed.

⁴ Pursuant to DEHP Operational Policy Wildlife Management (16/11/2015), 'In the Wild' is defined as in an independent state of natural liberty. The policy statement defines a range of factors determining whether a protected plant is 'in the wild' including the Ecological Assessment Report – 19 & 23 Adele Crescent, Bahrs Scrub, QLD, 4207

8.2.3. BIOSECURITY ACT 2014

Several weeds designated as Category 3 - restricted matter have been identified on the site. Pursuant to the Biosecurity Act, specimens considered as Category 3 are restricted to 'release into the environment'. As such, all relevant efforts are to be made during the construction phase to prevent the export of propagative material of these species from the site. These mitigation methods can be incorporated into an approved Construction Management Plan, to be provided during the Operational Works application stage.

Refer species list in **Appendix B** for species listed under the Biosecurity Act.

8.3. MATTERS OF LOCAL ENVIRONMENTAL SIGNIFICANCE

8.3.1. BIODIVERSITY OVERLAY CODE - VEGETATION MANAGEMENT AREAS

The site contains vegetation areas nominated as both Primary Vegetation Management Area and Secondary Vegetation Management Areas pursuant to the Biodiversity Overlay Code. Areas nominated as PVMA are also considered as Locally Significant Vine Forest. Much of the mapped areas will be retained within the development at the rear of proposed land parcels that in Lots 5-9 also represents a wildlife movement corridor (WiPA) designated under the Bahrs Scrub Local Development Area Plan (LPS v8.1, Dec 2012).

With respect to the polygons mapped as PVMA and LSVF, this assessment has ground truthed and verified the mapped polygons for their relevancy to both overlay categories with the results provided in **Section 6.1.9** of this report. As a result of the mapping challenge, it is considered that only one (1) area mapped

process by which the plant has become established i.e. either through human intervention or naturally occurring.

as PVMA and LSVF are in fact relevant to those categories. These are provided on **Figure 13**.

This area is located within the footprint for earthworks required to provide access to the residential land parcels and as such its removal is an unavoidable consequence of the proposed development.

Additionally, areas of SVMA to be impacted within the area of earthworks have been inspected and a tree survey conducted. A total of 15 native trees and two (2) Native Habitat Trees will require removal to house the development. Again, this is considered as an unavoidable consequence of the engineering requirements (i.e. earthworks) to adequately construct the proposed infrastructure.

To mitigate these residual environmental impacts, it is proposed to provide a financial offset for impacts within the PVMA/LSVF and SVMA areas and as such represents a performance-based solution to the Biodiversity Code requirements, as outlined within our code response in **Table H**. A separate offset proposal has been supplied under a separate cover. Refer **WCG Environmental Offset Proposal dated August 2022** supplied as part of the overall application package.

It is proposed that the financial offset be calculated based on a count of native trees and Native Habitat Trees rather than the area-based calculations given the highly modified nature of vegetation associated with the impact area. This proposed method is supported under Schedule 6 Part 3.1.9.1 of the LPS2015 (Planning Scheme Policy 3 – Environmental Management) in the scenario where tree density is less than one tree per 10m². As the Tree Survey Plan identifies 17 trees conforming to council definition of Native Trees (or Native Habitat Trees) within the clearing area and the total area of the impact is 2.92ha, a total tree density is calculated at 0.005 trees/10m² thus justifying the proposed method. The area of confirmed PVMA/LSVF differs from the balance of the SVMA area in

tree density and as such the offset is to include a total of 1,219m² of PVMA to be calculated on an area basis.

Refer to **WCG Offset Proposal** for further specification regarding the provision of the environmental offset.

8.3.2. WATERWAY & WETLANDS OVERLAY CODE

The LPS2015 is triggered by the presence of the waterway corridor mapped in the south-west area of the subject site.

The proposed development will retain the corridor in its entirety including the nominated buffers to development and be titled as a drainage corridor with tenure arrangements to be finalised with council. Enhancement of the corridor is proposed to reduce Lantana and other invasive species loads under the framework of a Site Based Rehabilitation Management Plan to be provide separately to this assessment.

Refer our response to the code provided in **Table H**.

8.3.1. WILDLIFE MOVEMENT AREA

The subject site holds direct connection to a Wildlife Movement Area (WiMA) designated under strategic framework of the Bahrs Scrub Local Development Area Plan (LPS v8.1, Dec 2012) providing a north-south conduit along the eastern site boundary to areas of greater vegetation retention to the north and south. The greater percentage of the WiMA is to be retained within the rear of proposed Lots 5-9. Whilst some modification to the alignment of the corridor is required under the proposal the overall intent of the corridor's purpose is maintained post-development.

As per the Bahrs Scrub Local Development Area Plan Section A1.3 the management intent of the WiMA is to:

- Protect and enhance core environmental values.

Under the proposed development this is achieved via retention of the WiMA is an altered but functional configuration within the rear of proposed lots 5-9. These areas will be subject to enhancement via the implementation of a Site Based Rehabilitation Plan provided in the development application package under a separate cover.

- Provide a major corridor linkage for koala and wildlife movement between Clarkes Hill through to Buccan Conservation Park and the Logan River.

The proposed development retains the capacity for faunal movement within the WiPA at the rear of lots 5-9. Potential barriers to movement associated with the development such as boundary fencing to define the post-development land parcels can be avoided via the specification of fauna friendly design configurations. Additionally, retention, protection and enhancement of the south-western waterway corridor provides an additional movement corridor through the region that may represent a preferred movement path to native fauna given the availability of water. It is recognised that fauna often favour movement corridors associated with waterways over terrestrial passages where an option is provided. As such, the post-development environment results in connective potential that would be considered as greater than that of the pre-development scenario given that enhancement of both the WiPA and the waterway corridor is proposed under a Site Based Rehabilitation Management Plan (SBRMP).

- Preserve regionally and locally significant scenic amenity values.

Enhancement and natural regeneration of the WiMA under the proposed SBRMP will result in increased amenity values compared with the pre-development site

that holds substantial residual land use issues such as the dominance of invasive weed species across the WiPA area (e.g. *Lantana camara*).

- Provide an appropriate transition and buffer between WiMAs and the developable area

Developable areas have been defined within the proposed RoL plan to ensure that adequate buffering and retention of the WiPA is provided. In, addition proposed lot sizes and configuration are considered as compliant with Section 7.3.11 of the Bahrs Scrub Local Development Area Plan (December 2012) with lot sizes substantially greater than 2000m² in area to facilitate retention of identified environmental values. Again, providing some benefit to faunal movement is the western riparian corridor nominated under the LPS2015. Whilst representing a narrow movement corridor, with enhancement, riparian corridors are often favoured by many faunal species.

The above discussion demonstrates the proposal has duly considered and allowed for the provision of the WiPA designated under the Bahrs Scrub Local Development Area Plan (December 2012) and as such, is considered as supportive to the overall purpose and desired outcomes of the strategic planning process designated for Bahrs Scrub development patterns.

Table H: Biodiversity Overlay Code Response (part 8.2.2 Logan Planning Scheme 2015)

Performance outcomes	Acceptable outcomes	Comments
For accepted development (subject to requirements) and assessable development		
Biodiversity corridors		
PO1 Development in a Biodiversity corridor identified on Biodiversity areas overlay map OM-02.02 is designed and located to: (a) provide for habitat links; (b) facilitate safe wildlife movement; (c) facilitate wildlife refuge; (d) enhance habitat values; (e) rehabilitate degraded areas with native vegetation.	AO1 Development is located outside a Biodiversity corridor identified on Biodiversity areas overlay map–OM-02.02.	AO1 Complies The development is located wholly outside of the mapped biodiversity corridor located to the subject sites eastern boundary. Additionally, local strategic wildlife linkages are to be retained to an adequate level to support wildlife movement and local linkages.
Primary vegetation management area		
PO2 Development in the Primary vegetation management area identified on Biodiversity areas overlay map–OM–02.01 is designed and located: (a) to: (i) protect the current extent of native vegetation; or (ii) achieve a net gain of native vegetation; (b) to rehabilitate degraded areas with native vegetation.	AO2.1 Development is located to avoid the need to clear any native vegetation in the Primary vegetation management area identified on Biodiversity areas overlay map–OM–02.01, unless: (a) if identified as a matter of local environmental significance on Biodiversity areas overlay map–OM–02.04, an offset is provided in accordance with section 3.1–Environmental offset standards in Planning scheme policy 3–Environmental management; or (b) if identified as a matter of State environmental significance on Biodiversity areas overlay map–OM-02.04, an offset is provided in accordance with the Queensland Environmental Offset Policy and the Environmental Offsets Act 2014.	AO2.1 Complies a) Areas of PMVA indicated in various areas over the site have been ground truthed and where native vegetation is present confirmed with the information within this report. As such an anticipated impact to 1,219m² of PVMA is necessary for removal. An offset proposal detailing the proposed offset strategy is provided under a separate cover to this report. b) Impacts to MSES are captured under addressing the PVMA nominated under the LPS2015. These matters are not considered as 'substantially different' pursuant to the requirements of the EO Act 2014 and as such a secondary offset obligation for MSES is not required.
	AO2.2 Development rehabilitates degraded areas in accordance with the South-East Queensland Ecological Restoration Framework.	AO2.2 Areas proposed for rehabilitation are to be approved under relevant OPW application and as such are deemed compliant with AO2.2 on approval.

Performance outcomes	Acceptable outcomes	Comments
Secondary vegetation management area		
PO3 Development in the Secondary vegetation management area identified on Biodiversity areas overlay map OM-02.01 is designed and located to either: (a) protect the current extent of native trees and native habitat trees; or (b) achieve a net gain of native trees and native habitat trees.	AO3 Development is located to avoid the need to clear any native trees and native habitat trees in the Secondary vegetation management area identified on Biodiversity areas overlay map OM-02.01, unless: (a) if clearing less than 10 native trees, compensatory planting is provided of: (i) two trees of the same species for every native tree cleared in a secondary vegetation management area; (ii) four trees of the same species for every native habitat tree cleared in a secondary vegetation management area; (b) if identified as a Matter of local environmental significance and not Both matters of local and state environmental significance on Biodiversity areas overlay map OM-02.04, an offset is provided in accordance with section 3.1 - Environmental offset standards in Planning scheme policy 3 - Environmental management; or (c) if identified as Both Matters of local and state environmental significance or Matters of State environmental significance on Biodiversity areas overlay map OM-02.04, an offset is provided in accordance with the Queensland Environmental Offset Policy and the Environmental Offsets Act	AO3 Complies As per the Biodiversity areas overlay mapping, the balance of the development footprint, aside from areas of PVMA, is designated as Secondary Vegetation Management Area. Resultingly, an offset will be provided accordance with section 3.1–Environmental offset standards in Planning scheme policy 3–Environmental management.
Koala corridor		
PO4 Development in a Koala corridor identified on Biodiversity areas overlay map–OM–02.02 is designed and located to protect and enhance koala habitat.	AO4 Development: (a) is located to avoid the need to clear any native vegetation in a Koala corridor identified on Biodiversity areas overlay map–OM–02.02; (b) in a Koala corridor identified on Biodiversity areas overlay map–OM–02.02 rehabilitates degraded koala habitat values within the Koala corridor, in accordance with the South East Queensland Ecological Restoration Framework.	AO4 Not Applicable The subject site is not located within the Koala Corridor as mapped by the Biodiversity Areas overlay.

Performance outcomes	Acceptable outcomes	Comments
Locally Significant Vegetation Area		
PO5 Development in a Locally significant vegetation area identified on the Biodiversity areas overlay map OM-02.03 protects Melaleuca irbyana, vine forest, Gossia gonoclada and significant remnant vegetation areas from: (a) encroachment; (b) edge effects.	A05 Development is located outside of a Locally significant vegetation area as identified on Biodiversity areas overlay map OM-02.03.	PO5 Performance based Compliance Areas of locally significant vine forest have been identified with the higher percentage either retained outside the development footprint or their relevance challenged as part of this assessment. One area of LSVF has been identified that will require unavoidable removal to facilitate adequate earthworks to provide minimum standards for access and land parcel development. The process of Avoid, Mitigate and Offset has been duly considered within the design process of the development with impacts considered as unavoidable. The residual impacts resulting from this necessary clearing will be mitigated by the provision of a suitable offset detailed in an offset proposal plan provided under a separate cover. Refer WCG Offset Proposal Plan dated August 2022.
For assessable development		
Locally Significant Melaleuca irbyana buffer area		
PO6 Development in a Biodiversity corridor or koala corridor identified on Biodiversity areas overlay map-OM-02.02 provides for the safe movement of native fauna by: (a) generating minimal additional night time traffic; (b) minimising the risk of injury or death to wildlife by vehicular traffic; (c) incorporating practices or measures to minimise disruption, injury or death during construction; (d) providing that a road or accessway has a low design speed; (e) providing fauna-friendly fencing.	A06 Development in a Biodiversity corridor or koala corridor identified on Biodiversity areas overlay map-OM-02.02 provides for the safe movement of native fauna through the implementation of: (a) the Queensland Government Fauna Sensitive Road Design Manual Volume 2: Preferred Practices; (b) the Queensland Government Koala-sensitive Design Guideline.	A05 Not Applicable The subject site is not located within either the Biodiversity Corridor or Koala Corridor as mapped by the Biodiversity Areas overlay.
PO7 Development within the Locally significant Melaleuca irbyana buffer area identified on Biodiversity areas overlay map-OM-02.03 protects the Locally significant Melaleuca irbyana area identified on Biodiversity areas overlay map-OM-02.03 from: (a) edge effects; (b) adverse changes to the local hydrology.	A07 Development within the Locally Significant Melaleuca irbyana buffer area identified on Biodiversity areas overlay map-OM-02.03 provides for a vegetated buffer within 50 metres of the Locally Significant Melaleuca irbyana area identified on Biodiversity areas overlay map-OM-02.03.	A06 Not Applicable The subject site is not located within the Locally significant Melaleuca irbyana buffer area, as mapped by the Biodiversity Areas overlay.

Performance outcomes	Acceptable outcomes	Comments
Landscape values		
P08 Development is designed and located to protect and enhance the landscape values of: (a) a ridgeline; (b) native vegetation.	A08 No acceptable outcome provided.	A07 Complies a) The site is not located on a ridgeline b) Where appropriate, landscape planting associated with the development will include native vegetation.
Lighting		
P09 Development in a Biodiversity corridor or Koala corridor identified on Biodiversity areas overlay map–OM–02.02 is designed to minimise adverse light impacts on native fauna.	A08 Lighting associated with development in a Biodiversity corridor or Koala corridor identified on Biodiversity areas overlay map–OM–02.02: complies with the dark surrounds lighting levels in AS4282-1997–Control of the obtrusive effects of outdoor lighting; is directed away from areas identified on Biodiversity areas overlay map–OM–02.00.	A08 Not Applicable The subject site is not located within either the Biodiversity Corridor or Koala Corridor as mapped by the Biodiversity Areas overlay.

Table I: Waterway Corridors and Wetland Overlay Code Response (part 8.2.12 Logan Planning Scheme 2015)

Performance outcomes	Acceptable outcomes	Comments
For self-assessable and assessable development		
Design and location		
PO1 Development is designed and located to provide a buffer to a Waterway corridors and wetlands area identified on Waterway corridors and wetlands overlay map—OM—13.00 that protects its ecosystem processes, water quality, function, scenic amenity and landscape values.	AO1 Development provides a buffer: (a) to the waterway areas identified on Waterway corridors and wetlands overlay map—OM—13.01: (i) of a width specified in Table 8.2.12.3.2—Waterway and wetland buffer width; (ii) measured to comply with Figure 8.2.12.3.1—Defining the top bank: upper reaches, middle reaches and lower reaches; (b) to the wetlands identified on Waterway corridors and wetlands overlay map—OM—13.02 of a width specified in Table 8.2.12.3.2—Waterway and wetland buffer width.	AO1 - Complies a) i) The waterway corridor buffer is to be retained under the proposed development a) ii) The waterway is considered as a waterway of the first order and as such is considered as minor pursuant to Table 8.2.12.3.2. As such a buffer of 10m from the high bank has been provided. b) NA. No wetlands are identified on the subject site.
For assessable development only		
Ecosystem processes		
PO2 Development is designed, constructed and managed to protect and enhance: (a) in-stream and riparian habitat values of a Waterway corridors and wetlands area identified on Waterway corridors and wetlands overlay map—OM—13.00; (b) safe wildlife movement. Note—Planning scheme policy 3—Environmental management provides guidance on how to achieve this outcome. Compliance with this performance outcome is to be demonstrated by an ecological assessment report prepared in accordance with part 2 of planning scheme policy 3—Environmental management.	AO2 If development does not provide a buffer to a Waterway corridors and wetlands area in accordance with AO1: (a) an ecological assessment report is prepared in accordance with part 2 of planning scheme policy 3—Environmental management that demonstrates how the development protects and enhances in-stream and riparian habitat values and results in no loss of connectivity which supports wildlife movement; (b) the ecological function of a Waterway corridors and wetlands area is protected and enhanced in accordance with section 3.3.1—Riparian corridor revegetation and weed control of planning scheme policy 3—Environmental management.	AO2 - Complies The proposed development provides a buffer to the waterway in accordance with PO1 above.

Performance outcomes	Acceptable outcomes	Comments
Natural hydrological and geomorphological processes		
PO3 Development is designed, constructed and managed to ensure: (a) the natural hydrological and geomorphological processes of a Waterway corridors and wetlands area identified on Waterway corridors and wetlands overlay map—OM—13.00 are maintained. (b) where the natural hydrological and geomorphological processes are modified, the near natural hydrology is re-instated.	AO3 Development is designed, constructed and managed to protect the natural hydrological and geomorphological processes of a Waterway corridors and wetlands area by: (a) providing an area equal to the buffer width identified on Waterway corridors and wetlands overlay map—OM—13.00 for either side of the existing channel to allow for the natural lateral and longitudinal movement of the channel; (b) stabilising banks using native vegetation in accordance with section 3.3.1—Riparian corridor revegetation and weed control and section 3.3.2—Near-natural hydrology reinstatement works of Planning Scheme Policy 3—Environmental Management; (c) reinstating the near-natural hydrology in accordance with section 3.3.2—Near-natural hydrology reinstatement works of planning scheme policy 3—Environmental management.	AO3 - Complies Impacts to hydrological and geomorphological processes will not be impacted by the proposed development as per AO3 in that; a) Buffers are to be retained in accordance with OM-13.00 under the proposed development. b) The extent of pre-development vegetation associated with waterways will be retained under the proposed development; and c) As per b) above
Erosion prone areas		
PO4 Development in an erosion prone area identified on Waterway corridors and wetlands overlay map—OM—13.03 is for coastal dependent development, or temporary, readily relocatable or able-to-be-abandoned development.	AO4 Development is not located in an erosion prone area identified on Waterway corridors and wetlands overlay map—OM—13.03 unless the development: (a) cannot be feasibly located elsewhere; (b) is coastal dependent development, or temporary, readily relocatable or able-to-be-abandoned development.	AO4 - Not applicable. The subject site is not located within an erosion prone area.

Performance outcomes	Acceptable outcomes	Comments
Water quality		
PO5 Development is designed, constructed and managed to protect water quality of a Waterway corridors and wetlands area identified on Waterway corridors and wetlands overlay map–OM–13.00 by: (a) providing vegetated buffers; (b) incorporating water sensitive urban design principles having regard to: (i) protecting water quality of surface and ground waters; (ii) minimising sewage discharges to the natural environment; (c) limiting discharge of sediments and pollutants into a Waterway corridors and wetlands area.	AO5 Development: (a) provides a vegetated riparian buffer in accordance with section 3.3.1–Riparian corridor revegetation and weed control of planning scheme policy 3–Environmental management; (b) provides effective erosion and sediment control in accordance with section 3.3–Filling and excavation standards of planning scheme policy 5–Infrastructure; (c) implements water sensitive urban design principles in accordance with section 3.6–Stormwater infrastructure standards and section 3.7–Landscaping standards of planning scheme policy 5–Infrastructure; (d) excludes stock from a Waterway corridors and wetlands area by providing a permanent fence and gate and utilises off-stream stock watering points.	AO5 - Complies It is not anticipated that negative impacts on water quality will occur as a result of the proposed development in that: a) Appropriate buffers to the waterway will be retained. b) All construction phase activities will be conducted under the framework of a site-specific erosion and sediment control plan. c) All relevant stormwater management requirements have been considered within submitted engineering plans. Refer application package for further information. d) Not relevant to the proposed use.
Access		
PO6 Development provides for an integrated and publicly accessible pedestrian network to: (a) a River waterway area identified on Waterway corridors and wetlands overlay map–OM–13.01; (b) a Major waterway area identified on Waterway corridors and wetlands overlay map–OM–13.01; (c) a Major wetland identified on Waterway corridors and wetlands overlay map–OM–13.02.	AO6 A pedestrian path is provided and constructed in accordance with section 3.4–Movement infrastructure standards of planning scheme policy 5–Infrastructure.	AO6 - Not applicable. The waterway associated with the subject site is designated as a Minor Waterway.
Tenure		
PO7 Development provides for tenure or management arrangements that facilitate the protection and enhancement of a Waterway corridors and wetlands.	AO7 No acceptable outcome provided.	AO7 Appropriate tenure arrangements can be negotiated and subsequently conditioned during the development assessment process.

9. RECOMMENDATIONS & MITIGATION MEASURES

9.1. REGULATORY COMPLIANCE

In order to ensure that vegetation clearing within the study area does not represent prohibited development pursuant to the Schedule 10 of the Planning Regulation 2017 an application to DoR for a relevant purpose determination is recommended. Whilst an appropriate pathway to regulatory compliance has been identified within this assessment, further confirmation from the State Department will reduce compliance risk to Loram and associated stakeholders. Notwithstanding, it is ultimately unnecessary to determine given the clearing is considered to be exempt clearing work under Schedule 21 of the Planning Regulation 2017.

Prior to clearing vegetation an application to notify clearing of vegetation within the protected plants survey trigger area (High Risk) will be required within ten (10) days of the clearing activity. No EVNT taxa were observed within areas to be impacted and as such the application will represent an exempt clearing notification only.

Development of the site will result in the loss of approximately 5.43ha of area mapped as Secondary Vegetation Management Area pursuant to the LPS2015 (a Matter of Local Environmental Significance). In accordance with Section 3.1 (Environmental offset standards) in the LPS2015 Planning Scheme Policy 3 (Environmental Management) an appropriate financial offset is proposed to mitigate the residual negative effects of development.

It is proposed that the financial offset be calculated based on a count of Native Trees and Native Habitat Trees rather than the area-based calculations provided by the calculator.

This proposed method is supported under Schedule 6 Part 3.1.9.1 of the LPS2015 (Planning Scheme Policy 3 – Environmental Management) in the scenario where tree density is less than one tree per 10m². As the Tree Survey Plan identifies 17 trees conforming to council definition of Native Trees (or Native Habitat Trees) within the clearing area and the total area of clearing is 2.92ha, a total tree density is calculated at 0.005 trees/10m² thus justifying the proposed method. The area of confirmed PVMA/LSVF differs from the balance of the SVMA area in tree density and as such the offset is to include a total of 1,219m² of PVMA to be calculated on an area basis.

As part of the application package an Environmental Offset Proposal has been prepared under a separate cover.

Refer to **WCG Environmental Offset Proposal 22-0099EBF Rev1.0 dated August 2022** for further details.

9.2. ENHANCEMENT OF ENVIRONMENTAL AREAS

In order to increase the quality of habitat and connective potential of the site, a detailed Site Based Rehabilitation Management Plan is to be prepared focusing on the overall enhancement of retained vegetation and designated corridors within the development. Such a plan will aim to reduce the substantial weed population noted within the WiPA and the waterway corridor and further, will aim to increase the potential and capacity for natural regeneration and recruitment. This plan has been prepared for consideration and is provided under a separate cover within the overall application package.

Refer to **WCG Site Based Rehabilitation Management Plan 22-0099EBF Iss A dated August 2022** for further details.

9.3. VEGETATION MANAGEMENT

In order to minimise impacts on adjacent habitats prior to and during vegetation clearing the following strategies are to be implemented:

- The boundaries of clearing areas are to be clearly delineated for machinery operators. No clearing is to occur outside of exclusion fencing.
- All trees are to be felled away from neighbouring vegetation to be retained.
- Directional clearing methods are to be undertaken during removal of vegetation with the aim of directing fauna into areas of retained vegetation neighbouring the site.
- The proposed area to be cleared will be minimised where possible, with clearing confined to the area required for the purposes of construction only.
- Construction phase site induction is to specify that no vegetation modification via any means is to occur beyond the nominated area, and no storage or dumping of any building material is to occur under the drip line of any retained trees.
- Any clearing and earthworks associated with the development is to avoid damage to root zones of retained trees e.g., no parking of vehicles or storage of materials or excavated fill under retained trees.

- Given the presence of exotic species over the subject site, care should be taken in the disposal of vegetation cleared from the Site, such that spread of propagules of these species is minimized. No vegetative materials cleared from the site should be placed near or within vegetation adjacent to the Site.
- An accredited fauna spotter / catcher is to be present during clearing operations. The fauna spotter / catcher must be approved to handle and manage Koala interactions as per the Nature Conservation (Koala) Conservation Plan 2017.
- Preparation of a Vegetation Management Plan (VMP) detailing the above is to be incorporated into the construction phase Environmental Management strategy to provide a transparent framework for site operators to effectively minimise negative effects during vegetation clearing activities. This plan has been provided as **Appendix C** of this report.

9.4. FAUNA MANAGEMENT

Fauna Management; a pre-clear fauna habitat report must be generated by a qualified fauna spotter / catcher. During operational works, the engaged fauna spotter / catcher must be onsite prior to and during vegetation felling activities to ensure fauna and habitat management actions are actioned as required. The fauna spotter catcher must review the animal breeding places recorded within the study area to determine their status in relation to being active or inactive at the time of vegetation clearing.

9.5. LANDSCAPING CONSIDERATIONS

In order to reduce the impact of native species removal from the site, landscaping plans developed for the proposal are to consider species

appropriate to the pre-clearing regional ecosystem community and where practical incorporate fauna habitat species and features. This includes the use of Koala preference species where appropriate.

9.6. EROSION AND SEDIMENT CONTROL

During clearing and construction activities, appropriate erosion and sediment control measures are to be implemented in accordance with an Erosion and Sediment control plan developed by an appropriately qualified professional. This plan at a minimum should contain details on E&SC measures to be incorporated into the construction phase of the proposal, details of monitoring and testing requirements that may be associated with the plan, actions to remediate any incidents that may occur and reporting obligations pursuant to relevant legislation.

9.7. STORMWATER MANAGEMENT

Stormwater quality and quantity during construction and post-construction phases of the development are to be conducted according to an approved Stormwater Management plan developed for the proposal by a suitably qualified professional to effectively mitigate the potential for increased impacts downstream potentially associated with the proposal.

10. CONCLUSION

This report has advised upon the relevant ecological factors and potential impacts to those factors associated with development of a 11-lot reconfiguration of two (2) land parcels to be located within the defined study area.

The study area was confirmed as holding High Value Regrowth Vegetation (Category C) in a general configuration conforming to DoR mapped polygons, however, given the on-ground condition of vegetation some alteration to the extent of mapped communities has been proposed. This resulted in a total of one (1) regulated vegetation community and two (2) broad non-regulated vegetation communities being identified within the study area. Re-definition of the vegetation communities has also extended to those areas defined under the LCP2015 where the mapped extent of Primary Vegetation Management Areas considered as Locally Significant Vine Forest has been challenged.

In summary, the investigation has identified the following impacts in relation to the study area and clearing impact area:

- Removal of 1,219m² of ground truthed PVMA also considered as Locally Significant Vine Forest (LPS2015) and Least Concern HVRV RE12.11.10.
- Impacts to 28,131.67m² of area mapped as Secondary Vegetation Management Area (SVMA) pursuant to the LPS2015. This area is recognised as non-regulated vegetation community VC3 in this report.
- In areas considered as SVMA, removal of 15 Native Trees and two (2) Native Habitat Trees as per the definitions under the LPS2015 outside of areas ground truthed as PVMA.
- Filling of existing dam to the south-east.

To minimise potential ecological impacts consequent of the proposed development, it is recommended the following matters are adhered to:

- The boundaries of clearing areas are to be clearly delineated for machinery operators. No clearing is to occur outside of exclusion fencing.
- All trees are to be felled away from neighbouring vegetation to be retained.
- Directional clearing methods are to be undertaken during removal of vegetation with the aim of directing fauna into areas of retained vegetation neighbouring the site.
- The proposed area to be cleared will be minimised where possible, with clearing confined to the area required for the purposes of construction only.
- Where possible, trees have been incorporated into planning design and retained throughout the subject site.
- Construction phase site induction is to specify that no vegetation modification via any means is to occur beyond the nominated area, and no storage or dumping of any building material is to occur under the drip line of any retained trees.
- Any clearing and earthworks associated with the development is to avoid damage to root zones of retained trees e.g., no parking of vehicles or storage of materials or excavated fill under retained trees.
- Given the presence of exotic species over the subject site, care should be taken in the disposal of vegetation cleared from the Site, such that spread of propagules of these species is minimized. No vegetative materials

cleared from the site should be placed near or within vegetation adjacent to the Site.

- An accredited fauna spotter / catcher is to be present during clearing operations. The fauna spotter / catcher must be approved to handle and manage Koala interactions as per the Nature Conservation (Koala) Conservation Plan 2017.
- Payment of a financial offset obligation under the framework of an infrastructure agreement to mitigate the significant residual environmental impacts of the development
- Implementation of a Vegetation Management Plan (VMP) detailing the above is to be incorporated into the construction phase Environmental Management strategy to provide a transparent framework for site operators to effectively minimise negative effects during vegetation clearing activities.
- Implementation of the Site Based Rehabilitation Management Plan to enhance retained fauna connectivity and waterway areas associated with post development site.

Based upon this conclusion and the provided recommendations, with consideration to ecological constraints the proposed development conforms to relevant Commonwealth, State and Local requirements and subject to approval from all relevant administrators is recommended for development consent approval.

11. REFERENCES

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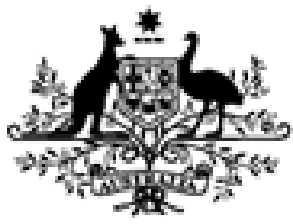
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Appendix A

EPBC & WILNET Search Results





EPBC Act Protected Matters Report

This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

Information on the coverage of this report and qualifications on data supporting this report are contained in the caveat at the end of the report.

Information is available about [Environment Assessments](#) and the EPBC Act including significance guidelines, forms and application process details.

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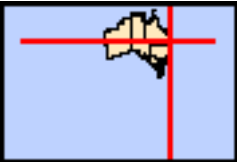
- [Summary](#)
- [Details](#)

[Matters of NES](#)[Other Matters Protected by the EPBC Act](#)[Extra Information](#)
- [Caveat](#)
- [Acknowledgements](#)



This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2015

[Coordinates](#)
Buffer: 2.0Km



Summary

Matters of National Environmental Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the [Administrative Guidelines on Significance](#).

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International Importance:	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Area:	None
Listed Threatened Ecological Communities:	3
Listed Threatened Species:	57
Listed Migratory Species:	15

Other Matters Protected by the EPBC Act

This part of the report summarises other matters protected under the Act that may relate to the area you nominated. Approval may be required for a proposed activity that significantly affects the environment on Commonwealth land, when the action is outside the Commonwealth land, or the environment anywhere when the action is taken on Commonwealth land. Approval may also be required for the Commonwealth or Commonwealth agencies proposing to take an action that is likely to have a significant impact on the environment anywhere.

The EPBC Act protects the environment on Commonwealth land, the environment from the actions taken on Commonwealth land, and the environment from actions taken by Commonwealth agencies. As heritage values of a place are part of the 'environment', these aspects of the EPBC Act protect the Commonwealth Heritage values of a Commonwealth Heritage place. Information on the new heritage laws can be found at <http://www.environment.gov.au/heritage>

A [permit](#) may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species.

Commonwealth Land:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	20
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves Terrestrial:	None
Australian Marine Parks:	None

Extra Information

This part of the report provides information that may also be relevant to the area you have nominated.

State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	37
Nationally Important Wetlands:	None
Key Ecological Features (Marine)	None

Details

Matters of National Environmental Significance

Wetlands of International Importance (Ramsar)		[Resource Information]
Name		Proximity
Moreton bay		Within 10km of Ramsar

Listed Threatened Ecological Communities

[Resource Information]

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Name	Status	Type of Presence
Coastal Swamp Sclerophyll Forest of New South Wales and South East Queensland	Endangered	Community likely to occur within area
Lowland Rainforest of Subtropical Australia	Critically Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

Listed Threatened Species

[Resource Information]

Name	Status	Type of Presence
Birds		
Anthochaera phrygia Regent Honeyeater [82338]	Critically Endangered	Foraging, feeding or related behaviour likely to occur within area
Botaurus poiciloptilus Australasian Bittern [1001]	Endangered	Species or species habitat likely to occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Cyclopsitta diophthalma coxeni Coxen's Fig-Parrot [59714]	Endangered	Species or species habitat may occur within area
Dasyornis brachypterus Eastern Bristlebird [533]	Endangered	Species or species habitat may occur within area
Erythrotriorchis radiatus Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Falco hypoleucos Grey Falcon [929]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat may occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area

Name	Status	Type of Presence
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Rostratula australis Australian Painted Snipe [77037]	Endangered	Species or species habitat likely to occur within area
Turnix melanogaster Black-breasted Button-quail [923]	Vulnerable	Species or species habitat likely to occur within area
Frogs		
Mixophyes fleayi Fleay's Frog [25960]	Endangered	Species or species habitat likely to occur within area
Mixophyes iteratus Giant Barred Frog, Southern Barred Frog [1944]	Vulnerable	Species or species habitat may occur within area
Insects		
Argynnis hyperbius inconstans Australian Fritillary [88056]	Critically Endangered	Species or species habitat may occur within area
Phyllodes imperialis smithersi Pink Underwing Moth [86084]	Endangered	Species or species habitat may occur within area
Mammals		
Chalinolobus dwyeri Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat likely to occur within area
Dasyurus maculatus maculatus (SE mainland population) Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) [75184]	Endangered	Species or species habitat likely to occur within area
Macroderma gigas Ghost Bat [174]	Vulnerable	Species or species habitat may occur within area
Petauroides volans Greater Glider (southern and central) [254]	Endangered	Species or species habitat known to occur within area
Petaurus australis australis Yellow-bellied Glider (south-eastern) [87600]	Vulnerable	Species or species habitat likely to occur within area
Petrogale penicillata Brush-tailed Rock-wallaby [225]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT) Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Endangered	Species or species habitat known to occur within area
Potorous tridactylus tridactylus Long-nosed Potoroo (northern) [66645]	Vulnerable	Species or species habitat likely to occur within area
Pseudomys novaehollandiae New Holland Mouse, Pookila [96]	Vulnerable	Species or species habitat likely to occur within area
Pteropus poliocephalus Grey-headed Flying-fox [186]	Vulnerable	Foraging, feeding or

Name	Status	Type of Presence
related behaviour known to occur within area		
Plants		
Arthraxon hispidus Hairy-joint Grass [9338]	Vulnerable	Species or species habitat likely to occur within area
Baloghia marmorata Marbled Balogia, Jointed Baloghia [8463]	Vulnerable	Species or species habitat likely to occur within area
Bosistoa transversa Three-leaved Bosistoa, Yellow Satinheart [16091]	Vulnerable	Species or species habitat likely to occur within area
Clematis fawcettii Stream Clematis [4311]	Vulnerable	Species or species habitat likely to occur within area
Corchorus cunninghamii Native Jute [14659]	Endangered	Species or species habitat likely to occur within area
Cryptocarya foetida Stinking Cryptocarya, Stinking Laurel [11976]	Vulnerable	Species or species habitat likely to occur within area
Cryptostylis hunteriana Leafless Tongue-orchid [19533]	Vulnerable	Species or species habitat likely to occur within area
Cupaniopsis shirleyana Wedge-leaf Tuckeroo [3205]	Vulnerable	Species or species habitat may occur within area
Diploglottis campbellii Small-leaved Tamarind [21484]	Endangered	Species or species habitat may occur within area
Endiandra floydii Floyd's Walnut, Crystal Creek Walnut [52955]	Endangered	Species or species habitat likely to occur within area
Endiandra hayesii Rusty Rose Walnut, Velvet Laurel [13866]	Vulnerable	Species or species habitat likely to occur within area
Fontainea venosa [24040]	Vulnerable	Species or species habitat may occur within area
Lepidium peregrinum Wandering Pepper-cress [14035]	Endangered	Species or species habitat may occur within area
Macadamia integrifolia Macadamia Nut, Queensland Nut Tree, Smooth-shelled Macadamia, Bush Nut, Nut Oak [7326]	Vulnerable	Species or species habitat likely to occur within area
Macadamia tetraphylla Rough-shelled Bush Nut, Macadamia Nut, Rough-shelled Macadamia, Rough-leaved Queensland Nut [6581]	Vulnerable	Species or species habitat known to occur within area
Marsdenia longiloba Clear Milkvine [2794]	Vulnerable	Species or species habitat likely to occur within area
Phaius australis Lesser Swamp-orchid [5872]	Endangered	Species or species habitat may occur within area
Planchonella eerwah Shiny-leaved Condoo, Black Plum, Wild Apple	Endangered	Species or species

Name	Status	Type of Presence
[17340] Plectranthus nitidus Nightcap Plectranthus, Silver Plectranthus [55742]	Endangered	habitat likely to occur within area Species or species habitat likely to occur within area
Randia moorei Spiny Gardenia [10577]	Endangered	Species or species habitat known to occur within area
Rhodamnia rubescens Scrub Turpentine, Brown Malletwood [15763]	Critically Endangered	Species or species habitat likely to occur within area
Rhodomyrtus psidioides Native Guava [19162]	Critically Endangered	Species or species habitat known to occur within area
Samadera bidwillii Quassia [29708]	Vulnerable	Species or species habitat likely to occur within area
Sophora fraseri [8836]	Vulnerable	Species or species habitat likely to occur within area
Thesium australe Austral Toadflax, Toadflax [15202]	Vulnerable	Species or species habitat likely to occur within area
Tylophora woollsii [20503]	Endangered	Species or species habitat likely to occur within area
Zieria collina [2178]	Vulnerable	Species or species habitat known to occur within area

Reptiles		
Coeranoscincus reticulatus Three-toed Snake-tooth Skink [59628]	Vulnerable	Species or species habitat likely to occur within area
Delma torquata Adorned Delma, Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area

Listed Migratory Species

[Resource Information]

* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area

Migratory Terrestrial Species		
Cuculus optatus Oriental Cuckoo, Horsfield's Cuckoo [86651]		Species or species habitat known to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area

Name	Threatened	Type of Presence
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Migratory Wetlands Species		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species		[<u>Resource Information</u>]
* Species is listed under a different scientific name on the EPBC Act - Threatened Species list.		
Name	Threatened	Type of Presence
Birds		
Actitis hypoleucos Common Sandpiper [59309]		Species or species habitat may occur within area
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
Apus pacificus Fork-tailed Swift [678]		Species or species habitat likely to occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area

Name	Threatened	Type of Presence
Calidris acuminata Sharp-tailed Sandpiper [874]		Species or species habitat may occur within area
Calidris ferruginea Curlew Sandpiper [856]	Critically Endangered	Species or species habitat may occur within area
Calidris melanotos Pectoral Sandpiper [858]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat likely to occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]	Vulnerable	Roosting known to occur within area
Lathamus discolor Swift Parrot [744]	Critically Endangered	Species or species habitat likely to occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Monarcha melanopsis Black-faced Monarch [609]		Species or species habitat known to occur within area
Monarcha trivirgatus Spectacled Monarch [610]		Species or species habitat known to occur within area
Myiagra cyanoleuca Satin Flycatcher [612]		Species or species habitat likely to occur within area
Numenius madagascariensis Eastern Curlew, Far Eastern Curlew [847]	Critically Endangered	Species or species habitat may occur within area
Pandion haliaetus Osprey [952]		Species or species habitat known to occur within area
Rhipidura rufifrons Rufous Fantail [592]		Species or species habitat likely to occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Endangered*	Species or species habitat likely to occur within area
Tringa nebularia Common Greenshank, Greenshank [832]		Species or species habitat likely to occur within area

Extra Information

Invasive Species

[Resource Information]

Weeds reported here are the 20 species of national significance (WoNS), along with other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity. The following feral animals are reported: Goat, Red Fox, Cat, Rabbit, Pig, Water Buffalo and Cane Toad. Maps from Landscape Health Project, National Land and Water Resouces Audit, 2001.

Name	Status	Type of Presence
Birds		
Acridotheres tristis Common Myna, Indian Myna [387]		Species or species habitat likely to occur within area
Anas platyrhynchos Mallard, Northern Mallard [974]		Species or species habitat likely to occur within area
Carduelis carduelis European Goldfinch [403]		Species or species habitat likely to occur within area
Columba livia Rock Pigeon, Rock Dove, Domestic Pigeon [803]		Species or species habitat likely to occur within area
Lonchura punctulata Nutmeg Mannikin [399]		Species or species habitat likely to occur within area
Passer domesticus House Sparrow [405]		Species or species habitat likely to occur within area
Streptopelia chinensis Spotted Turtle-Dove, Spotted Dove [780]		Species or species habitat likely to occur within area
Sturnus vulgaris Common Starling [389]		Species or species habitat likely to occur within area
Frogs		
Rhinella marina Cane Toad [83218]		Species or species habitat known to occur within area
Mammals		
Bos taurus Domestic Cattle [16]		Species or species habitat likely to occur within area
Canis lupus familiaris Domestic Dog [82654]		Species or species habitat likely to occur within area
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species habitat likely to occur within area
Feral deer Feral deer species in Australia [85733]		Species or species habitat likely to occur within area
Lepus capensis Brown Hare [127]		Species or species habitat likely to occur within area

Name	Status	Type of Presence
Mus musculus House Mouse [120]		Species or species habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Rattus norvegicus Brown Rat, Norway Rat [83]		Species or species habitat likely to occur within area
Rattus rattus Black Rat, Ship Rat [84]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Alternanthera philoxeroides Alligator Weed [11620]		Species or species habitat likely to occur within area
Anredera cordifolia Madeira Vine, Jalap, Lamb's-tail, Mignonette Vine, Anredera, Gulf Madeiravine, Heartleaf Madeiravine, Potato Vine [2643] Asparagus plumosus Climbing Asparagus-fern [48993]		Species or species habitat likely to occur within area
Cabomba caroliniana Cabomba, Fanwort, Carolina Watershield, Fish Grass, Washington Grass, Watershield, Carolina Fanwort, Common Cabomba [5171] Chrysanthemoides monilifera Bitou Bush, Boneseed [18983]		Species or species habitat likely to occur within area
Chrysanthemoides monilifera subsp. rotundata Bitou Bush [16332]		Species or species habitat likely to occur within area
Cryptostegia grandiflora Rubber Vine, Rubbervine, India Rubber Vine, India Rubbervine, Palay Rubbervine, Purple Allamanda [18913] Genista monspessulana Montpellier Broom, Cape Broom, Canary Broom, Common Broom, French Broom, Soft Broom [20126]		Species or species habitat likely to occur within area
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892] Opuntia spp. Prickly Pears [82753]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur

Name	Status	Type of Presence
		within area
Salix spp. except S.babylonica, S.x calodendron & S.x reichardtii		
Willows except Weeping Willow, Pussy Willow and Sterile Pussy Willow [68497]		Species or species habitat likely to occur within area
Salvinia molesta		
Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area
Senecio madagascariensis		
Fireweed, Madagascar Ragwort, Madagascar Groundsel [2624]		Species or species habitat likely to occur within area
Reptiles		
Hemidactylus frenatus		
Asian House Gecko [1708]		Species or species habitat likely to occur within area
Ramphotyphlops braminus		
Flowerpot Blind Snake, Brahminy Blind Snake, Cacing Besi [1258]		Species or species habitat may occur within area

Caveat

The information presented in this report has been provided by a range of data sources as acknowledged at the end of the report.

This report is designed to assist in identifying the locations of places which may be relevant in determining obligations under the Environment Protection and Biodiversity Conservation Act 1999. It holds mapped locations of World and National Heritage properties, Wetlands of International and National Importance, Commonwealth and State/Territory reserves, listed threatened, migratory and marine species and listed threatened ecological communities. Mapping of Commonwealth land is not complete at this stage. Maps have been collated from a range of sources at various resolutions.

Not all species listed under the EPBC Act have been mapped (see below) and therefore a report is a general guide only. Where available data supports mapping, the type of presence that can be determined from the data is indicated in general terms. People using this information in making a referral may need to consider the qualifications below and may need to seek and consider other information sources.

For threatened ecological communities where the distribution is well known, maps are derived from recovery plans, State vegetation maps, remote sensing imagery and other sources. Where threatened ecological community distributions are less well known, existing vegetation maps and point location data are used to produce indicative distribution maps.

Threatened, migratory and marine species distributions have been derived through a variety of methods. Where distributions are well known and if time permits, maps are derived using either thematic spatial data (i.e. vegetation, soils, geology, elevation, aspect, terrain, etc) together with point locations and described habitat; or environmental modelling (MAXENT or BIOCLIM habitat modelling) using point locations and environmental data layers.

Where very little information is available for species or large number of maps are required in a short time-frame, maps are derived either from 0.04 or 0.02 decimal degree cells; by an automated process using polygon capture techniques (static two kilometre grid cells, alpha-hull and convex hull); or captured manually or by using topographic features (national park boundaries, islands, etc). In the early stages of the distribution mapping process (1999-early 2000s) distributions were defined by degree blocks, 100K or 250K map sheets to rapidly create distribution maps. More reliable distribution mapping methods are used to update these distributions as time permits.

Only selected species covered by the following provisions of the EPBC Act have been mapped:

- migratory and
- marine

The following species and ecological communities have not been mapped and do not appear in reports produced from this database:

- threatened species listed as extinct or considered as vagrants
- some species and ecological communities that have only recently been listed
- some terrestrial species that overfly the Commonwealth marine area
- migratory species that are very widespread, vagrant, or only occur in small numbers

The following groups have been mapped, but may not cover the complete distribution of the species:

- non-threatened seabirds which have only been mapped for recorded breeding sites
- seals which have only been mapped for breeding sites near the Australian continent

Such breeding sites may be important for the protection of the Commonwealth Marine environment.

Coordinates

-27.88186 153.22533

Acknowledgements

This database has been compiled from a range of data sources. The department acknowledges the following custodians who have contributed valuable data and advice:

- [-Office of Environment and Heritage, New South Wales](#)
- [-Department of Environment and Primary Industries, Victoria](#)
- [-Department of Primary Industries, Parks, Water and Environment, Tasmania](#)
- [-Department of Environment, Water and Natural Resources, South Australia](#)
- [-Department of Land and Resource Management, Northern Territory](#)
- [-Department of Environmental and Heritage Protection, Queensland](#)
- [-Department of Parks and Wildlife, Western Australia](#)
- [-Environment and Planning Directorate, ACT](#)
- [-Birdlife Australia](#)
- [-Australian Bird and Bat Banding Scheme](#)
- [-Australian National Wildlife Collection](#)
- Natural history museums of Australia
- [-Museum Victoria](#)
- [-Australian Museum](#)
- [-South Australian Museum](#)
- [-Queensland Museum](#)
- [-Online Zoological Collections of Australian Museums](#)
- [-Queensland Herbarium](#)
- [-National Herbarium of NSW](#)
- [-Royal Botanic Gardens and National Herbarium of Victoria](#)
- [-Tasmanian Herbarium](#)
- [-State Herbarium of South Australia](#)
- [-Northern Territory Herbarium](#)
- [-Western Australian Herbarium](#)
- [-Australian National Herbarium, Canberra](#)
- [-University of New England](#)
- [-Ocean Biogeographic Information System](#)
- [-Australian Government, Department of Defence](#)
- [Forestry Corporation, NSW](#)
- [-Geoscience Australia](#)
- [-CSIRO](#)
- [-Australian Tropical Herbarium, Cairns](#)
- [-eBird Australia](#)
- [-Australian Government – Australian Antarctic Data Centre](#)
- [-Museum and Art Gallery of the Northern Territory](#)
- [-Australian Government National Environmental Science Program](#)
- [-Australian Institute of Marine Science](#)
- [-Reef Life Survey Australia](#)
- [-American Museum of Natural History](#)
- [-Queen Victoria Museum and Art Gallery, Inveresk, Tasmania](#)
- [-Tasmanian Museum and Art Gallery, Hobart, Tasmania](#)
- Other groups and individuals

The Department is extremely grateful to the many organisations and individuals who provided expert advice and information on numerous draft distributions.

Please feel free to provide feedback via the [Contact Us](#) page.

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Queensland Government

WildNet species list

Search Criteria: Species List for a Specified Point
Species: All
Type: Native
Queensland status: Rare and threatened species
Records: Confirmed
Date: Since 1980
Latitude: -27.7417
Longitude: 153.1754
Distance: 2
Email: shayes@wolterconsulting.com.au
Date submitted: Monday 20 Jun 2022 14:44:16
Date extracted: Monday 20 Jun 2022 14:50:03

The number of records retrieved = 13

Disclaimer

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Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Strigidae	<i>Ninox strenua</i>	powerful owl		V		3
animals	mammals	Phascolarctidae	<i>Phascolarctos cinereus</i>	koala		E	E	33
plants	land plants	Apocynaceae	<i>Leichhardtia coronata</i>			V		4/4
plants	land plants	Euphorbiaceae	<i>Croton mamillatus</i>	Bahrs scrub croton		CR		5/5
plants	land plants	Euphorbiaceae	<i>Fontainea venosa</i>			V	V	11/11
plants	land plants	Myrtaceae	<i>Eucalyptus curtisii</i>	Plunkett mallee		NT		1/1
plants	land plants	Myrtaceae	<i>Gossia gonoclada</i>			CR	E	1/1
plants	land plants	Myrtaceae	<i>Rhodamnia duminicola</i>	rib-fruited malletwood		E		2/2
plants	land plants	Proteaceae	<i>Macadamia integrifolia</i>	macadamia nut		V	V	6/6
plants	land plants	Sapindaceae	<i>Diploglottis campbellii</i>	small-leaved tamarind		E	E	1/1
plants	land plants	Sapotaceae	<i>Planchonella eerwah</i>			E	E	2/2
plants	land plants	Solanaceae	<i>Solanum mentiens</i>			E		3/3
plants	land plants	Symplocaceae	<i>Symplocos harroldii</i>	hairy hazelwood		NT		3/3

CODES

I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992*.

The codes are Extinct (EX), Extinct in the Wild (PE), Critically Endangered (CR), Endangered (E), Vulnerable (V), Near Threatened (NT), Special Least Concern (SL) and Least Concern (C).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999*.

The values of EPBC are Extinct (EX), Extinct in the Wild (XW), Critically Endangered (CE), Endangered (E), Vulnerable (V) and Conservation Dependent (CD).

Records - The first number indicates the total number of records of the taxon (wildlife records and species listings for selected areas).

This number is output as 99999 if it equals or exceeds this value. A second number located after a / indicates the number of specimen records for the taxon.

This number is output as 999 if it equals or exceeds this value.

Appendix B

Flora Survey List



Appendix B - Master Flora Species List

Client: Loram Pty Ltd

Project: Lot 7 Paradise Road, Larapinta

Scientific Name	Common Name	Community	Stratum	Abundance
ACANTHACEAE				
<i>Pseuderanthemum variable</i>	Love Flower	1, 2, NR2	G	Common
APOCYNACEAE				
<i>Parsonsia straminea</i>	Monkey Rope	1,2, NR2	S	Common
ARACEAE				
<i>Gymnostachys anceps</i>	Settlers Flax	1,2, NR2	S	Occasional
ASCLEPIADACEAE				
<i>Gomphocarpus physocarpus*</i>	Balloon Cotton Bush	1,2, NR2, NR1	S	Common
ASPARAGACEAE				
<i>Lomandra multiflora</i>	Many Flowered Matt Rush	1,2, NR2	G	Common
<i>Praxelis clematidea*</i>	Praxelis	1,2, NR2, NR1	G	Common
ASPHODELACEAE				
<i>Geitonoplesium cymosum</i>	Scrambling Lily	1	S	Occasional
ASTERACEAE				
<i>Ageratum houstonianum*</i>	Blue billy goat weed	1,2, NR2, NR1	G	Common
<i>Ambrosia artemisiifolia*³</i>	Annual Ragweed	NR1	G	Occasional
<i>Bidens pilosa*</i>	Cobblers Pegs	1,2, NR2, NR1	G	Common
<i>Chrysocephalum apiculatum</i>	Yellow Buttons	1,2, NR2	G	Frequent
<i>Crassocephalum crepidioides*</i>	Thickhead	NR1	G	Common
<i>Onopordum acanthium*</i>	Scotch Thistle	NR1	G	Common
CACTACEAE				
<i>Hylocereus undatus*</i>	Night Blooming Cactus	NR2	S	Rare
CAESALPINIACEAE				
<i>Cassia fistula*</i>	Golden Shower Tree	NR1	T1	Occasional
CAMPANULACEAE				
<i>Lobelia purpurascens</i>	White Root	1,2	G	Common
<i>Wahlenbergia communis</i>	Tufted Bluebell	1,2	G	Common
CASUARINACEAE				
<i>Allocasuarina littoralis</i>	River She-oak	1,2, NR2,	T2	Common
COMMELINACEAE				
<i>Commelina diffusa</i>	Native Wandering Jew	1,2	G	Common
CONVOLVULACEAE				
<i>Ipomoea cairica*</i>	Coastal Morning Glory	NR2	G, S	Common
CYPERACEAE				
<i>Cyperus polystachyos*</i>	Umbrella Sedge	NR2, NR1	G	Common
<i>Gahnia aspera</i>	Rough Saw-sedge	1,2, NR2, NR1	G	Common
<i>Lepidosperma laterale</i>	Variable Saw Sedge	1,2, NR2	G	Common
DENNSTAEDTIACEAE				
<i>Histiopteris incisa</i>	Bats Wing Fern	VC2	G	Common
DILLENIACEAE				
<i>Hibbertia stricta</i>	Narrow Leafed Guinea Bush	1	G	Occasional
EUPHORBIACEAE				
<i>Macaranga tanarius</i>	Macaranga	NR2	T1	Uncommon
FABACEAE				
<i>Crotalaria lanceolata*</i>	Lance Leaved Rattlepod	NR2, NR1	G	Common
<i>Delonix regia*</i>	Poinciana	NR1	S	Occasional
<i>Glycine clandestina</i>	Twining Glycine	1, 2	G	Occasional
<i>Jacksonia scoparia</i>	Dogwood	NR2	S	Rare
<i>Neonotonia wightii*</i>	Glycine	NR2, NR1	G	Common
GOODENIACEAE				
<i>Goodenia rotundifolia</i>	Round Leafed Goodenia	1	G	Occasional
HEMEROCALLIDACEAE				
<i>Dianella caerulea</i>	Blueberry Lilly	1,2, NR2, NR1	G	Common
IRIDACEAE				
<i>Patersonia glabrata</i>	Native Iris	2	G	Rare

Appendix B - Master Flora Species List

Client: Loram Pty Ltd

Project: Lot 7 Paradise Road, Larapinta

Scientific Name	Common Name	Community	Stratum	Abundance
LAURACEAE				
Cassytha filiformis	Bush Devils Twine	1	G	Occasional
Endiandra sieberi	Corkwood	NR2	S	Rare
LAXMANNIACEAE				
Thysanotus tuberosus	Fringed Lily	NR1	G	Common
MALVACEAE				
Brachychiton bidwillii	Little Kurrajong	NR1	T2	Rare
MIMOSACEAE				
Acacia concurrens	Black Wattle	1,2, NR2	S, T2	Frequent
Acacia implexa	Lightwood	NR2	T2	Rare
Acacia macradenia	Zig Zag Wattle	NR2	T2	Rare
MYRTACEAE				
Angophora leiocarpa	Smooth barked apple	1,2	T2, T1	Common
Angophora woodsiana	Smudgee	1	T2	Occasional
Corymbia citriodora subsp. variegata	Spotted Gum	1, 2 NR1, NR2	T2, T1	Common
Corymbia gummifera	Red bloodwood	NR1	T2, T1	Rare
Corymbia henryi	Large Leaved Spotted Gum	2	T1	Common
Corymbia intermedia	Pink Bloodwood	1, 2	T2, T1	Common
Corymbia torelliana*	Cadagi	NR1	T1	Rare
Eucalyptus crebra	Narrow Leafed Iron Bark	1, NR2	T2, T1	Common
Eucalyptus fibrosa subsp. fibrosa	Broad Leaved Ironbark	2	T1, S	Common
Eucalyptus racemosa	Scribbly Gum	1	T2, T1	Common
Eucalyptus seeana	Fine-leaved Red Gum	1	T2, T1	Common
Eucalyptus tereticornis	Forest Red Gum	NR2	T1	Occasional
Leptospermum polygalifolium	Wild May	NR2	S	Rare
Lophostemon confertus	Brush box	1, NR1	T2	Common
Lophostemon suaveolens	Swamp box	1	T2	Occasional
Melaleuca irbyana	Swamp Tea Tree	NR2	T2	Rare
Melaleuca linariifolia	Snow in Summer	NR2	T2	Rare
Melaleuca quinquenervia	Broad Leaved Paperbark	NR2	T2	Rare
Melaleuca viminalis	Weeping Bottlebrush	NR2	T2	Rare
Psidium guineense*	Brazilian Guava	NR2	T2	Rare
OXALIDACEAE				
Oxalis chnoodes	Hairy Oxalis	1,2	G	Common
PASSIFLORACEAE				
Passiflora suberosa*	Corky Passion Vine	1,2, NR2, NR1	G	Common
PHYLLANTHACEAE				
Glochidion sumatranum	Large Leafed Cheese Tree	NR2	S	Rare
POACEAE				
Alloteropsis semialata	Cockatoo Grass	1,2, NR2,	G	Occasional
Chloris gayana*	Rhodes Grass	1,2, NR2, NR1	G, S	Common
Cymbopogon refractus	Barbed Wire Grass	1,2, NR2, NR1	G	Common
Cynodon dactylon	Couch Grass	NR1	G	Common
Entolasia stricta	Wiry Panic	1,2	G	Occasional
Imperata cylindrica	Bladey Grass	1,2, NR2, NR1	G	Common
Melinis minutifolia*	Molasses Grass	1	G	Occasional
Melinis repens*	Natal Grass	1,2, NR2, NR1	G	Common
Megathyrsus maximus*	Guinea Grass	1,2, NR2, NR1	G, S	Common
Setaria sphacelata*	South African Pidgeon Grass	NR2	G, S	Common
Sporobolus africanus*	Parramatta Grass	NR2	G	Rare
Ottochloa gracillima	Ottochloa	1,2	G	Common
Paspalum dilatatum	Paspalum	1,2, NR2, NR1	G	Common
Paspalum notatum*	Bahia Grass	NR1	G	Common

Appendix B - Master Flora Species List

Client: Loram Pty Ltd

Project: Lot 7 Paradise Road, Larapinta

Scientific Name	Common Name	Community	Stratum	Abundance
<i>Themeda triandra</i>	Kangaroo Grass	1,2	G	Common
<i>Urochloa decumbens</i> *	Signal Grass	NR2, NR1	G	Common
PROTEACEAE				
<i>Banksia integrifolia</i> subsp. <i>compar</i>	Coastal Banksia	1	S	Occasional
<i>Grevillia banksii</i>	Red Silky Oak	1	S	Rare
<i>Grevillea banksii</i>	White Silky Oak	NR2	S	Rare
RHAMNACEAE				
<i>Alphitonia excelsa</i>	Soap tree	1,2, NR2	S, T2	Common
RUTACEAE				
<i>Murraya paniculata</i> *	Mock orange	NR2	S	Occasional
SAPINDACEAE				
<i>Cupaniopsis anacardioides</i>	Tuckeroo	NR2	G	Rare
SOLANACEAE				
<i>Solanum mauritianum</i> *	Wild Tobacco	NR2	S	Rare
<i>Solanum seaforthianum</i> *	Brazilian Nightshade	2, NR2	G	Rare
THYMELAEACEAE				
<i>Pimelea linifolia</i>	Rice Flower	1, 2, NR2	S	Common
VERBENACEAE				
<i>Lantana camara</i> * ³	Lantana	NR2	S	Occasional
<i>Verbena bonariensis</i> *	Purple Top	1, 2, NR2, NR1	G	Frequent
VIOLACEAE				
<i>Viola hederacea</i>	Native Violet	1	G	Occasional

Exotic / Weed / Invasive = *

Category (n) Restricted Matter (Biosecurity Act 2014) = (n)

Refer Figure 12 for veg community definitions

Appendix C

Operational Works Vegetation Management Plan



Operational Works Vegetation Management Plan (VMP)

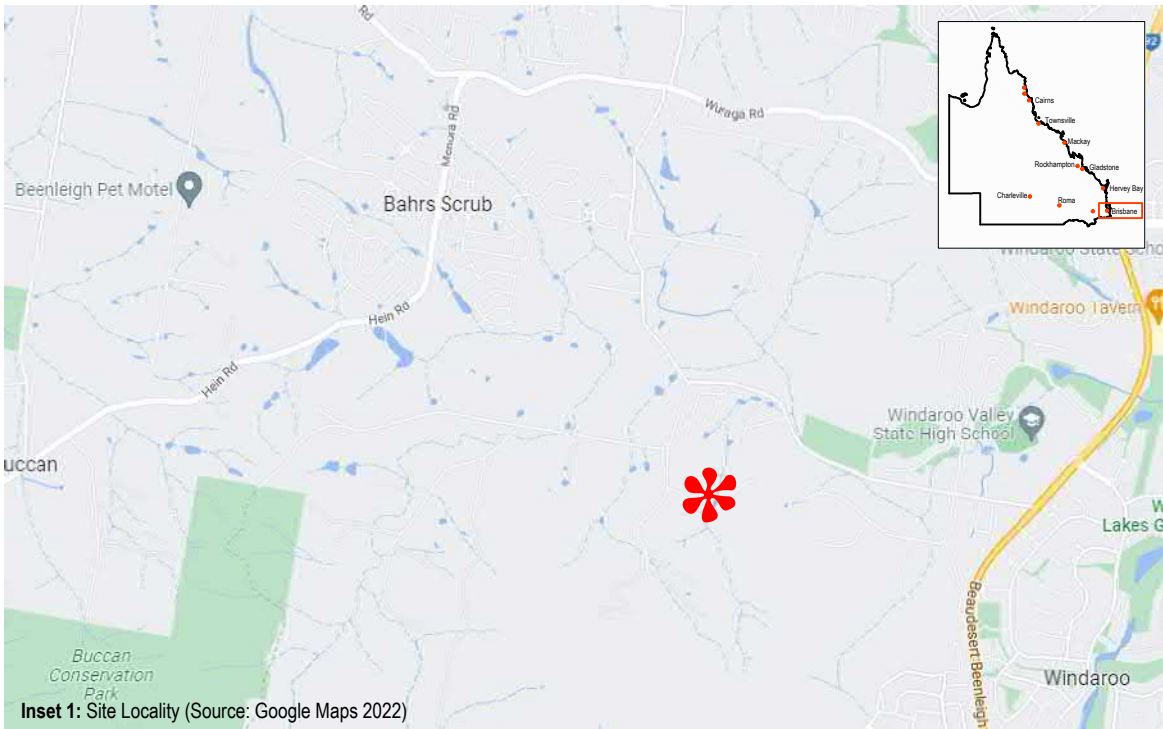
19 & 23 Adele Crescent, Bahrs Scrub, QLD, 4207

PROPERTY DESCRIPTION

Address: 19-23 Adele Cr, Bahrs Scrub, QLD, 4207
Description: Lot 27 & 28 on RP169807.
LGA: Logan City Council
Site Area: 3.85ha and 3.47 ha (7.32ha collectively)

DRAWING SCHEDULE

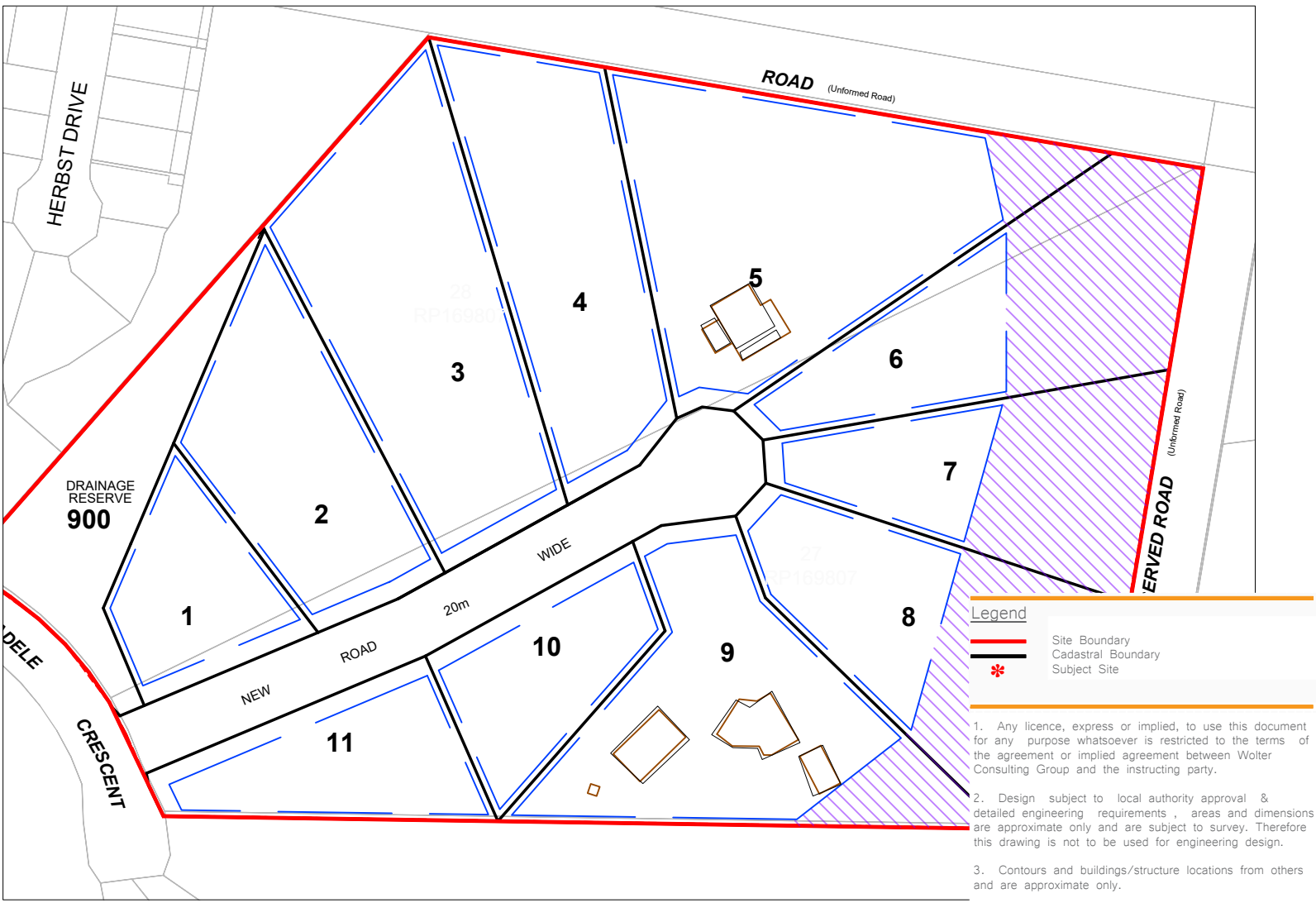
- VMP-00 COVER SHEET
- VMP-01 SPECIFICATION NOTES
- VMP-02 TREE RETENTION REMOVAL PLAN
- VMP-03 EXISTING TREE DATA CATALOGUE (a)
- VMP-04 TPZ FENCING REQUIREMENTS
- VMP-05 ENVIRONMENTAL PROCEDURES (a)
- VMP-06 ENVIRONMENTAL PROCEDURES (b)
- VMP-07 ENVIRONMENTAL PROCEDURES (c)
- VMP-08 ENVIRONMENTAL PROCEDURES (d)



Inset 1: Site Locality (Source: Google Maps 2022)



Inset 3: Site Aerial



Inset 2: Development Proposal

1.0 INTRODUCTION

Wolter Consulting Group's (WCG) Environment division were engaged by PacificCorp Pty Ltd to prepare this Operational Works stage Vegetation Management Plan (VMP) for the proposed residential subdivision at 19-23 Adele Cr, Bahrs Scrub. The Subject Site is located within the Logan City Council (LCC) Local Government Area and the encompasses a total area of approximately 7.32 hectares (ha). The purpose of this VMP is to manage the protection and removal of vegetation within the Subject Site, in accordance with the Logan City Plan 2015. This VMP has been produced by overlaying site data with proposed works to determine impacts and disturbance on existing vegetation. Tee data is only displayed for those trees directly within and closely adjoining the area subject to site works.

This VMP is structured as follows:

- 1.0 Introduction
- 2.0 Vegetation Clearing Staging
- 3.0 Tree Protection Procedures
- 4.0 Tree Clearing Procedures
- 5.0 Construction Procedures
- 6.0 Weed Management
- 7.0 Erosion and Sediment Control
- 8.0 Wildlife Management
- 9.0 Industry Standards
- 10.0 Responsible Authority

From an ecological planning context, it is noted that:

- The Logan City Plan 2015 nominates the entire subject site as *Secondary Vegetation Management Area* pursuant to the *Biodiversity Areas Overlay Code* with areas of *Primary Vegetation Management Area* also considered as *Locally Significant Vine Forest* randomly distributed across the area to be impacted by development. The Ecological assessment has ground truthed the relevancy of the LSVF polygons and provided a true representation of the extent of vine forest that is provded in this VMP. Refer WCG Ecological Assessment for further information.
- The Logan City Plan 2015 nominates a waterway corridor at the south western boundary of the site pursuant to the Waterway Corridor and Wetlands Code. The corridor is to be retained in its entirety within a dedicated Drainage Easement.
- Areas of Regulated Vegetation are nominated within the site and the area to be impacted by development. High Value Regrowth Vegetation classified as RE12.11.5 and as *Essential Habitat* for a variety EVNT flora nd fauna. Pursuant to the Planning Regulation 2017 conditions for an exemption to requiring a clearing permit from SARA can be satisfied based on clearing for urban purposes in an urban area.
- Areas of Regulated Vegetation are also nominated as *Trigger Area for Protected Plants Survey* pursuant to the Nature Conservation Act 1992. The site was surveyed in accordance with the guidlines with three (3) specimens of the *Vulnerable Macadamia integrifolia* located, none of which are located within the area to be impacted by development.

No other relevant State or Local ecological constraints are associated with the site.

2.0 VEGETATION CLEARING STAGING

The following stages will be required to be undertaken by the contractor in order to implement the framework of this VMP.

- Stage 1** - 48 hours prior to vegetation clearing a DES approved fauna spotter catcher (FSC) is to undertake a faunal pre-clearance survey of the site. The FSC is to relate findings and recommendations to relevant stakeholders with a detailed report. The report is to consider the methods required to clear the site of fauna with particular consideration to the clearance of any macro fauna that may occur and be trapped when fencing constrains egress from the site.
- Stage 2** - Tree Protection Procedures are to be installed as per specification on Sheet 02 and Sheet 05 and the locations approved on this plan..
- Stage 3** - Prior to commencement of operational vegetation clearing the FSC is to conduct relevant fauna protection procedures as specified in this plan.
- Stage 4** - Undertake vegetation clearing works in accordance with the specifications of this plan.
- Stage 5** - The approved FSC must provide a post-clearance fauna report detailing interactions with fauna during the clearing activities to all releavnt stakeholders.

3.0 TREE PROTECTION PROCEDURES

Indicative locations of Tree Protection Fencing are provided on Sheet 6 of this VMP. Fencing is to be installed in accordance with the following.

- TPZ's are required for all individual or groups of trees that are to be retained adjacent to the subject site and is in accordance with Australian Standard 4970-2009 Protection of Trees on Development Sites;
- Regardless of tree size or height, the TPZ must be outside the respective drip line of the individual or group of trees;
- Temporary fencing must be erected at the boundary of the TPZ marked areas must be installed in accordance with AS4970. Refer Inset 4 for standard drawing. Sheet 02 and Sheet 05 provides locations;
- If fencing is a hazard to construction / earth moving equipment, a mulch mound is to be constructed. This mound is to be 4 m past the TPZ and clearly delineate extent of disturbance permitted;
- Appropriate signage i.e. 'Vegetation Protection - No Go Zone' must be erected at the boundary of TPZ / mulch mound to prevent vehicles from entering and prevent stockpiling occurring near retained trees / vegetation;
- Damage prevention to tree trunks and bark (i.e. do not attach guides or stays to trees / vegetation) must be employed;
- No excavation works should encroach within the drip line of retained trees unless under the direct supervision of project Arborist;

- Do not store or otherwise place bulk or potentially harmful materials (i.e. construction refuse, concrete waste, herbicides, diesel, etc.) under or within 1 m of TPZs;
- Avoid ground compaction under trees. If compaction does occur (i.e. from the location of a construction plant or vehicle parking) loosen and aerate the soil to a depth of 75 mm by hand methods; and
- Any damage to trees during works is to be rectified according to AS 4373/96 Pruning of Amenity Trees and best horticultural practices. The project Arborist must oversee works.

3.1 OPERATIONAL WORKS WITHIN THE TPZS OF VEGETATION TO BE RETAINED

Where earthworks are planned within the TPZ of vegetation to be retained, to an extent over an area greater than 10% of the mapped TPZ, operational works must follow the guidelines outlined below.

Earthworks and other construction activities within the TPZ of vegetation to be retained will be controlled by the following guidelines:

- Earthworks must be excluded from the Structural Root Zone (SRZ) of vegetation to be retained;
- All construction activities within proximity of vegetation to be retained must be supervised by a Project Arborist (minimum AQF Level 5);
- Any below ground incursion within the TPZ of vegetation to be retained is to be water excavated under low pressure, under the supervision of the Project Arborist;
- The Project Arborist is to be consulted if changes to plans are made that affect the retained vegetation, and operational works must to be paused to allow the Project Arborist to assess the impact to retained vegetation;
- If the roots of vegetation to be retained are encountered outside of the TPZ, and consist of a diameter greater than 50mm, operational works within the area are to be paused to allow for an assessment by the Project Arborist; and
- At the completion of operational works within the site, the Project Arborist is to undertake a site assessment and develop an audit report to identify any further remedial actions required.

4.0 TREE CLEARING PROCEDURES

- All site vegetation is to be removed utilising directional clearing methods (where indicated) and the specifications regarding fauna management on sheet 08.
- Hollow Bearing Trees are to be soft felled in order to reduce the potential for wildlife harm (refer Table 6 on Sheet 09;
- Where practical retain and process cleared vegetation through a mechanical chipper for redistribution onsite as organic mulch and stockpile away from retained trees and drainage courses for future distribution;
- Cleared vegetation that has been stockpiled for longer than a 24-hour period must be inspected by an accredited DES fauna spotter prior to mulching / chipping or removed from site whole;
- Do not mulch herbaceous weed species. Mulch woody weed species only if they are free from any form of seeds during the time of works. Remove off site if trees are seed bearing; and
- If mulch is stockpiled for over 24 hours, a fauna spotter (qualified by Department of Environment and Science (DES)) must be contacted to inspect the mulch for habitat value and fauna incidence prior to distribution.

5.0 CONSTRUCTION PROCEDURES

Individual tree size and height will vary for all trees / vegetation to be retained. Each tree / vegetation must be assessed on an individual level. The following construction recommendations should be considered when conducting any form of earthworks near retained trees / vegetation. This is particularly relevant for trees retained on adjoining properties and land parcels:

- All Works within a designated TPZ of retained vegetation must be supervised by the project Arborist (AQF Level 5);
- When cutting / trenching around tree roots trim damaged existing roots in trench with a clean cut. Minimise root surface area by keeping a clean straight cut. A permeable antifungal agent should be applied to cut roots as soon as cut is applied, prior to back filling;
- Do not cover over trench with hardened surface or concrete;
- Back fill trench as soon as possible with existing soil type;
- Maintain regular inspections over the duration of construction for signs of stress;
- If trees / vegetation are to unavoidably have large areas cut away from TPZs, the entire exclusion zone should be mulched to to a final settled depth of minimum 100 mm thick to assist in retaining moisture around the base of the tree;
- If work activities are to unavoidably occur within TPZs, the project Arborist is required to prepare a suitable Work Method Statement and oversee activities. Only light equipment or manual techniques are permitted within TPZs, as approved by the project Arborist;
- When adding fill or altering existing soil profiles the soil is to be reinstated and levelled to the existing soil profile at the boundary of the TPZ. Once appropriate soil level is reached ensure existing ground is not compacted;
- Root guards should be installed if retained trees / vegetation are in close proximity to power cables, sewer / service lines that may require excavation or ongoing maintenance;
- If contact with encroaching canopies and root systems from neighbouring properties are unavoidable, an inspection by the project Arborist is required, and an ensuing Root Management Plan will be required.

6.0 WEED MANAGEMENT

- Treatment of prohibited and restricted pest plants and environmental weeds must be conducted prior to the commencement of operational vegetation removal works;
- Prohibited and/or Restricted pest plants under the Biosecurity Act 2014 must be removed in accordance with the limitations prescribed in the (DoR) Accepted Development Vegetation Clearing Code - Managing Weeds 2020;
- Methods to remove pest species may include mechanical, chemical and physical removal;
- Chemical removal must be undertaken by appropriately licensed contractor holding an accredited commercial operator licence
- Restrict ground disturbance to the smallest possible footprint; and
- Weed surveys are to be conducted during and post-construction. Treat any individual or infestation of weeds immediately.

7.0 EROSION AND SEDIMENT CONTROL

- All necessary precautions must be implemented to prevent erosion and sediment dispersal from the Subject Site;
- A construction phase erosion and sediment control plan is recommended prior to clearing vegetation for any Stage associated with the development; and
- Ensure compliance with Best Practice Erosion and Sediment Control Guidelines (IECA 2008), as per Brisbane City Council standards as a minimum standard of performance.

8.0 WILDLIFE MANAGEMENT

- A pre-clear fauna report must be completed by the project DES accredited fauna spotter / catcher and issued to Council prior to commencement of works;
- Pre-clear inspection must occur within 48 hours prior to vegetation clearing;
- The project DES accredited fauna spotter / catcher is required to be present onsite prior to and during the removal of trees / vegetation onsite to reduce risk of fauna injury / death and direct all clearing activities; and
- When an animal is located the following hierarchy of action applies in order of preference: (i) DES accredited spotter catcher advice and (ii) The procedures provided in the specification on sheet 08 are to be adhered to.

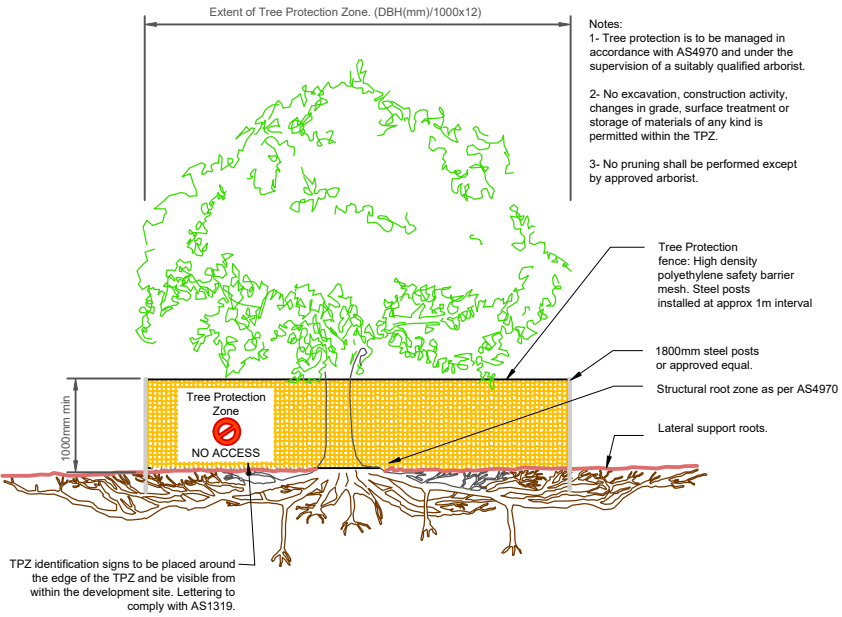
9.0 INDUSTRY STANDARDS

This VMP must be implemented according to the following standards and guidelines:

- AS 4970/09 Protection of Trees on Development Sites;
- AS 4373/96 Pruning of Amenity Trees;
- Department of Primary Industries and Fisheries Biosecurity fact sheet series;
- Planning Regulation 2017;
- Accepted Development Vegetation Clearing Code - Managing Weeds 2020, and
- Best Practice Erosion and Sediment Control Guidelines (IECA 2008).

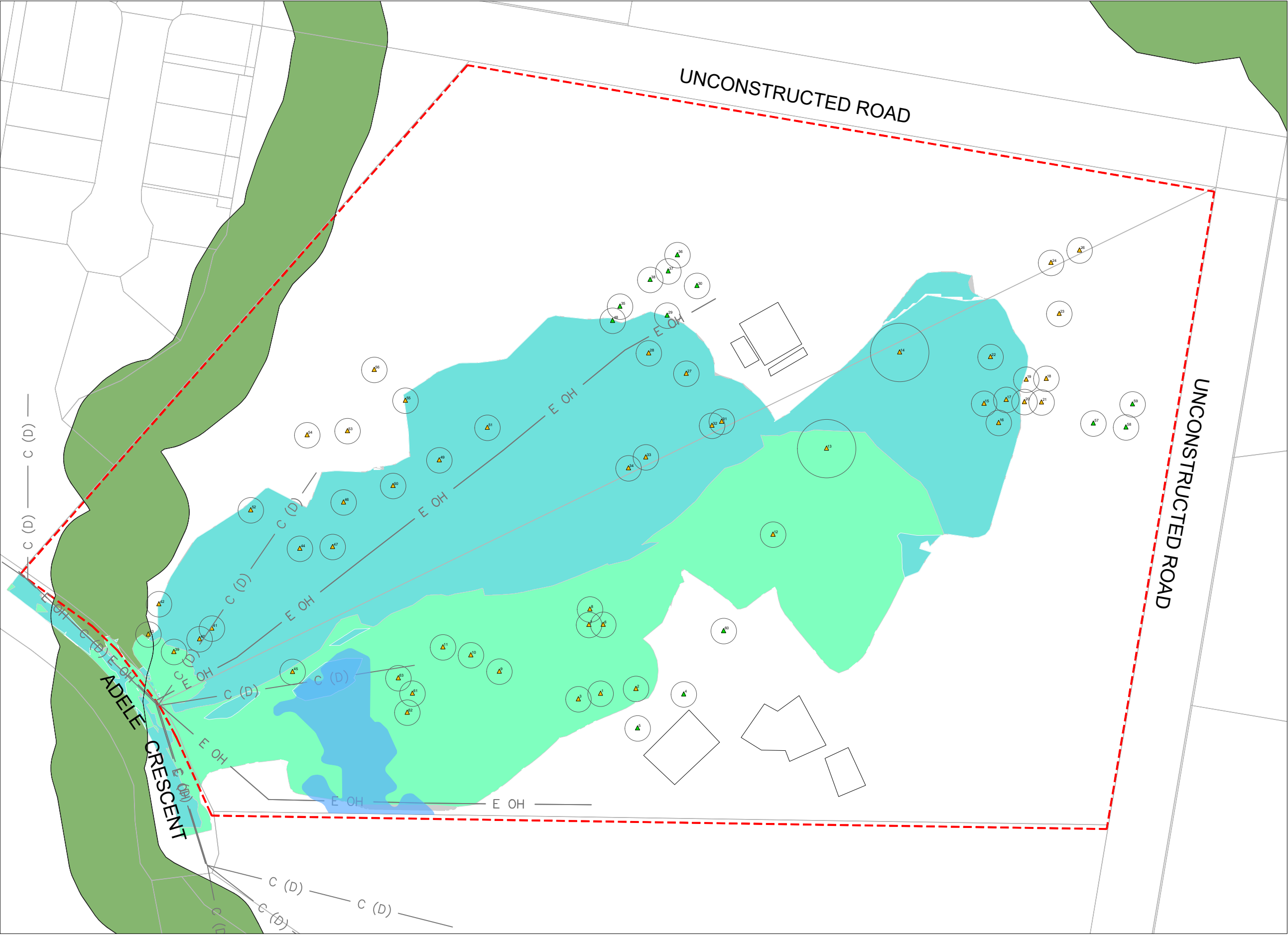
10.0 RESPONSIBLE AUTHORITY

- The site supervisor is responsible for ensuring the implementation and compliance of this VMP; For queries pertaining to the content of this VMP, contact:
Steve Hayes
Director - Environment, Wolter Consulting Group
Ph: (07) 3666 5200
Email: shayes@wolterconsulting.com.au



Inset 4: Example of installed Tree Protection Fencing. All fencing is to be installed in accordance with AS4970 and in accordance with the specifications provided within this plan.

- Legend
- Site Boundary
 - Vegetation Protection Fencing
 - Confirmed LSVF to be impacted
 - LCC Waterway Corridor
 - Existing Overhead Power
 - Existing Telcomms
 - Earthworks Cut
 - Earthworks Fill
 - Tree to be removed with TPZ
 - Tree to be retained with TPZ



OPW VEGETATION MANAGEMENT PLAN
19-23 Adele Crescent, Bahrs Scrub, QLD 4207
Description
Local Authority

Lots 27 & 28 on RP169807
LOGAN CITY COUNCIL

CLIENT
PACIFICCORP
(ADELE) PTY
LTD



DRAWING NO.
22-0099EBF
DATE DRAWN
20-08-2022

VERSION
A
SHEET NO.
VMP-02

Tree Data Catalogue

Tree Number	Botanical Name	Common Name	DBH (mm) class	TPZ radius (m)	Notes	Retain/Remove
1	Libidibia ferrea	Leopard Tree	350	4.2	EXOTIC TREE	Remove
2	Thuja orientalis	Exotic Conifer	350	4.2	EXOTIC TREE	Remove
3	Thuja orientalis	Exotic Conifer	350	4.2	EXOTIC TREE	Remove
4	Spathodea campanulata	African Tulip	350	4.2	EXOTIC TREE	Retain
5	Jagera psuedophorus	Jagera	350	4.2	NATIVE TREE	Retain
6	Mallotus indica	Red Kamala	350	4.2	NATIVE TREE	Remove
7	Mallotus indica	Red Kamala	350	4.2	NATIVE TREE	Remove
8	Libidibia ferrea	Leopard Tree	350	4.2	EXOTIC TREE	Remove
9	Libidibia ferrea	Leopard Tree	350	4.2	EXOTIC TREE	Remove
10	Euclayptus torreliana	Cadaghi	350	4.2	EXOTIC TREE	Remove
11	Liquidamber styraciflua	Liquid Amber	350	4.2	EXOTIC TREE	Remove
12	Ficus obliqua	Small Leaved Fig	350	4.2	NATIVE TREE	Remove
13	Flindersia collina	Leopard Ash	800	9.6	NATIVE HABITAT TREE	Remove
14	Flindersia collina	Leopard Ash	800	9.6	NATIVE HABITAT TREE	Remove
15	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Remove
16	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Remove
17	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Remove
18	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Retain
19	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Remove
20	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Remove
21	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Retain
22	Acacia dissparrima	Hickory Wattle	350	4.2	NATIVE TREE	Remove
23	Acacia dispparimma	Hickory Wattle	350	4.2	NATIVE TREE	Retain
24	Acacia dispparimma	Hickory Wattle	350	4.2	NATIVE TREE	Retain
25						
26	Acacia dispparimma	Hickory Wattle	350	4.2	NATIVE TREE	Retain
27	Eucalyptus crebra	Narrow Leaved Iron Bark	350	4.2	NATIVE TREE	Remove
28	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Remove
29	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Remove
30	Grevillia robusta	Silky Oak	350	4.2	NATIVE TREE	Retain
31	Eucalyptus major	Grey Gum	350	4.2	NATIVE TREE	Remove
32	Eucalyptus major	Grey Gum	350	4.2	NATIVE TREE	Remove
33	Eucalyptus major	Grey Gum	350	4.2	NATIVE TREE	Remove
34	Euclyptus major	Grey Gum	350	4.2	NATIVE TREE	Remove
35	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Retain
36	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Retain
37	Castonospermum australe	Black Bean	350	4.2	NATIVE TREE	Retain
38	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Retain
39	Acacia dispparimma	Hickory Wattle	350	4.2	NATIVE TREE	Remove
40	Acacia dispparimma	Hickory Wattle	350	4.2	NATIVE TREE	Remove
41	Psidium guajava	Guava	350	4.2	EXOTIC TREE	Remove
42	Psidium guajava	Guava	350	4.2	EXOTIC TREE	Remove
43	Psidium guajava	Guava	350	4.2	EXOTIC TREE	Remove
44	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Remove
45	Libidibia ferrea	Leopard Tree	350	4.2	EXOTIC TREE	Remove
46	Flidersia australe	Australian Teak	350	4.2	NATIVE TREE	Remove
47	Syzygium australe	Scrub Cherry	350	4.2	NATIVE TREE	Remove
48	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Remove
49	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Remove
50	Acacia dispparimma	Hickory Wattle	350	4.2	NATIVE TREE	Remove
51	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Remove
52	Eucalyptus torreliana	Cadaghi	350	4.2	EXOTIC TREE	Remove
53	Acacia dispparimma	Hickory Wattle	350	4.2	NATIVE TREE	Retain
54	Acacia dispparimma	Hickory Wattle	350	4.2	NATIVE TREE	Retain
55	Jacaranda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Remove
56	Acacia dispparimma	Hickory Wattle	350	4.2	NATIVE TREE	Retain
57	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Retain
58	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Retain
59	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Retain
60	Mangifera indica	Mango	350	4.2	EXOTIC TREE	Retain
61	Jacaraanda mimosifolia	Jacaranda	350	4.2	EXOTIC TREE	Remove
62	Melelueca quinquenervia	Broad Leafed Paperbark	350	4.2	NATIVE TREE	Remove
63	Cinnamomum camphora	Camphor Laurel	350	4.2	EXOTIC TREE	Remove

- Legend
- Site Boundary
 - Vegetation Protection Fencing
 - Earthworks Cut
 - Earthworks Fill
 - Waterway Corridor (LCP2015)
 - Clearing Direction
 - Indicative Stockpile Location
 - Tree to be removed with TPZ
 - Tree to be retained with TPZ

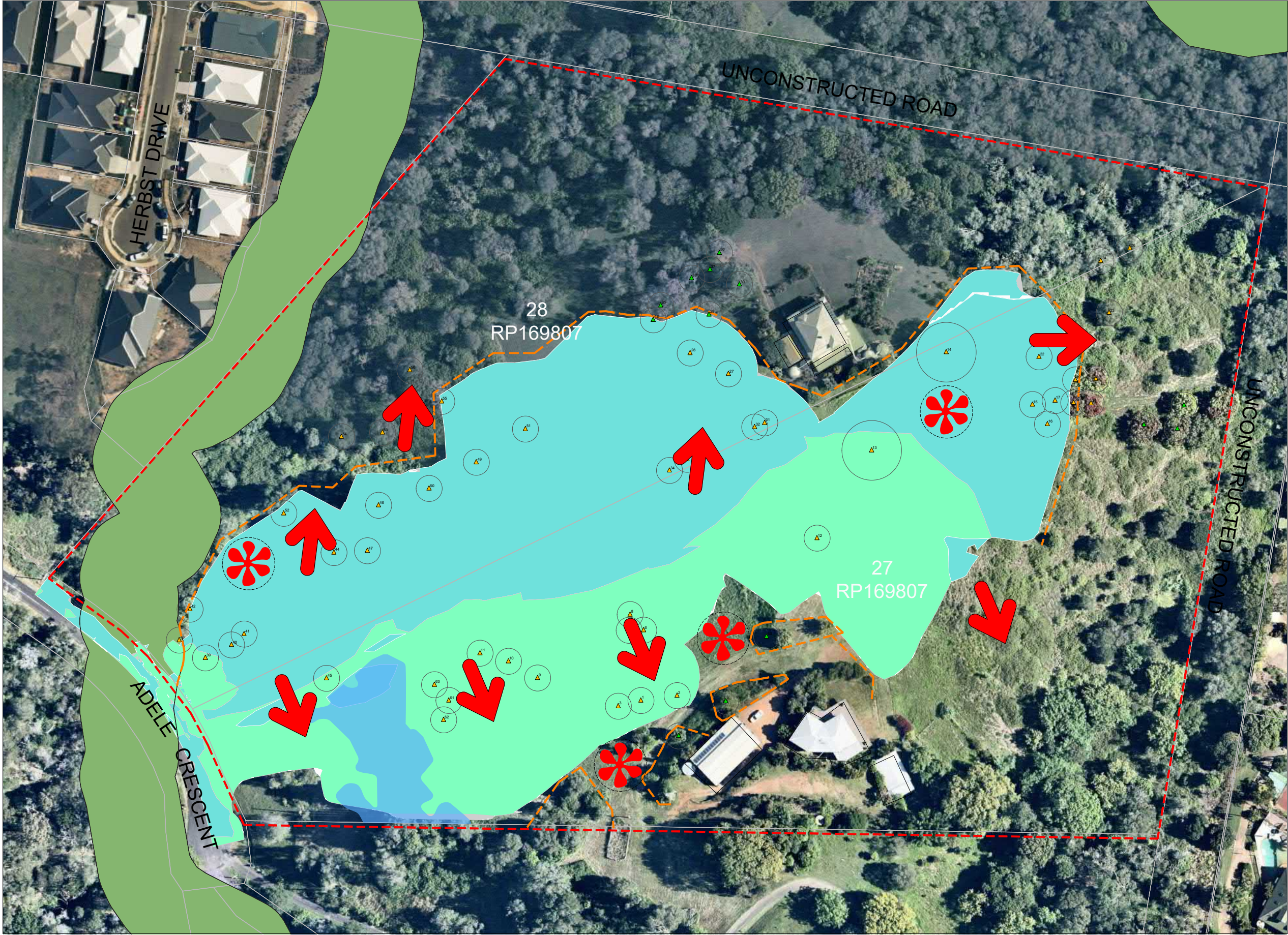


Table 1 - General Environmental Duty

Procedure — General Environmental Duty
Objective
To comply with environmental duties pursuant to the Environmental Protection Act 1994.
Management Strategy
- Notwithstanding that which is written below, all persons associated with, or working on, the subject site are to familiarise themselves with their Environmental Duties under the EP Act. The following is a limited summary of the EP Act. - A person must not carry out any activity that causes, or is likely to cause, environmental harm, unless the person takes all reasonable and practicable measures to prevent or minimise the harm (" general environmental duty").
Actions
- A person who, while carrying out an activity, becomes aware that serious, or material, environmental harm is caused (or potentially caused) by the person’s, or someone else’s, act or omission in carrying out the primary activity, or another activity being carried out in association with the activity. - However, this does not apply if the harm is authorised to be caused under: i) an environmental protection policy; or ii) an environmental management program; or iii) an environmental protection order; or iv) an environmental authority; or v) an emergency direction - As soon as reasonably practicable after becoming aware of the event involving the harm, the person must if the person is carrying out the activity during the person’s employment, or engagement by, or as the agent of, someone else (the “employer”) – i) tell the employer of the event, its nature and the circumstances in which it happened; or ii) if the employer cannot be contacted - give written notice to the administering authority of the event, its nature and the circumstances in which it happened; - Once the employer becomes aware of an event involving harm, the person must: i) Give written notice to the administering authority of the event, its nature and the circumstances in which it happened; - In accordance with the EP Act “<i>Environment</i>” includes: i) ecosystems and their constituent parts including people, communities; and ii) all natural and physical resources; and iii) the qualities and charateristics of locations, places and areas however large or small that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest amenity, harmony and sense of community; and iv) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (i) to (iii). “Environmental Harm” is any adverse effect or potential adverse effect (whether temporary or permanent and of whatever magnitude, duration or frequency) on an environmental value. Environmental Harm may be caused by an activity; i) Whether the harm is a direct or indirect result of the activity; or ii) Whether the harm results from the activity alone or from the combined effects of the activity and other activities or factors.
Performance Criteria / Indicators
- Environmental harm is not caused (or potentially caused) by the person’s, or someone else’s, act or omission in carrying out the primary activity, or another activity being carried out in association with the activity. - All (if any) incidents resulting in environmental harm are dealt with in accordance with ‘Actions’ section of this Environmental Procedure.
Reporting / Responsibilities
- It is recommended that the person providing advice of an event causing environmental harm to record the details of the event and the details of the person(s) advised. - The contractor is to maintain records of staff Induction and continuing training with reference to the above.
Corrective Action
- Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register. - The Contractor shall implement the corrective action as required within the agreed timeframe noted on the CAR. - The Contractor shall advise the Project Manager after completion of the corrective action.

Table 2 - Weed Control Methods

Weed Control Methods	
Manual Methods	
Name	Description
Hand Removal	Appropriate for small numbers of plants in isolated areas. Low impact method. Weed is manually pulled from the soil or where a deep tap root is present a trowel or knife can be used to loosen soil enabling removal of the entire plant. Bag and remove from site.
Crowning	Used on weeds with growth points located at or below ground level (e.g. <i>Asparagus spp</i>). Above ground components of the plant are trimmed at near to ground level. A knife (or similar) is then inserted close to the base of the plant at an angle ensuring the knife tip is well under the root system. Roots are then severed close to the base of the plant. The crown must be removed from site and disposed of in an appropriate manner.
Mechanical Methods	
Name	Description
Brushcutting	Use of brush cutters to reduce the dominance of larger areas of herbaceous species and grasses. Chemical treatment can be used in association (prior to brush cutting or during active regrowth stage).
Chainsaw	Use of chainsaw to fell species that can then be chemically treated to reduce regrowth potential.
Slashing	Slashing and mowing to reduce weed growth and restrict flowering at critical weed lifecycle periods
Mulching	Mulching and smothering using large and small machinery specifically designed to mulch trees and woody vegetation in-situ. The use of the mulch on-site can assist in supressing weed growth but should be utilised cautiously as some weed species have characteristic propagative capabilities where vegetative germination is possible.
Blade Ploughing	The use of a dozer blade to push over woody weeds and destroy root systems. Should only be utilised where sensitive weeds removal techniques are not required.
Chemical Methods	
Name	Description
Cut / Paint (Cut/Stump)	Preferred method for woody weeds, trees and some vines (e.g. groundsel, Camphor Laurel). The plant trunk is cut horizontally near to ground level with herbicide applied immediately to the exposed internal structures with a spray bottle or paint brush. Can be utilised during periods of light rain where spray methods are rendered useless.
Frilling	Appropriate for tree sized woody weeds (<100mm diameter). An axe or chainsaw is used to slice sections of the trunk at 100mm intervals around the entire circumference of the tree. These incisions are made at an angle of approx. 45 degrees ensuring the Cambrian layer is not exceeded with the incision. Herbicide (neat or 2:1) is then painted or sprayed into the hole within 7 seconds of the wound being made. Utilise only where public safety issues or not relevant as treated tree specimens are likely to drop branches as the tree dies.
Scrape / Paint	Similar to cut/stump but more useful on vine species particularly where it is necessary or preferable to retain the vine structure intact (e.g. aerial tubers on Madeira vine). Propagules are initially removed (where appropriate) before scraping the plant tissue away on one side of the stem for up to 100cm before leaving a small gap and repeating on the other side of the stem. Undiluted herbicide is then applied to the exposed xylem tissue within 7 seconds of exposure.
Spot/Foliar Spray	Low volume distribution of herbicide via the use of knapsack or hand held pneumatic spray packs (can include 12V battery operated ute/quad mounted units). Appropriate for a wide range of herbaceous weed species. Less efficient when dealing with high abundance woody weeds.
Splatter Gun/Gas Gun	Utilises a gas gun (fan shaped nozzle = Gas Gun Treatment and Nozzle delivering solid stream of large droplets = Splatter Gun) to treat hard to access or high abundance areas of herbaceous and/or woody weeds. Applies a low volume of concentrated herbicide to the target species reaching potential distances of up 10m away. Non- target damage is minimised given the high concentration and minimal contact area required to treat target species. Particularly effective on large Lantana thickets. Gas gun method (i.e. Fan shaped nozzle providing uniform coverage of 4-5m²) is utilised in areas where water access is limited and is generally useful for smaller isolated weed occurrences.
Stem Inject	Applies to all larger woody weeds and trees (greater than 100mm trunk diameter). A battery powered drill is used to excavate a hole placed at an angle of approximately 45 degrees into the xylem tissue of the trunk. Care must be taken to ensure the hole is located within the xylem and not into deadwood in the centre of the trunk. Herbicide (neat or 2:1) is then injected directly into the hole within 7 seconds. This process is repeated around the entire circumference of the trunk at approximately 100mm intervals.
High Volume Foliar Distribution	Distribution of chemical mix (generally low concentration) via the use of petrol driven pump, tank, retractable hose and hand gun under high pressure. Effective for where large areas of treatment are required. An additional benefit is that units can be mounted on 4WD or other vehicles to enable access to remote locations or where access to water may be limited (i.e. chemical mix can be prepared and transported to site).
Over spray method	Useful where large dense infestations of weeds species occur. Herbicide is sprayed over the top of the infestation canopy at recommended rates using the weed canopy as shelter for regenerating plants underneath. Sprayed plants are left intact to prevent erosion, protect native seedlings, retain habitat and discourage human access.
Basal Barking	Herbicide is mixed with Diesel to assist bark penetration. The herbicide mix is sprayed onto the trunk to a height of 30cm and for the entire circumference of the target specimen. Do not utilise this method where the bark is corky, wet or charred.

OPW VEGETATION MANAGEMENT PLAN

19-23 Adele Crescent, Bahrs Scrub, QLD 4207

Description

Local Authority

Lots 27 & 28 on RP169807

LOGAN CITY COUNCIL

CLIENT

PACIFICCORP
(ADELE) PTY
LTD



DRAWING NO.

22-0099EBF

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20-08-2022

VERSION

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SHEET NO.

VMP-05

Table 3 - Vegetation Management

Procedure – Vegetation Management
Objective
- To protect native vegetation, and to minimise the environmental impact of vegetation clearing activities on the preserved vegetation. - To protect fauna from impacts resulting directly from the clearing of vegetation. - To clear vegetation in a way which minimises harm to native fauna and allows for escape into neighbouring vegetation communities.
Management Strategy
- Maximise the retention of existing native vegetation, as far as is practicable, given the inherent constraints associated with the proposed development, and comply with the requirements of Local, State and Commonwealth Laws for Vegetation Management. - Ensure the protection of the vegetation and associated habitats that form part of conservation areas. - Ensure native fauna that inhabit the vegetation to be cleared are protected as far as practicable. - Vegetation to be preserved is to be clearly identified to prevent damage or disturbance. - Construct the protective fence prior to construction activities. - If native trees are identified within the clearance zone that may be retained with minor, practical modifications to the earthworks, such modifications shall be implemented, and the trees protected with fences and/or trunk girdles. - If individual trees or other specific vegetation is identified in the strip adjacent to the clearance zone that requires protection, such protection shall be provided. Earthworks are not to be constructed within the drip line of any vegetation that is to be retained. - Restricted weeds (Biosecurity Act 2014) shall be eradicated by nominated weed strategies. - During clearing, weed species will be stockpiled separately and disposed of off-site. Should weed species end up in the mulching pile they will be removed or an assessment of the risk of propagation will be undertaken. If risk is high the entire pile is not to be mulched. - If mature trees (any tree having a diameter at the base greater than 150mm) are damaged that are not scheduled for clearance, steps shall be undertaken to re-establish the tree if possible, and to carry out relevant rehabilitation works if required. - If disposal methods are not compliant with Local Authority Guidelines, necessary changes shall be made to correct the disposal procedures
Actions
- Prior to the commencement of any vegetation clearance, the Contractor shall identify all areas to be cleared on construction plans, and in the field. These areas will be clearly marked in the field, and vegetation outside this boundary will not be disturbed in any way without approval from Council’s manager – Environmental Services. - The temporary protective fence shall be constructed prior to the commencement of any construction work on site. The fence will be of a minimum height of 1.2m (3 wire) and will run along all boundaries of protected areas including as much of the Tree Protection Zone (as practicable) of trees within the vegetation to be protected. Temporary fencing to be fauna friendly.

- Prior to the commencement of vegetation clearance, the Contractor shall undertake a survey of the vegetation in the clearance zones to identify individual native trees within the clearance zone that may be retained with minor, practicable modifications to the earthworks, and individual trees, or other specific vegetation outside the clearance zone that may require specific forms of protection. - Individual trees identified are to be protected by a 1.2m (3 wire) high fence to be constructed within 500mm of any construction activity and are to include as much of the Primary Root Zone as is practicable. - The Contractor shall provide temporary fences and/or trunk girdles (as described above) to prevent unintended physical damage to the root system, trunk or canopy of native vegetation identified for retention. - At least every 100m a sign is to be attached to all tree protection fencing bearing the following phrase in red letters on white background at least 50mm in height: “NO GO ZONE – VEGETATION PROTECTION AREA” - All trees to be lopped or felled shall first be checked for wildlife (eg Koalas, Possums, and Cockatoos). If any wildlife is present, the tree shall not be lopped until the animal has left the tree. Refer Fauna Management Procedure in Table 3. - All vegetation to be retained in residential areas and recreational parkland should be healthy and vigorous, with an expected lifespan of at least fifty (50) years. All individual trees and stands of vegetation will be subject to a risk assessment by a qualified Arborist if necessary. - All construction machinery and vehicles shall be washed down before entering the site in order to remove soil that may contain weed seeds, soil pathogens, and other pest species. - All identified weed species shall be removed by the contractor where practicable. Weeds shall not be mulched (eg. Lantana, asparagus, umbrella tree). - Compaction around tree bases by heavy machinery is to be avoided where practicable. Vehicles should not drive or park under tree drip-lines. Stockpiling should not occur under drip-lines. Should work need to be undertaken under the drip-line, time / traffic should be limited, and a mulch layer (10cm depth) or a sufficient soil buffer should be used. - Vegetation is to be cleared through delineation of disturbed areas, to allow for fauna species currently occurring onsite an escape route into neighbouring vegetation that is to be retained. Directional clearing mechanisms to be conducted. - Temporary protective measures, such as distinctive safety fencing around root zones of large trees will be used where necessary and practicable. - It is intended that Vegetation removed from the site for development purposes will be chipped and used as mulch in the vegetation/rehabilitation/weed control program. (Burning is not an acceptable disposal method). - If chipped material is stockpiled, bunding is to be provided, as runoff may be acidic, and / or contain tannins and phenols. - All imported fill material is to be clean and free of vegetative matter.
If vegetation is to be mulched, the Contractor shall separate native and non-native species into different stockpiles as far as is practicable. The Contractor shall remove cleared non-native vegetation from site for disposal at a suitable facility. Non-native vegetation shall not be mulched for re-use on site, to minimise the risk of propagation.
The Contractor shall monitor vegetation clearance and associated earthworks components of the proposed works on a continual basis to confirm that specific controls have been implemented, and appropriate work practices are being adopted to achieve the specified performance objectives

Performance Criteria / Indicators
- No protected vegetation cleared or damaged - Imported fill is visibly clear of vegetative matter - Cleared vegetation (non-weed) is chipped and re-used or stockpiled.
Reporting / Responsibilities
- The Contractor is responsible for monitoring, control measures and corrective actions. - The Contractor shall implement corrective actions.
Corrective Action
- In the event that protected vegetation is cleared or damaged without prior approval, the Contractor shall advise the Project Manager. - Non-conformance shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the project non-conformance register. - The Contractor shall implement the corrective action as required within the agreed timeframe noted on the CAR. - The Contractor shall advise the Project Manager after completion of the corrective action.

Table 4 - Fauna Management

Procedure – Fauna Management
Objective
- To minimise the potential for construction phase activities to cause damage to native fauna that are resident on the site - To identify the actions that are to be undertaken on any part of the subject site during clearing activities - To provide the required scope of works of a suitably qualified Fauna Spotter/Catcher.
Management Strategy
- Minimise risk of harm to resident native fauna to within acceptable limits. - Minimise the risk of injury/mortality of fauna within the limitations of Occupational Health and Safety (OH&S) Guidelines - Ensure native fauna that inhabit the vegetation to be cleared are protected as far as practicable prior to clearing activities
Actions
a) Pre-Clearing Phase
- A DES Suitably Qualified Spotter-Catcher will be required to undertake a pre-clearing survey to identify fauna inhabiting the site a maximum of one week prior to clearing activities. Vegetation containing wildlife is to be clearly marked and recorded and a report provided to the principal summarising findings of the survey prior to clearing activities - Vegetation clearing and other site works must not commence until the Fauna Spotter/Catcher has certified that the site has been fully inspected and any necessary fauna protection measures or relocation procedures are implemented. - Pre-clearing survey is to locate (as far as practical) all nests, hollows, dreys and other forms of potential habitat for fauna. - Due to the height and location of hollows on site, the inspection of hollows prior to clearing will involve a visual inspection of any visible part of the hollow from the ground for any fauna movement or activity. - Nest inspections will occur before and after the supporting vegetation is cleared. Where possible, the Spotter-Catcher will remove the nest before clearing occurs. Any native chicks removed from nests will be transported to a suitably qualified wildlife carer to be raised. If the parent birds remain nearby the fauna spotter will attempt to relocate the nest if suitable habitat is available and will monitor the nest to ensure contact and feeding activities are re-established between the adults and juveniles. Refer Re-location procedure for further details.
b) During Clearing
- A DES Suitably Qualified Spotter-Catcher will be required during all operational works requiring vegetation clearing. All issues identified within this report will be discussed with the operators and Site Foreman to ensure the Fauna Management Plan is correctly implemented during site works. The Spotter-Catcher will manage all fauna interactions which occur during the course of clearing works - Immediately after each tree is felled the Spotter-Catcher will thoroughly inspect each hollow for the presence of fauna. The Spotter-Catcher will utilise a torch to aid in this inspection and the mechanical manipulation and modification of some hollows may be required to ensure a thorough inspection is completed. All animals will be captured and removed from the hollows, monitored and relocated off site.

- Wood debris stockpiles may need to be moved, mulched or otherwise disposed of as part of works. Due to the inherent habitat value of these features, a thorough inspection of each debris stockpile by the Spotter-Catcher on site is recommended prior to the movement or modification to ensure no fauna are injured. This process should also be conducted to any vegetation stockpiles created during clearing works that are left undisturbed overnight. The Spotter-Catcher on site will determine the extent of inspection required dependent on the size, location and composition of the individual stockpiles
- Excavated arboreal termitaria that are felled as part of clearing works will be broken open by the Spotter-Catcher. This will be completed in order to fully inspect the mound for the presence of fauna. The Spotter-Catcher will use manual force and a small jimmy bar in order to gain access to the interior of the mound without causing injury to any resident fauna. Any animals present will be captured and released at a secondary appropriate location.
- Due to the threat and spread of Chytridiomycosis (*Batrachochytrium dendrobatidis*) throughout the native frog population of Australia, all frog handling and management is conducted in a manner to restrict the spread of this disease. All amphibians are handled wearing disposable gloves and held in individual bags when not captured in the same location. Frogs are kept moist until they can be released to avoid dehydration. Frogs are released in areas of moist substrate preferably adjacent to an established waterbody.
- All terrestrial fauna captured on site will be placed in clean calico catch bags until a suitable release time and location are found. These animals will be placed in a cool quiet place away from clearing activity and regularly monitored for signs of stress or injury. All healthy fauna will be relocated into the areas of the development to be retained as park (i.e. the western extent of the site).
- Detailed records will be made by the Spotter-Catcher with regard to all fauna interactions that occur onsite. The following details are recorded for each animal encountered;
 - Species
 - Age and Sex (if known)
 - Health status
 - Time, Date and Location of interaction
 - Release location and time
 - Outcome of interaction
 - Additional notes and comments
- In the event that Koala are located in trees to be felled, all works are to cease within a ten-metre radius of the tree and are not to re-commence until such a time that the individual has moved of its own accord.
- A post-clearance report will be generated for the client detailing all fauna interactions that occurred in association with site works.

Performance Criteria / Indicators

- All wildlife occurring in area to be cleared is removed and relocated by a suitably qualified Fauna Spotter/Catcher.
- No fauna in the area to be cleared is harmed as a result of construction phase activities.
- Pre and post clearance reports are provided to the principal by the suitably qualified person (i.e. Fauna Spotter/Catcher).

Reporting / Responsibilities

- The Contractor is to keep records of death/injury of animals resulting from the construction phase of the development.
- If construction works do result in an injury to wildlife the Contractor must record all details and inform DEHP in their specified “return of operations” reporting period or in accordance with their permit conditions.

Corrective Action
- In the event that site vegetation is cleared and is not supervised by the fauna spotter/catcher, the Contractor shall advise the Project Manager - Non-conformance with this plan shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the non-conformance register. - The Contractor shall implement the corrective action as required within the agreed timeframe noted on the CAR. - The Contractor shall advise the Project Manager after completion of the corrective action.

Table 5 - Fauna Relocation

Procedure — Fauna Relocation & Injury Treatment
Objective
- To provide a framework for the release of native animals captured during vegetation clearing activities. - To provide procedure to treat injured fauna
Management Strategy
- Prior to vegetation clearing activities identify a suitable location to release captured fauna - Where animal interaction occurs as a result of works, relocate uninjured animals to suitable location - Where injury occurs ensure animal receives adequate care with all practicable effort made to rehabilitate said animal. - Maintain suitable records in the event of animal interaction, injury or death.
Actions
a) Pre-Clearing Phase
- A DES Suitably Qualified Spotter-Catcher will be required during all vegetation clearing operational works. The Spotter-Catcher will manage all fauna interactions which occur during the course of clearing works - All terrestrial fauna captured on site will be placed in clean calico catch bags until a suitable release time. Release time should be conducive to the particular species natural time of activity (e.g. dusk or evening for possums). Until release, the animals will be placed in a cool quiet place away from clearing activity and regularly monitored for signs of stress or injury. - All healthy fauna will be relocated into the area of site intended for retention. If no area is deemed suitable an alternative release site is to be determined and assessed prior o the commencement of clearing operations. - Injured and juvenile wildlife will be transported by the Spotter-Catcher to a suitably qualified Veterinary Surgery or Wildlife Carer where they will receive appropriate care. - All invasive pest species captured on site will be ethically euthanised in accordance with the <i>Queensland Animal Care and Protection Act 2001</i> (Qld). - Detailed records will be made by the Spotter-Catcher with regard to all fauna interactions that occur onsite. The following details are recorded for each animal encountered; - Species - Age and Sex (if known) - Health status - Time, Date and Location of interaction - Outcome of interaction - Release location and time - Additional notes and comments
Performance Criteria / Indicators
- Records maintained of animal releases into appropriate release sites - Records maintained of animals requiring treatment and the location to which the animal was transported to receive required treatment
Reporting / Responsibilities
The Contractor is responsible for monitoring, control measures and corrective actions.
Corrective Action
Non-conformance with this plan shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the non-conformance register.

Table 6 - Hollow Bearing Tree Removal

Procedure — HOLLOW BEARING TREE REMOVAL
Objective
- To remove tree specimens with potential fauna bearing hollows - To protect fauna from impacts resulting directly from the clearing of vegetation. - To clear vegetation in a way that minimises harm to native fauna and allows for escape into neighbouring vegetation communities or relocation.
Management Strategy
- Maximise the retention of existing native vegetation, as far as is practicable, given the inherent constraints associated with the proposed development, and comply with the requirements of Local, State and Commonwealth Laws for Vegetation Management. - Minimise the risk of injury/mortality of potentially denning/roosting fauna within the limitations of Occupational Health and Safety (OH&S) Guidelines - A suitably qualified fauna spotter/catcher is to undertake a pre-clearance survey of all hollows prior to clearing activities. - Ensure native fauna that inhabit the vegetation to be cleared are protected as far as practicable prior to clearing activities
Actions
- A DEHP Suitably Qualified Spotter-Catcher will be required during all vegetation clearing operational works. All issues identified within this report will be discussed with the operators and Site Foreman to ensure the Fauna Management Plan is correctly implemented during site works. The Spotter-Catcher will manage all fauna interactions which occur during the course of clearing works - Hollow-bearing trees should be removed via a method that does not require traditional tree felling methods i.e. clear-drop chainsaw cut or bulldozer/excavator “rip and push” methods undesirable due to the violence of tree-ground impact and associated high risk of injury/mortality to fauna (e.g. via hollow collapse, collision with walls, etc). Options include: - The use of an excavator or similar machine with a harvester head attachment, which can hold the trunk while the tree base is sawn, and then the lowers the tree to the ground for inspection (preferred method, but limited in practicality to small to medium sized trees). - Use of a crane to hold the tree while the base is sawn, and then lower the tree to the ground for inspection (preferred method). - If the above is not practical, an excavator can cut the roots and slowly push over the tree, counterbalancing the fall rate by pushing down on the root ball to minimise acceleration and final impact (least preferred method as seldom effective). Prior to beginning root severance, the tree should be bumped by the machine at least 3-5 times at approximately 1-minute intervals to encourage evacuation before felling. Caution will be required not to risk personal injury via falling branches - Clearing outside spring-summer is highly recommended to minimise the risk of many hollow-obligate birds nesting and micro-chiropteran bat breeding season. - Any feral species (including bees) detected during tree felling are to be euthanised. - In the event that Koala are located in trees to be felled, all works are to cease within a ten-metre radius of the tree and are not to re-commence until such a time that the individual has moved of its own accord.
Performance Criteria / Indicators
- No injury or death of native fauna recorded - Successful rescue and relocation of hollow dwelling fauna
Reporting / Responsibilities
The Contractor is responsible for monitoring, control measures and corrective actions.
Corrective Action
- In the event that hollow bearing trees are removed un-supervised by the fauna spotter/catcher, the Contractor shall advise the Project Manager - Non-conformance with this plan shall be documented and a Corrective Action Request (CAR) issued. All CARs shall be included in the non-conformance register.



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