



**Santos GLNG Project**  
**Lot 20 FTY1805**  
**Phase 2 Ecological Assessment Report**

December 2013



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## Appendices

- Appendix A – Methods
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- Appendix C - Regional ecosystem mapping modifications
- Appendix D – Fauna habitat features
- Appendix E - Threatened species survey results
- Appendix F – Flora and fauna species list
- Appendix G – Field data sheets

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# 1. Introduction

## 1.1 Background

Lot 20 FTY1805 (herein referred to as Lot 20) is located within the Fairview Gas Field. Construction footprints within Lot 20 are comprised of 32 Right of Ways (RoW) and 12 proposed well pads (Figure 1). This report presents the results of an ecological assessment of the RoWs, proposed well pads and associated buffer areas within Lot 20.

All desktop and field assessments were undertaken in accordance with the Santos GLNG Upstream Methodology for Undertaking Environmental Assessments (Santos document number: 6300-650-SPE-0002, Rev 1 dated 16/08/2013) (Santos Methodology). Field surveys were undertaken by four SEWPaC approved ecologists from 3–8 November 2013. Further details of the methods used are provided in Appendix A.

## 1.2 Report layout

Section 2 of this report provides, for each RoW or proposed well pad (refer Figure 1), a summary of the following environmental features:

- Regional Ecosystems (REs)
- Environmentally Sensitive Areas (ESAs)
- Threatened Ecological Communities (TECs)
- Essential habitat
- Vegetation community and habitat values
- Threatened species
- Fauna habitat features
- Watercourses
- Wetlands, lakes and springs.

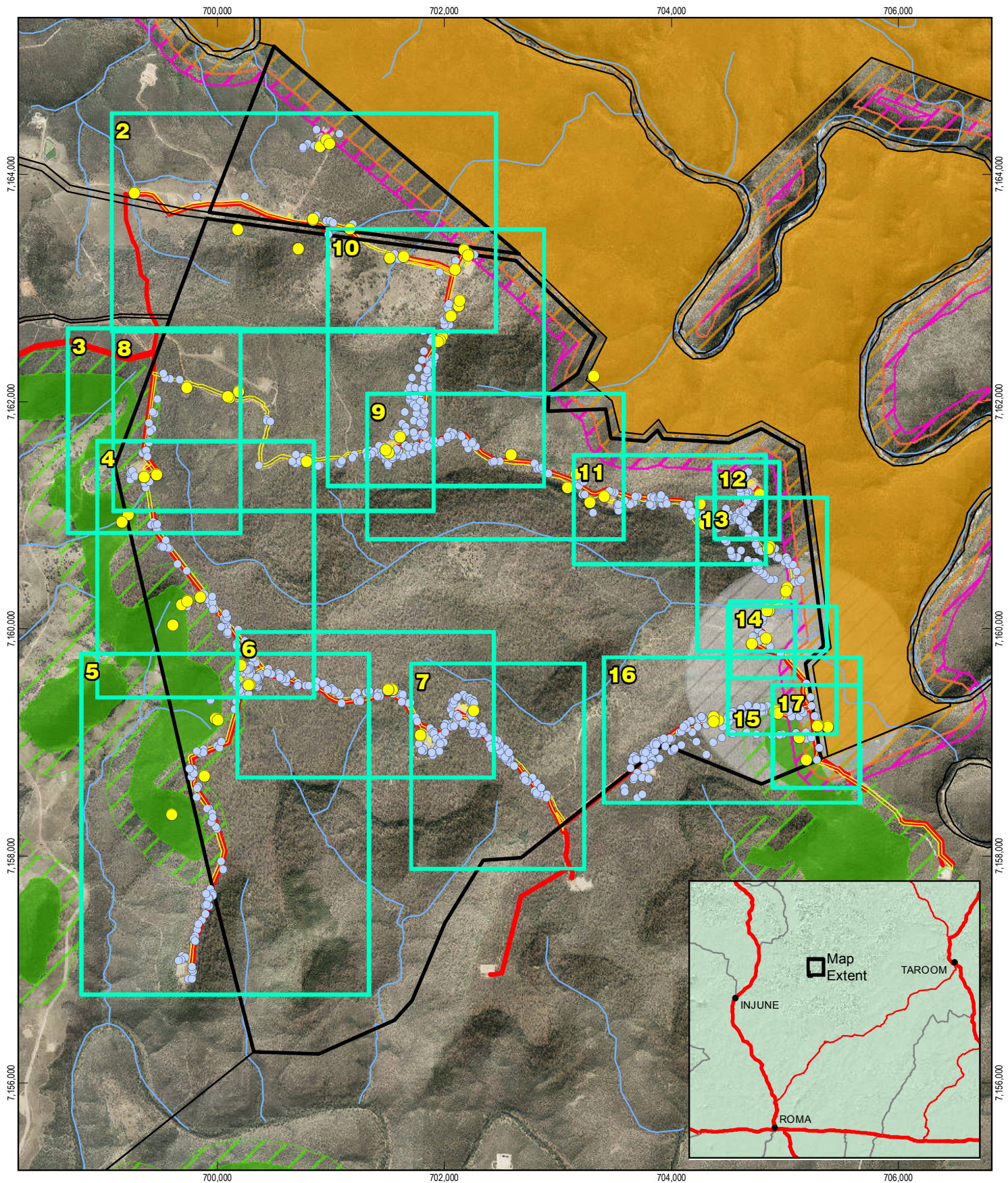
Section 3 provides information on threatened species relevant to Lot 20, including habitat mapping and habitat clearing calculations.

Further detail, including definitions, RE mapping modifications, species lists and data sheets are provided in the appendices.

## 1.3 Limitations

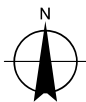
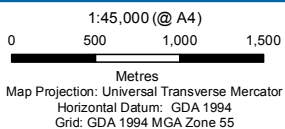
Ecological field assessment and reporting is limited to the RoW and proposed well pad footprints, and appropriate assessment buffers. Buffers were determined in accordance with Santos Methodology. Ecological values within Lot 20 that are outside of these areas were not assessed as part of this scope of works.

Assessment was limited to RoWs and proposed well pads located wholly within Lot 20. The exception to this was proposed well pad FV11-13 and FV 12-03, which GHD had been requested to survey, although this infrastructure is located outside of Lot 20. Where infrastructure occurred partially within Lot 20 and partially within adjacent lots, assessments were undertaken for the infrastructure within Lot 20 only. This was the case for RoWs 115, 120 and 142. Assessment for the remaining portion of these RoWs located outside of Lot 20 are assumed to have already been surveyed or will be surveyed as part of a separate scope of works to those described in this report.



**LEGEND**

- |                   |                           |                              |                         |                         |
|-------------------|---------------------------|------------------------------|-------------------------|-------------------------|
| ● Assessment Site | — Watercourse             | □ Clearing Limit             | ■ ESA Cat A Constraints | ■ ESA Cat B Constraints |
| ● Fauna Habitat   | ▭ Fairview Lot 20 FTY1805 | ■ Vegetation Management Area | ▨ ESA Cat A Primary     | ▨ ESA Cat B Primary     |
| ▭ Cadastre        | ▨ Essential Habitat       | ▨ ESA Cat A Secondary        |                         |                         |



Santos GLNG  
 Fairview Lot 20 Ecological Assessments

Job Number 41-27125  
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 Date 06 Dec 2013

Lot 20 FTY1805 Overview

Figure 1

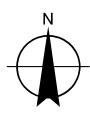
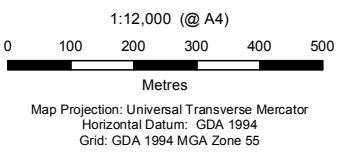
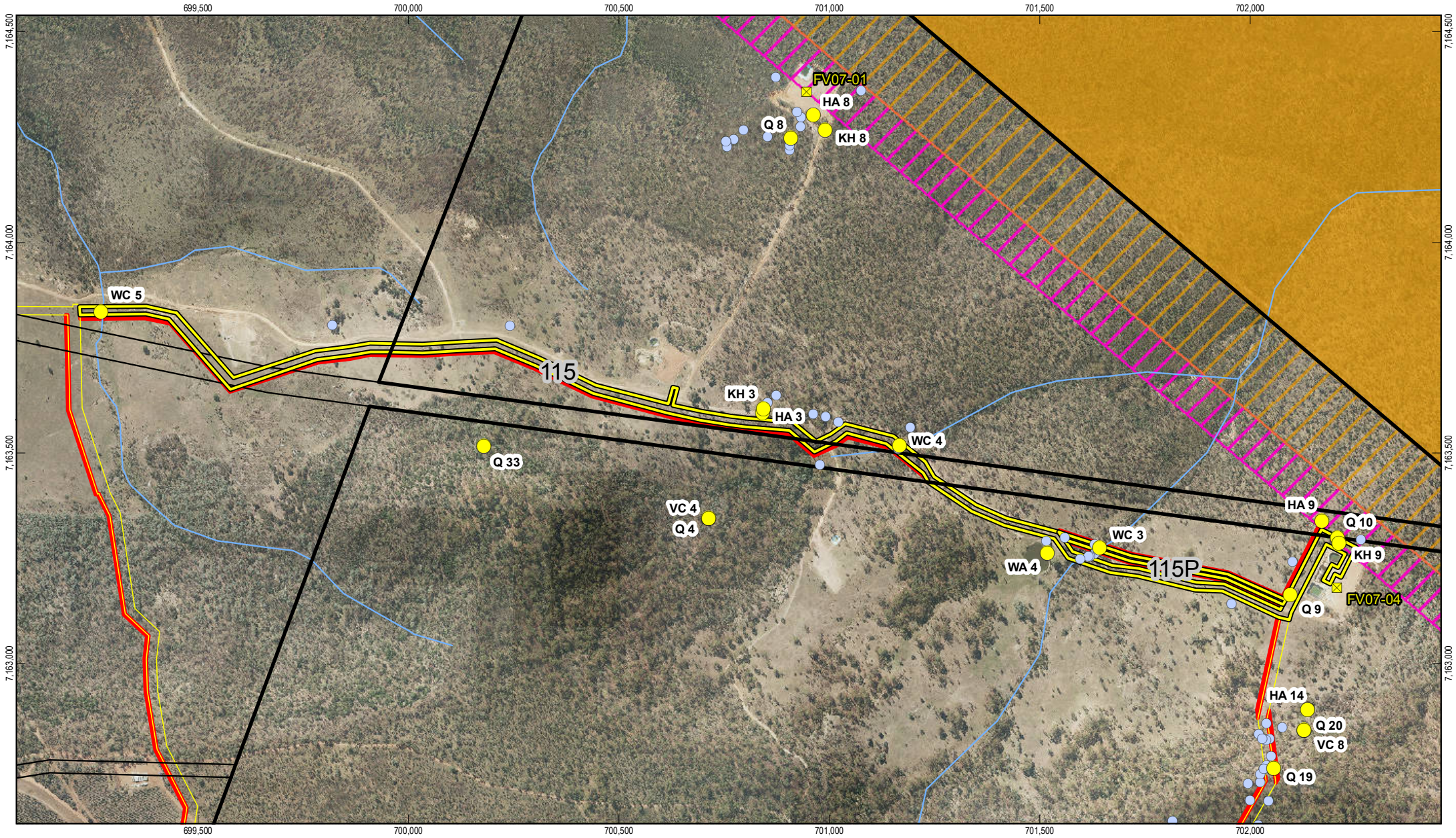


## 2. Ecological assessment results

### 2.1 Overview

The presentation of results from ecological assessments of RoWs and proposed well pads within Lot 20 has been grouped together based on spatial association. The ecological values present within these areas are also broadly similar. The infrastructure groups are discussed in the following sections as follows:

- Section 2.2– RoWs 115, 115P and proposed well pads FV07-01 and FV07-04
- Section 2.3– RoWs 116, 117 and proposed well pad FV06-42
- Section 2.4– RoWs 118, 119, 119P and proposed well pad FV11-06
- Section 2.5– Row 120 and well pad FV11-13
- Section 2.6– RoWs 121, 121P, 122, 122P and well pad FV12-01
- Section 2.7– RoWs 123, 123P, 124 and well pad FV12-01
- Section 2.8– RoW 129
- Section 2.9– RoWs 130, 131, 132 and well pad FV07-06
- Section 2.10– RoW 133
- Section 2.11– RoWs 134, 135 and well pad FV07-07
- Section 2.12– RoWs 136, 126P and FV07-08
- Section 2.13– RoW 137
- Section 2.14– RoWs 138, 138P and well pad FV07-10
- Section 2.15– RoW 139
- Section 2.16– RoW 140 and well pad FV 12-03
- Section 2.17– RoWs 142 and 142P, within Lot 20 only



LEGEND			
<span style="color: yellow;">●</span> Assessment Site	Fairview Lot 20 FTY1805	ESA Cat A Constraints	ESA Cat B Constraints
<span style="color: blue;">●</span> Fauna Habitat	Cadastre	ESA Cat A Primary	ESA Cat B Primary
<span style="color: yellow;">✕</span> Well Pad	Clearing Limit	ESA Cat A Secondary	
Watercourse	Vegetation Management Area	Essential Habitat	
RoW 115, RoW 115P			



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RoW 115, RoW 115P,  
 FV07-01 and FV07-04

Figure 2

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 145 Ann St Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com  
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 Data source: Santos: Well Pad Locations, Cadastre, Clearing Limit, Vegetation Management Area, Watercourse, Imagery, Environmentally Sensitive Areas, Essential Habitat/Supplied October 2013; ESRI: Hillshade/2008; GHD: Assessment Site, Fauna Habitat/2013. Created by: AF

## 2.2 RoWs 115 and 115P, proposed well pads FV07-01 and FV07-04

### 2.2.1 Approvals and actions summary for RoW 115, 115P, FV07-01 and FV07-04

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	Yes	Fauna habitat features	Yes
TECs	Yes	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.2.2 Regional ecosystems

#### **Regional ecosystems mapped**

One polygon of of concern RE 11.3.39/11.3.2 intersects with RoW 115 and well pad FV07-01. This same RE polygon is also mapped and within 200 m of RoW 115P and FV07-04. The RE short descriptions are as follows:

- 11.3.39: *Eucalyptus melanophloia* +/- *E. chloroclada* woodland on undulating plains and valleys with sandy soils
- 11.3.2: *Eucalyptus populnea* woodland on alluvial plains

The remainder of RoW 115 and the entire area encompassing RoW 115P and FV07-04 is mapped as non-remnant vegetation.

#### **Regional ecosystems field validation**

Field validation of the mapped of concern RE polygon of 11.3.39/11.3.2 determined that the landzone and vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.7:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.7: *Eucalyptus crebra* woodland on coarse-grained sedimentary rocks

Field validation points are shown on Figure 2 (Q 4, Q 8, Q9, Q 10 and Q 33). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with the Department of Environment and Heritage Protection (DEHP) would be required to change the existing RE mapping. This would be in the form of a Property Map of Assessable Vegetation (PMAV) application or RE mapping modification request.

### 2.2.3 Environmentally sensitive areas

#### ***Environmentally sensitive areas mapped***

- Category A ESA
  - None mapped within RoWs 115, 115P FV07-01 and FV07-04
  - A Category A ESA (National Park) including primary and secondary protection zones are located within 1 km of the RoWs and well pads.
  - The eastern end of RoW 115 and FV07-04 intersects the secondary protection zone of a Category A ESA.
- Category B ESA
  - None mapped within RoWs or well pads or within 1 km of RoWs or well pads
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pads are contained
  - Of concern RE: 11.3.39/11.3.2 is mapped within the RoW 115 and FV07-04

#### ***Environmentally sensitive areas field validation***

- Category C ESA

Mapped of concern RE 11.3.39/11.3.2 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.7. Field validation mapping amendments would therefore remap this area as not being representative of a Category C ESA containing an of concern RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### ***Approval requirement or further action***

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing ESA/RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

Only limited petroleum activities are permitted within the secondary protection zone of Category A ESAs as per the Environmental Authority (EA) conditions.

### 2.2.4 Threatened ecological communities

#### ***Threatened ecological communities mapped***

No TECs are mapped within the RoWs 115, 115P FV07-01 and FV07-04.

One small area potentially representative of the TEC, Brigalow (*Acacia harpophylla* dominant and co-dominant) (Brigalow TEC), is mapped on Santos GIS data layers. This area has been field-validated during previous field surveys undertaken by Aurecon in 2011, is present within 300 m of RoW 115. No TECs are mapped within 300 m of RoW 115P, FV07-01 or FV07-04.

#### ***Threatened ecological communities field validation***

Field validation of the small brigalow area was undertaken and it was confirmed that the area does meet the criteria for Brigalow TEC as it meets the criteria for polygon size (>0.5ha). However, this area is too small to be mapped as a RE.

#### ***Approval requirement or further action***

Due to the size of the brigalow polygon not satisfying the criteria to meet remnant status, no RE mapping amendments have been made for this community. However, the brigalow vegetation

community has been mapped in the TEC mapping for Lot 20 (refer to spatial data for location of this TEC).

#### 2.2.5 Essential habitat

##### ***Essential habitat mapped***

No essential habitat mapped under the *Vegetation Management Act 1999* (VM Act) is present within RoWs 115, 115P FV07-01 and FV07-04 or within 200 m of the RoWs or well pads.

Low value essential habitat mapped under the Biodiversity Planning Assessment (BPA) mapping is located within RoW 115 and FV07-01 and is associated with the mapped RE polygon 11.3.39/11.3.2 discussed in Section 2.2.2.

##### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.3.39/11.3.2 is presented in Section 2.2.2.

##### **Approval requirement or further action**

None

#### 2.2.6 Vegetation community and habitat values

The following vegetation communities occur over RoWs 115, 115P, FV07-01 and FV07-04:

- Mixed eucalypt woodland to open forest on plateaus and gently sloping foothills: RoW 115 and FV07-01
- Non-remnant shrubby regrowth and cleared pastures: RoW 115, 115P, FV07-04

Descriptions of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 2 (VC 4, HA 8, HA 9, HA 10, KH 3, KH 8, KH 9).

##### **Approval requirement or further action**

None, however, rehabilitation activities are to be in accordance with the GLNG Project Remediation, Rehabilitation, Recovery and Monitoring Plan, Coal Seam Gas Fields (RPS 2011) (Document number: 0020-GLNG-4.1.3-0012) (RRRMP).

#### 2.2.7 Threatened species

##### ***Threatened species field validation***

No threatened flora species were recorded from RoWs 115, 115P, FV07-01 and FV07-04 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

Three threatened fauna species were recorded from field assessments of the RoWs and well pads:

- Squatter pigeon: FV07-01
- Large-eared pied bat: RoW 115
- Little pied bat: RoW 115

Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

### Threatened species habitat mapping

Potential habitat for fauna species listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the *Nature Conservation Act 1992* (NC Act) has been mapped over the RoWs and well pads (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

### Approval requirement or further action

Management actions listed within the following approved GLNG Project documents are to be followed during pre-construction, construction and operation:

- GLNG Project CSG Fields Significant Species Management Plan (RPS 2012) (document number: 0020-GLNG-4-1.3-0003) (SSMP)
- Roma, Arcadia and Fairview CSG Fields Species Management Plan (Aurecon 2012) (document number: STO-FL-T2GS-L-32)1(SMP)
- GLNG Gas Transmission Pipeline Species Management Plan (document number: 3380-GLNG-3-1.3-0036) (GTP SMP)

#### 2.2.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 115, 115P, FV07-01 and FV07-04. Fauna habitat features recorded included hollow bearing trees, hollow stag trees, hollow logs, nests, burrows and termite mounds. Locations of these features are mapped on Figure 2 and are presented in Appendix D.

### Approval requirement or further action

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.2.9 Watercourses

##### Watercourses mapped

Three mapped stream order 1 watercourses intersect RoW 115. No mapped watercourses are located within 100 m of RoWs 115P, FV07-01 or FV07-04.

##### Watercourses field validation

Field validation of these watercourses determined all to be drainage features under the *Water Act 2000*. Watercourse assessment locations are shown as sites WC 3, WC 4 and WC 5 on Figure 2. A summary of results is presented in Table 1; watercourse assessments are presented in Appendix G.

Table 1 Watercourse assessments in RoW 115

Watercourse reference	Location (easting, northing)		Assessment outcome	Reason
WC 3	701642	7163275	Drainage feature ( <i>Water Act 2000</i> )	No extended or permanent period of flow – only carries water flow for a short duration after a rainfall event Lacks sufficient flow adequacy to sustain basic ecological processes and support riverine species Lacks continuous and defined bed and banks and the presence of in-stream islands, benches or bars

Watercourse reference	Location (easting, northing)		Assessment outcome	Reason
WC 4	701167	7163518	Drainage feature ( <i>Water Act 2000</i> )	No extended or permanent period of flow – only carries water flow for a short duration after a rainfall event Lacks sufficient flow adequacy to sustain basic ecological processes and support riverine species Lacks continuous and defined bed and banks and the presence of in-stream islands, benches or bars
WC 5	699270	7163835	Drainage feature ( <i>Water Act 2000</i> )	No extended or permanent period of flow – only carries water flow for a short duration after a rainfall event Lacks sufficient flow adequacy to sustain basic ecological processes and support riverine species Lacks continuous and defined bed and banks and the presence of in-stream islands, benches or bars

#### Approval requirement or further action

None

#### 2.2.10 Wetlands, lakes and springs

##### *Wetlands, lakes and springs mapped*

A DEHP Queensland Wetland is mapped within RoW 115. Additionally, this wetland is within 300 m of RoWs 115P, FV07-01 and FV07-04. This wetland is associated with the of concern wetland RE 11.3.2.

One farm dam identified from aerial imagery is located within 300 m of the RoW 115.

##### *Wetlands, lakes and springs field validation*

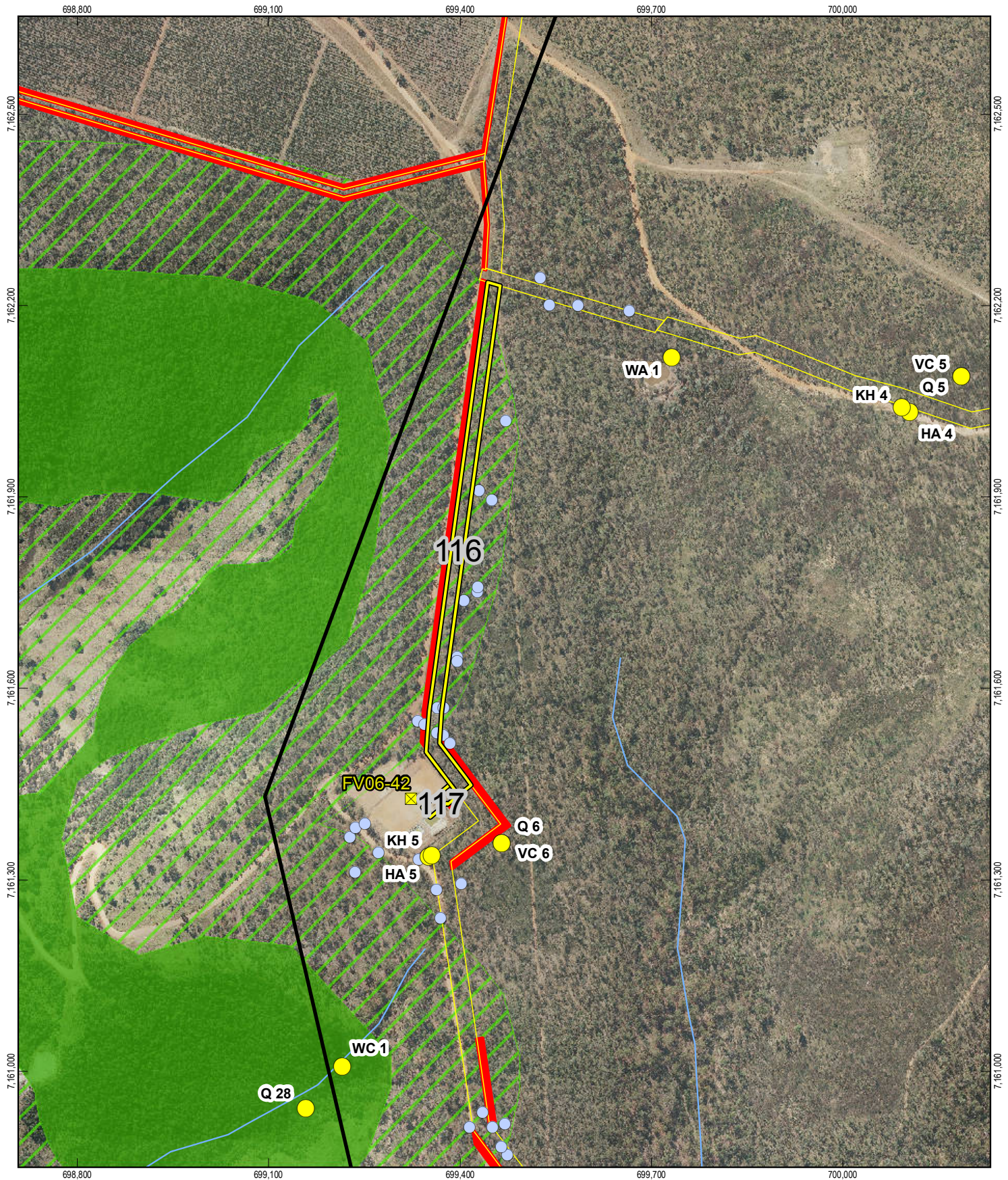
Field validation of the REs within and adjacent to RoW 115, FV04-01 and FV07-04 found the wetland RE polygon located within the RoW and well pads and within 300 m of the infrastructure pads was more consistent with the no concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation within Lot 20 confirmed that no wetlands occur within RoW 115, FV04-01 and FV07-04 or within 300 m of the RoW within Lot 20.

The wetland RE polygon continues outside of Lot 20, but within 300 m of RoW 115, 115P and FV07-04. Although, this polygon was not surveyed outside of Lot 20, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. As such, no wetlands occur within 300 m of the RoWs 115, 115p, FV07-01 and FV07-04.

Field validation of the farm dam, located at WA 4 (Figure 2), determined that this dam is not a wetland under the EA, as it is a modified feature representative of an artificial stand-alone water storage that is not within a natural water body or channel.

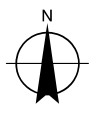
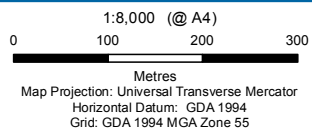
#### Approval requirement or further action

None



**LEGEND**

- |                 |                         |                            |                       |                       |
|-----------------|-------------------------|----------------------------|-----------------------|-----------------------|
| Assessment Site | Watercourse             | Cadastre                   | Essential Habitat     | ESA Cat A Secondary   |
| Fauna Habitat   | RoW 116, RoW 117        | Clearing Limit             | ESA Cat A Constraints | ESA Cat B Constraints |
| Well Pad        | Fairview Lot 20 FTY1805 | Vegetation Management Area | ESA Cat A Primary     | ESA Cat B Primary     |



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Fairview Lot 20 Ecological Assessments

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**RoW 116, RoW 117  
and FV06-42**

**Figure 3**



## 2.3 RoW 116, RoW 117 and FV06-42

### 2.3.1 Approvals and actions summary for RoW 116, 117 and FV06-42

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.3.2 Regional ecosystems

#### *Regional ecosystems mapped*

RoW 116, 117 and FV06-42 are located within the no concern at present RE polygon mapped as 11.10.1/11.10.13a. Endangered RE 11.9.4a is also mapped within 200 m of the RoWs and well pad. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.13a: *Eucalyptus cloeziana* +/- *E. melanoleuca* +/- *Corymbia bunites* +/- *E. sphaerocarpa* woodland to open-forest.
- 11.9.4a: Semi-evergreen vine thicket, generally dominated by a low tree layer (5-10 m high) which is floristically diverse and variable.

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygon of 11.10.1/11.10.13a determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps

RE 11.9.4a was also field validated to be correctly mapped.

Field validation points are shown on Figure 3 (Q 6 and Q 28). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.3.3 Environmentally sensitive areas

#### *Environmentally sensitive areas mapped*

- Category A ESA
  - None mapped within RoWs 116, 117 and FV06-42 and within 1 km of RoWs or well pad
- Category B ESA
  - None mapped within RoWs or well pad
  - A Category B ESA (Endangered RE) including primary and secondary protection zones is located within 1 km of the RoWs and well pad.
  - RoW 116, 117 and FV06-42 intersect the primary and/or secondary protection zones of the Category B ESA (Endangered RE).
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained

#### *Environmentally sensitive areas field validation*

- Category B ESA

Mapped endangered RE 11.9.4a was field validated to be correctly mapped.

#### **Approval requirement or further action**

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

### 2.3.4 Threatened ecological communities

#### *Threatened ecological communities mapped*

No TECs are mapped within RoWs 116, 117 and FV06-42.

RE 11.9.4a, which is mapped within 300 m of the RoWs and well pad, is a constituent RE of the Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions (SEVT) TEC.

#### *Threatened ecological communities field validation*

RE 11.9.4a was field validated to be correctly mapped. Therefore, the SEVT TEC is also correctly mapped

#### **Approval requirement or further action**

None

### 2.3.5 Essential habitat

#### *Essential habitat mapped*

No essential habitat mapped under the VM Act is present within RoWs 116, 117 and FV06-42 or within 200 m of the RoWs or well pad.

Medium value essential habitat mapped under the BPA mapping is located within the RoWs and well pad footprints. This mapping is associated with the mapped RE polygon 11.10.1/11.10.13a discussed in Section 2.3.2.

### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.3.2.

### **Approval requirement or further action**

None

### **2.3.6 Vegetation community and habitat values**

The following vegetation communities occur over RoWs 116, 117 and FV06-42:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills

The semi-evergreen vine thicket vegetation community, associated with RE 11.9.4a, is also located within 200 m of the RoWs and well pad.

Descriptions of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 3 (VC 6, HA 5 and KH 5).

### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

### **2.3.7 Threatened species**

#### ***Threatened species field validation***

No threatened flora or fauna species were recorded from RoWs 116, 117 and FV06-42 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

#### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoWs and well pad (Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### **2.3.8 Fauna habitat features**

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 116, 117 and FV06-42. Fauna habitat features recorded included hollow bearing trees, hollow stag trees and hollow logs. Locations of these features are mapped on Figure 3 and are presented in Appendix D.

### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### 2.3.9 Watercourses

#### ***Watercourses mapped***

No mapped watercourses are located within RoWs 116, 117 and FV06-42 or within 100 m of these RoWs or well pad.

#### ***Watercourses field validation***

No field validation undertaken or required.

#### **Approval requirement or further action**

None

### 2.3.10 Wetlands, lakes and springs

#### ***Wetlands, lakes and springs mapped***

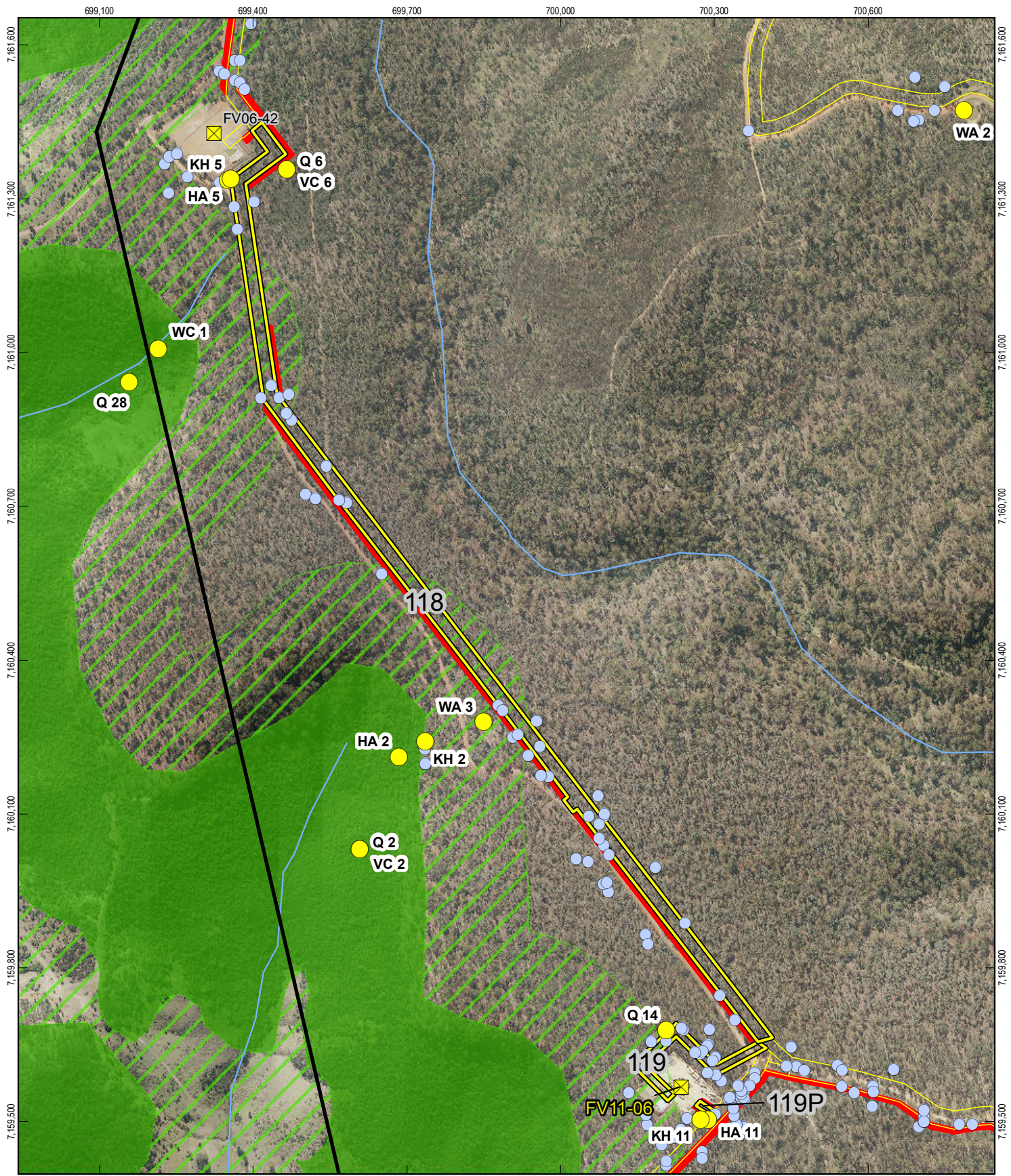
No mapped wetlands, lakes or springs are located within RoWs 116, 117 and FV06-42 or within 300 m of these RoWs or well pad.

#### ***Wetlands, lakes and springs field validation***

No field validation undertaken or required.

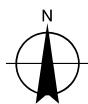
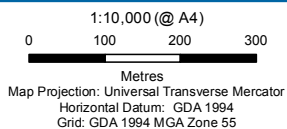
#### **Approval requirement or further action**

None



**LEGEND**

- |                 |                            |                            |                       |                       |
|-----------------|----------------------------|----------------------------|-----------------------|-----------------------|
| Assessment Site | Watercourse                | Cadastre                   | Essential Habitat     | ESA Cat A Secondary   |
| Fauna Habitat   | RoW 118, RoW 119, RoW 119P | Clearing Limit             | ESA Cat A Constraints | ESA Cat B Constraints |
| Well Pad        | Fairview Lot 20 FTY1805    | Vegetation Management Area | ESA Cat A Primary     | ESA Cat B Primary     |



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RoW 118, RoW 119,  
RoW 119P and FV11-06

**Figure 4**

## 2.4 RoW 118, RoW 119, RoW 119P and FV11-06

### 2.4.1 Approvals and actions summary for RoWs 118, 119, 119P and FV11-06

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.4.2 Regional ecosystems

#### *Regional ecosystems mapped*

RoWs 118, 119, 119P and FV11-06 are located within the no concern at present RE polygon mapped as 11.10.1/11.10.13a. Endangered RE 11.9.4a is also mapped within 200 m of the RoWs and well pad. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.13a: *Eucalyptus cloeziana* +/- *E. melanoleuca* +/- *Corymbia bunites* +/- *E. sphaerocarpa* woodland to open-forest.
- 11.9.4a: Semi-evergreen vine thicket, generally dominated by a low tree layer (5-10 m high) which is floristically diverse and variable.

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygon of 11.10.1/11.10.13a determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps

RE 11.9.4a was also field validated to be correctly mapped.

Field validation points are shown on Figure 4 (Q 2, Q 6 and Q 14). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### *Approval requirement or further action*

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.4.3 Environmentally sensitive areas

#### ***Environmentally sensitive areas mapped***

- Category A ESA
  - None mapped within RoWs 118, 119, 119P and FV11-06 and within 1 km of RoWs or well pad
- Category B ESA
  - None mapped within RoWs 118, 119, 119P and FV11-06
  - A Category B ESA (Endangered RE) including primary and secondary protection zones is located within 1 km of the RoWs and well pads.
  - RoW 118, 119, 119P and FV11-06 intersect the primary and/or secondary protection zones of the Category B ESA (Endangered RE).
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained

#### ***Environmentally sensitive areas field validation***

- Category B ESA

Mapped endangered RE 11.9.4a was field validated to be correctly mapped.

#### **Approval requirement or further action**

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

### 2.4.4 Threatened ecological communities

#### ***Threatened ecological communities mapped***

No TECs are mapped within RoWs 118, 119, 119P and FV11-06.

RE 11.9.4a which is mapped within 300 m of the RoWs and well pad is a constituent RE of the SEVT TEC.

#### ***Threatened ecological communities field validation***

RE 11.9.4a was field validated to be correctly mapped. Therefore, the SEVT TEC is also correctly mapped.

#### **Approval requirement or further action**

None

### 2.4.5 Essential habitat

#### ***Essential habitat mapped***

No essential habitat mapped under the VM Act is present within RoWs 118, 119, 119P and FV11-06 or within 200 m of the RoWs or well pads.

Medium value essential habitat mapped under the BPA mapping is located within the RoWs and well pad footprints. This mapping is associated with the mapped RE polygon 11.10.1/11.10.13a discussed in Section 2.4.5.

### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.4.5.

### **Approval requirement or further action**

None

### **2.4.6 Vegetation community and habitat values**

The following vegetation communities occur over RoWs 118, 119, 119P and FV11-06:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills

The semi-evergreen vine thicket vegetation community, associated with RE 11.9.4a, is also located within 200 m of the RoWs and well pad.

Descriptions of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 4 (VC 6, VC 2, HA 2, HA 11, KH 2 and KH11).

### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

### **2.4.7 Threatened species**

#### ***Threatened species field validation***

No threatened flora species were recorded from RoWs 118, 119, 119P and FV11-06 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat, was recorded from field assessments of RoW 118 and FV11-06. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

#### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoWs and well pad. Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### **2.4.8 Fauna habitat features**

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 118, 119, 119P and FV11-06. Fauna habitat features recorded included hollow bearing trees, hollow stag trees, hollow logs and nearby rocky outcrops and rock crevices/caves. Locations of these features are mapped on Figure 4 and are presented in Appendix D.



### Approval requirement or further action

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.4.9 Watercourses

##### *Watercourses mapped*

No mapped watercourses intersect RoWs 118, 119, 119P and FV11-06. One mapped stream order 1 watercourse is located within 100 m of RoW 118.

##### *Watercourses field validation*

Field validation of the watercourse mapped within 100 m of RoW 118 determined it to be a drainage feature under the *Water Act 2000*. The watercourse assessment location is shown as site WC 1 on Figure 4. A summary of results is presented in Table 2, watercourse assessments are presented in Appendix G.

Table 2 Watercourse assessments in RoW 118

Watercourse reference	Location (easting, northing)		Assessment outcome	Reason
WC 1	699215	7161007	Drainage feature ( <i>Water Act 2000</i> )	No extended or permanent period of flow – only carries water flow for a short duration after a rainfall event Lacks sufficient flow adequacy to sustain basic ecological processes and support riverine species Lacks continuous and defined bed and banks and the presence of in-stream islands, benches or bars

### Approval requirement or further action

None

#### 2.4.10 Wetlands, lakes and springs

##### *Wetlands, lakes and springs mapped*

No mapped wetlands, lakes or springs are located within RoWs 118, 119, 119P and FV11-06 or within 300 m of these RoWs or well pad.

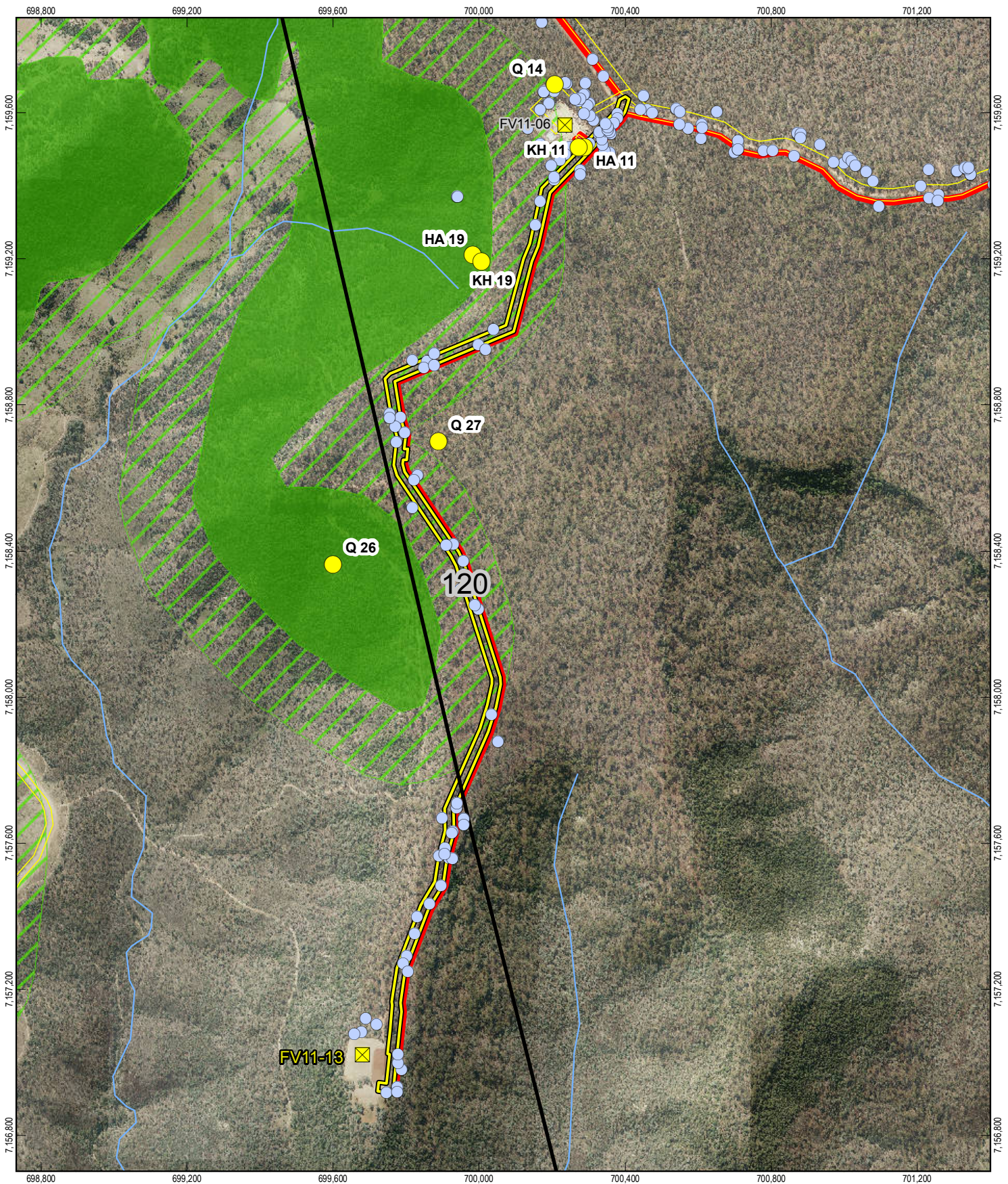
One shallow dam scrape identified from aerial imagery is located within 300 m of the RoW 118.

##### *Wetlands, lakes and springs field validation*

Field validation of the shallow dam scrape, located at WA 3 (Figure 4), determined that this dam is not a wetland under the EA as it is a modified feature representative of an artificial stand-alone water storage that is not within a natural water body or channel.

### Approval requirement or further action

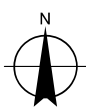
None



**LEGEND**

- |                 |                         |                            |                       |                       |
|-----------------|-------------------------|----------------------------|-----------------------|-----------------------|
| Assessment Site | Watercourse             | Cadastre                   | Essential Habitat     | ESA Cat A Secondary   |
| Fauna Habitat   | RoW 120                 | Clearing Limit             | ESA Cat A Constraints | ESA Cat B Constraints |
| Well Pad        | Fairview Lot 20 FTY1805 | Vegetation Management Area | ESA Cat A Primary     | ESA Cat B Primary     |

1:14,000 (@ A4)  
 0 100 200 300 400  
 Metres  
 Map Projection: Universal Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 55



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**RoW 120 and FV11-13**

**Figure 5**

## 2.5 RoW 120 and FV11-13

### 2.5.1 Approvals and actions summary for RoW 120 and FV11-13

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.5.2 Regional ecosystems

#### *Regional ecosystems mapped*

RoW 120 is located within two no concern at present RE polygons mapped as 11.10.1/11.10.1 and 11.10.1/11.10.13a. Well pad FV11-13 is located within the no concern at present RE polygon mapped as 11.10.1/11.10.1. Endangered RE 11.9.4a is also mapped within 200 m of the RoW and well pad. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.13a: *Eucalyptus cloeziana* +/- *E. melanoleuca* +/- *Corymbia bunites* +/- *E. sphaerocarpa* woodland to open-forest.
- 11.9.4a: Semi-evergreen vine thicket, generally dominated by a low tree layer (5-10 m high) which is floristically diverse and variable.

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygons 11.10.1/11.10.1 and 11.10.1/11.10.13a determined that the vegetation composition is more consistent with the no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps

RE 11.9.4a was also field validated to be correctly mapped.

Field validation points are shown on Figure 5 (Q 26). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.5.3 Environmentally sensitive areas

#### ***Environmentally sensitive areas mapped***

- Category A ESA
  - None mapped within RoW 120 and FV11-13 and within 1 km of the RoW or well pad
- Category B ESA
  - None mapped within the RoW or well pad
  - A Category B ESA (Endangered RE) including primary and secondary protection zones is located within 1 km of the RoW and well pad.
  - RoW 120 intersects the primary and secondary protection zones of the Category B ESA (Endangered RE).
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoW and well pad are contained

#### ***Environmentally sensitive areas field validation***

- Category B ESA

Mapped endangered RE 11.9.4a was field validated to be correctly mapped.

#### **Approval requirement or further action**

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

### 2.5.4 Threatened ecological communities

#### ***Threatened ecological communities mapped***

No TECs are mapped within RoW 120 and FV11-13.

RE 11.9.4a, which is mapped within 300 m of the RoW and well pad, is a constituent RE of the SEVT TEC.

#### ***Threatened ecological communities field validation***

RE 11.9.4a was field validated to be correctly mapped. Therefore, the SEVT TEC is also correctly mapped.

#### **Approval requirement or further action**

None

### 2.5.5 Essential habitat

#### ***Essential habitat mapped***

No essential habitat mapped under the VM Act is present within RoW 120 and FV11-13 or within 200 m of the RoW or well pad.

Medium value essential habitat mapped under the BPA mapping is located within the RoW and well pad footprints. This mapping is associated with the mapped REs over the area as discussed in Section 2.5.2.

### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of the mapped RE polygons 11.10.1/11.10.1 and 11.10.1/11.10.13a is presented in Section 2.5.2.

### **Approval requirement or further action**

None

### 2.5.6 Vegetation community and habitat values

The following vegetation communities occur over RoW 120 and FV11-13:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills

The semi-evergreen vine thicket vegetation community, associated with RE 11.9.4a, is also located within 200 m of the RoW and well pad.

Descriptions of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 5 (VC 1, VC 2, HA 19 and KH 19).

### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

### 2.5.7 Threatened species

#### ***Threatened species field validation***

No threatened flora species were recorded from RoW 120 and FV11-13 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat, was recorded from field assessments of RoW 120. Further information relating to the threatened species records is contained within Section 3.

#### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoW and well pad (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### 2.5.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoW 120 and FV11-13. Fauna habitat features recorded included hollow bearing trees, hollow stag trees and nearby rocky outcrops and rock crevices/caves. Locations of these features are mapped on Figure 5 and are presented in Appendix D.

### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

## 2.5.9 Watercourses

### ***Watercourses mapped***

No mapped watercourses are located within RoW 120 and FV11-13 or within 100 m of the RoW or well pad.

### ***Watercourses field validation***

No field validation undertaken or required.

### **Approval requirement or further action**

None

## 2.5.10 Wetlands, lakes and springs

### ***Wetlands, lakes and springs mapped***

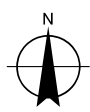
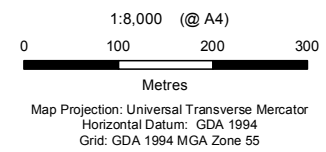
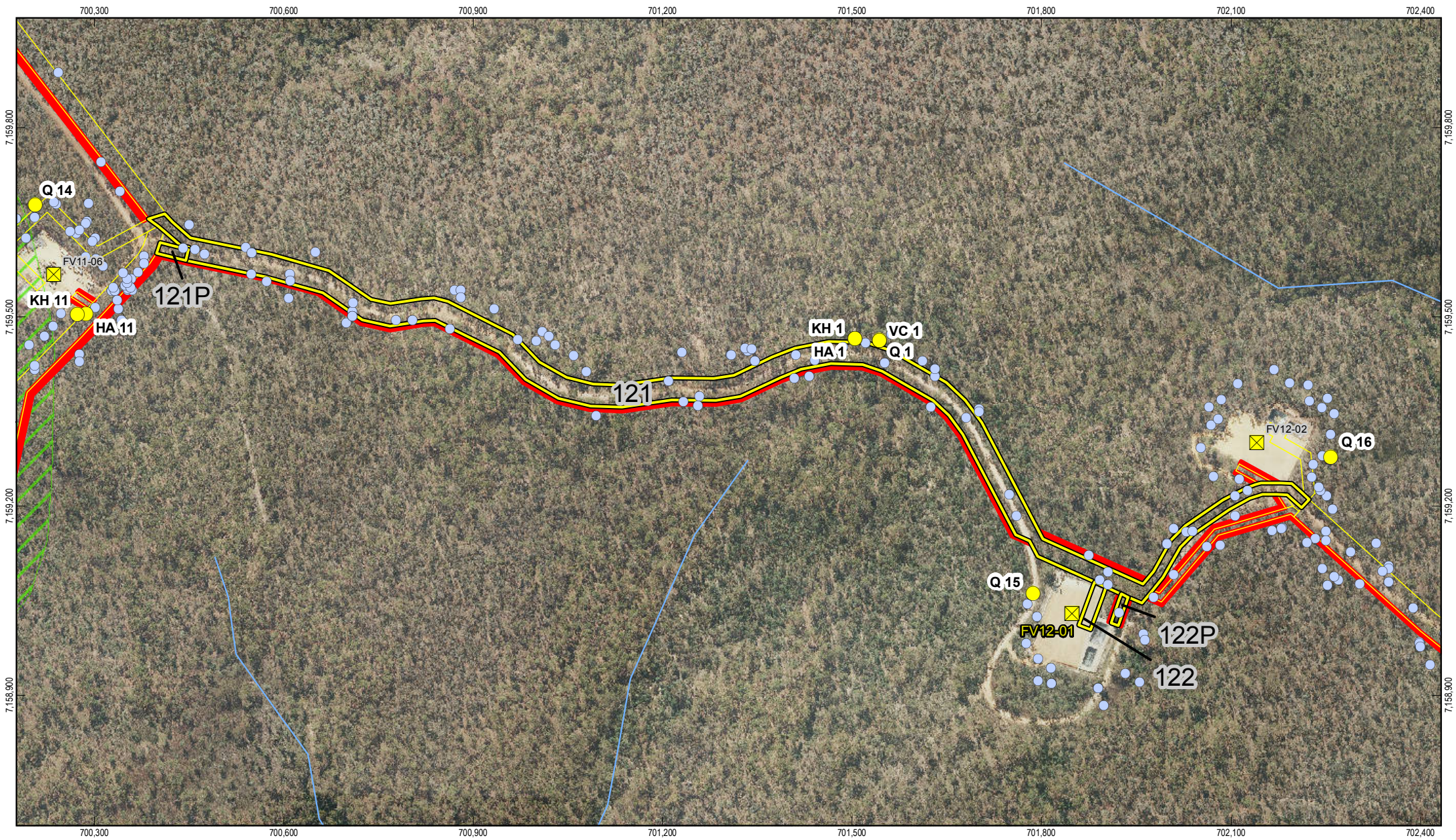
No mapped wetlands, lakes or springs are located within RoW 120 and FV11-13 or are within 300 m of this RoW and well pad.

### ***Wetlands, lakes and springs field validation***

No field validation undertaken or required.

### **Approval requirement or further action**

None



LEGEND			
<span style="color: yellow;">●</span>	Assessment Site		Fairview Lot 20 FTY1805
<span style="color: blue;">●</span>	Fauna Habitat		Cadastre
	Watercourse		Clearing Limit
	RoW 121, RoW121P,		Vegetation Management Area
	RoW 122 and RoW 122P		Essential Habitat
	ESA Cat A Constraints		ESA Cat B Constraints
	ESA Cat A Primary		ESA Cat B Primary
	ESA Cat A Secondary		



**Santos**

Santos GLNG  
 Fairview Lot 20 Ecological Assessments  
 RoW 121, RoW 121P,  
 RoW 122, RoW 122P  
 and FV12-01

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**Figure 6**

G:\41\27125\GIS\Maps\MXD\41\_2712504\_023\_ROW6\_Rev0.mxd  
 145 Ann St Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com  
 © 2013. Whilst every care has been taken to prepare this map, GHD (and Santos, ESRI) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.  
 Data source: Santos: Well Pad Locations, Cadastre, Clearing Limit, Vegetation Management Area, Watercourse, Imagery, Environmentally Sensitive Areas, Essential Habitat/Supplied October 2013; ESRI: Hillshade/2008; GHD: Assessment Site, Fauna Habitat/2013. Created by: AF

## 2.6 RoW 121, RoW 121P, RoW 122 and 122P and FV12-01

### 2.6.1 Approvals and actions summary for RoW 121, 121P, 122, 122P and FV12-01

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.6.2 Regional ecosystems

#### *Regional ecosystems mapped*

RoWs 121, 121P, 122, 122P and FV12-01 are located within the no concern at present RE polygon mapped as 11.10.1/11.10.13a. No other RE types are mapped within 200 m of the RoWs and well pad. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.13a: *Eucalyptus cloeziana* +/- *E. melanoleuca* +/- *Corymbia bunites* +/- *E. sphaerocarpa* woodland to open-forest.

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygon of 11.10.1/11.10.13a determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps

Field validation points are shown on Figure 6 (Q 1 and Q 15). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.6.3 Environmentally sensitive areas

#### *Environmentally sensitive areas mapped*

- Category A ESA



- None mapped within RoWs 121, 121P, 122, 122P and FV12-01 and within 1 km of RoWs or well pad
- Category B ESA
  - None mapped within RoWs 121, 121P, 122, 122P and FV12-01
  - A Category B ESA (Endangered RE) including primary and secondary protection zones is located within 1 km of RoWs 121, 121P, 122 and 122P. No ESAs are mapped within 1 km of FV12-01.
  - RoWs 121 and 121P intersect the secondary protection zones of the Category B ESA (Endangered RE).
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained

#### ***Environmentally sensitive areas field validation***

- Category B ESA

The mapped endangered RE 11.9.4a was field validated to be correctly mapped.

#### **Approval requirement or further action**

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

### 2.6.4 Threatened ecological communities

#### ***Threatened ecological communities mapped***

No TECs are mapped within RoWs 121, 121P, 122, 122P and FV12-01 or within 300 m of the RoWs and well pad.

#### ***Threatened ecological communities field validation***

Not applicable to RoWs 121, 121P, 122, 122P and FV12-01.

#### **Approval requirement or further action**

None

### 2.6.5 Essential habitat

#### ***Essential habitat mapped***

No essential habitat mapped under the VM Act is present within RoWs 121, 121P, 122, 122P and FV12-01 or within 200 m of the RoWs or well pad.

Medium value essential habitat mapped under the BPA mapping is located within the RoWs and well pad footprints. This mapping is associated with the mapped RE polygon 11.10.1/11.10.13a discussed in Section 2.6.2.

#### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.6.2.

#### **Approval requirement or further action**

None

### 2.6.6 Vegetation community and habitat values

The following vegetation communities occur over RoWs 121, 121P, 122, 122P and FV12-01:

- Mixed eucalypt woodland to open forest on plateaus and gently sloping foothills

Description of this vegetation community and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 6 (VC 1, HA 1, KH 1).

#### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

### 2.6.7 Threatened species

#### ***Threatened species field validation***

No threatened flora species were recorded from RoWs 121, 121P, 122, 122P and FV12-01 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the squatter pigeon, was recorded from field assessments close to RoWs 122, 122P and FV12-01. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

#### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoWs and well pad (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

#### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### 2.6.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 121, 121P, 122, 122P and FV12-01. Fauna habitat features recorded included hollow bearing trees, hollow stag trees, hollow logs, exfoliating bark, termite mounds and nests. Locations of these features are mapped on Figure 6 and are presented in Appendix D.

#### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### 2.6.9 Watercourses

#### ***Watercourses mapped***

No mapped watercourses are located within RoWs 121, 121P, 122, 122P and FV12-01 or within 100 m of these RoWs or well pad.

***Watercourses field validation***

No field validation undertaken or required.

**Approval requirement or further action**

None

2.6.10 Wetlands, lakes and springs

***Wetlands, lakes and springs mapped***

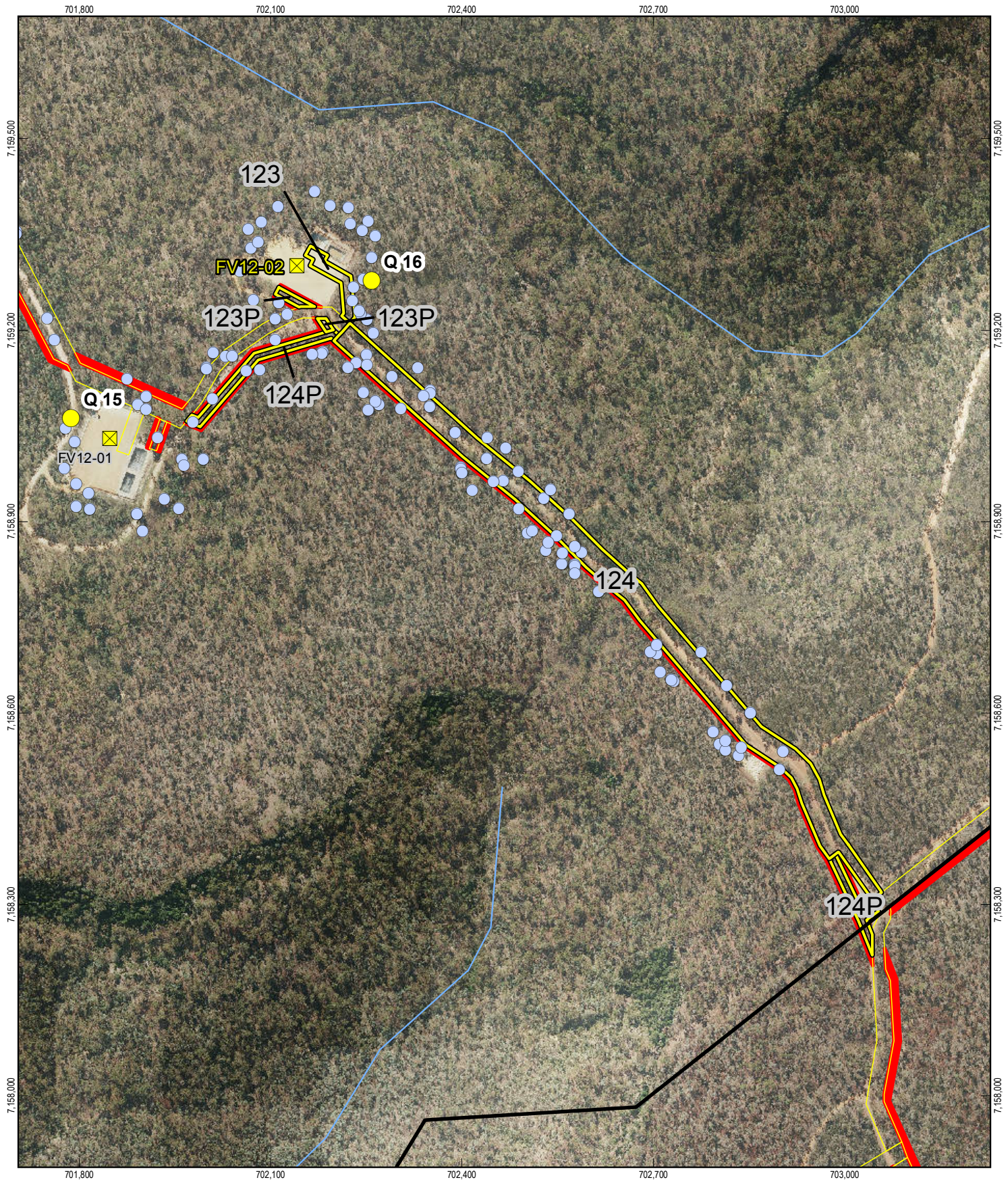
No mapped wetlands, lakes or springs are located within RoWs 121, 121P, 122, 122P and FV12-01 or within 300 m of these RoWs or well pad.

***Wetlands, lakes and springs field validation***

No field validation undertaken or required.

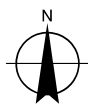
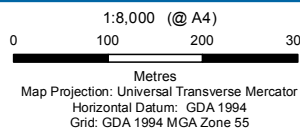
**Approval requirement or further action**

None



**LEGEND**

- |                 |   |                            |                       |                       |
|-----------------|---|----------------------------|-----------------------|-----------------------|
| Assessment Site | Watercourse                             | Cadastre                   | Essential Habitat     | ESA Cat A Secondary   |
| Fauna Habitat   | RoW 123, RoW 123P, RoW 124 and RoW 124P | Clearing Limit             | ESA Cat A Constraints | ESA Cat B Constraints |
| Well Pad        | Fairview Lot 20 FTY1805                 | Vegetation Management Area | ESA Cat A Primary     | ESA Cat B Primary     |



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**RoW 123, RoW 123P, RoW 124,  
RoW 124P and FV12-02**

**Figure 7**

## 2.7 RoW 123, RoW 123P, RoW 124, RoW 124P and FV12-02

### 2.7.1 Approvals and actions summary for RoW 123, 123P, 124, 124P and FV12-02

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.7.2 Regional ecosystems

#### **Regional ecosystems mapped**

RoWs 123, 123P, 124, 124P and FV12-02 are located within the no concern at present RE polygon mapped as 11.10.1/11.10.13a. No other RE types are mapped within 200 m of the RoWs and well pad. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.13a: *Eucalyptus cloeziana* +/- *E. melanoleuca* +/- *Corymbia bunites* +/- *E. sphaerocarpa* woodland to open-forest.

#### **Regional ecosystems field validation**

Field validation of the mapped no concern at present RE polygon of 11.10.1/11.10.13a determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps

Field validation points are shown on Figure 7 (Q 16). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.7.3 Environmentally sensitive areas

#### ***Environmentally sensitive areas mapped***

- Category A ESA
  - None mapped within RoWs 123, 123P, 124, 124P and FV12-02 and within 1 km of RoWs or well pad
- Category B ESA
  - None mapped within RoWs 123, 123P, 124, 124P and FV12-02 and within 1 km of RoWs or well pad
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained

#### ***Environmentally sensitive areas field validation***

Not applicable to RoWs 123, 123P, 124, 124P and FV12-02.

#### **Approval requirement or further action**

None

### 2.7.4 Threatened ecological communities

#### ***Threatened ecological communities mapped***

No TECs are mapped within RoWs 123, 123P, 124, 124P and FV12-02 or within 300 m of the RoWs and well pad.

#### ***Threatened ecological communities field validation***

Not applicable to RoWs 123, 123P, 124, 124P and FV12-02.

#### **Approval requirement or further action**

None

### 2.7.5 Essential habitat

#### ***Essential habitat mapped***

No essential habitat mapped under the VM Act is present within RoWs 123, 123P, 124, 124P and FV12-02 or within 200 m of the RoWs or well pad.

Medium value essential habitat mapped under the BPA mapping is located within the RoWs and well pad footprints. This mapping is associated with the mapped RE polygon 11.10.1/11.10.13a discussed in Section 2.7.2.

#### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.7.2.

#### **Approval requirement or further action**

None

### 2.7.6 Vegetation community and habitat values

The following vegetation communities occur over RoWs 123, 123P, 124, 124P and FV12-02:

- Mixed eucalypt woodland to open forest on plateaus and gently sloping foothills

Description of this vegetation community and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 7 (VC 1, HA 1, KH 1).

#### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

### 2.7.7 Threatened species

#### ***Threatened species field validation***

No threatened flora species were recorded from RoWs 123, 123P, 124, 124P and FV12-02 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the squatter pigeon, was recorded from field assessments close to the RoW 124P. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

#### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoWs and well pad (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

#### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### 2.7.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 123, 123P, 124, 124P and FV12-02. Fauna habitat features recorded included hollow bearing trees, hollow stag trees and hollow logs. Locations of these features are mapped on Figure 7 and are presented in Appendix D.

#### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### 2.7.9 Watercourses

#### ***Watercourses mapped***

No mapped watercourses are located within RoWs 123, 123P, 124, 124P and FV12-02 or within 100 m of these RoWs or well pad.

***Watercourses field validation***

No field validation undertaken or required.

**Approval requirement or further action**

None

2.7.10 Wetlands, lakes and springs

***Wetlands, lakes and springs mapped***

No mapped wetlands, lakes or springs are located within RoWs 123, 123P, 124, 124P and FV12-02 or within 300 m of these RoWs or well pad.

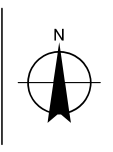
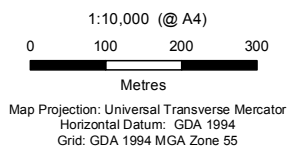
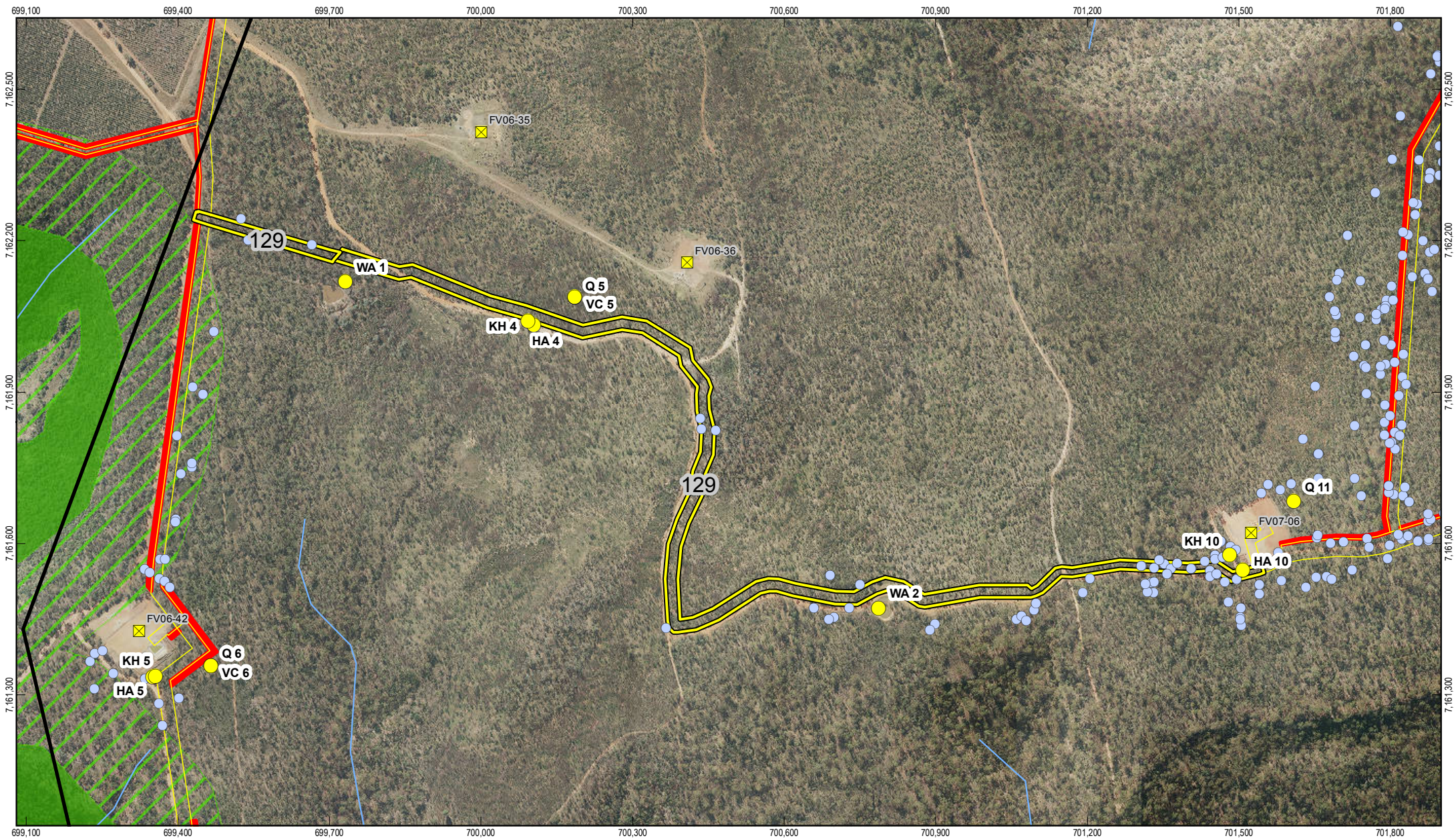
***Wetlands, lakes and springs field validation***

No field validation undertaken or required.

**Approval requirement or further action**

None





LEGEND	
	Assessment Site
	Fauna Habitat
	Watercourse
	RoW 129
	Fairview Lot 20 FTY1805
	Cadastre
	Clearing Limit
	Vegetation Management Area
	Essential Habitat
	ESA Cat A Constraints
	ESA Cat A Primary
	ESA Cat A Secondary
	ESA Cat B Constraints
	ESA Cat B Primary



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RoW 129 Figure 8

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Data source: Santos: Well Pad Locations, Cadastre, Clearing Limit, Vegetation Management Area, Watercourse, Imagery, Environmentally Sensitive Areas, Essential Habitat/Supplied October 2013; ESRI: Hillshade/2008; GHD: Assessment Site, Fauna Habitat/2013. Created by: AF

## 2.8 RoW 129

### 2.8.1 Approvals and actions summary for RoW 129

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.8.2 Regional ecosystems

#### *Regional ecosystems mapped*

RoW 129 is located within non-remnant vegetation and the no concern at present RE polygon mapped as 11.10.1/11.10.13a. No other RE types are mapped within 200 m of the RoW. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.13a: *Eucalyptus cloeziana* +/- *E. melanoleuca* +/- *Corymbia bunites* +/- *E. sphaerocarpa* woodland to open-forest.

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygon of 11.10.1/11.10.13a determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps

Field validation points are shown on Figure 8 (Q 5). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.8.3 Environmentally sensitive areas

#### *Environmentally sensitive areas mapped*

- Category A ESA
  - None mapped within RoW 129 and within 1 km of RoW

- Category B ESA
  - None mapped within RoW
  - A Category B ESA (Endangered RE) including primary and secondary protection zones is located within 1 km of the RoW
  - The western portion of RoW 129 is located within the secondary protection zone of the Category B ESA (Endangered RE).
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained

#### ***Environmentally sensitive areas field validation***

- Category B ESA

Mapped endangered RE 11.9.4a was field validated to be correctly mapped.

#### **Approval requirement or further action**

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

#### 2.8.4 Threatened ecological communities

##### ***Threatened ecological communities mapped***

No TECs are mapped within RoW 129.

RE 11.9.4a which is mapped within 300 m of the RoWs and well pad is a constituent RE of the SEVT TEC.

##### ***Threatened ecological communities field validation***

RE 11.9.4a was field validated to be correctly mapped. Therefore, the SEVT TEC is also correctly mapped.

#### **Approval requirement or further action**

None

#### 2.8.5 Essential habitat

##### ***Essential habitat mapped***

No essential habitat mapped under the VM Act is present within RoW 129 or within 200 m of the RoW.

Medium value essential habitat mapped under the BPA mapping is located within the RoW footprint. This mapping is associated with the mapped RE polygon 11.10.1/11.10.13a discussed in Section 2.8.2.

##### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.8.2.

#### **Approval requirement or further action**

None

## 2.8.6 Vegetation community and habitat values

The following vegetation communities occur over RoW 129:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills
- Non-remnant shrubby regrowth and cleared pastures

Descriptions of these vegetation community and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 8 (VC 5, HA 4, KH 4).

### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

## 2.8.7 Threatened species

### ***Threatened species field validation***

No threatened flora species were recorded from RoW 129 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat, was recorded from field assessments of RoW 129. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoW (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

## 2.8.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoW 129. Fauna habitat features recorded included hollow bearing trees, hollow stag trees, hollow logs and farm dams. Locations of these features are mapped on Figure 8 and are presented in Appendix D.

### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

## 2.8.9 Watercourses

### ***Watercourses mapped***

No mapped watercourses are located within RoW 129 or within 100 m of the RoW.

### ***Watercourses field validation***

No field validation undertaken or required.

### **Approval requirement or further action**

None

#### 2.8.10 Wetlands, lakes and springs

##### ***Wetlands, lakes and springs mapped***

No mapped wetlands, lakes or springs are located within RoW 129 or within 300 m of these RoWs or well pad.

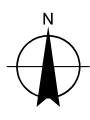
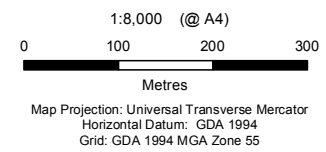
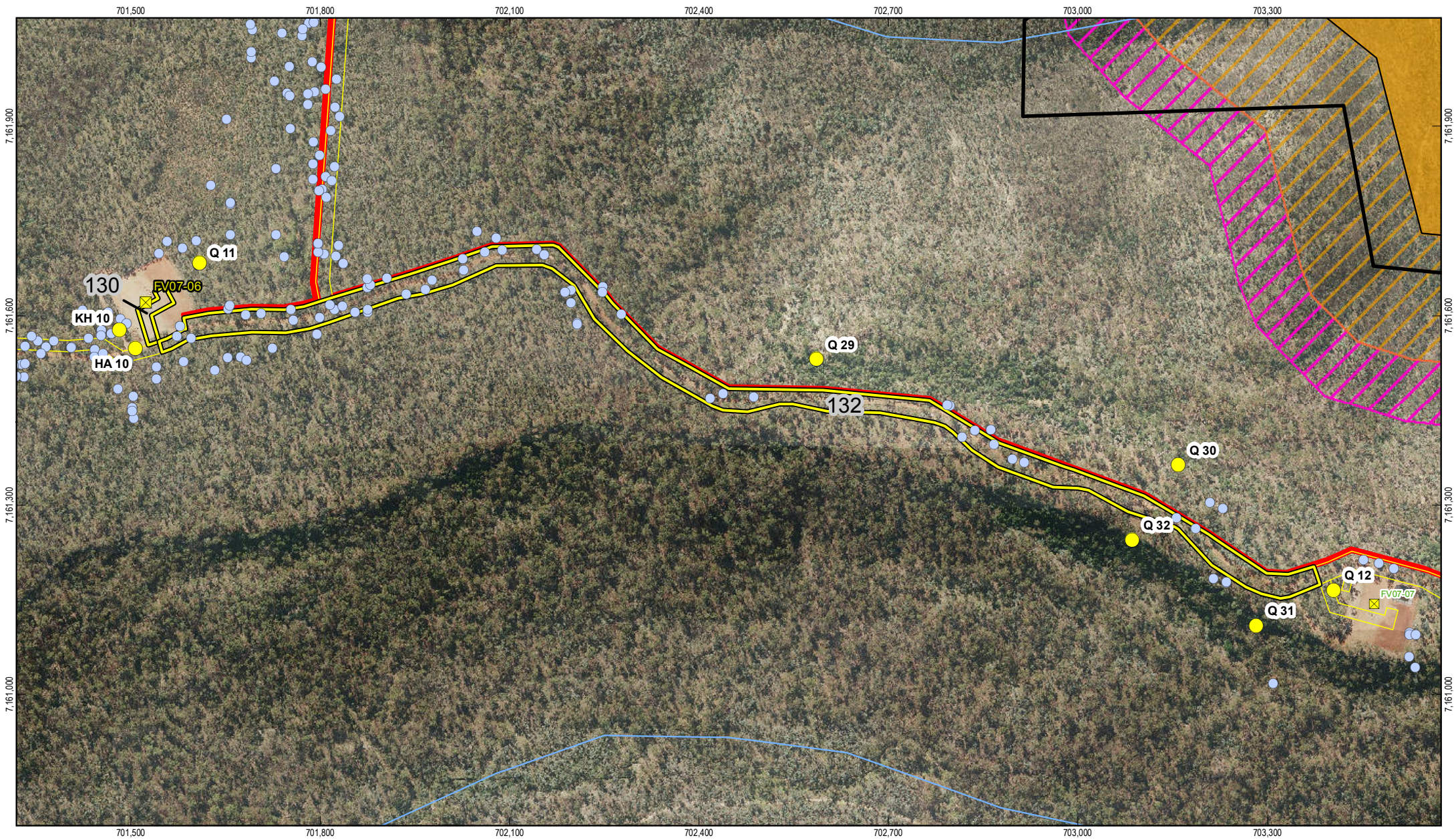
Two farm dams identified from aerial imagery are located within 300 m of RoW 129.

##### ***Wetlands, lakes and springs field validation***

Field validation of these farm dams, located at WA 1 and WA 2 (Figure 8), determined that these dams are not classified as wetlands under the EA as they are modified features representative of artificial stand-alone water storages that are not within a natural water body or channel.

### **Approval requirement or further action**

None



LEGEND	
	Assessment Site
	Fauna Habitat
	Well Pad
	Watercourse
	RoW 130, RoW 131 and RoW 132
	Fairview Lot 20 FTY1805
	Cadastral
	Clearing Limit
	Vegetation Management Area
	Essential Habitat
	ESA Cat A Constraints
	ESA Cat A Primary
	ESA Cat A Secondary
	ESA Cat B Constraints
	ESA Cat B Primary



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RoW 130, RoW 131,  
 RoW 132 and FV07-06

Figure 9

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Data source: Santos: Well Pad Locations, Cadastral, Clearing Limit, Vegetation Management Area, Watercourse, Imagery, Environmentally Sensitive Areas, Essential Habitat/Supplied October 2013; ESRI: Hillshade/2008; GHD: Assessment Site, Fauna Habitat/2013. Created by: AF

## 2.9 RoW 130, RoW 131, RoW 132 and FV07-06

### 2.9.1 Approvals and actions summary for RoW 130, 131, 132 and FV07-06

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.9.2 Regional ecosystems

#### *Regional ecosystems mapped*

RoWs 130, 131 and part of 132 are located entirely within no concern at present RE polygon mapped as 11.10.1/11.10.13a. The remainder of RoW 132 and FV06-07 are located entirely within no concern at present RE polygon mapped as 11.10.1/11.10.1. Additionally, the of concern RE polygon 11.3.39/11.3.2 is mapped within 200 m of RoW 132. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.13a: *Eucalyptus cloeziana* +/- *E. melanoleuca* +/- *Corymbia bunites* +/- *E. sphaerocarpa* woodland to open-forest.
- 11.3.39: *Eucalyptus melanophloia* +/- *E. chloroclada* woodland on undulating plains and valleys with sandy soils
- 11.3.2: *Eucalyptus populnea* woodland on alluvial plains

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygons of 11.10.1/11.10.13a and 11.10.1/11.10.1 determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus* spp., *Corymbia* spp., *Acacia* spp. woodland on coarse-grained sedimentary rocks. Crests and scarps

Field validation points are shown on Figure 9 (Q 11, Q 29, Q 30, Q 31 and Q 32). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

## 2.9.3 Environmentally sensitive areas

### *Environmentally sensitive areas mapped*

- Category A ESA
  - None mapped within RoWs 130, 131, 132 and FV06-07 and within 1 km of RoW
- Category B ESA
  - None mapped within RoWs 130, 131, 132 or FV07-06
  - None mapped within 1 km of RoWs 130, 131, 132 or FV07-06
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained
  - Of concern RE: 11.3.39/11.3.2 is mapped within 1 km of RoW 132

### *Environmentally sensitive areas field validation*

- Category B ESA within 1 km of RoW 132

An area mapped as no concern at present 11.10.1/11.10.1 was field validated to contain endangered RE 11.9.4a. This area has been field-validated during previous field surveys undertaken by Aurecon in 2011. These field validation results have been incorporated into the field validated RE mapping.

- Category C ESA within 1 km of RoW 133

Mapped of concern RE 11.3.39/11.3.2 within Lot 20 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.7. The full extent of mapped RE 11.3.39/11.3.2 outside of Lot 20 was not field-validated. However, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. Thus, the of concern RE, and therefore the Category C ESA, is not considered to exist within 1 km of RoW 133. Field validation mapping amendments has remapped relevant areas as not being representative of a Category C ESA containing an of concern RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

### **Approval requirement or further action**

Only limited petroleum activities are permitted within the primary protection zone of Category C ESAs as per the EA conditions.

## 2.9.4 Threatened ecological communities

### *Threatened ecological communities mapped*

No TECs are mapped within RoWs 130, 131, 132 and FV07-06.

### *Threatened ecological communities field validation*

RE 11.9.4a was field validated within 300 m of the RoW 132. Therefore, the SEVT TEC has also been field validated as present within 300 m of RoW 132.

### **Approval requirement or further action**

None



## 2.9.5 Essential habitat

### ***Essential habitat mapped***

No essential habitat mapped under the VM Act is present within RoWs 130, 131, 132 and FV07-06 or within 200 m of the RoWs and well pad.

Medium value essential habitat mapped under the BPA mapping is located within the RoW and well pad footprints. This mapping is associated with the mapped RE polygon 11.10.1/11.10.13a discussed in Section 2.9.2.

### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.9.2.

### **Approval requirement or further action**

None

## 2.9.6 Vegetation community and habitat values

The following vegetation communities occur over RoWs 130, 131, 132 and FV07-06:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills

The semi-evergreen vine thicket vegetation community, associated with RE 11.9.4a, is also located within 200 m of the RoW 132.

Description of this vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 9 (VC 3, HA 10 and KH 10).

### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

## 2.9.7 Threatened species

### ***Threatened species field validation***

No threatened flora species were recorded from RoWs 130, 131, 132 and FV07-06 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat, was recorded from field assessments of RoW 133, located adjacent to RoWs 130, 131 and FV07-06. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoWs and well pad (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

## 2.9.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 130, 131, 132 and FV07-06. Fauna habitat features recorded included hollow bearing trees, hollow stag trees, hollow logs, termite mounds, nests, exfoliating bark and rocky outcrops. Locations of these features are mapped on Figure 9 and are presented in Appendix D.

### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

## 2.9.9 Watercourses

### ***Watercourses mapped***

No mapped watercourses are located within RoWs 130, 131, 132 and FV07-06 or within 100 m of the RoW.

### ***Watercourses field validation***

No field validation undertaken or required.

### **Approval requirement or further action**

None

## 2.9.10 Wetlands, lakes and springs

### ***Wetlands, lakes and springs mapped***

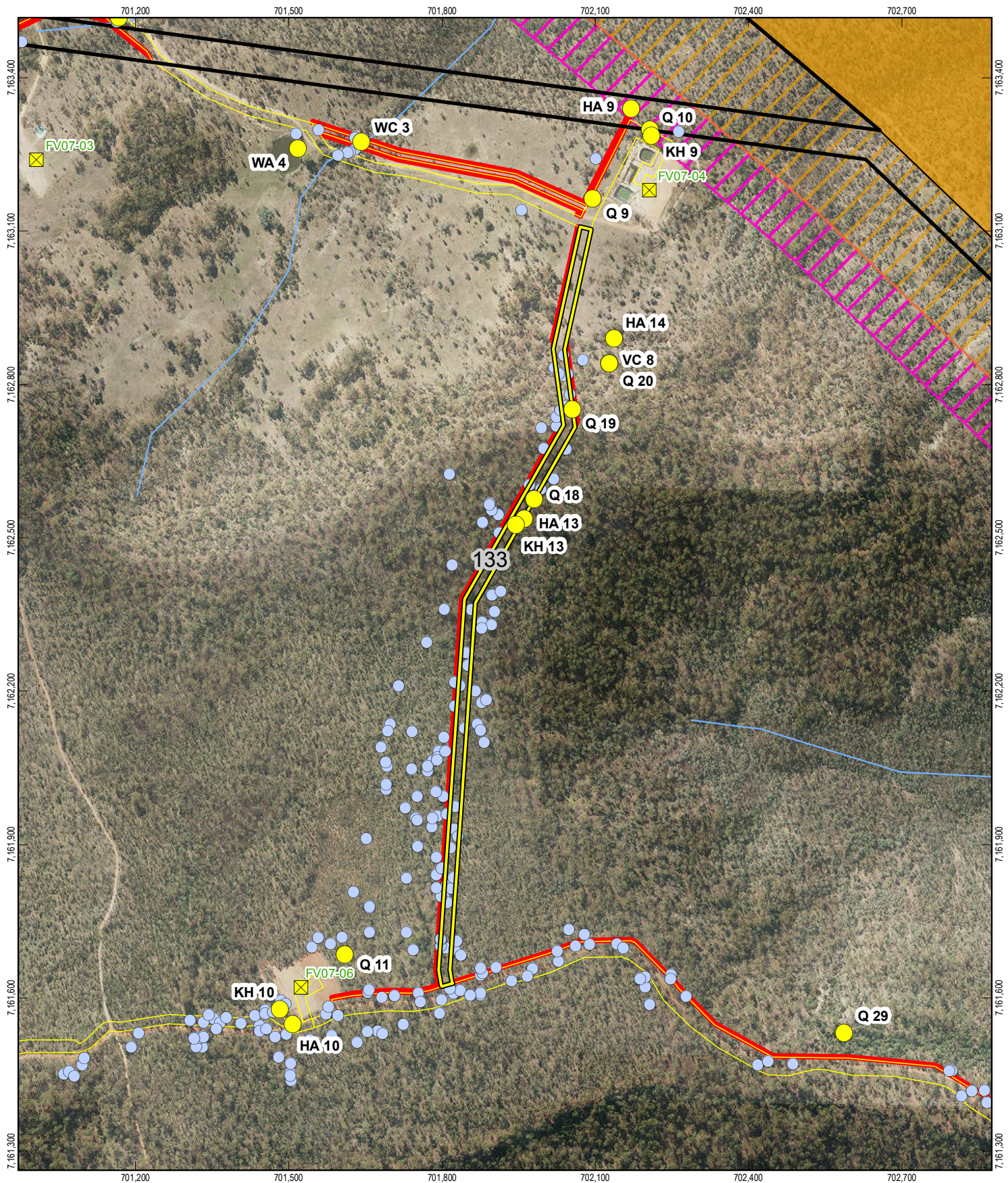
No mapped wetlands, lakes or springs are located within RoWs 130, 131, 132 and FV07-06. However, a DEHP Queensland Wetland is mapped within 300 m of RoW 132. This wetland is associated with the of concern wetland RE 11.3.2.

### ***Wetlands, lakes and springs field validation***

Field validation of the REs within and adjacent to RoW 132 found the wetland RE polygon located within 300 m of the RoW was more consistent with the no concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation confirmed that no wetlands occur within RoW 132 or within 300 m of the RoW. Field validation points for the wetland REs can be found in Figure 2 to Figure 17.

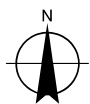
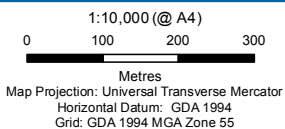
### **Approval requirement or further action**

None



**LEGEND**

- |                 |                         |                            |                       |                       |
|-----------------|-------------------------|----------------------------|-----------------------|-----------------------|
| Assessment Site | Watercourse             | Cadastre                   | Essential Habitat     | ESA Cat A Secondary   |
| Fauna Habitat   | RoW 133                 | Clearing Limit             | ESA Cat A Constraints | ESA Cat B Constraints |
| Well Pad        | Fairview Lot 20 FTY1805 | Vegetation Management Area | ESA Cat A Primary     | ESA Cat B Primary     |



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RoW 133

Figure 10

## 2.10 RoW 133

### 2.10.1 Approvals and actions summary for RoW 133

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.10.2 Regional ecosystems

#### *Regional ecosystems mapped*

The majority of RoW 133 is located within no concern at present RE polygon mapped as 11.10.1/11.10.13a. Additionally, a small portion of the RoW is located within of concern RE polygon mapped as 11.3.39/11.3.2. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.13a: *Eucalyptus cloeziana* +/- *E. melanoleuca* +/- *Corymbia bunites* +/- *E. sphaerocarpa* woodland to open-forest.
- 11.3.39: *Eucalyptus melanophloia* +/- *E. chloroclada* woodland on undulating plains and valleys with sandy soils
- 11.3.2: *Eucalyptus populnea* woodland on alluvial plains

The remainder RoW 133 is mapped as non-remnant vegetation.

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygons of 11.10.1/11.10.13a determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4. Additionally, field validation of the mapped of concern RE polygon of 11.3.39/11.3.2 determined that the landzone and vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.7:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps
- 11.10.7: *Eucalyptus crebra* woodland on coarse-grained sedimentary rocks

Field validation points are shown on Figure 10 (Q 18, Q 19, Q 20). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

#### 2.10.3 Environmentally sensitive areas

##### ***Environmentally sensitive areas mapped***

- Category A ESA
  - None mapped within RoW 133
  - A Category A ESA (National Park) including primary and secondary protection zones are located within 1 km of the RoW
- Category B ESA
  - None mapped within RoW 133
  - None mapped within 1 km of RoW 133
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained
  - Of concern RE: 11.3.39/11.3.2 is mapped across a small portion of RoW 133 and within 1 km of RoW 133

##### ***Environmentally sensitive areas field validation***

- Category B ESA within 1 km of RoW 133

An area of mapped no concern at present RE 11.10.1/11.10.1 was field validated as being consistent with the endangered RE 11.9.4a. This area has been field-validated during previous field surveys undertaken by Aurecon in 2011. This field-validated Category B ESA is within 1 km of the RoW.

- Category C ESA within RoW 133
- Category C ESA within 1 km of RoW 133

Mapped of concern RE 11.3.39/11.3.2 within Lot 20 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.7. The full extent of mapped RE 11.3.39/11.3.2 outside of Lot 20 was not field-validated. However, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. Thus, the of concern RE, and therefore the Category C ESA, is not considered to exist within 1 km of RoW 133. Field validation mapping amendments has remapped relevant areas as not being representative of a Category C ESA containing an of concern RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

### **Approval requirement or further action**

Only limited petroleum activities are permitted within the secondary protection zone of Category A ESAs as per the Environmental Authority (EA) conditions.

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

#### 2.10.4 Threatened ecological communities

##### ***Threatened ecological communities mapped***

No TECs are mapped within RoW 133

##### ***Threatened ecological communities field validation***

RE 11.9.5 was field validated within 300 m of the RoW 133. The field validated 11.9.5 RE polygon does not meet the size requirements to be considered remnant vegetation. However, it does meet the size requirements for brigalow TEC. Therefore, the brigalow TEC has been field validated as present within 300 m of RoW 133.

##### **Approval requirement or further action**

None

#### 2.10.5 Essential habitat

##### ***Essential habitat mapped***

No essential habitat mapped under the VM Act is present within RoW 133 or within 200 m of the RoW.

Medium value essential habitat mapped under the BPA mapping is located within the majority of the RoW footprint. A small area of low value essential habitat mapped under the BPA mapping is also mapped within the RoW. This mapping is associated with the mapped RE polygon 11.10.1/11.10.13a discussed in Section 2.10.2.

##### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.10.2.

##### **Approval requirement or further action**

None

#### 2.10.6 Vegetation community and habitat values

The following vegetation communities occur over RoW 133:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills
- Mixed eucalypt woodland to open-forest on steep rocky slopes
- Non-remnant shrubby regrowth and cleared pastures

Descriptions of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 10 (VC 20, HA 13, HA 14 and KH 13).

##### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

### 2.10.7 Threatened species

#### ***Threatened species field validation***

No threatened flora species were recorded from RoW 133 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat, was recorded from field assessments of RoW 133. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

#### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoW (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

#### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### 2.10.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoW 133. Fauna habitat features recorded included hollow bearing trees, hollow stag trees, hollow logs, nests and rocky outcrops. Locations of these features are mapped on Figure 10 and are presented in Appendix D.

#### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

### 2.10.9 Watercourses

#### ***Watercourses mapped***

No mapped watercourses are located within RoW 133 or within 100 m of the RoW.

#### ***Watercourses field validation***

No field validation undertaken or required.

#### **Approval requirement or further action**

None

### 2.10.10 Wetlands, lakes and springs

#### ***Wetlands, lakes and springs mapped***

A DEHP mapped Queensland wetland occurs across and within 300 m of RoW 133. This wetland is associated with the of concern wetland RE 11.3.2.

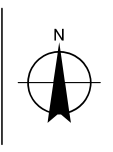
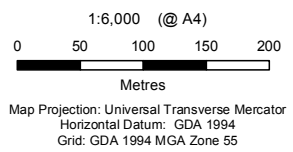
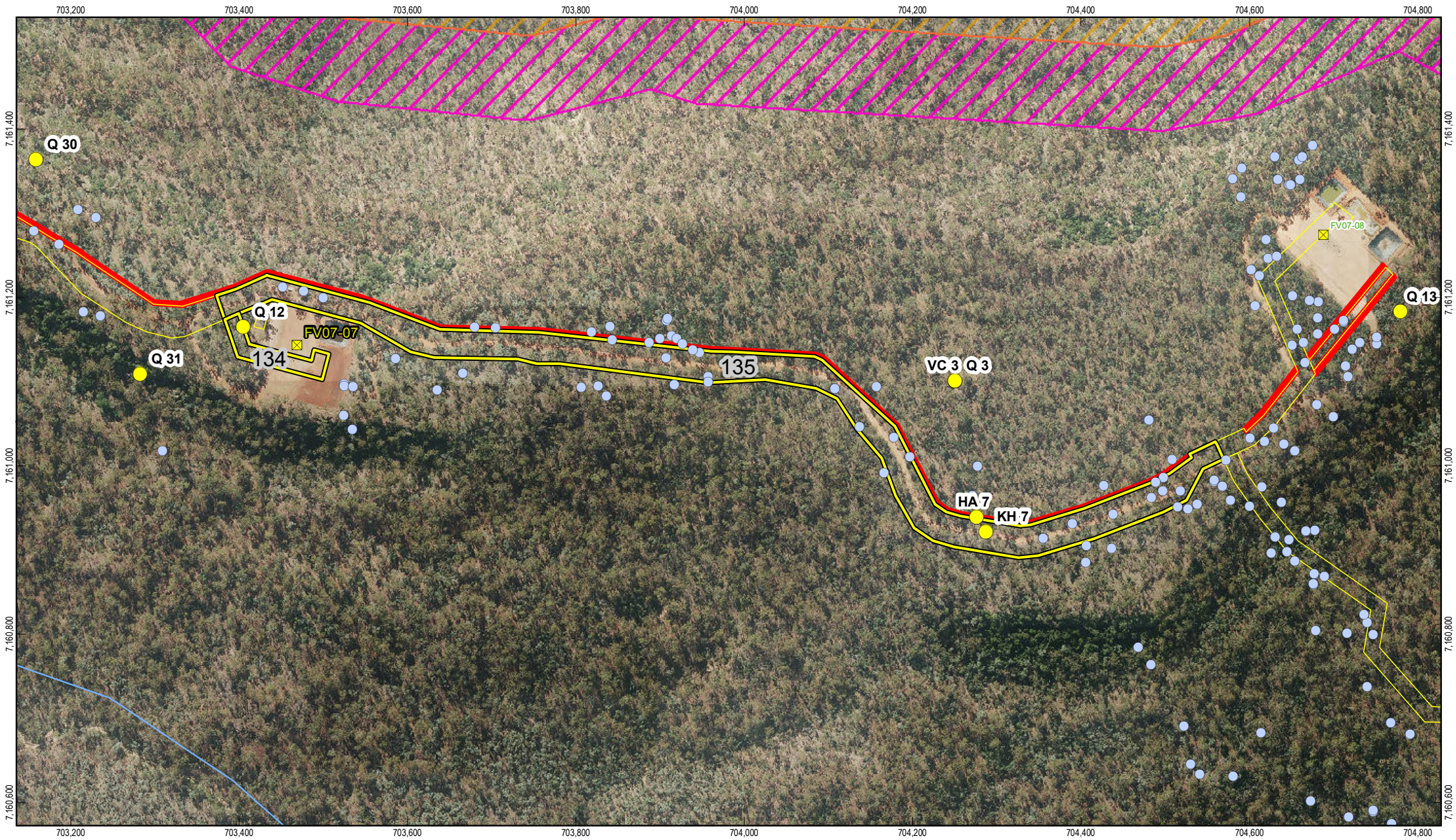
### ***Wetlands, lakes and springs field validation***

Field validation of the REs within and adjacent to RoW 137 found the wetland RE polygon located within 300 m of the RoW was more consistent with the no concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation confirmed that no wetlands occur within RoW 133 or within 300 m of the RoW. Field validation points for the wetland REs can be found in Figure 10.

### **Approval requirement or further action**

None





LEGEND	
	Assessment Site
	Fauna Habitat
	Well Pad
	Watercourse
	RoW 134 and RoW 135
	Fairview Lot 20 FTY1805
	Cadastral
	Clearing Limit
	Vegetation Management Area
	Essential Habitat
	ESA Cat A Constraints
	ESA Cat A Primary
	ESA Cat A Secondary
	ESA Cat B Constraints
	ESA Cat B Primary



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RoW 134, RoW 135  
 and FV07-07

Figure 11

G:\41\27125\GIS\Maps\MXD\41\_2712504\_028\_ROW11\_Rev0.mxd  
 145 Ann St Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com  
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 Data source: Santos: Well Pad Locations, Cadastral, Clearing Limit, Vegetation Management Area, Watercourse, Imagery, Environmentally Sensitive Areas, Essential Habitat/Supplied October 2013; ESRI: Hillshade/2008; GHD: Assessment Site, Fauna Habitat/2013. Created by: AF

## 2.11 RoW 134, RoW 135 and FV07-07

### 2.11.1 Approvals and actions summary for RoW 134, RoW 135 and FV07-07

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.11.2 Regional ecosystems

#### *Regional ecosystems mapped*

The RoWs 134, 135 and FV07-07 are located entirely within no concern at present RE polygon mapped as 11.10.1/11.10.1. The RE short description is as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygons of 11.10.1/11.10.1 determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps

Field validation points are shown on Figure 11 (Q 12 and Q 3). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.11.3 Environmentally sensitive areas

#### *Environmentally sensitive areas mapped*

- Category A ESA
  - None mapped within RoWs 134, 135 and FV07-07
  - A Category A ESA (National Park) including primary and secondary protection zones are located within 1 km of the RoW
- Category B ESA

- None mapped within RoWs 134, 135 and FV07-07
- None mapped within 1 km of RoWs 134, 135 and FV07-07
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained
  - Of concern RE: 11.3.39/11.3.2 and 11.10.13a/11.10.1/11.3.25 are mapped within 1 km of RoWs 134, 135 and FV07-07

#### ***Environmentally sensitive areas field validation***

- Category B ESA within 1 km of RoWs 134, 135 and FV07-07

An area mapped as no concern at present 11.10.1/11.10.1 was field validated to contain endangered RE 11.9.4a. This area has been field-validated during previous field surveys undertaken by Aurecon in 2011. These field validation results have been incorporated into the field validated RE mapping.

- Category C ESA within 1 km of RoWs 134, 135 and FV07-07

Mapped of concern RE 11.3.39/11.3.2 and 11.10.13a/11.10.1/11.3.25 within Lot 20 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.7. The full extent of mapped RE 11.3.39/11.3.2 and 11.10.13a/11.10.1/11.3.25 outside of Lot 20 was not field-validated. However, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. Thus, the of concern RE, and therefore the Category C ESA, is not considered to exist within 1 km of RoWs 134, 135 and FV07-07. Field validation mapping amendments has remapped relevant areas as not being representative of a Category C ESA containing an of concern RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Only limited petroleum activities are permitted within the secondary protection zone of Category A ESAs as per the Environmental Authority (EA) conditions.

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

#### 2.11.4 Threatened ecological communities

##### ***Threatened ecological communities mapped***

No TECs are mapped within RoWs 134, 135 and FV07-07.

##### ***Threatened ecological communities field validation***

RE 11.9.4a was field validated within 300 m of the RoWs 134, 135 and FV07-07. Therefore, the SEVT TEC has also been field validated as present within 300 m of the RoWs and well pad.

#### **Approval requirement or further action**

None

#### 2.11.5 Essential habitat

##### ***Essential habitat mapped***

No essential habitat mapped under the VM Act is present within RoWs 134, 135 and FV07-07 or within 200 m of the RoWs and well pad.

Medium value essential habitat mapped under the BPA mapping is located within the entire RoW and well pad footprints. This mapping is associated with the mapped RE polygon 11.10.1/11.10.1 discussed in Section 2.11.2.

#### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.11.2.

#### **Approval requirement or further action**

None

#### 2.11.6 Vegetation community and habitat values

The following vegetation communities occur over RoWs 134, 135 and FV07-07:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills
- Semi-evergreen vine thicket on rocky escarpments

Descriptions of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 11 (VC 3, HA 7, KH 7).

#### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

#### 2.11.7 Threatened species

##### ***Threatened species field validation***

No threatened flora species were recorded from RoWs 134, 135 and FV07-07 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat, was recorded from field assessments of RoW 135 and FV07-07. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

##### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoWs and well pad (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

#### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.11.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 134, 135 and FV07-07. Fauna habitat features recorded included hollow bearing trees, hollow stag trees, hollow logs, nests in termite

mounds, exfoliating bark and rocky outcrops. Locations of these features are mapped on Figure 11 and are presented in Appendix D.

#### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.11.9 Watercourses

##### ***Watercourses field validation***

No mapped watercourses are located within RoWs 134, 135 and FV07-07 or within 100 m of the RoWs and well pad.

##### ***Watercourses field validation***

No field validation undertaken or required.

#### **Approval requirement or further action**

None

#### 2.11.10 Wetlands, lakes and springs

##### ***Wetlands, lakes and springs mapped***

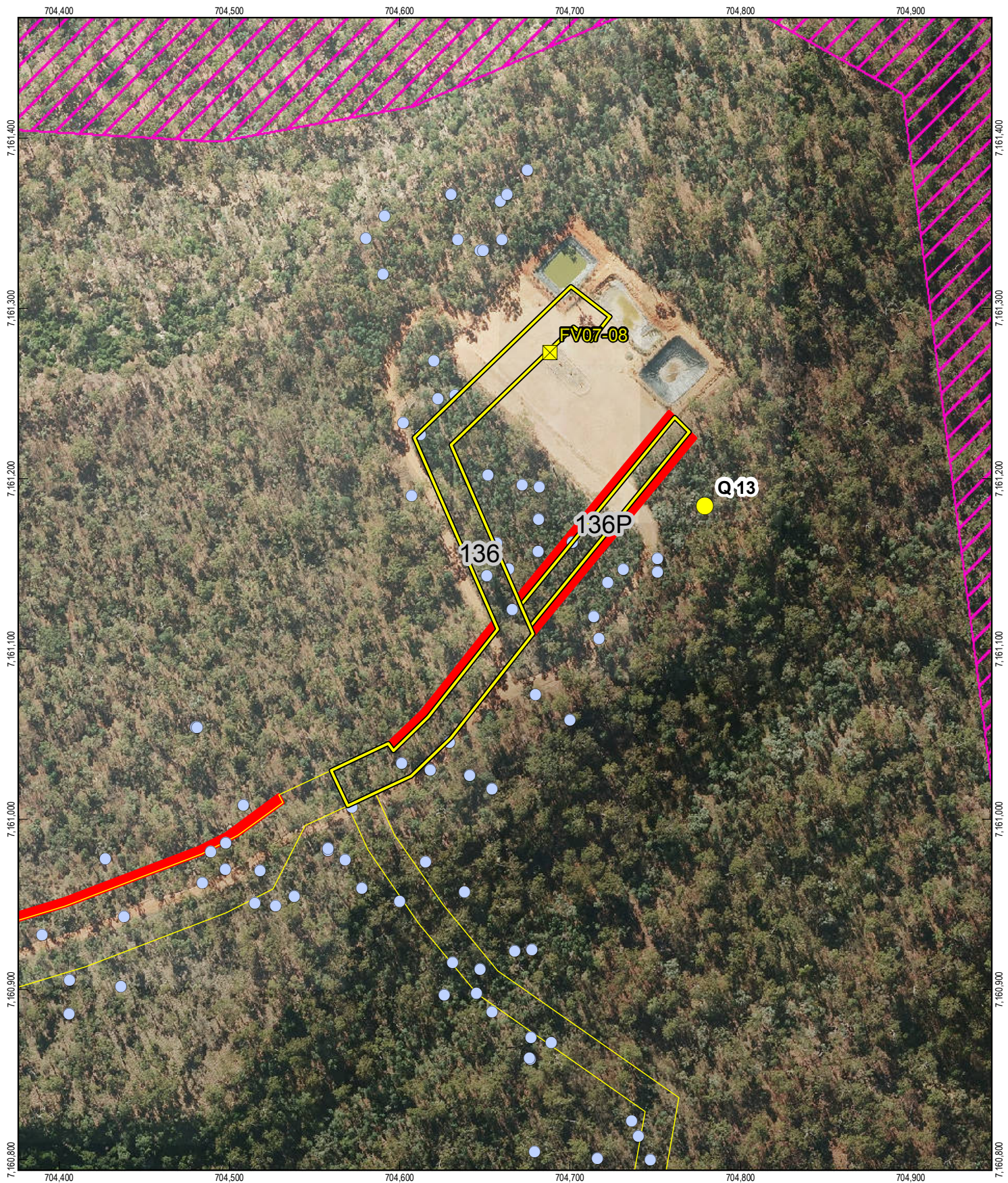
A DEHP mapped Queensland wetland occurs across and within 300 m of RoWs 134, 135 and FV07-07. This wetland is associated with the of concern wetland REs 11.3.2 and 11.3.25.

##### ***Wetlands, lakes and springs field validation***

Field validation of the REs within and adjacent to RoWs 134, 135 and FV07-07 found the wetland RE polygon located within 300 m of the RoW was more consistent with the no concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation within Lot 20 confirmed that no wetlands occur within 300 m of FV07-08 within Lot 20. Field validation points for the wetland REs can be found in Figure 2 to Figure 17.

#### **Approval requirement or further action**

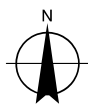
None



**LEGEND**

- |                 |                         |                            |                       |                       |
|-----------------|-------------------------|----------------------------|-----------------------|-----------------------|
| Assessment Site | Watercourse             | Cadastre                   | ESA Cat A Constraints | ESA Cat B Constraints |
| Fauna Habitat   | RoW 136 and RoW 136P    | Clearing Limit             | ESA Cat A Primary     | ESA Cat B Primary     |
| Well Pad        | Fairview Lot 20 FTY1805 | Vegetation Management Area | ESA Cat A Secondary   | Essential Habitat     |

1:3,000 (@ A4)  
 0 50 100  
 Metres  
 Map Projection: Universal Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 55



Santos GLNG  
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 Date | 06 Dec 2013

**RoW 136, RoW 136P  
 and FV07-08**

**Figure 12**

## 2.12 RoW 136, RoW 136P and FV07-08

### 2.12.1 Approvals and actions summary for RoW 136, RoW 136P and FV07-08

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.12.2 Regional ecosystems

#### *Regional ecosystems mapped*

The RoWs 136, 136P and FV07-08 are located entirely within no concern at present RE polygon mapped as 11.10.1/11.10.1. The RE short description is as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygons of 11.10.1/11.10.1 determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps

Field validation points are shown on Figure 12 (Q 13). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.12.3 Environmentally sensitive areas

#### *Environmentally sensitive areas mapped*

- Category A ESA
  - None mapped within RoWs 136, 136P and FV07-08
  - A Category A ESA (National Park) including primary and secondary protection zones are located within 1 km of the RoW
- Category B ESA

- None mapped within RoWs 136, 136P and FV07-08
- None mapped within 1 km of RoWs 136, 136P and FV07-08
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained
  - Of concern RE: 11.3.39/11.3.2 and 11.10.13a/11.10.1/11.3.25 are mapped within 1 km of RoW 137

#### ***Environmentally sensitive areas field validation***

- Category B ESA within 1 km of RoWs 136, 136P and FV07-08

An area mapped as no concern at present 11.10.1/11.10.1 was field validated to contain endangered RE11.9.4a. This area has been field-validated during previous field surveys undertaken by Aurecon in 2011. These field validation results have been incorporated into the field validated RE mapping.

- Category C ESA within RoWs 136, 136P and FV07-08
- Category C ESA within 1 km of RoWs 136, 136P and FV07-08

Mapped of concern RE 11.3.2/11.3.25 and 11.10.13a/11.10.1/11.3.25 within Lot 20 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.4. The full extent of mapped RE 11.3.2/11.3.25 and 11.10.13a/11.10.1/11.3.25 outside of Lot 20 was not field-validated. However, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. Thus, the of concern RE, and therefore the Category C ESA, is not considered to exist within 1 km of RoWs 136, 136P and FV07-08. Field validation mapping amendments have remapped relevant areas as not being representative of a Category C ESA containing an of concern RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### ***Approval requirement or further action***

Only limited petroleum activities are permitted within the secondary protection zone of Category A ESAs as per the Environmental Authority (EA) conditions.

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

#### 2.12.4 Threatened ecological communities

##### ***Threatened ecological communities mapped***

No TECs are mapped within RoWs 136, 136P and FV07-08.

##### ***Threatened ecological communities field validation***

No TECs are mapped within 300 m of RoWs 136, 136P and FV07-08.

#### ***Approval requirement or further action***

None

#### 2.12.5 Essential habitat

##### ***Essential habitat mapped***

No essential habitat mapped under the VM Act is present within RoWs 136, 136P and FV07-08 or within 200 m of the RoWs and well pad.



Medium value essential habitat mapped under the BPA mapping is located within the entire RoW footprint. This mapping is associated with the mapped RE polygon 11.10.1/11.10.1 discussed in Section 2.12.2.

#### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.12.2.

#### **Approval requirement or further action**

None

#### 2.12.6 Vegetation community and habitat values

The following vegetation communities occur over RoWs 136, 136P and FV07-08:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills

Descriptions of this vegetation community and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 12 (VC 3, HA 7, KH 7).

#### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

#### 2.12.7 Threatened species

##### ***Threatened species field validation***

No threatened flora species were recorded from RoWs 136, 136P and FV07-08 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat was recorded from field assessments of the RoW 135, located adjacent to RoWs 136, 136P and FV07-08. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

##### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoWs and well pad (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

#### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.12.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 136, 136P and FV07-08. Fauna habitat features recorded included hollow bearing trees, hollow stag trees and hollow logs. Locations of these features are mapped on Figure 12 and are presented in Appendix D.

### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.12.9 Watercourses

##### ***Watercourses field validation***

No mapped watercourses are located within RoWs 136, 136P and FV07-08 or within 100 m of the RoWs and well pad.

##### ***Watercourses field validation***

No field validation undertaken or required.

### **Approval requirement or further action**

None

#### 2.12.10 Wetlands, lakes and springs

##### ***Wetlands, lakes and springs mapped***

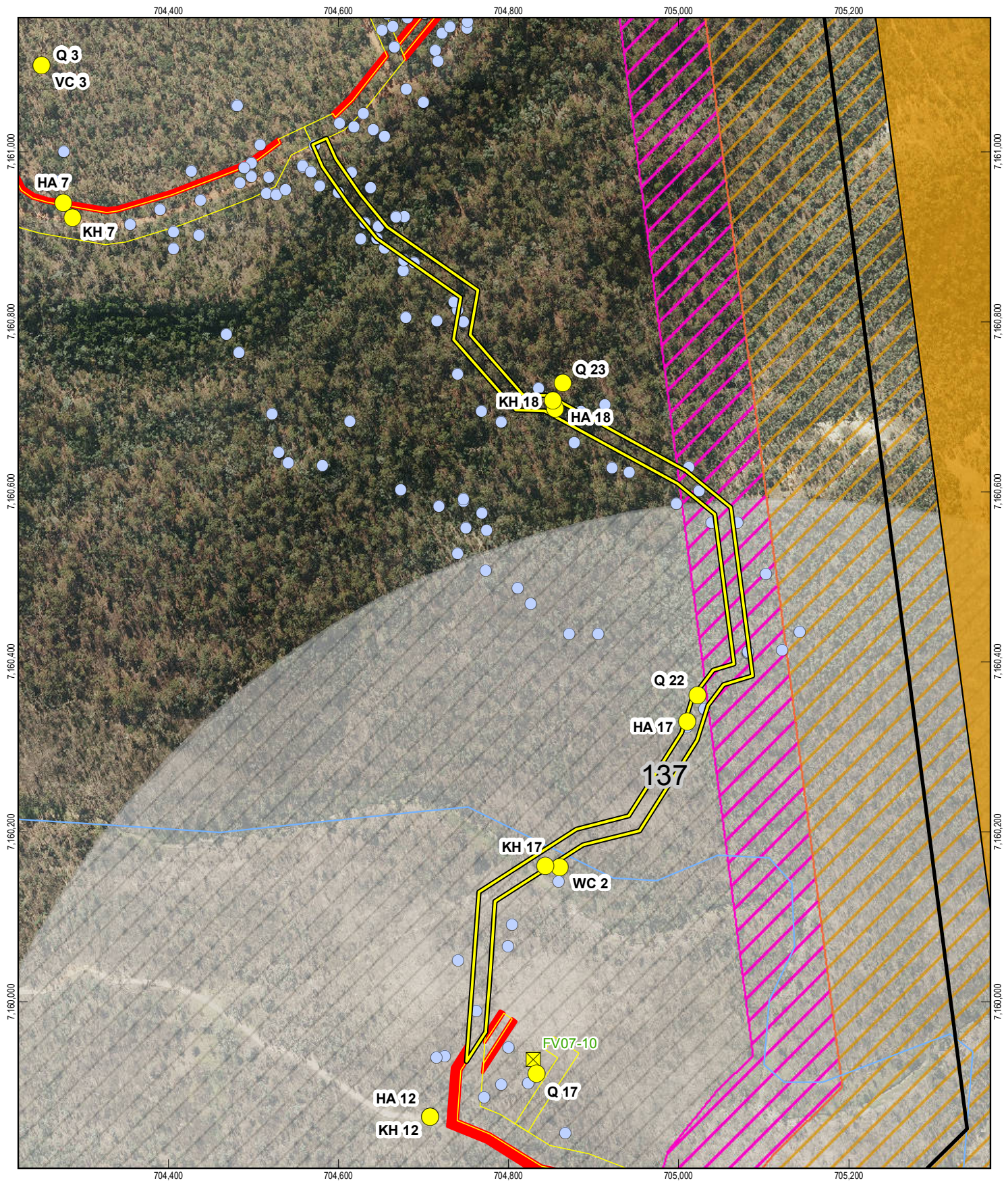
A DEHP mapped Queensland wetland occurs across and within 300 m of FV07-08. This wetland is associated with the of concern wetland RE 11.3.2.

##### ***Wetlands, lakes and springs field validation***

Field validation of the REs within and adjacent to FV07-08 found the wetland RE polygon located within 300 m of the RoW was more consistent with the no concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation within Lot 20 confirmed that no wetlands occur within 300 m of FV07-08 within Lot 20. Field validation points for the wetland REs can be found in Figure 2 to Figure 17.

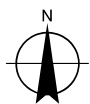
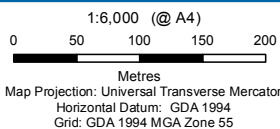
### **Approval requirement or further action**

None



**LEGEND**

- |                 |                         |                            |                       |                       |
|-----------------|-------------------------|----------------------------|-----------------------|-----------------------|
| Assessment Site | Watercourse             | Cadastre                   | Essential Habitat     | ESA Cat A Secondary   |
| Fauna Habitat   | RoW 137                 | Clearing Limit             | ESA Cat A Constraints | ESA Cat B Constraints |
| Well Pad        | Fairview Lot 20 FTY1805 | Vegetation Management Area | ESA Cat A Primary     | ESA Cat B Primary     |



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**RoW 137**

**Figure 13**

## 2.13 RoW 137

### 2.13.1 Approvals and actions summary for RoW 137

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.13.2 Regional ecosystems

#### *Regional ecosystems mapped*

The RoW 137 is located within two regional ecosystems. Approximately half of the RoW is located within no concern at present RE polygon mapped as 11.10.1/11.10.1 and half is located within of concern RE polygon mapped as 11.3.2/11.3.25. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.3.2: *Eucalyptus populnea* woodland on alluvial plains
- 11.3.25: *Eucalyptus camaldulensis* or *E. tereticornis* open-forest to woodland. In fringing levees and banks or rivers and drainage lines

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygons of 11.10.1/11.10.1 determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.7. Additionally, field validation of the mapped of concern RE polygon of 11.3.2/11.3.25 determined that the landzone and vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.7:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps
- 11.10.7: *Eucalyptus crebra* woodland on coarse-grained sedimentary rocks

Field validation points are shown on Figure 13 (Q 17, Q 22, Q 23). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.13.3 Environmentally sensitive areas

#### *Environmentally sensitive areas mapped*

- Category A ESA
  - None mapped within RoW 137
  - A Category A ESA (National Park) including primary and secondary protection zones are located within 1 km of the RoW
- Category B ESA
  - None mapped within RoW 137
  - A Category B (Endangered RE) including primary and secondary protection zones is located within 1 km of RoW 137
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained
  - Of concern RE: 11.3.2/11.3.25 is mapped across approximately half of RoW 137 and within 1 km of RoW 137

#### *Environmentally sensitive areas field validation*

- Category B ESA within 1 km of RoW 137
- Category C ESA within RoW 137
- Category C ESA within 1 km of RoW 137

Mapped endangered RE 11.9.4a was field validated to be correctly mapped.

Mapped of concern RE 11.3.2/11.3.25 within Lot 20 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.7. The full extent of mapped RE 11.3.2/11.3.25 outside of Lot 20 was not field-validated. However, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. Thus, the of concern RE, and therefore the Category C ESA, is not considered to exist within 1 km of RoW 133. Field validation mapping amendments has remapped relevant areas as not being representative of a Category C ESA containing an of concern RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Only limited petroleum activities are permitted within the secondary protection zone of Category A ESAs as per the Environmental Authority (EA) conditions.

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

### 2.13.4 Threatened ecological communities

#### *Threatened ecological communities mapped*

No TECs are mapped within RoW 137.

#### *Threatened ecological communities field validation*

No TECs are mapped within 300 m of RoW 137.

### **Approval requirement or further action**

None

#### 2.13.5 Essential habitat

##### ***Essential habitat mapped***

Essential habitat mapping under the VM Act for the NC Act listed near threatened species, *Acacia calantha*, occurs across the southern half of RoW 137 and occurs within 200 m of the RoW.

Medium value essential habitat mapped under the BPA mapping is located within the majority of the RoW footprint. This mapping is associated with the mapped RE polygons 11.10.1/11.10.13a and 11.3.2/11.3.25 discussed in Section 2.13.2.

##### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.13.2.

### **Approval requirement or further action**

None

#### 2.13.6 Vegetation community and habitat values

The following vegetation communities occur over RoW 137:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills
- Mixed eucalypt woodland to open-forest on steep rocky slopes

Descriptions of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 13 (VC 3, VC 7, HA 12, HA 18, HA17, KH 12, KH 17 and KH 18).

### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

#### 2.13.7 Threatened species

##### ***Threatened species field validation***

No threatened flora species were recorded from RoW 137 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat was recorded during field assessments of RoW 139, located adjacent to RoW 137. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

##### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoW (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

### Approval requirement or further action

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.13.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoW 137. Fauna habitat features recorded included hollow bearing trees, hollow stag trees, hollow logs and rocky outcrops. Locations of these features are mapped on Figure 13 and are presented in Appendix D.

### Approval requirement or further action

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.13.9 Watercourses

##### *Watercourses field validation*

A single mapped stream order 2 watercourses intersects RoW 137. No other mapped watercourses are located within 100 m of the RoW.

##### *Watercourses field validation*

Field validation of the watercourses determined it to be a drainage feature under the *Water Act 2000*. The watercourse assessment location is shown as site WC 2 on Figure 13. A summary of results is presented in Table 3, watercourse assessments are presented in Appendix G.

Table 3 Watercourse assessments in RoW 137

Watercourse reference	Location (easting, northing)		Assessment outcome	Reason
WC 2	704860	7160158	Drainage feature ( <i>Water Act 2000</i> )	No extended or permanent period of flow – only carries water flow for a short duration after a rainfall event Lacks sufficient flow adequacy to sustain basic ecological processes and support riverine species Lacks continuous and defined bed and banks and the presence of in-stream islands, benches or bars

### Approval requirement or further action

None

#### 2.13.10 Wetlands, lakes and springs

##### *Wetlands, lakes and springs mapped*

A DEHP mapped Queensland wetland occurs across and within 300 m of RoW 137. This wetland is associated with the of concern wetland RE 11.3.2 and 11.3.25.

##### *Wetlands, lakes and springs field validation*

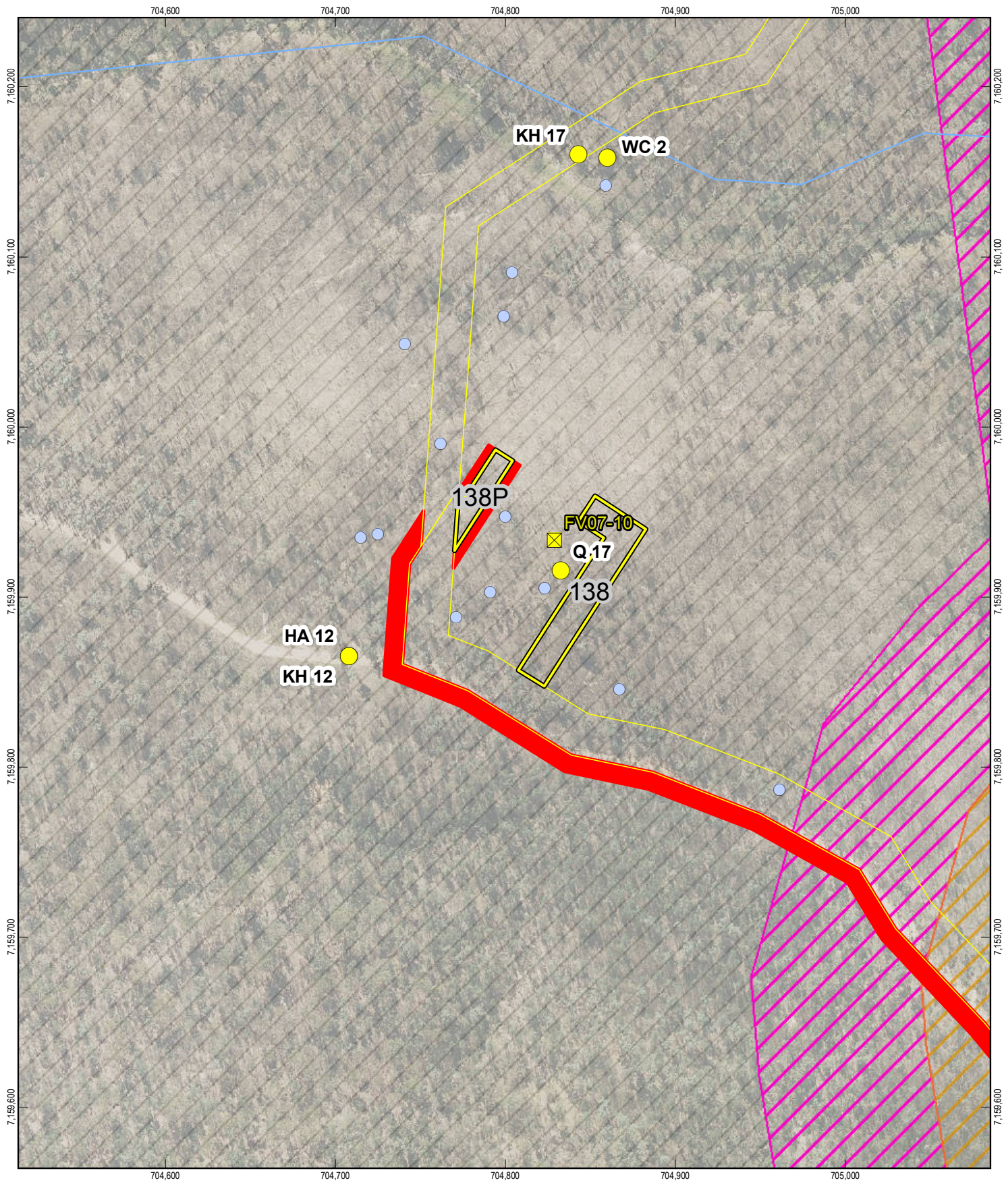
Field validation of the REs within and adjacent to RoW 132 found the wetland RE polygon located within 300 m of the RoW was more consistent with the no concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation within Lot 20 confirmed that no wetlands occur within RoW 137 or within 300 m of the RoW within Lot 20. The wetland RE polygon continues outside of Lot 20, but within 300 m of RoW 137. Although this polygon was

not surveyed outside of Lot 20, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. As such, no wetlands occur within 300 m of RoW 137. Field validation points for the wetland REs can be found in Figure 13.

**Approval requirement or further action**

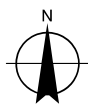
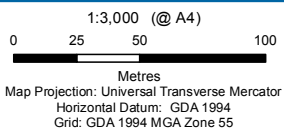
None





**LEGEND**

- |                 |                         |                            |                       |                       |
|-----------------|-------------------------|----------------------------|-----------------------|-----------------------|
| Assessment Site | Watercourse             | Cadastre                   | Essential Habitat     | ESA Cat A Secondary   |
| Fauna Habitat   | RoW 138 and RoW 138P    | Clearing Limit             | ESA Cat A Constraints | ESA Cat B Constraints |
| Well Pad        | Fairview Lot 20 FTY1805 | Vegetation Management Area | ESA Cat A Primary     | ESA Cat B Primary     |



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RoW 138, RoW 138P  
and FV07-10

**Figure 14**

## 2.14 RoW 138, RoW 138P and FV07-10

### 2.14.1 Approvals and actions summary for RoW 138, RoW 138P and FV07-10

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.14.2 Regional ecosystems

#### *Regional ecosystems mapped*

The RoWs 138, 138P and FV07-10 are located entirely within no concern at present RE polygon mapped as 11.10.1/11.10.1. The RE short description is as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygons of 11.10.1/11.10.1 determined that the vegetation composition is consistent with the RE mapping.

Field validation points are shown on Figure 14 (Q 17). Refer to Appendix C for RE field validation results and proposed RE mapping amendments for Lot 20.

#### **Approval requirement or further action**

Although there are no changes to the RE mapping within RoWs 138, 138P and FV07-10, mapping changes for Lot 20 as a whole would require lodgement of field validation RE mapping amendments (Appendix C) with DEHP to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.14.3 Environmentally sensitive areas

#### *Environmentally sensitive areas mapped*

- Category A ESA
  - None mapped within RoWs RoWs 138, 138P and FV07-10
  - A Category A ESA (National Park) including primary and secondary protection zones are located within 1 km of the RoW
- Category B ESA
  - None mapped within RoWs 138, 138P and FV07-10
  - A Category B (Endangered RE) including primary and secondary protection zones is located within 1 km of RoWs 138, 138P and FV07-10

- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained
  - Of concern RE: 11.3.2/11.3.25 is mapped within 1 km of RoWs 138, 138P and FV07-10

#### ***Environmentally sensitive areas field validation***

- Category B ESA within 1 km of RoWs 138, 138P and FV07-10  
Category C ESA within 1 km of RoWs 138, 138P and FV07-10

Mapped endangered RE 11.9.4a was field validated to be correctly mapped.

Mapped of concern RE 11.3.2/11.3.25 within Lot 20 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.7. The full extent of mapped RE 11.3.2/11.3.25 outside of Lot 20 was not field-validated. However, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. Thus, the of concern RE, and therefore the Category C ESA, is not considered to exist within 1 km of RoWs 138, 138P and FV07-10. Field validation mapping amendments has remapped relevant areas as not being representative of a Category C ESA containing an of concern RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Only limited petroleum activities are permitted within the secondary protection zone of Category A ESAs as per the Environmental Authority (EA) conditions.

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

#### 2.14.4 Threatened ecological communities

##### ***Threatened ecological communities mapped***

No TECs are mapped within RoWs 138, 138P and FV07-10.

##### ***Threatened ecological communities field validation***

No TECs are mapped within 300 m of RoWs 138, 138P and FV07-10.

#### **Approval requirement or further action**

None

#### 2.14.5 Essential habitat

##### ***Essential habitat mapped***

Essential habitat mapping under the VM Act for the NC Act listed near threatened species, *Acacia calantha*, occurs across the entirety of RoWs 138, 138P and FV07-10 and occurs within 200 m of the RoWs and well pad.

Medium value essential habitat mapped under the BPA mapping is located within the entire RoW and well pad footprint. This mapping is associated with the mapped RE polygons 11.10.1/11.10.1 and 11.3.2/11.3.25 discussed in Section 2.14.2.

### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.14.2.

### **Approval requirement or further action**

None

#### 2.14.6 Vegetation community and habitat values

The following vegetation communities occur over RoWs 138, 138P and FV07-10:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills

Descriptions of this vegetation community and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 14 (VC 3, VC 7, HA 12, KH 12).

### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

#### 2.14.7 Threatened species

### ***Threatened species field validation***

No threatened flora species were recorded from RoWs 138, 138P and FV07-10 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat was recorded from field assessments of RoW 139, located adjacent to RoWs 138, 139P and FV07-10. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoWs and well pad (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.14.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 138, 138P and FV07-10. Fauna habitat features recorded included hollow bearing trees and hollow stag trees. Locations of these features are mapped on Figure 14 and are presented in Appendix D.

### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.14.9 Watercourses

##### ***Watercourses field validation***

No mapped watercourses are located within RoWs 138, 138P and FV07-10 or within 100 m of the RoWs and well pad.

##### ***Watercourses field validation***

No field validation undertaken or required.

##### **Approval requirement or further action**

None

#### 2.14.10 Wetlands, lakes and springs

##### ***Wetlands, lakes and springs mapped***

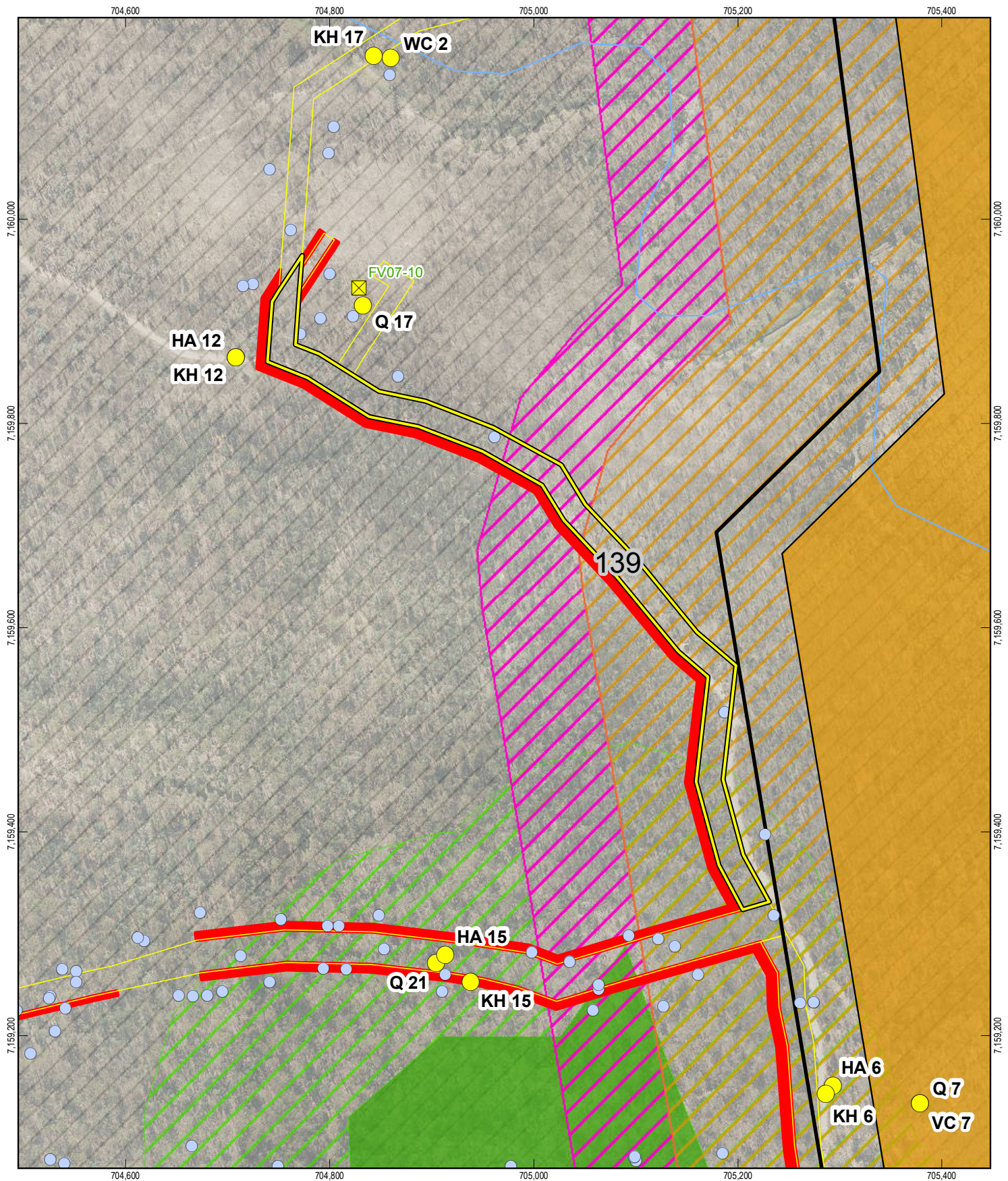
A DEHP mapped Queensland wetland occurs across and within 300 m of RoWs 138, 138P and FV07-10. This wetland is associated with the of concern wetland REs 11.3.2 and 11.3.25.

##### ***Wetlands, lakes and springs field validation***

Field validation of the REs within and adjacent to RoWs 138, 138P and FV07-10 found the wetland RE polygon located within 300 m of the RoW was more consistent with the not concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation within Lot 20 confirmed that no wetlands occur within 300 m of RoWs 138, 138P and FV07-10 within Lot 20. Field validation points for the wetland REs can be found in Figure 13 and Figure 16.

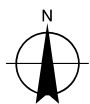
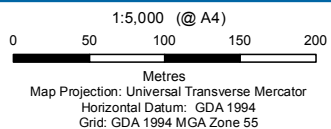
##### **Approval requirement or further action**

None



**LEGEND**

- |                 |                         |                            |                       |                       |
|-----------------|-------------------------|----------------------------|-----------------------|-----------------------|
| Assessment Site | Watercourse             | Cadastral                  | Essential Habitat     | ESA Cat A Secondary   |
| Fauna Habitat   | RoW 139                 | Clearing Limit             | ESA Cat A Constraints | ESA Cat B Constraints |
| Well Pad        | Fairview Lot 20 FTY1805 | Vegetation Management Area | ESA Cat A Primary     | ESA Cat B Primary     |



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RoW 139

Figure 15

## 2.15 RoW 139

### 2.15.1 Approvals and actions summary for RoW 139

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.15.2 Regional ecosystems

#### *Regional ecosystems mapped*

The RoW 137 is located within two regional ecosystems. Approximately half of the RoW is located within no concern at present RE polygon mapped as 11.10.1/11.10.1 and half is located within of concern RE polygon mapped as 11.3.2/11.3.25. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.3.2: *Eucalyptus populnea* woodland on alluvial plains
- 11.3.25: *Eucalyptus camaldulensis* or *E. tereticornis* open-forest to woodland. In fringing levees and banks or rivers and drainage lines

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygons of 11.10.1/11.10.1 determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.7. Additionally, field validation of the mapped of concern RE polygon of 11.3.2/11.3.25 determined that the landzone and vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.7:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps
- 11.10.7: *Eucalyptus crebra* woodland on coarse-grained sedimentary rocks

Field validation points are shown on Figure 15 (Q 17). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

### 2.15.3 Environmentally sensitive areas

#### *Environmentally sensitive areas mapped*

- Category A ESA
  - None mapped within RoW 139
  - A Category A ESA (National Park) including primary and secondary protection zones are located within 1 km of the RoW
- Category B ESA
  - None mapped within RoW 137
  - A Category B (Endangered RE) including primary and secondary protection zones is located within 1 km of RoW 139
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained
  - Of concern RE: 11.3.2/11.3.25 is mapped part of RoW 139 and within 1 km of the RoW

#### *Environmentally sensitive areas field validation*

- Category B ESA within 1 km of RoW 139
- Category C ESA within RoW 139
- Category C ESA within 1 km of RoW 139

Mapped endangered RE 11.9.4a was field validated to be correctly mapped.

Mapped of concern RE 11.3.2/11.3.25 within Lot 20 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.7. The full extent of mapped RE 11.3.2/11.3.25 outside of Lot 20 was not field-validated. However, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. Thus, the of concern RE, and therefore the Category C ESA, is not considered to exist within 1 km of RoW 139. Field validation mapping amendments have remapped relevant areas as not being representative of a Category C ESA containing an of concern RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

#### **Approval requirement or further action**

Only limited petroleum activities are permitted within the secondary protection zone of Category A ESAs as per the Environmental Authority (EA) conditions.

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

### 2.15.4 Threatened ecological communities

#### *Threatened ecological communities mapped*

No TECs are mapped within RoW 139.

#### *Threatened ecological communities field validation*

RE 11.9.4a was field validated within 300 m of the RoW 139. Therefore, the SEVT TEC has also been field validated as present within 300 m of RoW 139.



### **Approval requirement or further action**

None

#### 2.15.5 Essential habitat

##### ***Essential habitat mapped***

Essential habitat mapping under the VM Act for the NC Act listed near threatened species, *Acacia calantha*, occurs across all of RoW 139 and occurs within 200 m of the RoW.

Very high value essential habitat mapped under the BPA mapping is located within the majority of the RoW footprint. Additionally, a small portion of the RoW occurs within medium value habitat mapped under the BPA mapping. This mapping is associated with the mapped RE polygons 11.10.1/11.10.1 and 11.3.2/11.3.25 discussed in Section 2.15.2.

##### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.15.2.

### **Approval requirement or further action**

None

#### 2.15.6 Vegetation community and habitat values

The following vegetation communities occur over RoW 139:

- Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills

The semi-evergreen vine thicket vegetation community, associated with RE 11.9.4a, is also located within 200 m of the RoW.

Descriptions of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 15 (VC 7, HA 6, HA 12, KH 6 and KH 12).

### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

#### 2.15.7 Threatened species

##### ***Threatened species field validation***

No threatened flora species were recorded from RoW 139 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the little pied bat was recorded from field assessments of the RoW. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

##### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoW (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.15.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoW 139. Fauna habitat features recorded included hollow bearing trees and hollow stag trees. Locations of these features are mapped on Figure 15 and are presented in Appendix D.

### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.15.9 Watercourses

##### ***Watercourses field validation***

No mapped watercourses are located within RoW 139 or within 100 m of the RoW.

##### ***Watercourses field validation***

No field validation undertaken or required.

### **Approval requirement or further action**

None

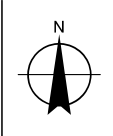
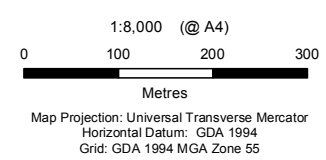
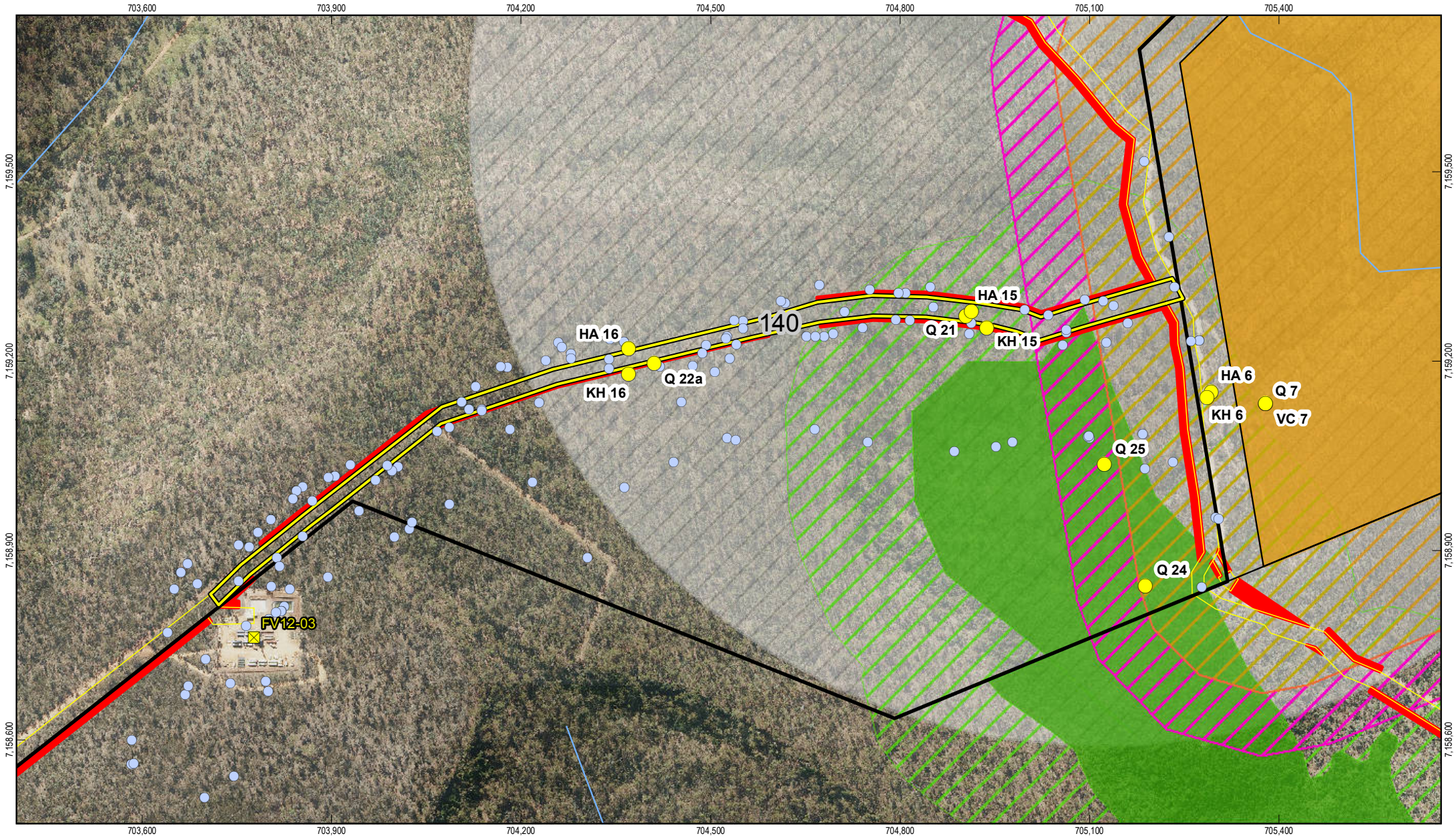
#### 2.15.10 Wetlands, lakes and springs

##### ***Wetlands, lakes and springs mapped***

A DEHP mapped Queensland wetland occurs across and within 300 m of RoW 139. This wetland is associated with the of concern wetland RE 11.3.2 and 11.3.25.

##### ***Wetlands, lakes and springs field validation***

Field validation of the REs within and adjacent to RoW 132 found the wetland RE polygon located within 300 m of the RoW was more consistent with the no concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation within Lot 20 confirmed that no wetlands occur within RoW 139 or within 300 m of the RoW within Lot 20. The wetland RE polygon continues outside of Lot 20, but within 300 m of RoW 139. Although this polygon was not surveyed outside of Lot 20, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. As such, no wetlands occur within 300 m of the RoW 139. Field validation points for the wetland REs can be found in Figure 16.



LEGEND			
	Assessment Site		Fairview Lot 20 FTY1805
	Fauna Habitat		Cadastre
	Well Pad		Clearing Limit
	Watercourse		Vegetation Management Area
	RoW 140		Essential Habitat
	ESA Cat A Constraints		ESA Cat B Constraints
	ESA Cat A Primary		ESA Cat B Primary
	ESA Cat A Secondary		



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RoW 140 and FV12-03 **Figure 16**

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 145 Ann St Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com  
 © 2013. Whilst every care has been taken to prepare this map, GHD (and Santos, ESRI) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.  
 Data source: Santos: Well Pad Locations, Cadastre, Clearing Limit, Vegetation Management Area, Watercourse, Imagery, Environmentally Sensitive Areas, Essential Habitat/Supplied October 2013; ESRI: Hillshade/2008; GHD: Assessment Site, Fauna Habitat/2013. Created by: AF

## 2.16 RoW 140 and FV12-03

### 2.16.1 Approvals and actions summary for RoW 140 and FV12-03

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	No	Fauna habitat features	Yes
TECs	No	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.16.2 Regional ecosystems

#### *Regional ecosystems mapped*

RoW 140 and FV12-03 are located within the no concern at present RE polygon mapped as 11.10.1/11.10.13a. A small section of the RoW crosses the endangered RE 11.9.4a at its eastern end. No other RE types are mapped within 200 m of the RoWs and well pad. The RE short descriptions are as follows:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.13a: *Eucalyptus cloeziana* +/- *E. melanoleuca* +/- *Corymbia bunites* +/- *E. sphaerocarpa* woodland to open-forest.
- 11.9.4a: Semi-evergreen vine thicket on crests, mid-slopes, undulating plains and rises formed from fine-grained sediments

#### *Regional ecosystems field validation*

Field validation of the mapped no concern at present RE polygon of 11.10.1/11.10.13a determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.4: *Eucalyptus decorticans*, *Lysicarpus angustifolius* +/- *Eucalyptus spp.*, *Corymbia spp.*, *Acacia spp.* woodland on coarse-grained sedimentary rocks. Crests and scarps

Additionally, field validation of the polygon mapped as 11.9.4a where it crosses RoW 140 determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.4.

Field validation points are shown on Figure 16 (Q 21 and Q 22a). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

#### 2.16.3 Environmentally sensitive areas

##### ***Environmentally sensitive areas mapped***

- Category A ESA
  - None mapped within RoWs 140 and FV12-03 and within 1 km of RoWs or well pad
  - A Category A ESA (National Park) including primary and secondary protection zones are located within 1 km of the RoW
- Category B ESA
- A Category B (Endangered RE) including primary and secondary protection zones is located within RoW 140 and within 1 km of RoW 140
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained
  - Of concern RE: 11.3.2/11.3.25 is mapped across a small part of RoW 140 at its eastern end and is located within 1 km of RoW 140

##### ***Environmentally sensitive areas field validation***

- Category B ESA within RoW 140
- Category B ESA within 1 km of RoW 140
- Category C ESA within RoW 140
- Category C ESA within 1 km of RoW 140

Mapped endangered RE 11.9.4a was field validated to be incorrectly mapped where it crosses RoW 140. Field validation of the mapped RE determined the vegetation composition to be more consistent with no concern at present RE polygon 11.10.1/11.10.4. However, field validation of the same polygon further south confirmed the presence of RE 11.9.4a. Thus, the category B ESA (Endangered RE) occurs within 1 km of RoW 140.

Mapped of concern RE 11.3.2/11.3.25 within Lot 20 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.7. The full extent of mapped RE 11.3.2/11.3.25 outside of Lot 20 was not field-validated. However, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.4. Thus, the of concern RE, and therefore the Category C ESA, is not considered to exist within 1 km of RoW 140. Field validation mapping amendments has remapped relevant areas as not being representative of a Category C ESA containing an of concern RE and a Category B ESA containing Endangered RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

### **Approval requirement or further action**

Only limited petroleum activities are permitted within the secondary protection zone of Category A ESAs as per the Environmental Authority (EA) conditions.

Only limited petroleum activities are permitted within the primary protection zone of Category B ESAs as per the EA conditions.

#### 2.16.4 Threatened ecological communities

##### ***Threatened ecological communities mapped***

RE 11.9.4a, which forms part of the SEVT TEC, is mapped as occurring within and adjacent to RoW 140 at its eastern end.

##### ***Threatened ecological communities field validation***

RE 11.9.4a was field validated within 300 m of the RoW 139. Therefore, the SEVT TEC has also been field validated as present within 300 m of RoW 140.

##### **Approval requirement or further action**

None

#### 2.16.5 Essential habitat

##### ***Essential habitat mapped***

Essential habitat mapping under the VM Act for the NC Act listed near threatened species, *Acacia calantha*, occurs across all of RoW 140 and occurs within 200 m of the RoW.

Very high value essential habitat mapped under the BPA mapping is located within a small section of the RoW footprint at its eastern end. The remaining RoW and well pad footprint occurs within medium value habitat mapped under the BPA mapping. This mapping is associated with the mapped RE polygons 11.10.1/11.10.1 and 11.3.2/11.3.25 discussed in Section 2.16.2.

##### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.16.2.

##### **Approval requirement or further action**

None

#### 2.16.6 Vegetation community and habitat values

The following vegetation communities occur over RoW 140 and FV12-03:

- Mixed eucalypt woodland to open forest on plateaus and gently sloping foothills
- Mixed eucalypt woodland to open-forest on steep rocky slopes

Description of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 16 (VC 7, HA 15, HA 16, KH 15 and KH 16).

##### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

#### 2.16.7 Threatened species

##### ***Threatened species field validation***

No threatened flora species were recorded from RoW 140 and FV12-03 during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the squatter pigeon was recorded from field assessments for RoW 142, located adjacent to RoW 140. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

#### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoW and well pad (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

#### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.16.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoW 140 and FV12-03. Fauna habitat features recorded included hollow bearing trees, hollow stag trees and hollow logs. Locations of these features are mapped on Figure 16 and are presented in Appendix D.

#### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.16.9 Watercourses

##### ***Watercourses mapped***

No mapped watercourses are located within RoW 140 and FV12-03 or within 100 m of these RoWs or well pad.

##### ***Watercourses field validation***

No field validation undertaken or required.

#### **Approval requirement or further action**

None

#### 2.16.10 Wetlands, lakes and springs

##### ***Wetlands, lakes and springs mapped***

A DEHP mapped Queensland wetland occurs across RoW 140. This wetland is associated with the of concern wetland RE 11.3.2 and 11.3.25.

##### ***Wetlands, lakes and springs field validation***

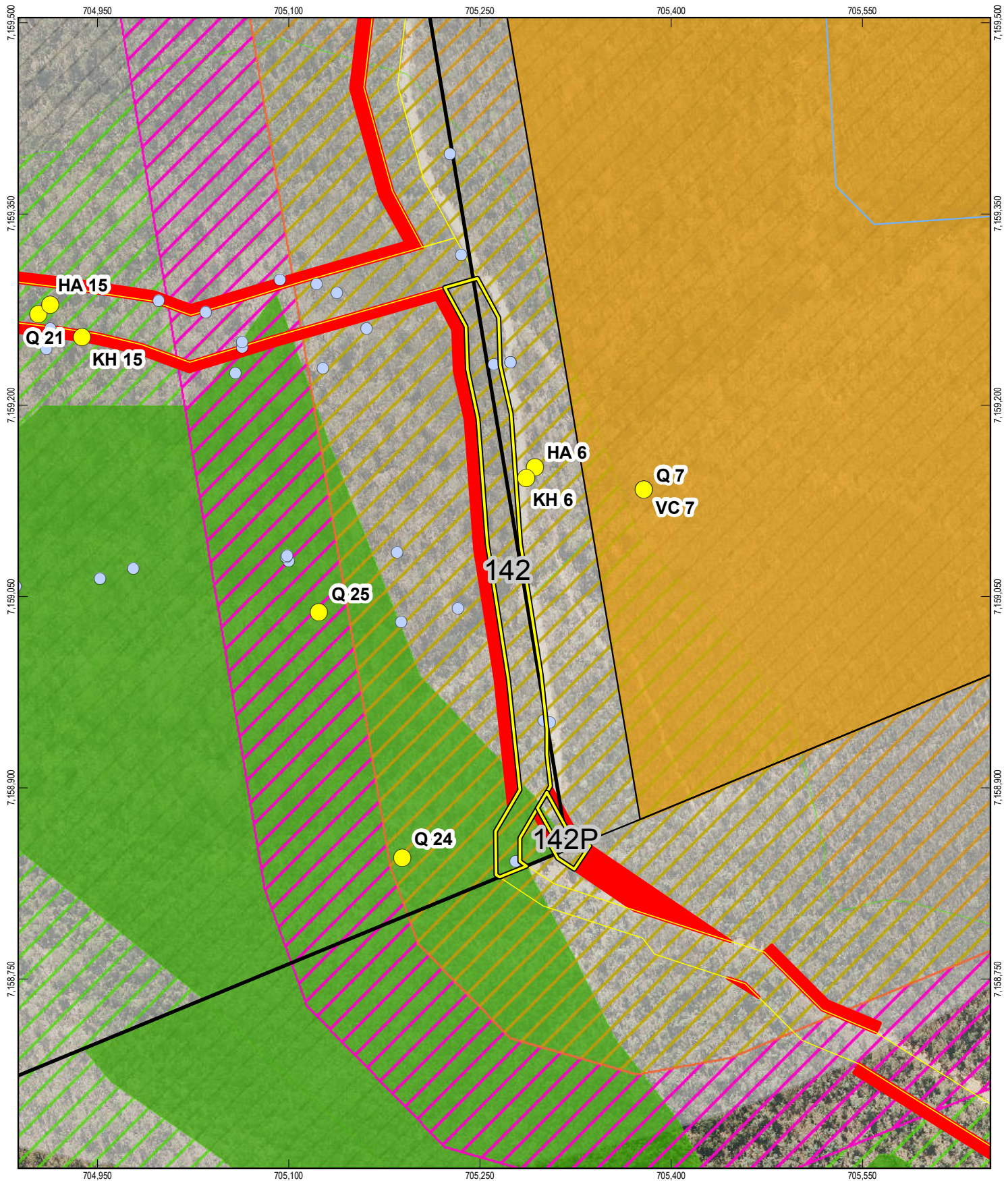
Field validation of the REs within and adjacent to RoW 140 found the wetland RE polygon located within 300 m of the RoW was more consistent with the no concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation within Lot 20 confirmed that no wetlands occur within RoW 140 within Lot 20. The wetland RE polygon continues outside of Lot 20, but within 300 m of RoW 140. Although, this polygon was not surveyed outside of Lot 20, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7.

As such, no wetlands occur within 300 m of the RoW 140. Field validation points for the wetland REs can be found in Figure 16.

**Approval requirement or further action**

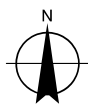
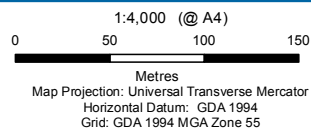
None





**LEGEND**

- |                 |                         |                            |                       |                       |
|-----------------|-------------------------|----------------------------|-----------------------|-----------------------|
| Assessment Site | RoW 142 and RoW 142P    | Clearing Limit             | ESA Cat A Constraints | ESA Cat B Constraints |
| Fauna Habitat   | Fairview Lot 20 FTY1805 | Vegetation Management Area | ESA Cat A Primary     | ESA Cat B Primary     |
| Watercourse     | Cadastre                | Essential Habitat          | ESA Cat A Secondary   |                       |



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Job Number | 41-27125  
Revision | 0  
Date | 06 Dec 2013

**RoW 142 and RoW 142P**

**Figure 17**

## 2.17 RoW 142 and RoW 142P within Lot 20 only

### 2.17.1 Approvals and actions summary for RoW 142 and 142P - within Lot 20 only

Item	Approval/further action required*	Item	Approval/further action required*
REs	Yes	Threatened species	Yes
ESAs	Yes	Fauna habitat features	Yes
TECs	Yes	Watercourses	No
Essential habitat	No	Wetlands	No
Vegetation community/ habitat values	No		

\* - refer to the 'Approval requirement or further action' section for each item identified as yes above

### 2.17.2 Regional ecosystems

#### *Regional ecosystems mapped*

RoWs 142 and 142P are located within the of concern RE polygon mapped as 11.3.2/11.3.25, with a small portion of the southern end located within the endangered RE polygon mapped as 11.9.4a. The no concern at present RE polygon 11.10.7/11.10.1 is mapped within 200 m of the RoWs. The RE short descriptions are as follows:

- 11.3.2: *Eucalyptus populnea* woodland on alluvial plains
- 11.3.25: *Eucalyptus camaldulensis* or *E. tereticornis* open-forest to woodland. In fringing levees and banks or rivers and drainage lines
- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.7: *Eucalyptus crebra* woodland on coarse-grained sedimentary rocks
- 11.9.4a: Semi-evergreen vine thicket on crests, mid-slopes, undulating plains and rises formed from fine-grained sediments

#### *Regional ecosystems field validation*

Field validation of the mapped of concern RE polygon of 11.3.2/11.3.25 determined that the vegetation composition is more consistent with no concern at present RE polygon 11.10.1/11.10.7:

- 11.10.1: *Corymbia citriodora* open forest on coarse-grained sedimentary rocks
- 11.10.7: *Eucalyptus crebra* woodland on coarse-grained sedimentary rocks

Field validation of the polygon mapped as 11.9.4a where it crosses the RoWs determined that the RE mapping is correct.

Field validation points are shown on Figure 17 (Q 7, Q 24 and Q 25). Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

### **Approval requirement or further action**

Lodgement of field validation RE mapping amendments (Appendix C) with DEHP would be required to change the existing RE mapping. This would be in the form of a PMAV application or RE mapping modification request.

#### 2.17.3 Environmentally sensitive areas

##### ***Environmentally sensitive areas mapped***

- Category A ESA
  - None mapped within RoWs 142 and 142P and within 1 km of RoWs
  - A Category A ESA (National Park) including primary and secondary protection zones are located within 1 km of the RoWs
- Category B ESA
- A Category B (Endangered RE) including primary and secondary protection zones is located within RoWs 142 and 142P and within 1 km of the RoWs
- Category C ESA
  - Lot 20 FTY1805 is tenured as State Forest within which the RoWs and well pad are contained
  - Of concern RE: 11.3.2/11.3.25 is mapped across the majority of RoW 142 and half of RoW 142P and within 1 km of the RoWs

##### ***Environmentally sensitive areas field validation***

- Category B ESA within RoWs 142 and 142P
- Category B ESA within 1 km of RoWs 142 and 142P
- Category C ESA within RoWs 142 and 142P
- Category C ESA within 1 km of RoWs 142 and 142P

Mapped endangered RE 11.9.4a was field validated to be correctly mapped where it crosses RoWs 142 and 142P. Thus, the category B ESA (Endangered RE) occurs within the RoWs.

Mapped of concern RE 11.3.2/11.3.25 within Lot 20 was field validated to be more consistent with no concern at present RE polygon 11.10.1/11.10.7. The full extent of mapped RE 11.3.2/11.3.25 outside of Lot 20 was not field-validated. However, general observations of the RE determined the vegetation to be consistent with 11.10.1/11.10.7. Thus, the of concern RE, and therefore the Category C ESA, is not considered to exist within 1 km of RoWs 142 and 142P. Field validation mapping amendments has remapped relevant areas as not being representative of a Category C ESA containing an of concern RE. Refer to Appendix C for RE field validation results and proposed RE mapping amendments.

### **Approval requirement or further action**

Only limited petroleum activities are permitted within the secondary protection zone of Category A ESAs as per the Environmental Authority (EA) conditions.

Only limited petroleum activities are permitted within Category B ESAs and within the primary protection zone of Category B ESAs as per the EA conditions.

#### 2.17.4 Threatened ecological communities

##### ***Threatened ecological communities mapped***

RE 11.9.4a, which forms part of the SEVT TEC, is mapped as occurring within and adjacent to RoWs 142 and 142P at their southern end.

##### ***Threatened ecological communities field validation***

RE 11.9.4a was field validated within RoWs 142 and 142P. Therefore, the SEVT TEC has also been field validated as present within the RoWs.

##### **Approval requirement or further action**

None

#### 2.17.5 Essential habitat

##### ***Essential habitat mapped***

Essential habitat mapping under the VM Act for the NC Act listed near threatened species, *Acacia calantha*, occurs across all of RoWs 142 and 142P and occurs within 200 m of the RoWs.

Very high value essential habitat mapped under the BPA mapping is located across the entirety of RoWs 142 and 142P. This mapping is associated with the mapped RE polygons 11.3.2/11.3.25 and 11.9.4a discussed in Section 2.17.2.

##### ***Essential habitat field validation***

No field validation of essential habitat was undertaken. Field validation of RE polygon 11.10.1/11.10.13a is presented in Section 2.17.2.

##### **Approval requirement or further action**

None

#### 2.17.6 Vegetation community and habitat values

The following vegetation communities occur over RoWs 142 and 142P:

- Mixed eucalypt woodland to open forest on plateaus and gently sloping foothills
- Mixed eucalypt woodland to open-forest on steep rocky slopes
- Semi-evergreen vine thicket on rocky escarpments

Description of these vegetation communities and habitat values are contained within Appendix A. Field validation points for vegetation communities and habitat values are shown on Figure 17 (VC 7, HA 6, HA 15, KH 6 and KH 15).

##### **Approval requirement or further action**

None, however rehabilitation activities are to be in accordance with the GLNG Project RRRMP.

#### 2.17.7 Threatened species

##### ***Threatened species field validation***

No threatened flora species were recorded from RoWs 142 and 142P during field assessments. A likelihood of occurrence assessment for flora species identified in desktop searches as having the potential to occur within Lot 20 is presented in Appendix E, Table 10.

One threatened fauna species, the squatter pigeon was recorded from field assessments of RoW 142. Further information relating to the threatened species records is contained within Section 3.

Lists of all flora and fauna species recorded from field assessments are contained within Appendix F.

#### ***Threatened species habitat mapping***

Potential habitat for EPBC Act and NC Act listed threatened fauna species has been mapped over the RoWs (see Section 3.2). Calculations of the extent of species habitat within Lot 20 are presented in Section 3.1.

#### **Approval requirement or further action**

Management actions listed within the approved GLNG Project SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.17.8 Fauna habitat features

Fauna habitat features that have potential to be fauna breeding places for least concern and threatened fauna species were recorded within RoWs 142 and 142P. Fauna habitat features recorded included hollow bearing trees, hollow stag trees and hollow logs. Locations of these features are mapped on Figure 17 and are presented in Appendix D.

#### **Approval requirement or further action**

Management actions listed within the SSMP, SMP and GTP SMP documents are to be followed during pre-construction, construction and operation.

#### 2.17.9 Watercourses

##### ***Watercourses mapped***

No mapped watercourses are located within RoWs 142 and 142P or within 100 m of these RoWs.

##### ***Watercourses field validation***

No field validation undertaken or required.

#### **Approval requirement or further action**

None

#### 2.17.10 Wetlands, lakes and springs

##### ***Wetlands, lakes and springs mapped***

A DEHP mapped Queensland wetland occurs across RoWs 142 and 142P. This wetland is associated with the of concern wetland RE 11.3.2 and 11.3.25.

##### ***Wetlands, lakes and springs field validation***

Field validation of the REs within and adjacent to RoWs 142 and 142P found the wetland RE polygon was more consistent with the no concern at present RE 11.10.1/11.10.7, which is not a wetland RE. Thus field validation within Lot 20 FTY1805 confirmed that no wetlands occur within RoWs 142 and 142P within Lot 20. The wetland RE polygon continues outside of Lot 20, but within 300 m of RoWs 142 and 142P. Although, this polygon was not surveyed outside of Lot 20, general observations of the RE determined the vegetation to be consistent with

11.10.1/11.10.7. As such, no wetlands occur within 300 m of the RoWs 142 and 142P. Field validation points for the wetland REs can be found in Figure 17.

**Approval requirement or further action**

None

### 3. Threatened species

#### 3.1 Threatened fauna species habitat clearing extents

Table 4 contains the areas of potential habitat for threatened fauna species of relevance to the Santos GLNG Project, as listed under the EPBC Act and/or the NC Act, which will be cleared for the construction of RoWs within Lot 20. Further detail regarding threatened species habitat mapping for Lot 20 is provided in Section 3.2.

**Table 4 Threatened fauna species habitat and TEC clearing extents within Lot 20**

Species	EPBC Act / NC Act status	Habitat within Lot 20 to be cleared for construction*
Brigalow scaly-foot ( <i>Paradelma orientalis</i> )	Not listed / Vulnerable	31.14 ha
Collared delma ( <i>Delma torquata</i> )	Vulnerable / Vulnerable	31.14 ha
Dunmall's snake ( <i>Furina dunmalli</i> )	Vulnerable / Vulnerable	53.96 ha
Fitzroy River turtle ( <i>Rheodytes leukops</i> )	Vulnerable / Vulnerable	0 ha
Golden-tailed gecko ( <i>Strophurus taenicauda</i> )	Not listed / Near threatened	75.03 ha
Ornamental snake ( <i>Denisonia maculata</i> )	Vulnerable / Vulnerable	0 ha
Woma ( <i>Aspidites ramsayi</i> )	Not listed / Vulnerable	6.05 ha
Yakka skink ( <i>Egernia rugosa</i> )	Vulnerable / Vulnerable	31.14 ha
Koala ( <i>Phascolarctos cinereus</i> )	Vulnerable / Special least concern	6.34 ha
Large-eared pied bat ( <i>Chalinolobus dwyeri</i> )	Vulnerable / Vulnerable	24.91 ha
Little pied bat ( <i>Chalinolobus picatus</i> )	Not listed / Near threatened	72.74 ha
Northern quoll ( <i>Dasyurus hallucatus</i> )	Vulnerable / Least concern	75.03 ha
South-eastern long-eared bat ( <i>Nyctophilus corbeni</i> )	Vulnerable / Vulnerable	44.08 ha
Australian painted snipe ( <i>Rostratula australis</i> )	Vulnerable, Migratory / Vulnerable	0 ha
Black-breasted button quail ( <i>Turnix melanogaster</i> )	Vulnerable / Vulnerable	0.07 ha
Glossy black-cockatoo ( <i>Calyptorhynchus lathamii</i> )	Not listed / Vulnerable	0 ha
Powerful owl ( <i>Ninox strenua</i> )	Not listed / Vulnerable	75.03 ha
Red goshawk ( <i>Erythrotriorchis radiatus</i> )	Vulnerable / Endangered	0 ha
Square-tailed kite ( <i>Lophoictinia isura</i> )	Not listed / Near threatened	14.79 ha
Squatter pigeon ( <i>Geophaps scripta scripta</i> )	Vulnerable / Vulnerable	88.16 ha
Star finch ( <i>Neochmia ruficauda ruficauda</i> )	Endangered / Endangered	0 ha
Rough collared frog ( <i>Cyclorana verrucosa</i> )	Not listed / Near threatened	0 ha
Tusked frog ( <i>Adelotus brevis</i> )	Not listed / Vulnerable	0 ha
Semi-evergreen vine thicket TEC	Endangered	0.07 ha
Brigalow TEC	Endangered	0 ha

\*Where habitat calculations are 0 ha, no suitable habitat for the species has been identified within Lot 20 or occurs within the proposed RoWs within Lot 20. Refer to Section 3.2 for further detail on species habitat mapping within Lot 20.

### 3.2 Threatened fauna species habitat mapping

A review of available published literature, GLNG Project approvals and management plans, existing ecological reports and relevant database searches during the desktop assessment identified 23 fauna species and 13 flora species listed under the EPBC Act or NC Act as requiring further assessment of likelihood of occurrence and potential habitat mapping for Lot 20. Potential habitat for 16 threatened fauna species has been identified and mapped within Lot 20. Habitat mapping for fauna species identified as unlikely to occur within Lot 20 has not been undertaken. Table 5 identifies potential habitat within Lot 20 for threatened fauna species using the habitat hierarchy described in the Santos Methodology. This table also contains reference to figures of mapped potential habitat for each species as appropriate. Threatened fauna species survey effort and results from field assessments within Lot 20 are presented in Appendix E.

Potential habitat mapping for threatened flora species is not a requirement of the Santos Methodology; therefore, threatened flora species of relevance to Lot 20 are not included further in this section. A brief discussion on threatened flora potential habitat within Lot 20 and results of the field survey is contained within Appendix E.



Table 5 Threatened fauna species habitat descriptions within Lot 20

Species	Likelihood of occurrence*	Potential habitat within Lot 20	Figure reference
Brigalow scaly-foot ( <i>Paradelma orientalis</i> )	Potential to occur	<p><b>General habitat:</b> The majority of Lot 20 contains RE that might be suitable for the species (REs on landzone 9 and 10). However, habitat areas with suitable microhabitat features, as determined from field surveys, are only located within certain locations in Lot 20. Areas containing suitable microhabitat features have been mapped as general habitat for the species; these include:</p> <ul style="list-style-type: none"> <li>• rocky areas and escarpments</li> <li>• SEVT</li> <li>• Eucalypt woodlands with a mixed shrub layer of acacias and <i>Callitris</i> sp. that may exude tree sap</li> <li>• Microhabitat features to shelter under during the day, including rock slabs, logs, peeling bark</li> </ul> <p><b>Unlikely habitat:</b> Other areas within Lot 20 are mapped within similar landzones and REs suitable for the species but do not display suitable microhabitat features that the species might use as shelter. Habitats within these areas were generally lacking any rock slabs, logs or woody/leafy debris and have sparse to absent shrub layers. However, severe fire within the past year may have destroyed such microhabitat features in these areas.</p>	Figure 18
Collared delma ( <i>Delma torquata</i> )	Potential to occur	<p><b>General habitat:</b> Eucalypt woodlands or SEVT within rocky areas that contain dense microhabitat features including: rocks, logs, bark and other coarse woody debris. Mats of leaf litter are an essential requirement in habitats where the collared delma is found.</p> <p><b>Unlikely habitat:</b> Other areas within Lot 20 are mapped in similar landzones and REs suitable for the species but lack the presence of dense microhabitat features and are therefore considered unlikely habitat for the species.</p>	Figure 19
Dunmall's snake ( <i>Furina dunmali</i> )	Potential to occur	<p><b>General habitat:</b> Areas of RE 11.10.1 where microhabitat features including fallen timber and ground litter are present.</p> <p><b>Unlikely habitat:</b> Although 11.10.1 is widely mapped within Lot 20, microhabitat requirements including fallen timber and ground litter are only present in select places. Other areas within Lot 20 have been determined to be unsuitable, as areas and microhabitats have been affected by fire, logging, or are located on narrow escarpment peninsulas where suitable microhabitat features are absent.</p>	Figure 20

Species	Likelihood of occurrence*	Potential habitat within Lot 20	Figure reference
Fitzroy River turtle ( <i>Rheodytes leukops</i> )	Unlikely to occur	<b>Unlikely habitat:</b> Suitable habitat in the form of permanent, deep pools and flowing water associated with tributaries of the Dawson River is not present within Lot 20.	N/A
Golden-tailed gecko ( <i>Strophurus taenicauda</i> )	Potential to occur	<b>General habitat:</b> All woodland environments within Lot 20, particularly those associated with peeling bark from trees, stags or logs. <b>Unlikely habitat:</b> Areas of non-remnant vegetation.	Figure 21
Ornamental snake ( <i>Denisonia maculata</i> )	Unlikely to occur	<b>Unlikely habitat:</b> Suitable habitats in the form of gilgais or cracking clay soils are not present within Lot 20.	N/A
Woma ( <i>Aspidites ramsay</i> )	Potential to occur	<b>General habitat:</b> Habitat within Lot 20 is limited to small areas of stony ridge country where brigalow or other acacia species dominate. <b>Unlikely habitat:</b> Eucalypt woodlands and non-remnant vegetation that is not located on stony ridge country.	Figure 22
Yakka skink ( <i>Egernia rugosa</i> )	Potential to occur	<b>General habitat:</b> The majority of Lot 20 contains RE that might be suitable for the species (REs on landzone 9 and 10). However, habitat areas with suitable microhabitat features, as determined from field surveys, are only located within certain locations in Lot 20. Areas containing suitable microhabitat features has been mapped as general habitat for the species; these include: <ul style="list-style-type: none"> <li>• rocky areas and escarpments</li> <li>• SEVT</li> <li>• Eucalypt woodlands with a mixed shrub layer of acacias and <i>Callitris</i> sp. that may exude tree sap</li> <li>• Microhabitat features to shelter under during the day, including rock slabs, logs, peeling bark</li> </ul> <b>Unlikely habitat:</b> Other areas within Lot 20 are mapped within similar landzones and REs suitable for the species but do not display suitable microhabitat features that the species might use as shelter. Habitats within these areas were generally lacking any rock slabs, logs or woody/leafy debris and have sparse to absent shrub layers. However, severe fire within the past year may have destroyed such microhabitat features in these areas.	Figure 23

Species	Likelihood of occurrence*	Potential habitat within Lot 20	Figure reference
Koala ( <i>Phascolarctos cinereus</i> )	Potential to occur	<p><b>General habitat:</b> Woodlands and forests dominated by eucalypt species that occur in conjunction with areas considered to have more fertile soils (that contains higher soil moisture levels) i.e. in association with watercourses.</p> <p><b>Unlikely habitat:</b> Preferred koala food and shelter trees are located in all eucalypt dominated woodlands within Lot 20. However, taking into consideration soil moisture and soil fertility in areas of eucalypt woodland, it may be less likely that koalas are present on top of the rocky plateaus due to lower soil moisture and fertility and are instead occurring at low densities in eucalypt dominated remnant vegetation areas associated with lowland areas, rivers and creeks that have been mapped as general habitat for the species as a result.</p>	Figure 24
Large-eared pied bat ( <i>Chalinolobus dwyeri</i> )	Confirmed present	<p><b>General habitat:</b> The large-eared pied bat is generally restricted to the interface of sandstone escarpments and adjacent relatively fertile valleys, for roosting and foraging habitats respectively. The species may also forage for a few kilometres along watercourses and linear remnants of vegetation leading away from roosting sites.</p> <p>Roosting habitat is potentially available on the sandstone cliffs within lot 20, but as there are no previous records of the species in these areas, all mapped habitat for the species is classified as general habitat. Potential foraging habitat is limited to the central and northern areas of Lot 20. A weak echolocation call from the species was recorded from potential foraging habitat in the north of Lot 20.</p> <p><b>Unlikely habitat:</b> Areas within Lot 20 that are not associated with roosting and foraging habitats, such as eucalypt woodlands on tops of plateaus.</p> <p><b>Recommendation:</b> Results from the field survey cannot confirm if the species roosts within potential habitat areas within Lot 20 or just commutes into potential foraging habitats from roosting sites outside of Lot 20. It is recommended that further targeted anabat surveys around potential roosting and foraging habitats are undertaken to further understand the species presence and movements within Lot 20 and the surrounding area.</p>	Figure 25
Little pied bat ( <i>Chalinolobus picatus</i> )	Confirmed present	<p><b>General habitat:</b> Although previously not recorded within the area, this species has potential to occur in any woodland environment within Lot 20. A particular preference, however, is for areas where there are tree hollows and rocky escarpments that may also be used as roosting habitat. Water sources, including pools and</p>	Figure 26

Species	Likelihood of occurrence*	Potential habitat within Lot 20	Figure reference
		<p>farm dams within Lot 20, are also considered foraging habitat for the species. Little pied bat was recorded in Lot 20 during field surveys but, due to the broad nature of habitats occupied by the species, the locations in which it was recorded are not considered to represent core or essential habitat areas.</p> <p><b>Unlikely habitat:</b> Areas of non-remnant vegetation.</p>	
Northern quoll ( <i>Dasyurus hallucatus</i> )	Potential to occur	<p><b>General habitat:</b> Rocky escarpments and gorges may provide potential denning/shelter habitat. Should the species be found within Lot 20, potential denning areas would be recognised as 'essential habitat'. Remnant vegetation within 2 km of rocky areas are considered potential foraging or dispersal habitat.</p> <p><b>Unlikely habitat:</b> Non-remnant vegetation and remnant vegetation areas outside of the mapping criteria above.</p> <p><b>Recommendation:</b> Undertake further targeted surveys of rocky escarpment areas within Lot 20 to identify if the species and/or denning/shelter habitat is present.</p>	Figure 27
South-eastern long-eared bat ( <i>Nyctophilus corbeni</i> )	Potential to occur	<p><b>General habitat:</b> Areas dominated by large ironbark species some of which contained larger hollows or a generally a higher concentration of hollows within the site represent habitat mapped for this species within Lot 20. Large hollow bearing trees may be used as roosting sites for the species. Shrub layer vegetation was also present within these areas, but had been severely burnt within the past 12 months. Habitat areas for this species also include water sources that are of importance for foraging.</p> <p><b>Unlikely habitat:</b> Ironbark woodlands are generally present across much of Lot 20, but not all areas of ironbark woodlands contained large mature trees that contained potential tree hollows. These areas were identified during field surveys as unlikely habitat for the species.</p> <p><b>Recommendation:</b> The echolocation call of the south-eastern long-eared bat is unable to be differentiated from calls of other species within the <i>Nyctophilus</i> genus. Calls from <i>Nyctophilus</i> sp. were identified from anabat data analysis from field surveys, but cannot be identified to species level. As a result, the south-eastern long-eared bat may be present within Lot 20 and it is recommended that further targeted microbat surveys using harp trapping be undertaken to try to confirm the presence of this species within Lot 20.</p>	Figure 28
Australian Painted Snipe	Unlikely to occur	<p><b>Unlikely habitat:</b></p>	N/A

Species	Likelihood of occurrence*	Potential habitat within Lot 20	Figure reference
<i>(Rostratula australis)</i>		Suitable habitat in the form of wetlands with surrounding aquatic vegetation is not present within Lot 20.	
Black-breasted button quail <i>(Turnix melanogaster)</i>	Potential to occur	<b>General habitat:</b> Areas mapped as SEVT (RE 11.9.4a) where deep leaf litter is present. <b>Unlikely habitat:</b> Eucalypt woodland and non-remnant areas within Lot 20.	Figure 29
Glossy black-cockatoo <i>(Calyptorhynchus lathamii)</i>	Unlikely to occur	<b>Unlikely habitat:</b> Suitable habitat in the form of stands of Casuarina sp. and Allocasuarina sp. species is not present within Lot 20. Individual trees are present within Lot 20, but not in high enough densities to support the species.	N/A
Powerful owl <i>(Ninox strenua)</i>	Potential to occur	<b>General habitat:</b> Although previously not recorded in Lot 20, this species has potential to occur within any woodland environment, particularly where old growth trees are present that may be used for nesting. The species hunts larger arboreal mammals, such as greater gliders, which are abundant throughout Lot 20. <b>Unlikely habitat:</b> Areas of non-remnant vegetation.	Figure 30
Red goshawk <i>(Erythrotriorchis radiatus)</i>	Unlikely to occur	<b>Unlikely habitat:</b> Suitable habitat for this species is not present within Lot 20, e.g. tall trees within 1 km of permanent water for nesting. The forest and/or woodland within Lot 20 does not necessarily contain a mosaic of vegetation types or support a high level of biodiversity suitable for the species.	N/A
Square-tailed kite <i>(Lophoictinia isura)</i>	Potential to occur	<b>General habitat:</b> Eucalypt woodlands and areas with a broken canopy in the northern portion of Lot 20. <b>Unlikely habitat:</b> Eucalypt woodlands are present throughout Lot 20. However, this species has not been recorded within Lot 20 or the surrounding region. Habitat requirements are for structurally diverse woodlands, treed watercourses and areas with a broken canopy with an abundance of passerines. The eucalypt woodland within Lot 20 instead consists more of homogenous woodlands with a limited abundance of bird species, therefore habitat is generally considered unlikely.	Figure 31
Squatter pigeon <i>(Geophaps scripta scripta)</i>	Confirmed present	<b>General habitat:</b> Areas of remnant, regrowth or modified communities, including non-remnant areas within 3 km of mapped watercourses or water bodies. Although two squatter pigeons were recorded on site during field assessments, there is a general lack	Figure 32

Species	Likelihood of occurrence*	Potential habitat within Lot 20	Figure reference
		<p>of existing records for the species within Lot 20 from previous ecological studies or database results. The squatter pigeon is considered to have broad and general habitat requirements, as a result the habitats in which individuals were found during field surveys are not considered to represent core or essential habitat areas for the species. Furthermore, the modification of habitat areas by the construction of well pads and associated dams may increase the availability of water resources relied upon by the species within Lot 20.</p> <p><b>Unlikely habitat:</b> Areas greater than 3 km from watercourses or waterbodies.</p>	
Star finch ( <i>Neochmia ruficauda ruficauda</i> )	Unlikely to occur	<p><b>Unlikely habitat:</b> Populations of this species are considered extremely limited or potentially extinct. Potentially suitable habitat, being grasslands or grassy woodlands near permanent bodies of water, although potentially present along RoW 115, is considered unlikely to support this species.</p>	N/A
Rough collared frog ( <i>Cyclorana verrucosa</i> )	Potential to occur	<p><b>General habitat:</b> Three farm dams that act as sources of temporary/permanent water adjacent to the RoWs.</p> <p><b>Unlikely habitat:</b> Eucalypt woodland, SEVT and non-remnant vegetation where permanent/temporary water sources are not present.</p>	Figure 33
Tusked frog ( <i>Adelotus brevis</i> )	Unlikely to occur	<p><b>Unlikely habitat:</b> This species is unlikely to occur within Lot 20, as it is generally only found at elevations less than 400 m above sea level. Preferred habitats of rainforest, wet sclerophyll forest, flooded grassland and pastures near areas of wet forest, usually in association with water are not present within Lot 20.</p>	N/A

\*Likelihood of occurrence criteria:

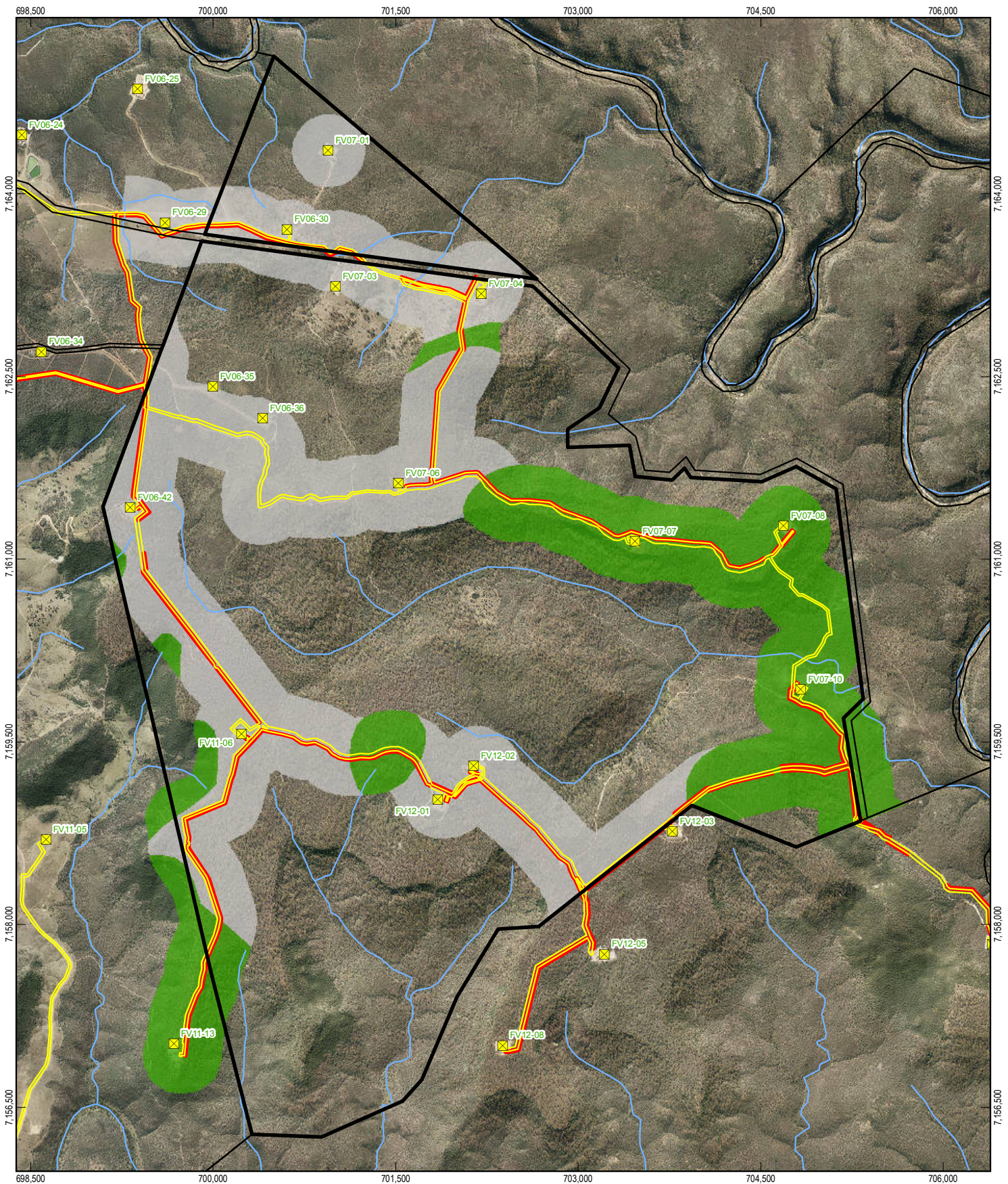
Confirmed present – species was recorded during field surveys of Lot 20 undertaken in November 2013

Potential to occur – suitable habitat requirements are present within Lot 20, even if the species has not been recorded from field surveys

Unlikely to occur – habitat requirements for the species are not present within Lot 20

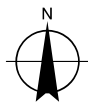
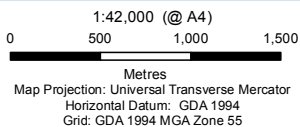
### 3.3 Threatened flora species

No threatened flora species listed under the NC Act or EBPC Act were identified during surveys of Lot 20. A likelihood of occurrence assessment has been undertaken for listed flora species identified as having the potential to occur within Lot 20. The results are presented in Appendix E, Table 10.



**LEGEND**

- |             |                         |                            |                               |
|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |

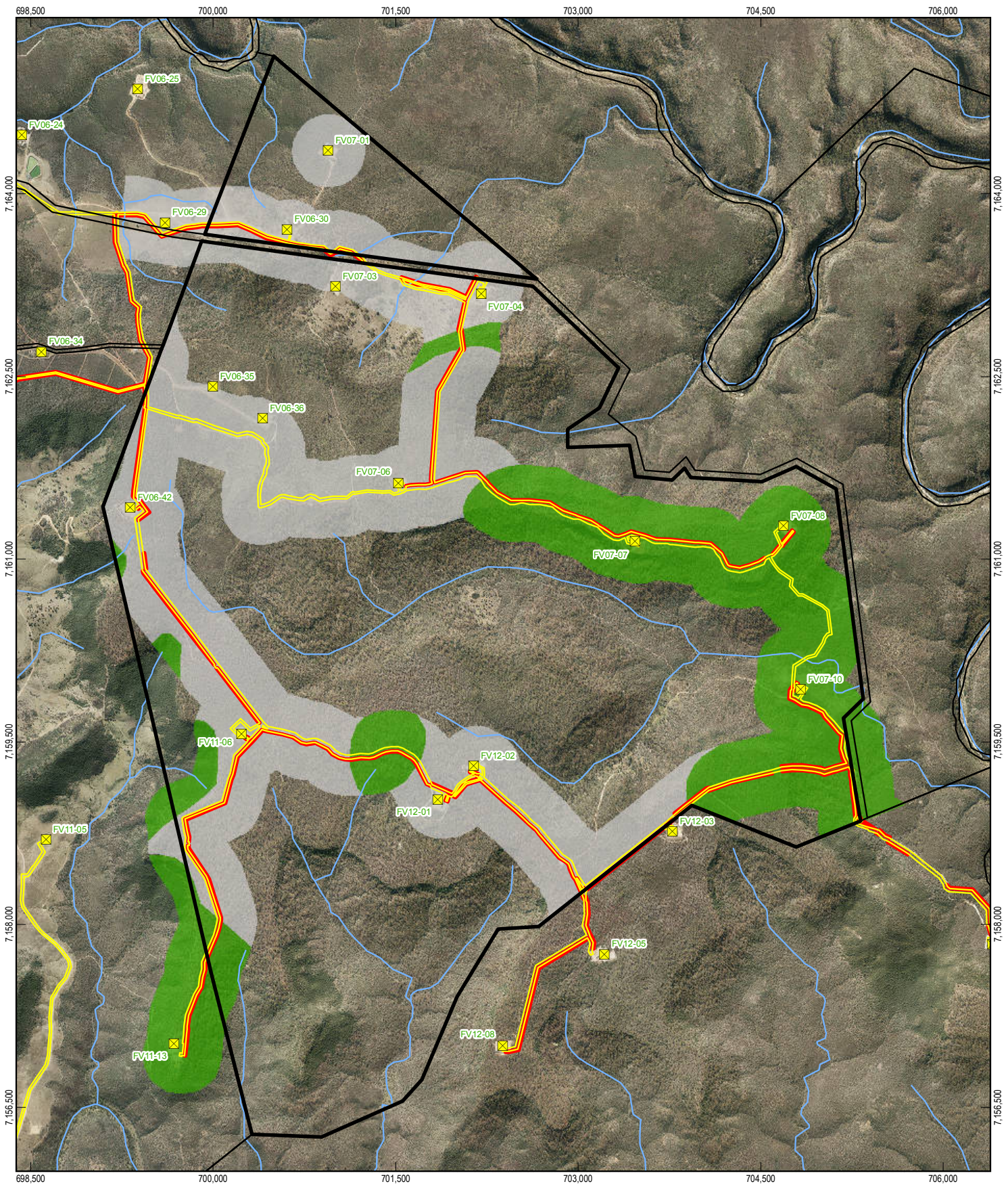


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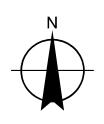
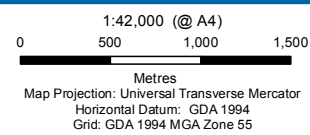
**Brigalow Scaly-foot  
(*Paradelma orientalis*) Habitat** **Figure 18**





**LEGEND**

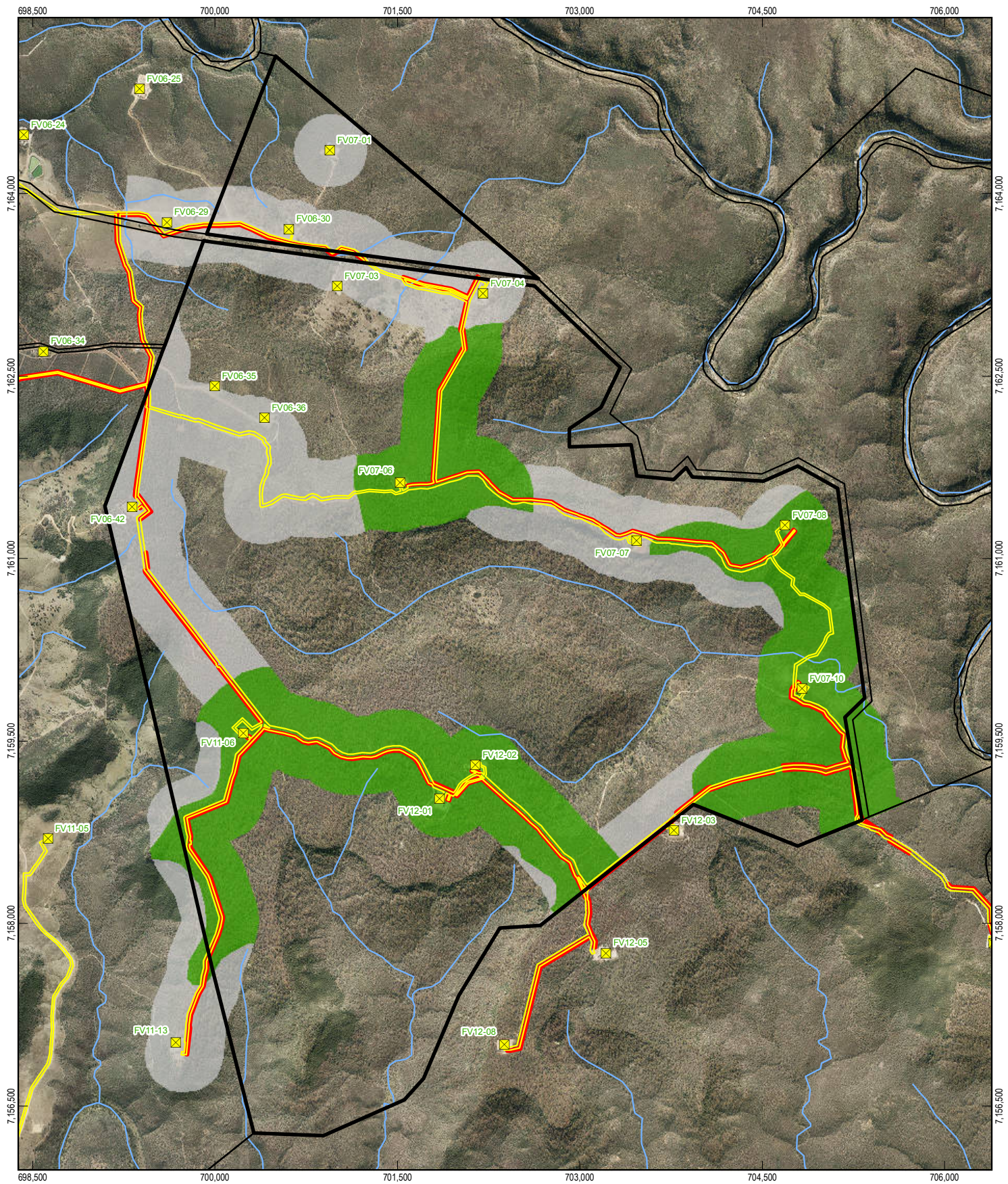
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|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |



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Fairview Lot 20 Ecological Assessments  
**Collared Delma**  
*(Delma torquata)* Habitat

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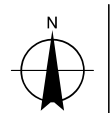
**Figure 19**



**LEGEND**

- |             |                         |                            |                               |
|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |

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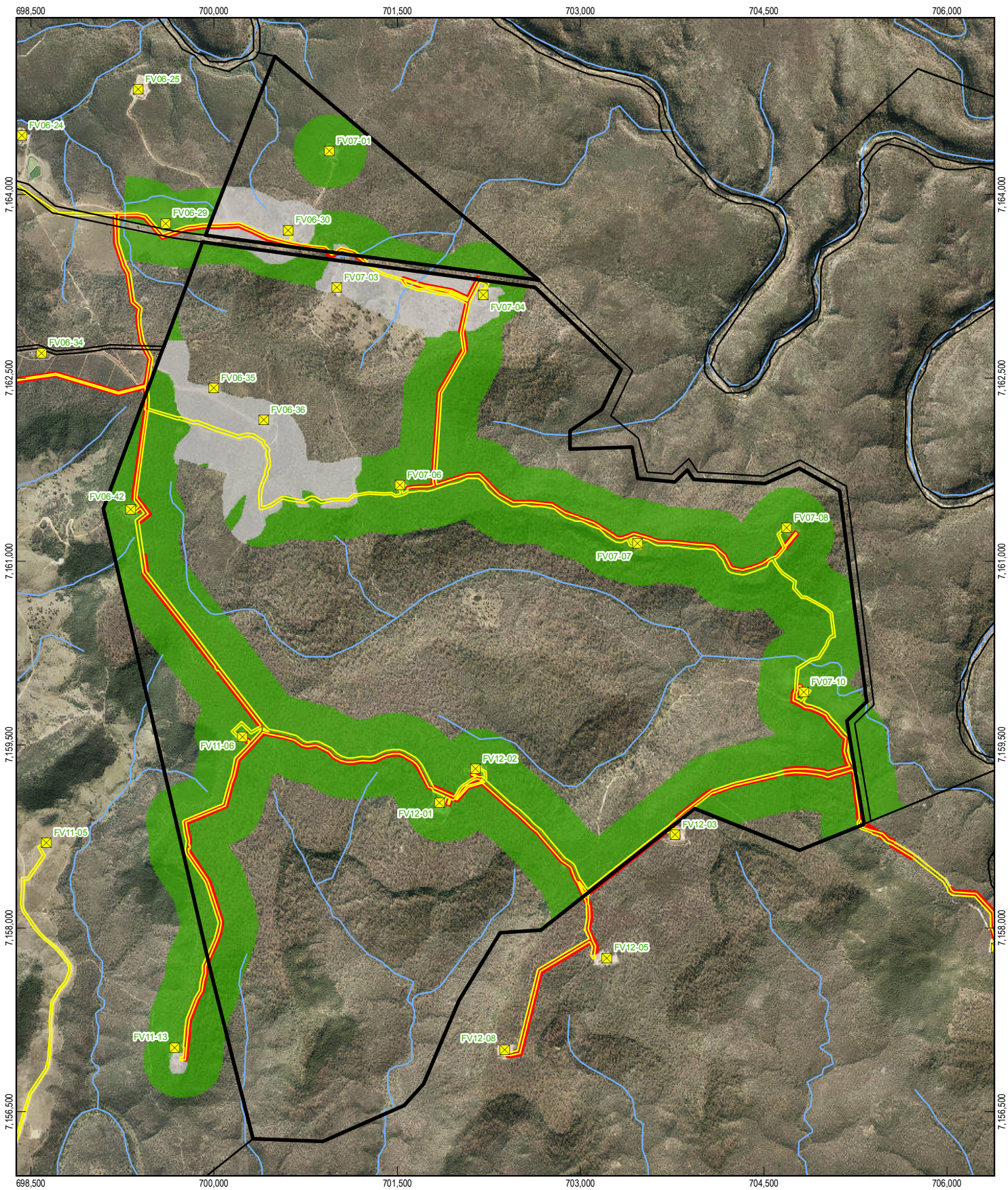
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 Fairview Lot 20 Ecological Assessments  
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 Revision | 0  
 Date | 05 Dec 2013

**Dunmall's Snake  
 (*Furina dunmali*) Habitat** **Figure 20**

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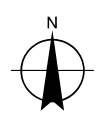
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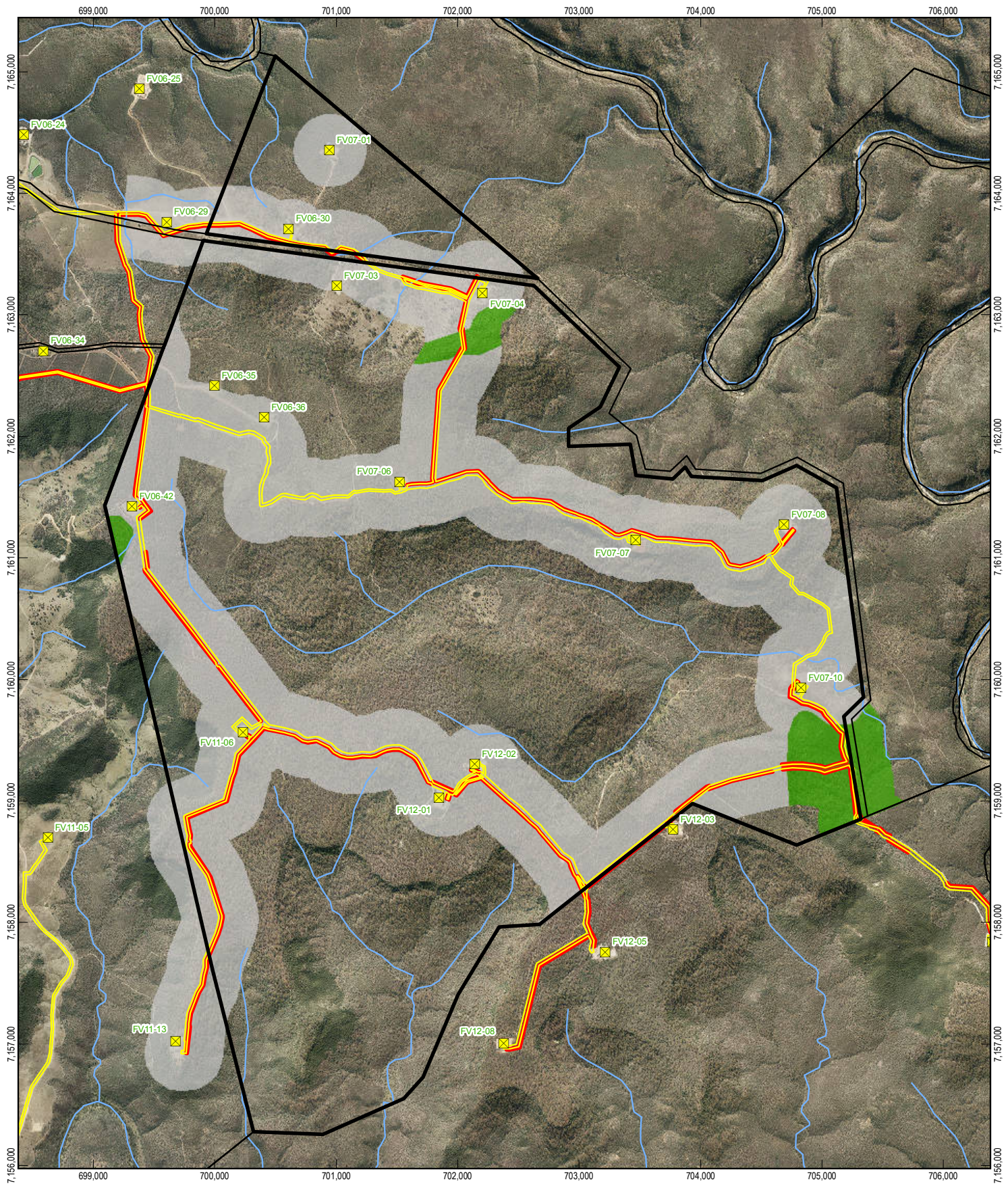
**LEGEND**

- Well Pad
- Fairview Lot 20 FTY1805
- Clearing Limit
- Habitat Classification**
- Watercourse
- Cadastre
- Vegetation Management Area
- General Habitat
- Unlikely Habitat

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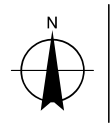
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 Fairview Lot 20 Ecological Assessments  
 Job Number | 41-27125  
 Revision | 0  
 Date | 05 Dec 2013  
**Golden-tail Gecko**  
*(Strophurus taenicauda)* Habitat Figure 21



**LEGEND**

- |             |                         |                            |                               |
|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |

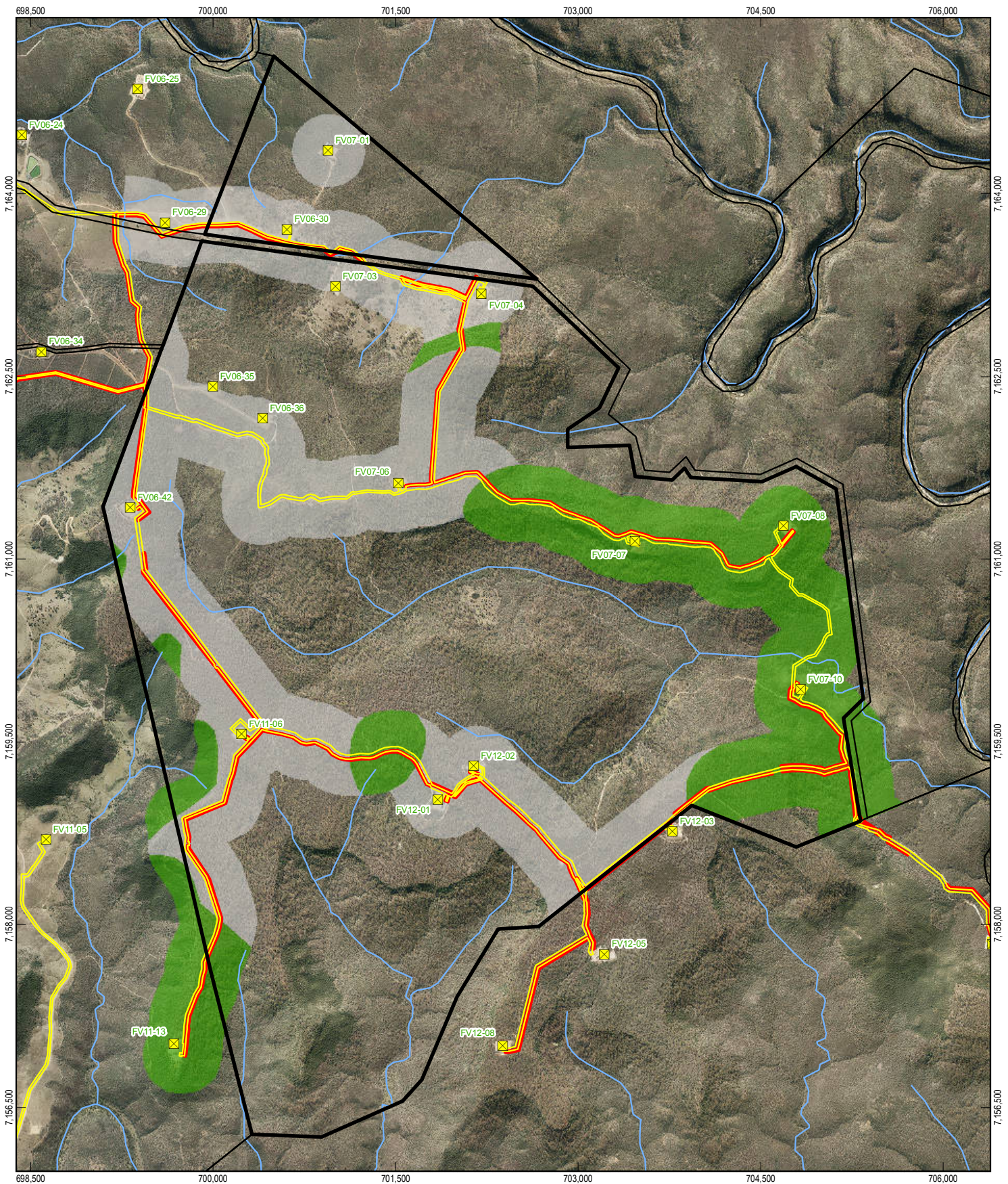
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Santos GLNG  
 Fairview Lot 20 Ecological Assessments  
 Woma  
 (*Aspidites ramsayi*) Habitat

Job Number | 41-27125  
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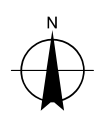
**Figure 22**



**LEGEND**

- |             |                         |                            |                               |
|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |

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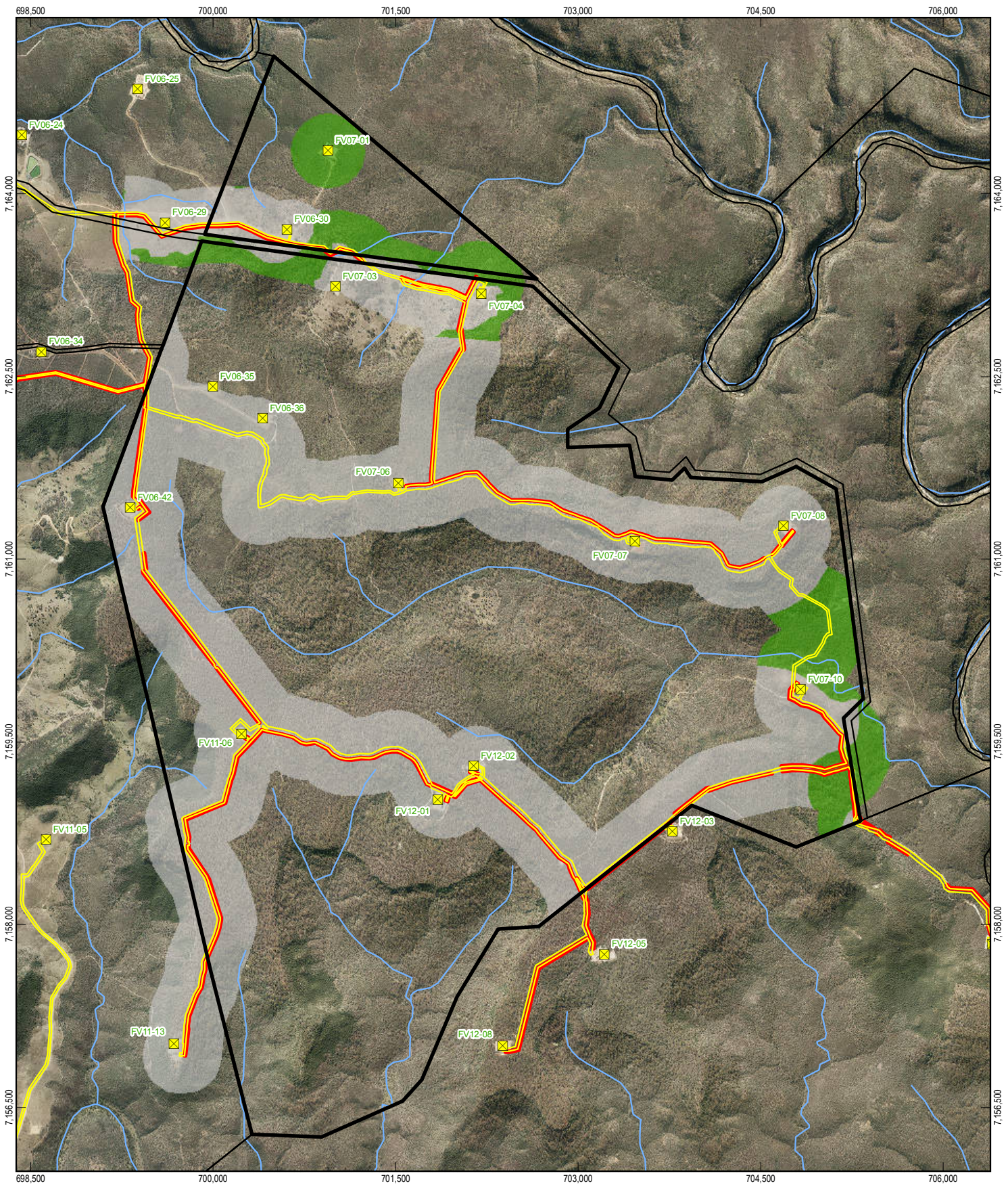


Santos GLNG  
 Fairview Lot 20 Ecological Assessments  
 Yakka Skink  
 (*Egernia rugosa*) Habitat

Job Number | 41-27125  
 Revision | 0  
 Date | 05 Dec 2013

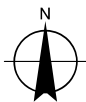
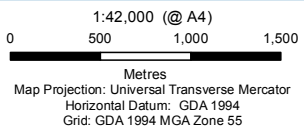
**Figure 23**

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 Data source: Santos: Well Pad Locations, Cadastre, Clearing Limit, Vegetation Management Area, Watercourse, Imagery/Supplied October 2013; ESRI: Hillshade/2008; GHD: Habitat Areas/2013. Created by: AF



**LEGEND**

- |             |                         |                            |                               |
|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |

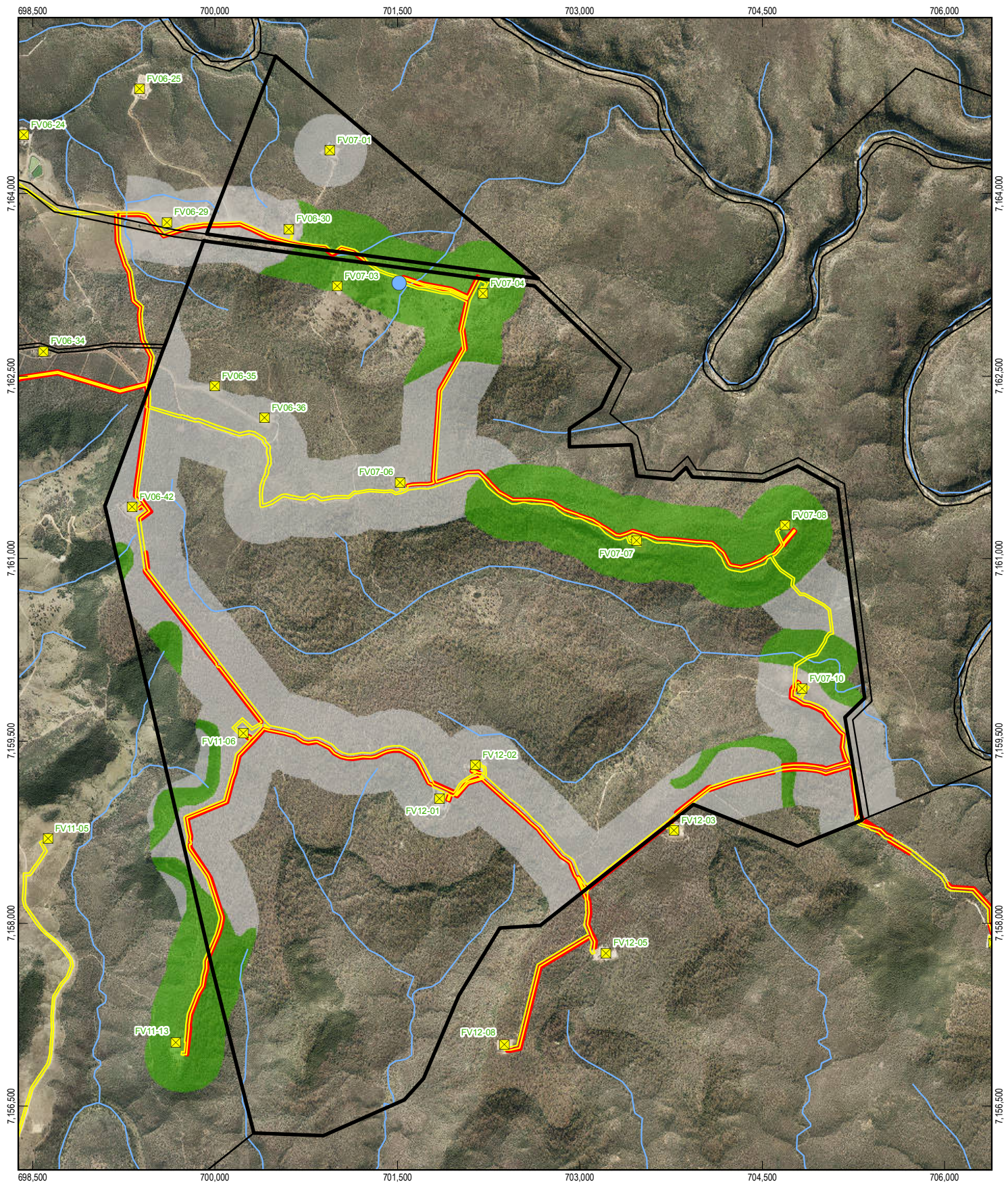


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Date | 05 Dec 2013

**Koala (*Phascolarctos cinereus*)  
Habitat**

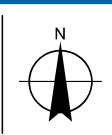
**Figure 24**



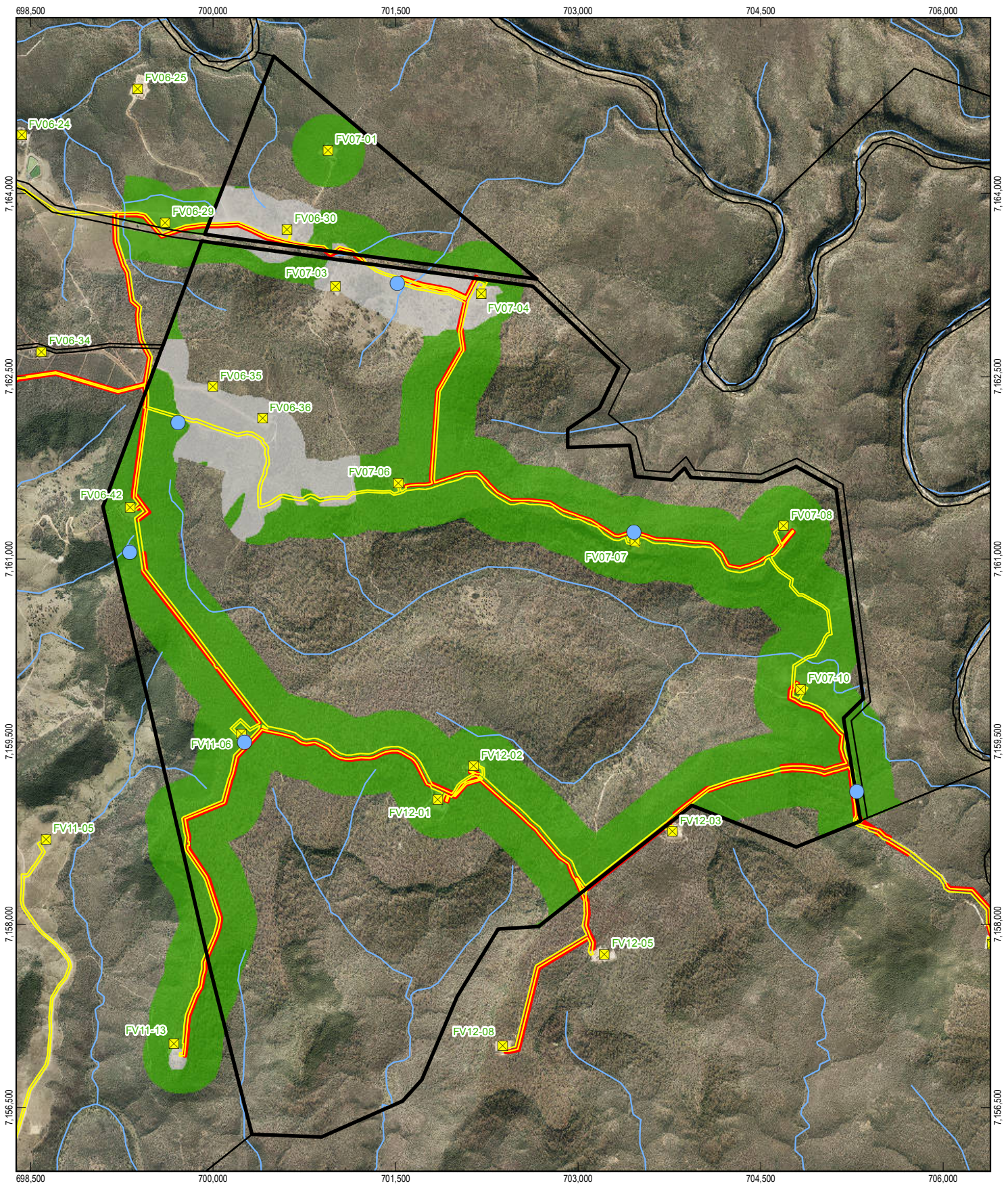
**LEGEND**

- Large-eared Pied Bat
- Fairview Lot 20 FTY1805
- Clearing Limit
- Habitat Classification
- General Habitat
- Cadastre
- Vegetation Management Area
- Unlikely Habitat
- ✕ Well Pad
- Watercourse

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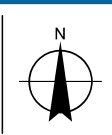
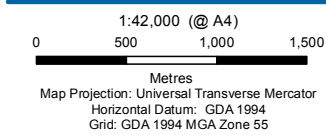


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**Large-eared Pied Bat**  
*(Chalinolobus dwyeri)* Habitat **Figure 25**



**LEGEND**

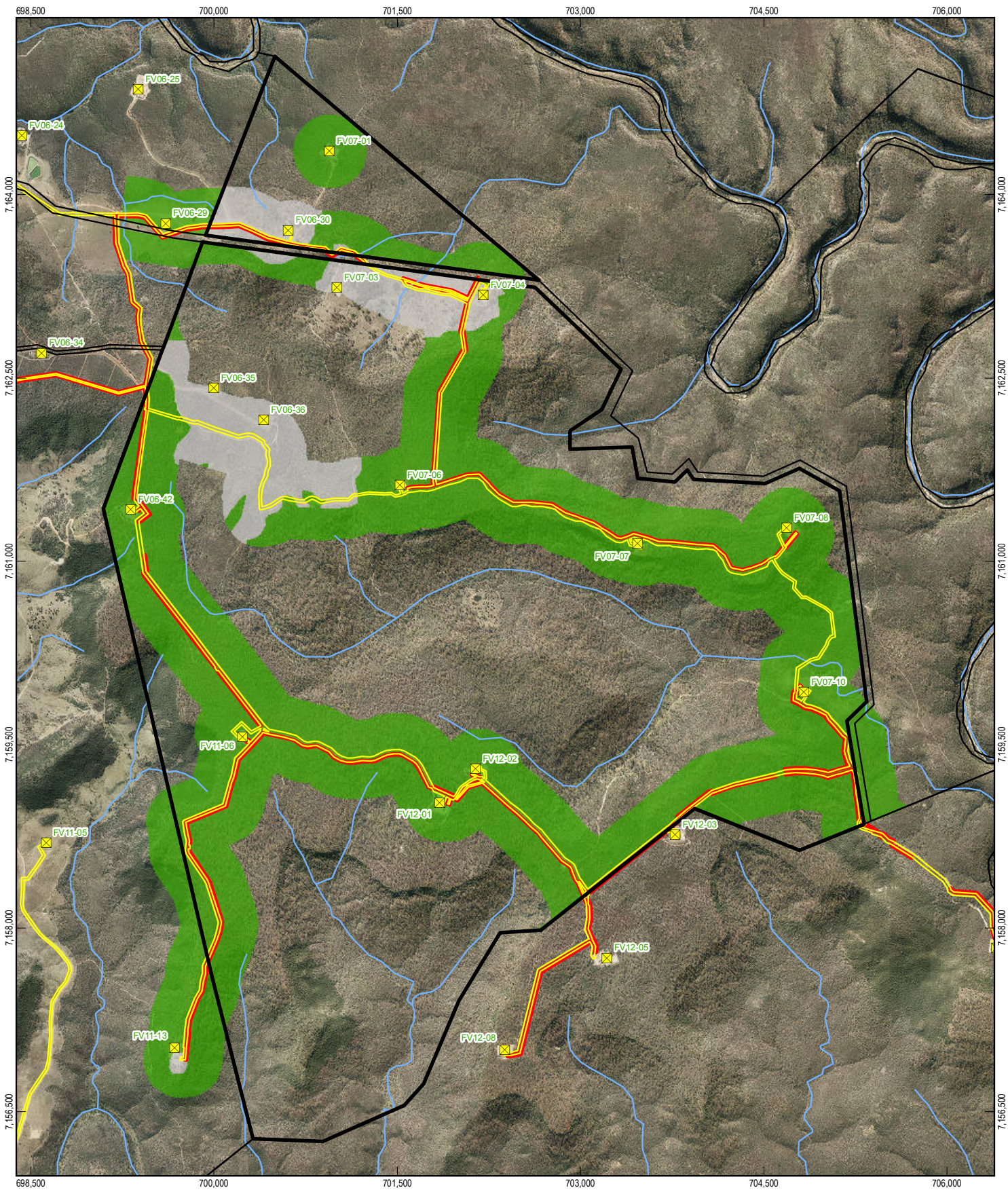
- Little Pied Bat
- Fairview Lot 20 FTY1805
- Cadastre
- Clearing Limit
- Vegetation Management Area
- General Habitat
- Unlikely Habitat
- Watercourse
- ✕ Well Pad



Santos GLNG  
Fairview Lot 20 Ecological Assessments  
Little Pied Bat  
(*Chalinolobus picatus*) Habitat **Figure 26**

Job Number	41-27125
Revision	0
Date	05 Dec 2013

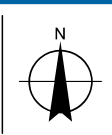




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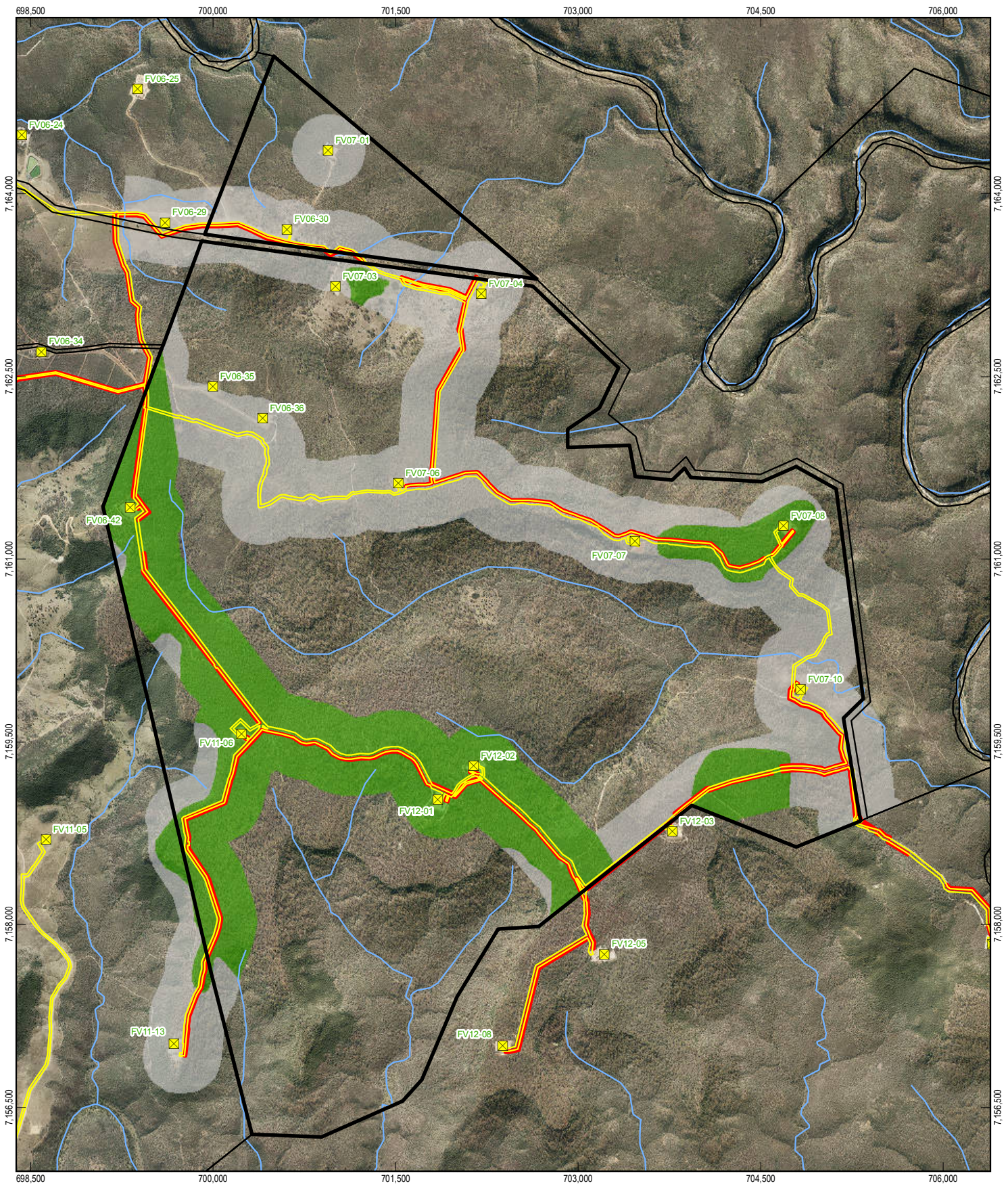
- Well Pad
- Fairview Lot 20 FTY1805
- Clearing Limit
- Habitat Classification**
- Watercourse
- Cadastre
- Vegetation Management Area
- General Habitat
- Unlikely Habitat

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 0 500 1,000 1,500  
 Metres  
 Map Projection: Universal Transverse Mercator  
 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 55



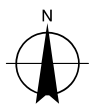
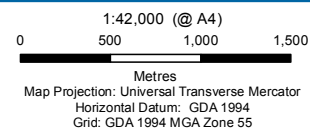
Santos GLNG  
 Fairview Lot 20 Ecological Assessments  
 Northern Quoll  
 (*Dasyurus hallucatus*) Habitat **Figure 27**

Job Number | 41-27125  
 Revision | 0  
 Date | 05 Dec 2013



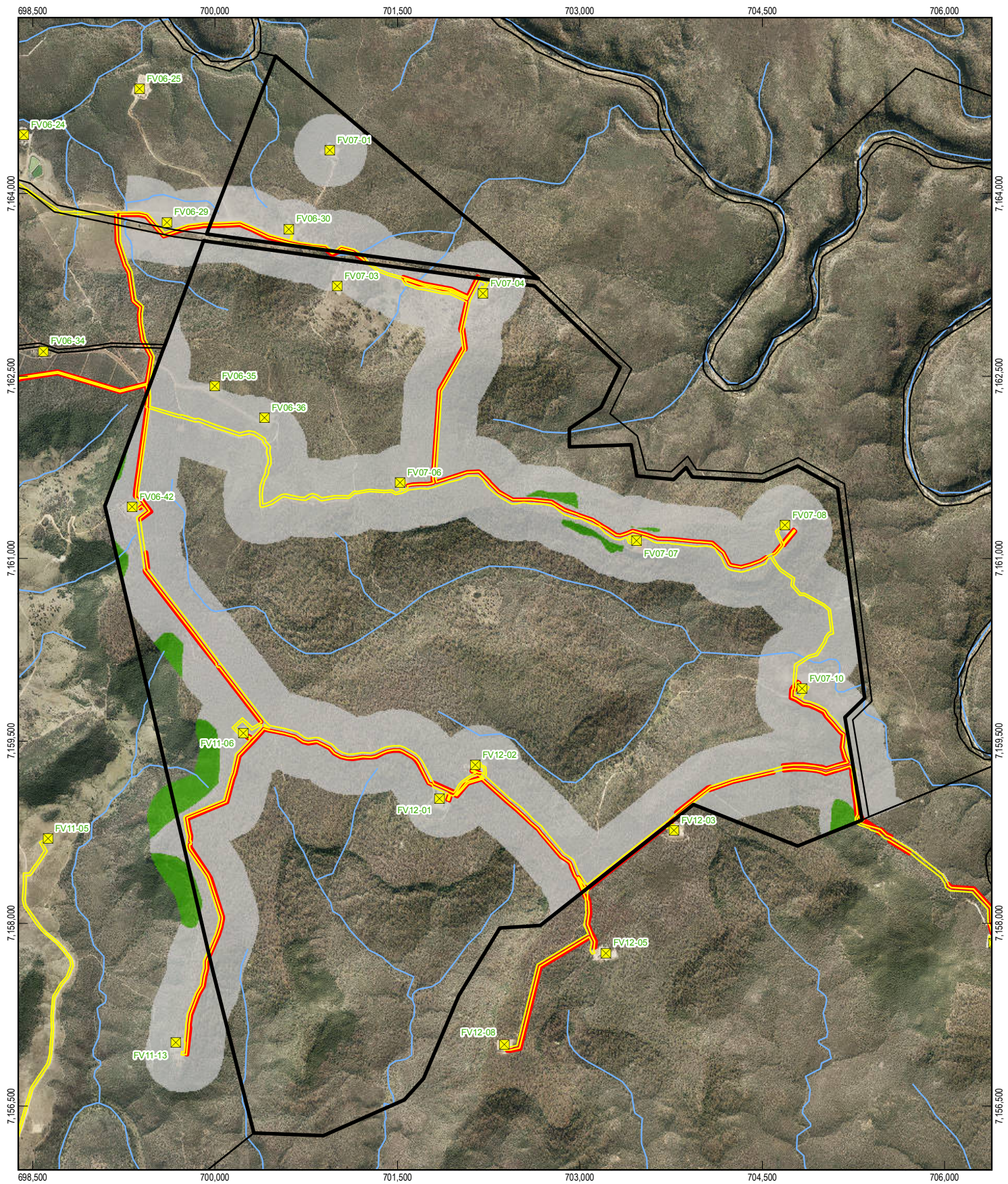
**LEGEND**

- |             |                         |                            |                               |
|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |



Santos GLNG  
Fairview Lot 20 Ecological Assessments  
Job Number 41-27125  
Revision 0  
Date 05 Dec 2013

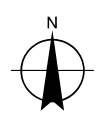
**South-eastern Long-eared Bat  
(*Nyctophilus corbeni*) Habitat** **Figure 28**



**LEGEND**

- Well Pad
- Fairview Lot 20 FTY1805
- Clearing Limit
- Habitat Classification
- Watercourse
- Cadastre
- Vegetation Management Area
- General Habitat
- Unlikely Habitat

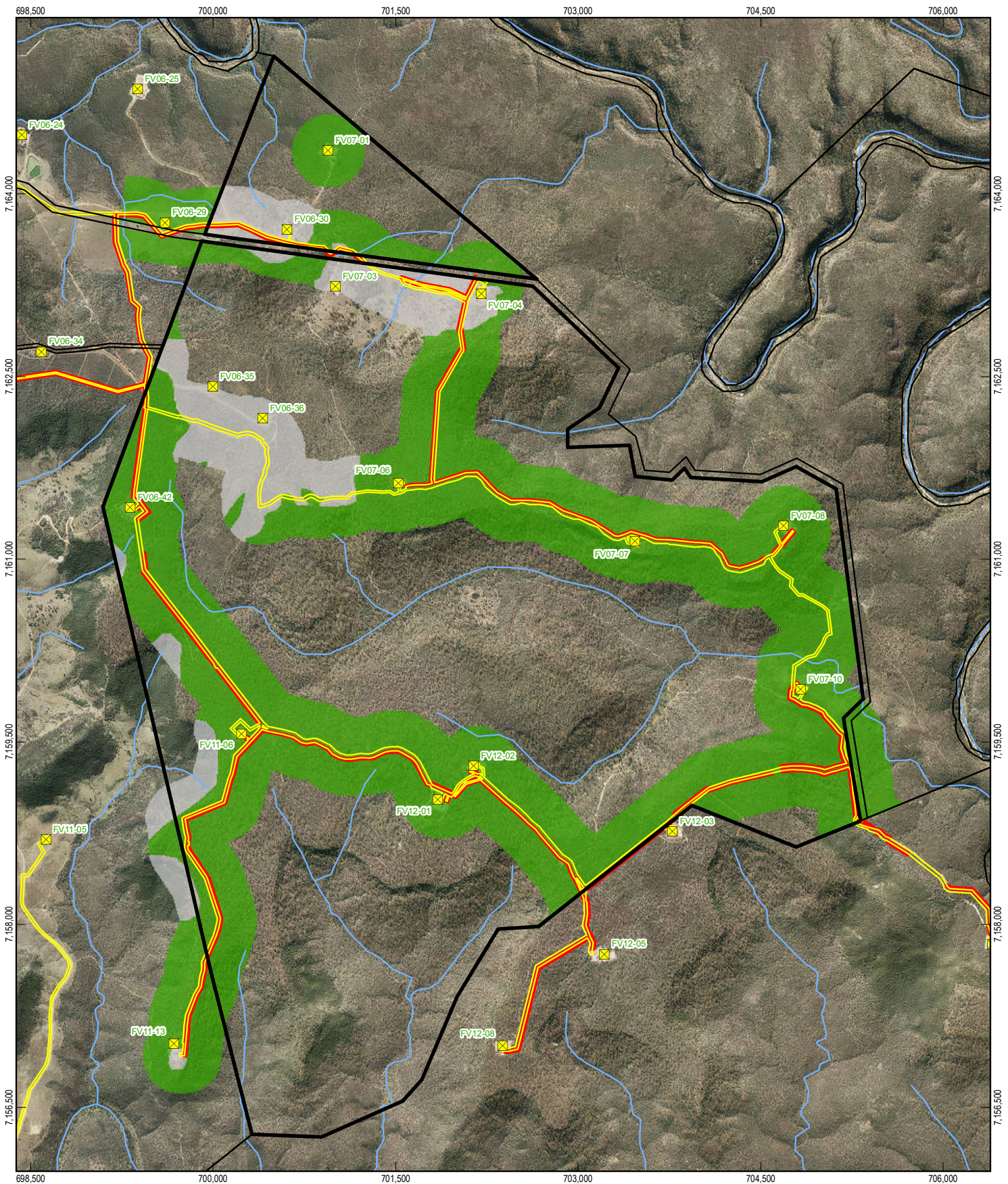
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 Metres  
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 Horizontal Datum: GDA 1994  
 Grid: GDA 1994 MGA Zone 55



Santos GLNG  
 Fairview Lot 20 Ecological Assessments  
 Job Number 41-27125  
 Revision 0  
 Date 05 Dec 2013

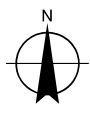
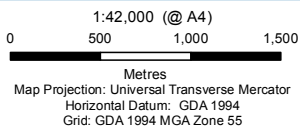
**Black-breasted Button Quail  
 (*Turnix melanogaster*) Habitat Figure 29**

G:\41\27125\GIS\Maps\MXD\41\_2712504\_001\_Black-BreastedButtonQuail\_Rev0.mxd 145 Ann St Brisbane QLD 4000 Australia T 61 7 3316 3000 F 61 7 3316 3333 E bnemail@ghd.com W www.ghd.com  
 © 2013. Whilst every care has been taken to prepare this map, GHD (and Santos, ESR) make no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and cannot accept liability and responsibility of any kind (whether in contract, tort or otherwise) for any expenses, losses, damages and/or costs (including indirect or consequential damage) which are or may be incurred by any party as a result of the map being inaccurate, incomplete or unsuitable in any way and for any reason.  
 Data source: Santos: Well Pad Locations, Cadastre, Clearing Limit, Vegetation Management Area, Watercourse, Imagery/Supplied October 2013; ESR: Hillshade/2008; GHD: Habitat Areas/2013. Created by: AF



**LEGEND**

- |             |                         |                            |                               |
|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |

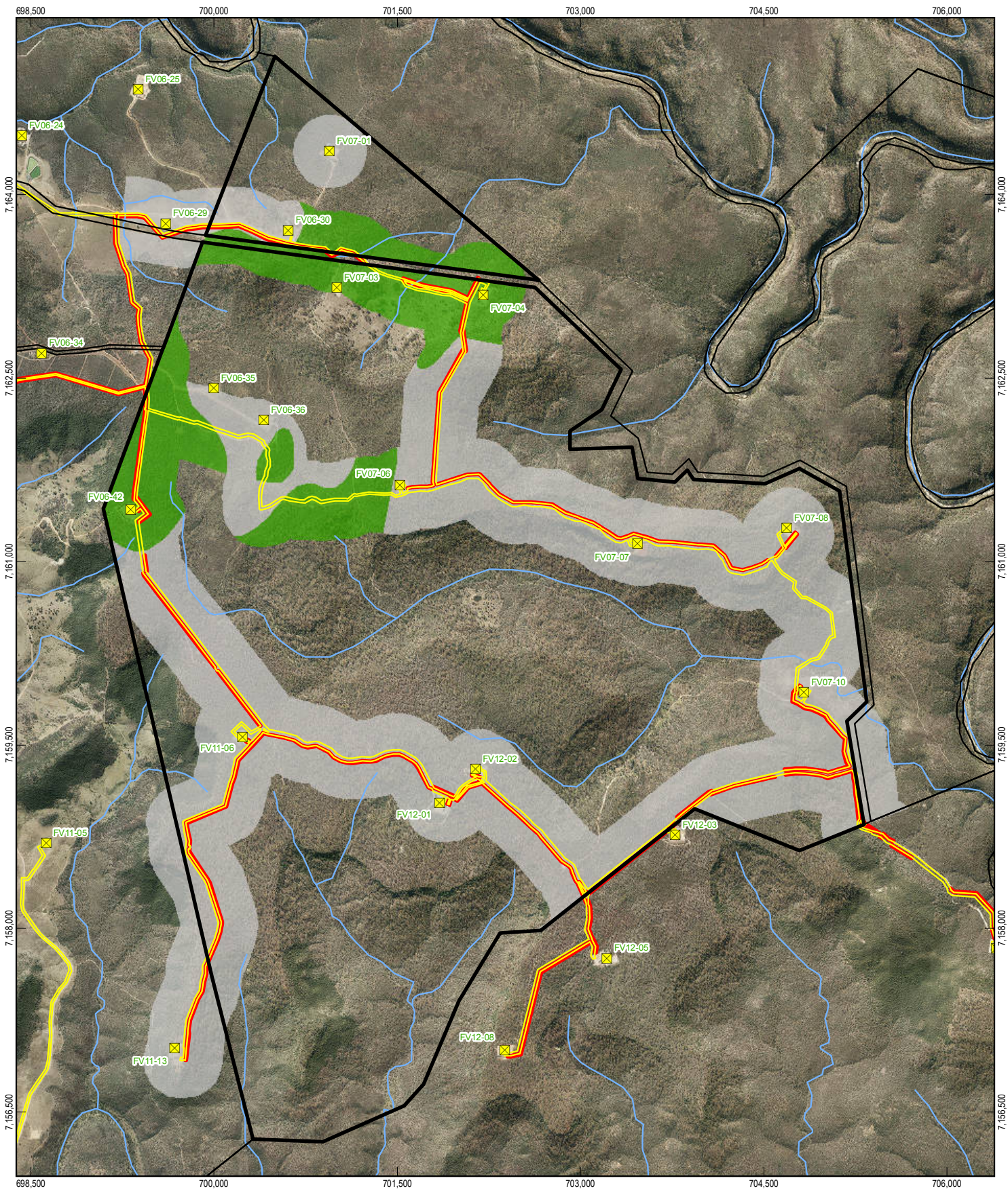


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Fairview Lot 20 Ecological Assessments

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Revision | 0  
Date | 05 Dec 2013

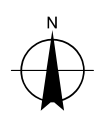
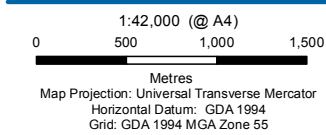
**Powerful Owl  
(*Ninox strenua*) Habitat**

**Figure 30**



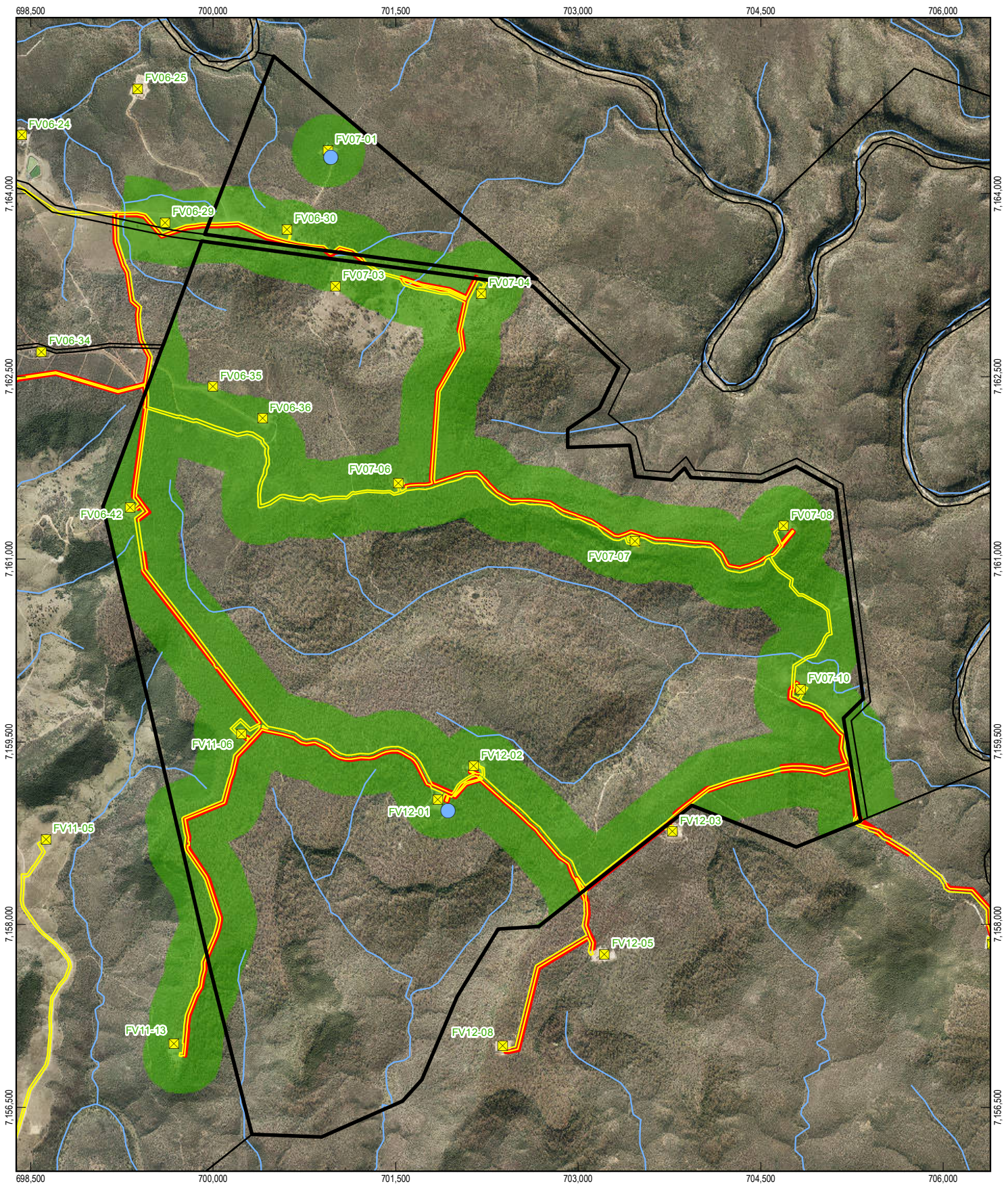
**LEGEND**

- |             |                         |                            |                               |
|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |



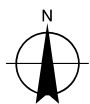
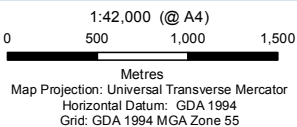
Santos GLNG  
 Fairview Lot 20 Ecological Assessments  
 Job Number 41-27125  
 Revision 0  
 Date 05 Dec 2013

**Square-tailed Kite  
 (*Lophoictinia isura*) Habitat** **Figure 31**



**LEGEND**

- Squatter Pigeon
- Watercourse
- Cadastre
- Vegetation Management Area
- ✕ Well Pad
- Fairview Lot 20 FTY1805
- Clearing Limit
- Habitat Classification
- General Habitat

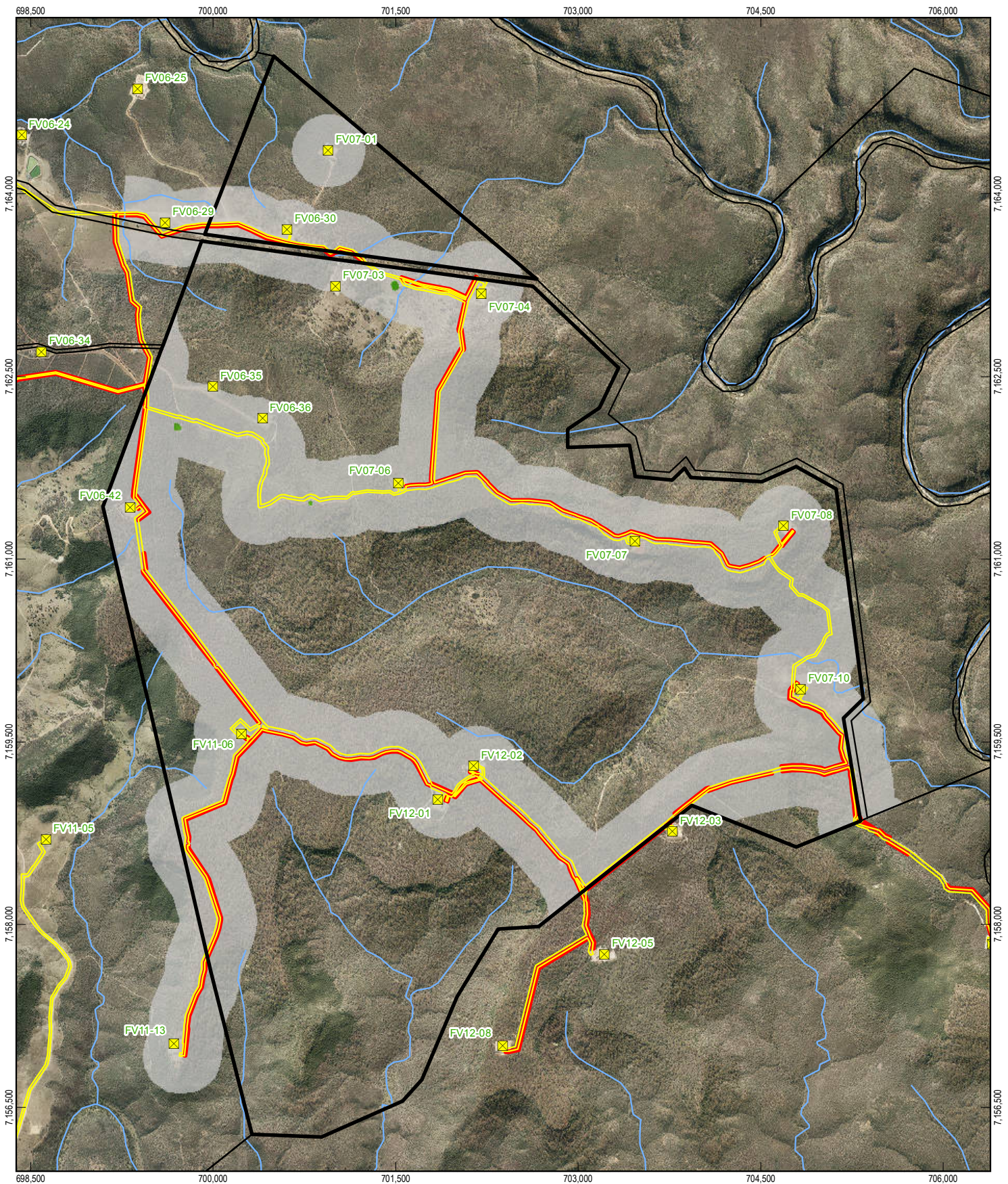


Santos GLNG  
Fairview Lot 20 Ecological Assessments

Job Number | 41-27125  
Revision | 0  
Date | 05 Dec 2013

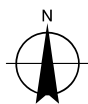
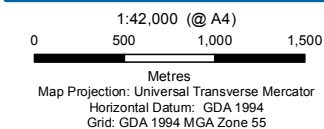
**Squatter Pigeon (*Geophaps scripta scripta*) Habitat**

**Figure 32**



**LEGEND**

- |             |                         |                            |                               |
|-------------|-------------------------|----------------------------|-------------------------------|
| Well Pad    | Fairview Lot 20 FTY1805 | Clearing Limit             | <b>Habitat Classification</b> |
| Watercourse | Cadastre                | Vegetation Management Area | General Habitat               |
|             |                         |                            | Unlikely Habitat              |



Santos GLNG  
Fairview Lot 20 Ecological Assessments

Job Number | 41-27125  
Revision | 0  
Date | 05 Dec 2013

**Rough Collared Frog  
(*Cyclorana verrucosa*) Habitat Figure 33**

## 4. References

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# Appendices

# Appendix A – Methods

Desktop and field ecological assessments of RoWs, proposed well pads and associated assessment buffers within Lot 20 were undertaken in accordance with the Santos Methodology.

Ecological features assessed under the Santos Methodology and types of assessments undertaken within Lot 20 included:

- Environmentally sensitive areas – assessed within 1 km of RoW footprints by quaternary vegetation assessments (Neldner *et al.* 2012)
- Regional ecosystems – assessed within 200 m of RoW footprints by quaternary vegetation assessments (Neldner *et al.* 2012)
- Threatened Ecological Community assessments - assessed within 300 m of RoW footprints by quaternary vegetation assessments (Neldner *et al.* 2012)
- Vegetation community assessments – assessed for each broad vegetation community within Lot 20 from criteria defined in the Fairview Environmental Authority (EPPG00928713), Schedule D – Land
- Mapped watercourses – assessed within 100 m of RoW footprints by the Works Within a Watercourse Assessment Checklist and Fluor/Santos Works Within a Watercourse Assessment and Approvals manual (document number: 6300-110-PRC-10104-FLR02-GENL Rev B)
- Wetlands, lakes and springs – assessed within 300 m of RoW footprints by the Wetland Rapid Assessment Checklist and the Procedure for Conducting Wetlands Assessments (document number: 3301-GLNG-4-1.3-0016) and Guideline for Conducting Wetlands Assessments (document number: 3301-GLNG-4-1.3-0017)
- General fauna habitat assessments – assessed within 200 m of RoW footprints by habitat and condition assessments (Eyre *et al.* 2012)
- Essential habitat (mapped under the *Vegetation Management Act 1999*) – assessed within 200 m of RoW footprints by targeted species searches
- Fauna habitat features and potential breeding places – type and location recorded within each RoW footprint
- Targeted threatened species searches – assessed within 300 m of RoW footprints for flora and fauna species listed as endangered, vulnerable or, near threatened (EVNT) under the EPBC Act and NC Act. Survey methods undertaken were appropriate for each targeted flora and fauna species as identified within relevant species survey guidelines published by the Department of the Environment (DOE) and/or DEHP including:
  - Random meander transects (Cropper 1993) for threatened flora species
  - Diurnal active searches
  - Remote camera detection
  - Anabat deployment
  - Diurnal bird surveys
  - Spotlighting – driving and walking transects
  - Call playback
  - Incidental species observations
- Koala habitat assessments and surveys – presence/absence of koala habitat assessed within 200 m of RoW footprints by collecting information on koala population and habitat



information outlined in Interim koala referral advice for proponents (DSEWPaC 2012), including:


- Koala habitat assessment: determining habitat critical to the survival of the koala including lists of primary and secondary food tree species.
- Koala survey: undertaking koala surveys using the techniques outlined in Policy 4 (page 72) of the *Nature Conservation (koala) Conservation Plan 2006 and Management Program 2006-2016* and for koala utilisation and frequency (faecal pellet surveys) using the spot assessment technique (Phillips & Callaghan 2011)


# Appendix B – Vegetation communities and habitat values


- Vegetation community descriptions
- Benchmarks for representative ecosystems

## Vegetation community descriptions



Community name	REs	Community characteristics	Fauna habitat value	Photo																																																																								
Mixed eucalypt woodland to open-forest on plateaus and gently sloping foothills <b>(Eucalypt woodland on flats and plains)</b>	11.10.1, 11.10.7, 11.10.4	<p>This community occurs across the majority of Lot 20.</p> <p>This community comprises a woodland to open-forest on hilltops and lower slopes, formed from medium to coarse-grained sediments, and is characterised by <i>Corymbia citriodora</i> and <i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>.</p> <p>Other species such as <i>Eucalyptus crebra</i>, <i>Eucalyptus melanophloia</i> and <i>Corymbia trachyphloia</i> are also present in the canopy.</p> <p>The vegetation cover was typically sparse to moderate density (20 to 50 per cent), including the sub canopy layer. The shrub layer was typically moderately dense (20 to 60 per cent) and the ground layer was mostly sparse (20 to 50 per cent) while some sites recorded dense ground cover (70-100 per cent). Species composition in all strata consisted of mainly native species.</p> <p>This community was in good condition across its distribution (VAST level 1-2) with low levels of weed infestation. Weeds occurred predominately in the ground layer and included <i>Opuntia tomentosa</i>, <i>Bidens pilosa</i>, <i>Cenchrus ciliaris</i>, <i>Conyza bonarienses</i> and <i>Malvastrum americanum</i>. <i>Opuntia</i> spp. were the most commonly observed weeds and were recorded at low densities at most sites within this vegetation community.</p>	<p>Survey sites: HA 1, HA 3, HA 5, HA 7, HA 8, HA 9, HA 10, HA 11, HA 12, HA 13 (n=10)</p> <table border="1"> <thead> <tr> <th colspan="2">Trees with hollows</th> <th>(Average per ha)</th> </tr> </thead> <tbody> <tr> <td>No. of trees containing hollows &lt; 10 cm diameter</td> <td></td> <td>3 trees</td> </tr> <tr> <td>Total number of hollows &lt; 10 cm diameter</td> <td></td> <td>4.8 hollows</td> </tr> <tr> <td>No. of trees containing hollows &gt; 10 cm diameter</td> <td></td> <td>3 trees</td> </tr> <tr> <td>Total number of hollows &gt; 10 cm diameter</td> <td></td> <td>9 hollows</td> </tr> <tr> <th colspan="2">Hollow bearing logs</th> <th>(Average per ha)</th> </tr> <tr> <td>Number of logs with hollows &gt; 10 cm diameter</td> <td></td> <td>0.4 logs</td> </tr> <tr> <td>Total number of logs with hollows</td> <td></td> <td>0.4 logs</td> </tr> <tr> <th colspan="2">Fallen woody material</th> <th>(Average per ha)</th> </tr> <tr> <td>Total length of logs &gt; 10 cm diameter</td> <td></td> <td>500 m</td> </tr> <tr> <td>Total number of logs</td> <td></td> <td>150 logs</td> </tr> <tr> <th colspan="3">Abundance of other habitat characteristics</th> </tr> <tr> <th>Characteristic</th> <th colspan="2">Abundance (0-7)<sup>^</sup> (average per ha)</th> </tr> <tr> <td>Decorticated bark</td> <td colspan="2">2</td> </tr> <tr> <td>Course leaf litter (&gt; 2 cm diameter)</td> <td colspan="2">3</td> </tr> <tr> <td>Fine leaf litter (&lt; 2 cm diameter)</td> <td colspan="2">2.3</td> </tr> <tr> <td>Bare ground</td> <td colspan="2">3.4</td> </tr> <tr> <td>Grass</td> <td colspan="2">4.5</td> </tr> <tr> <td>Soil cracks</td> <td colspan="2">0</td> </tr> <tr> <td>Stones (20–60 cm)</td> <td colspan="2">0.1</td> </tr> <tr> <td>Boulders (61 cm – 2 m)</td> <td colspan="2">0</td> </tr> <tr> <td>Large boulders (&gt; 2 m)</td> <td colspan="2">0</td> </tr> <tr> <td>Rock crevices</td> <td colspan="2">0</td> </tr> <tr> <td>Exfoliating rock</td> <td colspan="2">0</td> </tr> </tbody> </table> <p><sup>^</sup>Abundance key: 0 = None, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant</p>	Trees with hollows		(Average per ha)	No. of trees containing hollows < 10 cm diameter		3 trees	Total number of hollows < 10 cm diameter		4.8 hollows	No. of trees containing hollows > 10 cm diameter		3 trees	Total number of hollows > 10 cm diameter		9 hollows	Hollow bearing logs		(Average per ha)	Number of logs with hollows > 10 cm diameter		0.4 logs	Total number of logs with hollows		0.4 logs	Fallen woody material		(Average per ha)	Total length of logs > 10 cm diameter		500 m	Total number of logs		150 logs	Abundance of other habitat characteristics			Characteristic	Abundance (0-7) <sup>^</sup> (average per ha)		Decorticated bark	2		Course leaf litter (> 2 cm diameter)	3		Fine leaf litter (< 2 cm diameter)	2.3		Bare ground	3.4		Grass	4.5		Soil cracks	0		Stones (20–60 cm)	0.1		Boulders (61 cm – 2 m)	0		Large boulders (> 2 m)	0		Rock crevices	0		Exfoliating rock	0		 <p>Representative photo: Site VC 4</p>  <p>Representative photo: Site VC 6</p> <p>Survey Sites: VC 1, VC 3, VC 4, VC 6, Q 1, Q 3, Q 3, Q 6, Q 8, Q 10, Q 11, Q 12, Q 13, Q 14 Q 15, Q 16, Q 17, Q 18, Q 22, Q 22a, Q 27, Q 34</p>
			Trees with hollows		(Average per ha)																																																																							
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Mixed eucalypt woodland to open-forest on steep rocky slopes <b>(Eucalypt woodland on rocky slopes)</b>	11.10.1, 11.10.4	<p>This community occurs on steep rocky slopes in narrow bands, across Lot 20.</p> <p>This community comprises a woodland to open-forest on scarps and steep slopes formed from medium to coarse-grained sediments, and is characterised by <i>Corymbia citriodora</i> (dominant) and <i>Eucalyptus fibrosa</i> subsp. <i>nubila</i> (sub dominant).</p> <p>Other species such as <i>Eucalyptus crebra</i>, <i>Eucalyptus decorticans</i>, <i>Angophora leiocarpa</i>, <i>Corymbia trachyphloia</i> and <i>Brachychiton</i> spp. are also present in the canopy.</p> <p>The vegetation cover was typically sparse to moderately-sparse (20 to 50 per cent), including the sub canopy layer. The shrub layer was typically of moderate to sparse density (20 to 60 per cent) and the ground layer was mostly sparse (20 to 50 per cent). Species composition in all strata consisted of mainly native species</p> <p>This community was in good condition across its distribution (VAST level 1-2) with low levels of weed infestation. Weeds occurred predominately in the ground layer and included <i>Opuntia tomentosa</i>, <i>O. stricta</i> and <i>Cenchrus ciliaris</i>. <i>Opuntia</i> spp. were the most commonly observed weeds and were recorded at low densities at most sites within this vegetation community.</p>	<table border="1"> <thead> <tr> <th colspan="2">Survey sites: HA 6, HA 15, HA 17, HA 18 (n=4)</th> </tr> <tr> <th>Trees with hollows</th> <th>(Average per ha)</th> </tr> </thead> <tbody> <tr> <td>No. of trees containing hollows &lt; 10 cm diameter</td> <td>2.5 trees</td> </tr> <tr> <td>Total number of hollows &lt; 10 cm diameter</td> <td>3.75 hollows</td> </tr> <tr> <td>No. of trees containing hollows &gt; 10 cm diameter</td> <td>3.5 trees</td> </tr> <tr> <td>Total number of hollows &gt; 10 cm diameter</td> <td>6 hollows</td> </tr> <tr> <th>Hollow bearing logs</th> <th>(Average per ha)</th> </tr> <tr> <td>Number of logs with hollows &gt; 10 cm diameter</td> <td>1.5 logs</td> </tr> <tr> <td>Total number of logs with hollows</td> <td>3 logs</td> </tr> <tr> <th>Fallen woody material</th> <th>(Average per ha)</th> </tr> <tr> <td>Total length of logs &gt; 10 cm diameter</td> <td>415 m</td> </tr> <tr> <td>Total number of logs</td> <td>115 logs</td> </tr> <tr> <th colspan="2">Abundance of other habitat characteristics</th> </tr> <tr> <th>Characteristic</th> <th>Abundance (0-7)<sup>^</sup> (average per ha)</th> </tr> <tr> <td>Decorticating bark</td> <td>3</td> </tr> <tr> <td>Course leaf litter (&gt; 2 cm diameter)</td> <td>3.5</td> </tr> <tr> <td>Fine leaf litter (&lt; 2 cm diameter)</td> <td>2.75</td> </tr> <tr> <td>Bare ground</td> <td>2</td> </tr> <tr> <td>Grass</td> <td>4.5</td> </tr> <tr> <td>Soil cracks</td> <td>0</td> </tr> <tr> <td>Stones (20–60 cm)</td> <td>4</td> </tr> <tr> <td>Boulders (61 cm – 2 m)</td> <td>3.75</td> </tr> <tr> <td>Large boulders (&gt; 2 m)</td> <td>2.5</td> </tr> <tr> <td>Rock crevices</td> <td>2.5</td> </tr> <tr> <td>Exfoliating rock</td> <td>2.5</td> </tr> </tbody> </table> <p><sup>^</sup>Abundance key: 0 = None, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant</p>	Survey sites: HA 6, HA 15, HA 17, HA 18 (n=4)		Trees with hollows	(Average per ha)	No. of trees containing hollows < 10 cm diameter	2.5 trees	Total number of hollows < 10 cm diameter	3.75 hollows	No. of trees containing hollows > 10 cm diameter	3.5 trees	Total number of hollows > 10 cm diameter	6 hollows	Hollow bearing logs	(Average per ha)	Number of logs with hollows > 10 cm diameter	1.5 logs	Total number of logs with hollows	3 logs	Fallen woody material	(Average per ha)	Total length of logs > 10 cm diameter	415 m	Total number of logs	115 logs	Abundance of other habitat characteristics		Characteristic	Abundance (0-7) <sup>^</sup> (average per ha)	Decorticating bark	3	Course leaf litter (> 2 cm diameter)	3.5	Fine leaf litter (< 2 cm diameter)	2.75	Bare ground	2	Grass	4.5	Soil cracks	0	Stones (20–60 cm)	4	Boulders (61 cm – 2 m)	3.75	Large boulders (> 2 m)	2.5	Rock crevices	2.5	Exfoliating rock	2.5	 <p>Representative photo: Site Q 19</p> <p>Survey sites: VC 7, Q 7, Q 19, Q 21, Q 23, Q 25, Q 30, Q 31, Q 33</p>
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Semi-evergreen vine thicket on rocky escarpments <b>(Semi-evergreen vine thicket)</b>	11.9.4a	<p>This community occurs on steep rocky sandstone scarp, predominately along the western edge of Lot 20.</p> <p>This community comprises semi-evergreen vine thicket on steep slopes and sandstone ranges with shallow, loamy soils, and is characterised by having an emergent layer dominated by <i>Brachychiton</i> spp and a dense low tree and shrub layer dominated by a mix of shrub and vine species.</p> <p>Common species include <i>Atalaya hemiglauca</i>, <i>Diospyros humilis</i>, <i>Geijera parviflora</i>, <i>Carissa ovata</i>, <i>Denhamia oleaster</i>, <i>Erythroxylon australe</i>, <i>Cupaniopsis anacardioides</i>, <i>Apophyllum anomalum</i> and <i>Parsonsia</i> spp.</p> <p>The emergent layer was sparse (&lt; 10 per cent), but the overall vegetation cover was typically moderate to dense (30 to 70 per cent), including shrubs and vines. The ground layer was mostly dense (70 to 100 per cent). Species composition in all strata consisted of mainly native species.</p> <p>This community was in good condition across its distribution (VAST level 1) with low levels of weed infestation. Two weed species were recorded at low densities within the community. These occurred predominately in the ground layer and included <i>Opuntia tomentosa</i> and <i>Cenchrus ciliaris</i>.</p>	<table border="1"> <thead> <tr> <th colspan="2">Survey sites: HA 2, HA 19 (n=2)</th> </tr> <tr> <th>Trees with hollows</th> <th>(Average per ha)</th> </tr> </thead> <tbody> <tr> <td>No. of trees containing hollows &lt; 10 cm diameter</td> <td>1 tree</td> </tr> <tr> <td>Total number of hollows &lt; 10 cm diameter</td> <td>1 hollow</td> </tr> <tr> <td>No. of trees containing hollows &gt; 10 cm diameter</td> <td>1 tree</td> </tr> <tr> <td>Total number of hollows &gt; 10 cm diameter</td> <td>2 hollows</td> </tr> <tr> <th>Hollow bearing logs</th> <th>(Average per ha)</th> </tr> <tr> <td>Number of logs with hollows &gt; 10 cm diameter</td> <td>4 logs</td> </tr> <tr> <td>Total number of logs with hollows</td> <td>4 logs</td> </tr> <tr> <th>Fallen woody material</th> <th>(Average per ha)</th> </tr> <tr> <td>Total length of logs &gt; 10 cm diameter</td> <td>720 m</td> </tr> <tr> <td>Total number of logs</td> <td>200 logs</td> </tr> <tr> <th colspan="2">Abundance of other habitat characteristics</th> </tr> <tr> <th>Characteristic</th> <th>Abundance (0-7)<sup>^</sup> (average per ha)</th> </tr> <tr> <td>Decortivating bark</td> <td>2.5</td> </tr> <tr> <td>Course leaf litter (&gt; 2 cm diameter)</td> <td>2.5</td> </tr> <tr> <td>Fine leaf litter (&lt; 2 cm diameter)</td> <td>3.5</td> </tr> <tr> <td>Bare ground</td> <td>1</td> </tr> <tr> <td>Grass</td> <td>5</td> </tr> <tr> <td>Soil cracks</td> <td>0</td> </tr> <tr> <td>Stones (20–60 cm)</td> <td>2.5</td> </tr> <tr> <td>Boulders (61 cm – 2 m)</td> <td>2</td> </tr> <tr> <td>Large boulders (&gt; 2 m)</td> <td>1.5</td> </tr> <tr> <td>Rock crevices</td> <td>2</td> </tr> <tr> <td>Exfoliating rock</td> <td>3</td> </tr> <tr> <td colspan="2"><sup>^</sup>Abundance key: 0 = None, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant</td> </tr> </tbody> </table>	Survey sites: HA 2, HA 19 (n=2)		Trees with hollows	(Average per ha)	No. of trees containing hollows < 10 cm diameter	1 tree	Total number of hollows < 10 cm diameter	1 hollow	No. of trees containing hollows > 10 cm diameter	1 tree	Total number of hollows > 10 cm diameter	2 hollows	Hollow bearing logs	(Average per ha)	Number of logs with hollows > 10 cm diameter	4 logs	Total number of logs with hollows	4 logs	Fallen woody material	(Average per ha)	Total length of logs > 10 cm diameter	720 m	Total number of logs	200 logs	Abundance of other habitat characteristics		Characteristic	Abundance (0-7) <sup>^</sup> (average per ha)	Decortivating bark	2.5	Course leaf litter (> 2 cm diameter)	2.5	Fine leaf litter (< 2 cm diameter)	3.5	Bare ground	1	Grass	5	Soil cracks	0	Stones (20–60 cm)	2.5	Boulders (61 cm – 2 m)	2	Large boulders (> 2 m)	1.5	Rock crevices	2	Exfoliating rock	3	<sup>^</sup> Abundance key: 0 = None, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		 <p>Representative photo: Site VC 2</p> <p>Survey sites: VC 2, Q 2, Q 24, Q 26, Q 28, Q 29, Q 32</p>
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Brigalow (Acacia harpophylla) open-forest on lower foothills <b>(Brigalow open-forest)</b>	11.9.5	<p>This community occurs at a single location as a small polygon at the northern side of Lot 20.</p> <p>This community comprises an open-forest on a rocky slopes below steeper scarps formed from consolidated fine-grained sediments. The community is dominated by <i>Acacia harpophylla</i>, but also commonly contains <i>Eucalyptus populneus</i>, <i>Brachychiton</i> spp., <i>Callitris glaucophylla</i>, <i>Eremophila mitchellii</i> and <i>Geijera parviflora</i>.</p> <p>The vegetation cover was typically sparse to moderately-dense (30 to 70 per cent), including the sub canopy layer. The shrub layer was typically of sparse density (10 to 20 per cent) and the ground layer was mostly sparse (10 to 30 per cent). Species composition in all strata consisted of mainly native species</p> <p>This community was in good condition across its distribution (VAST level 2) with low levels of weed infestation. Two weed species were recorded at low densities within the community. These occurred predominately in the ground layer and included <i>Opuntia tomentosa</i> and <i>Cenchrus ciliaris</i>.</p>	<table border="1"> <tr> <td colspan="2">Survey sites: HA 14 (n=1)</td> </tr> <tr> <td><b>Trees with hollows</b></td> <td><b>(Average per ha)</b></td> </tr> <tr> <td>No. of trees containing hollows &lt; 10 cm diameter</td> <td>0 trees</td> </tr> <tr> <td>Total number of hollows &lt; 10 cm diameter</td> <td>0 hollows</td> </tr> <tr> <td>No. of trees containing hollows &gt; 10 cm diameter</td> <td>0 trees</td> </tr> <tr> <td>Total number of hollows &gt; 10 cm diameter</td> <td>0 hollows</td> </tr> <tr> <td><b>Hollow bearing logs</b></td> <td><b>(Average per ha)</b></td> </tr> <tr> <td>Number of logs with hollows &gt; 10 cm diameter</td> <td>0 logs</td> </tr> <tr> <td>Total number of logs with hollows</td> <td>0 logs</td> </tr> <tr> <td><b>Fallen woody material</b></td> <td><b>(Average per ha)</b></td> </tr> <tr> <td>Total length of logs &gt; 10 cm diameter</td> <td>280 m</td> </tr> <tr> <td>Total number of logs</td> <td>80 logs</td> </tr> <tr> <td colspan="2"><b>Abundance of other habitat characteristics</b></td> </tr> <tr> <td><b>Characteristic</b></td> <td><b>Abundance (0-7)^ (average per ha)</b></td> </tr> <tr> <td>Decorticating bark</td> <td>3</td> </tr> <tr> <td>Course leaf litter (&gt; 2 cm diameter)</td> <td>3</td> </tr> <tr> <td>Fine leaf litter (&lt; 2 cm diameter)</td> <td>3</td> </tr> <tr> <td>Bare ground</td> <td>2</td> </tr> <tr> <td>Grass</td> <td>3</td> </tr> <tr> <td>Soil cracks</td> <td>0</td> </tr> <tr> <td>Stones (20-60 cm)</td> <td>6</td> </tr> <tr> <td>Boulders (61 cm – 2 m)</td> <td>3</td> </tr> <tr> <td>Large boulders (&gt;2 m)</td> <td>0</td> </tr> <tr> <td>Rock crevices</td> <td>0</td> </tr> <tr> <td>Exfoliating rock</td> <td>2</td> </tr> <tr> <td colspan="2">^Abundance key: 0 = None, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant</td> </tr> </table>	Survey sites: HA 14 (n=1)		<b>Trees with hollows</b>	<b>(Average per ha)</b>	No. of trees containing hollows < 10 cm diameter	0 trees	Total number of hollows < 10 cm diameter	0 hollows	No. of trees containing hollows > 10 cm diameter	0 trees	Total number of hollows > 10 cm diameter	0 hollows	<b>Hollow bearing logs</b>	<b>(Average per ha)</b>	Number of logs with hollows > 10 cm diameter	0 logs	Total number of logs with hollows	0 logs	<b>Fallen woody material</b>	<b>(Average per ha)</b>	Total length of logs > 10 cm diameter	280 m	Total number of logs	80 logs	<b>Abundance of other habitat characteristics</b>		<b>Characteristic</b>	<b>Abundance (0-7)^ (average per ha)</b>	Decorticating bark	3	Course leaf litter (> 2 cm diameter)	3	Fine leaf litter (< 2 cm diameter)	3	Bare ground	2	Grass	3	Soil cracks	0	Stones (20-60 cm)	6	Boulders (61 cm – 2 m)	3	Large boulders (>2 m)	0	Rock crevices	0	Exfoliating rock	2	^Abundance key: 0 = None, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		 <p>Representative photo: Site VC 8, Q 20</p> <p>Survey Sites: VC 8, Q 20</p>
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Non-remnant shrubby regrowth and cleared pastures <b>(Non-remnant)</b>	Non-remnant	<p>This community occurs in three areas at the north-western corner of Lot 20.</p> <p>This community ranges from low, dense regrowth eucalypts and acacias to areas of cleared pasture with sparse to very-sparse mature tree cover. All representative sites for this community occurred on flat to gently undulating land, both on the hill top and at the foothills. Characteristic species include <i>Eucalyptus melanophloia</i>, <i>Eucalyptus tenuipes</i>, <i>Angustifolius Lysicarpus</i>, <i>Allocasuarina inophloia</i>, <i>Callitris glaucophylla</i> <i>Acacia longispicata</i> and <i>Acacia leiocalyx</i>.</p> <p>The vegetation cover ranged from sparse to moderately-dense (10 to 60 per cent), including the sub canopy layer. The shrub layer was typically sparse (10 to 40 per cent) and the ground layer was mostly sparse (20 to 50 per cent) while the cleared pasture sites recorded moderately-dense ground cover (50-80 per cent). Species composition in all strata consisted of mainly native species.</p> <p>This community was in moderate condition across its distribution (VAST level 3) with low levels of weed infestation. Weeds occurred predominately in the ground layer at low densities and included <i>Opuntia tomentosa</i>, <i>Cenchrus ciliaris</i> and <i>Verbena aristigera</i>.</p>	<table border="1"> <thead> <tr> <th colspan="2">Survey sites: HA 4 (n=1)</th> </tr> <tr> <th>Trees with hollows</th> <th>(Average per ha)</th> </tr> </thead> <tbody> <tr> <td>No. of trees containing hollows &lt; 10 cm diameter</td> <td>0 trees</td> </tr> <tr> <td>Total number of hollows &lt; 10 cm diameter</td> <td>0 hollows</td> </tr> <tr> <td>No. of trees containing hollows &gt; 10 cm diameter</td> <td>0 trees</td> </tr> <tr> <td>Total number of hollows &gt; 10 cm diameter</td> <td>0 hollows</td> </tr> <tr> <th>Hollow bearing logs</th> <th>(Average per ha)</th> </tr> <tr> <td>Number of logs with hollows &gt; 10 cm diameter</td> <td>0 logs</td> </tr> <tr> <td>Total number of logs with hollows</td> <td>0 logs</td> </tr> <tr> <th>Fallen woody material</th> <th>(Average per ha)</th> </tr> <tr> <td>Total length of logs &gt; 10 cm diameter</td> <td>0 m</td> </tr> <tr> <td>Total number of logs</td> <td>0 logs</td> </tr> <tr> <th colspan="2">Abundance of other habitat characteristics</th> </tr> <tr> <th>Characteristic</th> <th>Abundance (0-7)<sup>^</sup> (average per ha)</th> </tr> <tr> <td>Decorticated bark</td> <td>1</td> </tr> <tr> <td>Course leaf litter (&gt; 2 cm diameter)</td> <td>2</td> </tr> <tr> <td>Fine leaf litter (&lt; 2 cm diameter)</td> <td>1</td> </tr> <tr> <td>Bare ground</td> <td>3</td> </tr> <tr> <td>Grass</td> <td>5</td> </tr> <tr> <td>Soil cracks</td> <td>0</td> </tr> <tr> <td>Stones (20–60 cm)</td> <td>0</td> </tr> <tr> <td>Boulders (61 cm – 2 m)</td> <td>0</td> </tr> <tr> <td>Large boulders (&gt; 2 m)</td> <td>0</td> </tr> <tr> <td>Rock crevices</td> <td>0</td> </tr> <tr> <td>Exfoliating rock</td> <td>0</td> </tr> <tr> <td colspan="2"> <sup>^</sup>Abundance key: 0 = None, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant           </td> </tr> </tbody> </table>	Survey sites: HA 4 (n=1)		Trees with hollows	(Average per ha)	No. of trees containing hollows < 10 cm diameter	0 trees	Total number of hollows < 10 cm diameter	0 hollows	No. of trees containing hollows > 10 cm diameter	0 trees	Total number of hollows > 10 cm diameter	0 hollows	Hollow bearing logs	(Average per ha)	Number of logs with hollows > 10 cm diameter	0 logs	Total number of logs with hollows	0 logs	Fallen woody material	(Average per ha)	Total length of logs > 10 cm diameter	0 m	Total number of logs	0 logs	Abundance of other habitat characteristics		Characteristic	Abundance (0-7) <sup>^</sup> (average per ha)	Decorticated bark	1	Course leaf litter (> 2 cm diameter)	2	Fine leaf litter (< 2 cm diameter)	1	Bare ground	3	Grass	5	Soil cracks	0	Stones (20–60 cm)	0	Boulders (61 cm – 2 m)	0	Large boulders (> 2 m)	0	Rock crevices	0	Exfoliating rock	0	<sup>^</sup> Abundance key: 0 = None, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		 <p>Representative photo: Site Q 9</p>  <p>Representative photo: Site VC 5</p> <p>Survey sites: VC 5, Q 5, Q 9</p>
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## **Benchmarks for representative ecosystems**

### **Benchmark 1: Eucalypt woodland on flats and plains**



#### **Fairview, RE 11.10.1**

Representative ecosystem	Brigalow open-forest
Site vegetation description	<ul style="list-style-type: none"> <li>• <i>Corymbia citriodora</i> <i>Eucalyptus fibrosa</i> subsp. <i>nubila</i> or <i>Eucalyptus crebra</i> woodland</li> <li>• <i>Eucalyptus decorticans</i>, <i>Lysicarpus angustifolius</i> +/- <i>Eucalyptus</i> spp., <i>Corymbia</i> spp., <i>Acacia</i> spp. woodland</li> </ul>
Regional ecosystems sampled	11.10.1 (RPS <sup>1</sup> and GHD <sup>2</sup> ) and 11.10.4, 11.10.7 (RPS and GHD)
Available DEHP benchmarks	11.10.1
Site assessment information	<p><u>GHD (2013) Sites</u></p> <p>RE: 11.10.1/11.10.4 Site VC 1. Property: Lot 20 FTY1850 Location: 701543, 7159463</p> <p>RE: 11.10.1/11.10.4. Site VC 3. Property: Lot 20 FTY1850 Location: 704250, 7161101</p> <p>RE: 11.10.1/11.10.7. Site VC 4. Property: Lot 20 FTY1850 Location: 700713, 7163345</p> <p>RE: 11.10.1/11.10.4. Site VC 6. Property: Lot 20 FTY1850 Location: 699465, 7161357</p> <p><u>RPS (2011) Sites</u></p> <p>RE: 11.10.1. Property: Springwater Location: 145.992485. -25.744935</p>

<sup>1</sup>CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>GHD ecological surveys undertaken in November 2013

Native species richness			
Strata	Average species richness (RPS) <sup>1</sup>	Average species richness (GHD) <sup>2</sup>	Benchmark value <sup>3</sup>
Trees	4	5	6
Shrubs	6	9	6
Herbs and forbs	10	10	10
Grasses	12	6	16

<sup>1</sup>Data taken from the description of benchmark community 6 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013

<sup>3</sup>Published benchmarks from the Department of Environment and Heritage Protection – not available for 11.10.1

Species list		
Species recorded in disturbance area (GHD) <sup>2</sup>		Included in RPS indicative species list for community <sup>1</sup>
Scientific name	Common name	
<b>Tree species</b>		
<i>Corymbia citriodora</i>	spotted gum	
<i>Corymbia clarksoniana</i>	Clarkson's bloodwood	
<i>Corymbia trachyphloia</i>	brown bloodwood	
<i>Corymbia citriodora</i>	smooth gum	✓
<i>Eucalyptus crebra</i>	narrow-leaved ironbark	
<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i>	broad-leaved ironbark	
<i>Callitris glaucophylla</i>	white cypress-pine	✓
<i>Allocasuarina luehmannii</i>	bul oak	
<i>Eucalyptus chloroclada</i>	Baradine gum	
<b>Shrub species</b>		
<i>Psyrax odorata</i>	sweet susie	
<i>Acacia longispicata</i>		
<i>Alphitonia excelsa</i>	red ash	
<i>Acacia leiocalyx</i>	early black wattle	
<i>Capparis lasiantha</i>	wait-a-while	
<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	sticky hopbush	✓
<i>Grewia latifolia</i>	dog's balls	
<i>Allocasuarina inophloia</i>	hairy oak	✓
<i>Keraudrenia collina</i>		
<i>Breynia oblongifolia</i>	coffee bush	
<i>Exocarpos cupressiformis</i>	wild cherry	
<i>Petalostigma pubescens</i>	quinine berry bush	
<b>Herb and forb species</b>		
<i>Fimbristylis dichotoma</i>	common finger rush	✓
<i>Brunoniella australe</i>	blue trumpet	
<i>Hibiscus sturtii</i> var. <i>sturtii</i>	hill hibiscus	✓
<i>Lomandra multiflora</i>	many-flowered matrush	
<i>Calotis lappulacea</i>	yellow burr-daisy	
<i>Cheilanthes sieberi</i>	mulga fern	
<i>Chrysocephalum apiculatum</i>	billy-buttons	
<i>Dianella caerulea</i>	blueberry lily	
<i>Lomandra filiformis</i>	wattle matrush	
<i>Leucopogon mitchellii</i>		
<i>Spermacoce multicaulis</i>		
<i>Eremophila debilis</i>	winter apple	✓

Species list		
Species recorded in disturbance area (GHD) <sup>2</sup>		Included in RPS indicative species list for community <sup>1</sup>
<i>Pterocaulon redolens</i>		✓
<b>Grass species</b>		
<i>Alloteropsis semialata</i>	cockatoo grass	✓
<i>Arundinella nepalensis</i>	reed grass	
<i>Ancistrachne uncinulata</i>	hooky grass	✓
<i>Aristida lignosa</i>		
<i>Digitaria divaricatissima</i>		
<i>Enneapogon lindleyanus</i>		
<i>Eriachne mucronata</i>	mountain wanderrie	✓
<i>Chrysopogon fallax</i>	golden beard	
<i>Aristida calycina</i>	dark wiregrass	✓
<i>Aristida caput-medusae</i>	many-headed wiregrass	✓
<b>Common weed species</b>		
<i>Opuntia tomentosa</i> (LPA Class 2)	Velvety tree pear	
<b>NOTE:</b> See Benchmark 6, Appendix 2 in the CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS 2011) for additional species for this vegetation community		
<sup>1</sup> Data taken from the description of benchmark community 6 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).		
<sup>2</sup> Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013		

Ground cover					
Type	Average cover (%)			Range (%)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>
Native grass	26	16.9	21.0	36-89	0-50
Native herbs and forbs	5.0	4.5		4-7	3-15
Native shrubs	0.5	0.8		0-1.8	0-15
Litter (<10 cm diameter)	11.0	29.2	52.0	5-21	3-65
Coarse woody debris (> 10 cm diameter)		23.0			0-80
Rock	7.0	0.7		0-21	0-8
Bare ground	7.0	25.0		3-15	2-51
Non-native species	2.0	0.1		0-5.4	0-2
<sup>1</sup> Data taken from the description of benchmark community 6 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).					
<sup>2</sup> Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013					
<sup>3</sup> Data taken from Department of Environment and Heritage Protection benchmark values for 11.10.1					

Trees and shrubs data									
Strata	Average cover (%)			Height range (m)		Median height (m)		Average stem count (per ha)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	Canopy species (>20 cm DBH)	Shrub species
T1		35.7	35		12-18	14	25	66	
T2		18.6	N/A		6-12	8.5	N/A	29	
S1		7.6			4-6	4.5		0.5	296
S2		3.9			1-4	2.0		0	545
Trees (total)		54.3						95	
Shrubs (total)	55	11.5	22					0.5	841
Eucalyptus	3	52.2		14-18				86	85
Non-eucalypts		13.6		10-13				9	756

<sup>1</sup>Data taken from the description of benchmark community 6 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013

<sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.10.1

## Benchmark 2: Eucalypt woodland on rocky slopes



### Fairview, RE 11.10.1

Representative ecosystem	Brigalow open-forest
Site vegetation description	<ul style="list-style-type: none"> <li><i>Corymbia citriodora</i> or <i>Eucalyptus crebra</i> woodland</li> <li><i>Eucalyptus decorticans</i>, <i>Lysicarpus angustifolius</i> +/- <i>Eucalyptus</i> spp., <i>Corymbia</i> spp., <i>Acacia</i> spp. woodland</li> </ul>
Regional ecosystems sampled	11.10.1 (RPS <sup>1</sup> and GHD <sup>2</sup> ) and 11.10.7 (RPS)
Available DEHP benchmarks	11.10.1
Site assessment information	<p><u>GHD (2013) Sites</u> RE: 11.10.1. Site VC 7. Property: Lot 20 FTY1850 Location: Zone 55 705378, 7159133</p> <p><u>RPS (2011) Sites</u> RE: 11.10.1. Property: Springwater Location: 145.992485. -25.744935</p>
<p><sup>1</sup>CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).</p> <p><sup>2</sup>GHD ecological surveys undertaken in November 2013</p>	

Native species richness			
Strata	Average species richness (RPS) <sup>1</sup>	Average species richness (GHD) <sup>2</sup>	Benchmark value <sup>3</sup>
Trees	4	7	6
Shrubs	6	9	6
Herbs and forbs	10	9	10
Grasses	12	10	16
<p><sup>1</sup>Data taken from the description of benchmark community 6 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).</p> <p><sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013</p> <p><sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.10.1</p>			

Species list		
Species recorded in disturbance area (GHD)?		Included in RPS indicative species list for community <sup>1</sup>
Scientific name	Common name	
<b>Tree species</b>		
<i>Corymbia citriodora</i>	spotted gum	
<i>Corymbia clarksoniana</i>	Clarkson's bloodwood	
<i>Corymbia trachyphloia</i>	brown bloodwood	
<i>Corymbia citriodora</i>	smooth gum	✓
<i>Eucalyptus crebra</i>	narrow-leaved ironbark	
<i>Eucalyptus fibrosa</i> subsp. <i>fibrosa</i>	broad-leaved ironbark	
<i>Callitris glaucophylla</i>	white cypress-pine	✓
<i>Angophora leiocarpa</i>	smooth gum apple	
<i>Eucalyptus tenuipes</i>	narrow-leaved white mahogany	
<i>Lophostemon suaveolens</i>	swamp mahogany	
<b>Shrub species</b>		
<i>Terminalia oblongata</i>	yellow wood	
<i>Acacia longispicata</i>		
<i>Alphitonia excelsa</i>	red ash	
<i>Acacia leiocalyx</i>	early black wattle	
<i>Dodonaea triangularis</i>	hopbush	
<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	sticky hopbush	✓
<i>Grewia latifolia</i>	dog's balls	
<i>Grevillea striata</i>	beefwood	✓
<i>Keraudrenia collina</i>		
<i>Acacia complanata</i>	zig-zag wattle	
<i>Hakea lorea</i> subsp. <i>lorea</i>	gnarled cork bark	
<i>Petalostigma pubescens</i>	quinine berry bush	
<b>Herb and forb species</b>		
<i>Fimbristylis dichotoma</i>	common finger rush	✓
<i>Brunoniella australe</i>	blue trumpet	
<i>Lomandra longifolia</i>	long-leaved matrush	✓
<i>Eustrephus latifolia</i>	wombat berry	
<i>Dianella caerulea</i>	blueberry lily	
<i>Lomandra filiformis</i>	wattle matrush	
<i>Cyperus gracilis</i>	slender sedge	
<i>Xanthorrhoea johnsonii</i>	grass tree	
<i>Capparis lasiantha</i>	wait-a-while	
<i>Spermacoce multicaulis</i>		
<i>Eremophila debilis</i>	winter apple	✓
<i>Evolvulus alsinoides</i>	tropical speedwell	✓
<b>Grass species</b>		
<i>Arundinella nepalensis</i>	reed grass	
<i>Themeda triandra</i>	kangaroo grass	✓
<i>Ancistrachne uncinulata</i>	hooky grass	✓
<i>Aristida lignosa</i>		
<i>Cymbopogon bombycinus</i>	citronella grass	
<i>Digitaria divaricatissima</i>		
<i>Enneapogon nigricans</i>	bottle washers	
<i>Entolasia stricta</i>	wiry panic	✓
<i>Eragrostis sororia</i>	woodland love grass	✓
<i>Panicum effusum</i>	hairy panic	
<i>Aristida calycina</i>	dark wiregrass	✓

Species list		
Species recorded in disturbance area (GHD) <sup>2</sup>		Included in RPS indicative species list for community <sup>1</sup>
<i>Aristida caput-medusae</i>	many-headed wiregrass	✓
<b>Common weed species</b>		
<i>Opuntia tomentosa</i> (LPA Class 2)	Velvety tree pear	
<b>NOTE:</b> See Benchmark 6, Appendix 2 in the CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS 2011) for additional species for this vegetation community		
<sup>1</sup> Data taken from the description of benchmark community 6 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).		
<sup>2</sup> Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013		

Ground cover					
Type	Average cover (%)			Range (%)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>
Native grass	26	14.0	21.0	36-89	0-45
Native herbs and forbs	5.0	7.8		4-7	2-20
Native shrubs	0.5	1.0		0-1.8	0-5
Litter (<10 cm diameter)	11.0	39.6	52.0	5-21	10-68
Coarse woody debris (> 10 cm diameter)		5.0			0-10
Rock	7.0	18.4		0-21	0-55
Bare ground	7.0	14.2		3-15	0-40
Non-native species	2.0	0.0		0-5.4	0
<sup>1</sup> Data taken from the description of benchmark community 6 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).					
<sup>2</sup> Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013					
<sup>3</sup> Data taken from Department of Environment and Heritage Protection benchmark values for 11.10.1					



Trees and shrubs data									
Strata	Average cover (%)			Height range (m)		Median height (m)		Average stem count (per ha)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	Canopy species (>20 cm DBH)	Shrub species
T1		22.3	35		11-17	14	25	18	
T2		1.2	N/A		6-11	8.5	N/A	10	
S1		9.5			2-6	3.5		0	1220
S2		N/A			N/A	N/A		N/A	N/A
Trees (total)		23.5						28	
Shrubs (total)	55	9.5	22						1220
Eucalyptus	3	24.7		14-18				28	120
Non-eucalypts		8.3		10-13				0	1100

<sup>1</sup>Data taken from the description of benchmark community 6 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013

<sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.10.1

### Benchmark 3: Semi-evergreen vine thicket



#### Fairview 11.9.4a

Representative ecosystem	Brigalow open-forest
Site vegetation description	Semi-evergreen vine thicket
Regional ecosystems sampled	11.9.4a (GHD <sup>2</sup> & RPS)
Available DEHP benchmarks	11.8.3, 11.9.4 and 11.9.4c
Site assessment information	<p><u>GHD (2013) Sites</u>  RE: 11.9.4. Site: VC 2. Property: Lot 20 FTY1850  Location: Zone 55 699608, 7160031</p> <p><u>RPS (2011) Sites</u>  RE: 11.9.4. Property: Fairview  Location: 148.980722, -25.660450</p>
<p><sup>1</sup>CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).</p> <p><sup>2</sup>GHD ecological surveys undertaken in November 2013</p>	

Native species richness			
Strata	Average species richness (RPS) <sup>1</sup>	Average species richness (GHD) <sup>2</sup>	Benchmark value <sup>3</sup>
Trees	10	11	16
Shrubs	17	11	14
Herbs and forbs	3	5	9
Grasses	4	1	1
<p><sup>1</sup>Data taken from the description of benchmark community 7 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).</p> <p><sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013</p> <p><sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.9.4a</p>			

Species list		
Species recorded in disturbance area (GHD) <sup>2</sup>		Included in RPS indicative species list for community <sup>1</sup>
Scientific name	Common name	
<b>Tree species</b>		
<i>Brachychiton rupestris</i>	narrow-leaved bottle tree	✓
<i>Brachychiton populneus</i>	kurrajong	
<i>Brachychiton bidwillii</i>	dwarf kurrajong	
<i>Diospyros humilis</i>	small-leaved ebony	
<i>Petalostigma pubescens</i>	quinine berry bush	
<i>Croton insularis</i>	silver croton	✓
<i>Capparis mitchellii</i>	bumble tree	
<i>Denhamia oleaster</i>		

Species list		
Species recorded in disturbance area (GHD) <sup>2</sup>		Included in RPS indicative species list for community <sup>1</sup>
<i>Acacia fasciculifera</i>	rosewood	✓
<i>Geijera parviflora</i>		✓
<i>Flindersia australis</i>	Australian teak	
<i>Cupaniopsis anacardioides</i>	tuckeroo	
<b>Shrub species</b>		
<i>Notelaea microcarpa</i>	native olive	✓
<i>Atalaya hemiglauca</i>	cattle bush	
<i>Psydrax odorata</i>	sweet susie	
<i>Apophyllum anomalum</i>	warrior bush	✓
<i>Erythroxylon australe</i>	cocaine bush	
<i>Carissa ovata</i>	currant bush	✓
<i>Alectryon diversifolius</i>	holly bush	✓
<i>Solanum semiarmatum</i>	ginger's whiskers	
<i>Breynia oblongifolia</i>	coffee bush	
<i>Turraea pubescens</i>	native witch-hazel	
<i>Pittosporum spinescens</i>	wallaby apple	✓
<i>Passiflora aurantia</i>	blunt-leaved passionfruit	
<i>Parsonsia eucalyptophylla</i>	monkey vine	
<i>Erythrina vespertilio</i>	bat's wing coral	
<b>Herb and forb species</b>		
<i>Nyssanthes erecta</i>		
<i>Cyperus gracilis</i>	slender sedge	✓
<i>Abutilon oxycarpum</i>	flannel flower	✓
<i>Jasminum didymum</i> subsp. <i>lineare</i>	jasmine	
<i>Jasminum simplicifolium</i> subsp. <i>australiense</i>	jasmine	
<i>Cheilanthes sieberi</i>	mulga fern	
<b>Grass species</b>		
<i>Ancistrachne uncinulata</i>	hooky grass	✓
<b>Common weed species</b>		
<i>Opuntia tomentosa</i>	velvety tree pear	
<i>Cenchrus ciliaris</i>	buffel grass	
<b>NOTE:</b> See Benchmark 6, Appendix 2 in the CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS 2011) for additional species for this vegetation community		
<sup>1</sup> Data taken from the description of benchmark community 7 in Appendix 2. CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).		
<sup>2</sup> Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013		
*key species for broad ecosystem group (RPSS 2011)		

Ground cover					
Type	Average cover (%)			Range (%)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>
Native grass	9.0	46.0	4	6-14	5-70
Native herbs and forbs	7.0	2.4		0-19	0-10
Native shrubs	7.0	12.0		5-7	0-20
Litter (<10 cm diameter)	12.0	12.0	32	5-15	5-20
Coarse woody debris (> 10 cm diameter)		0.4			0-2
Rock	27.0	26.6		25-29	3-85
Bare ground	13.0	0.6		11-15	0-3
Non-native species	8.0	0.0		1-7	0

<sup>1</sup>Data taken from the description of benchmark community 7 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013

<sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.9.4a

Trees and shrubs data									
Strata	Average cover (%)			Height range (m)		Median height (m)		Average stem count (per ha) (GHD 2013)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	Canopy species (>20 cm DBH)	Shrub species
E		27.4	54.0		10-13	11.5	11	6	
T1		26.6	23		6-10	8	7	6	
S1		21.8			4-6	5		4	640
S2		14.2			1-4	1.5			520
Trees (total)		54.0						12	
Shrubs (total)	60.0	36.0	41.0					4	1160
Eucalyptus	70.0	0.0		12-16				0	0
Non-eucalypts		54.0		12-16				16	1160

<sup>1</sup>Data taken from the description of benchmark community 7 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013

<sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.9.4a

#### Benchmark 4: Brigalow open-forest



#### Fairview, RE 11.9.5

Representative ecosystem	Brigalow open-forest
Site vegetation description	<ul style="list-style-type: none"> <li>• <i>Acacia harpophylla</i> open-forest</li> <li>• <i>Acacia harpophylla</i> and/or <i>Casuarina cristata</i> shrubby open-forest</li> <li>• <i>Acacia harpophylla</i> and <i>Eucalyptus populnea</i> woodland</li> </ul>
Regional ecosystems sampled	11.9.5 (GHD <sup>2</sup> & RPS <sup>1</sup> )
Available DEHP benchmarks	11.4.3 and 11.9.5
Site assessment information	<p><u>GHD (2013) Sites</u>  RE: 11.9.5. Site VC 8. Property: Lot 20 FTY1850  Location: Zone 55 702127, 7162841</p> <p><u>RPS (2011) Sites</u>  RE: 11.9.5a. Property: Coxon Creek  Location: 149.090330, -26.349438  RE: 11.9.5. Property: Springwater  Location: 148.949149, -25.701510  RE 11.9.5. Property: N/A – within AVPA  Location: 148.917537, -25.499639  RE 11.9.5. Property: N/A – within AVPA  Location: 148.920056, -25.494751</p>
<sup>1</sup> CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011). <sup>2</sup> GHD ecological surveys undertaken in November 2013	

Native species richness			
Strata	Average species richness (RPS) <sup>1</sup>	Average species richness (GHD) <sup>2</sup>	Benchmark value <sup>3</sup>
Trees	2	3	7
Shrubs	11	10	8
Herbs and forbs	9	6	10
Grasses	5	5	8
<sup>1</sup> Data taken from the description of benchmark community 4 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011). <sup>2</sup> Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013 <sup>3</sup> Data taken from Department of Environment and Heritage Protection benchmark values for 11.9.5			

Species list		
Species recorded in disturbance area (GHD) <sup>2</sup>		Included in RPS indicative species list for community <sup>1</sup>
Scientific name	Common name	
<b>Tree species</b>		
<i>Acacia harpophylla</i>	brigalow	✓
<i>Brachychiton populneus</i>	kurrajong	
<i>Eucalyptus populnea</i>	poplar box	✓
<b>Shrub species</b>		
<i>Psydrax odorata</i>	sweet susie	✓
<i>Callitris glaucophylla</i>	white cypress lone	
<i>Atalaya hemiglauca</i>	cattle bush	
<i>Eremophila mitchellii</i>	false sandalwood	✓
<i>Geijera parviflora</i>	wilga	
<i>Carissa ovata</i>	currant bush	✓
<i>Apophyllum anomalum</i>	warrior bush	
<i>Capparis lasiantha</i>	wait-a-while	
<i>Parsonsia eucalyptophylla</i>	monkey vine	
<b>Herb and forb species</b>		
<i>Brunoniella australe</i>	blue trumpet	
<i>Nyssanthes erecta</i>		
<i>Eremophila debilis</i>	winter apple	
<i>Solanum stelligerum</i>	devil's needle	
<i>Oxalis perennans</i>	grassland wood-sorrel	
<i>Cheilanthes sieberi</i>	mulga fern	✓
<i>Tribulus terrestris</i>	caltrop	
<b>Grass species</b>		
<i>Digitaria divaricatissima</i>		
<i>Aristida lignosa</i>		
<i>Enteropogon ramosus</i>	twirly windmill grass	
<i>Paspalidium distans</i>	box grass	
<b>Common weed species</b>		
<i>Cenchrus ciliaris</i>	buffel grass	✓
<i>Opuntia tomentosa</i>	velvety tree pear	
<b>NOTE:</b> See Benchmark 6, Appendix 2 in the CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS 2011) for additional species for this vegetation community		
<sup>1</sup> Data taken from the description of benchmark community 4 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).		
<sup>2</sup> Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013		
*key species for broad ecosystem group (RPSS 2011)		

Ground cover					
Type	Average cover (%)			Range (%)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>
Native grass	26.0	5.0	4	10-40	0-10
Native herbs and forbs	8.0	2.4		2-20	0-4
Native shrubs	0.5	2.0		0-2	0-5
Litter (<10 cm diameter)	18.0	44.0	66	6-25	30-65
Coarse woody debris (> 10 cm diameter)		18.0			10-30
Rock	17.0	8.2		1-26	0-20
Bare ground	32.0	17.4		9-64	0-31
Non-native species	0.5	3.0		0-1	0-15

<sup>1</sup>Data taken from the description of benchmark community 4 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013

<sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.9.5



Trees and shrubs data									
Strata	Average cover (%)			Height range (m)		Median height (m)		Average stem count (per ha)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	Canopy species (>20 cm DBH)	Shrub species
T1		45.4	59.0		9-13	11	25	100	
T2		16.0	48.0		6-9	7	8		
S1		13.9			3-6	4.5		26	100
S2		0.3			1-2.5	1.8			280
Trees (total)		61.4						126	
Shrubs (total)	25.0	14.2	1.1						380
Eucalyptus	65.0	0.0		12-25				0	0
Non-eucalypts		45.4		11-15				126	380

<sup>1</sup>Data taken from the description of benchmark community 4 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013

<sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.9.5

## Benchmark 5: Non-remnant



### Fairview, Non-remnant

Representative ecosystem	Brigalow open-forest
Site vegetation description	<ul style="list-style-type: none"> <li>Cleared pasture with very sparse mature eucalypts</li> <li>Shrubby regrowth eucalypts and acacias</li> </ul>
Regional ecosystems sampled	Non-remnant (GHD <sup>2</sup> ) No equivalent sites were sampled by RPS <sup>1</sup>
Available DEHP benchmarks	N/A
Site assessment information	<u>GHD (2013) Sites</u> Non-remnant. Site VC 5. Property: Lot 20 FTY1850 Location: Zone 55 700185, 7162088 <u>RPS (2011) Sites</u> No equivalent sites were sampled by RPS <sup>1</sup>
<sup>1</sup> CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011). <sup>2</sup> GHD ecological surveys undertaken in November 2013	

Native species richness			
Strata	Average species richness (RPS) <sup>1</sup>	Average species richness (GHD) <sup>2</sup>	Benchmark value <sup>3</sup>
Trees	N/A	3	N/A
Shrubs	N/A	13	N/A
Herbs and forbs	N/A	18	N/A
Grasses	N/A	5	N/A
<sup>1</sup> Data taken from the description of benchmark community 4 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011). <sup>2</sup> Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013 <sup>3</sup> Data taken from Department of Environment and Heritage Protection benchmark values for 11.9.5			

Species list		
Species recorded in disturbance area (GHD) <sup>2</sup>		Included in RPS indicative species list for community <sup>1</sup>
Scientific name	Common name	
<b>Tree species</b>		
<i>Eucalyptus tenuipes</i>	narrow-leaved white mahogany	
<i>Eucalyptus chloroclada</i>	Baradine gum	
<i>Lysicarpus angustifolius</i>	budgeroo	
<b>Shrub species</b>		
<i>Allocasuarina inophloia</i>	hairy oak	
<i>Acacia longispicata</i>		

Species list		
Species recorded in disturbance area (GHD) <sup>2</sup>		Included in RPS indicative species list for community <sup>1</sup>
<i>Exocarpos cupressiformis</i>	wild cherry	
<i>Acacia leiocalyx</i>	early black wattle	
<i>Petalostigma pubescens</i>	quinine berry bush	
<i>Alphitonia excelsa</i>	red ash	
<i>Notelaea microcarpa</i>	native olive	
<i>Keraudrenia collina</i>		
<i>Breynia oblongifolia</i>	coffee bush	
<i>Hakea purpurea</i>		
<b>Herb and forb species</b>		
<i>Xanthorrhoea johnsonii</i>	grass tree	
<i>Solanum ellipticum</i>	potato bush	
<i>Abutilon fraseri</i>	dwarf lantern flower	
<i>Hibiscus sturtii</i> var. <i>sturtii</i>	hill hibiscus	
<i>Indigofera linnaei</i>		
<i>Gonocarpus urceolatus</i>		
<i>Dianella caerulea</i>	blueberry lily	
<i>Lomandra longifolia</i>	long-leaved matrush	
<i>Oxalis perennans</i>	grassland wood-sorrel	
<b>Grass species</b>		
<i>Aristida calycina</i>	dark wiregrass	
<i>Aristida caput-medusae</i>	many-headed wiregrass	
<i>Themeda triandra</i>	kangaroo grass	
<i>Aristida lignosa</i>		
<i>Chrysopogon fallax</i>	golden beard	
<i>Entolasia stricta</i>	wiry panic	
<i>Heteropogon contortus</i>	black spear grass	
<b>Common weed species</b>		
<i>Cenchrus ciliaris</i>	buffel grass	
<i>Opuntia tomentosa</i>	velvety tree pear	
<b>NOTE:</b> See Benchmark 6, Appendix 2 in the CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS 2011) for additional species for this vegetation community		
<sup>1</sup> Data taken from the description of benchmark community 4 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).		
<sup>2</sup> Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013		
*key species for broad ecosystem group (RPSS 2011)		

Ground cover					
Type	Average cover (%)			Range (%)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>
Native grass	N/A	7.6	N/A	N/A	2-20
Native herbs and forbs	N/A	6.8		N/A	3-13
Native shrubs	N/A	3,0		N/A	0-15
Litter (<10 cm diameter)	N/A	36.0	N/A	N/A	15-60
Coarse woody debris (> 10 cm diameter)		1,0			0-3
Rock	N/A	0.0		N/A	0
Bare ground	N/A	45.6		N/A	14-76
Non-native species	N/A	0.0		N/A	0

<sup>1</sup>Data taken from the description of benchmark community 4 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013

<sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.9.5

Trees and shrubs data									
Strata	Average cover (%)			Height range (m)		Median height (m)		Average stem count (per ha)	
	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	RPS (2011) <sup>1</sup>	GHD (2013) <sup>2</sup>	GHD (2013) <sup>2</sup>	Benchmark value <sup>3</sup>	Canopy species (>20 cm DBH)	Shrub species
T1		2.9	N/A		8-12	10	N/A	0	
T2		N/A	N/A		N/A	N/A	N/A		
S1		7.5			6-8	6.5		0	660
S2		6.2			1-6	3.5			300
Trees (total)		2.9						0	
Shrubs (total)	N/A	13.7	N/A						960
Eucalyptus	N/A	6.6		N/A				0	580
Non-eucalypts		10.0		N/A				0	380

<sup>1</sup>Data taken from the description of benchmark community 4 in Appendix 2, CSG Gas Fields (Fairview, Roma and Arcadia Valley Project Areas) Remediation, Rehabilitation, Recovery and Monitoring Plan (RPS, 2011).

<sup>2</sup>Data recorded and averaged (where applicable) for vegetation communities surveyed by GHD during ecological surveys in November 2013

<sup>3</sup>Data taken from Department of Environment and Heritage Protection benchmark values for 11.9.5

# Appendix C - Regional ecosystem mapping modifications

## **Methodology**

A combination of desktop assessments and detailed field assessments were used to accurately map and define vegetation communities within Lot 20 on FTY1805, based on vegetation categories defined by the Queensland Herbarium.

### **Desktop assessment**

Prior to surveys, a desktop assessment was undertaken to assist with the determination of vegetation community boundaries within Lot 20 on FTY1805. The following information sources were reviewed:

- Current certified RE mapping Version 7.0.
- Queensland Herbarium mapping and methodology procedures outlined in Neldner *et al.*, (2012).
- High resolution aerial imagery.

### **Field assessments**

Field validation of DEHP mapped REs (Version 7.0) were carried out by GHD ecologists between the 1<sup>st</sup> and 9<sup>th</sup> of November 2013. Sites were assessed within Lot 20 on FTY1805 using the quaternary method described by the Queensland Herbarium's *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland* (Neldner *et al.*, 2012). In brief, a quaternary level of assessment involves collection of data regarding the structure and composition of strata comprising the vegetation community.

A combination of high resolution aerial imagery, previous ecological surveys and field traverses (using hand held GPS) were used to delineate between RE boundaries.

### **Site landform and geology**

The regional geology is dominated by ridges and plateaus, comprising middle to late Jurassic sandstones, from approximately 190 to 145 million years ago (Willmott, 2006). The key geological units underlying much of Lot 20 on FTY1805 comprises the Evergreen and Precipice Sandstone formations and the Boxvale Sandstone Member, consisting of quartzose, labile and sub-labile sandstones, siltstone, mudstone and minor shale and coal conglomerates (Geoscience Australia, 2013). Soils on these mesas are characterised as skeletal to rocky soils (Sodosols) and shallow sandy soils with sandstone rock outcrops on the steep slopes and scarps (CSIRO, 2010).

Minor watercourses and drainage lines transect the project area, feeding into the Hutton Creek to the south and Dawson River to the north-east. Within the region, remnant vegetation exhibits a high degree of connectivity in association with State forests and Expedition National Park, located to the north of Lot 20 on FTY1805. The lower slopes of escarpments have been largely cleared for livestock grazing.

### **Existing certified RE mapping**

The current certified RE mapping (Version 7.0) identified Lot 20 on FTY1805 as supporting predominantly remnant vegetation containing least concern RE 11.10.1 and 11.10.13 on jump-ups and hill slopes. Escarpments on the western and south-eastern extent of the property are mapped as containing semi-evergreen vine thicket (RE 11.9.4a) and north-eastern lower slopes consisting of predominantly alluvial woodlands 11.3.2 and 11.3.39. The description of these REs, sourced from the Queensland Herbarium's Regional Ecosystem Description Database (REDD), is provided below in Table 6. The certified RE mapping for Lot 20 on FTY1805 is provided in Figure 34.

### **Field-validated vegetation mapping**

A total of five REs were observed within the Lot 20 on FTY1805 during field surveys. A large proportion of Lot 20 was found to contain mixed eucalypt woodland comprising no concern at present REs 11.10.1, 11.10.4 and 11.10.7. Most areas mapped as containing semi evergreen vine thicket (RE 11.9.4a) were confirmed present; however, three additional areas were observed in the northeast on steep escarpments, and the extent of one polygon to the south-east was reduced. With the exception of the northern-most extent of Lot 20, no alluvial floodplain ecosystems (land zone 3) previously mapped by DEHP were observed within Lot 20.

A description of each observed RE is provided below in Table 7 and field-validated RE mapping is presented in Figure 35. The polygons represented in Figure 35 refine the present certified RE mapping across Lot 20 by proposing more accurate mapping based on aerial photography interpretation coupled with field survey data, using a method consistent with the Queensland Herbarium procedure for ground-truthing REs (Neldner *et al.*, 2012).

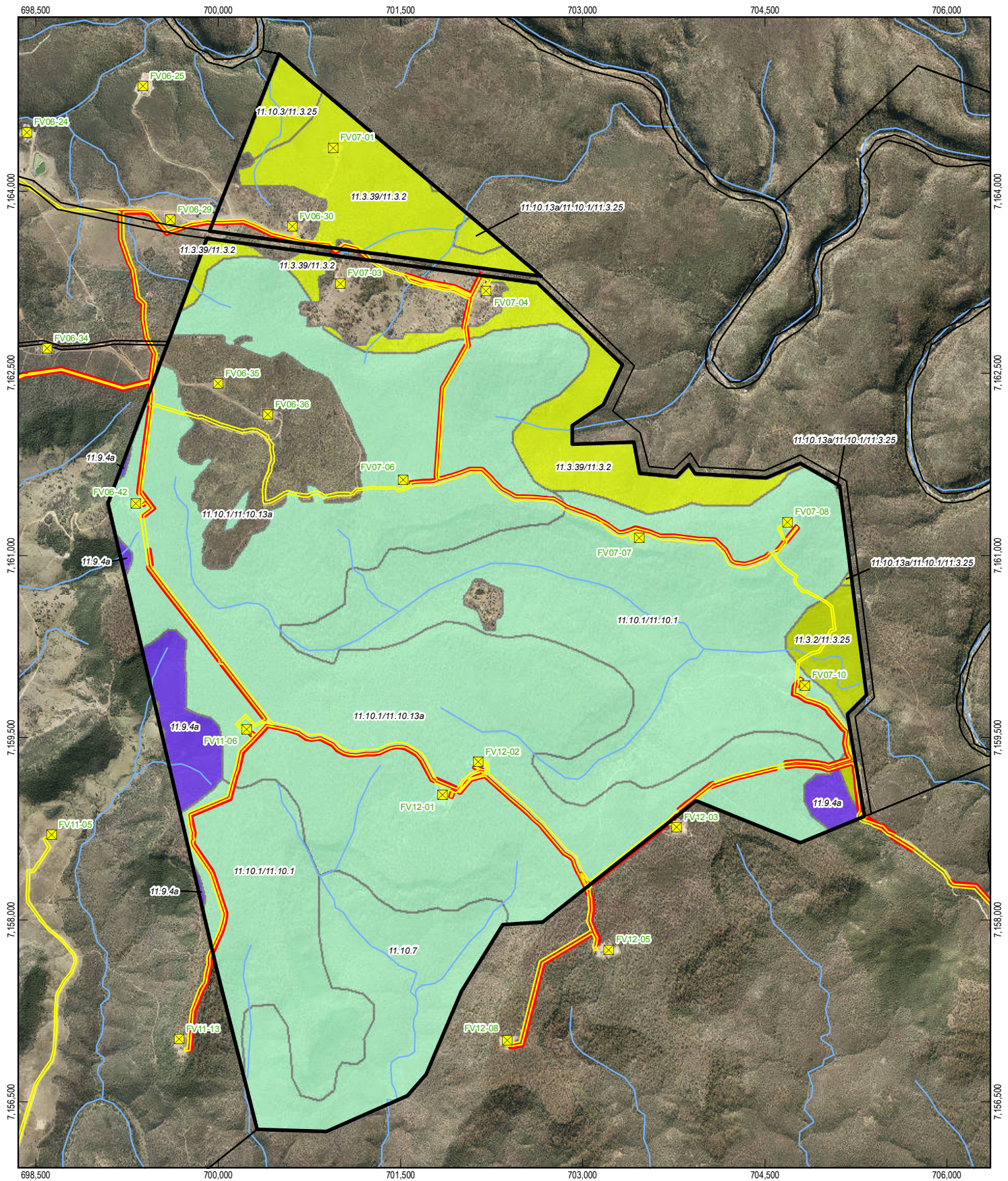


Table 6 Regional Ecosystem descriptions

Regional Ecosystem	Biodiversity Status	REDD Description	Comments
11.3.2	of concern	<i>Eucalyptus populnea</i> woodland to open-woodland. <i>E. melanophloia</i> may be present and locally dominant. Occurs on Cainozoic alluvial plains with variable soil types including texture contrast, deep uniform clays, massive earths and sometimes cracking clays.	Mapped as occurring within Lot 20 on FTY1805 by DEHP certified mapping (version 7.0) but not observed during field surveys.
11.3.25	of concern	<i>Eucalyptus camaldulensis</i> or <i>E. tereticornis</i> open-forest to woodland. Other tree species such as <i>Casuarina cunninghamiana</i> , <i>E. coolabah</i> , <i>Melaleuca bracteata</i> , <i>Melaleuca viminalis</i> , <i>Livistona</i> spp. (in north), <i>Melaleuca</i> spp. and <i>Angophora floribunda</i> are commonly present and may be locally dominant. Occurs on fringing levees and banks of major rivers and drainage lines of alluvial plains throughout the region. Soils are very deep, alluvial, grey and brown cracking clays with or without some texture contrast. These are usually moderately deep to deep, soft or firm, acid, neutral or alkaline brown sands, loams or black cracking or non-cracking clays, and may be sodic at depth	Mapped as occurring within Lot 20 on FTY1805 by DEHP certified mapping (version 7.0) but not observed during field surveys.
11.3.39	no concern at present	<i>Eucalyptus melanophloia</i> predominates forming a distinct canopy (10-18 m high) forming an open-woodland to woodland. <i>E. chloroclada</i> is present and often co-dominant on the slopes leading away from the drainage lines. Other tree species may also occur including <i>Angophora floribunda</i> (which may be locally dominant), <i>Callitris glaucophylla</i> , <i>E. populnea</i> , <i>E. populnea</i> x <i>E. crebra</i> hybrids and (towards drainage lines) <i>E. tereticornis</i> . Shrub layers are not usually present in this association. Occurs on flat to undulating wide valley floors on alluvial or colluvial material derived from surrounding dissected sandstone ranges, generally with deep, loamy or sandy, duplex soils.	Mapped as occurring within Lot 20 on FTY1805 by DEHP certified mapping (version 7.0) but not observed during field surveys.

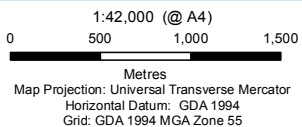
Regional Ecosystem	Biodiversity Status	REDD Description	Comments
11.9.4a	endangered	Semi-evergreen vine thicket, generally dominated by a low tree layer (5-10 m high) which is floristically diverse and variable. Common co-dominant species include <i>Croton insularis</i> , <i>Denhamia oleaster</i> . Emergents (16-25 m high) are usually present including species such as <i>Cadellia pentastylis</i> and <i>Brachychiton</i> spp. usually on better sites, and <i>Eucalyptus orgadophila</i> and <i>Casuarina cristata</i> on drier, poorer sites. Occurs on steep upper and middle slopes where heavy clay soils have formed from sediments. It may grade into <i>Acacia harpophylla</i> , softwood spp. (11.9.5a) on the lower slopes. It is prominent on the steep slopes of sandstone ranges, where shale has been exposed, and aspect, rainfall and runoff provide sufficient available water for its development. The soils are generally shallow, brown or grey-brown loams or light clays grading into medium or heavy clays.	Mapped and confirmed present within Lot 20 on FTY1805.
11.10.1	no concern at present	<i>Corymbia citriodora</i> predominates and forms a distinct but discontinuous open-forest (to woodland) canopy (20-30 m high). On rocky slopes, <i>Eucalyptus crebra</i> and <i>C. hendersonii</i> may be scattered throughout the canopy. On flats and footslopes, scattered <i>E. crebra</i> , <i>C. clarksoniana</i> and <i>C. tessellaris</i> may occur. <i>Corymbia trachyphloia</i> and <i>E. cloeziana</i> often occur on crests and plateaus while <i>E. apothalassica</i> and <i>E. longirostrata</i> sometimes occur in moister microhabitats. Occurs on hills and ranges, particularly on colluvial lower slopes, formed from medium to coarse-grained sediments (usually sandstone). Associated soils are often texture contrast with a thin sandy or loamy surface horizon and some uniform sandy and lithosol soils.  11.10.1c: <i>Eucalyptus fibrosa</i> , <i>Eucalyptus</i> spp. woodland.	Mapped and confirmed present within Lot 20 on FTY1805.
11.10.4	no concern at present	<i>Eucalyptus decorticans</i> predominates forming a distinct but discontinuous canopy (25-30 m high). <i>Eucalyptus decorticans</i> usually forms pure stands, however other <i>Eucalyptus</i> spp. often form part of the canopy and dominate Other tree species that may be present and/or dominant include <i>Acacia shirleyi</i> , <i>Angophora leiocarpa</i> , <i>Callitris glaucophylla</i> , <i>Eucalyptus apothalassica</i> , <i>Lysicarpus angustifolius</i> , <i>E. exserta</i> , <i>E. fibrosa</i> subsp. <i>nubila</i> , <i>E. panda</i> , <i>E. tenuipes</i> , <i>Corymbia trachyphloia</i> , and <i>E. virens</i> . On very rocky shallow soils, <i>Eucalyptus bakeri</i> , <i>E. curtisii</i> or <i>E. viridis</i> may occur. Occurs on crests, scarps and upper slopes of ranges formed from medium to coarse-grained sediments with shallow soils.	Not mapped as occurring within Lot 20 on FTY1805 by DEHP certified mapping (version 7.0) but confirmed present during field surveys

Regional Ecosystem	Biodiversity Status	REDD Description	Comments
11.10.7	no concern at present	<i>Eucalyptus crebra</i> and/or <i>E. melanophloia</i> +/- <i>E. populnea</i> shrubby woodland. <i>Eucalyptus melanophloia</i> and/or <i>E. crebra</i> predominate and form a distinct but open canopy. <i>E. populnea</i> is commonly present and may be locally dominant particularly on lower slopes. Occurs on the lower slopes of scarp retreats, associated with dissected tablelands. Associated soils are generally moderately deep, acidic, sandy, yellow earths and sandy-surfaced texture contrast soils formed from medium to coarse-grained sediments.	Mapped and confirmed present within Lot 20 on FTY1805.
11.10.13	no concern at present	Open-forest (to woodland) with a range of canopy species including <i>Eucalyptus cloeziana</i> , <i>E. melanoleuca</i> , <i>E. sphaerocarpa</i> , <i>Corymbia bunites</i> , <i>C. hendersonii</i> , <i>C. trachyphloia</i> , <i>E. suffulgens</i> , <i>C. leichhardtii</i> , <i>C. citriodora</i> , <i>E. baileyana</i> . Occurs on sandstone scarps and tablelands with shallow soils formed from medium to coarse-grained sediments.	Mapped as occurring within Lot 20 on FTY1805 by DEHP certified mapping (version 7.0) but not observed during field surveys.



**LEGEND**

- |                         |                            |                                      |                         |
|-------------------------|----------------------------|--------------------------------------|-------------------------|
| Well Pad                | Cadastre                   | Regional Ecosystem v7 (Biodiversity) | Of Concern sub-dominant |
| Watercourse             | Clearing Limit             | Endangered dominant                  | Not of Concern          |
| Fairview Lot 20 FTY1805 | Vegetation Management Area | Of Concern dominant                  |                         |




Santos GLNG  
Fairview Lot 20 Ecological Assessments


Job Number 41-27125  
Revision 0  
Date 05 Dec 2013


DEHP Certified Regional  
Ecosystem Mapping (v7.0)


**Figure 34**

Table 7 Descriptions of field-validated regional ecosystem polygons located within Lot 20 on FTY1805


Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
1	11.3.39/11.3.2	11.10.1c/11.10.7	<p>This polygon is located in the northern extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic cross-bedded quartzose sandstone, sub-labile and labile sandstone, siltstone and mudstone, consistent with land zones 9 or 10. Landforms are derived from the Precipice Sandstone and Evergreen Sandstone formations.</p> <p><b>Tree layers:</b> Field surveys found this area to contain a mixed polygon of open forest (10–17 m) dominated by <i>Eucalyptus fibrosa subsp. nubila</i> and <i>E. crebra</i>. Other associated tree species observed includes <i>E. melanophloia</i>, <i>C. trachyphloia</i> and <i>Acacia shirleyi</i>.</p> <p><b>Shrub Layers:</b> The shrub layer was frequently dominated by <i>Acacia leiocalyx</i> and <i>Alphitonia excelsa</i> with other associated species including <i>Acacia longispicata</i>, <i>Petalostigma pubescens</i> and <i>Carissa ovata</i>.</p> <p><b>Ground Layer:</b> The groundcover consisted primarily of native grasses (sparse to moderately dense) including <i>Aristida caput-medusae</i>, <i>Themeda triandra</i> and <i>Enneapogon</i> spp..</p>	
2	11.10.13a/11.10.1/11.3.25	11.10.1c/11.10.7	Refer to <b>Polygon 1</b>	


Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
3	11.3.39/11.3.2	11.10.1	<p>This polygon is located in the northern extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic sub-labile and labile sandstone, mudstone and minor shale and coal, consistent with land zones 9 or 10. Landforms are derived from the Evergreen Sandstone formations.</p> <p><b>Tree Layers:</b> Field surveys found this area to contain open forest (12–16 m) dominated by <i>Corymbia citriodora</i> and <i>Eucalyptus fibrosa subsp. nubila</i>. Other associated tree species observed includes <i>C. tessellaris</i> and <i>Callitris glaucophylla</i>.</p> <p><b>Shrub Layers:</b> The shrub layer was dominated by <i>Petalostigma pubescens</i> with associated species consisting of <i>Alphitonia excelsa</i>, <i>Geijera parviflora</i>, <i>Psydrax odorata</i> and <i>Croton insularis</i>.</p> <p><b>Ground Layer:</b> The groundcover consisted primarily of grass species (moderately dense) including <i>Aristida caput-medusae</i>, <i>Ancistrachne uncinulata</i> and <i>Cenchrus ciliaris</i>.</p>	


Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
4	11.3.39/11.3.2	11.10.1	<p>This polygon is located in the northern extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic sub-labile and labile sandstone, mudstone and minor shale and coal, consistent with land zones 9 or 10. Landforms are derived from the Evergreen Sandstone formation.</p> <p><b>Tree Layers:</b> Field surveys found this area to contain open forest (11–17 m) dominated by <i>Corymbia citriodora</i> and <i>Eucalyptus crebra</i>. Other associated tree species observed includes <i>E. fibrosa</i> subsp. <i>nubila</i>, <i>E. melanophloia</i> and <i>E. populnea</i>.</p> <p><b>Shrub Layers:</b> The shrub layer was dominated by <i>Acacia leiocalyx</i> with associated species consisting of <i>Petalostigma pubescens</i>, <i>Alphitonia excelsa</i>, <i>Callitris glaucophylla</i>, <i>Capparis mitchellii</i> and <i>Carissa ovata</i>.</p> <p><b>Ground Layer:</b> The groundcover consisted primarily of grass species (moderately dense) including <i>Aristida calycina</i>, <i>Enneapogon nigricans</i> and <i>A. caput-medusae</i>.</p>	


Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
5	11.3.39/11.3.2	11.10.1	<p>This polygon is located in the north-eastern extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic cross-bedded quartzose sandstone, sub-labile lithic sandstone and siltstone, consistent with land zones 9 or 10. Landforms are derived from the Precipice Sandstone formation.</p> <p><b>Tree Layers:</b> Field surveys found this area to contain open forest (14–17 m) dominated by <i>Corymbia citriodora</i> with subdominant and associated <i>Eucalyptus crebra</i> and <i>E. fibrosa</i>.</p> <p><b>Shrub Layers:</b> The shrub layer was dominated by <i>Acacia leiocalyx</i> with associated species consisting of <i>Acacia shirleyi</i>, <i>Alphitonia excelsa</i>, <i>Callitris glaucophylla</i>, <i>Acacia longispicata</i> and <i>Petalostigma pubescens</i>.</p> <p><b>Ground Layer:</b> The groundcover consisted primarily of grass species (moderately dense) including <i>Aristida calycina</i>, <i>Themeda triandra</i> and <i>A. caput-medusae</i>.</p>	





Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
6	11.3.2/11.3.25	11.10.1/11.10.7	<p>This polygon is located in the eastern extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic cross-bedded quartzose sandstone, sub-labile lithic sandstone and siltstone, consistent with land zones 9 or 10. Landforms are derived from the Precipice Sandstone formation.</p> <p><b>Tree Layers:</b> Field surveys found this area to contain a mixed polygon of open forest (11–17 m) dominated by <i>Eucalyptus melanophloia</i> and <i>Corymbia citriodora</i>. <i>E. crebra</i> and found to be dominant at times. Other associated tree species observed includes <i>E. fibrosa subsp. nubila</i>, <i>E. crebra</i>, <i>Angophora leiocarpa</i> and <i>Callitris glaucophylla</i>.</p> <p><b>Shrub Layers:</b> The shrub layer was dominated by <i>Acacia leiocalyx</i> and <i>Acacia longispicata</i> with associated species consisting of <i>Alphitonia excelsa</i>, <i>Callitris glaucophylla</i>, <i>Terminalia oblongata</i> <i>Acacia longispicata</i> and <i>Dodonaea triangularis</i>.</p> <p><b>Ground Layer:</b> The groundcover consisted primarily of grass species (moderately dense) including <i>Arundinella nepalensis</i>, <i>Aristida caput-medusae</i>, <i>Themeda triandra</i> and <i>Ancistrachne uncinulata</i>.</p>	

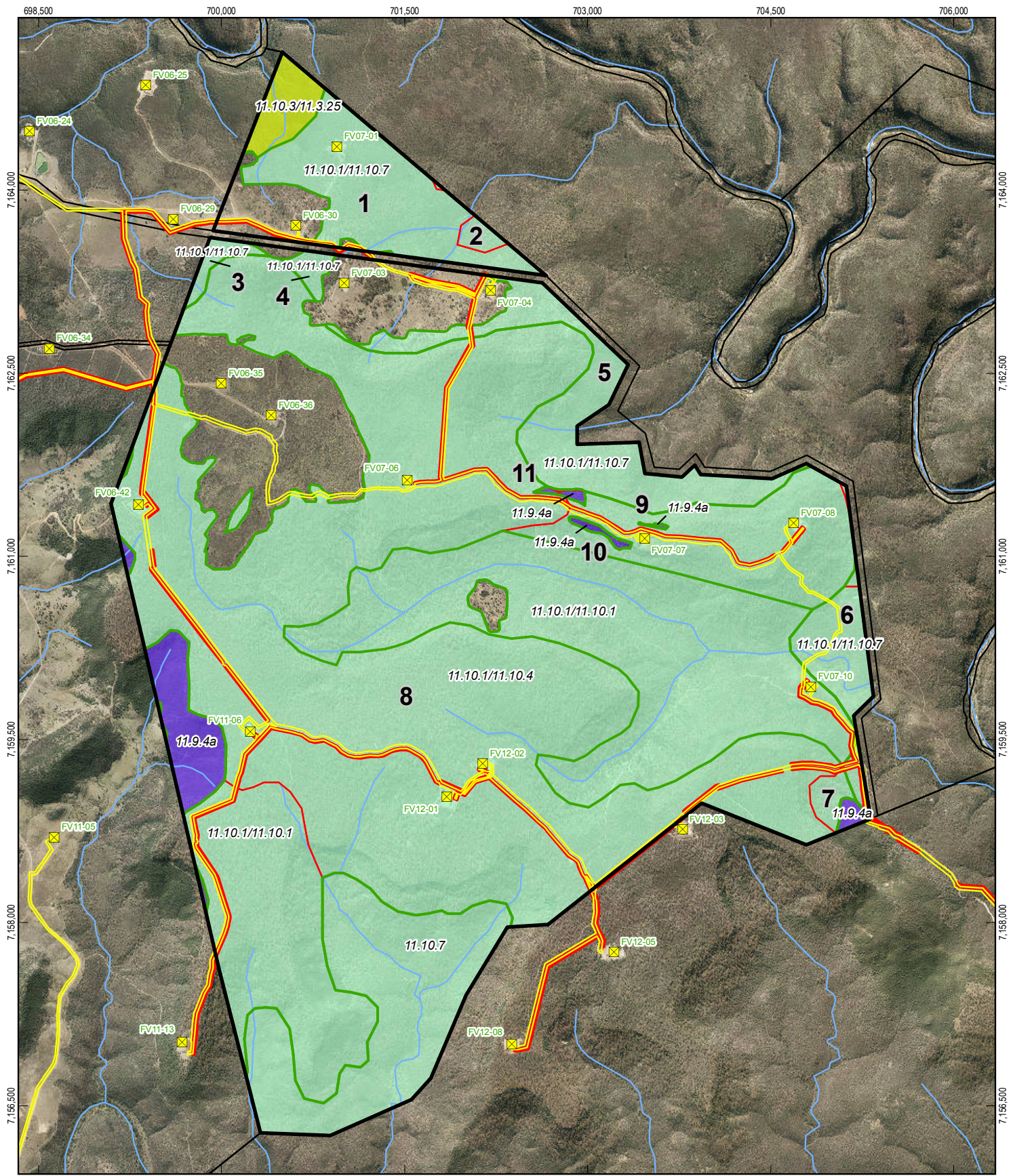
Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
7	11.9.4a	11.10.1	<p>This polygon is located in the eastern extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic quartzose sandstone, sub-labile and labile sandstone, mudstone and siltstone, consistent with land zones 9 or 10. Landforms are derived from the Evergreen Sandstone formation and Boxvale Sandstone Member.</p> <p><b>Tree Layers:</b> Field surveys found this area to contain open forest (10–17 m) dominated by <i>Corymbia citriodora</i>. Other associated tree species observed includes <i>E. decorticans</i> and <i>Callitris glaucophylla</i>.</p> <p><b>Shrub Layers:</b> The shrub layer was dominated by <i>Acacia bancroftiorum</i> with associated species consisting of <i>Acacia macradenia</i>, <i>Callitris glaucophylla</i>, <i>A. longispicata</i>, <i>A. leiocalyx</i> and <i>Dodonaea triangularis</i>.</p> <p><b>Ground Layer:</b> The groundcover consisted primarily of grass species (moderately dense) including <i>Cymbopogon bombycinus</i>, <i>Themeda triandra</i> and <i>Ancistrachne uncinulata</i>.</p>	

Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
8	11.10.1/11.10.13 a	11.10.1/11.10.4	<p>This polygon is located in the central and western extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic quartzose sandstone, sub-labile and labile sandstone, mudstone and siltstone, consistent with land zones 9 or 10. Landforms are derived from the Evergreen formation and Boxvale Sandstone Member.</p> <p><b>Tree Layers:</b> Field surveys found this area to contain a mixed polygon of open forest (9–18 m) dominated by <i>Corymbia citriodora</i>, <i>Eucalyptus fibrosa</i> subsp. <i>nubila</i> and <i>E. tenuipes</i>. Other associated tree species observed includes <i>E. crebra</i>, <i>C. trachyphloia</i>, <i>Lysicarpus angustifolius</i>, <i>Angophora leiocarpa</i> and <i>Callitris glaucophylla</i>.</p> <p><b>Shrub Layers:</b> The shrub layer was dominated by <i>Acacia leiocalyx</i>, <i>A. longispicata</i>, <i>Petalostigma pubescens</i> with associated species consisting of <i>Alphitonia pubescens</i>, <i>Geijera parviflora</i>, <i>Psyrax odorata</i> and <i>Callitris glaucophylla</i>.</p> <p><b>Ground Layer:</b> The groundcover consisted primarily of grass species (sparse to moderately dense) including <i>Cymbopogon bombycinus</i>, <i>Themeda triandra</i>, <i>Arundinella nepalensis</i>, <i>Panicum effusum</i>, <i>Aristida caput-medusae</i> and <i>Enneapogon spp.</i>.</p>	

Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
9	11.10.1/11.10.1	11.9.4a	<p>This polygon is located in the north-eastern extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic quartzose sandstone, sub-labile and labile sandstone, mudstone, consistent with land zones 9 or 10. Landforms are derived from the Evergreen formation and Boxvale Sandstone Member.</p> <p><b>Tree Layers:</b> Field surveys found this area to contain semi evergreen vine thicket with an emergent layer (11–13 m) of <i>Brachychiton</i> spp. and a tree layer dominated by <i>Diospyros humilis</i>. Other associated tree species observed includes <i>Flindersia australis</i>, <i>Atalaya hemiglauca</i> and <i>Brachychiton</i> spp.</p> <p><b>Shrub Layers:</b> The shrub layer was dominated by <i>Geijera parviflora</i>, <i>Ficus rubiginosa</i> and <i>Carissa ovata</i> with associated species consisting of <i>Cupaniopsis anacardioides</i>, <i>Denhamia oleaster</i>, <i>Psyrdrax odorata</i> and <i>Turraea pubescens</i>.</p> <p><b>Ground Layer:</b> The groundcover consisted primarily of grass species (sparse to moderately dense) including <i>Ancistrachne uncinulata</i>, <i>Themeda avenacea</i> and <i>Aristida caput-medusae</i>.</p>	

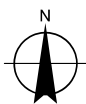
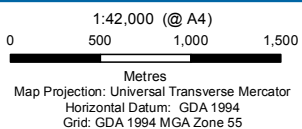
Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
10	11.10.1/11.10.1	11.9.4a	<p>This polygon is located in the north-eastern extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic quartzose sandstone, sub-labile and labile sandstone, mudstone, consistent with land zones 9 or 10. Landforms are derived from the Evergreen formation and Boxvale Sandstone Member.</p> <p><b>Tree Layers:</b> Field surveys found this area to contain semi evergreen vine thicket with an emergent layer (12–14 m) of <i>Brachychiton</i> spp. and a tree layer dominated by <i>Diospyros humilis</i> and <i>Brachychiton populneus</i>. Other associated tree species observed includes <i>Brachychiton rupestris</i>, and <i>Geijera parviflora</i>.</p> <p><b>Shrub Layers:</b> The shrub layer was dominated by <i>Ficus rubiginosa</i> and <i>Carissa ovata</i> with associated species consisting of <i>Cupaniopsis anacardioides</i>, <i>Acalypha capillipes</i>, <i>Flindersia australis</i> and <i>Croton insularis</i>.</p> <p><b>Ground Layer:</b> The groundcover was dominated primarily by <i>Ancistrachne uncinulata</i> (sparse to moderately dense).</p>	

Polygon	Mapped RE	Observed RE	Community Description	Representative Photo
11	11.10.1/11.10.13 a	11.9.4a	<p>This polygon is located in the north-eastern extent of Lot 20 on FTY1805.</p> <p><b>Land zone:</b> Occurs on landforms derived from underlying or outcropping sedimentary rock, including Jurassic quartzose sandstone, sub-labile and labile sandstone, mudstone, consistent with land zones 9 or 10. Landforms are derived from the Evergreen formation and Boxvale Sandstone Member.</p> <p><b>Tree Layers:</b> Field surveys found this area to contain semi evergreen vine thicket with an emergent layer (11–13 m) of <i>Brachychiton</i> spp. and a tree layer dominated by <i>Diospyros humilis</i>. Other associated tree species observed includes <i>Flindersia australis</i>, <i>Atalaya hemiglauca</i> and <i>Brachychiton</i> spp..</p> <p><b>Shrub Layers:</b> The shrub layer was dominated by <i>Geijera parviflora</i>, <i>Ficus rubiginosa</i> and <i>Carissa ovata</i> with associated species consisting of <i>Cupaniopsis anacardioides</i>, <i>Denhamia oleaster</i>, <i>Psyrax odorata</i> and <i>Turraea pubescens</i>.</p> <p><b>Ground Layer:</b> The groundcover consisted primarily of grass species (sparse to moderately dense) including <i>Ancistrachne uncinulata</i>, <i>Themeda avenacea</i> and <i>Aristida caput-medusae</i>.</p>	



**LEGEND**

- |                         |                            |                                       |   |
|-------------------------|----------------------------|---------------------------------------|---|
| Well Pad                | Cadastre                   | Field Validated RE Boundary           | Field Validated Regional Ecosystem (BD) |
| Watercourse             | Clearing Limit             | Certified Regional Ecosystem Boundary | Endangered dominant                     |
| Fairview Lot 20 FTY1805 | Vegetation Management Area |                                       | Of Concern sub-dominant                 |
|                         |                            |                                       | Not of Concern                          |



Santos GLNG  
Fairview Lot 20 Ecological Assessments

Job Number | 41-27125  
Revision | 0  
Date | 05 Dec 2013

Field Validated  
Regional Ecosystem

**Figure 35**

# Appendix D – Fauna habitat features



## Fauna habitat features locations

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	8/11/2013	701192.4	7163560.81	115	Ironbark
Hollow in Tree	8/11/2013	701630.16	7163282.7	115	Ironbark
Hollow in Tree	8/11/2013	701629.82	7163260.54	115	Spotted gum
Hollow in Tree	8/11/2013	700961.84	7163591.99	115	Spotted gum
Hollow in Tree	4/11/2013	700853	7163619	115	
Hollow in Tree	4/11/2013	700978	7163471	115	Stag
Hollow in Tree	8/11/2013	701619.68	7163254.05	115	Stag
Hollow in Tree	8/11/2013	700991.88	7163586	115	Stag
Hollow in Tree	8/11/2013	701021.84	7163574.47	115	Stag
Hollow in Tree	8/11/2013	700241.77	7163802.31	115	Stag
Hollow in Tree	8/11/2013	701956	7163142	115	Stag
Hollow in Tree	8/11/2013	701615	7163254	115	Stag
Hollow in Tree	8/11/2013	701596	7163248	115	Stag
Hollow in Tree	8/11/2013	701163	7163509	115	Stag
Hollow in Tree	8/11/2013	701515	7163291	115	
Hollow in Tree	8/11/2013	701559	7163298	115	
Nest in Tree	4/11/2013	700874	7163637	115	Inactive
Nesting Site	8/11/2013	699819.89	7163803.12	115	
Hollow in Tree	7/11/2013	699395.81	7161648.79	116	Ironbark
Hollow in Tree	7/11/2013	699471.69	7162019.95	116	Corymbia
Hollow in Tree	7/11/2013	699427.48	7161751.36	116	Ironbark
Hollow in Tree	7/11/2013	699395.71	7161642.14	116	Stag
Hollow in Tree	7/11/2013	699427.6	7161759.12	116	Stag
Hollow in Tree	7/11/2013	699449.72	7161895.07	116	Stag
Hollow in Tree	7/11/2013	699398	7161813	116	Stag
Hollow in Tree	7/11/2013	699406	7161738	116	
Hollow Log	7/11/2013	699429.86	7161909.78	116	
Caves	3/11/2013	699737	7160198	118	Rock crevice
Caves	3/11/2013	699733	7160234	118	Rock crevice, SEVT escarpment adj to row,
Hollow in Tree	7/11/2013	700340.59	7159698.79	118	Stag
Hollow in Tree	7/11/2013	700311.17	7159745.77	118	Ironbark
Hollow in Tree	7/11/2013	700243.02	7159887.53	118	Stag
Hollow in Tree	7/11/2013	700184.4	7159995.89	118	Ironbark

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	7/11/2013	700084.62	7160038.39	118	Ironbark
Hollow in Tree	7/11/2013	700094.39	7160020.52	118	Stag
Hollow in Tree	7/11/2013	700074.8	7160052.95	118	Ironbark
Hollow in Tree	7/11/2013	700085.51	7160097.11	118	Stag
Hollow in Tree	7/11/2013	700055.35	7160095.35	118	Ironbark
Hollow in Tree	7/11/2013	700075.21	7160080.64	118	Ironbark
Hollow in Tree	7/11/2013	700085.56	7160100.43	118	Stag
Hollow in Tree	7/11/2013	699976.18	7160173	118	Ironbark
Hollow in Tree	7/11/2013	699936.62	7160213.48	118	Ironbark
Hollow in Tree	7/11/2013	699907.06	7160250.49	118	Ironbark
Hollow in Tree	7/11/2013	699917.16	7160254.77	118	Ironbark
Hollow in Tree	7/11/2013	699877.85	7160311.88	118	Stag
Hollow in Tree	7/11/2013	699887.74	7160301.75	118	Stag
Hollow in Tree	7/11/2013	699730.25	7160513.55	118	Stag
Hollow in Tree	7/11/2013	699650.73	7160567.93	118	Stag
Hollow in Tree	7/11/2013	699582.53	7160707.46	118	Stag
Hollow in Tree	7/11/2013	699502.42	7160723.07	118	Stag
Hollow in Tree	7/11/2013	699543.42	7160777.86	118	Ironbark
Hollow in Tree	7/11/2013	699474.48	7160868.65	118	Stag
Hollow in Tree	7/11/2013	699464.64	7160882.09	118	Stag
Hollow in Tree	7/11/2013	699435.32	7160935.72	118	Ironbark
Hollow in Tree	7/11/2013	699414.87	7160911.65	118	Ironbark
Hollow in Tree	7/11/2013	699369.59	7161240.31	118	Ironbark
Hollow in Tree	4/11/2013	699363	7161284	118	Stag
Hollow in Tree	4/11/2013	699402	7161294	118	Stag
Hollow in Tree	7/11/2013	700302	7159625	118	Stag
Hollow in Tree	7/11/2013	700289	7159651	118	Stag
Hollow in Tree	7/11/2013	700291	7159680	118	Stag
Hollow in Tree	7/11/2013	700166	7159865	118	Stag
Hollow in Tree	7/11/2013	700171	7159847	118	Stag
Hollow in Tree	7/11/2013	700093	7159948	118	Stag
Hollow in Tree	7/11/2013	700054	7160007	118	Stag
Hollow in Tree	7/11/2013	700031	7160012	118	Stag
Hollow in Tree	7/11/2013	700073	7160135	118	Stag
Hollow in Tree	7/11/2013	699959	7160232	118	Stag
Hollow in Tree	7/11/2013	699953	7160282	118	Stag

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	7/11/2013	699567	7160712	118	Stag
Hollow in Tree	7/11/2013	699522	7160715	118	Stag
Hollow in Tree	7/11/2013	699451	7160912	118	Stag
Hollow in Tree	7/11/2013	699470	7160918	118	Stag
Hollow in Tree	7/11/2013	700083	7159964	118	
Hollow in Tree	7/11/2013	700090	7159967	118	
Hollow in Tree	7/11/2013	699961	7160175	118	
Rocky Outcrop	3/11/2013	699735	7160227	118	SEVT escarpment adj to row
Rocky Outcrop	3/11/2013	699736	7160198	118	Rock crevice, SEVT
Hollow in Tree	8/11/2013	699689.21	7157120.18	120	Ironbark
Hollow in Tree	8/11/2013	700153.71	7159292.74	120	Ironbark
Hollow in Tree	8/11/2013	699719.11	7157105.33	120	Corymbia
Hollow in Tree	8/11/2013	699776.75	7156932.71	120	Corymbia
Hollow in Tree	8/11/2013	699746.42	7156918.76	120	Corymbia
Hollow in Tree	8/11/2013	699776.55	7156919.42	120	Corymbia
Hollow in Tree	8/11/2013	699929.66	7158418.53	120	Corymbia
Hollow in Tree	8/11/2013	699678.62	7157083.78	120	Ironbark
Hollow in Tree	8/11/2013	699938.85	7157695.94	120	Ironbark
Hollow in Tree	8/11/2013	699784.29	7158766.43	120	Ironbark
Hollow in Tree	8/11/2013	699998.15	7158964.88	120	Ironbark
Hollow in Tree	8/11/2013	700205.78	7159416.05	120	Ironbark
Hollow in Tree	8/11/2013	700276.46	7159441.58	120	Ironbark
Hollow in Tree	8/11/2013	700276.27	7159429.39	120	Ironbark
Hollow in Tree	8/11/2013	700357.51	7159489.11	120	Ironbark
Hollow in Tree	8/11/2013	700328.18	7159541.63	120	Ironbark
Hollow in Tree	8/11/2013	699856.88	7158919.36	120	Spotted gum
Hollow in Tree	8/11/2013	699787.52	7156981.3	120	Spotted gum
Hollow in Tree	8/11/2013	699958.51	7157667.94	120	Spotted gum
Hollow in Tree	8/11/2013	699997.28	7158241.33	120	Spotted gum
Hollow in Tree	8/11/2013	699832.11	7158608.37	120	Spotted gum
Hollow in Tree	8/11/2013	699754.31	7158775.75	120	Spotted gum
Hollow in Tree	8/11/2013	699877.29	7158941.22	120	Spotted gum
Hollow in Tree	8/11/2013	699987.41	7158252.56	120	Spotted gum
Hollow in Tree	8/11/2013	700379.21	7159596.27	120	Ironbark
Hollow in Tree	8/11/2013	699823.24	7157353.07	120	Spotted gum

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	8/11/2013	699658.45	7157077.43	120	Stag
Hollow in Tree	8/11/2013	699777.75	7156999.18	120	Stag
Hollow in Tree	8/11/2013	699802.23	7157291.34	120	Stag
Hollow in Tree	8/11/2013	699864.64	7157435.55	120	Stag
Hollow in Tree	8/11/2013	699895.51	7157484.95	120	Stag
Hollow in Tree	8/11/2013	699916.72	7157559.98	120	Stag
Hollow in Tree	8/11/2013	699926.74	7157558.72	120	Stag
Hollow in Tree	8/11/2013	699939.07	7157710.34	120	Stag
Hollow in Tree	8/11/2013	699958.49	7157666.83	120	Stag
Hollow in Tree	8/11/2013	699958.26	7157651.32	120	Stag
Hollow in Tree	8/11/2013	699927.86	7157632.94	120	Stag
Hollow in Tree	8/11/2013	699907.08	7157586.72	120	Stag
Hollow in Tree	8/11/2013	700052.06	7157879.27	120	Stag
Hollow in Tree	8/11/2013	699947.89	7158295.26	120	Stag
Hollow in Tree	8/11/2013	699909.54	7158415.51	120	Stag
Hollow in Tree	8/11/2013	699821.87	7158595.23	120	Stag
Hollow in Tree	8/11/2013	699773.22	7158697.9	120	Stag
Hollow in Tree	8/11/2013	700018.04	7158952.39	120	Stag
Hollow in Tree	8/11/2013	700038.94	7159006.37	120	Stag
Hollow in Tree	8/11/2013	700379.04	7159585.19	120	Stag
Hollow in Tree	8/11/2013	699792	7157271	120	Stag
Hollow in Tree	8/11/2013	699804	7157248	120	Stag
Hollow in Tree	8/11/2013	699890	7157566	120	Stag
Hollow in Tree	8/11/2013	699925	7157628	120	Stag
Hollow in Tree	8/11/2013	700033	7157952	120	Stag
Hollow in Tree	8/11/2013	699956	7158372	120	Stag
Hollow in Tree	8/11/2013	699817	7158518	120	Stag
Hollow in Tree	8/11/2013	699771	7158741	120	Stag
Hollow in Tree	8/11/2013	699849	7158903	120	Stag
Hollow in Tree	8/11/2013	700167	7159358	120	Stag
Hollow in Tree	8/11/2013	700353	7159543	120	Stag
Hollow in Tree	8/11/2013	700360	7159543	120	Stag
Hollow in Tree	8/11/2013	699876.79	7158907.98	120	Stump
Hollow in Tree	8/11/2013	699905	7157571	120	
Hollow in Tree	8/11/2013	699899	7157669	120	
Hollow in Tree	8/11/2013	699958	7158337	120	

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	8/11/2013	699796	7158725	120	
Hollow in Tree	8/11/2013	699755	7158764	120	
Hollow in Tree	8/11/2013	699817	7158922	120	
Hollow in Tree	8/11/2013	700333	7159541	120	Ironbark
Hollow in Tree	8/11/2013	700353	7159545	120	Ironbark
Hollow in Tree	8/11/2013	700359	7159560	120	Ironbark
Hollow in Tree	8/11/2013	700369	7159571	120	Ironbark
Rocky Outcrop	8/11/2013	699778	7157022	120	Escarpment
Rocky Outcrop	8/11/2013	699830	7157400	120	Escarpment
Hollow in Tree	3/11/2013	701346	7159431	121	
Hollow in Tree	3/11/2013	701336	7159446	121	
Hollow in Tree	3/11/2013	701308	7159440	121	
Hollow in Tree	3/11/2013	701506	7159465	121	
Hollow in Tree	3/11/2013	701486	7159453	121	
Hollow in Tree	3/11/2013	701346	7159431	121	
Hollow in Tree	3/11/2013	701335	7159446	121	
Hollow in Tree	3/11/2013	701309	7159440	121	
Hollow in Tree	7/11/2013	701749.21	7159218.71	121	Stag
Hollow in Tree	7/11/2013	701701.07	7159354.63	121	Stag
Hollow in Tree	7/11/2013	701701	7159350.2	121	Stag
Hollow in Tree	7/11/2013	701631.55	7159405.55	121	Stag
Hollow in Tree	7/11/2013	701680.77	7159340.53	121	Stag
Hollow in Tree	7/11/2013	701611.84	7159430.22	121	Stump
Hollow in Tree	7/11/2013	701631.74	7159417.73	121	Stag
Hollow in Tree	7/11/2013	701562.29	7159473.08	121	Stag
Hollow in Tree	7/11/2013	701562.29	7159473.08	121	Stag
Hollow in Tree	7/11/2013	701501.86	7159461.81	121	Spotted gum
Hollow in Tree	7/11/2013	701521.91	7159459.29	121	Spotted gum
Hollow in Tree	7/11/2013	701411.15	7159439.92	121	Spotted gum
Hollow in Tree	7/11/2013	701330.97	7159450	121	Ironbark
Hollow in Tree	7/11/2013	701441.16	7159431.71	121	Ironbark
Hollow in Tree	7/11/2013	701230.46	7159443.77	121	Ironbark
Hollow in Tree	7/11/2013	701209.69	7159398.65	121	Ironbark
Hollow in Tree	7/11/2013	701079.36	7159412.82	121	Ironbark
Hollow in Tree	7/11/2013	701059.67	7159438.6	121	Ironbark
Hollow in Tree	7/11/2013	700999.77	7159461.67	121	Spotted gum

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	7/11/2013	701010.04	7159477.03	121	Ironbark
Hollow in Tree	7/11/2013	701019.97	7159469.12	121	Ironbark
Hollow in Tree	7/11/2013	701029.8	7159455.67	121	Ironbark
Hollow in Tree	7/11/2013	700870.46	7159543.41	121	Ironbark
Hollow in Tree	7/11/2013	700880.49	7159542.15	121	Ironbark
Hollow in Tree	7/11/2013	700880.32	7159531.07	121	Stag
Hollow in Tree	7/11/2013	700709.28	7159509.28	121	Spotted gum
Hollow in Tree	7/11/2013	700709.48	7159522.58	121	Ironbark
Hollow in Tree	7/11/2013	700698.95	7159490.6	121	Ironbark
Hollow in Tree	7/11/2013	700650.43	7159602.14	121	Stag
Hollow in Tree	7/11/2013	700609.75	7159568.41	121	Ironbark
Hollow in Tree	7/11/2013	700540.1	7159610.46	121	Ironbark
Hollow in Tree	7/11/2013	700550	7159601.44	121	Stag
Hollow in Tree	7/11/2013	700459.71	7159607.24	121	Ironbark
Hollow in Tree	7/11/2013	700450.26	7159646.16	121	Ironbark
Hollow in Tree	7/11/2013	701761	7159185	121	Stag
Hollow in Tree	7/11/2013	701625	7159357	121	Stag
Hollow in Tree	7/11/2013	701552	7159428	121	Stag
Hollow in Tree	7/11/2013	701432	7159406	121	Stag
Hollow in Tree	7/11/2013	700933	7159513	121	Stag
Hollow in Tree	7/11/2013	700863	7159481	121	Stag
Hollow in Tree	7/11/2013	700778	7159495	121	Stag
Hollow in Tree	7/11/2013	700608	7159530	121	Stag
Hollow in Tree	7/11/2013	700475	7159600	121	Stag
Hollow in Tree	7/11/2013	700441	7159609	121	Stag
Hollow in Tree	7/11/2013	701409	7159403	121	Ironbark
Hollow in Tree	7/11/2013	701258	7159375	121	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	701233	7159366	121	Ironbark
Hollow in Tree	7/11/2013	701256	7159359	121	Ironbark
Hollow in Tree	7/11/2013	701095	7159344	121	
Hollow in Tree	7/11/2013	700971	7159464	121	Ironbark
Hollow in Tree	7/11/2013	700804	7159495	121	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	700611	7159558	121	Ironbark
Hollow in Tree	7/11/2013	700573	7159556	121	Ironbark
Hollow in Tree	7/11/2013	700549	7159568	121	Ironbark
Hollow Log	7/11/2013	701341.01	7159449.85	121	

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Nesting Site	7/11/2013	700709.14	7159500.42	121	Kingfisher nesting site in termite mound
Termite Mounds	7/11/2013	700709.14	7159500.42	121	
Hollow in Tree	7/11/2013	702903.67	7158539.58	124	Ironbark
Hollow in Tree	7/11/2013	702833.28	7158532.9	124	Ironbark
Hollow in Tree	7/11/2013	702803.43	7158551.09	124	Ironbark
Hollow in Tree	7/11/2013	702813.34	7158542.07	124	Ironbark
Hollow in Tree	7/11/2013	702793.68	7158570.08	124	Ironbark
Hollow in Tree	7/11/2013	702814.88	7158642.89	124	Stag
Hollow in Tree	7/11/2013	702775.5	7158694.46	124	Stag
Hollow in Tree	7/11/2013	702705.19	7158693.32	124	Ironbark
Hollow in Tree	7/11/2013	702695.19	7158695.69	124	Ironbark
Hollow in Tree	7/11/2013	702705.4	7158706.61	124	Stag
Hollow in Tree	7/11/2013	702587.11	7158851.36	124	Spotted gum
Hollow in Tree	7/11/2013	702576.78	7158832.68	124	Ironbark
Hollow in Tree	7/11/2013	702576.75	7158830.46	124	Ironbark
Hollow in Tree	7/11/2013	702556.72	7158834.09	124	Ironbark
Hollow in Tree	7/11/2013	702576.58	7158819.39	124	Ironbark
Hollow in Tree	7/11/2013	702577.21	7158860.38	124	Ironbark
Hollow in Tree	7/11/2013	702556.98	7158850.71	124	Ironbark
Hollow in Tree	7/11/2013	702567.96	7158912.6	124	Stag
Hollow in Tree	7/11/2013	702528.16	7158936.47	124	Ironbark
Hollow in Tree	7/11/2013	702538.4	7158949.61	124	Ironbark
Hollow in Tree	7/11/2013	702488.63	7158978.08	124	Ironbark
Hollow in Tree	7/11/2013	702438.74	7158998.78	124	Ironbark
Hollow in Tree	7/11/2013	702469.11	7159014.94	124	Ironbark
Hollow in Tree	7/11/2013	702439.23	7159030.91	124	Ironbark
Hollow in Tree	7/11/2013	702398.36	7158984.99	124	Ironbark
Hollow in Tree	7/11/2013	702398.33	7158982.78	124	Ironbark
Hollow in Tree	7/11/2013	702389.15	7159039.43	124	Ironbark
Hollow in Tree	7/11/2013	702349.6	7159079.92	124	Ironbark
Hollow in Tree	7/11/2013	702349.99	7159105.4	124	Stag
Hollow in Tree	7/11/2013	702349.92	7159100.97	124	Ironbark
Hollow in Tree	7/11/2013	702330.45	7159141.16	124	Ironbark
Hollow in Tree	7/11/2013	702290.07	7159127.37	124	Ironbark
Hollow in Tree	7/11/2013	702260.99	7159195.41	124	Ironbark

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	7/11/2013	702250.42	7159161.22	124	Ironbark
Hollow in Tree	7/11/2013	702251.27	7159216.61	124	Ironbark
Hollow in Tree	7/11/2013	702241.36	7159225.62	124	Ironbark
Hollow in Tree	7/11/2013	702029.47	7159159.04	124	Stag
Hollow in Tree	7/11/2013	702039.53	7159160	124	Ironbark
Hollow in Tree	7/11/2013	702009.48	7159164.89	124	Ironbark
Hollow in Tree	7/11/2013	701999.09	7159141.78	124	Stag
Hollow in Tree	7/11/2013	701999.05	7159139.56	124	Stag
Hollow in Tree	7/11/2013	701977.69	7159055.67	124	Stag
Hollow in Tree	7/11/2013	702898	7158511	124	Stag
Hollow in Tree	7/11/2013	702838	7158546	124	Stag
Hollow in Tree	7/11/2013	702852	7158600	124	Stag
Hollow in Tree	7/11/2013	702732	7158650	124	Stag
Hollow in Tree	7/11/2013	702728	7158652	124	Stag
Hollow in Tree	7/11/2013	702711	7158664	124	Stag
Hollow in Tree	7/11/2013	702614	7158791	124	Stag
Hollow in Tree	7/11/2013	702548	7158878	124	Stag
Hollow in Tree	7/11/2013	702531	7158855	124	Stag
Hollow in Tree	7/11/2013	702503	7158882	124	Stag
Hollow in Tree	7/11/2013	702510	7158886	124	Stag
Hollow in Tree	7/11/2013	702489	7158920	124	Stag
Hollow in Tree	7/11/2013	702009	7159092	124	Stag
Hollow in Tree	7/11/2013	702813	7158557	124	
Hollow in Tree	7/11/2013	702535	7158868	124	
Hollow in Tree	7/11/2013	702465	7158964	124	
Hollow in Tree	7/11/2013	702449	7158963	124	
Hollow in Tree	7/11/2013	702400	7158977	124	
Hollow in Tree	7/11/2013	702416	7158949	124	
Hollow in Tree	7/11/2013	702304	7159077	124	
Hollow in Tree	7/11/2013	702270	7159083	124	
Hollow in Tree	7/11/2013	702264	7159089	124	
Hollow in Tree	7/11/2013	702253	7159075	124	
Hollow in Tree	7/11/2013	702245	7159102	124	
Hollow in Tree	7/11/2013	702234	7159149	124	
Hollow in Tree	7/11/2013	702221	7159142	124	
Hollow in Tree	7/11/2013	702107	7159185	124	



Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	7/11/2013	702062	7159136	124	
Hollow Log	7/11/2013	702567.94	7158911.49	124	
Hollow Log	7/11/2013	702339.81	7159096.69	124	
Hollow Log	7/11/2013	702251	7159146	124	
Hollow Log	7/11/2013	702083	7159138	124	
Hollow Log	7/11/2013	702852	7158600	124	Log pile
Hollow in Tree	4/11/2013	700750	7161519	129	Stag, wetland 2/dam 2
Hollow in Tree	4/11/2013	700692	7161537	129	wetland 2/dam 2
Hollow in Tree	8/11/2013	700698.51	7161454.09	129	Corymbia
Hollow in Tree	8/11/2013	700688.42	7161450.92	129	Corymbia
Hollow in Tree	8/11/2013	701060.02	7161450.84	129	Corymbia
Hollow in Tree	8/11/2013	700366.75	7161432.51	129	Corymbia
Hollow in Tree	8/11/2013	700728.92	7161472.47	129	Corymbia
Hollow in Tree	8/11/2013	699584.87	7162199.97	129	Ironbark
Hollow in Tree	8/11/2013	700658.61	7161472.43	129	Spotted gum
Hollow in Tree	8/11/2013	701453.52	7161570.09	129	Spotted gum
Hollow in Tree	8/11/2013	699665.1	7162192.12	129	Stag
Hollow in Tree	8/11/2013	700899.16	7161439.98	129	Stag
Hollow in Tree	8/11/2013	700888.95	7161429.05	129	Stag
Hollow in Tree	8/11/2013	701070.14	7161456.23	129	Stag
Hollow in Tree	8/11/2013	701080.05	7161447.21	129	Stag
Hollow in Tree	8/11/2013	701352.92	7161559.43	129	Stag
Hollow in Tree	8/11/2013	701332.72	7161551.98	129	Stag
Hollow in Tree	8/11/2013	701443.11	7161545.87	129	Stag
Hollow in Tree	8/11/2013	701433.35	7161564.86	129	Stag
Hollow in Tree	8/11/2013	699540	7162201	129	Stag
Hollow in Tree	8/11/2013	700434	7161849	129	Stag
Hollow in Tree	8/11/2013	700437	7161826	129	Stag
Hollow in Tree	8/11/2013	700465	7161824	129	Stag
Hollow in Tree	8/11/2013	701095	7161469	129	Stag
Hollow in Tree	8/11/2013	701099	7161482	129	Stag
Hollow in Tree	8/11/2013	701206	7161531	129	Stag
Hollow in Tree	8/11/2013	701308	7161556	129	Stag
Hollow in Tree	8/11/2013	701343	7161567	129	Stag
Hollow in Tree	8/11/2013	701407	7161551	129	Stag
Hollow in Tree	8/11/2013	701307	7161556	129	Ironbark

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow Log	8/11/2013	699525.27	7162244.08	129	
Hollow Log	8/11/2013	701191.37	7161503.15	129	
Hollow Log	8/11/2013	701366	7161551	129	
Hollow in Tree	8/11/2013	701673.93	7161534.61	131	Corymbia
Hollow in Tree	8/11/2013	701653.84	7161533.81	131	Corymbia
Hollow in Tree	8/11/2013	701683.91	7161530.03	131	Stag
Hollow in Tree	8/11/2013	701724.36	7161548.25	131	Stag
Hollow in Tree	8/11/2013	701655	7161611	131	Stag
Hollow in Tree	8/11/2013	701657	7161616	131	Stag
Hollow in Tree	8/11/2013	701707	7161604	131	Stag
Hollow in Tree	8/11/2013	701754	7161610	131	Stag
Hollow in Tree	8/11/2013	701682	7161601	131	
Hollow in Tree	8/11/2013	701758	7161593	131	
Hollow in Tree	8/11/2013	701799	7161597	131	
Hollow in Tree	8/11/2013	701823	7161609	131	
Hollow in Tree	8/11/2013	701936.57	7161633.67	132	Corymbia
Hollow in Tree	8/11/2013	703156.47	7161279.32	132	Ironbark
Hollow in Tree	8/11/2013	703186.35	7161263.35	132	Spotted gum
Hollow in Tree	8/11/2013	702197.51	7161620.84	132	Ironbark
Hollow in Tree	8/11/2013	701835.86	7161615.26	132	Corymbia
Hollow in Tree	8/11/2013	701875.89	7161605.78	132	Corymbia
Hollow in Tree	8/11/2013	701977.09	7161656.33	132	Corymbia
Hollow in Tree	8/11/2013	702207.06	7161588.56	132	Corymbia
Hollow in Tree	8/11/2013	702048.57	7161733.91	132	Ironbark
Hollow in Tree	8/11/2013	702197.81	7161640.78	132	Ironbark
Hollow in Tree	8/11/2013	702896.77	7161373.05	132	Ironbark
Hollow in Tree	8/11/2013	702027.55	7161672.18	132	Ironbark
Hollow in Tree	8/11/2013	702866.99	7161395.66	132	Ironbark
Hollow in Tree	8/11/2013	701795	7161570.45	132	Spotted gum
Hollow in Tree	8/11/2013	702797.63	7161457.67	132	Spotted gum
Hollow in Tree	8/11/2013	702207.03	7161586.34	132	Corymbia
Hollow in Tree	8/11/2013	701855.8	7161606.09	132	Stag
Hollow in Tree	8/11/2013	701875.95	7161610.22	132	Stag
Hollow in Tree	8/11/2013	701966.83	7161642.08	132	Stag
Hollow in Tree	8/11/2013	702088.3	7161704.5	132	Stag
Hollow in Tree	8/11/2013	702078.55	7161723.48	132	Stag

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	8/11/2013	702187.72	7161637.61	132	Stag
Hollow in Tree	8/11/2013	702277.58	7161603	132	Stag
Hollow in Tree	8/11/2013	702816.95	7161407.51	132	Stag
Hollow in Tree	8/11/2013	703215.25	7161183.13	132	Stag
Hollow in Tree	8/11/2013	703235.25	7161177.28	132	Stag
Hollow in Tree	8/11/2013	703235.27	7161178.39	132	Stag
Hollow in Tree	8/11/2013	701875	7161645	132	Stag
Hollow in Tree	8/11/2013	701880	7161649	132	Stag
Hollow in Tree	8/11/2013	701875	7161659	132	Stag
Hollow in Tree	8/11/2013	701906	7161660	132	Stag
Hollow in Tree	8/11/2013	702061	7161701	132	Stag
Hollow in Tree	8/11/2013	702143	7161705	132	Stag
Hollow in Tree	8/11/2013	702155	7161697	132	Stag
Hollow in Tree	8/11/2013	702248	7161646	132	Stag
Hollow in Tree	8/11/2013	702418	7161469	132	Stag
Hollow in Tree	8/11/2013	702793	7161458	132	Stag
Hollow in Tree	8/11/2013	702486.49	7161471.28	132	Stump
Hollow in Tree	8/11/2013	702915	7161367	132	Ironbark, With exfoliating bark
Hollow in Tree	8/11/2013	702026	7161691	132	
Hollow in Tree	8/11/2013	702438	7161476	132	<i>Corymbia citriodora</i>
Hollow in Tree	8/11/2013	702837	7161418	132	
Hollow in Tree	8/11/2013	702862	7161419	132	
Hollow in Tree	8/11/2013	703209	7161305	132	<i>Corymbia citriodora</i>
Hollow in Tree	8/11/2013	703230	7161295	132	
Rocky Outcrop	8/11/2013	702247	7161637	132	Escarpment, Along edge of ROW
Dead Hollow Log	6/11/2013	701658	7161779	133	
Hollow in Tree	6/11/2013	701815.81	7161617.78	133	Ironbark
Hollow in Tree	6/11/2013	701806.98	7161697.69	133	Stag
Hollow in Tree	6/11/2013	701797.15	7161712.25	133	<i>E. fibrosa</i>
Hollow in Tree	6/11/2013	701796.99	7161701.17	133	Corymbia
Hollow in Tree	6/11/2013	701797.19	7161714.46	133	Stag
Hollow in Tree	6/11/2013	701797.19	7161714.46	133	Stag
Hollow in Tree	6/11/2013	701808.85	7161820.66	133	Stag
Hollow in Tree	6/11/2013	701789.07	7161840.91	133	Stump
Hollow in Tree	6/11/2013	701799.31	7161854.05	133	

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	6/11/2013	701789.59	7161875.25	133	Corymbia
Hollow in Tree	6/11/2013	701780.45	7161935.22	133	Stump
Hollow in Tree	6/11/2013	701790.8	7161955.01	133	Large spotted gum
Hollow in Tree	6/11/2013	701780.71	7161951.84	133	Stump
Hollow in Tree	6/11/2013	701751.22	7161994.39	133	Corymbia
Hollow in Tree	6/11/2013	701772.06	7162043.94	133	Stump
Hollow in Tree	6/11/2013	701782.41	7162063.73	133	Two Stags
Hollow in Tree	6/11/2013	701772.21	7162053.91	133	Corymbia
Hollow in Tree	6/11/2013	701792.73	7162082.41	133	<i>E. fibrosa</i>
Hollow in Tree	6/11/2013	701843.65	7162128.17	133	Stag
Hollow in Tree	6/11/2013	701824.21	7162170.58	133	Stag
Hollow in Tree	6/11/2013	701864.83	7162199.88	133	Corymbia
Hollow in Tree	6/11/2013	701834.87	7162211.41	133	Spotted gum
Hollow in Tree	6/11/2013	701824.91	7162217.1	133	Stag
Hollow in Tree	6/11/2013	701857.21	7162359.55	133	<i>E. fibrosa</i>
Hollow in Tree	6/11/2013	701897.81	7162387.75	133	Spotted gum, Small hollows
Hollow in Tree	6/11/2013	701971.41	7162603.81	133	Stag
Hollow in Tree	6/11/2013	702042.78	7162673.64	133	Spotted gum
Hollow in Tree	6/11/2013	702023.37	7162718.26	133	Stag
Hollow in Tree	6/11/2013	701658	7161777	133	Stag
Hollow in Tree	6/11/2013	701627	7161807	133	Stag
Hollow in Tree	6/11/2013	701691	7162008	133	Stag
Hollow in Tree	6/11/2013	701691	7162018	133	Stag
Hollow in Tree	6/11/2013	701693	7162053	133	Stag
Hollow in Tree	6/11/2013	701690	7162061	133	Stag
Hollow in Tree	6/11/2013	701699	7162135	133	Stag
Hollow in Tree	6/11/2013	701804	7162361	133	Stag
Hollow in Tree	6/11/2013	701910	7162546	133	Stag
Hollow in Tree	6/11/2013	701897	7162555	133	Stag
Hollow in Tree	6/11/2013	701894	7162568	133	Stag
Hollow in Tree	6/11/2013	701825	7161695	133	Stag, Open trunk
Hollow in Tree	6/11/2013	701803	7161800	133	Stag, Open trunk
Hollow in Tree	6/11/2013	701819	7161814	133	Stag, Open trunk
Hollow in Tree	6/11/2013	701823	7161836	133	Stag, Small hollows on branches
Hollow in Tree	6/11/2013	701817	7161893	133	Stag, Ironbark

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	6/11/2013	701824	7161930	133	Stag
Hollow in Tree	6/11/2013	701809	7161959	133	Stag
Hollow in Tree	6/11/2013	701802	7161994	133	Stag
Hollow in Tree	6/11/2013	701791	7162070	133	Stag
Hollow in Tree	6/11/2013	701869	7162135	133	Stag
Hollow in Tree	6/11/2013	701878	7162178	133	Stag
Hollow in Tree	6/11/2013	701887	7162183	133	Stag
Hollow in Tree	6/11/2013	701854	7162273	133	Stag
Hollow in Tree	6/11/2013	701879	7162335	133	Stag
Hollow in Tree	6/11/2013	701897	7162330	133	Stag
Hollow in Tree	6/11/2013	701903	7162356	133	Stag
Hollow in Tree	6/11/2013	701915	7162395	133	Stag
Hollow in Tree	6/11/2013	702019	7162616	133	Stag
Hollow in Tree	6/11/2013	702039	7162758	133	Stag
Hollow in Tree	6/11/2013	702050	7162780	133	Stag
Hollow in Tree	6/11/2013	702046	7162820	133	Stag
Hollow in Tree	5/11/2013	701753	7161896	133	Stag
Hollow in Tree	5/11/2013	701748	7161952	133	Stag
Hollow in Tree	5/11/2013	701728	7161972	133	Stag
Hollow in Tree	5/11/2013	701770	7162296	133	Stag
Hollow in Tree	5/11/2013	701820	7162447	133	Stag
Hollow in Tree	5/11/2013	701912	7162510	133	Stag
Hollow in Tree	5/11/2013	701999	7162675	133	Stag
Hollow in Tree	5/11/2013	701994	7162715	133	Stag
Hollow in Tree	5/11/2013	702032	7162750	133	Stag
Hollow in Tree	5/11/2013	702037	7162818	133	Stag
Hollow in Tree	5/11/2013	702076	7162848	133	Stag
Hollow in Tree	6/11/2013	701658	7161779	133	Stag
Hollow in Tree	6/11/2013	701604	7161719	133	<i>Corymbia trachyphloia</i>
Hollow in Tree	6/11/2013	701658	7161729	133	<i>Corymbia trachyphloia</i>
Hollow in Tree	6/11/2013	701652	7161912	133	<i>Corymbia trachyphloia</i>
Hollow in Tree	6/11/2013	701680	7162090	133	
Hollow in Tree	6/11/2013	701694	7162122	133	
Hollow in Tree	6/11/2013	701715	7162210	133	
Hollow in Tree	6/11/2013	701893	7162565	133	
Hollow in Tree	6/11/2013	701837	7161683	133	Ironbark trunk hollows

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	6/11/2013	701829	7161712	133	Ironbark
Hollow in Tree	6/11/2013	701810	7161787	133	<i>Corymbia sp.</i>
Hollow in Tree	6/11/2013	701831	7161916	133	<i>Corymbia sp.</i>
Hollow in Tree	6/11/2013	701826	7161975	133	<i>Corymbia sp.</i>
Hollow in Tree	6/11/2013	701788	7162003	133	<i>Corymbia sp.</i>
Hollow in Tree	6/11/2013	701790	7162065	133	<i>Corymbia sp.</i>
Hollow in Tree	6/11/2013	701806	7162082	133	<i>Corymbia sp.</i>
Hollow in Tree	6/11/2013	701883	7162100	133	<i>Corymbia sp.</i>
Hollow in Tree	6/11/2013	701875	7162123	133	<i>Lysicarpus angustifolius</i>
Hollow in Tree	6/11/2013	701875	7162124	133	<i>Corymbia sp.</i>
Hollow in Tree	6/11/2013	701850	7162251	133	<i>Corymbia citriodora</i>
Hollow in Tree	6/11/2013	701877	7162323	133	<i>Lysicarpus angustifolius</i>
Hollow in Tree	6/11/2013	701993	7162595	133	
Hollow in Tree	6/11/2013	702020	7162833	133	Ironbark
Hollow in Tree	5/11/2013	701855	7161605	133	
Hollow in Tree	5/11/2013	701743	7161694	133	
Hollow in Tree	5/11/2013	701730	7161729	133	
Hollow in Tree	5/11/2013	701730	7161834	133	
Hollow in Tree	5/11/2013	701741	7162121	133	
Hollow in Tree	5/11/2013	702029	7162822	133	
Hollow Log	6/11/2013	701798.47	7161798.66	133	
Hollow Log	6/11/2013	701803.2	7162109.95	133	
Hollow Log	6/11/2013	701845.89	7162275.51	133	
Hollow Log	5/11/2013	701740	7162048	133	
Hollow Log	5/11/2013	701880	7162530	133	
Hollow Log	6/11/2013	701788.68	7161815.43	133	
Nest in Tree	6/11/2013	701815	7162625	133	<i>Corymbia citriodora</i> , currently unoccupied
Nest in Tree	5/11/2013	701752	7161948	133	
Rocky Outcrop	5/11/2013	702024	7162738	133	Escarpment
Rocky Outcrop	5/11/2013	702032	7162750	133	Escarpment
Rocky Outcrop	5/11/2013	702038	7162857	133	Escarpment
Hollow in Tree	8/11/2013	704436.21	7160901.77	135	Ironbark
Hollow in Tree	8/11/2013	704405.83	7160885.62	135	Ironbark
Hollow in Tree	8/11/2013	704557.96	7160981.89	135	Ironbark
Hollow in Tree	8/11/2013	703666.08	7161109.74	135	Ironbark

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	8/11/2013	703907.4	7161128.19	135	Ironbark
Hollow in Tree	8/11/2013	704107.71	7161091.87	135	Ironbark
Hollow in Tree	8/11/2013	704679.88	7161073.09	135	Ironbark
Hollow in Tree	8/11/2013	704751.3	7161145.13	135	Ironbark
Hollow in Tree	8/11/2013	703957.28	7161106.37	135	Ironbark
Hollow in Tree	8/11/2013	704751.42	7161152.88	135	Ironbark
Hollow in Tree	8/11/2013	703836.4	7161082.74	135	Spotted gum
Hollow in Tree	8/11/2013	704699.74	7161058.38	135	Spotted gum
Hollow in Tree	8/11/2013	703635.65	7161090.26	135	Stag
Hollow in Tree	8/11/2013	703826.54	7161095.08	135	Stag
Hollow in Tree	8/11/2013	703806.43	7161093.18	135	Stag
Hollow in Tree	8/11/2013	703916.96	7161097.02	135	Stag
Hollow in Tree	8/11/2013	704137.15	7161047.1	135	Stag
Hollow in Tree	8/11/2013	704196.85	7161010.72	135	Stag
Hollow in Tree	8/11/2013	704166.43	7160992.35	135	Stag
Hollow in Tree	8/11/2013	704406.14	7160905.56	135	Stag
Hollow in Tree	8/11/2013	703705	7161164	135	Stag
Hollow in Tree	8/11/2013	703841	7161166	135	Stag
Hollow in Tree	8/11/2013	703914	7161154	135	Stag
Hollow in Tree	8/11/2013	703908	7161173	135	Stag
Hollow in Tree	8/11/2013	703920	7161151	135	Stag
Hollow in Tree	8/11/2013	703927	7161145	135	Stag
Hollow in Tree	8/11/2013	703947	7161135	135	Stag
Hollow in Tree	8/11/2013	703939	7161138	135	Stag
Hollow in Tree	8/11/2013	704157	7161094	135	Stag
Hollow in Tree	8/11/2013	704178	7161034	135	Stag
Hollow in Tree	8/11/2013	704355	7160914	135	Stag
Hollow in Tree	8/11/2013	704427	7160977	135	Stag
Hollow in Tree	8/11/2013	704484	7160963	135	Stag
Hollow in Tree	8/11/2013	704515	7160951	135	Stag
Hollow in Tree	8/11/2013	704527	7160949	135	Stag
Hollow in Tree	8/11/2013	704538	7160955	135	Stag
Hollow in Tree	8/11/2013	704518	7160970	135	Stag
Hollow in Tree	8/11/2013	704572	7161007	135	Stag
Hollow in Tree	8/11/2013	704618	7161029	135	Stag
Hollow in Tree	8/11/2013	703957.18	7161099.73	135	Stump

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	8/11/2013	704497.53	7160970.64	135	Stump
Hollow in Tree	8/11/2013	704497.77	7160986.15	135	Stump
Hollow in Tree	8/11/2013	704508.15	7161008.15	135	Stump
Hollow in Tree	8/11/2013	704271	7160965	135	With exfoliating bark
Hollow in Tree	8/11/2013	704601	7161033	135	With exfoliating bark
Hollow in Tree	8/11/2013	704277	7161000	135	
Hollow in Tree	8/11/2013	703680	7161165	135	
Hollow in Tree	8/11/2013	703819	7161160	135	
Hollow in Tree	8/11/2013	703843	7161150	135	
Hollow in Tree	8/11/2013	703887	7161147	135	Ironbark
Hollow in Tree	8/11/2013	703900	7161151	135	
Hollow in Tree	8/11/2013	703909	7161175	135	
Hollow in Tree	8/11/2013	704390	7160932	135	
Hollow in Tree	8/11/2013	704438	7160943	135	
Hollow Log	8/11/2013	704557.98	7160983	135	
Hollow Log	8/11/2013	704567.91	7160976.2	135	
Hollow in Tree	8/11/2013	704480	7161054	136	Stag
Hollow in Tree	8/11/2013	704489	7160981	136	Stag
Hollow in Tree	8/11/2013	704714	7161119	136	Stag
Hollow in Tree	8/11/2013	704722	7161139	136	Stag
Hollow in Tree	8/11/2013	704629	7161045	136	Ironbark
Hollow in Tree	8/11/2013	704717	7161106	136	Ironbark
Hollow Log	8/11/2013	704481	7161054	136	Log pile
Hollow in Tree	7/11/2013	705009.78	7160323.37	137	Stag
Hollow in Tree	7/11/2013	705081.43	7160410.91	137	Stump
Hollow in Tree	7/11/2013	705081.45	7160412.02	137	Stump
Hollow in Tree	7/11/2013	705121.64	7160413.61	137	Stag
Hollow in Tree	7/11/2013	705142.07	7160435.46	137	Ironbark
Hollow in Tree	7/11/2013	704884.95	7160694.29	137	Stag
Hollow in Tree	7/11/2013	704884.95	7160694.29	137	Spotted gum, Small hollows
Hollow in Tree	7/11/2013	704835.15	7160721.65	137	Stag
Hollow in Tree	7/11/2013	704715.86	7160801.06	137	Spotted gum
Hollow in Tree	7/11/2013	704613.61	7160682.96	137	Spotted gum
Hollow in Tree	7/11/2013	704676.59	7160859.28	137	Spotted gum
Hollow in Tree	7/11/2013	704677.58	7160923.54	137	<i>Corymbia</i> sp.



Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	7/11/2013	704667.52	7160922.59	137	Ironbark
Hollow in Tree	7/11/2013	704637.93	7160957.39	137	Spotted gum
Hollow in Tree	7/11/2013	704577.7	7160959.43	137	Spotted gum, Small hollows
Hollow in Tree	7/11/2013	704905	7160433	137	Stag
Hollow in Tree	7/11/2013	704747	7160589	137	Stag
Hollow in Tree	7/11/2013	704718	7160583	137	Stag, Potential habitat for microbats
Hollow in Tree	7/11/2013	704673	7160602	137	Stag
Hollow in Tree	7/11/2013	704581	7160631	137	Stag
Hollow in Tree	7/11/2013	704799	7160065	137	Stag, Ironbark with open trunk
Hollow in Tree	7/11/2013	704804	7160091	137	Stag, Ironbark with open trunk
Hollow in Tree	7/11/2013	705030	7160345	137	Stag, Ironbark with small hollows
Hollow in Tree	7/11/2013	705012	7160629	137	Stag, Small hollows on branches
Hollow in Tree	7/11/2013	704913	7160702	137	Stag, Ironbark with small hollows
Hollow in Tree	7/11/2013	704740	7160814	137	Stag, Small hollows on branches
Hollow in Tree	7/11/2013	704647	7160912	137	Stag, Open trunk
Hollow in Tree	7/11/2013	704741	7160049	137	Stag
Hollow in Tree	7/11/2013	704997	7160586	137	Stag
Hollow in Tree	7/11/2013	704922	7160628	137	Stag
Hollow in Tree	7/11/2013	704768	7160695	137	Stag
Hollow in Tree	7/11/2013	704740	7160738	137	Stag
Hollow in Tree	7/11/2013	704626	7160897	137	Stag
Hollow in Tree	7/11/2013	704871	7160433	137	<i>Corymbia citriodora</i> , two hollows
Hollow in Tree	7/11/2013	704826	7160468	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704811	7160487	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704773	7160508	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704740	7160527	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704750	7160558	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704774	7160555	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704769	7160575	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704747	7160591	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704541	7160634	137	<i>Corymbia citriodora</i>

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	7/11/2013	704530	7160646	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704522	7160691	137	<i>Eucalyptus fibrosa</i>
Hollow in Tree	7/11/2013	704483	7160764	137	<i>Corymbia citriodora</i>
Hollow in Tree	7/11/2013	704747	7160800	137	Small hollows on branches
Hollow in Tree	7/11/2013	704736	7160823	137	<i>Corymbia citriodora</i> , Small hollows on branches
Hollow in Tree	7/11/2013	704689	7160869	137	
Hollow in Tree	7/11/2013	704615	7160975	137	<i>Corymbia citriodora</i> , Small hollows on branches
Hollow in Tree	7/11/2013	704859	7160142	137	
Hollow in Tree	7/11/2013	705039	7160564	137	
Hollow in Tree	7/11/2013	704942	7160623	137	
Hollow in Tree	7/11/2013	704791	7160682	137	
Hollow Log	7/11/2013	704468	7160785	137	
Hollow Log	7/11/2013	705069	7160564	137	
Hollow Log	7/11/2013	705024	7160601	137	
Hollow Log	7/11/2013	704654	7160887	137	
Hollow Log	7/11/2013	704645	7160898	137	
Hollow Log	7/11/2013	704679	7160805	137	
Hollow Log	7/11/2013	704676	7160860	137	
Hollow Log	7/11/2013	705102.95	7160503.66	137	
Rocky Outcrop	7/11/2013	704877	7160658	137	Escarpment
Rocky Outcrop	7/11/2013	704677	7160872	137	Escarpment
Rocky Outcrop	7/11/2013	704631	7160916	137	Escarpment
Rocky Outcrop	7/11/2013	704600	7160952	137	Escarpment
Hollow in Tree	7/11/2013	705278.11	7158842.13	139	Stag
Hollow in Tree	7/11/2013	705299.9	7158952.6	139	Spotted gum
Hollow in Tree	7/11/2013	705274.12	7159233.35	139	Stag
Hollow in Tree	7/11/2013	705274.12	7159233.35	139	Ironbark
Hollow in Tree	7/11/2013	705226.44	7159396.98	139	Ironbark
Hollow in Tree	7/11/2013	704961.32	7159786.69	139	Stag
Hollow in Tree	4/11/2013	705188	7159030	139	Stag
Hollow in Tree	7/11/2013	705305	7158951	139	Stag
Hollow in Tree	7/11/2013	705261	7159232	139	Stag
Hollow in Tree	7/11/2013	705187	7159517	139	Stag

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	4/11/2013	705233	7159041	139	
Hollow in Tree	4/11/2013	705185	7159085	139	
Dead Hollow Log	6/11/2013	704066.87	7159089.08	140	
Dead Hollow Log	6/11/2013	703905.12	7159018.44	140	
Hollow in Tree	6/11/2013	705235.26	7159318.17	140	Stag
Hollow in Tree	6/11/2013	705063.42	7159245.47	140	Stag
Hollow in Tree	6/11/2013	705063.49	7159249.9	140	Ironbark
Hollow in Tree	6/11/2013	704913.02	7159259.99	140	Stump
Hollow in Tree	6/11/2013	704853.16	7159285.29	140	Spotted gum
Hollow in Tree	6/11/2013	704712.47	7159278.59	140	Stag
Hollow in Tree	6/11/2013	704540.96	7159226.94	140	Stag
Hollow in Tree	6/11/2013	704530.58	7159204.94	140	Stag
Hollow in Tree	6/11/2013	704419.92	7159192.24	140	Stag
Hollow in Tree	6/11/2013	704339.76	7159203.45	140	Stag
Hollow in Tree	6/11/2013	704279.64	7159212.13	140	Spotted gum
Hollow in Tree	6/11/2013	704239.31	7159201.67	140	Ironbark
Hollow in Tree	6/11/2013	704178.91	7159191.52	140	Ironbark
Hollow in Tree	6/11/2013	704137.71	7159124.56	140	Stag
Hollow in Tree	6/11/2013	704117.63	7159124.87	140	Stag
Hollow in Tree	6/11/2013	704087.05	7159095.42	140	Spotted gum
Hollow in Tree	6/11/2013	704005.76	7159033.51	140	Stag
Hollow in Tree	6/11/2013	703995.62	7159027.02	140	Spotted gum
Hollow in Tree	6/11/2013	703895.03	7159015.27	140	Spotted gum
Hollow in Tree	6/11/2013	703854.65	7159001.48	140	Ironbark
Hollow in Tree	6/11/2013	703844.51	7158994.99	140	Ironbark
Hollow in Tree	6/11/2013	703803.63	7158949.08	140	Stump
Hollow in Tree	6/11/2013	703783.25	7158929.44	140	Ironbark
Hollow in Tree	6/11/2013	703752.81	7158908.86	140	Ironbark
Hollow in Tree	6/11/2013	703672.03	7158880.18	140	Ironbark
Hollow in Tree	6/11/2013	703661.77	7158865.93	140	Ironbark
Hollow in Tree	6/11/2013	703651.33	7158839.5	140	Stump
Hollow in Tree	6/11/2013	703640.22	7158769.86	140	Ironbark
Hollow in Tree	6/11/2013	704816	7159265	140	Stag
Hollow in Tree	6/11/2013	704695	7159244	140	Stag
Hollow in Tree	6/11/2013	704680	7159240	140	Stag
Hollow in Tree	6/11/2013	704652	7159240	140	Stag

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	6/11/2013	704507	7159183	140	Stag
Hollow in Tree	6/11/2013	704308	7159155	140	Stag
Hollow in Tree	6/11/2013	704229	7159135	140	Stag
Hollow in Tree	6/11/2013	703970	7159012	140	Stag
Hollow in Tree	6/11/2013	703944	7158964	140	Stag
Hollow in Tree	6/11/2013	703805	7158843	140	Stag
Hollow in Tree	6/11/2013	705127	7159229	140	
Hollow in Tree	6/11/2013	704666	7159239	140	
Hollow in Tree	6/11/2013	704183	7159092	140	
Hollow in Tree	6/11/2013	703814	7158889	140	
Hollow Log	6/11/2013	704551.56	7159263.35	140	
Hollow Log	6/11/2013	704339.54	7159189.05	140	
Hollow Log	6/11/2013	704279.52	7159204.38	140	
Hollow Log	6/11/2013	704137.67	7159122.34	140	
Hollow Log	6/11/2013	704454	7159136	140	
Hollow Log	6/11/2013	703818	7158875	140	
Hollow Log	6/11/2013	703854	7158923	140	With exfoliating bark
Hollow Log	6/11/2013	703753	7158852	140	
Hollow Log	6/11/2013	704551.39	7159252.27	140	
Rocky Outcrop	6/11/2013	705161	7159260	140	Escarpment
Rocky Outcrop	6/11/2013	705058	7159225	140	Escarpment
Rocky Outcrop	6/11/2013	704910	7159244	140	Escarpment
Rocky Outcrop	6/11/2013	704794	7159266	140	Escarpment
Rocky Outcrop	6/11/2013	704741	7159253	140	Escarpment
Hollow in Tree	6/11/2013	705122	7159295	140 and FV12-03	2 Stags
Hollow in Tree	6/11/2013	704493	7159225	140 and FV12-03	2 Stags
Hollow in Tree	6/11/2013	704487	7159213	140 and FV12-03	2 Stags
Hollow in Tree	6/11/2013	703988	7159035	140 and FV12-03	2 Stags
Hollow in Tree	6/11/2013	705138	7159288	140 and FV12-03	3 Stags
Hollow in Tree	6/11/2013	704341	7159235	140 and FV12-03	4 Stags
Hollow in Tree	6/11/2013	705100	7159078	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	705098	7159081	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704886	7159058	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704526	7159079	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704364	7159000	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704305	7158890	140 and FV12-03	Stag

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	6/11/2013	704218	7159009	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704000	7158922	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	703894	7158858	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	703801	7158791	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	703701	7158729	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	703668	7158673	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	703583	7158562	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	703699	7158509	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	705093	7159298	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	705035	7159273	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704998	7159282	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704848	7159318	140 and FV12-03	Stag, Ironbark
Hollow in Tree	6/11/2013	704809	7159308	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704798	7159308	140 and FV12-03	Stag, Small hollows on branches
Hollow in Tree	6/11/2013	704673	7159321	140 and FV12-03	Stag, Ironbark with small hollows on branches
Hollow in Tree	6/11/2013	704618	7159293	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704612	7159296	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704538	7159265	140 and FV12-03	Stag, Ironbark with small hollows on branches
Hollow in Tree	6/11/2013	704526	7159239	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704525	7159237	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704472	7159193	140 and FV12-03	Stag, Open trunk
Hollow in Tree	6/11/2013	704363	7159231	140 and FV12-03	Stag, Small hollows on branches
Hollow in Tree	6/11/2013	704259	7159229	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704168	7159192	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	704128	7159160	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	703930	7159037	140 and FV12-03	Stag
Hollow in Tree	6/11/2013	703839	7158982	140 and FV12-03	Stag, Ironbark with open trunk
Hollow in Tree	6/11/2013	703770	7158906	140 and FV12-03	Stag, Ironbark with hollow branches
Hollow in Tree	6/11/2013	703688	7158848	140 and FV12-03	Stag, Ironbark with hollow branches
Hollow in Tree	6/11/2013	703796	7158693	140 and FV12-03	Stag, Ironbark
Hollow in Tree	6/11/2013	705099	7159082	140 and FV12-03	
Hollow in Tree	6/11/2013	704978	7159072	140 and FV12-03	

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	6/11/2013	704952	7159064	140 and FV12-03	
Hollow in Tree	6/11/2013	704749	7159072	140 and FV12-03	
Hollow in Tree	6/11/2013	704665	7159092	140 and FV12-03	<i>Corymbia citriodora</i>
Hollow in Tree	6/11/2013	704540	7159075	140 and FV12-03	<i>Corymbia trachyphloia</i>
Hollow in Tree	6/11/2013	704442	7159040	140 and FV12-03	<i>Corymbia citriodora</i>
Hollow in Tree	6/11/2013	704087	7158974	140 and FV12-03	<i>Corymbia citriodora</i>
Hollow in Tree	6/11/2013	704023	7158934	140 and FV12-03	<i>Corymbia sp.</i>
Hollow in Tree	6/11/2013	703834	7158839	140 and FV12-03	
Hollow in Tree	6/11/2013	703825	7158812	140 and FV12-03	<i>Eucalyptus fibrosa</i>
Hollow in Tree	6/11/2013	703821	7158804	140 and FV12-03	<i>Eucalyptus fibrosa</i>
Hollow in Tree	6/11/2013	703820	7158804	140 and FV12-03	<i>Eucalyptus fibrosa</i>
Hollow in Tree	6/11/2013	703673	7158686	140 and FV12-03	<i>Eucalyptus fibrosa</i>
Hollow in Tree	6/11/2013	703584	7158600	140 and FV12-03	<i>Eucalyptus fibrosa</i>
Hollow in Tree	6/11/2013	703587	7158564	140 and FV12-03	
Hollow in Tree	6/11/2013	703745	7158543	140 and FV12-03	<i>Eucalyptus fibrosa</i>
Hollow in Tree	6/11/2013	704752	7159314	140 and FV12-03	Ironbark with small hollows on branches
Hollow Log	6/11/2013	704027	7158945	140 and FV12-03	
Hollow Log	6/11/2013	704363	7159231	140 and FV12-03	
Hollow Log	6/11/2013	704106	7159136	140 and FV12-03	
Hollow Log	6/11/2013	704265	7159222	140 and FV12-03	Pile
Hollow Log	6/11/2013	703870	7158979	140 and FV12-03	Felled trees
Hollow Log	6/11/2013	703812	7158802	140 and FV12-03	Log pile
Hollow Log	6/11/2013	703765	7158781	140 and FV12-03	Log pile
Hollow in Tree	4/11/2013	699235	7161312	FV06-42	3 Stags
Hollow in Tree	4/11/2013	699363.91	7161530.71	FV06-42	Ironbark
Hollow in Tree	4/11/2013	699373.88	7161526.12	FV06-42	Ironbark
Hollow in Tree	4/11/2013	699334.05	7161548.88	FV06-42	Ironbark
Hollow in Tree	4/11/2013	699344.01	7161543.19	FV06-42	Ironbark
Hollow in Tree	4/11/2013	699364.49	7161569.48	FV06-42	Ironbark, WPad near Hab 5
Hollow in Tree	4/11/2013	699374.53	7161569.33	FV06-42	Small hollows, Ironbark
Hollow in Tree	4/11/2013	699335	7161332	FV06-42	
Hollow in Tree	4/11/2013	699227	7161367	FV06-42	
Hollow in Tree	4/11/2013	699236	7161382	FV06-42	
Hollow in Tree	4/11/2013	699251	7161388	FV06-42	
Hollow in Tree	4/11/2013	699272	7161343	FV06-42	

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	4/11/2013	699383.74	7161513.79	FV06-42	Stag, greater glider (scats)
Hollow in Tree	5/11/2013	700932.33	7164298.27	FV07-01	Ironbark
Hollow in Tree	5/11/2013	700922.47	7164310.61	FV07-01	Ironbark
Hollow in Tree	5/11/2013	700931.98	7164275.01	FV07-01	Ironbark
Hollow in Tree	5/11/2013	700796	7164268	FV07-01	Stag
Hollow in Tree	5/11/2013	700773	7164245	FV07-01	Stag
Hollow in Tree	5/11/2013	700755	7164241	FV07-01	Stag
Hollow Log	5/11/2013	700873.5	7164393.35	FV07-01	
Hollow Log	5/11/2013	700906	7164220	FV07-01	
Hollow Log	5/11/2013	700854	7164252	FV07-01	
Hollow Log	5/11/2013	700757	7164232	FV07-01	
Hollow Log	5/11/2013	700757	7164227	FV07-01	Log pile
Termite Mounds	5/11/2013	700906	7164231	FV07-01	
Termite Mounds	5/11/2013	700908	7164248	FV07-01	
Termite Mounds	5/11/2013	701076	7164360	FV07-01	Hollow
Termite Mounds	5/11/2013	700755	7164241	FV07-01	
Hollow in Tree	5/11/2013	702212.87	7163290.46	FV07-04	Ironbark
Hollow in Tree	5/11/2013	702263.17	7163295.24	FV07-04	Ironbark
Other	5/11/2013	702101	7163242	FV07-04	Rabbit scat present
Hollow in Tree	5/11/2013	701464.08	7161604.28	FV07-06	
Hollow in Tree	5/11/2013	701464.1	7161605.39	FV07-06	
Hollow in Tree	5/11/2013	701453.62	7161576.74	FV07-06	
Hollow in Tree	5/11/2013	701453.5	7161568.98	FV07-06	Stag
Hollow in Tree	5/11/2013	701423.97	7161608.21	FV07-06	Stag
Hollow in Tree	5/11/2013	701442.94	7161534.79	FV07-06	Stag
Hollow in Tree	5/11/2013	701633.43	7161513.07	FV07-06	
Hollow in Tree	5/11/2013	701331	7161503	FV07-06	Stag
Hollow in Tree	5/11/2013	701319	7161504	FV07-06	Stag
Hollow in Tree	5/11/2013	701327	7161523	FV07-06	Stag
Hollow in Tree	5/11/2013	701333	7161524	FV07-06	Stag, Potential habitat for bats
Hollow in Tree	5/11/2013	701406	7161550	FV07-06	Stag
Hollow in Tree	5/11/2013	701503	7161454	FV07-06	Stag
Hollow in Tree	5/11/2013	701505	7161438	FV07-06	Stag
Hollow in Tree	5/11/2013	701545	7161699	FV07-06	Stag
Hollow in Tree	5/11/2013	701496	7161529	FV07-06	Stag

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	5/11/2013	701378	7161561	FV07-06	
Hollow in Tree	5/11/2013	701456	7161540	FV07-06	
Hollow in Tree	5/11/2013	701480	7161484	FV07-06	
Hollow in Tree	5/11/2013	701504	7161472	FV07-06	
Hollow in Tree	5/11/2013	701503	7161449	FV07-06	
Hollow in Tree	5/11/2013	701558	7161718	FV07-06	Trunk hollow
Hollow in Tree	5/11/2013	701582	7161707	FV07-06	
Hollow in Tree	5/11/2013	701469	7161572	FV07-06	
Hollow in Tree	5/11/2013	701473	7161524	FV07-06	
Hollow in Tree	5/11/2013	701541	7161500	FV07-06	
Hollow in Tree	5/11/2013	701584	7161527	FV07-06	
Hollow in Tree	5/11/2013	701596	7161565	FV07-06	
Hollow in Tree	5/11/2013	701573	7161568	FV07-06	
Hollow in Tree	5/11/2013	701358	7161540	FV07-06	With termite mound
Hollow Log	5/11/2013	701484.03	7161595.11	FV07-06	
Hollow Log	5/11/2013	701493.95	7161587.21	FV07-06	
Hollow Log	5/11/2013	701578	7161583	FV07-06	
Hollow Log	5/11/2013	701541	7161519	FV07-06	Log pile
Nest in Tree	5/11/2013	701315	7161521	FV07-06	Not currently occupied
Hollow in Tree	5/11/2013	703525.28	7161097.49	FV07-07	Ironbark
Hollow in Tree	5/11/2013	703525.25	7161095.27	FV07-07	Spotted gum
Hollow in Tree	5/11/2013	703524.71	7161059.82	FV07-07	Spotted gum
Hollow in Tree	5/11/2013	703534.49	7161043.05	FV07-07	Spotted gum
Hollow in Tree	5/11/2013	703586	7161127.58	FV07-07	Ironbark
Hollow in Tree	5/11/2013	703500	7161200	FV07-07	Stag
Hollow Log	5/11/2013	703535.27	7161094.01	FV07-07	
Hollow Log	5/11/2013	703477	7161208	FV07-07	
Nest in Tree	5/11/2013	703309	7161018	FV07-07	Termite Nest, Not currently occupied
Rocky Outcrop	5/11/2013	703452	7161213	FV07-07	Escarpment
Hollow in Tree	5/11/2013	704731.23	7161146.54	FV07-08	Ironbark
Hollow in Tree	5/11/2013	704711.53	7161171.23	FV07-08	Ironbark
Hollow in Tree	5/11/2013	704701.35	7161162.52	FV07-08	Ironbark
Hollow in Tree	5/11/2013	704711.54	7161172.33	FV07-08	Ironbark
Hollow in Tree	5/11/2013	704681.18	7161157.29	FV07-08	Ironbark
Hollow in Tree	5/11/2013	704681.47	7161176.12	FV07-08	Stag



Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	5/11/2013	704681.76	7161194.96	FV07-08	Stag
Hollow in Tree	5/11/2013	704671.74	7161196.22	FV07-08	Spotted gum
Hollow in Tree	5/11/2013	704651.74	7161202.07	FV07-08	Spotted gum
Hollow in Tree	5/11/2013	704622.3	7161246.84	FV07-08	Ironbark
Hollow in Tree	5/11/2013	704611.94	7161225.95	FV07-08	Stump
Hollow in Tree	5/11/2013	704641	7161026	FV07-08	Stag
Hollow in Tree	5/11/2013	704654	7161018	FV07-08	Stag
Hollow in Tree	5/11/2013	704664	7161147	FV07-08	Stag
Hollow in Tree	5/11/2013	704651	7161143	FV07-08	Stag
Hollow in Tree	5/11/2013	704657	7161162	FV07-08	Stag
Hollow in Tree	5/11/2013	704607	7161190	FV07-08	Stag
Hollow in Tree	5/11/2013	704590	7161320	FV07-08	Stag
Hollow in Tree	5/11/2013	704580	7161341	FV07-08	Stag
Hollow in Tree	5/11/2013	704647	7161334	FV07-08	Stag
Hollow in Tree	5/11/2013	704660	7161340	FV07-08	Stag
Hollow in Tree	5/11/2013	704630	7161367	FV07-08	Stag
Hollow in Tree	5/11/2013	704659	7161363	FV07-08	Stag
Hollow in Tree	5/11/2013	704663	7161367	FV07-08	Stag
Hollow in Tree	5/11/2013	704666	7161123	FV07-08	
Hollow in Tree	5/11/2013	704620	7161269	FV07-08	
Hollow Log	5/11/2013	704632.38	7161248.9	FV07-08	
Hollow Log	5/11/2013	704602	7161232.75	FV07-08	
Hollow Log	5/11/2013	704634	7161340	FV07-08	
Hollow Log	5/11/2013	704649	7161334	FV07-08	
Hollow Log	5/11/2013	704675	7161381	FV07-08	
Rocky Outcrop	5/11/2013	704591	7161354	FV07-08	Escarpment, Along ridgeline
Hollow in Tree	5/11/2013	704725	7159937	FV07-10	Burnt stag with minor hollows
Hollow in Tree	5/11/2013	704715	7159935	FV07-10	Stag, Ironbark
Hollow in Tree	5/11/2013	704762	7159990	FV07-10	Stag, Ironbark
Hollow in Tree	5/11/2013	704800	7159947	FV07-10	Stag, Trunk hollow
Hollow in Tree	5/11/2013	704823	7159905	FV07-10	Stag, Ironbark
Hollow in Tree	5/11/2013	704867	7159846	FV07-10	Stag
Hollow in Tree	5/11/2013	704791	7159903	FV07-10	Ironbark
Hollow in Tree	5/11/2013	704771	7159888	FV07-10	Ironbark
Hollow in Tree	5/11/2013	700192	7159625	FV11-06	2

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	5/11/2013	700343	7159495	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700338	7159513	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700337	7159527	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700349	7159550	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700358	7159547	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700314	7159580	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700303	7159592	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700297	7159619	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700286	7159649	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700272	7159632	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700240	7159679	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700236	7159682	FV11-06	Stag, Ironbark
Hollow in Tree	5/11/2013	700247	7159506	FV11-06	Stag
Hollow in Tree	5/11/2013	700235	7159485	FV11-06	Stag
Hollow in Tree	5/11/2013	700221	7159470	FV11-06	Stag
Hollow in Tree	5/11/2013	700206	7159423	FV11-06	Stag
Hollow in Tree	5/11/2013	700133	7159556	FV11-06	Stag
Hollow in Tree	5/11/2013	700177	7159656	FV11-06	Stag
Hollow in Tree	5/11/2013	699939	7159370	FV11-06	Scratches on trunk
Hollow in Tree	5/11/2013	699941	7159371	FV11-06	
Hollow in Tree	5/11/2013	700302	7159515	FV11-06	Ironbark
Hollow in Tree	5/11/2013	700330	7159547	FV11-06	Ironbark
Hollow in Tree	5/11/2013	700352	7159554	FV11-06	Ironbark
Hollow in Tree	5/11/2013	700352	7159560	FV11-06	Ironbark
Hollow in Tree	5/11/2013	700346	7159570	FV11-06	Ironbark
Hollow in Tree	5/11/2013	700286	7159596	FV11-06	Ironbark
Hollow in Tree	5/11/2013	700277	7159638	FV11-06	Ironbark
Hollow in Tree	5/11/2013	700262	7159636	FV11-06	Ironbark
Hollow in Tree	5/11/2013	700197	7159455	FV11-06	
Hollow in Tree	5/11/2013	700169	7159494	FV11-06	
Hollow in Tree	5/11/2013	700167	7159608	FV11-06	
Hollow Log	5/11/2013	700206	7159658	FV11-06	Ironbark
Hollow Log	5/11/2013	700167	7159514	FV11-06	
Hollow Log	5/11/2013	700177	7159656	FV11-06	
Hollow in Tree	5/11/2013	701793	7159025	FV12-01	Stag
Hollow in Tree	5/11/2013	701778	7159046	FV12-01	Stag

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	5/11/2013	701875	7159123	FV12-01	Stag
Hollow in Tree	5/11/2013	701905	7159096	FV12-01	Stag
Hollow in Tree	5/11/2013	701892	7159083	FV12-01	Stag
Hollow in Tree	5/11/2013	701905	7159076	FV12-01	Stag
Hollow in Tree	5/11/2013	701923	7159031	FV12-01	Stag
Hollow in Tree	5/11/2013	701961	7158998	FV12-01	Stag
Hollow in Tree	5/11/2013	701994	7158998	FV12-01	Stag
Hollow in Tree	5/11/2013	701816	7158919	FV12-01	Stag
Hollow in Tree	5/11/2013	701899	7158885	FV12-01	Stag
Hollow in Tree	5/11/2013	701933	7158935	FV12-01	Stag
Hollow in Tree	5/11/2013	701956	7158921	FV12-01	Stag
Hollow in Tree	5/11/2013	701890	7158912	FV12-01	Stag
Hollow in Tree	5/11/2013	701964	7158988	FV12-01	Angophora sp.
Hollow in Tree	5/11/2013	701795	7158959	FV12-01	
Hollow in Tree	5/11/2013	701815	7158944	FV12-01	
Hollow Log	5/11/2013	701776	7158983	FV12-01	Felled Corymbia sp.
Hollow Log	5/11/2013	701795	7158924	FV12-01	With exfoliating bark
Termite Mounds	5/11/2013	701890	7158912	FV12-01	
Hollow in Tree	5/11/2013	702065	7159358	FV12-02	Stag
Hollow in Tree	5/11/2013	702169	7159417	FV12-02	Stag, Ironbark
Hollow in Tree	5/11/2013	702193	7159395	FV12-02	Stag, Ironbark
Hollow in Tree	5/11/2013	702222	7159392	FV12-02	Stag, Ironbark
Hollow in Tree	5/11/2013	702253	7159371	FV12-02	Stag, Ironbark
Hollow in Tree	5/11/2013	702258	7159314	FV12-02	Stag
Hollow in Tree	5/11/2013	702052	7159293	FV12-02	Stag
Hollow in Tree	5/11/2013	702073	7159247	FV12-02	Stag
Hollow in Tree	5/11/2013	702107	7159217	FV12-02	Stag
Hollow in Tree	5/11/2013	702069	7159329	FV12-02	Ironbark
Hollow in Tree	5/11/2013	702080	7159338	FV12-02	Ironbark
Hollow in Tree	5/11/2013	702085	7159369	FV12-02	Ironbark
Hollow in Tree	5/11/2013	702111	7159394	FV12-02	Ironbark
Hollow in Tree	5/11/2013	702225	7159367	FV12-02	Ironbark
Hollow in Tree	5/11/2013	702244	7159356	FV12-02	Ironbark
Hollow in Tree	5/11/2013	702264	7159347	FV12-02	Ironbark
Hollow in Tree	5/11/2013	702245	7159280	FV12-02	Ironbark
Hollow in Tree	5/11/2013	702230	7159267	FV12-02	Ironbark

Habitat Feature	Date	Easting	Northing	Infrastructure ID	Comments
Hollow in Tree	5/11/2013	702228	7159246	FV12-02	Ironbark
Hollow in Tree	5/11/2013	702113	7159243	FV12-02	
Hollow in Tree	5/11/2013	702126	7159225	FV12-02	
Hollow in Tree	5/11/2013	702182	7159166	FV12-02	
Hollow in Tree	5/11/2013	702180	7159164	FV12-02	
Hollow in Tree	5/11/2013	702239	7159230	FV12-02	
Hollow Log	5/11/2013	702165	7159162	FV12-02	
Hollow in Tree	6/11/2013	703739.4	7158689.66	FV12-03	Ironbark
Hollow in Tree	6/11/2013	703799.46	7158677.66	FV12-03	Ironbark

# Appendix E - Threatened species survey results

## *Targeted threatened species survey effort*

During the November 2013 field surveys of Lot 20, threatened species searches were undertaken targeting the 16 threatened fauna species listed under the EPBC Act or NC Act with potential to occur. Additionally, 13 listed threatened flora species identified as having the potential to occur were targeted during surveys of Lot 20. Survey methods undertaken were appropriate for each species as identified within relevant species survey guidelines published by DOE and/or DEHP. These methods are listed in Appendix A. Table 8 outlines the survey effort undertaken for each targeted method employed during field surveys.

Table 8 Survey effort

Survey method/technique	Survey effort
Remote camera days	35 camera days
Remote camera nights	35 camera nights
Active search, bird surveys, targeted fauna surveys	41.5 person hours
Spotlighting (walking and driving transects)	29 person hours
Call playback	1.5 person hours
Attended anabat survey - walking transects	9 person hours
Unattended anabat survey - overnight	6 nights

## *Lot 20 threatened species field survey results*

Field surveys undertaken in Lot 20 during November 2013 recorded the following species, which are protected under the EPBC Act and/or NC Act:

- Squatter pigeon – vulnerable EPBC Act, vulnerable NC Act
- Large-eared pied bat – vulnerable EPBC Act, vulnerable NC Act
- Little pied bat – not listed EPBC Act, near threatened NC Act
- Rainbow bee-eater – migratory (JAMBA), special least concern NC Act

Echolocation calls from *Nyctophilus sp.* (potentially *N. corbeni*, south-eastern long-eared bat) were also identified from anabat data recorded during field surveys. The echolocation call of the south-eastern long-eared bat is unable to be differentiated from calls of other species within the *Nyctophilus* genus. The south-eastern long-eared bat may be present within Lot 20. Threatened fauna species recorded from field surveys are detailed in Table 9.

No threatened flora species were recorded during field surveys. A likelihood of occurrence assessment for threatened flora species identified during the desktop assessment process is presented in Table 10.

Table 9 Threatened fauna species records

Species name	Location northing)	(easting,	Date, Time	Number	Activity	Habitat type
Squatter pigeon	700969	7164304	5/11/2013, 7:20 am	3	Squatting on ground then flew into tree, also seen in cleared wellpad area FV07-01	Ironbark woodland with shrubby dense acacia understorey on flat terrain.
Squatter pigeon	701933	7158935	5/11/2013, 2:55 pm	1	Flew from ground to <i>Corymbia citriodora</i> , observed perching in tree, adjacent to FV12-01	Mixed eucalypt woodland
Large-eared pied bat	701512	7163264	6/11/2013, no time data	1	Echolocation calls recorded on anabat device adjacent to RoW 115	Farm dam in non-remnant vegetation close to mapped remnant vegetation
Little pied bat	701512	7163264	6/11/2013, no time data	Multiple	Echolocation calls recorded on anabat device adjacent to RoW 115	Farm dam in non-remnant vegetation close to mapped remnant vegetation
Little pied bat	703458	7161223	6/11/2013, no time data	Multiple	Echolocation calls recorded on anabat device adjacent to RoW 135 and FV07-07	Eucalypt woodland top of rocky escarpment
Little pied bat	700260	7159500	7/11/2013, no time data	Multiple	Echolocation calls recorded on anabat device adjacent to RoW 120, FV11-06	Eucalypt woodland
Little pied bat	705289	7159092	7/11/2013, no time data	Multiple	Echolocation calls recorded on anabat device adjacent to RoW 139 and 142	Eucalypt woodland on rocky hillside and gully
Little pied bat	699712	7162120	8/11/2013, no time data	Multiple	Echolocation calls recorded on anabat device adjacent to RoW 129	Farm dam in eucalypt woodland
Little pied bat	699317	7161059	8/11/2013, no time data	Multiple	Echolocation calls recorded on anabat device adjacent to 118	Rocky watercourse in SEVT/eucalypt woodland
Rainbow bee-eater	-	-	8/11/2013, no time data	1	RoW 120, incidental observation	-
Rainbow bee-eater	-	-	6/11/2013	1	RoW 140	Eucalypt woodland
<i>Nyctophilus sp.</i> (potential for <i>N. corbeni</i> )	701512 699712 703458	7163264 7162120 7161223	6/11/2013 8/11/2013 no time data	Multiple	Echolocation calls recorded on anabat devices adjacent to RoW 115, 118 and 129	Farm dams in non-remnant vegetation and Eucalypt woodland, rocky watercourse in SEVT/eucalypt woodland

Table 10 Threatened flora likelihood of occurrence assessment

Species	EPBC Act/NC Act status	Records*	Habitat requirements	Habitat available on Lot 20 and likelihood of occurrence <sup>1</sup>		
				Eucalypt open-forest to woodland	Semi-evergreen vine thicket	Brigalow open-forest
<i>Acacia calantha</i>	not listed/least concern	WO/H/EH	Grows in shallow soil on lower slopes of steep sandstone hills, in eucalypt woodland and open forest.	REs 11.10.1, 11.10.4 and 11.10.7 provide woodland to open forest habitat formed on sandstone with sandy loam shallow soils. The majority of Lot 20 is mapped as containing a mix of these REs, and this large area of the Lot is considered to provide suitable habitat to a range of EVNT species. Suitable open-forest to woodland habitat extends from the foothills of sandstone jump-ups, the steep rocky sandstone cliffs and boulders, up to a flat plateau. Many of these listed species are found in association with species that have been recorded during surveys within Lot 20, including, cypress pine, budgeroo, thready-bark she oak, bloodwoods, ironbarks and spotted gum. Suitable habitat availability on Lot 20 <b>Potential to occur</b>		
<i>Acacia islana</i>	not listed/near threatened	WO	Grows in Eucalyptus woodland on shallow, stony soil over sandstone			
<i>Acacia spania</i>	not listed/near threatened	WO	Occurs as relatively pure stands in shallow red soil surrounded by open eucalypt woodland.			
<i>Apatophyllum teretifolium</i> sandstone prickly bush	not listed/near threatened	WO/H	Occurs within coarse sandy soils among rock or along cliff edges on sandstone ridges. It is associated with ironbarks, narrow-leaved white mahogany, budgeroo, white and black cypress pine, bloodwoods and spotted gum.			
<i>Leucopogon grandiflorus</i> large-flowered beard heath	not listed/near threatened	WO/H	Occurs on slopes and crests of sandstone ridges, including cliff edges; occurs with Bancroft's wattle, rush-leaf wattle, ironbarks, smooth-barked apple, budgeroo, bloodwoods, thready-bark she-oak and black and white cypress pine.			
<i>Sannantha brachypoda</i>	not listed/near threatened	WO	Known from a few sites on sandstone gullies or on the sandy alluvials adjacent to sandstone ridges.			
<i>Tylophora linearis</i>	not listed/near threatened	WO/PMS T	Grows in dry scrub and open-forest. Found in low-altitude sedimentary flats in dry woodlands of Eucalyptus fibrosa, E. sideroxylon, E. albens, Callitris glaucophylla			

Species	EPBC Act/NC Act status	Records*	Habitat requirements	Habitat available on Lot 20 and likelihood of occurrence <sup>1</sup>		
				Eucalypt open-forest to woodland	Semi-evergreen vine thicket	Brigalow open-forest
<i>Bertya opposens</i>	vulnerable/ not listed	WO	and <i>Allocasuarina luehmannii</i> . Grows in a variety of habitat including; mixed shrubland, lancewood woodland, open forest with a shrubby understorey, Eucalyptus/Callitris open woodlands and semi-evergreen vine thicket communities. It usually occurs on shallow sandy loams or red earths associated with sandstone.		Semi-evergreen vine thicket occurs along the steep sandstone escarpments, concentrated on the western side of Lot 20, but occurring elsewhere in small areas. In these areas, the soils are shallow sandy-loams with exposed sandstone boulders. Suitable habitat is availability on Lot 20 <b>Potential to occur</b>	
<i>Wahlenbergia islensis</i>	not listed/near threatened	WO/H	Found among crevices on or near vertical rock faces of sandstone cliffs, gorges and large boulders within woodlands dominated by ironbarks, spotted gum, inland white mahogany, budgeroo, thready she oak, cypress pine, smooth bark apple and bloodwoods. It is occasionally on boulders with sunny positions among semi-evergreen vine thicket.			
<i>Cadellia pentastylis ooline</i>	vulnerable/ vulnerable	PMST	Occurs in a range of vegetation types including semi-evergreen vine thicket, brigalow-belah, poplar box and bendee communities. Often occurs on the edges of sandstone and basalt escarpments.			
<i>Melaleuca irbyana</i>	not listed/ endangered	WO/H	Grows in flat areas that are periodically waterlogged, in eucalypt forest, mixed forest and Melaleuca woodland with a sparse and grassy understorey. Grows on poorly drained, heavy clay soils.	No suitable habitat was observed within and adjacent to the infrastructure on Lot 20 <b>Unlikely to occur</b>		



Species	EPBC Act/NC Act status	Records*	Habitat requirements	Habitat available on Lot 20 and likelihood of occurrence <sup>1</sup>		
				Eucalypt open-forest to woodland	Semi-evergreen vine thicket	Brigalow open-forest
<i>Xerothamnella herbacea</i>	endangered/ endangered	WO	Occurs in brigalow dominated communities in shaded situations, often in leaf litter and is associated with gilgais. Soils are heavy, grey to dark brown clays.			A brigalow open-forest community exists in a small region adjacent to the Lot 20 infrastructure. However, this community is not considered to provide suitable habitat as it was small and exposed to sunlight and did not occur on heavy clay soils. <b>Unlikely to occur</b>
<i>Eriocaulon carsonii</i> salt pipewort	endangered/ endangered	H	Known only from spring wetlands fed by permanent ground water in relatively flat landscapes. In Queensland, it is known from 12 spring complexes.	No suitable groundwater spring habitat available within Lot 20. <b>Unlikely to occur</b>		

\*Desktop search sources: WO, Wildlife Online; H, HerbreCs; PMSP, Protected Matters Search Tool; EH, essential habitat and species location occurs for the species within the search area

<sup>1</sup>Likelihood of occurrence criteria:

Confirmed present – species was recorded during field surveys of Lot 20 undertaken in November 2013

Potential to occur – suitable habitat requirements are present within Lot 20, even if the species has not been recorded from field surveys

Unlikely to occur – habitat requirements for the species are not present within Lot 20

# Appendix F – Flora and fauna species list

- Flora species list
- Fauna species list

## Flora Survey Results

Family	Scientific Name	Common Name	NC Act Status	EPBC Act Status	LP Act Status	Survey sites
Acanthaceae	<i>Brunoniella australis</i>	blue trumpet	LC			VC3, VC4, VC5, VC7, VC8, Q10, Q11, Q13, Q15, Q16, Q17, Q18, Q23
Adiantaceae	<i>Cheilanthes sieberi</i> subsp. <i>sieberi</i>	rock fern	LC			VC1, VC2, VC3, VC6, Q10, Q13, Q17, Q20, Q21
Amaranthaceae	<i>Alternanthera denticulata</i>	lesser joyweed	LC			VC3
Amaranthaceae	<i>Nyssanthes erecta</i>		LC			VC2, VC8 Q3
Apocynaceae	<i>Carissa ovata</i>	currant bush	LC			VC2, VC4, VC8, Q13, Q21, Q24, Q25, Q26, Q28, Q29, Q31, Q32
Apocynaceae	<i>Hoya australis</i>	native hoyo	LC			Q28, Q32
Apocynaceae	<i>Marsdenia viridiflora</i>	native pear	LC			VC5, Q13, Q26
Apocynaceae	<i>Parsonsia eucalyptophylla</i>	monkey vine	LC			VC8, Q28, Q29
Apocynaceae	<i>Parsonsia lanceolata</i>		LC			VC3
Apocynaceae	<i>Secamone elliptica</i>	corky milk vine	LC			Q29
Asteraceae	<i>Bidens pilosa</i>	cobbler's pegs	I			Q17, Q22
Asteraceae	<i>Calotis cuneata</i> var. <i>cuneata</i>	mountain burr-daisy	LC			Q33
Asteraceae	<i>Calotis cuneifolia</i>	purple burr-daisy	LC			VC3, VC5, Q11, Q13, Q15, Q17, Q18,
Asteraceae	<i>Calotis lappulacea</i>	yellow burr-daisy	LC			VC1, Q10, Q15
Asteraceae	<i>Cassinia laevis</i>	cough bush	LC			Q15, Q16
Asteraceae	<i>Chrysocephalum apiculatum</i>	billy-buttons	LC			VC3, VC4, VC5, Q11, Q13, Q17, Q22
Asteraceae	<i>Conyza bonariensis</i>	flaxleaf fleabane	I			Q15
Asteraceae	<i>Cyanthillium cinereum</i>	vernonia	LC			VC5, Q13, Q16
Asteraceae	<i>Olearia</i> sp.		LC			VC2, VC7
Asteraceae	<i>Podolepis longipedata</i>		LC			Q15
Asteraceae	<i>Pterocaulon redolens</i>		LC			VC1, Q13, Q14, Q15, Q21
Asteraceae	<i>Xerochrysum bracteatum</i>	golden everlasting	LC			Q14, Q16
Bignoniaceae	<i>Pandorea pandorana</i>	wonga onga vine	LC			Q15, Q26, Q32
Byttneriaceae	<i>Keraudrenia collina</i>		LC			VC5, VC6, VC7, Q8
Cactaceae	<i>Opuntia stricta</i>	prickly pear	I		Class 2	Q23
Cactaceae	<i>Opuntia tomentosa</i>	velvety tree pear	I		Class 2	VC3, VC4, VC2, VC7, VC8, Q9, Q10, Q12, Q13, Q14, Q15, Q17, Q18, Q21, Q22, Q22a, Q23, Q24, Q26, Q27, Q28, Q29, Q31, Q32, Q33, Q34
Caesalpiniaceae	<i>Lysiphyllum carronii</i>	Queensland ebony	LC			Q24
Caesalpiniaceae	<i>Senna artemisioides</i> subsp. <i>zygophylla</i>	silver cassia	LC			Q21
Campanulaceae	<i>Wahlenbergia gracilis</i>	bluebell	LC			Q17
Campanulaceae	<i>Wahlenbergia queenslandica</i>	bluebell	LC			Q9, Q15
Capparaceae	<i>Apophyllum anomalum</i>	warrior bush	LC			VC2, VC8, Q28
Capparaceae	<i>Capparis canescens</i>	wild orange	LC			VC3, Q13, Q14, Q16, Q25
Capparaceae	<i>Capparis lasiantha</i>	wait-a-while	LC			VC4, VC8, Q19, Q21, Q24, Q33
Capparaceae	<i>Capparis loranthifolia</i>		LC			Q29
Capparaceae	<i>Capparis mitchellii</i>	bumble tree	LC			VC2, VC4
Casuarinaceae	<i>Allocasuarina inophloia</i>	hairy oak	LC			VC6, VC5
Casuarinaceae	<i>Allocasuarina leuhmannii</i>	buloak	LC			VC1
Celastraceae	<i>Denhamia oleaster</i>		LC			VC2, Q29
Celastraceae	<i>Denhamia</i> sp.		LC			VC2
Chenopodiaceae	<i>Einadia hastata</i>		LC			Q18
Chenopodiaceae	<i>Maireana microphylla</i>	cotton bush	LC			Q9
Chenopodiaceae	<i>Salsola kali</i>	soft roly-poly	LC			VC7
Chenopodiaceae	<i>Sclerolaena birchii</i>	galvanised burr	LC			Q9
Combretaceae	<i>Terminalia oblongata</i>	yellow wood	LC			VC3, VC7
Convolvulaceae	<i>Evolvulus alsinoides</i>	tropical speedwell	LC			VC5, Q9, Q18, Q19, Q22, Q29
Cupressaceae	<i>Callitris glaucophylla</i>	white cypress pine	LC			VC1, VC3, VC4, VC6, VC7, VC8, Q8, Q13, Q14, Q15, Q16, Q17, Q18, Q19, Q21, Q22, Q22a, Q23, Q24, Q25, Q30, Q31, Q33, Q34
Cyperaceae	<i>Cyperus gracilis</i>	slender sedge	LC			VC2, VC7, Q26
Cyperaceae	<i>Cyperus</i> sp.		LC			VC6
Cyperaceae	<i>Fimbristylis dichotoma</i>	common finger rush	LC			VC1, VC3, VC6, VC7, Q8, Q13, Q23
Cyperaceae	<i>Gahnia aspera</i>	rough saw sedge	LC			Q17, Q21, Q22a, Q23, Q24
Cyperaceae	<i>Scleria mackaviensis</i>		LC			Q14, Q21, Q25
Cyperaceae	<i>Scleria sphacelata</i>		LC			Q8, Q13, Q23, Q28
Dilleniaceae	<i>Hibbertia cistoidea</i>		LC			VC5, Q17
Ebenaceae	<i>Diospyros humilis</i>	small-leaved ebony	LC			VC2, Q21, Q24, Q26, Q28, Q29, Q32
Ericaceae	<i>Leucopogon mitchellii</i>		LC			VC1, VC5, VC6, Q11
Erythroxylaceae	<i>Erythroxylum australe</i>	cocaine bush	LC			VC2, Q28
Euphorbiaceae	<i>Acalypha capillipes</i>		LC			Q26, Q32
Euphorbiaceae	<i>Acalypha eremorum</i>		LC			Q24
Euphorbiaceae	<i>Croton insularis</i>	silver croton	LC			VC2, Q24, Q26, Q28, Q32, Q33
Euphorbiaceae	<i>Euphorbia tannensis</i>	desert spurge	LC			VC5
Fabaceae	<i>Desmodium</i> sp.		LC			Q19
Fabaceae	<i>Erythrina vespertilio</i>	bat's wing coral	LC			Q31
Fabaceae	<i>Glycine tomentella</i>	wooly glycine	LC			VC1, VC3
Fabaceae	<i>Hardenbergia violacea</i>	native sarsaparilla	LC			Q23
Fabaceae	<i>Hovea longipes</i>		LC			Q21, Q24, Q25
Fabaceae	<i>Indigofera brevidens</i>		LC			Q14, Q16
Fabaceae	<i>Indigofera linnaei</i>		LC			VC3, VC5, Q15, Q16, Q17, Q18
Fabaceae	<i>Swainsona</i> sp.		LC			Q12,
Goodeniaceae	<i>Goodenia</i> sp.	goodenia	LC			VC5, VC6, Q10, Q17
Haloragaceae	<i>Gonocarpus urceolatus</i>		LC			VC5
Hemerocallidaceae	<i>Dianella caerulea</i>	blueberry lily	LC			VC1, VC3, VC5, VC6, VC7, Q8, Q10, Q11, Q14, Q16, Q17, Q22a, Q23, Q25, Q27
Johnsoniaceae	<i>Tricoryne elatior</i>	yellow autumn-lily	LC			VC1, Q15, Q16, Q17, Q18

Family	Scientific Name	Common Name	NC Act Status	EPBC Act Status	LP Act Status	Survey sites
Juncaceae	<i>Juncus usitatus</i>		LC			Q15
Lamiaceae	<i>Spartothamnella juncea</i>	bead bush	LC			Q26
Laxmanniaceae	<i>Eustrephus latifolius</i>	wombat berry	LC			VC7, Q13, Q19, Q21, Q33
Laxmanniaceae	<i>Laxmannia gracilis</i>	wire lily	LC			VC1, VC6, Q8, Q13, Q14, Q15, Q16,
Laxmanniaceae	<i>Lomandra filiformis</i>	wattle matrush	LC			VC1, VC3, VC4, VC7, Q8, Q10, Q14, Q18, Q27
Laxmanniaceae	<i>Lomandra longifolia</i>	long-leaved matrush	LC			VC3, VC5, VC7, Q15, Q21
Laxmanniaceae	<i>Lomandra multiflora</i> subsp. <i>multiflora</i>	many-flowered matrush	LC			VC1, VC4
Malvaceae	<i>Abutilon fraseri</i>	dwarf lantern flower	LC			VC5
Malvaceae	<i>Abutilon oxycarpum</i>	flannel flower	LC			VC2, Q27
Malvaceae	<i>Abutilon</i> sp.		LC			Q10
Malvaceae	<i>Hibiscus sturtii</i> var. <i>sturtii</i>	hill hibiscus	LC			VC3, VC4, VC5, Q9, Q10, Q15, Q16, Q17
Malvaceae	<i>Malvastrum americanum</i>	malvastrum	I			Q22
Malvaceae	<i>Sida cunninghamii</i>	ridge sida	LC			Q9
Malvaceae	<i>Sida hackettiana</i>	spiked sida	LC			Q17
Malvaceae	<i>Sida</i> sp.		LC			Q15
Malvaceae	<i>Sida trichopoda</i>	high sida	LC			Q22
Meliaceae	<i>Owenia acidula</i>	emu bush	LC			Q25
Meliaceae	<i>Turraea pubescens</i>	native witch-hazel	LC			VC2, Q21, Q28, Q29, Q32, Q33
Mimosaceae	<i>Acacia bancroftiorum</i>	Bancroft's wattle	LC			Q12, Q16, Q21, Q33
Mimosaceae	<i>Acacia complanata</i>	flat-stemmed wattle	LC			VC7
Mimosaceae	<i>Acacia excelsa</i> subsp. <i>excelsa</i>	ironwood	LC			Q8, Q21
Mimosaceae	<i>Acacia fasciculifera</i>	rosewood	LC			Q24, Q28, Q33
Mimosaceae	<i>Acacia harpophylla</i>	brigalow	LC			VC8, Q9
Mimosaceae	<i>Acacia leiocalyx</i>	early black wattle	LC			VC1, VC3, VC5, VC6, Q10, Q11, Q12, Q14, Q15, Q16, Q17, Q18, Q19, Q21, Q22a, Q22, Q23, Q25, Q31, Q34
Mimosaceae	<i>Acacia longispicata</i>		LC			VC1, VC3, VC5, VC6, VC7, Q8, Q10, Q11, Q12, Q13, Q15, Q16, Q19, Q21, Q22a, Q23, Q25, Q27, Q30, Q34
Mimosaceae	<i>Acacia macradenia</i>	zig-zag wattle	LC			Q25
Mimosaceae	<i>Acacia salicina</i>	Sally wattle	LC			VC2
Mimosaceae	<i>Acacia shirleyi</i>	lancewood	LC			Q8, Q34
Moraceae	<i>Ficus rubiginosa</i>	rusty fig	LC			Q29, Q30, 31, Q32
Myoporaceae	<i>Eremophila debilis</i>	winter apple	LC			VC4, VC8, Q10, Q13, Q17, Q19, Q34
Myoporaceae	<i>Eremophila mitchellii</i>	false sandalwood	LC			VC8, Q24
Myrtaceae	<i>Angophora leiocarpa</i>	smooth apple	LC			VC7, Q15
Myrtaceae	<i>Corymbia citriodora</i>	spotted gum	LC			VC1, VC3, VC4, VC7, Q11, Q12, Q13, Q14, Q15, Q16, Q18, Q19, 21, Q22a, Q23, Q25, Q26, Q27, Q30, Q31, Q33, Q34
Myrtaceae	<i>Corymbia clarksoniana</i>	Clarkson's bloodwood	LC			Q18
Myrtaceae	<i>Corymbia tessellaris</i>	Moreton Bay ash	LC			Q33
Myrtaceae	<i>Corymbia trachyphloia</i>	brown bloodwood	LC			VC1, VC3, Q10, Q11, Q15
Myrtaceae	<i>Eucalyptus chloroclada</i>	Baradine gum	LC			VC1, VC5, Q15
Myrtaceae	<i>Eucalyptus crebra</i>	narrow-leaved ironbark	LC			VC4, VC6, VC7, Q8, Q10, Q12, Q14, Q16, Q17, Q21, Q22, Q23, Q27, Q29, Q34
Myrtaceae	<i>Eucalyptus decorticans</i>		LC			Q25
Myrtaceae	<i>Eucalyptus fibrosa</i>	broad-leaved ironbark	LC			Q19
Myrtaceae	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>	broad-leaved ironbark	LC			VC1, VC3, VC4, VC6, VC7, Q8, Q9, Q10, Q11, Q13, Q14, Q16, Q17, Q18, Q21, Q22, Q23, Q27, Q30, Q33
Myrtaceae	<i>Eucalyptus melanophloia</i>	silver-leaved ironbark	LC			VC4, Q9, Q10, Q12, Q19, Q22a, Q22, Q24, Q31
Myrtaceae	<i>Eucalyptus populnea</i>	poplar box	LC			VC4, VC8, Q17
Myrtaceae	<i>Eucalyptus tenuipes</i>	narrow-leaved white mahogany	LC			VC5, VC7, Q11
Myrtaceae	<i>Lophostemon suaveolens</i>	swamp box	LC			VC7
Myrtaceae	<i>Lysicarpus angustifolius</i>	budgeroo	LC			VC5, VC6, Q11, Q18
Myrtaceae	<i>Melaleuca nodosa</i>	prickly-leaved paperbark	LC			VC6
Nyctaginaceae	<i>Boerhavia dominii</i>	tar vine	LC			Q9, Q17
Oleaceae	<i>Jasminum didymum</i> subsp. <i>lineare</i>	jasmine	LC			VC1, VC2
Oleaceae	<i>Jasminum simplicifolium</i> subsp. <i>australiense</i>	jasmine	LC			VC4, Q28
Oleaceae	<i>Jasminum volubile</i>		LC			VC2, Q15, Q24, Q26, Q28, Q32
Oleaceae	<i>Notelaea microcarpa</i> var. <i>microcarpa</i>	native olive	LC			VC2, VC5, Q24, Q33
Oxalidaceae	<i>Oxalis perennans</i>	grassland wood-sorrel	LC			VC5, VC8
Passifloraceae	<i>Passiflora aurantia</i>	blunt-leaved passionfruit	LC			Q26
Phyllanthaceae	<i>Breynia oblongifolia</i>	coffee bush	LC			VC2, VC4, VC5, Q21, Q31
Picrodendraceae	<i>Petalostigma pubescens</i>	quinine berry tree	LC			VC1, VC2, VC3, VC4, VC5, Q10, Q11, Q13, Q15, Q16, Q17, Q18, Q19, Q21, Q22a, Q23, Q24, Q27, Q33
Pittosporaceae	<i>Bursaria spinosa</i> var. <i>spinosa</i>	sweet bursaria	LC			Q14, Q21, Q22a
Pittosporaceae	<i>Pittosporum spinescens</i>	wallaby apple	LC			Q24, Q28, Q29
Poaceae	<i>Alloteropsis semialata</i>	cockatoo grass	LC			VC1, Q13, Q18
Poaceae	<i>Ancistrachne uncinulata</i>	hooky grass	LC			VC1, VC2, VC7, Q21, Q24, Q25, Q26, Q28, Q29, Q31, Q32, Q33
Poaceae	<i>Aristida calycina</i>	dark wiregrass	LC			VC4, VC5, Q10, Q11, Q19, 22a, Q22, Q23, Q34

Family	Scientific Name	Common Name	NC Act Status	EPBC Act Status	LP Act Status	Survey sites
Poaceae	<i>Aristida caput-medusae</i>	many-headed wiregrass	LC			VC1, VC3, VC4, VC5, Q8, Q10, Q11, Q13, Q15, Q18, Q19, Q21, Q22a, Q24, Q27, Q29, Q3-, Q33, Q34
Poaceae	<i>Aristida lignosa</i>		LC			VC1, VC3, VC5, VC6, VC7, VC8, Q9
Poaceae	<i>Aristida ramosus</i>	purple wiregrass	LC			VC3, Q13
Poaceae	<i>Aristida sp.</i>		LC			QQ14, Q15, Q16, Q21, Q25
Poaceae	<i>Arundinella nepalensis</i>	reed grass	LC			VC3, VC6, VC7, Q17, Q21, Q22
Poaceae	<i>Austrostipa ramosissima</i>	stout bamboo grass	LC			Q24, Q26
Poaceae	<i>Bothriochloa sp.</i>		LC			VC1, VC5
Poaceae	<i>Cenchrus ciliaris</i>	buffel grass	I			VC1, VC5, VC8, Q17, Q21, Q22a, Q22, Q24, Q33
Poaceae	<i>Chrysopogon fallax</i>	golden beard	LC			VC1, Q9, Q17, Q22, Q23
Poaceae	<i>Cymbopogon bombycinus</i>	citronella grass	LC			VC1, VC7, Q13, Q14, Q23, Q25, Q30
Poaceae	<i>Cymbopogon refractus</i>	barbed wire grass	LC			Q8, Q9, Q10, Q11, Q12, Q13, Q21, Q22a, Q34
Poaceae	<i>Dichanthium sericeum</i>	Queensland bluegrass	LC			Q22
Poaceae	<i>Digitaria divaricatissima</i>		LC			VC1, VC3, VC7, VC8, Q8, Q17
Poaceae	<i>Enneapogon lindleyanus</i>		LC			VC1, VC3, Q10, Q18, Q19, Q21, Q25, Q30
Poaceae	<i>Enneapogon nigricans</i>	bottle washers	LC			VC4, VC7, Q8, Q10, Q11, Q13, Q17
Poaceae	<i>Enteropogon ramosus</i>	twirly windmill grass	LC			VC6, VC8, Q21, Q22, Q23
Poaceae	<i>Entolasia stricta</i>	wiry panic	LC			VC5, VC7, Q8, Q18
Poaceae	<i>Eragrostis leptostachya</i>	paddock lovegrass	LC			Q9
Poaceae	<i>Eragrostis sororia</i>	woodland lovegrass	LC			VC7, Q8
Poaceae	<i>Eragrostis sp.</i>		LC			Q10, Q15, Q21
Poaceae	<i>Eriachne mucronata</i>	mountain wanderrie	LC			VC1, VC3
Poaceae	<i>Eulalia aurea</i>	silky golden top	LC			VC1, Q16
Poaceae	<i>Heteropogon contortus</i>	black spear grass	LC			VC5, Q17, Q21
Poaceae	<i>Melinis repens</i>	red natal grass	LC			Q15
Poaceae	<i>Panicum effusum</i>	hairy panic	LC			VC7, Q14, Q17
Poaceae	<i>Panicum queenslandicum</i>		LC			Q15
Poaceae	<i>Panicum sp.</i>		LC			Q10, Q16
Poaceae	<i>Paspalidium distans</i>	box grass	LC			VC8
Poaceae	<i>Sporobolus creber</i>	western rat's tail grass	LC			VC3, Q14
Poaceae	<i>Themeda avenacea</i>	oat kangaroo grass	LC			Q12, Q13, Q15, Q16, Q17, Q21, Q29, Q30, Q31
Poaceae	<i>Themeda triandra</i>	kangaroo grass	LC			VC5, VC7, Q10, Q11, Q17, Q21, Q25, Q34
Polygalaceae	<i>Polygala linariifolia</i>	native milkwort	LC			Q13
Polypodiaceae	<i>Platynerium sp</i>		LC			Q29, Q31
Proteaceae	<i>Grevillea striata</i>	beefwod	LC			Q9, Q33
Proteaceae	<i>Hakea lorea</i> subsp. <i>lorea</i>	gnarled corkbark	LC			Q19, Q22a
Proteaceae	<i>Hakea purpurea</i>		LC			VC5
Proteaceae	<i>Persoonia falcata</i>		LC			VC5, Q15
Rhamnaceae	<i>Alphitonia excelsa</i>	red ash	LC			VC3, VC4, VC5, VC6, VC7, Q8, Q11, Q14, Q15, Q16, Q17, Q18, Q21, Q22a, Q23, Q25, Q28, Q29, Q33, Q34
Rubiaceae	<i>Psyrax odorata</i>	sweet Susie	LC			VC2, VC3, VC8, Q8, Q8, Q14, Q18, Q21, Q24, Q25, Q26, Q28, Q30, Q33
Rubiaceae	<i>Psyrax oleifolia</i>	myrtle tree	LC			Q13
Rubiaceae	<i>Spermacoce multicaulis</i>		LC			VC1, VC3, VC4, Q10, Q11, Q12, Q13, Q17, Q18, Q19, Q22, Q34
Rutaceae	<i>Flindersia australis</i>	Australian teak	LC			Q29, Q30, Q32
Rutaceae	<i>Geijera parviflora</i>	wilga	LC			VC2, VC8, Q14, Q26, Q28, Q29, Q32, Q33, Q34
Santalaceae	<i>Exocarpos cupressiformis</i>	wild cherry	LC			VC6, Q11, Q12, Q15
Santalaceae	<i>Exocarpos latifolia</i>	broad-leaved native cherry	LC			Q26
Santalaceae	<i>Santalum lanceolatum</i>	sandalwood	LC			Q21, Q23, Q30
Sapindaceae	<i>Alectryon diversifolius</i>	scrub boonaree	LC			VC2, Q21, Q24
Sapindaceae	<i>Atalaya hemiglauca</i>	cattle bush	LC			VC2, VC8, Q26, Q29
Sapindaceae	<i>Cupaniopsis anacardioides</i>	tuckeroo	LC			Q28, Q29, Q31, Q32
Sapindaceae	<i>Dodonaea stenophylla</i>	narrow-leaved hopbush	LC			Q12, Q14, Q24, Q31
Sapindaceae	<i>Dodonaea triangularis</i>	hopbush	LC			VC7, Q8, Q25
Sapindaceae	<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>	sticky hopbush	LC			VC4
Solanaceae	<i>Soalnum stelligerum</i>	devil's needle	LC			VC8, Q21, Q26
Solanaceae	<i>Solanum ellipticum</i>	potato bush	LC			VC5, Q8, Q10, Q11, Q14, Q18, Q27
Solanaceae	<i>Solanum parvifolium</i>		LC			Q27
Solanaceae	<i>Solanum semiarmatum</i>	ginger's whiskers	LC			VC2, Q28, Q32
Sparrmanniaceae	<i>Grewia latifolia</i>	dog's balls	LC			VC3, VC4, VC7, Q10, Q15, Q17, Q21, Q22a, Q25
Stackhousiaceae	<i>Stackhousia viminea</i>	slender stackhousia	LC			VC5
Sterculiaceae	<i>Brachychiton bidwillii</i>	dwarf kurrajong	Type A			Q31
Sterculiaceae	<i>Brachychiton populneus</i>	kurrajong	Type A			VC1, VC2, VC4, VC8, Q11, Q16, Q18, Q22, Q24, Q26, Q29, Q31, Q32, Q33
Sterculiaceae	<i>Brachychiton rupestris</i>	narrow-leaved bottle tree	Type A			VC2, Q9, Q15, Q26, Q28, Q29, Q30, Q32
Verbenaceae	<i>Verbena aristigera</i>	Mayne's pest	I			VC4, Q9
Vitaceae	<i>Clematicissus opaca</i>		LC			
Xanthorrhoeaceae	<i>Xanthorrhoea johnsonii</i>	grass tree	LC			VC5, VC7, Q11, Q13, Q15, Q25
Zygophyllaceae	<i>Tribulus terrestris</i>	caltrop	LC			VC8

## Fauna species list

Group	Scientific Name	Common Name	EPBC Act status	NC Act status	Survey Site
Amphibians	<i>Limnodynastes tasmaniensis</i>	spotted marsh Frog	-	Least concern	WA 1
Amphibians	<i>Litoria caerulea</i>	green tree frog	-	Least concern	HA 6, HA 13, HA 14, spotlighting - WC 1, Rocky creek, RoW 142, driving, RoW 135/132/131/129
Amphibians	<i>Litoria latopalmata</i>	broad-palmed rocket frog	-	Least concern	WA 1, HA 13 and HA 14
Amphibians	<i>Litoria nasuta</i>	striped rocket frog	-	Least concern	WA 4, Spotlighting - Rocky creek, RoW 142
Amphibians	<i>Litoria peronii</i>	emerald-spotted tree frog	-	Least concern	WA 4, HA 13 and HA 14, spotlighting - walking, RoW 124, HA 14
Amphibians	<i>Litoria rubella</i>	desert tree frog	-	Least concern	WA 1, WA 2, WA 4, HA 2, HA 4, HA 8, HA 9, HA 15, HA 16, HA 17, HA 18, Spotlighting - Rocky creek, RoW 142
Amphibians	<i>Platyplectrum ornatum</i>	ornate burrowing frog	-	Least concern	Spotlighting - HA 14
Amphibians	<i>Pseudophryne coriacea</i>	red-backed toadlet	-	Least concern	HA 4
Amphibians	<i>Pseudophryne major</i>	major toadlet	-	Least concern	HA 13 and HA 14
Amphibians	<i>Rhinella marina</i>	cane toad	-	Introduced	WA 1, WA 2, WA 4, Spotlighting - WC 1, walking, RoW 137
Birds	<i>Acanthiza reguloides</i>	buff-rumped Thornbill	-	Least concern	HA 1, HA 2, HA 3, HA 6, HA 7, HA 9, HA 10, HA 13, HA 14, HA 15, HA 16, WA 2, FV07-07, FV07-08
Birds	<i>Aegotheles cristatus</i>	Australian owl-nightjar	-	Least concern	HA 13, HA 14, HA 17, HA 18, Spotlighting - HA 14, Rocky creek, RoW 142, RoW 124
Birds	<i>Alisterus scapularis</i>	Australian king-parrot	-	Least concern	Incidental
Birds	<i>Anas gracilis</i>	grey teal	-	Least concern	WA 4
Birds	<i>Anas superciliosa</i>	Pacific black duck	-	Least concern	WA 4, RC 7
Birds	<i>Aprosmictus erythropterus</i>	red winged parrot	-	Least concern	HA 1, HA 3, HA 19
Birds	<i>Aquila audax</i>	wedge-tailed eagle	-	Least concern	HA 15 and HA 16
Birds	<i>Ardea pacifica</i>	white-necked heron	-	Least concern	RC 7
Birds	<i>Aviceda subcristata</i>	Pacific baza	-	Least concern	FV07-07
Birds	<i>Aythya australis</i>	hardhead	-	Least concern	RC 7
Birds	<i>Burhinus grallarius</i>	bush stone-curlew	-	Least concern	HA 13 and HA 14
Birds	<i>Cacatua galerita</i>	sulfur-crested cockatoo	-	Least concern	HA 8, HA 12, RC 3
Birds	<i>Cacomantis flabelliformis</i>	fan tailed cuckoo	Marine	Least concern	HA 2
Birds	<i>Calyptorhynchus funereus</i>	yellow-tailed black-cockatoo	-	Least concern	HA 17 and HA 18
Birds	<i>Chalcites basalis</i>	Horsfield's bronze-cuckoo	Marine	Least concern	FV07-07
Birds	<i>Chenonetta jubata</i>	Australian wood duck	-	Least concern	WA 4, RC 7
Birds	<i>Cinlosoma punctatum</i>	spotted quail-thrush	-	Least concern	HA 2
Birds	<i>Climacteris picumnus</i>	brown treecreeper	-	Least concern	HA 13 and HA 14
Birds	<i>Colluricincla harmonica</i>	grey shrike thrush	-	Least concern	HA 1, HA 2, HA 4, HA 5, HA 6, HA 8, HA 10, HA 12, HA 13, HA 14, HA 17, HA 18, HA 19, FV07-08, FV12-01, FV12-02, WA 1
Birds	<i>Coracina novaehollandiae</i>	black-faced cuckoo-shrike	Marine	Least concern	HA 1, HA 2, HA 3, HA 5, HA 9, HA 10, HA 13, HA 14, HA 15, HA 16, HA 17, HA 18, FV07-08, FV12-01
Birds	<i>Coracina papuensis</i>	white-bellied cuckoo-shrike	Marine	Least concern	HA 9
Birds	<i>Coracina tenuirostris</i>	cicadabird	Marine	Least concern	HA 1, HA 10, HA 13, HA 14, HA 17, HA 18, FV07-07
Birds	<i>Corcorax melanorhamphos</i>	white-winged chough	-	Least concern	HA 1, HA 7
Birds	<i>Cormobates leucophaea</i>	white-throated treecreeper	-	Least concern	HA 2, HA 17, HA 18, HA 19, FV07-08
Birds	<i>Cormobates leucophaea</i>	white-browed treecreeper	-	Least concern	FV12-02
Birds	<i>Corvus coronoides</i>	Australian raven	-	Least concern	HA 1, HA 13, HA 14
Birds	<i>Corvus orru</i>	Torresian crow	-	Least concern	HA 1, HA 3, HA 8, HA 13, HA 14, HA 17, HA 18, HA 19, FV12-01, RC 3, RC 4, RC 7
Birds	<i>Cracticus nigrogularis</i>	ped butcherbird	-	Least concern	HA 9, HA 12
Birds	<i>Cracticus tibicen</i>	Australian magpie	-	Least concern	HA 3, HA 8, HA 10
Birds	<i>Cracticus torquatus</i>	grey butcherbird	-	Least concern	HA 1, HA 2, HA 3, HA 6, HA 11, HA 17, HA 18, FV12-01
Birds	<i>Dacelo novaeguineae</i>	laughing kookaburra	-	Least concern	HA 1, HA 2, HA 3, HA 5, HA 10, HA 13, HA 14, HA 15, HA 16, HA 17, HA 18, Spotlighting - driving/walking, RoW 124/121/120, FV11-06
Birds	<i>Dicaeum hirundinaceum</i>	mistletoebird	-	Least concern	FV07-07, HA 10, HA 17 and HA 18
Birds	<i>Dicrurus bracteatus</i>	spangled drongo	Marine	Least concern	FV07-07, HA 19
Birds	<i>Elseomyzomela melanops</i>	black-fronted dotterel	-	Least concern	WA 1
Birds	<i>Entomyzomela cyanotis</i>	blue-faced honeyeater	-	Least concern	FV07-07, WA 4
Birds	<i>Eolophus roseicapillus</i>	galah	-	Least concern	HA 3
Birds	<i>Eopsaltria australis</i>	eastern yellow robin	-	Least concern	HA 1, HA 15, HA 16, HA 17, HA 18, HA 19, FV07-08
Birds	<i>Eurostopodus mystacalis</i>	white-throated nightjar	Marine	Least concern	Spotlighting - WC 1, Rocky creek, RoW 142
Birds	<i>Eurystomus orientalis</i>	dollarbird	Marine	Least concern	HA 2, WA 1
Birds	<i>Geopelia cuneata</i>	diamond dove	-	Least concern	WA 1, HA 4
Birds	<i>Geopelia striata</i>	peaceful dove	-	Least concern	WA 1, WA 2, HA 1, HA 5, HA 7, HA 12, HA 13, HA 14, HA 17, HA 18, FV12-02
Birds	<i>Geophaps scripta scripta</i>	squatter pigeon (southern)	Vulnerable	Vulnerable	HA 8, FV12-01

Group	Scientific Name	Common Name	EPBC Act status	NC Act status	Survey Site
Birds	<i>Grallina cyanoleuca</i>	magpie lark	-	Least concern	HA 9, RC 7
Birds	<i>Lalage leucomela</i>	varied triller	-	Least concern	HA 2
Birds	<i>Lichenostomus leucotis</i>	white-eared honeyeater	-	Least concern	HA 5, HA 8, FV12-02, FV12-01, incidental
Birds	<i>Malurus melanocephalus</i>	red-backed fairy-wren	-	Least concern	HA 3, HA 4, HA 8, HA 13, HA 14, HA 17, HA 18, HA 19, WA 4, FV07-07
Birds	<i>Manorina melanocephala</i>	noisy miner	-	Least concern	HA 1, HA 2, HA 3, HA 9, WA 4, HA 13, HA 14, FV12-02, FV12-01
Birds	<i>Meliphaga lewinii</i>	Lewins honeyeater	-	Least concern	HA 2, HA 3, HA 9, HA 19, FV07-07
Birds	<i>Melithreptus albogularis</i>	white-throated honeyeater	-	Least concern	HA 8, HA 10, HA 13 and HA 14, FV07-08
Birds	<i>Merops ornatus</i>	rainbow bee-eater	JAMBA; Marine	Special least concern	RoW 120, RoW 140
Birds	<i>Microeca fascians</i>	Jacky winter	-	Least concern	HA 1, HA 3, HA 4, WA 2, FV07-07
Birds	<i>Myiagra inquieta</i>	restless flycatcher	-	Least concern	HA 3, HA 13 and HA 14
Birds	<i>Myiagra rubecula</i>	leaden flycatcher	-	Least concern	WA 1, HA 2, HA 3, HA 5, HA 15 and HA 16
Birds	<i>Nechmia modesta</i>	plum-headed finch	-	Least concern	WA 1
Birds	<i>Nechmia temporalis</i>	red-browed finch	-	Least concern	Incidental
Birds	<i>Ninox novaeseelandiae</i>	southern boobook	Marine	Least concern	Throughout
Birds	<i>Oriolus sagittatus</i>	olive-backed oriole	-	Least concern	HA 1, HA 3
Birds	<i>Pachycephala rufiventris</i>	rufous whistler	-	Least concern	HA 2
Birds	<i>Pardalotus punctatus</i>	spotted pardalote	-	Least concern	HA 13 and HA 14
Birds	<i>Pardalotus striatus</i>	striated pardalote	-	Least concern	HA 1, HA 17 and HA 18, FV12-02
Birds	<i>Petroica goodenovii</i>	red-capped robin	-	Least concern	HA 4
Birds	<i>Phalacrocorax sulcirostris</i>	little black cormorant	-	Least concern	WA 4, RC 7
Birds	<i>Philemon corniculatus</i>	noisy friarbird	-	Least concern	HA 1, FV07-08, WA 1
Birds	<i>Platycercus adscitus</i>	pale headed rosella	-	Least concern	HA 1, HA 3, HA 6, HA 13, HA 14
Birds	<i>Podargus strigoides</i>	tawny frogmouth	-	Least concern	HA 17 and HA 18, spotlighting throughout
Birds	<i>Pomatostomus temporalis</i>	grey-crowned babbler	-	Least concern	HA 1, HA 3, HA 9, HA 19, WA 4
Birds	<i>Rhipidura leucophrys</i>	willie wagtail	-	Least concern	HA 2, HA 3, HA 9, WA 4
Birds	<i>Smicronis brevirostris</i>	weebill	-	Least concern	HA 1, HA 2, HA 3, HA 4, HA 5, HA 6, HA 7, HA 8, HA 9, HA 11, HA 13, HA 14, HA 15, HA 16, HA 17, HA 18, HA 19, WA 1, FV12-02, FV07-07
Birds	<i>Strepera graculina</i>	pieb currawong	-	Least concern	HA 1, HA 2, HA 3, HA 6, HA 7, HA 9, HA 10, HA 12, HA 13, HA 14, HA 15, HA 16, HA 17, HA 18, HA 19, WA 1, WA 2, RC 4, FV12-01, FV12-02, FV07-08
Birds	<i>Struthidea cinerea</i>	apostlebird	-	Least concern	HA 1, HA 3, WA 1
Birds	<i>Tachybaptus novaehollandiae</i>	Australasian grebe	-	Least concern	RC 3, WA 1, WA 4
Birds	<i>Taeniopygia bichenovii</i>	double-barred finch	-	Least concern	WA 1, WA 2, HA 2, HA 4, HA 6, HA 13, HA 14, HA 15, HA16, HA 17, HA 18
Birds	<i>Todiramphus macleayii</i>	forest kingfisher	Marine	Least concern	HA 1, HA 3, HA 9, HA 13 and HA 14, WA 2, FV07-07, FV12-02
Birds	<i>Todiramphus sanctus</i>	sacred kingfisher	Marine	Least concern	HA 2
Birds	<i>Trichoglossus haematodus</i>	rainbow lorikeet	-	Least concern	HA 1, HA 9, HA 19, FV07-07
Birds	<i>Zosterops lateralis</i>	silvereye	Marine	Least concern	WA 2, HA 13 and HA 14
Birds	<i>Cacomantis flabelliformis</i>	fan tailed cuckoo	Marine	Least concern	HA 5, HA 6
Mammals	<i>Austronomus australis</i>	white-striped freetail-bat	-	Least concern	Throughout
Mammals	<i>Canis familiaris dingo</i>	dingo	-	Introduced	RC 3, RC 7
Mammals	<i>Chalinolobus dwyeri</i>	large-eared pied bat	Vulnerable	Vulnerable	AN 2
Mammals	<i>Chalinolobus gouldii</i>	Gould's wattled bat	-	Least concern	Throughout
Mammals	<i>Chalinolobus morio</i>	chocolate wattled bat	-	Least concern	Throughout
Mammals	<i>Chalinolobus picatus</i>	little pied bat	-	Near threatened	AN 2, AN 11, AN 9
Mammals	<i>Felis catus</i>	cat	-	Introduced	RC 1, RC 6
Mammals	<i>Isoodon macrourus</i>	northern brown bandicoot	-	Least concern	HA 15 and HA 16
Mammals	<i>Lepus capensis</i>	brown hare	-	Least concern	HA 4, HA 10
Mammals	<i>Macropus dorsalis</i>	black striped wallaby	-	Least concern	Spotlighting - walking, RoW 124
Mammals	<i>Macropus giganteus</i>	eastern grey kangaroo	-	Least concern	HA 15 and HA 16
Mammals	<i>Macropus robustus</i>	euro	-	Least concern	RC 1, FV12-01, HA 17 and HA 18
Mammals	<i>Macropus sp.</i>	wallaby	-	Least concern	FV07-07, HA 13 and HA 14
Mammals	<i>Miniopterus schreibersii</i>	common bentwing bat	-	Least concern	Throughout
Mammals	<i>Mormopterus beccarii</i>	Beccari's freetail-bat	-	Least concern	Throughout
Mammals	<i>Mormopterus ridei</i>	eastern little free-tailed bat	-	Least concern	Throughout
Mammals	<i>Mormopterus sp.</i>		-	-	Throughout
Mammals	<i>Nyctophilus sp.</i>		-	-	AN 2, AN 11, AN 13
Mammals	<i>Oryctolagus cuniculus</i>	rabbit	-	Introduced	Spotlighting - walking, RoW 137
Mammals	<i>Petauroides volans</i>	greater glider	-	Least concern	HA 1, HA 3, HA 5, HA 6, HA 7, HA 11, HA 17, HA 18, FV12-01, FV12-02, spotlighting - throughout
Mammals	<i>Petaurus breviceps</i>	sugar glider	-	Least concern	Spotlighting - Rocky creek, RoW 142, WC 1
Mammals	<i>Petrogale assimilis</i>	allied rock-wallaby	-	Least concern	HA 17 and HA 18
Mammals	<i>Petrogale herberti</i>	Herbert's rock wallaby	-	Least concern	RC 1, HA 17 and HA 18
Mammals	<i>Saccolaimus flaviventris</i>	yellow-bellied sheath-tailed bat	-	Least concern	Throughout
Mammals	<i>Scotorepens balstoni</i>	inland broad-nosed bat	-	Least concern	Throughout

Group	Scientific Name	Common Name	EPBC Act status	NC Act status	Survey Site
Mammals	<i>Scotorepens greyii</i>	little broad-nosed bat	-	Least concern	Throughout
Mammals	<i>Sus scrofa</i>	pig	-	Introduced	RC 7, HA 12, HA 15 and HA 16
Mammals	<i>Taphozous troughtoni</i>	Troughton's Sheathtail-bat	-	Least concern	throughout
Mammals	<i>Trichosurus vulpecula</i>	common brushtail possum	-	Least concern	HA 9
Mammals	<i>Vespadelus baverstocki</i>	inland forest bat	-	Least concern	Throughout
Mammals	<i>Vespadelus troughtoni</i>	Eastern cave bat	-	Least concern	Throughout
Mammals	<i>Vespadelus vulturinus</i>	little forest bat	-	Least concern	Throughout
Reptiles	<i>Antaresia maculosa</i>	spotted python	-	Least concern	Spotlighting - walking, RoW 137
Reptiles	<i>Carlia pectoralis</i>	open-litter rainbow-skink	-	Least concern	HA 1, HA 6, HA 7, HA 13, HA 14, HA 17 and HA 18, FV07-08, FV12-01, Incidental, Spotlighting - walking, RoW 137, HA 14
Reptiles	<i>Carlia schmeltzii</i>	robust rainbow-skink	-	Least concern	HA 2, HA 7, HA 13, HA 14, HA 15, HA 16, FV07-07, incidental
Reptiles	<i>Carlia vivax</i>	lively rainbow-skink	-	Least concern	Incidental
Reptiles	<i>Cryptoblepharus plagiocephalus</i>	Peron's snake-eyed skink	-	Least concern	HA 13 and HA 14
Reptiles	<i>Cryptoblepharus pulcher</i>	elegant snake-eyed skink	-	Least concern	HA 6
Reptiles	<i>Cryptoblepharus virgatus</i>	wall skink	-	Least concern	HA 1, FV12-02
Reptiles	<i>Cryptophis nigrescens</i>	small-eyed snake	-	Least concern	Incidental, Spotlighting, RoW 136
Reptiles	<i>Ctenotus robustus</i>	eastern striped skink	-	Least concern	Incidental
Reptiles	<i>Demansia papuensis</i>	greater black whipsnake	-	Least concern	HA 15 and HA 16
Reptiles	<i>Demansia psammophis</i>	yellow-faced whipsnake	-	Least concern	WC 4
Reptiles	<i>Diporiphora nobbi</i>	nobbi dragon	-	Least concern	Incidental
Reptiles	<i>Eulamprus brachysoma</i>	northern barsided skink	-	Least concern	FV07-07
Reptiles	<i>Gehyra catenata</i>	chain-backed dtella	-	Least concern	Spotlighting - WC 1
Reptiles	<i>Gehyra dubia</i>	dubious dtella	-	Least concern	HA 1, HA 13 and HA 14, Spotlighting - walking, RoW 124, RoW 136, RoW 137
Reptiles	<i>Heteronotia binoei</i>	Bynoe's gecko	-	Least concern	HA 2, HA 6, HA 13, HA 14, HA 17 and HA 18, Spotlighting - HA 14, RoW 137, Rocky creek, RoW 142
Reptiles	<i>Lerista fragillilis</i>	eastern Mulch-Slider	-	Least concern	HA 1, HA 13 and HA 14
Reptiles	<i>Lialis burtonis</i>	Burton's legless lizard	-	Least concern	HA 6, HA 14, Spotlighting - WC 1
Reptiles	<i>Morethia boulengeri</i>	south-eastern morethia skink	-	Least concern	HA 13 and HA 14
Reptiles	<i>Oedura monilis</i>	ocellated velvet gecko	-	Least concern	HA 8
Reptiles	<i>Oedura rhombifer</i>	zigzag velvet gecko	-	Least concern	HA 12, Spotlighting - walking, RoW 124, WC 1
Reptiles	<i>Pygopus schraderi</i>	eastern hooded scaly-foot	-	Least concern	WA 1
Reptiles	<i>Underwoodisaurus milii</i>	thick-tailed gecko	-	Least concern	Spotlighting - WC 1 and RoW 136
Reptiles	<i>Varanus panoptes</i>	yellow-spotted monitor	-	Least concern	Incidental



# Appendix G – Field data sheets

- Quaternary flora assessments
- Vegetation community assessments
- Fauna habitat assessments
- Koala habitat assessments
- Watercourse assessments
- Wetlands assessments
- Microbat call identification report

# Quaternary Site Form

## Location

Site:	Q 1	Recorder:	JN/PW	Day/Date:	03/11/13
Project:	Fairview Lot 20 FTY 1850				
Locality:	250-AW-6805-61 / RoW 121		Pics: 9287-9290		
Coordinates:	Zone	55	E	7 0 1 5 4 3	N 7 1 5 9 4 6 3 Datum: _____

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	14-18	S
T2	8.5	7-12	S
T3		-	
S1	2.5	3-6	S
S2	1.5	1-3	V
G	0.6	0-1	M

### Structural formation (including height):

Open woodland (11.10.1)

Ecologically dominant layer: T1

Land form element# (40 m radius): Slope

Land form pattern# (300 m radius): Plateau - gentle

slope

Soil and geology: Sandy

Slope and aspect: < 10°, West-North-West

VAST 1

Mapped 11.10.1/11.10.13a.

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** - dominant; **c** - codominant; **s** - subdominant; **a** - associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	s	<i>Eucalyptus fibrosa subsp. nubila</i>
T2	d	<i>Callitris glaucophylla</i>
T2	a	<i>Eucalyptus chloroclada</i>
T2	s	<i>Allocasuarina luehmannii</i>
S1	a	<i>Petalostigma pubescens</i>
S1	a	<i>Allocasuarina luehmannii</i>
S1	d	<i>Callitris glaucophylla</i>
S1	a	<i>Corymbia trachyphloia</i>
S1	s	<i>Acacia longispicata</i>
S1	a	<i>Acacia leiocalyx</i>
S2	c	<i>Allocasuarina luehmannii</i>
S2	a	<i>Opuntia tomentosa*</i>
S2	a	<i>Brachychiton populneus</i>
S2	c	<i>Petalostigma pubescens</i>
S2	a	<i>Jasminum didymum</i>
G	a	<i>Lomandra multiflora</i>
G	a	<i>Aristida sp.</i>
G	a	<i>Calotis lappulacea</i>
G	a	<i>Fimbristylis dichotoma</i>
G	a	<i>Enneapogon lindleyanus</i>
G	a	<i>Cheilanthes sieberi</i>
G	a	<i>Tricoryne elatior</i>


Str.	Rel. dom.	Scientific Name
G	a	<i>Laxmannia gracilis</i>
G	a	<i>Lomandra filiformis</i>
G	a	<i>Chrysopogon fallax</i>
G	a	<i>Eriachne mucronata</i>
G	a	<i>Digitaria divaricatissima</i>
G	a	<i>Dianella caerulea</i>
G	a	<i>Ancistrachne uncinulata</i>
G	a	<i>Cymbopogon bombycinus</i>
G	a	<i>Pterocaulon redolens</i>
G	a	<i>Alloteropsis semialata</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Leucopogon mitchellii</i>

**Transect - crown cover measured (transect intercept method)**

**Coordinates:**                      **Datum:** \_\_\_\_\_                      **Transect length:** \_\_\_\_\_

Start point                      Zone  E  N

End point                      Zone  E  N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:  m

Intercept of EDL 0 - 50m:  m

Intercept of EDL 50 - 100m:  m

Measured crown cover % of EDL 0 - 100m:  %

Structural formation: \_\_\_\_\_

Conclusions/notes: \_\_\_\_\_

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END

# Quaternary Site Form

## Location

**Site:** Q 2      **Recorder:** JN/PW      **Day/Date:** 03/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** 800-RG-6399-613      **Pics:** 9339-9342  
**Coordinates:** Zone   E        N        **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	11.5	10-13	V
T1	18	6-10	D
T2		-	
T3		-	
S1	5	4-6	S
S2	1.5	1-4	S
G	0.8	0-1	M

### Structural formation (including height):

SEVT (11.9.4a)

Ecologically dominant layer: T1

Land form element# (40 m radius): Scarp

Land form pattern# (300 m radius): Escarpment

Soil and geology: Exposed granite rock with loam soils

Slope and aspect: 35°-45°, West

VAST 1

Mapped RE 11.9.4a

## Plant species

Record relative (numerical) dominance for each stratum;  
*d* – dominant; *c* – codominant; *s* – subdominant; *a* – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
E	c	<i>Brachychiton populneus</i>
E	s	<i>Brachychiton rupestris</i>
T1	c	<i>Diospyros humilis</i>
T1	c	<i>Croton insularis</i>
T1	a	<i>Petalostigma pubescens</i>
T1	a	<i>Acacia salicina</i>
T1	a	<i>Capparis mitchellii</i>
T1	A	<i>Denhamia oleaster</i>
T1	a	<i>Geijera parviflora</i>
T1	a	<i>Notelaea macrocarpa</i>
T1	a	<i>Atalaya hemiglauca</i>
S1	d	<i>Croton insularis</i>
S1	a	<i>Psydrax odorata</i>
S1	a	<i>Apophyllum anomalum</i>
S1	a	<i>Jasminum volubile</i>
S1	a	<i>Petalostigma pubescens</i>
S1	a	<i>Denhamia sp.</i>
S2	a	<i>Carissa ovate</i>
S2	a	<i>Solanum semiarmatum</i>
S2	a	<i>Breynia oblongifolia</i>
S2	a	<i>Croton insularis</i>
S2	a	<i>Alectryon diversifolius</i>
S2	a	<i>Opuntia tomentosa*</i>
S2	a	<i>Turraea pubescens</i>

Str.	Rel. dom.	Scientific Name
S2	a	<i>Erythroxyllum australe</i>
G	d	<i>Ancistrachne uncinulata</i>
G	a	<i>Nyssanthes erecta</i>
G	a	<i>Abutilon fraseri</i>
G	a	<i>Jasminum simplicifolium</i>
G	s	<i>Cyperus gracilis</i>
G	a	<i>Olearia sp.</i>
G	a	<i>Cheilanthes sieberi</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates: Datum: \_\_\_\_\_ Transect length: \_\_\_\_\_

Start point Zone  E 0     N

End point Zone  E 0     N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:  m

Intercept of EDL 0 - 50m:  m

Intercept of EDL 50 -100m:  m

Measured crown cover % of EDL 0 -100m:  %

Structural formation: \_\_\_\_\_

Conclusions/notes: \_\_\_\_\_

\_\_\_\_\_

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END

# Quaternary Site Form

## Location

Site:	Q 3	Recorder:	JN/PW	Day/Date:	03/11/13
Project:	Fairview Lot 20 FTY 1850				
Locality:	RoW 135	Pics:	9414-9417		
Coordinates:	Zone	55	E	7 0 4 2 5 0	N 7 1 6 1 1 0 1
Datum: .....					

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	12	10-16	S
T2	8	6-10	S
T3		-	
S1	4.5	4-6	S
S2	1.5	1-4	V
G	0.6	0-1	M

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Flat plateau

Land form pattern# (300 m radius): Flat plateau on ridge

top

Soil and geology: Loamy sand

Slope and aspect: < 5°, slightly west

Recently burnt (last 12 mth)

VAST 2

Mapped 11.10.1/11.10.13a.

## Plant species

Record relative (numerical) dominance for each stratum;  
 d – dominant; c – codominant; s – subdominant; a – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	c	<i>Eucalyptus fibrosa</i>
T1	a	<i>Corymbia citriodora</i>
T1	a	<i>Callitris glaucophylla</i>
T1	a	<i>Corymbia trachyphloia</i>
T1	c	<i>Eucalyptus crebra</i>
T2	d	<i>Callitris glaucophylla</i>
T2	a	<i>Eucalyptus fibrosa</i>
T2	a	<i>Eucalyptus crebra</i>
T2	a	<i>Corymbia trachyphloia</i>
S1	d	<i>Acacia longispicata</i>
S1	a	<i>Petalostigma pubescens</i>
S1	a	<i>Alphitonia excels</i>
S1	a	<i>Callitris glaucophylla</i>
S2	a	<i>Grewia latifolia</i>
S2	a	<i>Petalostigma pubescens</i>
S2	a	<i>Leucopogon mitchellii</i>
S2	a	<i>Psydrax odorata</i>
S2	a	<i>Opuntia tomentosa*</i>
G	a	<i>Hibiscus sturtii</i>
G	a	<i>Fimbristylis dichotoma</i>
G	a	<i>Enneapogon lindleyanus</i>
G	a	<i>Cheilanthes sieberi</i>
G	a	<i>Alternanthera denticulata</i>


Str.	Rel. dom.	Scientific Name
G	a	<i>Arundinella nepalensis</i>
G	a	<i>Lomandra longifolia</i>
G	a	<i>Parsonsia lanceolata</i>
G	a	<i>Dianella caerulea</i>
G	a	<i>Lomandra filiformis</i>
G	a	<i>Digitaria divaricatissima</i>
G	a	<i>Cyperus sp.</i>
G	a	<i>Aristida ramosus</i>
G	a	<i>Aristida lignosa</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Eriachne mucronata</i>
G	a	<i>Chrysocephalum apiculatum</i>
G	a	<i>Glycine tomentella</i>
G	a	<i>Calotis cuneifolia</i>
G	a	<i>Spermacoce multicaulis</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates:                      Datum: \_\_\_\_\_                      Transect length: \_\_\_\_\_

Start point                      Zone   E         N

End point                      Zone   E         N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
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-	m		
-	m		
-	m		
-	m		

Summary:	
Minimum height of plants included in the transect table:	<input type="text"/> m
Intercept of EDL 0 - 50m:	<input type="text"/> m
Intercept of EDL 50 - 100m:	<input type="text"/> m
Measured crown cover % of EDL 0 - 100m:	<input type="text"/> %
Structural formation:	
Conclusions/notes:	

END

# Quaternary Site Form

## Location

<b>Site:</b>	Q 4	<b>Recorder:</b>	JN/PW	<b>Day/Date:</b>	04/11/13
<b>Project:</b>	Fairview Lot 20 FTY 1850				
<b>Locality:</b>	125-AW-6745-61	<b>Pics:</b>	9438-9441		
<b>Coordinates:</b>	Zone	55	E	7 0 0 7 1 3	N 7 1 6 3 3 4 5
<b>Datum:</b> .....					

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	11-17	M
T2	8	6-11	S
T3		-	
S1	4	3-6	S
S2	12	1-3	V
G	0.7	0-1	M

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Gentle slope

Land form pattern# (300 m radius): Low undulating hills

Soil and geology: Loamy sand

Slope and aspect: < 10°, South-east

VAST 2

Mapped 11.3.39/11.3.2

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	s	<i>Eucalyptus crebra</i>
T1	a	<i>Eucalyptus melanophloia</i>
T1	a	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>
T1	a	<i>Eucalyptus populnea</i>
T2	s	<i>Eucalyptus crebra</i>
T2	d	<i>Corymbia citriodora</i>
T2	a	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>
S1	d	<i>Acacia leiocalyx</i>
S1	a	<i>Callitris glaucophylla</i>
S1	a	<i>Terminalia oblongata</i>
S2	d	<i>Acacia leiocalyx</i>
S2	a	<i>Capparis mitchellii</i>
S2	a	<i>Brachychiton populneus</i>
S2	a	<i>Petalostigma pubescens</i>
S2	a	<i>Opuntia tomentosa</i> *
S2	a	<i>Grewia latifolia</i>
S2	a	<i>Breynia oblongifolia</i>
S2	a	<i>Dodonaea viscosa</i> subsp. <i>spatulata</i>
S2	a	<i>Alphitonia excels</i>
S2	a	<i>Carissa ovata</i>
S2	a	<i>Capparis lasiantha</i>
G	a	<i>Brunoniella australis</i>




Str.	Rel. dom.	Scientific Name
G	a	<i>Eremophila debilis</i>
G	a	<i>Aristida calycina</i>
G	a	<i>Enneapogon nigricans</i>
G	a	<i>Lomandra multiflora</i>
G	a	<i>Lomandra filiformis</i>
G	a	<i>Spermacoce multicaulis</i>
G	a	<i>Chrysocephalum apiculatum</i>
G	a	<i>Hibiscus sturtii</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Jasminum simplicifolium</i> subsp. <i>australiense</i>
G	a	<i>Verbena aristigera</i> *
G	a	<i>Cheilanthes sieberi</i>

**Transect - crown cover measured (transect intercept method)**

<b>Coordinates:</b>	<b>Datum:</b> .....	<b>Transect length:</b> .....
Start point	Zone <input type="text"/> <input type="text"/> E <input type="text"/> 0 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> N <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
End point	Zone <input type="text"/> <input type="text"/> E <input type="text"/> 0 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> N <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

<b>Summary:</b>	
Minimum height of plants included in the transect table:	<input type="text"/> m
Intercept of EDL 0 - 50m:	<input type="text"/> m
Intercept of EDL 50 -100m:	<input type="text"/> m
Measured crown cover % of EDL 0 -100m:	<input type="text"/> %
Structural formation:	
Conclusions/notes:	

# Quaternary Site Form

## Location

Site:	Q 5	Recorder:	JN/PW	Day/Date:	04/11/13
Project:	Fairview Lot 20 FTY 1850				
Locality:	710-RG-6419-613 / RoW 129		Pics: 9447-9450		
Coordinates:	Zone	55	E	7 0 0 1 8 5	N 7 1 6 2 0 8 8
Datum: .....					

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	10	8-12	V
T2		-	
T3		-	
S1	6.5	6-8	M
S2	3.5	1-6	M
G	0.6	0-1	M

**Structural formation (including height):**  
 Non-remnant, shrubby regrowth Eucalypts and Acacias

**Ecologically dominant layer:** T1

**Land form element# (40 m radius):** Flat

**Land form pattern# (300 m radius):** Plateau on rocky ridge top

**Soil and geology:** Sandy

**Slope and aspect:** < 5°, N/A

VAST 3

Mapped non-remnant.

Evidence of recent fire (within last 12 months)

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	a	<i>Eucalyptus chloroclada</i>
T1	d	<i>Eucalyptus tenuipes</i>
S1	d	<i>Eucalyptus tenuipes</i>
S1	a	<i>Acacia longispicata</i>
S1	a	<i>Lysicarpus angustifolius</i>
S1	a	<i>Allocasuarina inophloia</i>
S2	a	<i>Exocarpos cupressiformis</i>
S2	a	<i>Leucopogon mitchellii</i>
S2	a	<i>Acacia leiocalyx</i>
S2	a	<i>Petalostigma pubescens</i>
S2	a	<i>Lysicarpus angustifolius</i>
S2	a	<i>Alphitonia excels</i>
S2	a	<i>Notelaea microcarpa</i>
S2	a	<i>Keraudrenia collina</i>
S2	a	<i>Breynia oblongifolia</i>
S2	a	<i>Hakea purpurea</i>
S2	a	<i>Xanthorrhoea johnsonii</i>
G	a	<i>Solanum ellipticum</i>
G	a	<i>Abutilon fraseri</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Calotis cuneifolia</i>
G	a	<i>Evolvulus alsinoides</i>
G	a	<i>Oxalis perennans</i>
G	a	<i>Brunoniella australis</i>



# Quaternary Site Form

## Location

**Site:** Q 6      **Recorder:** JN/PW      **Day/Date:** 04/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** 63-AW-6753-611L/ RoW 118      Pics: 9540-9543  
**Coordinates:** Zone 55 E 6 9 9 4 6 5 N 7 1 6 1 3 5 7      **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	11-16	M
T2	9	7-11	M
T3		-	
S1	4.5	4-6	S
S2	2.5	1-4	S
G	1.0	0-1	D

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element<sup>#</sup> (40 m radius): Flat

Land form pattern<sup>#</sup> (300 m radius): Plateau on top of

rocky jump-up

Soil and geology: Dark brown loam

Slope and aspect: < 5°, Slightly West

VAST 2

Mapped 11.10.1/11.10.13a.

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Eucalyptus fibrosa subsp. nubila</i>
T1	a	<i>Lysicarpus angustifolius</i>
T1	a	<i>Allocasuarina inophloia</i>
T1	s	<i>Eucalyptus crebra</i>
T2	s	<i>Eucalyptus fibrosa subsp. nubila</i>
T2	a	<i>Lysicarpus angustifolius</i>
T2	d	<i>Allocasuarina inophloia</i>
S1	d	<i>Allocasuarina inophloia</i>
S1	a	<i>Eucalyptus fibrosa subsp. nubila</i>
S1	a	<i>Acacia longispicata</i>
S1	a	<i>Acacia leiocalyx</i>
S2	c	<i>Callitris glaucophylla</i>
S2	a	<i>Allocasuarina inophloia</i>
S2	a	<i>Eucalyptus fibrosa subsp. nubila</i>
S2	c	<i>Melaleuca nodosa</i>
S2	a	<i>Exocarpos cupressiformis</i>
S2	a	<i>Alphitonia excelsa</i>
S2	a	<i>Keraudrenia collina</i>
S2	a	<i>Acacia leiocalyx</i>
S2	a	<i>Leucopogon mitchellii</i>
G	d	<i>Arundinella nepalensis</i>
G	a	<i>Dianella caerulea</i>
G	a	<i>Cyperus sp.</i>


Str.	Rel. dom.	Scientific Name
G	a	<i>Aristida lignosa</i>
G	a	<i>Cheilanthes sieberi</i>
G	a	<i>Laxmannia gracilis</i>
G	a	<i>Salsola kali</i>
G	a	<i>Enteropogon ramosus</i>
G	a	<i>Fimbristylis dichotoma</i>
G	a	<i>Goodenia sp.</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates: \_\_\_\_\_ Datum: \_\_\_\_\_ Transect length: \_\_\_\_\_

Start point Zone  E 0  N

End point Zone  E 0  N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:	<input type="text"/>	m
Intercept of EDL 0 - 50m:		m
Intercept of EDL 50 - 100m:		m
Measured crown cover % of EDL 0 - 100m:		%
Structural formation:		
Conclusions/notes:		

END

# Quaternary Site Form

## Location

<b>Site:</b>	Q 7	<b>Recorder:</b>	JN/PW	<b>Day/Date:</b>	04/11/13
<b>Project:</b>	Fairview Lot 20 FTY 1850				
<b>Locality:</b>	300-AW-6801-553M / RoW 142	<b>Pics:</b>	9558-9561		
<b>Coordinates:</b>	Zone	55	E	7 0 5 3 7 8	N 7 1 5 9 1 3 3
<b>Datum:</b>					

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14	11-17	M
T2	8.5	6-11	M
T3		-	
S1	3.5	2-6	S
S2		-	
G	0.6	0-1	S

### Structural formation (including height):

Open woodland fringing ephemeral watercourse

Ecologically dominant layer: T1

Land form element# (40 m radius): Rocky slope

Land form pattern# (300 m radius): Watercourse at the base of an escarpment

Soil and geology: Light brown, sandy loam

Slope and aspect: 10°-15°, East

VAST 1

Mapped 11.3.39/11.3.2.

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	s	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>
T1	a	<i>Eucalyptus crebra</i>
T1	a	<i>Callitris glaucophylla</i>
T1	a	<i>Angophora leiocarpa</i>
T1	a	<i>Eucalyptus tenuipes</i>
T1	a	<i>Lophostemon suaveolens</i>
T2	d	<i>Corymbia citriodora</i>
T2	s	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>
T2	a	<i>Callitris glaucophylla</i>
T2	a	<i>Eucalyptus crebra</i>
S1	c	<i>Terminalia oblongata</i>
S1	a	<i>Opuntia tomentosa</i> *
S1	d	<i>Acacia longispicata</i>
S1	c	<i>Callitris glaucophylla</i>
S1	a	<i>Alphitonia excelsa</i>
S1	a	<i>Dodonaea triangularis</i>
S1	a	<i>Grewia latifolia</i>
S1	a	<i>Keraudrenia collina</i>
S1	a	<i>Acacia complanata</i>
G	d	<i>Arundinella nepalensis</i>
G	s	<i>Themeda triandra</i>
G	a	<i>Fimbristylis dichotoma</i>


Str.	Rel. dom.	Scientific Name
G	a	<i>Brunoniella australis</i>
G	a	<i>Lomandra filiformis</i>
G	a	<i>Lomandra longifolia</i>
G	a	<i>Eustrephus latifolius</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Dianella caerulea</i>
G	a	<i>Entolasia stricta</i>
G	a	<i>Cyperus gracilis</i>
G	a	<i>Ancistrachne uncinulata</i>
G	a	<i>Eragrostis sororia</i>
G	a	<i>Enneapogon nigricans</i>
G	a	<i>Cymbopogon bombycinus</i>
G	a	<i>Panicum effusum</i>
G	a	<i>Digitaria divaricatissima</i>
G	a	<i>Olearia sp.</i>
G	a	<i>Xanthorrhoea johnsonii</i>

**Transect - crown cover measured (transect intercept method)**

**Coordinates:**                      **Datum:** \_\_\_\_\_                      **Transect length:** \_\_\_\_\_  
 Start point                      Zone   E 0      N        
 End point                      Zone   E 0      N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

Summary:	
Minimum height of plants included in the transect table:	m
Intercept of EDL 0 - 50m:	m
Intercept of EDL 50 - 100m:	m
Measured crown cover % of EDL 0 - 100m:	%
Structural formation:	
Conclusions/notes:	

# Quaternary Site Form

## Location

**Site:** Q 8      **Recorder:** JN/PW      **Day/Date:** 04/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** FV07-01      **Pics:** 9613-9616  
**Coordinates:** Zone                 **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14	12-16	S
T2	9	7-11	M
T3		-	
S1	5	2-6	M
S2	2	1-2	V
G	0.6	0-1	M

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element<sup>#</sup> (40 m radius): Gentle slope

Land form pattern<sup>#</sup> (300 m radius): Gently undulating

Soil and geology: Light-brown loamy sand

Slope and aspect: < 5°, N/A

VAST 1

Mapped 11.3.39/11.3.2

## Plant species

Record relative (numerical) dominance for each stratum;  
*d* – dominant; *c* – codominant; *s* – subdominant; *a* – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	s	<i>Eucalyptus crebra</i>
T1	d	<i>Eucalyptus fibrosa subsp. nubila</i>
T2	s	<i>Eucalyptus fibrosa subsp. nubila</i>
T2	d	<i>Acacia shirleyi</i>
T2	a	<i>Eucalyptus crebra</i>
S1	d	<i>Acacia shirleyi</i>
S1	A	<i>Acacia longispicata</i>
S1	d	<i>Alphitonia excelsa</i>
S1	a	<i>Callitris glaucophylla</i>
S2	a	<i>Dodonaea triangularis</i>
S2	d	<i>Acacia excelsa subsp. excelsa</i>
S2	a	<i>Psyrdrax odorata</i>
S2	a	<i>Acacia longispicata</i>
G	d	<i>Aristida caput-medusae</i>
G	a	<i>Eragrostis sororia</i>
G	a	<i>Fimbristylis dichotoma</i>
G	a	<i>Lomandra filiformis</i>
G	a	<i>Entolasia stricta</i>
G	a	<i>Dianella caerulea</i>
G	a	<i>Enneapogon nigricans</i>
G	a	<i>Solanum ellipticum</i>
G	a	<i>Cymbopogon refractus</i>
G	a	<i>Laxmannia gracilis</i>



	<b>Str.</b>	<b>Rel. dom.</b>	<b>Scientific Name</b>
	G	a	<i>Keraudrenia collina</i>
	G	a	<i>Digitaria divaricatissima</i>
	G	a	<i>Scleria sphacelata</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates:                      Datum: \_\_\_\_\_                      Transect length: \_\_\_\_\_

Start point                      Zone   E 0  N

End point                      Zone   E 0  N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

Summary:		
Minimum height of plants included in the transect table:	m	
Intercept of EDL 0 - 50m:	m	
Intercept of EDL 50 - 100m:	m	
Measured crown cover % of EDL 0 - 100m:	%	
Structural formation:		
Conclusions/notes:		

END

# Quaternary Site Form

## Location

**Site:** Q 9      **Recorder:** JN/PW      **Day/Date:** 05/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** FV07-04      **Pics:** 9627-9630  
**Coordinates:** Zone                 **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	8	6-11	V
T2		-	
T3		-	
S1	3	1-5	V
S2		-	
G	0.6	0-1	M

### Structural formation (including height):

Open pasture with sparse regrowth eucalypts

Ecologically dominant layer: T1

Land form element# (40 m radius): Gentle slope

Land form pattern# (300 m radius): Gently undulating

Soil and geology: Light-brown sandy loam

Slope and aspect: 5°, North

VAST 3

Non remnant

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Eucalyptus melanophloia</i>
T1	a	<i>Eucalyptus fibrosa subsp. nubila</i>
T1	a	<i>Acacia harpophylla</i>
T1	a	<i>Brachychiton rupestris</i>
S1	a	<i>Grevillea striata</i>
S1	a	<i>Maireana microphylla</i>
S1	a	<i>Sclerolaena birchii</i>
S1	a	<i>Psydrax odorata</i>
S1	a	<i>Eucalyptus melanophloia</i>
G	a	<i>Hibiscus sturtii</i>
G	a	<i>Chrysopogon fallax</i>
G	a	<i>Boerhavia dominii</i>
G	a	<i>Verbena aristigera</i> *
G	a	<i>Opuntia tomentosa</i> *
G	a	<i>Cymbopogon refractus</i>
G	a	<i>Wahlenbergia queenslandica</i>
G	a	<i>Aristida lignosa</i>
G	a	<i>Evolvulus alsinoides</i>
G	a	<i>Eragrostis leptostachya</i>
G	a	<i>Sida cunninghamii</i>



# Quaternary Site Form

## Location

**Site:** Q 10      **Recorder:** PW and JN      **Day/Date:** 5/11/2013 9:00am  
**Project:** Fairview Lot 20  
**Locality:** FV07-04      Photos: N= 9636; E= 9633; S= 9634; W= 9635  
**Coordinates:** Zone 5 5 E 0 7 0 2 2 0 6 N 7 1 6 3 2 9 8      **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	12	10-14	S
T2	8.5	8-10	S
T3		-	
S1	4	2-6	M
S2	1.2	1-2	V
G		0-1	

### Structural formation (including height):

Closed woodland

### Ecologically dominant layer: T1

### Land form element# (40 m radius): Slope

### Land form pattern# (300 m radius):

Gently undulating hills

### Soil and geology:

Sand (tan colour)

### Slope and aspect:

Northerly (<10°)

Mapped as 11.3.39/11.3.2

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Eucalyptus fibrosa subsp. nubila</i>
	s	<i>Eucalyptus crebra</i>
	a	<i>Eucalyptus melanophloia</i>
T2	d	<i>Eucalyptus fibrosa subsp. nubila</i>
		<i>Eucalyptus crebra</i>
		<i>Corymbia trachyphloia</i>
S1	d	<i>Acacia leiocalyx</i>
		<i>Petalostigma pubescens</i>
		<i>Acacia longispicata</i>
S2		<i>Grewia latifolia</i>
		<i>Petalostigma pubescens</i>
G		<i>Enneapogon lindleyanus</i>
		<i>Lomandra filiformis</i>
		<i>Opuntia tomentosa*</i>
		<i>Themeda triandra</i>
		<i>Cymbopogon refractus</i>
		<i>Brunoniella australis</i>
		<i>Calotis lappulacea</i>
		<i>Aristida sp.</i>
		<i>Hibiscus sturtii</i>
		<i>Abutilon sp.</i>
	<i>Enneapogon nigricans</i>	
	<i>Goodenia sp.</i>	



# Quaternary Site Form

## Location

Site:	Q 11	Recorder:	JN/PW	Day/Date:	05/11/13
Project:	Fairview Lot 20 FTY 1850				
Locality:	FV07-06	Pics:	9651-9654		
Coordinates:	Zone	55	E	7 0 1 6 0 9	N 7 1 6 1 6 8 4
Datum: .....					

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	12-17	S
T2	9	7-11	M
T3		-	
S1	4.5	3-6	S
S2	2	1-2	S
G	0.6	0-1	M

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Flat

Land form pattern# (300 m radius): Gently sloping

plateau

Soil and geology: Red-brown loam

Slope and aspect: < 5°, N/A

VAST 2

Mapped 11.10.1/11.10.13a.

## Plant species

Record relative (numerical) dominance for each stratum;  
 d – dominant; c – codominant; s – subdominant; a – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Eucalyptus tenuipes</i>
T1	s	<i>Eucalyptus fibrosa subsp. nubila</i>
T1	a	<i>Brachychiton populneus</i>
T1	a	<i>Corymbia citriodora</i>
T1	a	<i>Corymbia trachyphloia</i>
T2	d	<i>Eucalyptus tenuipes</i>
T2	s	<i>Eucalyptus fibrosa subsp. nubila</i>
T2	a	<i>Lysicarpus angustifolius</i>
S1	a	<i>Petalostigma pubescens</i>
S1	s	<i>Lysicarpus angustifolius</i>
S1	a	<i>Acacia leiocalyx</i>
S1	a	<i>Acacia longispicata</i>
S2	a	<i>Xanthorrhoea johnsonii</i>
S2	a	<i>Alphitonia excelsa</i>
S2	a	<i>Petalostigma pubescens</i>
S2	a	<i>Exocarpos cupressiformis</i>
G	a	<i>Leucopogon mitchellii</i>
G	a	<i>Calotis cuneifolia</i>
G	a	<i>Dianella caerulea</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Cymbopogon refractus</i>
G	a	<i>Solanum ellipticum</i>
G	a	<i>Brunoniella australis</i>


Str.	Rel. dom.	Scientific Name
G	a	<i>Aristida calycina</i>
G	a	<i>Enneapogon nigricans</i>
G	a	<i>Chrysocephalum apiculatum</i>
G	a	<i>Spermacoce multicaulis</i>
G	a	<i>Themeda triandra</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates:                      Datum:                      Transect length: \_\_\_\_\_

Start point                      Zone   E 0       N

End point                      Zone   E 0       N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:	<input type="text"/> m
Intercept of EDL 0 - 50m:	<input type="text"/> m
Intercept of EDL 50 -100m:	<input type="text"/> m
Measured crown cover % of EDL 0 -100m:	<input type="text"/> %
Structural formation:	
Conclusions/notes:	

END

# Quaternary Site Form

## Location

**Site:** Q 12      **Recorder:** JN/PW      **Day/Date:** 05/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** FV07-07      **Pics:** 9666-9669  
**Coordinates:** Zone                 **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	17	15-18	S
T2	10	9-12	M
T3		-	
S1	7	4-7	S
S2	2	1-3	V
G	0.9	0-1	D

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Flat

Land form pattern# (300 m radius): Plateau on top of

rocky jump-up

Soil and geology: Dark red-brown loam

Slope and aspect: < 5°, N/A

VAST 1

Mapped 11.10.1

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	a	<i>Eucalyptus melanophloia</i>
T1	s	<i>Eucalyptus crebra</i>
T2	d	<i>Eucalyptus melanophloia</i>
S1	c	<i>Acacia leiocalyx</i>
S1	c	<i>Acacia longispicata</i>
S2	a	<i>Eucalyptus melanophloia</i>
S2	a	<i>Acacia bancroftiorum</i>
S2	a	<i>Acacia longispicata</i>
S2	a	<i>Dodonaea stenophylla</i>
G	d	<i>Themeda avenacea</i>
G	a	<i>Swainsona sp.</i>
G	a	<i>Cymbopogon refractus</i>
G	a	<i>Opuntia tomentosa*</i>
G	a	<i>Spermacoce multicaulis</i>
G	a	<i>Exocarpos cupressiformis</i>



A large empty rectangular box with a dashed border, intended for notes or additional data.

Str.	Rel. dom.	Scientific Name

**Transect - crown cover measured (transect intercept method)**

**Coordinates:**      **Datum:** \_\_\_\_\_      **Transect length:** \_\_\_\_\_

Start point      Zone  E  N

End point      Zone  E  N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:	<input type="text"/> m
Intercept of EDL 0 - 50m:	<input type="text"/> m
Intercept of EDL 50 - 100m:	<input type="text"/> m
Measured crown cover % of EDL 0 - 100m:	<input type="text"/> %
Structural formation:	
Conclusions/notes:	

**END**

# Quaternary Site Form

## Location

**Site:** Q 13      **Recorder:** JN/PW      **Day/Date:** 05/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** FV07-08      **Pics:** 9670 - 9673  
**Coordinates:** Zone                  **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	15-18	S
T2	10	8-12	M
T3		-	
S1	7	2-7	M
S2	2	1-2	V
G	0.6	0-1	S

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Flat

Land form pattern# (300 m radius): Plateau - gentle

slope

Soil and geology: Light-brown loam

Slope and aspect: < 5°, N/A

VAST 1

Mapped 11.10.1

## Plant species

Record relative (numerical) dominance for each stratum;  
*d* - dominant; *c* - codominant; *s* - subdominant; *a* - associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	s	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>
T2	d	<i>Callitris glaucophylla</i>
T2	a	<i>Corymbia citriodora</i>
T2	s	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>
S1	a	<i>Parsonsia</i> sp.
S1	a	<i>Petalostigma pubescens</i>
S1	a	<i>Opuntia tomentosa</i> *
S1	a	<i>Acacia longispicata</i>
S2	d	<i>Acacia longispicata</i>
S2	a	<i>Opuntia tomentosa</i> *
S2	a	<i>Corymbia citriodora</i>
S2	a	<i>Callitris glaucophylla</i>
S2	a	<i>Capparis canescens</i>
S2	a	<i>Psydrax oleifolia</i>
S2	a	<i>Eustrephus latifolius</i>
G	a	<i>Opuntia tomentosa</i> *
G	a	<i>Carissa ovata</i>
G	a	<i>Cyanthillium cinereum</i>
G	a	<i>Fimbristylis dichotoma</i>
G	a	<i>Pterocaulon redolens</i>
G	a	<i>Enneapogon nigricans</i>
G	a	<i>Cymbopogon refractus</i>


Str.	Rel. dom.	Scientific Name
G	a	<i>Aristida ramosus</i>
G	a	<i>Petalostigma pubescens</i>
G	a	<i>Laxmannia gracilis</i>
G	a	<i>Themeda avenacea</i>
G	a	<i>Eremophila debilis</i>
G	a	<i>Xanthorrhoea johnsonii</i>
G	a	<i>Chrysocephalum apiculatum</i>
G	a	<i>Cymbopogon bombycinus</i>
G	a	<i>Brunoniella australis</i>
G	a	<i>Spermacoce multicaulis</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Alloteropsis semialata</i>
G	a	<i>Parsonsia eucalyptophylla</i>
G	a	<i>Scleria sphacelata</i>
G	a	<i>Calotis cuneifolia</i>
G	a	<i>Cheilanthes sieberi</i>
G	a	<i>Polygala linariifolia</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates:                  Datum:                  Transect length: \_\_\_\_\_

Start point                  Zone  E 0  N

End point                      Zone  E 0  N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
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-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

Summary:	
Minimum height of plants included in the transect table:	m
Intercept of EDL 0 - 50m:	m
Intercept of EDL 50 -100m:	m
Measured crown cover % of EDL 0 -100m:	%
Structural formation:	
Conclusions/notes:	

**END**

# Quaternary Site Form

## Location

**Site:** Q 14      **Recorder:** PW and JN      **Day/Date:** 5/11/2013 1:30pm  
**Project:** Fairview Lot 20  
**Locality:** FV11-06      **Photos:** N= 9730; E= 9731; S= 9732; W= 9729  
**Coordinates:** Zone 5 5 E 0 7 0 0 2 0 6 N 7 1 5 9 6 7 8      **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	12	9-15	M
T2	7	6-9	S
T3		-	
S1	3.5	2-6	S
S2	1.2	1-2	V
G		0-1	M

### Structural formation (including height):

Closed woodland

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Flat rise/ hill top

### Land form pattern# (300 m radius):

Plateau

### Soil and geology:

Clay/loam (Dark brown colour)

### Slope and aspect:

Westerly (<5°)

Mapped as 11.10.1/11.10.13

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Eucalyptus fibrosa subsp. nubila</i>
	a	<i>Corymbia citriodora</i>
	a	<i>Eucalyptus crebra</i>
T2	d	<i>Eucalyptus fibrosa subsp. nubila</i>
		<i>Callitris glaucophylla</i>
S1	d	<i>Acacia leiocalyx</i>
		<i>Psydrax odorata</i>
		<i>Opuntia tomentosa*</i>
		<i>Geijera parviflora</i>
		<i>Alphitonia excelsa</i>
		<i>Eucalyptus fibrosa subsp. nubila</i>
S2		<i>Opuntia tomentosa*</i>
		<i>Psydrax odorata</i>
		<i>Acacia leiocalyx</i>
		<i>Alphitonia excelsa</i>
		<i>Bursaria spinosa</i>
		<i>Indigofera breviflora</i>
		<i>Capparis canescens</i>
		<i>Dodonaea stenophylla</i>
G		<i>Dianella caerulea</i>
		<i>Aristida sp.</i>
		<i>Scleria mackaviensis</i>
		<i>Panicum effusum</i>


Str.	Rel. dom.	Scientific Name
		<i>Laxmannia gracilis</i>
		<i>Pterocaulon redolens</i>
		<i>Sporobolus creber</i>
		<i>Solanum ellipticum</i>
		<i>Lomandra filiformis</i>
		<i>Cymbopogon bombycinus</i>
		<i>Xerochrysum bracteatum</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates:	Datum:	Transect length:
Start point	Zone <input style="width:20px; height:15px;" type="text"/> <input style="width:20px; height:15px;" type="text"/> E <input style="width:20px; text-align:center; border: 1px solid black;"/> 0 <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/> N <input style="width:20px; text-align:center; border: 1px solid black;"> <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/></input>	
End point	Zone <input style="width:20px; height:15px;" type="text"/> <input style="width:20px; height:15px;" type="text"/> E <input style="width:20px; text-align:center; border: 1px solid black;"/> 0 <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/> N <input style="width:20px; text-align:center; border: 1px solid black;"> <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/> <input style="width:20px; text-align:center; border: 1px solid black;"/></input>	

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

<b>Summary:</b>	
Minimum height of plants included in the transect table:	m
Intercept of EDL 0 - 50m:	m
Intercept of EDL 50 - 100m:	m
Measured crown cover % of EDL 0 - 100m:	%
Structural formation:	
Conclusions/notes:	

END

# Quaternary Site Form

## Location

**Site:** Q 15      **Recorder:** PW and JN      **Day/Date:** 5/11/2013  
**Project:** Fairview Lot 20  
**Locality:** FV12-01      **Photos:** No photos  
**Coordinates:** Zone 5 5 E 0 7 0 1 7 8 7 N 7 1 5 9 0 6 2      **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	12	10-17	M
T2	8	6-10	S
T3		-	
S1	3.5	3-6	S
S2	2	1-3	V
G		0-1	M

### Structural formation (including height):

Closed woodland

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Flat rise/ hill top

### Land form pattern# (300 m radius):

Plateau

### Soil and geology:

Sand (Light brown colour)

### Slope and aspect:

Westerly (<5°)

Mapped as 11.10.1/11.10.13a

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
	a	<i>Angophora leiocarpa</i>
	a	<i>Corymbia trachyphloia</i>
T2		<i>Brachychiton rupestris</i>
	d	<i>Callitris glaucophylla</i>
		<i>Petalostigma pubescens</i>
		<i>Alphitonia excelsa</i>
S1		<i>Eucalyptus chloroclada</i>
		<i>Acacia longispicata</i>
		<i>Acacia leiocalyx</i>
		<i>Alphitonia excelsa</i>
		<i>Opuntia tomentosa*</i>
S2		<i>Persoonia falcata</i>
		<i>Acacia leiocalyx</i>
		<i>Petalostigma pubescens</i>
		<i>Opuntia tomentosa*</i>
		<i>Cassinia laevis</i>
		<i>Parsonia eucalyptophylla</i>
		<i>Jasminum volubile</i>
G		<i>Exocarpos cupressiformis</i>
		<i>Grewia latifolia</i>
		<i>Pandorea pandorana</i>
		<i>Melinis repens*</i>

<i>Wahlenbergia queenslandica</i>
<i>Calotis lappulacea</i>
<i>Sida sp.</i>

Str.	Rel. dom.	Scientific Name
		<i>Brunoniella australis</i>
		<i>Hibiscus sturtii</i>
		<i>Calotis cuneifolia</i>
		<i>Eragrostis sp.</i>
		<i>Xanthorrhoea johnsonii</i>
		<i>Aristida caput-medusae</i>
		<i>Themeda avenacea</i>
		<i>Laxmannia gracilis</i>
		<i>Aristida sp.</i>
		<i>Panicum queenslandicum</i>
		<i>Juncus usitatus</i>
		<i>Conyza bonariensis</i>
		<i>Pterocaulon redolens</i>
		<i>Podolepis longipedata</i>
		<i>Indigofera linnaei</i>
		<i>Lomandra longifolia</i>
		<i>Tricoryne elatior</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates:                      Datum:                      Transect length: \_\_\_\_\_

Start point                      Zone  E 0  N

End point                      Zone  E 0  N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
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-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:	<input type="text"/> m
Intercept of EDL 0 - 50m:	<input type="text"/> m
Intercept of EDL 50 - 100m:	<input type="text"/> m
Measured crown cover % of EDL 0 - 100m:	<input type="text"/> %
Structural formation:	<input type="text"/>
Conclusions/notes:	<input type="text"/>

END

# Quaternary Site Form

## Location

**Site:** Q 16      **Recorder:** PW and JN      **Day/Date:** 5/11/2013  
**Project:** Fairview Lot 20  
**Locality:** FV12-02      Photos: N= 9775; E= 9774; S= 9773; W= 9772  
**Coordinates:** Zone 5 5 E 0 7 0 2 2 5 7 N 7 1 5 9 2 7 7      **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	10-18	S
T2	8	7-10	S
T3		-	
S1	3	2-5	M
S2		-	
G		0-1	S

### Structural formation (including height):

Closed woodland

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Flat rise/ hill top

### Land form pattern# (300 m radius):

Plateau

### Soil and geology:

Sand (Light brown colour)

### Slope and aspect:

NA

Mapped as 11.10.1/11.10.13a

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>
	a	<i>Corymbia citriodora</i>
	a	<i>Eucalyptus crebra</i>
T2	d	<i>Acacia leiocalyx</i>
		<i>Petalostigma pubescens</i>
		<i>Alphitonia excelsa</i>
		<i>Callitris glaucophylla</i>
S1	d	<i>Acacia leiocalyx</i>
		<i>Brachychiton populneus</i>
		<i>Alphitonia excelsa</i>
		<i>Corymbia citriodora</i>
		<i>Petalostigma pubescens</i>
		<i>Capparis canescens</i>
		<i>Cassinia laevis</i>
		<i>Acacia longispicata</i>
		<i>Acacia bancroftiorum</i>
G		<i>Tricoryne elatior</i>
		<i>Dianella caerulea</i>
		<i>Themeda avenacea</i>
		<i>Laxmannia gracilis</i>
		<i>Xerochrysum bracteatum</i>
		<i>Hibiscus sturtii</i>
		<i>Indigofera linnaei</i>
		<i>Brunoniella australis</i>





# Quaternary Site Form

## Location

<b>Site:</b> Q 17	<b>Recorder:</b> PW and JN	<b>Day/Date:</b> 5/11/2013 4:00pm
<b>Project:</b> Fairview Lot 20		
<b>Locality:</b> FV07-10      Photos: N= 9780; E= 9781; S= 9782; W= 9779		
<b>Coordinates:</b> Zone	5 5	E 0 7 0 4 8 3 2      N 7 1 5 9 9 1 5 <b>Datum:</b> .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	12	10-14	S
T2	7	6-10	S
T3		-	
S1	4.5	4-6	S
S2	2	1-4	V
G		0-1	M

### Structural formation (including height):

Woodland

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Slope

### Land form pattern# (300 m radius):

Hill side

### Soil and geology:

Sand (Light brown colour)

### Slope and aspect:

Easterly (10°)

Mapped as 11.10.1/11.10.1

VAST = III

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Eucalyptus fibrosa subsp. nubila</i>
	s	<i>Callitris glaucophylla</i>
	a	<i>Eucalyptus crebra</i>
	a	<i>Eucalyptus populnea</i>
T2	d	<i>Callitris glaucophylla</i>
		<i>Eucalyptus fibrosa subsp. nubila</i>
S1	d	<i>Acacia leiocalyx</i>
		<i>Petalostigma pubescens</i>
		<i>Alphitonia excelsa</i>
S2		<i>Alphitonia excelsa</i>
		<i>Opuntia tomentosa*</i>
		<i>Acacia leiocalyx</i>
		<i>Grewia latifolia</i>
		<i>Brachychiton rupestris</i>
		<i>Psydrax sp.</i>
G		<i>Dodonaea viscosa subsp. spatulata</i>
		<i>Capparis canescens</i>
		<i>Aristida caput-medusae</i>
G		<i>Panicum effusum</i>
		<i>Digitaria divaricatissima</i>
		<i>Chrysopogon fallax</i>
		<i>Hibiscus sturtii</i>
		<i>Cenchrus ciliaris*</i>



# Quaternary Site Form

## Location

Site:	Q 18	Recorder:	JN/PW	Day/Date:	06/11/13
Project:	Fairview Lot 20 FTY 1850				
Locality:	RoW 133 / 200-AW-6755-611L	Pics:	9799-9802		
Coordinates:	Zone	55	E	7 0 1 9 8 0	N 7 1 6 2 5 7 4
Datum:					

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	15-18	V
T2	9	7-13	M
T3		-	
S1	5	1-6	M
S2		-	
G	0.6	0-0.8	S

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Moderately-steep slope

Land form pattern# (300 m radius): Plateau and steep escarpment edge

Soil and geology: Light-brown loam with granite boulders and outcrops

Slope and aspect: 15°, East

Recently burnt (within 12 months)

VAST 1

Mapped 11.10.1

## Plant species

Record relative (numerical) dominance for each stratum;  
 d – dominant; c – codominant; s – subdominant; a – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	s	<i>Eucalyptus fibrosa subsp. nubila</i>
T1	a	<i>Corymbia clarksoniana</i>
T2	d	<i>Corymbia citriodora</i>
T2	s	<i>Callitris glaucophylla</i>
T2	a	<i>Lysicarpus angustifolius</i>
T2	a	<i>Petalostigma pubescens</i>
S1	a	<i>Corymbia citriodora</i>
S1	a	<i>Lysicarpus angustifolius</i>
S1	a	<i>Petalostigma pubescens</i>
S1	a	<i>Acacia leiocalyx</i>
S1	a	<i>Eustrephus latifolius</i>
S1	a	<i>Alphitonia excelsa</i>
G	a	<i>Brachychiton populneus</i>
G	a	<i>Solanum ellipticum</i>
G	a	<i>Indigofera linnaei</i>
G	a	<i>Alloteropsis semialata</i>
G	a	<i>Lomandra filiformis</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Entolasia stricta</i>
G	a	<i>Brunoniella australis</i>
G	a	<i>Calotis cuneifolia</i>
G	a	<i>Opuntia tomentosa*</i>
G	a	<i>Evolvulus alsinoides</i>



# Quaternary Site Form

## Location

**Site:** Q 19      **Recorder:** JN/PW      **Day/Date:** 06/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** RoW 133 / 200-AW-6755-611L      **Pics:** 9807-9810  
**Coordinates:** Zone         N        **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	14-16	S
T2	10	8-12	S
T3		-	
S1	5	1-6	M
S2		-	
G	0.5	0-1	S

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Steep slope

Land form pattern# (300 m radius): Steep slope on side

Of low hill/jump-up

Soil and geology: Light-brown loam with granite outcrops

Slope and aspect: 30°, North

VAST 1

Mapped 11.3.39/11.3.2

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	s	<i>Eucalyptus fibrosa</i>
T2	s	<i>Callitris glaucophylla</i>
T2	a	<i>Eucalyptus fibrosa</i>
T2	s	<i>Eucalyptus melanophloia</i>
S1	a	<i>Petalostigma pubescens</i>
S1	a	<i>Hakea lorea</i> subsp. <i>lorea</i>
S1	a	<i>Eustrephus latifolius</i>
S1	s	<i>Acacia longispicata</i>
S1	a	<i>Acacia leiocalyx</i>
G	a	<i>Capparis lasiantha</i>
G	a	<i>Spermacoce multicaulis</i>
G	a	<i>Eremophila debilis</i>
G	a	<i>Desmodium</i> sp.
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Evolvulus alsinoides</i>
G	a	<i>Enneapogon lindleyanus</i>
G	a	<i>Aristida calycina</i>



# Quaternary Site Form

## Location

**Site:** Q 20      **Recorder:** PW and JN      **Day/Date:** 6/11/2013  
**Project:** Fairview Lot 20  
**Locality:** RoW 133      Photos: N= 9822; E= 9823; S= 9824; W= 9825  
**Coordinates:** Zone 5 5 E 0 7 0 2 1 2 7 N 7 1 6 2 8 4 1      **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11	9-13	M
T2	7	6-9	S
T3		-	
S1	4.5	3-6	S
S2	1.8	1-2.5	V
G	0.5	0-1	S

### Structural formation (including height):

Woodland

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Hill side/ slope

### Land form pattern# (300 m radius):

Rolling hills

### Soil and geology:

Clay/loam (Brown colour)

### Slope and aspect:

Northerly (15°)

Mapped as 11.3.39/11.3.2

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Acacia harpophylla</i>
T2	d	<i>Acacia harpophylla</i>
		<i>Brachychiton populneus</i>
		<i>Eucalyptus populnea</i>
S1		<i>Psydrax odorata</i>
	d	<i>Acacia harpophylla</i>
		<i>Callitris glaucophylla</i>
		<i>Atalaya hemiglauca</i>
		<i>Eremophila mitchellii</i>
		<i>Geijera parviflora</i>
S2		<i>Opuntia tomentosa</i> *
		<i>Carissa ovata</i>
		<i>Apophyllum anomalum</i>
		<i>Capparis lasiantha</i>
		<i>Parsonsia eucalyptophylla</i>
G		<i>Aristida lignosa</i>
		<i>Brunoniella australis</i>
		<i>Paspalidium distans</i>
		<i>Enteropogon ramosa</i>
		<i>Cenchrus ciliaris</i> *
		<i>Digitaria divaricatissima</i>
		<i>Nyssanthes erecta</i>
		<i>Eremophila debilis</i>





# Quaternary Site Form

## Location

**Site:** Q 21      **Recorder:** PW and JN      **Day/Date:** 6/11/2013 12:00pm  
**Project:** Fairview Lot 20  
**Locality:** RoW. 140      Photos: N= 9864; E= 9863; S= 9865; W= 9862  
**Coordinates:** Zone   E        N        **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14.5	13-17	S
T2	10	8-13	S
T3		-	
S1	4.5	3-6	M
S2	2	1.5-3	V
G		0-1	M

### Structural formation (including height):

Woodland

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Hill slope

### Land form pattern# (300 m radius):

Rolling hills

### Soil and geology:

Rocky - loam (Dark brown colour)

### Slope and aspect:

Easterly (15°-20°)

Mapped as 11.10.1/11.10.13

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
	a	<i>Eucalyptus fibrosa subsp. nubila</i>
	a	<i>Eucalyptus crebra</i>
T2	d	<i>Corymbia citriodora</i>
		<i>Callitris glaucophylla</i>
		<i>Eucalyptus crebra</i>
S1	c	<i>Acacia leiocalyx</i>
	c	<i>Alphitonia excelsa</i>
		<i>Opuntia tomentosa*</i>
		<i>Diospyros humilis</i>
		<i>Petalostigma pubescens</i>
S2		<i>Santalum lanceolatum</i>
		<i>Bursaria spinosa</i>
		<i>Psydrax odorata</i>
		<i>Senna artemisioides subsp. zygophylla</i>
		<i>Alectryon diversifolius</i>
		<i>Capparis lasiantha</i>
		<i>Carissa ovata</i>
	<i>Alphitonia excelsa</i>	
	<i>Acacia excelsa</i>	
	<i>Eustrephus latifolia</i>	
	<i>Santalum lanceolatum</i>	
	<i>Acacia bancroftiorum</i>	
	<i>Grewia latifolia</i>	

<i>Petalostigma pubescens</i>
<i>Hovea longipes</i>
<i>Turraea pubescens</i>
<i>Opuntia tomentosa*</i>
<i>Acacia longispicata</i>
<i>Breytia oblongifolia</i>
G <i>Enteropogon ramosa</i>
<i>Pterocaulon redolens</i>
<i>Gahnia aspera</i>
<i>Solanum stelligerum</i>
<i>Enneapogon lindleyanus</i>
<i>Cenchrus ciliaris*</i>
<i>Heteropogon contortus</i>
<i>Lomandra longifolia</i>
<i>Dianella longifolia</i>
<i>Scleria mackaviensis</i>
<i>Ancistrachne uncinulata</i>

Str.	Rel. dom.	Scientific Name
G		<i>Arundinella nepalensis</i>
		<i>Cymbopogon bombycinus</i>
		<i>Themeda avenacea</i>
		<i>Themeda triandra</i>
		<i>Aristida sp.</i>
		<i>Cheilanthes sieberi</i>
		<i>Aristida caput-medusae</i>
		<i>Eragrostis sp.</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates: \_\_\_\_\_ Datum: \_\_\_\_\_ Transect length: \_\_\_\_\_

Start point Zone   E       N

End point Zone   E       N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:	<input type="text"/> m
Intercept of EDL 0 - 50m:	<input type="text"/> m
Intercept of EDL 50 -100m:	<input type="text"/> m
Measured crown cover % of EDL 0 -100m:	<input type="text"/> %
Structural formation:	<input type="text"/>
Conclusions/notes:	<input type="text"/>
<input type="text"/>	
<input type="text"/>	
<input type="text"/>	
<input type="text"/>	
<input type="text"/>	
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<input type="text"/>	
<input type="text"/>	
<input type="text"/>	

# Quaternary Site Form

## Location

**Site:** Q 22      **Recorder:** JN/PW      **Day/Date:** 07/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** RoW 137/500-RG-6396-613      **Pics:** 9287-9290  
**Coordinates:** Zone   E        N        **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	14	11-14	S
T2	8	7-10	S
T3		-	
S1	4	1-6	M
S2		-	
G	0.8	0-1	M

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Moderately-steep slope

Land form pattern# (300 m radius): Rolling moderately-steep hills

Soil and geology: Light-brown sand with granite rock outcrops

Slope and aspect: 20°, East

VAST 1

Mapped 11.3.39/11.3.2

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Eucalyptus melanophloia</i>
T1	s	<i>Eucalyptus crebra</i>
T1	a	<i>Callitris glaucophylla</i>
T2	c	<i>Eucalyptus melanophloia</i>
T2	c	<i>Callitris glaucophylla</i>
T2	a	<i>Eucalyptus crebra</i>
S1	a	<i>Brachychiton populneus</i>
S1	a	<i>Malvastrum americanum</i> *
S1	a	<i>Acacia leiocalyx</i>
S1	a	<i>Bidens pilosa</i> *
G	a	<i>Evolvulus alsinoides</i>
G	a	<i>Enteropogon ramosus</i>
G	a	<i>Opuntia tomentosa</i> *
G	a	<i>Chrysocephalum apiculatum</i>
G	a	<i>Spermacoce multicaulis</i>
G	a	<i>Dichanthium sericeum</i>
G	a	<i>Arundinella nepalensis</i>
G	a	<i>Cenchrus ciliaris</i> *
G	a	<i>Sida trichopoda</i>
G	a	<i>Chrysopogon fallax</i>
G	a	<i>Aristida calycina</i>



# Quaternary Site Form

## Location

<b>Site:</b>	Q 22a	<b>Recorder:</b>	JN/PW	<b>Day/Date:</b>	06/11/13														
<b>Project:</b>	Fairview Lot 20 FTY 1850																		
<b>Locality:</b>	RoW 140	<b>Pics:</b>	9877-9880																
<b>Coordinates:</b>	Zone	55	E	7	0	4	4	1	1	N	7	1	5	9	1	9	7	<b>Datum:</b>	

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	17	15-18	S
T2	12	11-14	M
T3		-	
S1	7	4-8	M
S2	2	1-3	M
G	0.5	0-1	M

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Flat/plateau

Land form pattern# (300 m radius): Plateau - on top of

rocky jump-up

Soil and geology: Light reddish-brown, sandy

Slope and aspect: < 5°, N/A

VAST 1

Mapped 11.10.1/11.10.13a.

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** - dominant; **c** - codominant; **s** - subdominant; **a** - associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	a	<i>Callitris glaucophylla</i>
T1	a	<i>Eucalyptus melanophloia</i>
T2	d	<i>Eucalyptus melanophloia</i>
T2	a	<i>Corymbia citriodora</i>
S1	a	<i>Petalostigma pubescens</i>
S1	a	<i>Callitris glaucophylla</i>
S1	a	<i>Hakea lorea</i> subsp. <i>lorea</i>
S1	a	<i>Alphitonia excelsa</i>
S1	c	<i>Acacia longispicata</i>
S1	c	<i>Acacia leiocalyx</i>
S2	a	<i>Bursaria spinosa</i> var. <i>spinosa</i>
S2	a	<i>Opuntia tomentosa</i> *
S2	A	<i>Grewia latifolia</i>
S2	A	<i>Petalostigma pubescens</i>
S2	A	<i>Alphitonia excelsa</i>
S2	C	<i>Acacia longispicata</i>
S2	C	<i>Acacia leiocalyx</i>
S2	a	
G	s	<i>Cymbopogon refractus</i>
G	d	<i>Aristida caput-medusae</i>
G	a	<i>Gahnia aspera</i>
G	a	<i>Cenchrus ciliaris</i> *



# Quaternary Site Form

## Location

**Site:** Q 23      **Recorder:** JN/PW      **Day/Date:** 07/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** RoW 137/500-RG-6396-613      **Pics:** 9953-9956  
**Coordinates:** Zone                 **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	13-16	S
T2	12	8-12	M
T3		-	
S1	5	4-7	M
S2	2.5	1-3	S
G	0.5	0-0.8	S

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Rocky slope

Land form pattern# (300 m radius): Mid-slope, rocky

moderately-steep slope

Soil and geology: Light brown sand

Slope and aspect: 20°, West

VAST 1

Mapped 11.10.1

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T2	d	<i>Corymbia citriodora</i>
T2	a	<i>Callitris glaucophylla</i>
T2	a	<i>Eucalyptus crebra</i>
S1	a	<i>Corymbia citriodora</i>
S1	a	<i>Callitris glaucophylla</i>
S1	a	<i>Acacia longispicata</i>
S1	a	<i>Acacia leiocalyx</i>
S1	a	<i>Opuntia tomentosa</i> *
S2	d	<i>Acacia leiocalyx</i>
S2	a	<i>Acacia longispicata</i>
S2	a	<i>Petalostigma pubescens</i>
S2	a	<i>Alphitonia excelsa</i>
S2	a	<i>Corymbia citriodora</i>
S2	a	<i>Santalum lanceolatum</i>
G	a	<i>Dianella caerulea</i>
G	a	<i>Opuntia tomentosa</i> *
G	a	<i>Scleria sphacelata</i>
G	a	<i>Gahnia aspera</i>
G	a	<i>Brunoniella australis</i>
G	a	<i>Chrysopogon fallax</i>
G	a	<i>Aristida calycina</i>
G	a	<i>Fimbristylis dichotoma</i>




Str.	Rel. dom.	Scientific Name
G	a	<i>Enteropogon ramosus</i>
G	a	<i>Cymbopogon bombycinus</i>
G	a	<i>Opuntia stricta</i> *
G	a	<i>Hardenbergia violacea</i>

**Transect - crown cover measured (transect intercept method)**

<b>Coordinates:</b>	<b>Datum:</b>	<b>Transect length:</b>
Start point	Zone <input type="text"/> <input type="text"/> E 0 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> N <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
End point	Zone <input type="text"/> <input type="text"/> E 0 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> N <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

<b>Summary:</b>	
Minimum height of plants included in the transect table:	m
Intercept of EDL 0 - 50m:	m
Intercept of EDL 50 -100m:	m
Measured crown cover % of EDL 0 -100m:	%
Structural formation:	
Conclusions/notes:	

END

# Quaternary Site Form

## Location

**Site:** Q 24      **Recorder:** PW and JN      **Day/Date:** 7/11/2013 11:30am  
**Project:** Fairview Lot 20  
**Locality:** RoW 142      **Photos:** N= 9989; E= 9988; S= 9990; W= 9991-9992  
**Coordinates:** Zone   E        N        **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	11.5	10-13	S
T2	7	6-10	M
T3		-	
S1	5	4-6	M
S2	2	1.5-4	M
G		0-1	V

### Structural formation (including height):

Semi Evergreen Vine Thicket

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

North-facing slope and gully

### Land form pattern# (300 m radius):

Rolling hills

### Soil and geology:

Loam (Dark brown colour) - Rocky

### Slope and aspect:

Northerly (15°)

Mapped as 11.9.4a

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	c	<i>Eucalyptus melanophloia</i>
	c	<i>Diospyros humilis</i>
	a	<i>Lysiphillum carronii</i>
	a	<i>Eremophila mitchellii</i>
	a	<i>Brachychiton populneus</i>
T2	c	<i>Acacia fasciculifera</i>
	c	<i>Eremophila mitchellii</i>
		<i>Lysiphillum carronii</i>
		<i>Brachychiton populneus</i>
		<i>Callitris glaucophylla</i>
S1		<i>Opuntia tomentosa</i> *
		<i>Petalostigma pubescens</i>
		<i>Lysiphillum carronii</i>
		<i>Diospyros humilis</i>
		<i>Eremophila mitchellii</i>
S2		<i>Alectryon diversifolius</i>
		<i>Hovea longipes</i>
		<i>Carissa ovata</i>
		<i>Capparis lasiantha</i>
		<i>Pittosporum spinescens</i>
		<i>Opuntia tomentosa</i> *
		<i>Jasminum volubile</i>
	<i>Croton insularis</i>	
	<i>Notelaea microcarpa</i>	


Str.	Rel. dom.	Scientific Name
		<i>Dodonaea stenophylla</i>
		<i>Psydrax odorata</i>
		<i>Acalypha eremorum</i>
		<i>Clematicissus opaca</i>
G		<i>Ancistrachne uncinulata</i>
		<i>Gahnia aspera</i>
		<i>Aristida caput-medusae</i>
		<i>Cenchrus ciliaris*</i>
		<i>Austrostipa ramosissima</i>
		<i>Spartothamnella juncea</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates:                      Datum:                      Transect length: \_\_\_\_\_

Start point                      Zone   E 0         N

End point                      Zone   E 0         N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:	<input type="text"/> m
Intercept of EDL 0 - 50m:	<input type="text"/> m
Intercept of EDL 50 -100m:	<input type="text"/> m
Measured crown cover % of EDL 0 -100m:	<input type="text"/> %
Structural formation:	<input type="text"/>
Conclusions/notes:	<input type="text"/>

END

# Quaternary Site Form

## Location

**Site:** Q 25      **Recorder:** PW and JN      **Day/Date:** 7/11/2013  
**Project:** Fairview Lot 20  
**Locality:** RoW 142      **Photos:** N= 0003; E= 9998; S= 9999; W= 0001 and 0002  
**Coordinates:** Zone   E        N        **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	10-17	M
T2	8.5	8-10	S
T3		-	
S1	6	5-8	M
S2	3	1-5	S
G		0-1	M

### Structural formation (including height):

Woodland

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Hill side

### Land form pattern# (300 m radius):

Rolling hills

### Soil and geology:

Rocky - sandy loam (Dark brown colour)

### Slope and aspect:

Southerly (10°)

Mapped as 11.9.4

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
*d* - dominant; *c* - codominant; *s* - subdominant; *a* - associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
	a	<i>Callitris glaucophylla</i>
	a	<i>Eucalyptus decorticans</i>
T2	d	<i>Corymbia citriodora</i>
	a	<i>Callitris glaucophylla</i>
S1	d	<i>Acacia bancroftiorum</i>
		<i>Callitris glaucophylla</i>
		<i>Acacia macradenia</i>
S2		<i>Alphitonia excelsa</i>
		<i>Carissa ovata</i>
		<i>Acacia leiocalyx</i>
		<i>Acacia longispicata</i>
		<i>Psydrax odorata</i>
		<i>Dodonaea triangularis</i>
		<i>Capparis canescens</i>
		<i>Grewia latifolia</i>
		<i>Hovea longipes</i>
		<i>Owenia acidula</i>
G		<i>Xanthorrhoea johnsonii</i>
G		<i>Dianella caerulea</i>
		<i>Aristida sp.</i>
		<i>Themeda triandra</i>
		<i>Scleria mackaviensis</i>


Str.	Rel. dom.	Scientific Name
		<i>Ancistrachne uncinulata</i>
		<i>Enneapogon lindleyanus</i>
		<i>Cymbopogon bombycinus</i>

**Transect - crown cover measured (transect intercept method)**

Coordinates:	Datum:	Transect length:
Start point	Zone <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	E <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>
End point	Zone <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>	E <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/> <input style="width: 20px; height: 20px;" type="text"/>

Interval (metres)	Intercept	Str.	Height
	m		
	m		
	m		
	m		
	m		
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	m		
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	m		
	m		
	m		

<b>Summary:</b>		
Minimum height of plants included in the transect table:	m	
Intercept of EDL 0 - 50m:		m
Intercept of EDL 50 -100m:		m
Measured crown cover % of EDL 0 -100m:		%
Structural formation:		
Conclusions/notes:		

END

# Quaternary Site Form

## Location

**Site:** Q 26      **Recorder:** PW and JN      **Day/Date:** 8/11/2013 7:00am  
**Project:** Fairview Lot 20  
**Locality:** Photos: N= 0046; E= 0047; S= 0044; W= 0045  
**Coordinates:** Zone 5 5 E 0 6 9 9 6 0 0 N 7 1 5 8 3 6 3 **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	9	8-12	M
T2		-	
T3		-	
S1	6.5	4-8	M
S2	1.2	2-4	M
G		0-2	M

### Structural formation (including height):

Semi-evergreen Vine Thicket

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Slope - hill side

### Land form pattern# (300 m radius):

Escarpment

### Soil and geology:

Skeletal loam (Dark brown colour)

### Slope and aspect:

Southerly

Mapped as 11.10.1/11.10.13

VAST = I

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	c	<i>Brachychiton populneus</i>
	c	<i>Brachychiton rupestris</i>
	a	<i>Atalaya hemiglauca</i>
	a	<i>Corymbia citriodora</i>
S2	a	<i>Geijera parviflora</i>
	d	<i>Diospyros humilis</i>
		<i>Atalaya hemiglauca</i>
		<i>Psydrax odorata</i>
		<i>Jasminum volubile</i>
		<i>Pandorea pandorana</i>
S2		<i>Acalypha capillipes</i>
		<i>Opuntia tomentosa</i> *
		<i>Croton insularis</i>
		<i>Marsdenia viridiflora</i>
		<i>Carissa ovata</i>
		<i>Exocarpos latifolia</i>
		<i>Spartothamnella juncea</i>
		<i>Passiflora sp.</i>
G		<i>Solanum stelligerum</i>
	d	<i>Ancistrachne uncinulata</i>
		<i>Austrostipa ramosissima</i>
		<i>Cyperus gracilis</i>



# Quaternary Site Form

## Location

**Site:** Q 27      **Recorder:** JN/PW      **Day/Date:** 08/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** RoW 120      **Pics:** 0066-0069  
**Coordinates:** Zone   E       N        **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	15-18	S
T2	1	10-14	S
T3		-	
S1	5	4-8	M
S2	1.5	1-3	S
G	0.5	0-0.7	S

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Flat to slightly sloping

Land form pattern# (300 m radius): Plateau

Soil and geology: Red-brown loamy sand

Slope and aspect: < 5°, N/A

VAST 1

Mapped 11.10.1

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T2	d	<i>Corymbia citriodora</i>
T2	a	<i>Eucalyptus crebra</i>
T2	s	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>
S1	a	<i>Acacia longispicata</i>
S1	a	<i>Petalostigma pubescens</i>
S1	a	<i>Alphitonia excelsa</i>
S2	a	<i>Acacia longispicata</i>
S2	a	<i>Petalostigma pubescens</i>
S2	a	<i>Alphitonia excelsa</i>
G	a	<i>Lomandra filiformis</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Dianella caerulea</i>
G	a	<i>Solanum ellipticum</i>
G	a	<i>Solanum parvifolium</i>
G	a	<i>Opuntia tomentosa</i> *
G	a	<i>Abutilon oxycarpum</i>




Str.	Rel. dom.	Scientific Name

**Transect - crown cover measured (transect intercept method)**

<b>Coordinates:</b>	<b>Datum:</b> .....	<b>Transect length:</b> .....
Start point	Zone <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> E <input style="width: 20px;" type="text"/> 0 <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> N <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/>	
End point	Zone <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> E <input style="width: 20px;" type="text"/> 0 <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> N <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/> <input style="width: 20px;" type="text"/>	

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
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-	m		
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-	m		
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-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

<b>Summary:</b>	
Minimum height of plants included in the transect table:	m
Intercept of EDL 0 - 50m:	m
Intercept of EDL 50 - 100m:	m
Measured crown cover % of EDL 0 - 100m:	%
Structural formation:	
Conclusions/notes:	

# Quaternary Site Form

## Location

<b>Site:</b>	Q 28	<b>Recorder:</b>	JN/PW	<b>Day/Date:</b>	08/11/13
<b>Project:</b>	Fairview Lot 20 FTY 1850				
<b>Locality:</b>	800-RG-6399-611L/ RoW 118		Pics: 0091-0094		
<b>Coordinates:</b>	Zone	55	E	6 9 9 1 5 8	N 7 1 6 0 9 4 1
<b>Datum:</b> .....					

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	12	11-13	V
T1	8	7-10	M
T2		-	
T3		-	
S1	6	3-6	D
S2	1.5	1-2	D
G	1.0	0-1	M

### Structural formation (including height):

Semi-evergreen vine thicket

Ecologically dominant layer: T1

Land form element# (40 m radius): Steep slope

Land form pattern# (300 m radius): Steep rocky hillside

Soil and geology: Rocky with dark brown sandy loam

Slope and aspect: < 35-45°, West

VAST 1

Mapped 11.9.4a

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
E	d	<i>Brachychiton rupestris</i>
T1	a	<i>Acacia fasciculifera</i>
T1	a	<i>Diospyros humilis</i>
T1	a	<i>Geijera parviflora</i>
S1	a	<i>Cupaniopsis anacardioides</i>
S1	a	<i>Croton insularis</i>
S1	A	<i>Diospyros humilis</i>
S1	a	<i>Acacia fasciculifera</i>
S1	a	<i>Alphitonia excelsa</i>
S1	a	<i>Hoya australis</i>
S1	a	<i>Erythroxylum australe</i>
S2	a	<i>Psydrax odorata</i>
S2	a	<i>Pittosporum spinescens</i>
S2	a	<i>Turraea pubescens</i>
S2	a	<i>Parsonsia eucalyptophylla</i>
S2	a	<i>Erythroxylum australe</i>
S2	a	<i>Carissa ovata</i>
S2	a	<i>Solanum semiaratum</i>
S2	a	<i>Jasminum simplicifolium subsp. australiense</i>
S2	a	<i>Jasminum volubile</i>
S2	a	<i>Apophyllum anomalum</i>
G	d	<i>Ancistrachne uncinulata</i>
G	a	<i>Scleria sphacelata</i>

Large blank rectangular area with horizontal dashed lines, intended for notes or a sketch.

Str.	Rel. dom.	Scientific Name
G	a	<i>Opuntia tomentosa*</i>

**Transect - crown cover measured (transect intercept method)**

<b>Coordinates:</b>		<b>Datum:</b> _____			<b>Transect length:</b> _____	
Start point	Zone <input type="text"/> <input type="text"/>	E	<input type="text"/> 0 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	N	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	
End point	Zone <input type="text"/> <input type="text"/>	E	<input type="text"/> 0 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	N	<input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
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-	m		
-	m		
-	m		
-	m		
-	m		

<b>Summary:</b>	
Minimum height of plants included in the transect table:	<input type="text"/> m
Intercept of EDL 0 - 50m:	<input type="text"/> m
Intercept of EDL 50 - 100m:	<input type="text"/> m
Measured crown cover % of EDL 0 - 100m:	<input type="text"/> %
Structural formation:	
Conclusions/notes:	

END

# Quaternary Site Form

## Location

<b>Site:</b>	Q 29	<b>Recorder:</b>	PW and JN	<b>Day/Date:</b>	8/11/2013		
<b>Project:</b>	Fairview Lot 20						
<b>Locality:</b>	RoW 132	<b>Photos:</b>	0114 - 0116				
<b>Coordinates:</b>	Zone	5	5	E	0 7 0 2 5 8 6 N 7 1 6 1 5 3 1	<b>Datum:</b>	

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	12	11-13	V
T1	8	6-10	M
T2		-	
T3		-	
S1	4	3-6	S
S2	2	1-3	S
G		0-1	M

### Structural formation (including height):

Semi-evergreen Vine Thicket

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Rocky slope

### Land form pattern# (300 m radius):

Escarpment

### Soil and geology:

Skeletal, rocky loam (Dark brown colour)

### Slope and aspect:

Easterly (80° - 90°)

**Mapped as 11.10.1/11.10.13**

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
E	a	<i>Brachychiton populneus</i>
	a	<i>Eucalyptus crebra</i>
	a	<i>Brachychiton australis</i>
T1	d	<i>Diospyros humilis</i>
		<i>Opuntia tomentosa*</i>
		<i>Atalaya hemiglauca</i>
		<i>Flindersia australis</i>
S1	c	<i>Ficus rubiginosa</i>
		<i>Pittosporum spinescens</i>
		<i>Opuntia tomentosa*</i>
		<i>Secamone elliptica</i>
		<i>Denhamia oleaster</i>
	c	<i>Geijera parviflora</i>
		<i>Parsonsia eucalyptophylla</i>
		<i>Cupaniopsis anacardioides</i>
S2	d	<i>Carissa ovata</i>
		<i>Turraea pubescens</i>
		<i>Opuntia tomentosa*</i>
		<i>Capparis loranthifolia</i>
		<i>Parsonsia eucalyptophylla</i>
G	d	<i>Ancistrachne uncinulata</i>
		<i>Themeda avenacea</i>
		<i>Aristida caput-medusae</i>


Str.	Rel. dom.	Scientific Name
		<i>Platyserium sp.</i>
		<i>Refer to data sheet for additional photos</i>

**Transect - crown cover measured** (*transect intercept method*)

**Coordinates:**                    **Datum:** .....                    **Transect length:** .....  
Start point            Zone  E 0 N   
End point              Zone  E 0 N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

Summary:	
Minimum height of plants included in the transect table:	m
Intercept of EDL 0 - 50m:	m
Intercept of EDL 50 - 100m:	m
Measured crown cover % of EDL 0 - 100m:	%
Structural formation:	
Conclusions/notes:	

# Quaternary Site Form

## Location

<b>Site:</b>	Q 30	<b>Recorder:</b>	PW and JN	<b>Day/Date:</b>	8/11/2013				
<b>Project:</b>	Fairview Lot 20								
<b>Locality:</b>	RoW 132	Aurecon mapped SEVT - Part 2	Photos: 0122 - 0124						
<b>Coordinates:</b>	Zone	5	5	E	0 7 0 3 1 5 8	N	7 1 6 1 3 6 3	<b>Datum:</b>	

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	15	13-18	M
T2	12	10-13	S
T3		-	
S1	5.5	4-8	S
S2	2	1-4	V
G		0-1	M

### Structural formation (including height):

Closed woodland

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Hill slope

### Land form pattern# (300 m radius):

Escarpment

### Soil and geology:

Rocky, skeletal soils - loam (Dark brown colour)

### Slope and aspect:

Northerly

Mapped as 11.10.1/11.10.13

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** - dominant; **c** - codominant; **s** - subdominant; **a** - associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
	a	<i>Eucalyptus fibrosa subsp. nubila</i>
	a	<i>Brachychiton rupestris</i>
T2	d	<i>Corymbia citriodora</i>
		<i>Callitris glaucophylla</i>
S1	d	<i>Acacia longispicata</i>
		<i>Flindersia australis</i>
		<i>Alphitonia excelsa</i>
S2		<i>Ficus rubiginosa</i>
		<i>Santalum lanceolatum</i>
		<i>Psydrax odorata</i>
G		<i>Aristida caput-medusae</i>
		<i>Enneapogon lindleyanus</i>
		<i>Themeda avenacea</i>
		<i>Evolvulus alsinoides</i>
		<i>Nyssanthes erecta</i>
	<i>Cymbopogon bombycinus</i>	



# Quaternary Site Form

## Location

**Site:** Q 31      **Recorder:** PW and JN      **Day/Date:** 8/11/2013  
**Project:** Fairview Lot 20  
**Locality:** RoW 132 and 134      Aurecon mapped SEVT - Part 2      Photos: 0155 - 0158  
**Coordinates:** Zone 5 5 E 0 7 0 3 2 8 2 N 7 1 6 1 1 0 9      **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	13	11-16	S
T2	7	6-11	S
T3		-	
S1	4	2-6	S
S2	1.2	1-2	S
G		0-1	M

### Structural formation (including height):

Closed woodland with SEVT elements

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Hill slope

### Land form pattern# (300 m radius):

Escarpment

### Soil and geology:

Rocky, skeletal soils - loam (Dark brown colour)

### Slope and aspect:

Southerly

Mapped as 11.10.1/11.10.13

VAST = II

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** - dominant; **c** - codominant; **s** - subdominant; **a** - associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
	a	<i>Eucalyptus melanophloia</i>
	a	<i>Callitris glaucophylla</i>
T2	d	<i>Corymbia citriodora</i>
		<i>Callitris glaucophylla</i>
		<i>Erythrina vespertilio</i>
S1		<i>Opuntia tomentosa</i> *
		<i>Acacia leiocalyx</i>
		<i>Ficus rubiginosa</i>
		<i>Cupaniopsis anacardioides</i>
S2		<i>Brachychiton populneus</i>
		<i>Carissa ovata</i>
		<i>Dodonaea stenophylla</i>
		<i>Breynia oblongifolia</i>
		<i>Brachychiton bidwillii</i>
G		<i>Platycerium sp.</i>
		<i>Themeda avenacea</i>
		<i>Ancistrachne uncinulata</i>




Str.	Rel. dom.	Scientific Name
		<i>Refer to data sheet for additional points</i>

**Transect - crown cover measured (transect intercept method)**

**Coordinates:**                      **Datum:** .....                      **Transect length:** .....  
 Start point                      Zone   E 0      N       
 End point                      Zone   E 0      N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:	m
Intercept of EDL 0 - 50m:	m
Intercept of EDL 50 - 100m:	m
Measured crown cover % of EDL 0 - 100m:	%

Structural formation:

Conclusions/notes:


END

# Quaternary Site Form

## Location

**Site:** Q 32      **Recorder:** PW and JN      **Day/Date:** 8/11/2013  
**Project:** Fairview Lot 20  
**Locality:** RoW 132 and 134      Aurecon Mapped SEVT  
**Coordinates:** Zone 5 5 E 0 7 0 3 0 8 5 N 7 1 6 1 2 4 4      **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E	13	12-14	S
T1	7.5	6-10	M
T2		-	
T3		-	
S1	4.5	3-6	S
S2	2	1-3	S
G		0-1	M

### Structural formation (including height):

Semi-evergreen Vine Thicket

### Ecologically dominant layer: T1

### Land form element# (40 m radius):

Hill slope

### Land form pattern# (300 m radius):

Escarpment

### Soil and geology:

Skeletal, rocky loam (Dark brown)

### Slope and aspect:

Steep

### Southerly aspect

VAST = II

Incorrectly mapped as 11.10.1/11.10.13

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
E	a	<i>Brachychiton populneus</i>
	a	<i>Brachychiton rupestris</i>
T1	a	<i>Cupaniopsis anacardioides</i>
	c	<i>Brachychiton populneus</i>
	a	<i>Brachychiton rupestris</i>
	c	<i>Diospyros humilis</i>
	a	<i>Geijera parviflora</i>
S1	d	<i>Ficus rubiginosa</i>
		<i>Jasminum volubile</i>
		<i>Cupaniopsis anacardioides</i>
		<i>Flindersia australis</i>
		<i>Acalypha capillipes</i>
		<i>Pandorea pandorana</i>
		<i>Opuntia tomentosa*</i>
S2		<i>Turraea pubescens</i>
		<i>Ficus rubiginosa</i>
	d	<i>Carissa ovata</i>
		<i>Hoya australis</i>
		<i>Platycerium sp.</i>
		<i>Psydrax odorata</i>
		<i>Hovea longipes</i>
		<i>Solanum semiarmatum</i>
		<i>Croton insularis</i>
		<i>Opuntia tomentosa*</i>


Str.	Rel. dom.	Scientific Name
G		<i>Ancistrachne uncinulata</i>

**Transect - crown cover measured (transect intercept method)**

<b>Coordinates:</b>	<b>Datum:</b>	<b>Transect length:</b>
Start point	Zone <input type="text"/> <input type="text"/> E 0 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> N <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>
End point	Zone <input type="text"/> <input type="text"/> E 0 <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> N <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/> <input type="text"/>	<input type="text"/>

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
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-	m		
-	m		
-	m		

Summary:	
Minimum height of plants included in the transect table:	<input type="text"/> m
Intercept of EDL 0 - 50m:	<input type="text"/> m
Intercept of EDL 50 - 100m:	<input type="text"/> m
Measured crown cover % of EDL 0 - 100m:	<input type="text"/> %
Structural formation:	
Conclusions/notes:	

**END**

# Quaternary Site Form

## Location

**Site:** Q 33      **Recorder:** JN/PW      **Day/Date:** 08/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** 315-RG-6344-613      **Pics:** 0445-0448 (Jess' camera)  
**Coordinates:** Zone  E       N        **Datum:**

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	12-16	S
T2	10	8-11	M
T3		-	
S1	5	4-7	M
S2	2.5	1-3	S
G	0.5	0-1	S

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Moderately-steep

slope

Land form pattern# (300 m radius): Steep hillside of low

hill/jump-up

Soil and geology: Light-brown loamy sand with granite

boulders and outcrops

Slope and aspect: 15°, North

VAST 1

Mapped 11.3.39/11.3.2

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	s	<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>
T1	a	<i>Corymbia tessellaris</i>
T2	d	<i>Callitris glaucophylla</i>
T2	a	<i>Acacia fasciculifera</i>
T2	a	<i>Brachychiton populneus</i>
T2	a	<i>Grevillea striata</i>
S1	d	<i>Petalostigma pubescens</i>
S1	a	<i>Croton insularis</i>
S1	a	<i>Alphitonia excelsa</i>
S2	a	<i>Opuntia tomentosa</i> *
S2	a	<i>Psydrax odorata</i>
S2	a	<i>Geijera parviflora</i>
S2	a	<i>Alphitonia excelsa</i>
S2	c	<i>Turraea pubescens</i>
S2	a	<i>Croton insularis</i>
S2	a	<i>Eustrephus latifolius</i>
S2	a	<i>Notelaea microcarpa</i>
S2	a	<i>Acacia bancroftiorum</i>
G	a	<i>Calotis cuneata</i>
G	a	<i>Ancistrachne uncinulata</i>
G	a	<i>Capparis lasiantha</i>
G	a	<i>Aristida caput-medusae</i>

	<b>Str.</b>	<b>Rel. dom.</b>	<b>Scientific Name</b>
	G	a	<i>Cenchrus ciliaris</i> *

**Transect - crown cover measured (transect intercept method)**

**Coordinates:**                      **Datum:**                      **Transect length:** \_\_\_\_\_  
 Start point          Zone  E 0  N   
 End point              Zone  E 0  N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

**Summary:**

Minimum height of plants included in the transect table:          m

Intercept of EDL 0 - 50m:    m

Intercept of EDL 50 -100m:    m

Measured crown cover % of EDL 0 -100m:    %

Structural formation: \_\_\_\_\_

Conclusions/notes: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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\_\_\_\_\_

# Quaternary Site Form

## Location

**Site:** Q 34      **Recorder:** JN/PW      **Day/Date:** 08/11/13  
**Project:** Fairview Lot 20 FTY 1850  
**Locality:** 200-AW-6755-611L      Pics: 9170-9173 (Simon's camera)  
**Coordinates:** Zone   E        N        **Datum:** .....

## Vegetation structure

Median height of EDL is to be measured  
 Cover density is to be estimated  
 D = touching-overlap <0; M = touching-slight separation 0-0.25;  
 S = clearly separated 0.25-1; V = well separated 1-20

Stratum	Median height	Height interval	Est. cover density (D,M,S,V)
E		-	
T1	16	14-17	S
T2	11	10-13	S
T3		-	
S1	7	6-8	M
S2	2.5	2-4	M
G	0.4	0-1	S

### Structural formation (including height):

Open woodland

Ecologically dominant layer: T1

Land form element# (40 m radius): Moderately-steep slope

Land form pattern# (300 m radius): Slope towards water-course among rolling hills

Soil and geology: Light-brown sandy with granite boulders and outcrops

Slope and aspect: 15°, South

Recently burnt (within 12 months)

VAST 1

Mapped 11.3.39/11.3.2

## Plant species

Record relative (numerical) dominance for each stratum;  
**d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated  
 \* = exotic; <sup>2</sup> = class 2 declared weed; <sup>3</sup> = class 3 declared weed

Str.	Rel. dom.	Scientific Name
T1	d	<i>Corymbia citriodora</i>
T1	s	<i>Eucalyptus crebra</i>
T2	d	<i>Eucalyptus crebra</i>
T2	a	<i>Acacia shirleyi</i>
S1	d	<i>Acacia shirleyi</i>
S1	a	<i>Eucalyptus crebra</i>
S1	a	<i>Callitris glaucophylla</i>
S2	d	<i>Acacia leiocalyx</i>
S2	s	<i>Acacia longispicata</i>
S2	a	<i>Geijera parviflora</i>
S2	a	<i>Alphitonia excelsa</i>
S2	a	<i>Callitris glaucophylla</i>
G	a	<i>Eremophila debilis</i>
G	a	<i>Aristida calycina</i>
G	a	<i>Cymbopogon refractus</i>
G	a	<i>Themeda triandra</i>
G	a	<i>Aristida caput-medusae</i>
G	a	<i>Spermacoce multicaulis</i>
G	a	<i>Opuntia tomentosa*</i>


Str.	Rel. dom.	Scientific Name

**Transect - crown cover measured** (transect intercept method)

Coordinates:                      Datum:                      Transect length:                     

Start point                  Zone   E 0       N

End point                      Zone   E 0       N

Interval (metres)	Intercept	Str.	Height
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		
-	m		

<b>Summary:</b>		
Minimum height of plants included in the transect table:	<input type="text"/>	m
Intercept of EDL 0 - 50m:		m
Intercept of EDL 50 - 100m:		m
Measured crown cover % of EDL 0 - 100m:		%
Structural formation:		
Conclusions/notes:		

## Vegetation community/ analogue site

<b>Site:</b> VC 1		<b>Date:</b> 03/11/13		<b>Lot/plan:</b> Lot 20 FTY1805		<b>Obs:</b> JN/PW																																																																																																																																																																																																																																																																																																																							
<b>Photo nos:</b> North: 9288		East: 9290		South: 9289		West: 9287																																																																																																																																																																																																																																																																																																																							
<b>RE type:</b> 11.10.1 (Mapped 11.10.1/11.10.13a)				<b>GPS coords:</b> Zone 55 701543, 7159463																																																																																																																																																																																																																																																																																																																									
<b>Location description:</b> 250-AW-6805-61/ RoW 121																																																																																																																																																																																																																																																																																																																													
<b>Structural formation/Veg community:</b> Open woodland dominated by <i>Corymbia citriodora</i> and <i>Eucalyptus fibrosa</i> subsp. <i>nubila</i> , on plateau of a rocky jump-up																																																																																																																																																																																																																																																																																																																													
<b>Ecologically dominant layer:</b> T1																																																																																																																																																																																																																																																																																																																													
<b>Disturbance:</b>																																																																																																																																																																																																																																																																																																																													
<b>Wildfire</b> (0=<1yr, 1=1-5yr, 2=>5yr): <b>0</b>				<b>Grazing</b> (0=none to 3=severe): <b>0</b>																																																																																																																																																																																																																																																																																																																									
<b>Weeds</b> (0=none to 3=severe): <b>0</b>				<b>Erosion</b> (0=none to 3=severe): <b>0</b>																																																																																																																																																																																																																																																																																																																									
<b>Clearing</b> (0=none to 3=severe): <b>0</b>				<b>Other:</b>																																																																																																																																																																																																																																																																																																																									
<b>VAST condition</b> (see VAST table): <b>1</b>																																																																																																																																																																																																																																																																																																																													
<b>Erosion definition:</b> 0=stable, 1=slight disturbance (ie cattle tracks), 2 = moderate (pedestalling, sheet, rill), 3 = severe (pedestals, scalds, sand blown, exposure),																																																																																																																																																																																																																																																																																																																													
<b>Grazing definition:</b> 0=none, 1=small amount from few plants, 2=small to moderate amount from many plants, 3=moderate to large amount from many plants																																																																																																																																																																																																																																																																																																																													
<b>Clearing definition:</b> 0=none, 1=small amount/historic yet still remnant, 2= moderate amount, regrowth or near remnant status, 3=large amount, non-rem																																																																																																																																																																																																																																																																																																																													
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<b>Size of patch</b> (area ha): > 1000 ha				<b>Shape of patch:</b> (large polygon, linear <200m wide) <b>Large polygon</b>																																																																																																																																																																																																																																																																																																																									
<b>Location of patch</b> (low, med, high, very high): <b>Very high</b>				<b>Presence of edge effects impacts</b> (0=none to 3=severe): (weeds, light, wind, sp. composition) <b>1</b>																																																																																																																																																																																																																																																																																																																									
<b>Location of patch:</b> <b>low</b> =not connected to remnant or regrowth veg, <b>med</b> =connected to remnant veg along 10-50% of border OR connected to remnant veg along 1-10% of border and regrowth >25% of border, <b>high</b> = connected to remnant 50-75% of border, <b>very high</b> = connected to remnant >75% of border																																																																																																																																																																																																																																																																																																																													
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Ground cover (5 x 1m <sup>2</sup> plots, 0, 25, 50, 75, 100)	1	2	3	4	5	Mean
Native grass	10	10	7	20	0	9.4
Native herbs/forbs (non-grass)	3	15	10	5	3	7.2
Native shrubs (< 1m height)	15	0	0	0	0	3
Non-native grass	0	0	0	0	0	0
Non-native herbs and shrubs	0	0	0	0	0	0
Litter (woodies <10 cm diameter, dead annuals, etc.)	30	40	20	25	5	24
Litter (logs > 10 cm diameter)	10	5	10	3	60	17.6
Rock	0	0	5	0	8	2.6
Bare ground	32	30	48	47	24	36.2
<b>Total</b>	<b>=100%</b>	<b>=100%</b>	<b>=100%</b>	<b>=100%</b>	<b>=100%</b>	<b>100</b>
Species in 1 x 1 m quadrat	%	%	%	%	%	Mean
<i>Digitaria divaricatissima</i>	10	0	0	0	0	2
<i>Tricoryne elatior</i>	1	1	0	5	0	1.4
<i>Lomandra multiflora</i>	2	0	10	0	0	2.4
<i>Petalostigma pubescens</i>	15	0	0	0	0	3
<i>Glycine tomentella</i>	<1	0	0	0	0	0.2
<i>Dianella caerulea</i>	0	14	0	0	0	2.8
<i>Heteropogon contortus</i>	0	10	0	0	0	2
<i>Ancistrachne uncinulata</i>	0	0	5	0	0	1
<i>Aristida</i> sp.	0	0	2	0	0	0.4
<i>Eulalia aurea</i>	0	0	0	20	0	4
<i>Lomandra filiformis</i>	0	0	0	0	3	0.6

Other groundcover species (not in 1x1 m plots)				
Species	Strata	Rel. dom.	Height (m)	Cover estimate <u>100 x 50</u> (0.5 ha) (%)
<i>Spermacoce multicaulis</i>	G	a	0.5	<1
<i>Calotis lappulacea</i>	G	a	0.5	<1
<i>Cymbopogon bombycinus</i>	G	a	0.7	2
<i>Fimbristylis dichotoma</i>	G	a	0.4	5
<i>Enneapogon lindleyanus</i>	G	a	0.4	5
<i>Cheilanthes sieberi</i>	G	a	0.1	2
<i>Chrysopogon fallax</i>	G	a	0.5	5
<i>Eriachne mucronata</i>	G	a	0.6	10
<i>Aristida caput-medusae</i>	G	a	0.6	5
<i>Pterocaulon redolens</i>	G	a	0.7	1
<i>Dianella caerulea</i>	G	a	0.5	5





## Vegetation community/ analogue site

<b>Site:</b> VC 2		<b>Date:</b> 03/11/13		<b>Lot/plan:</b> Lot 20 FTY1805		<b>Obs:</b> JN/PW																																																																																																																																																																																																																																																																																																																							
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<b>Location description:</b> 800-RG-6399-613																																																																																																																																																																																																																																																																																																																													
<b>Structural formation/Veg community:</b> Semi-evergreen vine thicket on rocky escarpment																																																																																																																																																																																																																																																																																																																													
<b>Ecologically dominant layer:</b> T1																																																																																																																																																																																																																																																																																																																													
<b>Disturbance:</b>																																																																																																																																																																																																																																																																																																																													
<b>Wildfire</b> (0=<1yr, 1=1-5yr, 2=>5yr): <b>2</b>				<b>Grazing</b> (0=none to 3=severe): <b>0</b>																																																																																																																																																																																																																																																																																																																									
<b>Weeds</b> (0=none to 3=severe): <b>1</b>				<b>Erosion</b> (0=none to 3=severe): <b>0</b>																																																																																																																																																																																																																																																																																																																									
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<b>VAST condition</b> (see VAST table): <b>1</b>																																																																																																																																																																																																																																																																																																																													
<b>Erosion definition:</b> 0=stable, 1=slight disturbance (ie cattle tracks), 2 = moderate (pedestalling, sheet, rill), 3 = severe (pedestals, scalds, sand blown, exposure),																																																																																																																																																																																																																																																																																																																													
<b>Grazing definition:</b> 0=none, 1=small amount from few plants, 2=small to moderate amount from many plants, 3=moderate to large amount from many plants																																																																																																																																																																																																																																																																																																																													
<b>Clearing definition:</b> 0=none, 1=small amount/historic yet still remnant, 2= moderate amount, regrowth or near remnant status, 3=large amount, non-rem																																																																																																																																																																																																																																																																																																																													
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<b>Size of patch</b> (area ha): 100-500 ha				<b>Shape of patch:</b> (large polygon, linear <200m wide) <b>Large polygon</b>																																																																																																																																																																																																																																																																																																																									
<b>Location of patch</b> (low, med, high, very high): <b>Very high</b>				<b>Presence of edge effects impacts</b> (0=none to 3=severe): (weeds, light, wind, sp. composition) <b>0</b>																																																																																																																																																																																																																																																																																																																									
<b>Location of patch:</b> <b>low</b> =not connected to remnant or regrowth veg, <b>med</b> =connected to remnant veg along 10-50% of border OR connected to remnant veg along 1-10% of border and regrowth >25% of border, <b>high</b> = connected to remnant 50-75% of border, <b>very high</b> = connected to remnant >75% of border																																																																																																																																																																																																																																																																																																																													
<b>Edge effects definition:</b> <b>0</b> = stable, <b>1</b> = slight disturbance (ie couple non native sp), <b>2</b> = moderate (minor disturbance, some non native sp), <b>3</b> = severe (different sp composition, wind damage, differences in light amount)																																																																																																																																																																																																																																																																																																																													
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depression</td> <td>SH</td> <td>Steep hills</td> </tr> <tr> <td colspan="10"><b>Hills, Mountains, Tablelands</b></td> </tr> <tr> <td>F</td> <td>Slope or Hill not specified</td> <td>MOU</td> <td>Mound</td> <td>FOO</td> <td>Footslope</td> <td>STC</td> <td>Stream channel</td> <td>VH</td> <td>Very steep hills</td> </tr> <tr> <td>L</td> <td>Cliff (steep rocky faces), rocky ledge, rocky outcrop, scarp, crevice</td> <td>LEV</td> <td>Levee</td> <td>TAL</td> <td>Talus</td> <td>STB</td> <td>Stream bed</td> <td>PH</td> <td>Precipitous hills</td> </tr> <tr> <td>N</td> <td>Coastal rocky headland</td> <td>BAR</td> <td>Bar</td> <td>PLA</td> <td>Plain</td> <td>TDC</td> <td>Tidal creek</td> <td>UL</td> <td>Undulating low hills</td> </tr> <tr> <td>K</td> <td>Top, crest of mountain or ridge</td> <td>SCR</td> <td>Scroll</td> <td>RFL</td> <td>Rock flat</td> <td>EST</td> <td>Estuary</td> <td>RL</td> <td>Rolling low hills</td> </tr> <tr> <td>Q</td> <td>Jump Up (Cuesta) and Mesa, Tableland, Plateau,</td> <td>PST</td> <td>Prior stream</td> <td>RPL</td> <td>Rock platform</td> <td>SWP</td> <td>Swamp</td> <td>SL</td> <td>Steep low hills</td> </tr> <tr> <td colspan="10"><b>Dunes</b></td> </tr> <tr> <td>R</td> <td>Recent Coastal Dune (low dune less than about 15m) and</td> <td>FOR</td> <td>Foredune</td> <td>COS</td> <td>Cut-over surface</td> <td>SWL</td> <td>Swale</td> <td>VL</td> <td>Very steep low hills</td> </tr> <tr> <td>S</td> <td>Fossil Coastal Dune (High Dune greater than about 15m)</td> <td>LUN</td> <td>Lunette</td> <td>SCD</td> <td>Scald</td> <td>TRE</td> <td>Trench</td> <td>B</td> <td>Badlands</td> </tr> <tr> <td>T</td> <td>Inland Dune.</td> <td>BRI</td> <td>Beach ridge</td> <td>FAN</td> <td>Fan</td> <td>LAK</td> <td>Lake</td> <td>GR</td> <td>Gently undulating rises</td> </tr> <tr> <td colspan="10"><b>Water</b></td> </tr> <tr> <td>W</td> <td>Swamp or Marsh.</td> <td>EMB</td> <td>Embankment</td> <td>VLF</td> <td>Valley flat</td> <td>PLY</td> <td>Playa</td> <td>UR</td> <td>Undulating 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<b>Tree and shrub stem counts</b>			
<b>Canopy Species (E, T1, T2,T3)</b> Greater than 20 cm DBH only	<b>Strata</b>	<b>Height (m)</b>	<b>Stem count (in <u>100 x 50 (0.5 ha area)</u>)</b> Results x 2 = stems per ha
<i>Geijera parviflora</i>	T1	8	6
<i>Brachychiton rupestris</i>	E	11.5	4
<i>Capparis mitchellii</i>	S1	5	2
<i>Brachychiton populneus</i>	E	11.5	2
<i>Petalostigma pubescens</i>	S1	5	2

<b>Shrub Species (S1, S2)</b>	<b>Strata</b>	<b>Height (m)</b>	<b>Stem count (in <u>50 x 10 (0.05 ha)</u>)</b> Results x 20 = stems per ha
<i>Erythroxylon australe</i>	S2	1.5	4
<i>Carissa ovate</i>	S2	1.5	6
<i>Turraea pubescens</i>	S1	5	2
<i>Terminalia oblongata</i>	S1	5	2
<i>Jasminum volubile</i>	S2	1.5	4
<i>Alectryon diversifolius</i>	S2	1.5	2
<i>Jasminum simplicifolium</i>	S2	1.5	2
<i>Petalostigma pubescens</i>	S1	5	7
<i>Croton insularis</i>	S2	1.5	3
<i>Solanum semiarmatum</i>	S1	5	4
<i>Atalaya hemiglauca</i>	S1	5	5
<i>Diospyros humilis</i>	S1	5	1
<i>Notelaea microcarpa</i>	S1	5	2
<i>Denhamia sp.</i>	S1	5	1
<i>Denhamia oleaster</i>	S2	1.5	1
<i>Petalostigma pubescens</i>	S1	5	1
<i>Psydrax odorata</i>	S1	5	3

## Vegetation community/ analogue site

<b>Site:</b> VC 3		<b>Date:</b> 04/11/13		<b>Lot/plan:</b> Lot 20 FTY1805		<b>Obs:</b> JN/PW																																																																																																																																																																																																																																																																																																																							
<b>Photo nos:</b> North: 9416		East: 9414		South: 9415		West: 9417																																																																																																																																																																																																																																																																																																																							
<b>RE type:</b> 11.10.1 (Mapped 11.10.1/11.10.13a)				<b>GPS coords:</b> Zone 55 704250, 7161101																																																																																																																																																																																																																																																																																																																									
<b>Location description:</b> 560-RG-6355-613 / RoW 135																																																																																																																																																																																																																																																																																																																													
<b>Structural formation/Veg community:</b> Open woodland dominated by <i>Eucalyptus fibrosa</i> subsp. <i>Nubile</i> and <i>Eucalyptus crebra</i> , on plateau of a rocky jump-up																																																																																																																																																																																																																																																																																																																													
<b>Ecologically dominant layer:</b> T1																																																																																																																																																																																																																																																																																																																													
<b>Disturbance:</b>																																																																																																																																																																																																																																																																																																																													
<b>Wildfire</b> (0=<1yr, 1=1-5yr, 2=>5yr): <b>0</b>				<b>Grazing</b> (0=none to 3=severe): <b>1</b>																																																																																																																																																																																																																																																																																																																									
<b>Weeds</b> (0=none to 3=severe): <b>1</b>				<b>Erosion</b> (0=none to 3=severe): <b>0</b>																																																																																																																																																																																																																																																																																																																									
<b>Clearing</b> (0=none to 3=severe): <b>1</b>				<b>Other:</b>																																																																																																																																																																																																																																																																																																																									
<b>VAST condition</b> (see VAST table): <b>2</b>																																																																																																																																																																																																																																																																																																																													
<b>Erosion definition:</b> 0=stable, 1=slight disturbance (ie cattle tracks), 2 = moderate (pedestalling, sheet, rill), 3 = severe (pedestals, scalds, sand blown, exposure), <b>Grazing definition:</b> 0=none, 1=small amount from few plants, 2=small to moderate amount from many plants, 3=moderate to large amount from many plants <b>Clearing definition:</b> 0=none, 1=small amount/historic yet still remnant, 2= moderate amount, regrowth or near remnant status, 3=large amount, non-rem																																																																																																																																																																																																																																																																																																																													
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<b>Size of patch</b> (area ha): > 1000 ha				<b>Shape of patch:</b> (large polygon, linear <200m wide) <b>Large polygon</b>																																																																																																																																																																																																																																																																																																																									
<b>Location of patch</b> (low, med, high, very high): <b>Very high</b>				<b>Presence of edge effects impacts</b> (0=none to 3=severe): (weeds, light, wind, sp. composition) <b>1</b>																																																																																																																																																																																																																																																																																																																									
<b>Location of patch:</b> <b>low</b> =not connected to remnant or regrowth veg, <b>med</b> =connected to remnant veg along 10-50% of border OR connected to remnant veg along 1-10% of border and regrowth >25% of border, <b>high</b> = connected to remnant 50-75% of border, <b>very high</b> = connected to remnant >75% of border <b>Edge effects definition:</b> <b>0</b> = stable, <b>1</b> = slight disturbance (ie couple non native sp), <b>2</b> = moderate (minor disturbance, some non native sp), <b>3</b> = severe (different sp composition, wind damage, differences in light amount)																																																																																																																																																																																																																																																																																																																													
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<b>Top soil depth:</b> D		<b>Soil colour:</b> Reddish-brown			<b>Texture:</b> Sandy loam																																																																																																																																																																																																																																																																																																																								
<b>Notes, potential landzone:</b> 10																																																																																																																																																																																																																																																																																																																													
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th colspan="2">Situation</th> <th colspan="4">Element</th> <th colspan="2">Pattern</th> <th colspan="2">Slope Position</th> </tr> <tr> <th>Code</th> <th>Description</th> <th>Code</th> <th>Description</th> <th>Code</th> <th>Description</th> <th>Code</th> <th>Description</th> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td colspan="10">Plains</td> </tr> <tr> <td>A</td> <td>Not otherwise specified, flat gentle slopes; undulating terrain</td> <td>HCR</td> <td>Hillcrest</td> <td>DUS</td> <td>Duneslope</td> <td>STF</td> <td>Supratidal flat</td> <td>RM</td> <td>Rolling mountains</td> </tr> <tr> <td>B</td> <td>Alluvial plain or flat, alluvium, flood plain</td> <td>SUS</td> <td>Summit Surface</td> <td>BRK</td> <td>Breakaway</td> <td>FIL</td> <td>Fill-top</td> <td>SM</td> <td>Steep mountains</td> </tr> <tr> <td>U</td> <td>Claypan, Playa or Salina (including inland lakes), Salt 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<td>Steep hills</td> </tr> <tr> <td colspan="10">Hills, Mountains, Tablelands</td> </tr> <tr> <td>F</td> <td>Slope or Hill not specified</td> <td>MOU</td> <td>Mound</td> <td>FOO</td> <td>Footslope</td> <td>STC</td> <td>Stream channel</td> <td>VH</td> <td>Very steep hills</td> </tr> <tr> <td>L</td> <td>Cliff (steep rocky faces), rocky ledge, rocky outcrop, scarp, crevice</td> <td>LEV</td> <td>Levee</td> <td>TAL</td> <td>Talus</td> <td>STB</td> <td>Stream bed</td> <td>PH</td> <td>Precipitous hills</td> </tr> <tr> <td>N</td> <td>Coastal rocky headland</td> <td>BAR</td> <td>Bar</td> <td>PLA</td> <td>Plain</td> <td>TDC</td> <td>Tidal creek</td> <td>UL</td> <td>Undulating low hills</td> </tr> <tr> <td>K</td> <td>Top, crest of mountain or ridge</td> <td>SCR</td> <td>Scroll</td> <td>RFL</td> <td>Rock flat</td> <td>EST</td> <td>Estuary</td> <td>RL</td> <td>Rolling low hills</td> </tr> <tr> <td>Q</td> <td>Jump Up (Cuesta) and Mesa, Tableland, Plateau,</td> <td>PST</td> <td>Prior stream</td> 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Tree and shrub canopy cover (estimate)	E	T1	T2	T3	S1	S2	G
Average height (m)	N/A	12	8	N/A	4.5	1.5	0.6
Height range (m)	N/A	10-16	6-10	N/A	4-6	1-4	0-1
Line intercept totals (from below table)	N/A	28.0	12.1	N/A	11.4	1.2	N/A
Cover density estimate (D, M, S, V)	N/A	S	S	N/A	S	V	M

D = touching-overlap <0; M = touching-slight separation 0-0.25; S = clearly separated 0.25-1; V = well separated 1-20

Relative dominance (below): **d** – dominant; **c** – codominant; **s** – subdominant; **a** – associated

Tree and shrub canopy cover (100m line intercept)				
Species	Strata	Rel. dom.	Height (m)	Cover (100m line transect) (%)
<i>Petalostigma pubescens</i>	S1	a	3	0.2
<i>Petalostigma pubescens</i>	S1	a	6.5	8.2
<i>Petalostigma pubescens</i>	S2	a	2.5	0.9
<i>Petalostigma pubescens</i>	T2	a	7	2.8
<i>Eucalyptus crebra</i>	T1	c	11	2.4
<i>Petalostigma pubescens</i>	T2	a	7	1.4
<i>Eucalyptus crebra</i>	T2	a	9	3.3
<i>Petalostigma pubescens</i>	S1	a	6	3.0
<i>Eucalyptus crebra</i>	T1	c	12	3.7
<i>Eucalyptus crebra</i>	T1	c	13	2.1
<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>	T1	c	13	3.3
<i>Petalostigma pubescens</i>	S2	a	2.5	0.3
<i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>	T1	c	14	5.3
<i>Eucalyptus crebra</i>	T1	c	16	6.1
<i>Eucalyptus crebra</i>	T2	a	9	3.5
<i>Eucalyptus crebra</i>	T1	c	10	1.2
<i>Eucalyptus crebra</i>	T2	a	9	1.1
<i>Corymbia trachyphloia</i>	T1	a	14	3.9

Other tree and shrub species (not in 100 m transect)				
Species	Strata	Rel. dom.	Height (m)	Cover estimate 100 x 50 (0.5 ha) (%)
<i>Callitris glaucophylla</i>	T2	d	8	20
<i>Corymbia citriodora</i>	T1	a	14	15



## Vegetation community/ analogue site

<b>Site:</b> VC 4		<b>Date:</b> 04/11/13		<b>Lot/plan:</b> Lot 20 FTY1805		<b>Obs:</b> JN/PW	
<b>Photo nos:</b> North: 9440		East: 9441		South: 9438		West: 9439	
<b>RE type:</b> 11.10.1 (Mapped 11.3.39/11.3.2)				<b>GPS coords:</b> Zone 55 700713, 7163345			
<b>Location description:</b> 125-AW-6745-61							
<b>Structural formation/Veg community:</b> Open woodland dominated by <i>Corymbia citriodora</i> and <i>Eucalyptus crebra</i> , on gentle slope at foothill or granite jump-up							
<b>Ecologically dominant layer:</b> T1							
<b>Disturbance:</b>							
<b>Wildfire</b> (0=<1yr, 1=1-5yr, 2=>5yr): <b>0</b>				<b>Grazing</b> (0=none to 3=severe): <b>1</b>			
<b>Weeds</b> (0=none to 3=severe): <b>1</b>				<b>Erosion</b> (0=none to 3=severe): <b>0</b>			
<b>Clearing</b> (0=none to 3=severe): <b>1</b>				<b>Other:</b>			
<b>VAST condition</b> (see VAST table): <b>2</b>							
<b>Erosion definition:</b> 0=stable, 1=slight disturbance (ie cattle tracks), 2 = moderate (pedestalling, sheet, rill), 3 = severe (pedestals, scalds, sand blown, exposure),							
<b>Grazing definition:</b> 0=none, 1=small amount from few plants, 2=small to moderate amount from many plants, 3=moderate to large amount from many plants							
<b>Clearing definition:</b> 0=none, 1=small amount/historic yet still remnant, 2= moderate amount, regrowth or near remnant status, 3=large amount, non-rem							
<b>Ecosystem function:</b>							
<b>Size of patch</b> (area ha): > 1000 ha				<b>Shape of patch:</b> (large polygon, linear <200m wide) <b>Narrow section of remnant vegetation that is part of a larger contiguous RE polygon</b>			
<b>Location of patch</b> (low, med, high, very high): <b>High</b>				<b>Presence of edge effects impacts</b> (0=none to 3=severe): (weeds, light, wind, sp. composition) <b>2</b>			
<b>Location of patch:</b> <b>low</b> =not connected to remnant or regrowth veg, <b>med</b> =connected to remnant veg along 10-50% of border OR connected to remnant veg along 1-10% of border and regrowth >25% of border, <b>high</b> = connected to remnant 50-75% of border, <b>very high</b> = connected to remnant >75% of border							
<b>Edge effects definition:</b> <b>0</b> = stable, <b>1</b> = slight disturbance (ie couple non native sp), <b>2</b> = moderate (minor disturbance, some non native sp), <b>3</b> = severe (different sp composition, wind damage, differences in light amount)							
<b>Landform</b>							
<b>Situation:</b> F		<b>Element:</b> HSL			<b>Pattern:</b> UL		
<b>Slope position:</b> L		<b>Slope degree:</b> <10°			<b>Slope aspect:</b> East-south-east		
<b>Top soil depth:</b> D		<b>Soil colour:</b> Light grey-brown			<b>Texture:</b> Sandy		
<b>Notes, potential landzone:</b> 10, scattered granite boulders sitting on surface and exposed in places.							

Situation		Element						Pattern			Slope Position	
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	
<b>Plains</b>												
A	Not otherwise specified, flat gentle slopes; undulating terrain	HCR	Hillcrest	DUS	Duneslope	STF	Supratidal flat	RM	Rolling mountains	C	Crest	
B	Alluvial plain or flat, alluvium, flood plain	SUS	Summit Surface	BRK	Breakaway	FIL	Fill-top	SM	Steep mountains	D	Closed Depression	
	Claypan, Playa or Salina (including inland lakes), Salt Flat (Inland).	DUC	Dunecrest	CFS	Cliff-foot slope	REF	Feef flat	VM	Very steep mountains	F	Flat	
U	Tidal Flat (coastal), Salt Flat (coastal).	TOR	Tor	SFS	Scarp-foot Slope	ALC	Alcove	PM	Precipitous mountains	G	Gully	
V	Tidal Flat (coastal), Salt Flat (coastal).	TUM	Tumulus	BEN	Bench	GUL	Gully	UH	Undulating hills	H	Hillock	
<b>Streams, Lakes</b>												
C	Banks of lake, river, stream, watercourse, levees	DUN	Dune	BER	Berm	CIR	Cirque	RH	Rolling hills	L	Lower-Slope	
D	Gully, drainage line, ravine gorge, outwash	CON	Cone	PED	Pediment	DDE	depression	SH	Steep hills	M	Mid-Slope	
E	Channel Bed, distributaries of inland streams	MOU	Mound	FOO	Footslope	STC	Stream channel	VH	Very steep hills	P	Plateau	
<b>Hills, Mountains, Tablelands</b>												
F	Slope or Hill not specified	LEV	Levee	TAL	Talus	STB	Stream bed	PH	Precipitous hills	R	Ridge	
L	Cliff (steep rocky faces), rocky ledge, rocky outcrop, scarp, crevice	BAR	Bar	PLA	Plain	TDC	Tidal creek	UL	Undulating low hills	U	Upper-Slope	
N	Coastal rocky headland	SCR	Scroll	RFL	Rock flat	EST	Estuary	RL	Rolling low hills	V	Open Depression	
K	Top, crest of mountain or ridge	PST	Prior stream	RPL	Rock platform	SWP	Swamp	SL	Steep low hills	W	Wetland	
Q	Jump Up (Cuesta) and Mesa, Tableland, Plateau,	FOR	Foredune	COS	Cut-over surface	SWL	Swale	VL	Very steep low hills			
<b>Dunes</b>												
R	Recent Coastal Dune (low dune less than about 15m) and	LUN	Lunette	SCD	Scald	TRE	Trench	B	Badlands	<b>Soil Depth</b>		
S	Fossil Coastal Dune (High Dune greater than about 15m)	BRI	Beach ridge	FAN	Fan	LAK	Lake	GR	Gently undulating rises	Code	Description	
T	Inland Dune.	EMB	Embankment	VLV	Valley flat	PLY	Playa	UR	Undulating rises	D	Deep	
<b>Water</b>												
W	Swamp or Marsh.	DAM	Dam	WTF	Terrace flat	DOL	Doline	RR	Rolling rises	S	Shallow	
X	Fresh Water Aquatic.	CLI	Cliff	CBE	Channel bench	OXB	Ox-bow	SR	Steep rises	X	Skeletal	
Y	Salt Water Aquatic.	SCA	Scarp	BKP	Backplain	LAG	Lagoon	LP	Level plain			
Z	Melon Holes, Gugal, Depressions in Soil, Sink Holes.	HSL	Hillslope	SRP	Scroll plain	BOU	Blow-out	GP	Gently undulating plain			
		CUT	Cut face	FLD	Flood-out	MAA	Maar	UP	Undulating plain			
		LDS	Landslide	TEP	Terrace plain	CRA	Crater	RP	Rolling plain			
		BAN	(Stream) Bank	TDF	Tidal flat	PIT	Pit					
		BEA	Beach	IFF	Intertidal flat							







## Vegetation community/ analogue site

<b>Site:</b> VC 5		<b>Date:</b> 04/11/13		<b>Lot/plan:</b> Lot 20 FTY1805		<b>Obs:</b> JN/PW																																																																																																																																																																																																																																																																																																																							
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<b>RE type:</b> Non-remnant				<b>GPS coords:</b> Zone 55 700185, 7162088																																																																																																																																																																																																																																																																																																																									
<b>Location description:</b> 710-RG-6419-613 / RoW 129																																																																																																																																																																																																																																																																																																																													
<b>Structural formation/Veg community:</b> Non-remnant shrubby low regrowth. Evidence of recent fire (within last 12 months).																																																																																																																																																																																																																																																																																																																													
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depression</td> <td>SH</td> <td>Steep hills</td> </tr> <tr> <td colspan="10"><b>Hills, Mountains, Tablelands</b></td> </tr> <tr> <td>F</td> <td>Slope or Hill not specified</td> <td>MOU</td> <td>Mound</td> <td>FOO</td> <td>Footslope</td> <td>STC</td> <td>Stream channel</td> <td>VH</td> <td>Very steep hills</td> </tr> <tr> <td>L</td> <td>Cliff (steep rocky faces), rocky ledge, rocky outcrop, scarp, crevice</td> <td>LEV</td> <td>Levee</td> <td>TAL</td> <td>Talus</td> <td>STB</td> <td>Stream bed</td> <td>PH</td> <td>Precipitous hills</td> </tr> <tr> <td>N</td> <td>Coastal rocky headland</td> <td>BAR</td> <td>Bar</td> <td>PLA</td> <td>Plain</td> <td>TDC</td> <td>Tidal creek</td> <td>UL</td> <td>Undulating low hills</td> </tr> <tr> <td>K</td> <td>Top, crest of mountain or ridge</td> <td>SCR</td> <td>Scroll</td> <td>RFL</td> <td>Rock flat</td> <td>EST</td> <td>Estuary</td> <td>RL</td> <td>Rolling low hills</td> </tr> <tr> <td>Q</td> <td>Jump Up (Cuesta) and Mesa, Tableland, Plateau,</td> <td>PST</td> <td>Prior stream</td> <td>RPL</td> <td>Rock platform</td> <td>SWP</td> <td>Swamp</td> <td>SL</td> <td>Steep low hills</td> </tr> <tr> <td colspan="10"><b>Dunes</b></td> </tr> <tr> <td>R</td> <td>Recent Coastal Dune (low dune less than about 15m) and</td> <td>FOR</td> <td>Foredune</td> <td>COS</td> <td>Cut-over surface</td> <td>SWL</td> <td>Swale</td> <td>VL</td> <td>Very steep low hills</td> </tr> <tr> <td>S</td> <td>Fossil Coastal Dune (High Dune greater than about 15m)</td> <td>LUN</td> <td>Lunette</td> <td>SCD</td> <td>Scald</td> <td>TRE</td> <td>Trench</td> <td>B</td> <td>Badlands</td> </tr> <tr> <td>T</td> <td>Inland Dune.</td> <td>BRI</td> <td>Beach ridge</td> <td>FAN</td> <td>Fan</td> <td>LAK</td> <td>Lake</td> <td>GR</td> <td>Gently undulating rises</td> </tr> <tr> <td colspan="10"><b>Water</b></td> </tr> <tr> <td>W</td> <td>Swamp or Marsh.</td> <td>EMB</td> <td>Embankment</td> <td>VLF</td> <td>Valley flat</td> <td>PLY</td> <td>Playa</td> <td>UR</td> <td>Undulating 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A	Not otherwise specified, flat gentle slopes; undulating terrain	HCR	Hillcrest	DUS	Duneslope	STF	Supratidal flat	RM	Rolling mountains																																																																																																																																																																																																																																																																																																																				
B	Alluvial plain or flat, alluvium, flood plain	SUS	Summit Surface	BRK	Breakaway	FIL	Fill-top	SM	Steep mountains																																																																																																																																																																																																																																																																																																																				
U	Claypan, Playa or Salina (including inland lakes), Salt Flat (inland).	DUC	Dunecrest	CFS	Cliff-foot slope	REF	Feef flat	VM	Very steep mountains																																																																																																																																																																																																																																																																																																																				
V	Tidal Flat (coastal), Salt Flat (coastal).	TOR	Tor	SFS	Scarp-foot Slope	ALC	Alcove	PM	Precipitous mountains																																																																																																																																																																																																																																																																																																																				
<b>Streams, Lakes</b>																																																																																																																																																																																																																																																																																																																													
C	Banks of lake, river, stream, watercourse, levees	TUM	Tumulus	BEN	Bench	GUL	Gully	UH	Undulating hills																																																																																																																																																																																																																																																																																																																				
D	Gully, drainage line, ravine gorge, outwash	DUN	Dune	BER	Berm	CIR	Cirque	RH	Rolling hills																																																																																																																																																																																																																																																																																																																				
E	Channel Bed, distributaries of inland streams	CON	Cone	PED	Pediment	DDE	Drainage depression	SH	Steep hills																																																																																																																																																																																																																																																																																																																				
<b>Hills, Mountains, Tablelands</b>																																																																																																																																																																																																																																																																																																																													
F	Slope or Hill not specified	MOU	Mound	FOO	Footslope	STC	Stream channel	VH	Very steep hills																																																																																																																																																																																																																																																																																																																				
L	Cliff (steep rocky faces), rocky ledge, rocky outcrop, scarp, crevice	LEV	Levee	TAL	Talus	STB	Stream bed	PH	Precipitous hills																																																																																																																																																																																																																																																																																																																				
N	Coastal rocky headland	BAR	Bar	PLA	Plain	TDC	Tidal creek	UL	Undulating low hills																																																																																																																																																																																																																																																																																																																				
K	Top, crest of mountain or ridge	SCR	Scroll	RFL	Rock flat	EST	Estuary	RL	Rolling low hills																																																																																																																																																																																																																																																																																																																				
Q	Jump Up (Cuesta) and Mesa, Tableland, Plateau,	PST	Prior stream	RPL	Rock platform	SWP	Swamp	SL	Steep low hills																																																																																																																																																																																																																																																																																																																				
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R	Recent Coastal Dune (low dune less than about 15m) and	FOR	Foredune	COS	Cut-over surface	SWL	Swale	VL	Very steep low hills																																																																																																																																																																																																																																																																																																																				
S	Fossil Coastal Dune (High Dune greater than about 15m)	LUN	Lunette	SCD	Scald	TRE	Trench	B	Badlands																																																																																																																																																																																																																																																																																																																				
T	Inland Dune.	BRI	Beach ridge	FAN	Fan	LAK	Lake	GR	Gently undulating rises																																																																																																																																																																																																																																																																																																																				
<b>Water</b>																																																																																																																																																																																																																																																																																																																													
W	Swamp or Marsh.	EMB	Embankment	VLF	Valley flat	PLY	Playa	UR	Undulating rises																																																																																																																																																																																																																																																																																																																				
X	Fresh Water Aquatic.	DAM	Dam	TEF	Terrace flat	DOL	Doline	RR	Rolling rises																																																																																																																																																																																																																																																																																																																				
Y	Salt Water Aquatic.	CLI	Cliff	CBE	Channel bench	OXB	Ox-bow	SR	Steep rises																																																																																																																																																																																																																																																																																																																				
Z	Melon Holes, Gligal, Depressions in Soil, Sink Holes.	SCA	Scarp	BKP	Backplain	LAG	Lagoon	LP	Level plain																																																																																																																																																																																																																																																																																																																				
		HSL	Hillslope	SRP	Scroll plain	BOU	Blow-out	GP	Gently undulating plain																																																																																																																																																																																																																																																																																																																				
		CUT	Out face	FLD	Flood-out	MAA	Maar	UP	Undulating plain																																																																																																																																																																																																																																																																																																																				
		LDS	Landslide	TEP	Terrace plain	CRA	Crater	RP	Rolling plain																																																																																																																																																																																																																																																																																																																				
		BAN	(Stream) Bank	TDF	Tidal flat	PIT	Pit																																																																																																																																																																																																																																																																																																																						
		BEA	Beach	III	Intertidal flat																																																																																																																																																																																																																																																																																																																								



Ground cover (5 x 1m <sup>2</sup> plots, 0, 25, 50, 75, 100)	1	2	3	4	5	Mean
Native grass	5	4	7	2	20	7.6
Native herbs/forbs (non-grass)	5	5	13	3	8	6.8
Native shrubs (< 1m height)	15	0	0	0	0	3
Non-native grass	0	0	0	0	0	0
Non-native herbs and shrubs	0	0	0	0	0	0
Litter (woodies <10 cm diameter, dead annuals, etc)	25	15	60	25	55	36
Litter (logs > 10 cm diameter)	2	0	0	0	3	1
Rock	0	0	0	0	0	0
Bare ground	48	76	20	70	14	45.6
<b>Total</b>	<b>=100%</b>	<b>=100%</b>	<b>=100%</b>	<b>=100%</b>	<b>=100%</b>	<b>100</b>
Species in 1 x 1 m quadrat	%	%	%	%	%	Mean
<i>Persoonia falcata</i>	5	0	0	0	0	1
<i>Exocarpos cupressiformis</i>	15	0	0	0	0	3
<i>Aristida lignosa</i>	5	0	0	0	0	1
<i>Hibbertia cistoidea</i>	5	0	0	0	0	1
<i>Chrysocephalum apiculatum</i>	0	4	2	2	2	2
<i>Aristida caput-medusae</i>	0	4	0	0	20	4.8
<i>Indigofera linnaei</i>	0	1	0	0	1	0.4
<i>Solanum ellipticum</i>	0	0	10	0	5	3
<i>Goodenia</i> sp.	0	0	1	0	0	0.2
<i>Heteropogon contortus</i>	0	0	7		0	1.4
<i>Gonocarpus urceolatus</i>	0	0	0	1	0	0.2
<i>Bothriochloa</i> sp.	0	0	0	2	0	0.4

Other groundcover species (not in 1x1 m plots)				
Species	Strata	Rel. dom.	Height (m)	Cover estimate <u>100 x 50</u> (0.5 ha) (%)
<i>Hibiscus sturtii</i>	G	a	0.3	2
<i>Abutilon fraseri</i>	G	a	0.4	2
<i>Calotis cuneifolia</i>	G	a	0.2	5
<i>Evolvulus alsinoides</i>	G	a	0.2	5
<i>Oxalis perennans</i>	G	a	0.2	2
<i>Brunoniella australis</i>	G	a	0.1	5
<i>Cenchrus ciliaris</i>	G	a	0.8	2
<i>Aristida calycina</i>	G	a	0.7	5
<i>Lomandra longifolia</i>	G	a	0.6	5
<i>Dianella caerulea</i>	G	a	0.6	5





## Vegetation community/ analogue site

<b>Site:</b> VC 6		<b>Date:</b> 04/11/13		<b>Lot/plan:</b> Lot 20 FTY1805		<b>Obs:</b> JN/PW																																																																																																																																																																																																																																																																																																																							
<b>Photo nos:</b> North: 9543		East: 9542		South: 9540		West: 9541																																																																																																																																																																																																																																																																																																																							
<b>RE type:</b> 11.10.1 (Mapped 11.10.1/11.10.13a)				<b>GPS coords:</b> Zone 55 699465, 7161357																																																																																																																																																																																																																																																																																																																									
<b>Location description:</b> 250-AW-6805-61/ RoW 118																																																																																																																																																																																																																																																																																																																													
<b>Structural formation/Veg community:</b> Open ironbark woodland with a dense grassy ground layer																																																																																																																																																																																																																																																																																																																													
<b>Ecologically dominant layer:</b> T1																																																																																																																																																																																																																																																																																																																													
<b>Disturbance:</b>																																																																																																																																																																																																																																																																																																																													
<b>Wildfire</b> (0=<1yr, 1=1-5yr, 2=>5yr): <b>0</b>				<b>Grazing</b> (0=none to 3=severe): <b>1</b>																																																																																																																																																																																																																																																																																																																									
<b>Weeds</b> (0=none to 3=severe): <b>1</b>				<b>Erosion</b> (0=none to 3=severe): <b>0</b>																																																																																																																																																																																																																																																																																																																									
<b>Clearing</b> (0=none to 3=severe): <b>1</b>				<b>Other:</b>																																																																																																																																																																																																																																																																																																																									
<b>VAST condition</b> (see VAST table): <b>2</b>																																																																																																																																																																																																																																																																																																																													
<b>Erosion definition:</b> 0=stable, 1=slight disturbance (ie cattle tracks), 2 = moderate (pedestalling, sheet, rill), 3 = severe (pedestals, scalds, sand blown, exposure),																																																																																																																																																																																																																																																																																																																													
<b>Grazing definition:</b> 0=none, 1=small amount from few plants, 2=small to moderate amount from many plants, 3=moderate to large amount from many plants																																																																																																																																																																																																																																																																																																																													
<b>Clearing definition:</b> 0=none, 1=small amount/historic yet still remnant, 2= moderate amount, regrowth or near remnant status, 3=large amount, non-rem																																																																																																																																																																																																																																																																																																																													
<b>Ecosystem function:</b>																																																																																																																																																																																																																																																																																																																													
<b>Size of patch</b> (area ha): > 1000 ha				<b>Shape of patch:</b> (large polygon, linear <200m wide) <b>Large polygon</b>																																																																																																																																																																																																																																																																																																																									
<b>Location of patch</b> (low, med, high, very high): <b>Very high</b>				<b>Presence of edge effects impacts</b> (0=none to 3=severe): (weeds, light, wind, sp. composition) <b>1</b>																																																																																																																																																																																																																																																																																																																									
<b>Location of patch:</b> <b>low</b> =not connected to remnant or regrowth veg, <b>med</b> =connected to remnant veg along 10-50% of border OR connected to remnant veg along 1-10% of border and regrowth >25% of border, <b>high</b> = connected to remnant 50-75% of border, <b>very high</b> = connected to remnant >75% of border																																																																																																																																																																																																																																																																																																																													
<b>Edge effects definition:</b> <b>0</b> = stable, <b>1</b> = slight disturbance (ie couple non native sp), <b>2</b> = moderate (minor disturbance, some non native sp), <b>3</b> = severe (different sp composition, wind damage, differences in light amount)																																																																																																																																																																																																																																																																																																																													
<b>Landform</b>																																																																																																																																																																																																																																																																																																																													
<b>Situation:</b> Q		<b>Element:</b> RFL			<b>Pattern:</b> LP																																																																																																																																																																																																																																																																																																																								
<b>Slope position:</b> P		<b>Slope degree:</b> <5°			<b>Slope aspect:</b> West																																																																																																																																																																																																																																																																																																																								
<b>Top soil depth:</b> D		<b>Soil colour:</b> Dark Brown			<b>Texture:</b> Sandy loam																																																																																																																																																																																																																																																																																																																								
<b>Notes, potential landzone:</b>																																																																																																																																																																																																																																																																																																																													
<table border="1" style="width: 100%; border-collapse: collapse; font-size: small;"> <thead> <tr> <th colspan="2">Situation</th> <th colspan="4">Element</th> <th colspan="2">Pattern</th> <th colspan="2">Slope Position</th> </tr> <tr> <th>Code</th> <th>Description</th> <th>Code</th> <th>Description</th> <th>Code</th> <th>Description</th> <th>Code</th> <th>Description</th> <th>Code</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td colspan="10"><b>Plains</b></td> </tr> <tr> <td>A</td> <td>Not otherwise specified, flat gentle slopes; undulating terrain</td> <td>HCR</td> <td>Hillcrest</td> <td>DUS</td> <td>Duneslope</td> <td>STF</td> <td>Supratidal flat</td> <td>RM</td> <td>Rolling mountains</td> </tr> <tr> <td>B</td> <td>Alluvial plain or flat, alluvium, flood plain</td> <td>SUS</td> <td>Summit Surface</td> <td>BRK</td> <td>Breakaway</td> <td>FIL</td> <td>Fill-top</td> <td>SM</td> <td>Steep mountains</td> </tr> <tr> <td>U</td> <td>Claypan, Playa or Salina (including inland lakes), 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<td>PST</td> <td>Prior stream</td> <td>RPL</td> <td>Rock platform</td> <td>SWP</td> <td>Swamp</td> <td>SL</td> <td>Steep low hills</td> </tr> <tr> <td colspan="10"><b>Dunes</b></td> </tr> <tr> <td>R</td> <td>Recent Coastal Dune (low dune less than about 15m) and</td> <td>FOR</td> <td>Foredune</td> <td>COS</td> <td>Cut-over surface</td> <td>SWL</td> <td>Swale</td> <td>VL</td> <td>Very steep low hills</td> </tr> <tr> <td>S</td> <td>Fossil Coastal Dune (High Dune greater than about 15m)</td> <td>LUN</td> <td>Lunette</td> <td>SCD</td> <td>Scald</td> <td>TRE</td> <td>Trench</td> <td>B</td> <td>Badlands</td> </tr> <tr> <td>T</td> <td>Inland Dune.</td> <td>BRI</td> <td>Beach ridge</td> <td>FAN</td> <td>Fan</td> <td>LAK</td> <td>Lake</td> <td>GR</td> <td>Gently undulating rises</td> </tr> <tr> <td colspan="10"><b>Water</b></td> </tr> <tr> <td>W</td> <td>Swamp or Marsh.</td> <td>EMB</td> <td>Embankment</td> <td>VLF</td> <td>Valley flat</td> <td>PLY</td> <td>Playa</td> <td>UR</td> <td>Undulating 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plain</td> <td>CRA</td> <td>Crater</td> <td>RP</td> <td>Rolling plain</td> </tr> <tr> <td></td> <td></td> <td>BAN</td> <td>(Stream) Bank</td> <td>TDF</td> <td>Tidal flat</td> <td>PIT</td> <td>Pit</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td>BEA</td> <td>Beach</td> <td>III</td> <td>Intertidal flat</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>								Situation		Element				Pattern		Slope Position		Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	<b>Plains</b>										A	Not otherwise specified, flat gentle slopes; undulating terrain	HCR	Hillcrest	DUS	Duneslope	STF	Supratidal flat	RM	Rolling mountains	B	Alluvial plain or flat, alluvium, flood plain	SUS	Summit Surface	BRK	Breakaway	FIL	Fill-top	SM	Steep mountains	U	Claypan, Playa or Salina (including inland lakes), Salt Flat (inland).	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TOR	Tor	SFS	Scarp-foot Slope	ALC	Alcove	PM	Precipitous mountains	<b>Streams, Lakes</b>										C	Banks of lake, river, stream, watercourse, levees	TUM	Tumulus	BEN	Bench	GUL	Gully	UH	Undulating hills	D	Gully, drainage line, ravine gorge, outwash	DUN	Dune	BER	Berm	CIR	Cirque	RH	Rolling hills	E	Channel Bed, distributaries of inland streams	CON	Cone	PED	Pediment	DDE	Drainage depression	SH	Steep hills	<b>Hills, Mountains, Tablelands</b>										F	Slope or Hill not specified	MOU	Mound	FOO	Footslope	STC	Stream channel	VH	Very steep hills	L	Cliff (steep rocky faces), rocky ledge, rocky outcrop, scarp, crevice	LEV	Levee	TAL	Talus	STB	Stream bed	PH	Precipitous hills	N	Coastal rocky headland	BAR	Bar	PLA	Plain	TDC	Tidal creek	UL	Undulating low hills	K	Top, crest of mountain or ridge	SCR	Scroll	RFL	Rock flat	EST	Estuary	RL	Rolling low hills	Q	Jump Up (Cuesta) and Mesa, Tableland, Plateau,	PST	Prior stream	RPL	Rock platform	SWP	Swamp	SL	Steep low hills	<b>Dunes</b>										R	Recent Coastal Dune (low dune less than about 15m) and	FOR	Foredune	COS	Cut-over surface	SWL	Swale	VL	Very steep low hills	S	Fossil Coastal Dune (High Dune greater than about 15m)	LUN	Lunette	SCD	Scald	TRE	Trench	B	Badlands	T	Inland Dune.	BRI	Beach ridge	FAN	Fan	LAK	Lake	GR	Gently undulating rises	<b>Water</b>										W	Swamp or Marsh.	EMB	Embankment	VLF	Valley flat	PLY	Playa	UR	Undulating rises	X	Fresh Water Aquatic.	DAM	Dam	TEF	Terrace flat	DOL	Doline	RR	Rolling rises	Y	Salt Water Aquatic.	CLI	Cliff	CBE	Channel bench	OXB	Ox-bow	SR	Steep rises	Z	Melon Holes, Gligal, Depressions in Soil, Sink Holes.	SCA	Scarp	BKP	Backplain	LAG	Lagoon	LP	Level plain			HSL	Hillslope	SRP	Scroll plain	BOU	Blow-out	GP	Gently undulating plain			CUT	Out face	FLD	Flood-out	MAA	Maar	UP	Undulating plain			LDS	Landslide	TEP	Terrace plain	CRA	Crater	RP	Rolling plain			BAN	(Stream) Bank	TDF	Tidal flat	PIT	Pit					BEA	Beach	III	Intertidal flat				
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## Vegetation community/ analogue site

<b>Site:</b> VC 7		<b>Date:</b> 04/11/13		<b>Lot/plan:</b> Lot 20 FTY1805		<b>Obs:</b> JN/PW	
<b>Photo nos:</b> North: 9559		East: 9560		South: 9558		West: 9561	
<b>RE type:</b> 11.10.1 (Mapped 11.3.39/11.3.2)				<b>GPS coords:</b> Zone 55 705378, 7159133			
<b>Location description:</b> 300-AW-6801-553M / RoW 142							
<b>Structural formation/Veg community:</b> Rocky slope at the base of an escarpment containing an open-woodland dominated by <i>Corymbia citriodora</i> and <i>Eucalyptus fibrosa</i> subsp. <i>nubila</i> fringing a rocky gully							
<b>Ecologically dominant layer:</b> T1							
<b>Disturbance:</b>							
<b>Wildfire</b> (0=<1yr, 1=1-5yr, 2=>5yr): 1				<b>Grazing</b> (0=none to 3=severe): 1			
<b>Weeds</b> (0=none to 3=severe): 1				<b>Erosion</b> (0=none to 3=severe): 0			
<b>Clearing</b> (0=none to 3=severe): 1				<b>Other:</b>			
<b>VAST condition</b> (see VAST table): 1							
<b>Erosion definition:</b> 0=stable, 1=slight disturbance (ie cattle tracks), 2 = moderate (pedestalling, sheet, rill), 3 = severe (pedestals, scalds, sand blown, exposure),							
<b>Grazing definition:</b> 0=none, 1=small amount from few plants, 2=small to moderate amount from many plants, 3=moderate to large amount from many plants							
<b>Clearing definition:</b> 0=none, 1=small amount/historic yet still remnant, 2= moderate amount, regrowth or near remnant status, 3=large amount, non-rem							
<b>Ecosystem function:</b>							
<b>Size of patch</b> (area ha): > 1000 ha				<b>Shape of patch:</b> (large polygon, linear <200m wide) <b>Large polygon</b>			
<b>Location of patch</b> (low, med, high, very high): <b>Very high</b>				<b>Presence of edge effects impacts</b> (0=none to 3=severe): (weeds, light, wind, sp. composition) <b>1</b>			
<b>Location of patch:</b> <b>low</b> =not connected to remnant or regrowth veg, <b>med</b> =connected to remnant veg along 10-50% of border OR connected to remnant veg along 1-10% of border and regrowth >25% of border, <b>high</b> = connected to remnant 50-75% of border, <b>very high</b> = connected to remnant >75% of border							
<b>Edge effects definition:</b> 0 = stable, 1 = slight disturbance (ie couple non native sp), 2 = moderate (minor disturbance, some non native sp), 3 = severe (different sp composition, wind damage, differences in light amount)							
<b>Landform</b>							
<b>Situation:</b> F		<b>Element:</b> HSL			<b>Pattern:</b> SH		
<b>Slope position:</b> M		<b>Slope degree:</b> 20°			<b>Slope aspect:</b> East		
<b>Top soil depth:</b> X		<b>Soil colour:</b> Light brown			<b>Texture:</b> Sandy loam		

**Notes, potential landzone:** 11, rocky high bank of gully

Situation		Element				Pattern				Slope Position	
Code	Description	Code	Description	Code	Description	Code	Description	Code	Description	Code	Description
<b>Plains</b>											
A	Not otherwise specified, flat gentle slopes; undulating terrain	HCR	Hillcrest	DUS	Duneslope	STF	Supratidal flat	RM	Rolling mountains	C	Crest
B	Alluvial plain or flat, alluvium, flood plain	SUS	Summit Surface	BRK	Breakaway	FIL	Fill-top	SM	Steep mountains	D	Closed Depression
U	Claypan, Playa or Salina (including inland lakes), Salt Flat (Inland).	DUC	Dunecrest	CFS	Cliff-foot slope	REF	Feef flat	VM	Very steep mountains	F	Fiat
V	Tidal Flat (coastal), Salt Flat (coastal).	TOR	Tor	SFS	Scarp-foot Slope	ALC	Alcove	PM	Precipitous mountains	G	Gully
<b>Streams, Lakes</b>											
C	Banks of lake, river, stream, watercourse, levees	TUM	Tumulus	BEN	Bench	GUL	Gully	UH	Undulating hills	H	Hillock
D	Gully, drainage line, ravine gorge, outwash	DUN	Dune	BER	Berm	CIR	Cirque	RH	Rolling hills	L	Lower-Slope
E	Channel Bed, distributaries of inland streams	CON	Cone	PED	Pediment	DDE	Drainage depression	SH	Steep hills	M	Mid-Slope
<b>Hills, Mountains, Tablelands</b>											
F	Slope or Hill not specified	MOU	Mound	FOO	Footslope	STC	Stream channel	VH	Very steep hills	P	Plateau
L	Cliff (steep rocky faces), rocky ledge, rocky outcrop, scarp, crevice	LEV	Levee	TAL	Talus	STB	Stream bed	PH	Precipitous hills	R	Ridge
N	Coastal rocky headland	BAR	Bar	PLA	Plain	TDC	Tidal creek	UL	Undulating low hills	U	Upper-Slope
K	Top, crest of mountain or ridge	SCR	Scroll	RFL	Rock flat	EST	Estuary	RL	Rolling low hills	V	Open Depression
Q	Jump Up (Cuesta) and Mesa, Tableland, Plateau,	PST	Prior stream	RPL	Rock platform	SWP	Swamp	SL	Steep low hills	W	Wetland
<b>Dunes</b>											
R	Recent Coastal Dune (low dune less than about 15m) and	FOR	Foredune	COS	Cut-over surface	SWL	Swale	VL	Very steep low hills	<b>Soil Depth</b>	
S	Fossil Coastal Dune (High Dune greater than about 15m)	LUN	Lunette	SCD	Scald	TRE	Trench	B	Badlands	GR	Gently undulating rises
T	Inland Dune.	BRI	Beach ridge	FAN	Fan	LAK	Lake	UR	Undulating rises	UR	Undulating rises
<b>Water</b>											
W	Swamp or Marsh.	EMB	Embankment	VLF	Valley flat	PLY	Playa	RR	Rolling rises	D	Deep
X	Fresh Water Aquatic.	DAM	Dam	TEF	Terrace flat	DOL	Doline	SR	Steep rises	S	Shallow
Y	Salt Water Aquatic.	CLI	Cliff	CBE	Channel bench	OXB	Ox-bow	LP	Level plain	X	Skeletal
Z	Melon Holes, Gligal, Depressions in Soil, Sink Holes.	SCA	Scarp	BKP	Backplain	LAG	Lagoon	GP	Gently undulating plain		
		HSL	Hillslope	SRP	Scroll plain	BOU	Blow-out	UP	Undulating plain		
		CUT	Cut face	FLD	Flood-out	MAA	Maar	RP	Rolling plain		
		LDS	Landslide	TEP	Terrace plain	CRA	Crater				
		BAN	(Stream) Bank	TDF	Tidal flat	PIT	Pit				
		BEA	Beach	IIF	Intertidal flat						









## Vegetation community/ analogue site

<b>Site:</b> VC 8		<b>Date:</b> 06/11/13		<b>Lot/plan:</b> Lot 20 FTY1805		<b>Obs:</b> JN/PW																																																																																																																																																																																																																																																																																																																							
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<b>Location description:</b> RoW 133 / 200-AW-6755-611L																																																																																																																																																																																																																																																																																																																													
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<b>Top soil depth:</b> S		<b>Soil colour:</b> Dark brown			<b>Texture:</b> Loam																																																																																																																																																																																																																																																																																																																								
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<b>Ground cover (5 x 1m<sup>2</sup> plots, 0, 25, 50, 75, 100)</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>	<b>Mean</b>
Native grass	0	10	0	10	5	5
Native herbs/forbs (non-grass)	4	2	4	0	2	2.4
Native shrubs (< 1m height)	0	5	5	0	0	2
Non-native grass	0	0	0	0	0	0
Non-native herbs and shrubs	0	15	0	0	0	3
Litter (woodies <10 cm diameter, dead annuals, etc.)	50	35	30	65	40	44
Litter (logs > 10 cm diameter)	15	10	25	10	30	18
Rock	0	20	6	15	0	8.2
Bare ground	31	3	30	0	23	17.4
<b>Total</b>	<b>=100%</b>	<b>=100%</b>	<b>=100%</b>	<b>=100%</b>	<b>=100%</b>	<b>100</b>
<b>Species in 1 x 1 m quadrat</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>%</b>	<b>Mean</b>
<i>Brunoniella australis</i>	2	2	1	0	2	1.4
<i>Nyssanthes erecta</i>	2	0	0	0	0	0.4
<i>Opuntia tomentosa</i> *	0	15	0	0	0	3
<i>Capparis lasiantha</i>	0	5	0	0	0	1
<i>Paspalidium distans</i>	0	10	0	10	5	5
<i>Solanum stelligerum</i>	0	0	3	0	0	0.6
<i>Carissa ovata</i>	0	0	5	0	0	1

<b>Other groundcover species (not in 1x1 m plots)</b>				
<b>Species</b>	<b>Strata</b>	<b>Rel. dom.</b>	<b>Height (m)</b>	<b>Cover estimate <u>100 x 50</u> (0.5 ha) (%)</b>
<i>Aristida lignosa</i>	G	a	0.4	5
<i>Enteropogon ramosus</i>	G	a	0.6	5
<i>Cenchrus ciliaris</i> *	G	a	0.8	5
<i>Digitaria sp.</i>	G	a	0.8	3
<i>Eremophila debilis</i>	G	a	0.1	1
<i>Oxalis perennans</i>	G	a	0.1	1
<i>Cheilanthes sp.</i>	G	a	0.1	1
<i>Tribulus terrestris</i> *	G	a	0.1	<1





Site habitat assessment		
Site: HA 1	Date: 3/11/2013	Observers: SH
Photo nos: North: 8970, East: 8971, South: 8972, West: 8973		
RE type: Spotted gum with Callitris	GPS Co-ords: 701505, 7159466	
<b>Habitat description:</b> Open spotted gum woodland with subcanopy of Callitris and sparse shrublayer and sparse native grassy understorey		
<b>Trees with hollows (in 100 x 50 (0.5 ha area))</b>	<b>No. of trees containing hollows (tally)</b>	<b>Total number of hollows</b>
Hollow size < 10 cm diameter	3	6
Hollow size > 10 cm diameter	1	5
<b>Hollow bearing logs (in 100 x 50 (0.5 ha area)), hollows &gt;10 cm diameter</b>	<b>No. of logs containing hollows (tally)</b>	<b>Total number of hollows in logs</b>
	1	1
<b>Fallen woody material (in 50 x 10 (0.05 ha area))</b>	<b>Total length of logs &gt;10 cm diameter</b>	<b>Total number of logs (tally)</b>
	42m	14
<b>Other habitat characteristics (in 100 x 50 (0.5 ha area):</b>		
<b>Characteristic</b>	<b>Abundance (0-7)^</b>	<b>Notes</b>
Decorticating bark	1	
Course leaf litter (>2cm diam)	1	
Fine leaf litter (<2cm diam)	3	
Bare ground	4	
Grass	4	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
<b>^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant</b>		
<b>Other habitat features and notes (e.g. potential threatened species):</b> general potential habitat for golden-tailed gecko; grey shrike thrush, noisy friarbird, laughing kookaburra, forest kingfisher, <i>Carlia pectoralis</i> , buff-rumped thornbill, noisy miner, greater glider scats, black-faced cuckoo shrike, pale-headed rosella and <i>Lerista fragilis</i> observed.		

## Photos

North



East



South



West





Site habitat assessment		
Site: HA 2	Date: 3/11/2013	Observers: SH
Photo nos: North: 8974, East: 8975, South: 8976, West: 8977		
RE type: 11.9.4a	GPS Co-ords: 699684, 7160212	
<b>Habitat description:</b> Semi-evergreen vine thicket on sandstone ridge		
<b>Trees with hollows (in 100 x 50 (0.5 ha area))</b>	<b>No. of trees containing hollows (tally)</b>	<b>Total number of hollows</b>
Hollow size < 10 cm diameter	0	0
Hollow size > 10 cm diameter	0	0
<b>Hollow bearing logs (in 100 x 50 (0.5 ha area)), hollows &gt;10 cm diameter</b>	<b>No. of logs containing hollows (tally)</b>	<b>Total number of hollows in logs</b>
	4	4
<b>Fallen woody material (in 50 x 10 (0.05 ha area))</b>	<b>Total length of logs &gt;10 cm diameter Total:</b> 54 m	<b>Total number of logs (tally)</b> 15
<b>Other habitat characteristics (in 100 x 50 (0.5 ha area):</b>		
<b>Characteristic</b>	<b>Abundance (0-7)^</b>	<b>Notes</b>
Decorticating bark	2	
Course leaf litter (>2cm diam)	2	
Fine leaf litter (<2cm diam)	5	
Bare ground	1	
Grass	4	
Soil cracks	0	
Stones (20-60 cm)	2	
Boulders (61 cm – 2 m)	4	
Large boulders (>2 m)	3	
Rock crevices	4	
Exfoliating rock	3	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
<b>Other habitat features and notes (e.g. potential threatened species):</b> potential for black-breasted button quail, brigalow scaly-foot, collared delma		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 3	Date: 4/11/2013	Observers: SH
Photo nos: North: 8981, East: 8982, South: 8983, West: 8984		
RE type: 11.3.39-11.3.2	GPS Co-ords: 700841, 7163596	
Habitat description: Spotted gum forest with open shrub and understorey		
Trees with hollows (in <u>100 x 50</u> (0.5 ha area))	No. of trees containing hollows (tally)	Total number of hollows
	3	12
Hollow size < 10 cm diameter	2	2
Hollow size > 10 cm diameter	1	10
Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally)	Total number of hollows in logs
	0	0
Fallen woody material (in <u>50 x 10</u> (0.05 ha area))	Total length of logs >10 cm diameter Total: 14 m	Total number of logs (tally)
		4
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decorticating bark	1	
Course leaf litter (>2cm diam)	4	
Fine leaf litter (<2cm diam)	2	
Bare ground	4	
Grass	4	
Soil cracks	0	
Stones (20-60 cm)	1	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species): recently burnt		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 4	Date: 4/11/2013	Observers: SH
Photo nos: North: 8987, East: 8988, South: 8989, West: 8990		
RE type: Non-remnant	GPS Co-ords: 700105, 7162034	
Habitat description: Very dense ironbark regrowth with grassy understorey		
Trees with hollows (in <u>100 x 50</u> (0.5 ha area))	No. of trees containing hollows (tally)	Total number of hollows
	0	0
Hollow size < 10 cm diameter	0	0
Hollow size > 10 cm diameter	0	0
Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally)	Total number of hollows in logs
	0	0
Fallen woody material (in <u>50 x 10</u> (0.05 ha area))	Total length of logs >10 cm diameter Total:0m	Total number of logs (tally)
		0
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decortivating bark	1	
Course leaf litter (>2cm diam)	2	
Fine leaf litter (<2cm diam)	1	
Bare ground	3	
Grass	5	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species): Recently burnt		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 5	Date: 4/11/2013	Observers: SH
Photo nos: North: 9000, East: 9001, South: 9002, West: 9003		
RE type: 11.10.1/11.10.13a	GPS Co-ords: 699351, 7161336	
Habitat description: Ironbark woodland with grassy understorey		
Trees with hollows (in <u>100 x 50</u> (0.5 ha area))	No. of trees containing hollows (tally) 2	Total number of hollows 5
Hollow size < 10 cm diameter	1	2
Hollow size > 10 cm diameter	1	3
Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally) 1	Total number of hollows in logs 1
Fallen woody material (in <u>50 x 10</u> (0.05 ha area))	Total length of logs >10 cm diameter Total: 32 m	Total number of logs (tally) 12
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decorticating bark	2	
Course leaf litter (>2cm diam)	3	
Fine leaf litter (<2cm diam)	2	
Bare ground	4	
Grass	4	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species): General potential habitat for koala		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 6	Date: 4/11/2013	Observers: SH
Photo nos: North: 9019, East: 9020, South: 9021, West: 9022		
RE type: 11.3.2/11.3.25	GPS Co-ords: 705293, 7159151	
Habitat description: Spotted gum and ironbark woodland with callitris and rocky substrate		
Trees with hollows (in <u>100 x 50</u> (0.5 ha area))	No. of trees containing hollows (tally)	Total number of hollows
	2	4
Hollow size < 10 cm diameter	1	3
Hollow size > 10 cm diameter	1	1
Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally)	Total number of hollows in logs
	1	1
Fallen woody material (in <u>50 x 10</u> (0.05 ha area))	Total length of logs >10 cm diameter (measure each then sum) Total: 35 m	Total number of logs (tally)
		12
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decorticated bark	3	
Course leaf litter (>2cm diam)	3	
Fine leaf litter (<2cm diam)	3	
Bare ground	3	
Grass	4	
Soil cracks	0	
Stones (20-60 cm)	5	
Boulders (61 cm – 2 m)	6	
Large boulders (>2 m)	3	
Rock crevices	3	
Exfoliating rock	3	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species): potential essential habitat for brigalow scaly-foot and collared delma		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 7	Date: 4/11/2013	Observers: SH
Photo nos: North: 9035, East: 9036, South: 9037, West: 9038		
RE type: 11.10.1	GPS Co-ords: 704276, 7160940	
Habitat description: Ironbark woodland with occasional spotted gums and Callitris and open grassy understorey		
Trees with hollows (in 100 x 50 (0.5 ha area)) Results x 2 = hollows per ha	No. of trees containing hollows (tally) 3	Total number of hollows 7
Hollow size < 10 cm diameter	1	2
Hollow size > 10 cm diameter	2	5
Hollow bearing logs (in 100 x 50 (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally) 0	Total number of hollows in logs 0
Fallen woody material (in 50 x 10 (0.05 ha area))	Total length of logs >10 cm diameter Total: 15 m	Total number of logs (tally) 6
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decorticated bark	2	
Course leaf litter (>2cm diam)	2	
Fine leaf litter (<2cm diam)	2	
Bare ground	4	
Grass	4	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species): potential general habitat for golden-tailed gecko		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 8	Date: 5/11/2013	Observers: SH
Photo nos: North: 9044, East: 9045, South: 9046, West: 9047		
RE type: 11.10.1	GPS Co-ords: 700963, 7164303	
<b>Habitat description:</b> Ironbark woodland with grassy understorey		
<b>Trees with hollows (in 100 x 50 (0.5 ha area))</b>	<b>No. of trees containing hollows (tally)</b>	<b>Total number of hollows</b>
	3	6
<u>Hollow size &lt; 10 cm diameter</u>	3	5
<u>Hollow size &gt; 10 cm diameter</u>	1	1
<b>Hollow bearing logs (in 100 x 50 (0.5 ha area)), hollows &gt;10 cm diameter</b>	<b>No. of logs containing hollows (tally)</b>	<b>Total number of hollows in logs</b>
	0	0
<b>Fallen woody material (in 50 x 10 (0.05 ha area))</b>	<b>Total length of logs &gt;10 cm diameter</b> Total: 22 m	<b>Total number of logs (tally)</b>
		8
<b>Other habitat characteristics (in 100 x 50 (0.5 ha area):</b>		
<b>Characteristic</b>	<b>Abundance (0-7)^</b>	<b>Notes</b>
Decorticating bark	2	
Course leaf litter (>2cm diam)	4	
Fine leaf litter (<2cm diam)	3	
Bare ground	4	
Grass	4	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
<b>Other habitat features and notes (e.g. potential threatened species): squatter pigeon confirmed present</b>		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 9	Date: 5/11/2013	Observers: SH
Photo nos: North: 9048, East: 9049, South: 9050, West: 9051		
RE type: 11.10.1	GPS Co-ords: 702170, 7163338	
<b>Habitat description:</b> Ironbark woodland with open grassy understorey		
<b>Trees with hollows (in 100 x 50 (0.5 ha area))</b> Results x 2 = hollows per ha	<b>No. of trees containing hollows (tally)</b> 1	<b>Total number of hollows</b> 3
Hollow size < 10 cm diameter	0	0
Hollow size > 10 cm diameter	1	3
<b>Hollow bearing logs (in 100 x 50 (0.5 ha area)), hollows &gt;10 cm diameter</b>	<b>No. of logs containing hollows (tally)</b> 0	<b>Total number of hollows in logs</b> 0
<b>Fallen woody material (in 50 x 10 (0.05 ha area))</b>	<b>Total length of logs &gt;10 cm diameter</b> Total: 20 m	<b>Total number of logs (tally)</b> 5
<b>Other habitat characteristics (in 100 x 50 (0.5 ha area):</b>		
<b>Characteristic</b>	<b>Abundance (0-7)^</b>	<b>Notes</b>
Decorticating bark	3	
Course leaf litter (>2cm diam)	3	
Fine leaf litter (<2cm diam)	2	
Bare ground	2	
Grass	5	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
<b>Other habitat features and notes (e.g. potential threatened species):</b> potential habitat for koala		

## Photos

North



East



South



West





Site habitat assessment		
Site: HA 10	Date: 5/11/2013	Observers: SH
Photo nos: North: 9054, East: 9055, South: 9056, West: 9057		
RE type: 11.10.1/11.10.13	GPS Co-ords: 701508, 7161549	
<b>Habitat description:</b> Ironbark woodland with spotted gums and eucalyptus tenuipes and open grassy understorey		
<b>Trees with hollows (in 100 x 50 (0.5 ha area))</b>	<b>No. of trees containing hollows (tally)</b>	<b>Total number of hollows</b>
	4	10
<u>Hollow size &lt; 10 cm diameter</u>	1	1
<u>Hollow size &gt; 10 cm diameter</u>	4	9
<b>Hollow bearing logs (in 100 x 50 (0.5 ha area)), hollows &gt;10 cm diameter</b>	<b>No. of logs containing hollows (tally)</b>	<b>Total number of hollows in logs</b>
	0	0
<b>Fallen woody material (in 50 x 10 (0.05 ha area))</b>	<b>Total length of logs &gt;10 cm diameter</b> Total: 12 m	<b>Total number of logs (tally)</b>
		7
<b>Other habitat characteristics (in 100 x 50 (0.5 ha area):</b>		
<b>Characteristic</b>	<b>Abundance (0-7)^</b>	<b>Notes</b>
Decortivating bark	1	
Course leaf litter (>2cm diam)	3	
Fine leaf litter (<2cm diam)	2	
Bare ground	4	
Grass	5	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
<b>Other habitat features and notes (e.g. potential threatened species):</b>		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 11	Date: 5/11/2013	Observers: SH
Photo nos: North: 9075, East: 9076, South: 9077, West: 9078		
RE type: 11.10.1	GPS Co-ords: 700287, 7159505	
Habitat description: Ironbark woodland with grassy understorey		
Trees with hollows (in <u>100 x 50</u> (0.5 ha area))	No. of trees containing hollows (tally)	Total number of hollows
	4	10
Hollow size < 10 cm diameter	2	3
Hollow size > 10 cm diameter	3	7
Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally)	Total number of hollows in logs
	0	0
Fallen woody material (in <u>50 x 10</u> (0.05 ha area))	Total length of logs >10 cm diameter Total: 35 m	Total number of logs (tally)
		7
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decorticating bark	3	
Course leaf litter (>2cm diam)	3	
Fine leaf litter (<2cm diam)	2	
Bare ground	5	
Grass	5	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species): potential habitat for koala		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 12	Date: 5/11/2013	Observers: SH
Photo nos: North: 9092, East: 9093, South: 9094, West: 9095		
RE type: 11.10.1	GPS Co-ords: 704708; 7159865	
Habitat description: Ironbark woodland with Callitris		
Trees with hollows (in <u>100 x 50</u> (0.5 ha area))	No. of trees containing hollows (tally)	Total number of hollows
	1	2
Hollow size < 10 cm diameter	1	2
Hollow size > 10 cm diameter	0	0
Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally)	Total number of hollows in logs
	0	0
Fallen woody material (in 50 x 10 (0.05 ha area))	Total length of logs >10 cm diameter	Total number of logs (tally)
	40m	8
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decorticated bark	3	
Course leaf litter (>2cm diam)	3	
Fine leaf litter (<2cm diam)	2	
Bare ground	2	
Grass	5	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species):		

## Photos

North



East



South



West



Site habitat assessment		
Site: HA 13	Date: 6/11/2013	Observers: SH
Photo nos: North: 9113, East: 9114, South: 9115, West: 9116		
RE type: 11.10.1	GPS Co-ords: 701960, 7162537	
Habitat description: Mixed eucalypt woodland with dense acacia subcanopy and open grassy understorey		
Trees with hollows (in <u>100 x 50</u> (0.5 ha area))	No. of trees containing hollows (tally)	Total number of hollows
	1	3
Hollow size < 10 cm diameter	1	1
Hollow size > 10 cm diameter	1	2
Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally)	Total number of hollows in logs
	0	0
Fallen woody material (in <u>50 x 10</u> (0.05 ha area))	Total length of logs >10 cm diameter	Total number of logs (tally)
	18m	4
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decorticating bark	2	
Course leaf litter (>2cm diam)	4	
Fine leaf litter (<2cm diam)	3	
Bare ground	1	
Grass	5	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species):		

### Photos

North



East



South



West



Site habitat assessment		
Site: HA 14	Date: 6/11/2013	Observers: SH
Photo nos: North: 9118, East: 9119, South: 9120, West: 9121		
RE type: brigalow	GPS Co-ords: 702136, 7162889	
Habitat description: Brigalow at base of rocky slope		
<b>Trees with hollows (in <u>100 x 50</u> (0.5 ha area))</b>	<b>No. of trees containing hollows (tally)</b>	<b>Total number of hollows</b>
Hollow size < 10 cm diameter	0	0
Hollow size > 10 cm diameter	0	0
<b>Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows &gt;10 cm diameter</b>	<b>No. of logs containing hollows (tally)</b>	<b>Total number of hollows in logs</b>
	0	0
<b>Fallen woody material (in 50 x 10 (0.05 ha area))</b>	<b>Total length of logs &gt;10 cm diameter</b>	<b>Total number of logs (tally)</b>
	14m	4
<b>Other habitat characteristics (in 100 x 50 (0.5 ha area):</b>		
<b>Characteristic</b>	<b>Abundance (0-7)^</b>	<b>Notes</b>
Decorticating bark	3	
Course leaf litter (>2cm diam)	3	
Fine leaf litter (<2cm diam)	3	
Bare ground	2	
Grass	3	
Soil cracks	0	
Stones (20-60 cm)	6	
Boulders (61 cm – 2 m)	3	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	2	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
<b>Other habitat features and notes (e.g. potential threatened species):</b> potential habitat for brigalow scaly-foot, collared delma and dunmalls snake		

### Photos

North



East



South



West



Site habitat assessment		
Site: HA 15	Date: 6/11/2013	Observers: SH
Photo nos: North: 9124, East: 9125, South: 9126, West: 9127		
RE type: 11.10.1	GPS Co-ords: 704913, 7159278	
Habitat description: Spotted gum and ironbark woodland on rocky slope		
Trees with hollows (in <u>100 x 50</u> (0.5 ha area))	No. of trees containing hollows (tally)	Total number of hollows
Hollow size < 10 cm diameter	1	2
Hollow size > 10 cm diameter	3	5
Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally)	Total number of hollows in logs
	1	4
Fallen woody material (in 50 x 10 (0.05 ha area))	Total length of logs >10 cm diameter	Total number of logs (tally)
	25m	6
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decorticating bark	3	
Course leaf litter (>2cm diam)	4	
Fine leaf litter (<2cm diam)	3	
Bare ground	1	
Grass	5	
Soil cracks	0	
Stones (20-60 cm)	5	
Boulders (61 cm – 2 m)	4	
Large boulders (>2 m)	4	
Rock crevices	3	
Exfoliating rock	4	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species): potential habitat for collared delma and brigalow scaly-foot		

### Photos

North



East



South



West



Site habitat assessment		
Site: HA 16	Date: 6/11/2013	Observers: SH
Photo nos: North: 9128, East: 9129, South: 9130, West: 9131		
RE type: 11.10.1	GPS Co-ords: 704370, 7159220	
Habitat description: Spotted gum and ironbark woodland with acacia subcanopy and dense leaf litter ground layer		
Trees with hollows (in <u>100 x 50</u> (0.5 ha area))	No. of trees containing hollows (tally)	Total number of hollows
	1	4
Hollow size < 10 cm diameter	1	2
Hollow size > 10 cm diameter	1	2
Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows >10 cm diameter	No. of logs containing hollows (tally)	Total number of hollows in logs
	1	1
Fallen woody material (in <u>50 x 10</u> (0.05 ha area))	Total length of logs >10 cm diameter	Total number of logs (tally)
	18m	4
Other habitat characteristics (in 100 x 50 (0.5 ha area):		
Characteristic	Abundance (0-7)^	Notes
Decorticating bark	2	
Course leaf litter (>2cm diam)	6	
Fine leaf litter (<2cm diam)	5	
Bare ground	0	
Grass	4	
Soil cracks	0	
Stones (20-60 cm)	0	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
Other habitat features and notes (e.g. potential threatened species):		

### Photos

North



East



South



West



Site habitat assessment		
Site: HA 17	Date: 7/11/2013	Observers: SH
Photo nos: North: 9136, East: 9137, South: 9138, West: 9139		
RE type: 11.10.1	GPS Co-ords: 705009, 7160330	
Habitat description: Ironbark woodland with dense callitris subcanopy and grassy understorey		
<b>Trees with hollows (in <u>100 x 50</u> (0.5 ha area))</b>	<b>No. of trees containing hollows (tally)</b>	<b>Total number of hollows</b>
Hollow size < 10 cm diameter	1	1
Hollow size > 10 cm diameter	1	1
<b>Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows &gt;10 cm diameter</b>	<b>No. of logs containing hollows (tally)</b>	<b>Total number of hollows in logs</b>
	0	0
<b>Fallen woody material (in <u>50 x 10</u> (0.05 ha area))</b> Results x 20 = diameter per ha	<b>Total length of logs &gt;10 cm diameter</b> 10m	<b>Total number of logs (tally)</b> 3
<b>Other habitat characteristics (in 100 x 50 (0.5 ha area):</b>		
<b>Characteristic</b>	<b>Abundance (0-7)^</b>	<b>Notes</b>
Decorticating bark	2	
Course leaf litter (>2cm diam)	3	
Fine leaf litter (<2cm diam)	3	
Bare ground	2	
Grass	5	
Soil cracks	0	
Stones (20-60 cm)	3	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
<b>Other habitat features and notes (e.g. potential threatened species):</b>		

### Photos

North



East



South



West





Site habitat assessment		
Site: HA 18	Date: 7/11/2013	Observers: SH
Photo nos: North: XX, East: XX, South: XX, West: XX		
RE type: Spotted gum on rocky slope	GPS Co-ords: 704854, 7160698	
<b>Habitat description:</b> Spotted gum open forest with callitris patches on rocky slope		
<b>Trees with hollows (in <u>100 x 50</u> (0.5 ha area))</b>	<b>No. of trees containing hollows (tally)</b>	<b>Total number of hollows</b>
Hollow size < 10 cm diameter	2	3
Hollow size > 10 cm diameter	2	5
<b>Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows &gt;10 cm diameter</b>	<b>No. of logs containing hollows (tally)</b>	<b>Total number of hollows in logs</b>
	1	1
<b>Fallen woody material (in 50 x 10 (0.05 ha area))</b>	<b>Total length of logs &gt;10 cm diameter</b>	<b>Total number of logs (tally)</b>
	13m	2
<b>Other habitat characteristics (in 100 x 50 (0.5 ha area):</b>		
<b>Characteristic</b>	<b>Abundance (0-7)^</b>	<b>Notes</b>
Decorticating bark	4	
Course leaf litter (>2cm diam)	4	
Fine leaf litter (<2cm diam)	2	
Bare ground	2	
Grass	4	
Soil cracks	0	
Stones (20-60 cm)	3	
Boulders (61 cm – 2 m)	5	
Large boulders (>2 m)	3	
Rock crevices	4	
Exfoliating rock	3	
<b>^Abundance key: 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant</b>		
<b>Other habitat features and notes (e.g. potential threatened species):</b>		

**Photos**

No photos available

Site habitat assessment		
Site: HA 19	Date: 8/11/2013	Observers: SH
Photo nos: North: 9166, East: 9167, South: 9168, West: 9169		
RE type: 11.9.4	GPS Co-ords: 699981, 7159210	
<b>Habitat description:</b> Semi-evergreen vine thicket		
<b>Trees with hollows (in <u>100 x 50</u> (0.5 ha area))</b>	<b>No. of trees containing hollows (tally)</b>	<b>Total number of hollows</b>
Hollow size < 10 cm diameter	1	1
Hollow size > 10 cm diameter	1	2
<b>Hollow bearing logs (in <u>100 x 50</u> (0.5 ha area)), hollows &gt;10 cm diameter</b>	<b>No. of logs containing hollows (tally)</b>	<b>Total number of hollows in logs</b>
	0	0
<b>Fallen woody material (in 50 x 10 (0.05 ha area))</b>	<b>Total length of logs &gt;10 cm diameter</b>	<b>Total number of logs (tally)</b>
	18m	5
<b>Other habitat characteristics (in 100 x 50 (0.5 ha area):</b>		
<b>Characteristic</b>	<b>Abundance (0-7)^</b>	<b>Notes</b>
Decorticating bark	3	
Course leaf litter (>2cm diam)	3	
Fine leaf litter (<2cm diam)	2	
Bare ground	1	
Grass	6	
Soil cracks	0	
Stones (20-60 cm)	3	
Boulders (61 cm – 2 m)	0	
Large boulders (>2 m)	0	
Rock crevices	0	
Exfoliating rock	0	
^ <b>Abundance key:</b> 0 = nil, 1 = Rare, 2 = Rare to occasional, 3 = Occasional, 4 = Occasional to common, 5 = common, 6 = common to abundant, 7 = Abundant		
<b>Other habitat features and notes</b> (e.g. potential threatened species): Potential habitat for black- breasted button quail		

### Photos

North



East



South



West



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 1

**Date and recorder:** 3/11/13 LM

**Photos:** LM 61

**Easting:** 701492

**Northing:** 7159468 wp202

**General habitat description:** Eucalypt woodland dominated by *E. citriodora*, mixed tall to med height shrubs dominated by *C. glaucophylla* and *casuarina*

## Canopy tree species composition

Tree species	% canopy cover of species What proportion of canopy is represented by this species	Primary food tree species in LGA – refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	Food tree species in LGA – refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> – <i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	Not a koala habitat tree
<b>Tick one for each tree species</b>					
<i>Corymbia citriodora</i>	70	n	n	y	
<i>Callitris glaucophylla</i>	10	n	n	n	y
<i>Corymbia intermedia</i>	20	n	n	y	

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information <sup>c</sup>

Other habitat information <sup>c</sup>	Comments
Vegetative ground cover (% of ground area)	60
Leaf litter cover (% of ground area)	10
Area of surface water (% of ground area)	0
Distance to surface water (approximate)	2-3 km
Evidence of dogs in area	

## Habitat critical to the survival of the koala <sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	n
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** large remnant patch of veg, farm dam and Dawson river located approx. 3km away

**Condition and disturbance:** fire recent 12 months ago, few weeds, existing tracks and gas infrastructure

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011 <sup>d</sup>)

**Note:** If a more detailed koala survey is required (i.e. density estimates), refer to Policy 4 of the Queensland Government's Nature Conservation (Koala) Conservation Plan 2006-2016 <sup>e</sup> and Dique *et al.* 2003 <sup>f</sup>. This may be required where preliminary surveys (i.e. faecal pellet searches) reveal the presence of the koala at a site, for the purposes of informing impact assessment and Commonwealth referral.

## Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	good		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	y		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

## Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPac, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. Wildlife Research, 30, 127-133.

## Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 2

**Date and recorder:** LM 03/11/13

**Photos:** 62-63 LM

**Easting:** 699736

**Northing:** 7160241 wp hab22

**General habitat description:** SEVT on granite escarpment dense shrubs rocky groundcover

## Canopy tree species composition

Tree species	% canopy cover of species  What proportion of canopy is represented by this species	<u>Primary food tree species in LGA</u> – refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	<u>Food tree species in LGA</u> – refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<u>Koala habitat tree*</u> as defined in SEQ Koala SPP <sup>b</sup> – <i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	Not a koala habitat tree
<b>Tick one for each tree species</b>					
<i>Brachychiton rupestris</i>	20	n	n	n	y
<i>Acacia excelsa</i>	10	n	n	n	y
<i>Acacia sp</i>	20	n	n	n	y
Vine thicket sp	50	n	n	n	y

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	20, mostly rocky groundcover
<b>Leaf litter cover</b> (% of ground area)	30
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	2-3km
<b>Evidence of dogs in area</b>	no

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	n
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest or woodland habitats	n

## Other site notes

**Site context:** SEVT is not suitable koala habitat

**Condition and disturbance:** undisturbed, few scattered weeds

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011 <sup>d</sup>)

**Note:** If a more detailed koala survey is required (i.e. density estimates), refer to Policy 4 of the Queensland Government's Nature Conservation (Koala) Conservation Plan 2006-2016 <sup>e</sup> and Dique *et al.* 2003 <sup>f</sup>. This may be required where preliminary surveys (i.e. faecal pellet searches) reveal the presence of the koala at a site, for the purposes of informing impact assessment and Commonwealth referral.

## Faecal pellet survey data

**Survey date and time; survey team:** survey not undertaken in habitat type

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	-		
<b>Number of trees searched</b>	-		
<b>Koala faecal pellets observed</b> (Y/N)	-		
<b>Arboreal mammal scratches observed</b> (Y/N)	-		
<b>Koala(s) observed</b> (Y/N – if yes, details)	-		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

## Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012): [https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation\\_National%20Koala%20Tree%20Protection%20List.pdf](https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation_National%20Koala%20Tree%20Protection%20List.pdf)

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010): <http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

## Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 3

**Date and recorder:** 4/11/13 LM

**Photos:** 73-74 LM

**Easting:** 700844

**Northing:** 7163604 wp 228

**General habitat description:** *Corymbia citriodora* woodland on undulating terrain, sparse shrubs, mid dense to sparse groundcover that has been burnt previously

## Canopy tree species composition

Tree species	% canopy cover of species	<u>Primary food tree species in LGA</u> –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	any other <i>Eucalyptus</i> sp., and trees in genera <i>Corymbia</i> , <i>Melaleuca</i> , <i>Lophostemon</i> , <i>Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Corymbia citriodora</i>	90	n	n	y	
<i>Eucalyptus crebra</i>	10	n	y	y	

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	50
<b>Leaf litter cover</b> (% of ground area)	15
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	1 km
<b>Evidence of dogs in area</b>	Yes – tracks at dam nearby

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	y

## Other site notes

**Site context:** remnant veg linking larger contiguous patches of RE

**Condition and disturbance:** shrub and ground layers burnt less than one year ago

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011 <sup>d</sup>)

**Note:** If a more detailed koala survey is required (i.e. density estimates), refer to Policy 4 of the Queensland Government's Nature Conservation (Koala) Conservation Plan 2006-2016 <sup>e</sup> and Dique *et al.* 2003 <sup>f</sup>. This may be required where preliminary surveys (i.e. faecal pellet searches) reveal the presence of the koala at a site, for the purposes of informing impact assessment and Commonwealth referral.

## Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	good		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	no		
<b>Arboreal mammal scratches observed</b> (Y/N)	yes		
<b>Koala(s) observed</b> (Y/N – if yes, details)	no		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

## Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

## Site photos





# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 4

**Date and recorder:** LM 4/11/13

**Photos:** 78-79

**Easting:** 700093

**Northing:** 7162041

**General habitat description:** Non remnant, low ironbark regrowth to 3 m tall, shrubs absent, dense grassy groundcover

## Canopy tree species composition

Tree species	% canopy cover of species	<b>Primary</b> food tree species in LGA –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Eucalyptus fibrosa</i>	100		y		

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	70
<b>Leaf litter cover</b> (% of ground area)	5
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	500 m farm dam
<b>Evidence of dogs in area</b>	Yes tracks around dam

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	n
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** not koala habitat as non rem

**Condition and disturbance:** burnt by fire less than 1 year ago, previously cleared

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011 <sup>d</sup>)

**Note:** If a more detailed koala survey is required (i.e. density estimates), refer to Policy 4 of the Queensland Government's Nature Conservation (Koala) Conservation Plan 2006-2016 <sup>e</sup> and Dique *et al.* 2003 <sup>f</sup>. This may be required where preliminary surveys (i.e. faecal pellet searches) reveal the presence of the koala at a site, for the purposes of informing impact assessment and Commonwealth referral.

## Faecal pellet survey data

**Survey date and time; survey team:** no pellet survey undertaken as no overstorey canopy trees

	Search area 1	Search area 2	Search area 3
Pellet visibility (Poor, Medium, Good)*	-		
Number of trees searched	-		
Koala faecal pellets observed (Y/N)	-		
Arboreal mammal scratches observed (Y/N)	-		
Koala(s) observed (Y/N – if yes, details)	-		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

## Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPac, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

## Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 5

**Date and recorder:** 4/11/13LM

**Photos:** 88-89 LM

**Easting:** 699356

**Northing:** 7161337 wp 245

**General habitat description:** E fibrosa woodland row 118 and fv06-42, sparse acacia shrubs, dense grassy groundcover

## Canopy tree species composition

Tree species	% canopy cover of species	Primary food tree species in LGA –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	any other <i>Eucalyptus sp.</i> , and trees in genera <i>Corymbia</i> , <i>Melaleuca</i> , <i>Lophostemon</i> , <i>Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Eucalyptus fibrosa</i>	100	n	y	y	

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	75
<b>Leaf litter cover</b> (% of ground area)	5
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	1 km
<b>Evidence of dogs in area</b>	no

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** ridge top plateau bordered by SEVT to west, some disturbance from existing gas infrastructure, all rough barked trees

**Condition and disturbance:** see above

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011<sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	Med poor		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	n		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 6

**Date and recorder:** 4/11/13 LM

**Photos:** 94-95

**Easting:** 705286

**Northing:** 7159143

**General habitat description:** Mixed eucalypt woodland, mid-dense shrubs of mixed species, dense grassy groundcover on undulating terrain

## Canopy tree species composition

Tree species	% canopy cover of species	<b>Primary</b> food tree species in LGA – refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	Food tree species in LGA – refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> – <i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	Not a koala habitat tree
<b>Tick one for each tree species</b>					
<i>Corymbia citriodora</i>	40	n	n	y	
<i>Eucalyptus crebra</i>	30	n	y	y	
<i>Callitris glaucophylla</i>	10	n	n	n	y
<i>Eucalyptus melanophloia</i>	20	n	y	y	

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information <sup>c</sup>

	Comments
<b>Vegetative ground cover</b> (% of ground area)	80
<b>Leaf litter cover</b> (% of ground area)	5
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	2 km
<b>Evidence of dogs in area</b>	n

## Habitat critical to the survival of the koala <sup>c</sup>

	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** large contiguous patch or remnant veg on hilly escarpments and valleys

**Condition and disturbance:** fire damage within past year

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011 <sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	poor		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	y		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 7

**Date and recorder:** 4/11/13 LM

**Photos:** 101-103 LM

**Easting:** 704287

**Northing:** 7160922 wp 258

General habitat description: Open eucalypt woodland, secondary canopy layer with C glaucophylla dense to mid dense, other low shrubs present, dense grassy ground cover

## Canopy tree species composition

Tree species	% canopy cover of species	<u>Primary food tree species in LGA</u> –	<u>Food tree species in LGA</u> –	<u>Koala habitat tree*</u> as defined in SEQ Koala SPP <sup>b</sup> –	<u>Not a koala habitat tree</u>
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Corymbia citriodora</i>	40	n	n	y	
<i>Eucalyptus fibrosa</i>	30	n	y	y	
<i>Callitris glaucophylla</i>	30	n	n	n	y

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	70
<b>Leaf litter cover</b> (% of ground area)	15
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	2 km
<b>Evidence of dogs in area</b>	n

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** large contiguous patch or remnant veg on top of plateau

**Condition and disturbance:** fire damage within past year

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011<sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	poor		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	y		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

### Site photos





# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 8

**Date and recorder:** LM 5/11/13

**Photos:** 111-112 LM

**Easting:** 700983

**Northing:** 7164270 wp 261

**General habitat description:** Ironbark woodland with dense acacia understorey

## Canopy tree species composition

Tree species	% canopy cover of species	<b>Primary</b> food tree species in LGA –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Eucalyptus crebra</i>	75	n	y	y	
<i>Corymbia clarksoniana</i>	5	n	n	y	
<i>Acacia shirleyi</i>	20	n	n	n	n

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	70
<b>Leaf litter cover</b> (% of ground area)	15
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	2km
<b>Evidence of dogs in area</b>	no

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** Contiguous patch or remnant veg south of Dawson river

**Condition and disturbance:** Evidence of previous clearing, disturbed by gas infrastructure

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011<sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	Med		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	n		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

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### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. Wildlife Research, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 9

**Date and recorder:** LM 5/11/13

**Photos:** 113-114 LM

**Easting:** 702210

**Northing:** 7163287 wp 331

**General habitat description:** Ironbark woodland with mid dense acacia understorey

## Canopy tree species composition

Tree species	% canopy cover of species  What proportion of canopy is represented by this species	<b>Primary</b> food tree species in LGA –  refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	Food tree species in LGA –  refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –  <i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	Not a koala habitat tree
<b>Tick one for each tree species</b>					
<i>Eucalyptus crebra</i>	40	n	y	y	
<i>Eucalyptus fibrosa</i>	45	n	y	y	
<i>Eucalyptus melanophloia</i>	15	n	y	y	y

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information <sup>c</sup>

Other habitat information <sup>c</sup>	Comments
Vegetative ground cover (% of ground area)	60
Leaf litter cover (% of ground area)	10
Area of surface water (% of ground area)	0
Distance to surface water (approximate)	2km
Evidence of dogs in area	no

## Habitat critical to the survival of the koala <sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** contiguous patch or remnant veg south of Dawson River in the northern half with a patch of non-rem to south

**Condition and disturbance:** evidence of previous clearing, disturbed by gas infrastructure, fire within previous 12 months

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011<sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
Pellet visibility (Poor, Medium, Good)*	Med		
Number of trees searched	30		
Koala faecal pellets observed (Y/N)	n		
Arboreal mammal scratches observed (Y/N)	n		
Koala(s) observed (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. Wildlife Research, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 10

**Date and recorder:** LM 5/11/13

**Photos:** 120-121 LM

**Easting:** 701482

**Northing:** 7161578 wp 335

**General habitat description:** Mixed eucalypt woodland, mid-dense shrubs of mixed species, dense grassy groundcover

## Canopy tree species composition

Tree species	% canopy cover of species  What proportion of canopy is represented by this species	<b>Primary</b> food tree species in LGA –  refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	Food tree species in LGA –  refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –  <i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	Not a koala habitat tree
<b>Tick one for each tree species</b>					
<i>Eucalyptus fibrosa</i>	40	n	y	y	
<i>Corymbia citriodora</i>	15	n	n	y	
<i>Eucalyptus tenuipes</i>	30	n	y	y	
<i>Corymbia clarksoniana</i>	15	n	n	y	

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information <sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	60
<b>Leaf litter cover</b> (% of ground area)	10
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	4km
<b>Evidence of dogs in area</b>	no

## Habitat critical to the survival of the koala <sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees ( <b>secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012)</b> )	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** contiguous patch or remnant veg on top of ridgeline

**Condition and disturbance:** evidence of previous clearing, disturbed by gas infrastructure, fire within previous 12 months

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011<sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	good		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	n		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

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### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 11

**Date and recorder:** LM 5/11/13

**Photos:** 130-131 LM

**Easting:** 700272

**Northing:** 7159504 wp 472

**General habitat description:** Ironbark dominated woodland with shrubs

## Canopy tree species composition

Tree species	% canopy cover of species	<b>Primary</b> food tree species in LGA – refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	Food tree species in LGA – refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> – <i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	Not a koala habitat tree
	What proportion of canopy is represented by this species				
<b>Tick one for each tree species</b>					
<i>Eucalyptus fibrosa</i>	80	n	y	y	
<i>Eucalyptus melanophloia</i>	20	n	y	y	

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information <sup>c</sup>

	Comments
<b>Vegetative ground cover</b> (% of ground area)	60
<b>Leaf litter cover</b> (% of ground area)	10
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	4km
<b>Evidence of dogs in area</b>	no

## Habitat critical to the survival of the koala <sup>c</sup>

	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** contiguous patch or remnant veg on top of ridgeline

**Condition and disturbance:** evidence of previous clearing, disturbed by gas infrastructure, fire within previous 12 months

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011<sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	good		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	n		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPac, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

### Site photos





# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 12

**Date and recorder:** LM 5/11/13

**Photos:** 134-135 LM

**Easting:** 704707

**Northing:** 7159865 wp 504

**General habitat description:** Ironbark and Callitris dominated woodland with shrubs

## Canopy tree species composition

Tree species	% canopy cover of species	<b>Primary</b> food tree species in LGA –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Eucalyptus fibrosa</i>	60	n	y	y	
<i>Eucalyptus melanophloia</i>	20	n	y	y	
<i>Callitris glaucophylla</i>	20	n	n	n	y

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

	Comments
<b>Vegetative ground cover</b> (% of ground area)	70
<b>Leaf litter cover</b> (% of ground area)	10
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	1km
<b>Evidence of dogs in area</b>	no

## Habitat critical to the survival of the koala<sup>c</sup>

	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees ( <b>secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012)</b> )	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** Contiguous patch or remnant veg

**Condition and disturbance:** Fire within previous 12 months

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011<sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	med		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	N		
<b>Arboreal mammal scratches observed</b> (Y/N)	n		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

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### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPac, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. Wildlife Research, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 13

**Date and recorder:** 6/11/13 LM

**Photos:** 136-137

**Easting:** 701945

**Northing:** 7162525 wp 522

**General habitat description:** *Corymbia citriodora* woodland with dense tall shrub layer of acacia and *Alphitonia*

## Canopy tree species composition

Tree species	% canopy cover of species  What proportion of canopy is represented by this species	<b>Primary food tree species in LGA –</b>  refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	<b>Food tree species in LGA –</b>  refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<b>Koala habitat tree* as defined in SEQ Koala SPP<sup>b</sup> –</b>  <i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	<b>Not a koala habitat tree</b>
<b>Tick one for each tree species</b>					
<i>Corymbia citriodora</i>	90	n	n	y	
<i>Corymbia clarksoniana</i>	10	n	n	y	

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	60
<b>Leaf litter cover</b> (% of ground area)	15
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	5 km
<b>Evidence of dogs in area</b>	n

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees ( <b>secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012)</b> )	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** Open woodland on ridgetop, part of large contiguous patch of re

**Condition and disturbance:** Burnt heavily within past 12 months

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011 <sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	good		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	n		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

[https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation\\_National%20Koala%20Tree%20Protection%20List.pdf](https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation_National%20Koala%20Tree%20Protection%20List.pdf)

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. Wildlife Research, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 15

**Date and recorder:** 6/11/13 LM

**Photos:** 138-139

**Easting:** 704933

**Northing:** 7159251 wp 538

**General habitat description:** *Corymbia citriodora* dominated woodland with dense shrubland on rocky hillside

## Canopy tree species composition

Tree species	% canopy cover of species	Primary food tree species in LGA –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Corymbia citriodora</i>	60	n	n	y	
<i>Eucalyptus fibrosa</i>	20	n	y	y	
<i>Acacia leiocalyx</i>	10	n	n	n	y
<i>Callitris glaucophylla</i>	10	n	n	n	y

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	50
<b>Leaf litter cover</b> (% of ground area)	30
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	1km
<b>Evidence of dogs in area</b>	n

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees ( <b>secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012)</b> )	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** Large patch of contiguous remnant vegetation

**Condition and disturbance:** Undisturbed, not burnt, good condition

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011 <sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	poor		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	N		
<b>Arboreal mammal scratches observed</b> (Y/N)	Y		
<b>Koala(s) observed</b> (Y/N – if yes, details)	N		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

[https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation\\_National%20Koala%20Tree%20Protection%20List.pdf](https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation_National%20Koala%20Tree%20Protection%20List.pdf)

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. Wildlife Research, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 16

**Date and recorder:** 6/11/13 LM

**Photos:** 146-147

**Easting:** 7043370

**Northing:** 7159176 wp 549

**General habitat description:** *Corymbia citriodora* dominated woodland mid dense shrubs grassy ground layer

## Canopy tree species composition

Tree species	% canopy cover of species	Primary food tree species in LGA –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Corymbia citriodora</i>	80	n	n	y	
<i>Eucalyptus melanophloia</i>	20	n	y	y	

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	65
<b>Leaf litter cover</b> (% of ground area)	20
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	3km
<b>Evidence of dogs in area</b>	n

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** Large contiguous patch of re on ridgetop

**Condition and disturbance:** undisturbed very sparse weeds good condition

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011<sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** survey not undertaken

**Survey location details (site name / number):** N/A

**Survey location (transect start) Easting and Northing:** N/A

**Survey location (transect end) Easting and Northing:** N/A

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	-		
<b>Number of trees searched</b>	-		
<b>Koala faecal pellets observed</b> (Y/N)	-		
<b>Arboreal mammal scratches observed</b> (Y/N)	-		
<b>Koala(s) observed</b> (Y/N – if yes, details)	-		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

### Site photos





# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 17

**Date and recorder:** 7/11/13 LM

**Photos:** 152-153

**Easting:** 704843

**Northing:** 7160162 wp 565

**General habitat description:** Open eucalypt woodland on rocky undulating low hills mid dense shrubs

## Canopy tree species composition

Tree species	% canopy cover of species	Primary food tree species in LGA –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Corymbia citriodora</i>	60	n	n	y	
<i>Eucalyptus fibrosa</i>	35	n	y	y	
<i>Eucalyptus melanophloia</i>	5	n	y	y	

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

Other habitat information <sup>c</sup>	Comments
Vegetative ground cover (% of ground area)	65
Leaf litter cover (% of ground area)	5
Area of surface water (% of ground area)	1
Distance to surface water (approximate)	100m small ephemeral pools in watercourse only
Evidence of dogs in area	No but likely

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	<b>n</b>
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	<b>n</b>
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	<b>y</b>
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	<b>n</b>
A relatively high density of koalas is supported, regardless of the presence of food tree species	<b>n</b>
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	<b>n</b>

## Other site notes

**Site context:** large patch of contiguous remnant veg west of the Dawson river

**Condition and disturbance:** heavily burnt less than 12 months ago, few weeds evidence of pigs and cane toads

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011<sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	med		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	n		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPaC, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 18

**Date and recorder:** 7/11/13 LM

**Photos:** 154-155

**Easting:** 704851

**Northing:** 7160704 wp 572

**General habitat description:** Open *Corymbia citriodora* woodland on rocky hill side mid dense shrubs including *Callitris*

## Canopy tree species composition

Tree species	% canopy cover of species	Primary food tree species in LGA –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Corymbia citriodora</i>	75	n	n	y	
<i>Callitris glaucophylla</i>	15	n	n	n	n

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	50
<b>Leaf litter cover</b> (% of ground area)	20
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	2 km to Dawson river
<b>Evidence of dogs in area</b>	No

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	y
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** large patch of contiguous remnant veg west of the dawson river on rocky hillside

**Condition and disturbance:** intact remnant bushland, evidence of minor fire, sparse weeds, generally good condition

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011 <sup>d</sup>)

### Faecal pellet survey data

**Survey date and time; survey team:** as per koala habitat assessment

**Survey location details (site name / number):** as per koala habitat assessment

**Survey location (transect start) Easting and Northing:** as per koala habitat assessment

**Survey location (transect end) Easting and Northing:** as per koala habitat assessment

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	med		
<b>Number of trees searched</b>	30		
<b>Koala faecal pellets observed</b> (Y/N)	n		
<b>Arboreal mammal scratches observed</b> (Y/N)	y		
<b>Koala(s) observed</b> (Y/N – if yes, details)	n		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

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### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPac, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. Wildlife Research, 30, 127-133.

### Site photos



# Koala Habitat Assessment and Faecal Pellet Survey

**Project:** Lot 20 Fairview

**Site name/number:** KH 19

**Date and recorder:** 8/11/13 LM

**Photos:** 9166-9169 SH

**Easting:** 700007

**Northing:** 7159193 wp 2

**General habitat description:** brigalow and some softwood scrub on escarpment slope, dense shrubs dense grasses, rocky substrate

## Canopy tree species composition

Tree species	% canopy cover of species	Primary food tree species in LGA –	Food tree species in LGA –	Koala habitat tree* as defined in SEQ Koala SPP <sup>b</sup> –	Not a koala habitat tree
	What proportion of canopy is represented by this species	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees in bold	refer AKF <i>National Koala Tree Protection List 2012</i> <sup>a</sup> – trees not in bold	<i>any other Eucalyptus sp., and trees in genera Corymbia, Melaleuca, Lophostemon, Angophora</i>	
<b>Tick one for each tree species</b>					
<i>Acacia harpophylla</i>	80	n	n	n	y
Soft wood vine thicket species	10	n	n	n	y
<i>Brachychiton populneus</i>	10	n	n	n	y

\* non-juvenile koala habitat tree > 4 m in height OR trunk circumference > 31.5 cm at height of 1.3 m

## Other habitat information<sup>c</sup>

Other habitat information <sup>c</sup>	Comments
<b>Vegetative ground cover</b> (% of ground area)	80
<b>Leaf litter cover</b> (% of ground area)	10
<b>Area of surface water</b> (% of ground area)	0
<b>Distance to surface water</b> (approximate)	5 km
<b>Evidence of dogs in area</b>	n

## Habitat critical to the survival of the koala<sup>c</sup>

Habitat critical to the survival of the koala <sup>c</sup>	Yes / No
Primary koala food tree species comprise at least 30% of the overstorey trees	n
Primary koala food tree species comprise less than 30% of the overstorey trees, but together with secondary food tree species comprise at least 50% of the overstorey trees (secondary food trees in this instance are those identified for LGA that are not primary food trees (AKF, 2012))	n
Primary food tree species are absent but secondary food tree species alone comprise at least 50% of the overstorey trees	n
The above qualities are absent in a forest or woodland, but other essential habitat features are present and adjacent to areas exhibiting the above qualities	n
A relatively high density of koalas is supported, regardless of the presence of food tree species	n
Any form of landscape corridor which is essential for the dispersal of koalas between forest of woodland habitats	n

## Other site notes

**Site context:** mapped re 11.9.4a on escarpment slope

**Condition and disturbance:** some weeds, relatively undisturbed

## Koala faecal pellet survey - overview

Method based on Spot Assessment Technique (Phillips and Callaghan, 2011 <sup>d</sup>)

### Faecal pellet survey data

**Survey date and time, survey team:** not undertaken as not koala habitat

Survey location details (site name / number): N/A

Survey location (transect start) Easting and Northing: N/A

Survey location (transect end) Easting and Northing: N/A

	Search area 1	Search area 2	Search area 3
<b>Pellet visibility</b> (Poor, Medium, Good)*	-		
<b>Number of trees searched</b>	-		
<b>Koala faecal pellets observed</b> (Y/N)	-		
<b>Arboreal mammal scratches observed</b> (Y/N)	-		
<b>Koala(s) observed</b> (Y/N – if yes, details)	-		

\*Poor: Thick layer of leaf litter, grasses, weeds, shed bark / Medium: Limited amount of leaf litter, grasses, weeds, shed bark / Good: little or no leaf litter, grasses, weeds, shed bark

### Key references:

**a** Australian Koala Foundation's National Koala Tree Protection List; Recommended Tree Species for Protection and Planting of Koala Habitat (Mitchell, 2012):

<https://www.savethekoala.com/sites/default/files/Australian%20Koala%20Foundation%20National%20Koala%20Tree%20Protection%20List.pdf>

**b** State Planning Policy 2/10 Koala Conservation in South East Queensland (DERM, 2010):

<http://www.ehp.qld.gov.au/wildlife/koalas/strategy/pdf/koala-spp.pdf>

**c** Required habitat information and definition of 'habitat critical to the survival of the species' sourced from Interim koala referral advice for proponents (DSEWPac, 2012): <http://www.environment.gov.au/epbc/publications/pubs/bio240-0612-interim-koala-referral-advice.pdf>

**NOTE: this habitat assessment sheet will need to be reviewed and where necessary updated when the finalised koala referral guidelines are released by the Commonwealth**

**d** The Spot Assessment Technique (Phillips and Callaghan, 2011):

<http://www.biolink.com.au/sites/www.biolink.com.au/files/publications/Phillips%20%26%20Callaghan.pdf>

**e** Nature Conservation (Koala) Conservation Plan 2006-2016: <http://www.ehp.qld.gov.au/wildlife/koalas/legislation/pdf/conservation-plan-06-16.pdf>

**f** Dique *et al.* (2003). Evaluation of line transect sampling for estimating koala abundance in the Pine Rivers Shire, south east Queensland. *Wildlife Research*, 30, 127-133.

### Site photos



## WORKS WITHIN A WATERCOURSE ASSESSMENT

This watercourse assessment is to be filled out for all watercourse crossings to ensure compliance with environmental requirements and to ensure appropriate approvals are obtained.

### FIELD ASSESSMENT

Inspected by: Company:	Peter Wagner	GHD	Inspected Date: Time:	8/11/2013
				8:30am

Crossing Name:	Un-named watercourse	CWP Number	
Watercourse ID	WC 1 - Within Assessment Buffer Area	Crossing Type (E.g. pipeline/road)	Pipeline
Lot/Plan:	20FTY1805	Location Reference	
Site	R-HCS-02 <input type="checkbox"/> F-HCS-04 <input type="checkbox"/> F-HCS-05 <input checked="" type="checkbox"/> other/area:		
Land Tenure:	Freehold / Leasehold / other :	Petroleum Tenure	
Crossing Disturbance Status:	Existing crossing with no upgrade required: <input type="checkbox"/> Existing crossing with upgrade required: <input type="checkbox"/> New crossing in previously disturbed area: <input type="checkbox"/> New crossing in undisturbed area: <input checked="" type="checkbox"/>		
Land Access Approval to undertake assessment:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Cultural Heritage Approval to undertake assessment:	Yes <input type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Anticipated commencement date:		Can the crossing be installed within 10 days? If No, development approval and other approvals may be required.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

### HEALTH AND SAFETY

Have you completed a Safety Task Assessment (STA)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If No, cease inspection and complete.
Do you have appropriate PPE for the task?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Do you have adequate amount of water – at least 10 litres?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

### GENERAL ENVIRONMENTAL CONDITIONS

Temp: Cold (<5°C) <input type="checkbox"/> Cool (<15°C) <input type="checkbox"/> Mild (<25°C) <input checked="" type="checkbox"/> Warm (<35°C) <input type="checkbox"/> Hot (>35°C) <input type="checkbox"/>	Weather now: Clear/Fine <input checked="" type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input type="checkbox"/>
	Past 24 hrs: Clear/Fine <input checked="" type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input type="checkbox"/>
Wind: Still <input type="checkbox"/> Slight breeze <input checked="" type="checkbox"/> Windy <input type="checkbox"/> Strong Wind <input type="checkbox"/>	Air now: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>
	Air past 24hrs: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>

## CROSSING LOCATION (REFER SECTION 8.2)

GPS Coordinates - Latitude/Longitude (E – 6 Figs, N – 7 Figs) GDA94					
Latitude (E)	699215	Longitude (S)	7161007		
Bankfull Width (m)	5 m	Bank Width (m):	Left Bank: 2 m Right Bank: 1.5 m		
Stream Width at Water Surface (m):	NA	Baseflow Stream Width (m):	1.5 m		
Bank Height: Baseflow and water surface height difference:	<b>Note modified surrounds attributed to nearby dam. Two drainage gullies and one eroded washout.</b> Downstream left Bank: 1.8 m/ NA  Downstream Right Bank 2 m/ NA	<b>Photographs of site</b> Provide photos looking upstream and downstream from crossing location, as well as relevant to watercourse / waterway determination. Label photos.	Location	Latitude (E)	Longitude (S)
			A	699215	7161007
			B		
			C		
			D	NA	NA
E	NA	NA			
Water Present:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Water Type:	Flowing <input type="checkbox"/> Pool(s) present <input type="checkbox"/> Dry <input checked="" type="checkbox"/>				
Sample Site Length: 100 m	Water Surface Depth to Bed: NA				
<b>CHANNEL DETERMINATION (REFER TO SECTION 8.3)</b>					
Stream Order: 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 4+ <input type="checkbox"/>	Functional Zone Type - Sediment	Supply <input checked="" type="checkbox"/> Transfer <input type="checkbox"/> Storage <input type="checkbox"/>			
Identify Channel Type:	Irregular				
Channel Modifications:	Natural				
Bed Sediment Character:	Tight <input type="checkbox"/> Packed <input type="checkbox"/> Moderate <input type="checkbox"/> Low 1 <input checked="" type="checkbox"/> Low 2 <input type="checkbox"/>				
Bank Sediments Composition:	Bedrock 30 % Boulder 40 % Cobble 20 % Pebble 10 % Gravel % Sand Fines %				
Bed Material Angularity:	Very Angular <input type="checkbox"/> Angular <input checked="" type="checkbox"/> Sub-angular <input type="checkbox"/> Rounded <input type="checkbox"/> Well-rounded <input type="checkbox"/> Cobble pebble and gravel fractions not present <input type="checkbox"/>				
Bank Predominant Shape:	Concave <input type="checkbox"/> Convex <input type="checkbox"/> Stepped <input checked="" type="checkbox"/> Wide lower bench <input type="checkbox"/> Undercut <input type="checkbox"/>				
Bank Slope Downstream Right:	Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input checked="" type="checkbox"/> Moderate 30-60° <input type="checkbox"/> Low 10-30° <input type="checkbox"/> Flat <10° <input type="checkbox"/>				
Bank Slope Downstream Left:	Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input type="checkbox"/> Moderate 30-60° <input checked="" type="checkbox"/> Low 10-30° <input type="checkbox"/> Flat <10° <input type="checkbox"/>				
Channel Shape:	Deepened U-shape				
Bed Stability:	Severe Erosion <input type="checkbox"/> Moderate Erosion <input type="checkbox"/> Bed Stable <input type="checkbox"/> Moderate Deposition <input checked="" type="checkbox"/> Severe Deposition <input type="checkbox"/>				
Potential Fish Habitat Class:	Class1 <input type="checkbox"/> Class2 <input type="checkbox"/> Class3 <input type="checkbox"/> Class4 <input checked="" type="checkbox"/>				
Fish Migratory Passage Potential:	Nil <input checked="" type="checkbox"/> Very Restricted <input type="checkbox"/> Moderately Restricted <input type="checkbox"/> Partly Restricted <input type="checkbox"/> Good Passage <input type="checkbox"/> Unrestricted Passage <input type="checkbox"/>				

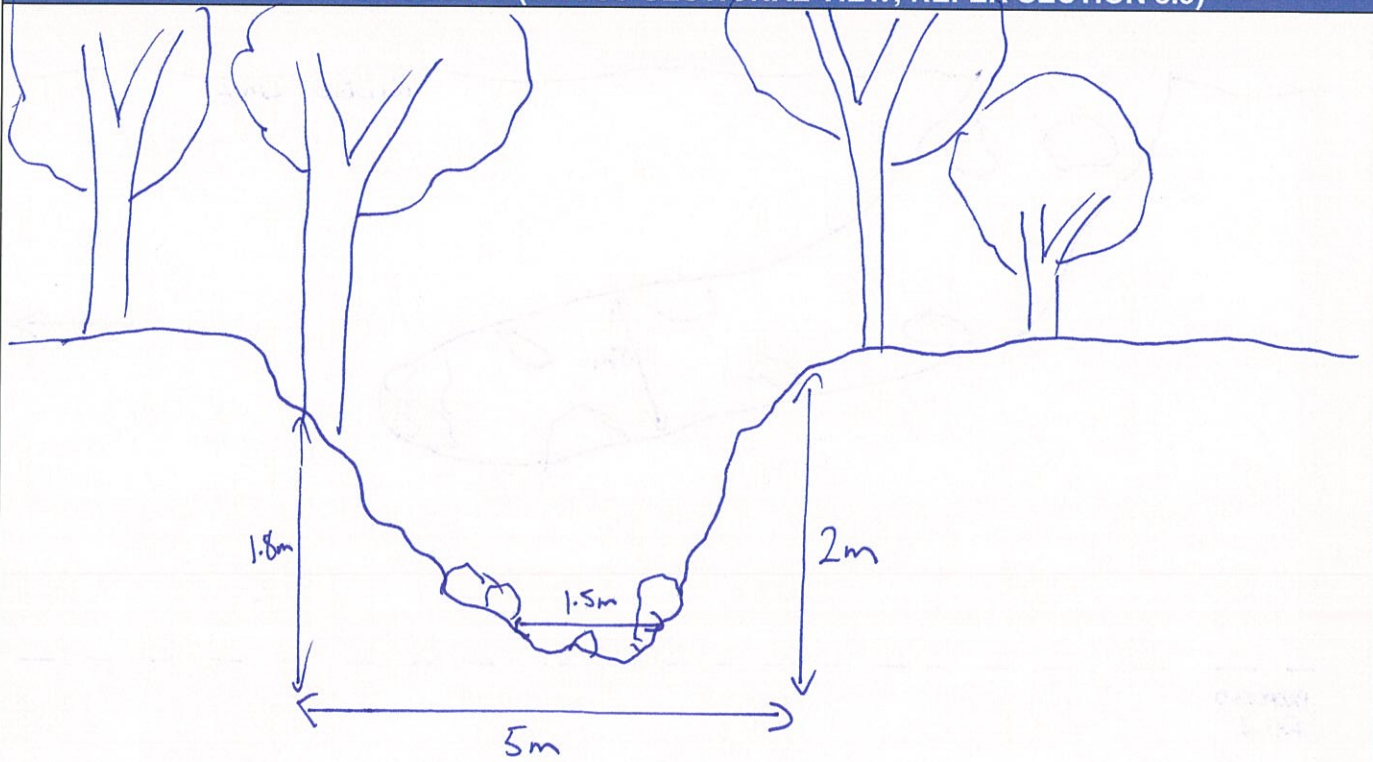
## FLORA/FAUNA ASSESSMENT (REFER TO SECTION 8.4)

Does any vegetation need to be removed?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>If Yes, no more than 0.25 Ha can be removed Estimate how much needs to be removed</b>
<b>Vegetation community description</b>		
Has an Aquatic and Ecological Assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, reference Report No:



Has a pre-disturbance assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If no, a pre-disturbance assessment may be required
Does the riparian zone at the watercourse fall within a mapped extent of a Regional Ecosystem and/ or TEC? (refer to Dekho maps)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If Yes, detail mapped RE code (biodiversity status) and TEC where applicable: Mapped as a mixed Not of Concern at Present RE 11.10.1/11.10.13a.
Does the riparian zone at the watercourse fall within any Category A, B or C Environmentally Sensitive Areas (ESAs) and/or their primary or secondary primary protection (buffer) zones (refer to Dekho maps)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If Yes, detail ESA category: Category C ESA (State Forest)
If present, is the mapped RE/TEC community consistent with the vegetation community observed on the ground	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If no, Check whether discrepancies have already been recorded in previous reports and GIS layers updated. If not a pre-disturbance assessment or quaternary level assessment may be required.
Does the proposed development activity comply with the clearing/significant disturbance restrictions of the applicable EA (refer Table 3)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If, no then flag with FLUOR Environment Team for review.
Are there any Cultural Heritage sites located within the crossing location or nearby area (refer to Dekho maps)	Yes <input type="checkbox"/> No <input type="checkbox"/>	If Yes, detail site:
General Vegetation Community description: (including a list of dominant flora species within each stratum)	<b>Woodland Community</b> <b>T1 = <i>Corymbia citriodora</i> (dominant); <i>Eucalyptus fibrosa</i> subsp. <i>nubila</i>; and <i>Lysicarpus angustifolia</i>.</b> <b>T2 = <i>Alphitonia excelsa</i>; and <i>Acacia longispicata</i></b> <b>G = <i>Arundinella nepalensis</i>; <i>Scleria</i> sp.; and <i>Solanum ellipticum</i>.</b>	
Are there any declared weeds within the area of the crossing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, describe flag on the ground and GPS and provide on map.
Are there any conservation significant species (i.e ENVT or Type A flora) within the area of the crossing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Riparian vegetation cover: Trees > 10 m: Trees < 10 m: Shrubs: Grasses, herbs and sedges:	40 % 20 % 30 % 60 %	
Riparian vegetation patchiness:	Occasional clumps	
Describe the riparian vegetation condition:	VAST III - Transformed	
Native woody vegetation regeneration:	Abundant <input type="checkbox"/> Present <input checked="" type="checkbox"/> Limited <input type="checkbox"/>	
<b>SAFETY CONSIDERATIONS</b>		
Are there any safety implications at the proposed crossing due to decreased Right of Way from Environmental Sensitive Areas or other constraints like topography?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>If Yes, Note concerns</b>

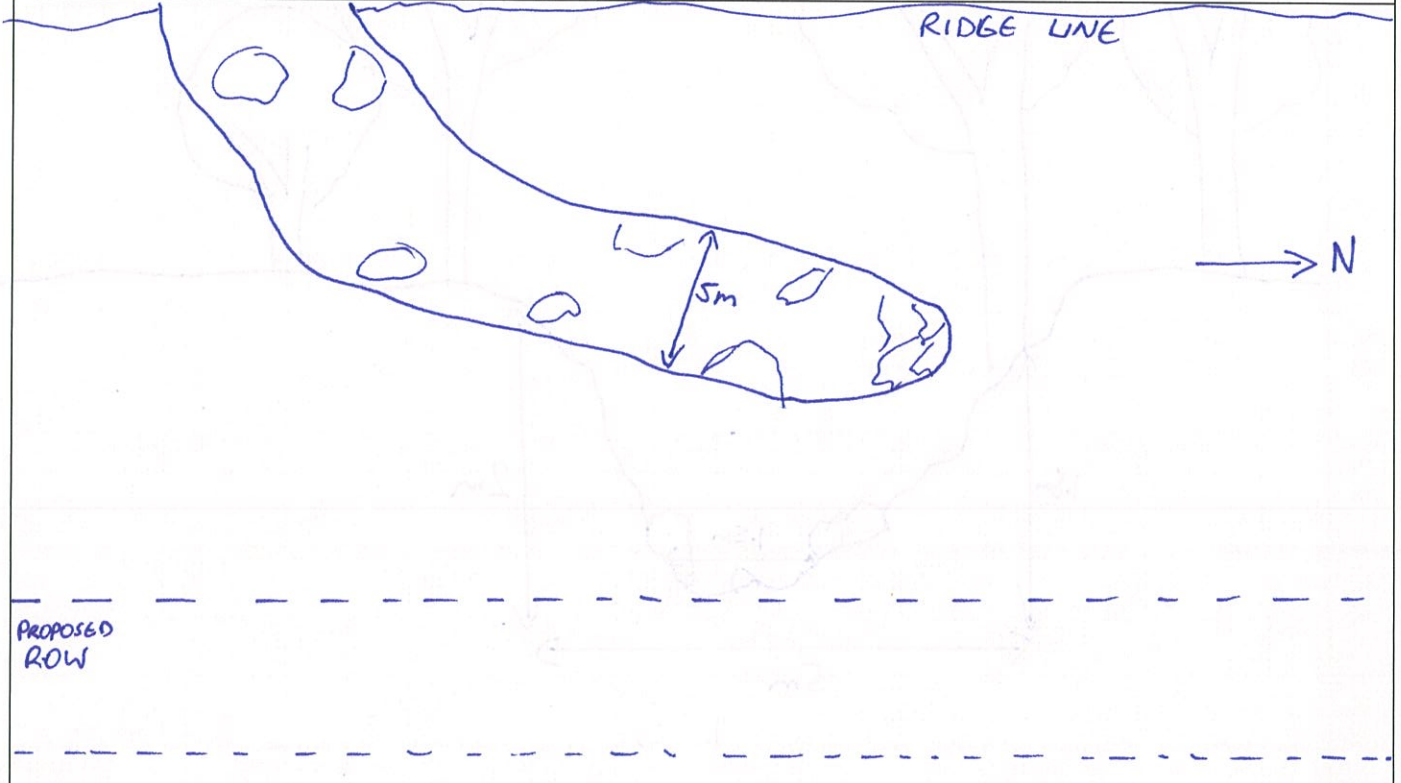
SKETCH OF CROSSING (CROSS-SECTIONAL VIEW, REFER SECTION 8.5)



Notes: Very Rocky DRAINAGE LINE

## SKETCH OF CROSSING (BIRDS EYE VIEW) (REFER SECTION 8.5)

Sketch birds eye view (i.e. view looking from above), depict how the stream curves, any vegetation, trees, areas of significance (cultural significance if known). Complete approx 10 times the Bankfull Width upstream and downstream of crossing site. Take photographs upstream and downstream (write photo locations on your sketch). Include any names of features (i.e. roads, farm house, power poles).



PROPOSED ROW

EXISTING ROAD

Notes:

ROCKY STREAM BED

BEGINNING OF DRAINAGE GULLY

## ASSESSMENT OUTCOME

LEGISLATIVE REQUIREMENTS DETERMINATION				
Part 1 - Waterway Definition Assessment ( <i>Fisheries Act 1994</i> )				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>Does the feature satisfy the waterway definition requirements of FHMOP 008 2009 (refer section 7.3.2) under the <i>Fisheries Act 1994</i>?</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>Does the feature have a defined bed and banks: The bed and banks need to be continuous rather than isolated and broken sections of a depression.</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p>	<p><b>WATERWAY UNDER FISHERIES ACT 1994?</b></p> <p style="text-align: center;"><input type="checkbox"/> <b>YES</b></p> <p style="text-align: center;"><b>(APPROVAL/LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have an extended, if non-permanent, period of flow: Flow must continue for a reasonable period after rain ceases and have some reliability commensurate with rainfall? Flow for several weeks after rainfall ceases does not constitute extended flow.</p> <p>Consider e.g. water present, catchment size, geomorphological features, and ecological indicators of sustained flow.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p>	<p style="text-align: center;"><input checked="" type="checkbox"/> <b>NO</b></p> <p style="text-align: center;"><b>(NO LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have sufficient flow adequacy: The flow needs to be sufficient to sustain basic ecological processes and to maintain biodiversity within the feature. Comment on any ecological indicators present e.g. riparian vegetation, presence/evidence of aquatic life etc.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p><b>No evidence of aquatic life. Vegetation consistent with areas surrounding (outside of area of influence)</b></p>	

Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>a.</p> <p><b>Do the works constitute waterway barrier works as defined in FHMOP 008 2009 (Appendix 3)?</b></p>	<p>As well as dams and weirs the following are examples of developments that are considered to be waterway barrier works:</p> <ul style="list-style-type: none"> <li>▪ Temporary dams, barriers to flow</li> <li>▪ Culverts</li> <li>▪ Bed level waterway crossings</li> <li>▪ Causeways (water crossings slightly above stream bed)</li> <li>▪ Tidal or floodgates (including maintenance and repair)</li> <li>▪ Partial bunds (where the development will only partially block a waterway)</li> <li>▪ Levee banks</li> <li>▪ Silt curtains</li> <li>▪ Netting and screens</li> <li>▪ Litter booms or Trash racks</li> <li>▪ Riffle structure</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, complete Section 2b.</p> <p>If <b>No</b>, implement construction works in accordance with environmental protection measures as requires in Environmental Authority and other relevant environmental requirements.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	
<p>b.</p> <p><b>Is the waterway crossing self assessable under WWBW01 for Temporary Waterway Barrier Works</b></p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>▪ Waterway barriers that will be in place for less than 42 calendar days</li> <li>▪ Waterway barriers that are less than 20m in length across the waterway from bank to bank and;</li> <li>▪ 10m or less in width (at the widest point).</li> <li>▪ Waterway barriers that are at least 500m distance from any existing natural or artificial waterway barrier (upstream or downstream) unless:               <ul style="list-style-type: none"> <li>○ the barrier is being constructed in order to perform maintenance or repairs on, or removal of, the existing barrier, or</li> <li>○ the barrier is being constructed in order to facilitate dewatering between the new and existing barriers, or</li> <li>○ the barrier is a silt curtain for control of sediment.</li> </ul> </li> <li>▪ Disturbance to the bed and banks of a waterway less than 5m from the toe of the barrier on either side.</li> <li>▪ Construction at the time of the year when the flows are lowest or have completely stopped.</li> <li>▪ A waterway barrier where there will be no ponding of water upstream.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW01 in addition to waterway crossing design and environmental protection measures as required in CEMP, Environmental Authority, EIS and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p> <p>If <b>No</b>, go to Section 2c.</p>	

Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>c.</p> <p>Is the waterway crossing self assessable under WWBW02 for Minor Waterway Barrier Works</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>• New waterway barrier works at <b>least 100m</b> from any other permanent waterway barrier works on same waterway.</li> <li>• Construction that is <b>not</b> on a bend or rapid section of a waterway.</li> <li>• Construction perpendicular to the water flow (within 10°).</li> <li>• Construction of minor barriers must commence and finish within 60 calendar days.</li> <li>• Construction during times of low flow, base flow or no flow conditions.</li> <li>• And either one of either:               <ul style="list-style-type: none"> <li>• <u>Part 1, Dams and Weirs</u></li> </ul> </li> <li>• Construction of a new <b>dam or weir</b> or maintenance of existing one on a waterway with a stream order of 1 or 2</li> <li>• Maximum waterway barrier height is <b>one metre or less</b> above the lowest point of the waterway bed</li> <li>• Upstream and downstream disturbance area must not be more than <b>10 m</b> in total from the upstream and downstream toe of the barrier.</li> <li>• <u>Or, Part 3, Culverts</u></li> <li>• Construction of a new <b>culvert</b> crossing or replacement/ modification or maintenance of existing culvert where the bankfull width of the waterway <b>is not</b> greater than 20m.</li> <li>• Construction of <b>culverts</b> where the <b>maximum</b> upstream/downstream length of the culvert cells is 15m plus apron (3m scour protection for culverts) or less.</li> <li>• The maximum disturbance area outside barrier footprint of 10 m (scour protection is included in the barrier footprint (upstream and/or downstream).</li> <li>• <u>Or, Part 4, Bed Level Crossings</u></li> <li>• Construction of a new <b>bed level</b> crossing or replacement/ modification or maintenance of existing <b>bed level</b> waterway where the bankfull width of the waterway can be less than or greater than 20m.</li> <li>• <b>Bed level</b> crossing footprint is no more than <b>15 m wide</b> (upstream/downstream), with a maximum disturbance area outside crossing footprint of <b>10 m (25 m in total)</b>.</li> <li>• Installation of <b>bed level</b> crossings <b>no higher</b> than natural bed level.</li> <li>• Installation of a <b>bed level</b> crossing at the same gradient as the waterway bed gradient.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW02 in addition to waterway crossing design and environmental protection measures as required, Environmental Authority and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	

Part 3 - Water Definition Assessment (Water Act 2000) & Relevant Environmental Authority				
Environmental Value	Checklist	Y / N	Justification for Placement	Overall Outcome
<p>Does the feature fit the definition of a <b>Drainage Feature</b> under the Water Act 2000?</p> <p><b>Drainage feature</b> means a natural landscape feature, including a gully, drain, drainage depression or other erosion feature that—</p> <p>(a) is formed by the concentration of, or operates to confine or concentrate, overland flow water during and immediately after rainfall events; and</p> <p>(b) flows for only a short duration after a rainfall event, regardless of the frequency of flow events; and</p> <p>(c) commonly, does not have enough continuing flow to create a Riverine environment</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>1. Does the feature carrying water flow only for a short duration after a rainfall event?</p> <p>2. Does the feature lack the presence of a riverine environment? (i.e flow adequacy to support riverine species).</p> <p>3. Does the feature lack the presence of in-stream islands, benches or bars?</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes to all</b> of these questions then the feature does not constitute a watercourse and no further assessment is required for the Water Act.</p> <p>If <b>no to any</b> one of these questions then this feature constitutes a watercourse under the Water Act 2000</p>	<p><b>Drainage Feature UNDER the WATER ACT 2000?</b></p> <p><input checked="" type="checkbox"/> <b>YES</b>            (NO APPROVAL REQUIRED)</p> <p>Implement environmental protection measures as required in Environmental authority and other relevant environmental requirements.</p> <p><input type="checkbox"/> <b>NO</b>  <b>Determined a Watercourse – see below</b></p>
		<input checked="" type="checkbox"/> yes <input type="checkbox"/> no		<p><b>Watercourse under the WATER ACT 2000?</b></p> <p><input type="checkbox"/> <b>YES</b>  <b>(APPROVAL/ LODGEMENT REQUIRED – DETERMINED A WATERCOURSE)</b></p> <p>Complete Pre and Post works checklists, and ensure appropriate lodgements are undertaken as per Environmental Authority Requirements.</p> <p><input checked="" type="checkbox"/> <b>NO</b>  <b>Determined a drainage feature– see Above.</b></p>

**Part 4 - Water Act Requirements (only complete if works are to take place within or adjacent to the watercourse – refer to Section 2 (Water Act) outcomes)**

Environmental Value	Checklist	Y / N	Justification for Placement	Comments
<p><b>Do the works require approval under the Water Act?</b> (Refer to summary flowchart within Section 9 of watercourse manual)</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>Excavation or placing fill in a way that would interfere with the flow of water in a watercourse, lake or spring by impounding or redirecting the flow of water (referring to completed product, following construction works).</li> </ul>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b>, go to Part 5, works may require a Riverine Protection Permit under the Water Act. Provide evidence that waterway crossing design satisfies DEHP Guidelines (next section) including reference to design drawings. Attach/reference all records and store in relevant Environmental Drive. Complete paperwork and forward to FLUOR Environment Team for review.  <b>If No, adhere to EA requirements!</b></p>	

**Part 5 – DNRM Assessment Requirements (Guideline – activities in a watercourse, lake or spring associated with mining operations) (refer to Section 1 (Water Act) outcomes)**

<p>What type (if any) vegetation will be required to be removed and quantity (area). (no more than 0.25ha), how will the vegetation be removed?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>List all species required for removal. Ensure FLUOR/SANTOS vegetation management plan and EA conditions are followed (indicate the requirements for this crossing).</p>	<p>Outside of planned Right of Way. See previous for a list of flora species present</p>
<p>Can the water crossing be located in a previously disturbed area?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If No, why not?</p>	<p>Outside of planned Right of Way</p>
<p>Is the water course from groundwater origin?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>Determine upstream water sources</p>	



## Section 6 – Overall Assessment Outcome

<p>Has the stream order been assessed a watercourse (Water Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes, must comply with the "Guideline – activities in a watercourse, lake or spring associated with mining operations" – Ensure all of this checklist is completed and conveyed to all relevant staff, contractors are to ensure compliance with EA conditions – ensure lodgement of PREWORKS TO DEHP 10 Business prior to works commencing.</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED, ASSESSED AS DRAINAGE FEATURE)</b></p>
<p>Has the stream order been assessed as a waterway (Fisheries Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete check boxes below          If <b>No</b> – no further assessment required</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED)</b></p>
<p>Is a development approval required (i.e. the self assessable code can not be adhered to)?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> Contact FLUOR Environment Team.</p>	
<p>Was the crossing assessed as a 'minor waterway barrier?', either:</p>		<p>If <b>Yes</b> complete the relevant 'Minor Waterway Barrier Works Self-Assessment Sheet' lodge to FLUOR Environment Team.</p>	
<p>Part 1 – Dams and Weirs</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 3 – Culverts</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 4 – Bed Level Crossings</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Was the crossing assessed as a 'temporary waterway barrier'?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete a Temporary Waterway Barrier Works Self-Assessment Sheet lodge to FLUOR Environmental Team for review.</p>	
<p><b>Were any EVNT species listed under the EPBC Act and/or NC Act present within the riparian zone of the waterway crossing</b></p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes GPS the position of individuals/populations, flag on site and contact FLUOR Environmental Team for review.          If No – no further assessment required</p>	
<p><b>Were any vegetation mapping discrepancies identified within the riparian zone of the waterway crossing</b></p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes undertake a quaternary level RE assessment and GPS the extent of the mapped community assemblage where applicable. Contact FLUOR Environment Team for review.          If No – no further assessment required</p>	

## WC 1 Pre-works Photographs

Photo **A** - Looking across the waterway at the proposed site works (outside of ROW)



Photo **B** - Looking downstream of the proposed site of works



Photo **C** - Looking upstream of the proposed site of works



Right Bank



Left Bank



## WORKS WITHIN A WATERCOURSE ASSESSMENT

This watercourse assessment is to be filled out for all watercourse crossings to ensure compliance with environmental requirements and to ensure appropriate approvals are obtained.

### FIELD ASSESSMENT

Inspected by: Company:	Peter Wagner	GHD	Inspected Date: Time:	7/11/2013
				8:00am

Crossing Name:	Un-named watercourse	CWP Number	
Watercourse ID	WC 2	Crossing Type (E.g. pipeline/road)	Pipeline
Lot/Plan:	20FTY1805	Location Reference	
Site	R-HCS-02 <input type="checkbox"/> F-HCS-04 <input type="checkbox"/> F-HCS-05 <input checked="" type="checkbox"/> other/area:		
Land Tenure:	Freehold / Leasehold / other :	Petroleum Tenure	
Crossing Disturbance Status:	Existing crossing with no upgrade required: <input type="checkbox"/> Existing crossing with upgrade required: <input type="checkbox"/> New crossing in previously disturbed area: <input checked="" type="checkbox"/> New crossing in undisturbed area: <input type="checkbox"/>		
Land Access Approval to undertake assessment:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Cultural Heritage Approval to undertake assessment:	Yes <input type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Anticipated commencement date:		Can the crossing be installed within 10 days? If No, development approval and other approvals may be required.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

### HEALTH AND SAFETY

Have you completed a Safety Task Assessment (STA)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If No, cease inspection and complete.
Do you have appropriate PPE for the task?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Do you have adequate amount of water – at least 10 litres?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

### GENERAL ENVIRONMENTAL CONDITIONS

Temp: Cold (<5°C) <input type="checkbox"/> Cool (<15°C) <input type="checkbox"/> Mild (<25°C) <input checked="" type="checkbox"/> Warm (<35°C) <input type="checkbox"/> Hot (>35°C) <input type="checkbox"/>	Weather now: Clear/Fine <input checked="" type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input type="checkbox"/>
	Past 24 hrs: Clear/Fine <input type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input checked="" type="checkbox"/>
Wind: Still <input type="checkbox"/> Slight breeze <input checked="" type="checkbox"/> Windy <input type="checkbox"/> Strong Wind <input type="checkbox"/>	Air now: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>
	Air past 24hrs: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>

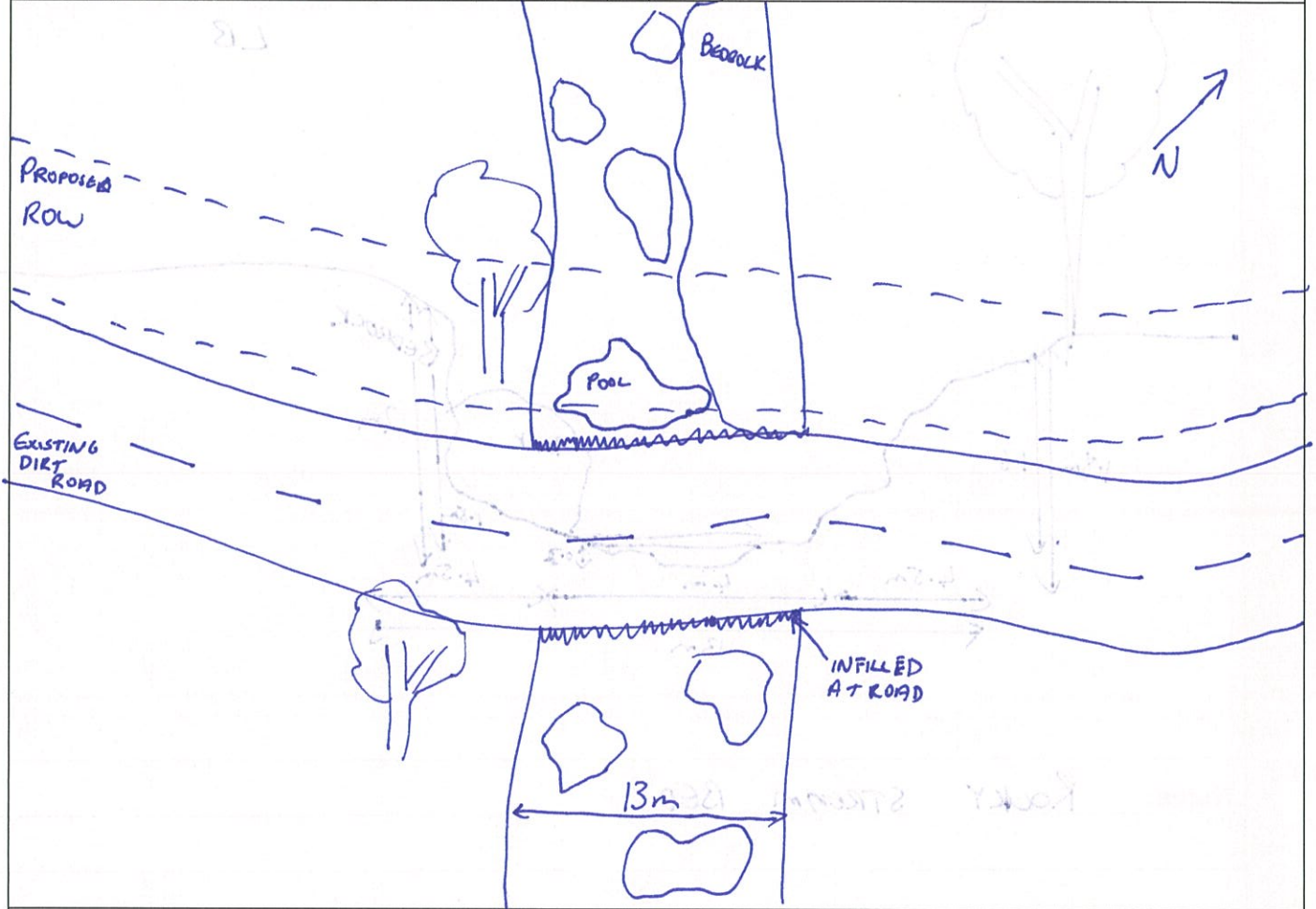
CROSSING LOCATION (REFER SECTION 8.2)					
GPS Coordinates - Latitude/Longitude (E – 6 Figs, N – 7 Figs) GDA94					
Latitude (E)	704860	Longitude (S)	7160158		
Bankfull Width (m)	13 m	Bank Width (m):	Left Bank: 4.5 m Right Bank: 4.5 m		
Stream Width at Water Surface (m):	3.5	Baseflow Stream Width (m):	4 m		
Bank Height: Baseflow and water surface height difference:	<b>Note modified surrounds attributed to nearby dam. Two drainage gullies and one eroded washout.</b> Downstream left Bank: 2 m/ 1.8  Downstream Right Bank 1.8 m/ 1.6	<b>Photographs of site</b> Provide photos looking upstream and downstream from crossing location, as well as relevant to watercourse / waterway determination. Label photos.	Location	Latitude (E)	Longitude (S)
			A	704860	7160158
			B		
			C		
			D	NA	NA
E	NA	NA			
Water Present:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>				
Water Type:	Flowing <input type="checkbox"/> Pool(s) present <input checked="" type="checkbox"/> Dry <input type="checkbox"/>				
Sample Site Length: 150 m			Water Surface Depth to Bed: 0.3 m		
CHANNEL DETERMINATION (REFER TO SECTION 8.3)					
Stream Order: 1 <input type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 4+ <input type="checkbox"/>		Functional Zone Type - Sediment		Supply <input type="checkbox"/> Transfer <input checked="" type="checkbox"/> Storage <input type="checkbox"/>	
Identify Channel Type:		Irregular meanders			
Channel Modifications:		Natural; in-filled at road crossing			
Bed Sediment Character:		Tight <input type="checkbox"/> Packed <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low 1 <input type="checkbox"/> Low 2 <input type="checkbox"/>			
Bank Sediments Composition:		Bedrock % Boulder 65 % Cobble 10 % Pebble 5 % Gravel 5 % Sand Fines 15 %			
Bed Material Angularity:		Very Angular <input type="checkbox"/> Angular <input type="checkbox"/> Sub-angular <input type="checkbox"/> Rounded <input checked="" type="checkbox"/> Well-rounded <input type="checkbox"/> Cobble pebble and gravel fractions not present <input type="checkbox"/>			
Bank Predominant Shape:		Concave <input checked="" type="checkbox"/> Convex <input type="checkbox"/> Stepped <input type="checkbox"/> Wide lower bench <input type="checkbox"/> Undercut <input type="checkbox"/>			
Bank Slope Downstream Right:		Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input type="checkbox"/> Moderate 30-60° <input type="checkbox"/> Low 10-30° <input checked="" type="checkbox"/> Flat <10° <input type="checkbox"/>			
Bank Slope Downstream Left:		Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input type="checkbox"/> Moderate 30-60° <input checked="" type="checkbox"/> Low 10-30° <input type="checkbox"/> Flat <10° <input type="checkbox"/>			
Channel Shape:		Deepened U-shape			
Bed Stability:		Severe Erosion <input type="checkbox"/> Moderate Erosion <input type="checkbox"/> Bed Stable <input checked="" type="checkbox"/> Moderate Deposition <input type="checkbox"/> Severe Deposition <input type="checkbox"/>			
Potential Fish Habitat Class:		Class1 <input type="checkbox"/> Class2 <input type="checkbox"/> Class3 <input type="checkbox"/> Class4 <input checked="" type="checkbox"/>			
Fish Migratory Passage Potential:		Nil <input checked="" type="checkbox"/> Very Restricted <input type="checkbox"/> Moderately Restricted <input type="checkbox"/> Partly Restricted <input type="checkbox"/> Good Passage <input type="checkbox"/> Unrestricted Passage <input type="checkbox"/>			

FLORA/FAUNA ASSESSMENT (REFER TO SECTION 8.4)		
Does any vegetation need to be removed?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>If Yes, no more than 0.25 Ha can be removed Estimate how much needs to be removed</b>
<b>Vegetation community description</b>		
Has an Aquatic and Ecological Assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, reference Report No:

Has a pre-disturbance assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If no, a pre-disturbance assessment may be required
Does the riparian zone at the watercourse fall within a mapped extent of a Regional Ecosystem and/ or TEC? (refer to Dekho maps)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If Yes, detail mapped RE code (biodiversity status) and TEC where applicable: Mapped as a mixed Of Concern REs 11.3.2/11.3.25.
Does the riparian zone at the watercourse fall within any Category A, B or C Environmentally Sensitive Areas (ESAs) and/or their primary or secondary primary protection (buffer) zones (refer to Dekho maps)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If Yes, detail ESA category: Category C ESA (State Forest) and Of Concern RE
If present, is the mapped RE/TEC community consistent with the vegetation community observed on the ground	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If no, Check whether discrepancies have already been recorded in previous reports and GIS layers updated. If not a pre-disturbance assessment or quaternary level assessment may be required. Ground-truthed as 11.10.7/11.10.1
Does the proposed development activity comply with the clearing/significant disturbance restrictions of the applicable EA (refer Table 3)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If, no then flag with FLUOR Environment Team for review.
Are there any Cultural Heritage sites located within the crossing location or nearby area (refer to Dekho maps)	Yes <input type="checkbox"/> No <input type="checkbox"/>	If Yes, detail site:
General Vegetation Community description: (including a list of dominant flora species within each stratum)	<b>Woodland Community</b> <b>T1 = <i>Corymbia citriodora</i> (dominant); <i>Eucalyptus fibrosa subsp. nubila</i>.</b> <b>T2 = <i>C. citriodora</i>; <i>E. fibrosa subsp. nubila</i>; and <i>Callitris glaucophylla</i></b> <b>S1 = <i>Acacia leiocalyx</i>; <i>Dodonaea viscosa</i></b> <b>G = <i>Arundinella nepalensis</i></b>	
Are there any declared weeds within the area of the crossing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, describe flag on the ground and GPS and provide on map.
Are there any conservation significant species (i.e ENV T or Type A flora) within the area of the crossing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Riparian vegetation cover: Trees > 10 m: Trees < 10 m: Shrubs: Grasses, herbs and sedges:		10 % 15 % 10 % 80 %
Riparian vegetation patchiness:		Occasional clumps
Describe the riparian vegetation condition:		VAST II – Modified (recent fire < 12 months)
Native woody vegetation regeneration:	Abundant <input checked="" type="checkbox"/> Present <input type="checkbox"/> Limited <input type="checkbox"/>	
<b>SAFETY CONSIDERATIONS</b>		
Are there any safety implications at the proposed crossing due to decreased Right of Way from Environmental Sensitive Areas or other constraints like topography?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>If Yes, Note concerns</b>

## SKETCH OF CROSSING (BIRDS EYE VIEW) (REFER SECTION 8.5)

Sketch birds eye view (i.e. view looking from above), depict how the stream curves, any vegetation, trees, areas of significance (cultural significance if known). Complete approx 10 times the Bankfull Width upstream and downstream of crossing site. Take photographs upstream and downstream (write photo locations on your sketch). Include any names of features (i.e. roads, farm house, power poles).



### Notes:

Predominantly bedrock/boulders along stream bed





## ASSESSMENT OUTCOME

LEGISLATIVE REQUIREMENTS DETERMINATION				
Part 1 - Waterway Definition Assessment ( <i>Fisheries Act 1994</i> )				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>Does the feature satisfy the waterway definition requirements of FHMOP 008 2009 (refer section 7.3.2) under the <i>Fisheries Act 1994</i>?</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>Does the feature have a defined bed and banks: The bed and banks need to be continuous rather than isolated and broken sections of a depression.</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p>	<p><b>WATERWAY UNDER FISHERIES ACT 1994?</b></p> <p style="text-align: center;"><input type="checkbox"/> <b>YES</b></p> <p style="text-align: center;"><b>(APPROVAL/LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have an extended, if non-permanent, period of flow: Flow must continue for a reasonable period after rain ceases and have some reliability commensurate with rainfall? Flow for several weeks after rainfall ceases does not constitute extended flow.</p> <p>Consider e.g. water present, catchment size, geomorphological features, and ecological indicators of sustained flow.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p>	<p style="text-align: center;"><input checked="" type="checkbox"/> <b>NO</b></p> <p style="text-align: center;"><b>(NO LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have sufficient flow adequacy: The flow needs to be sufficient to sustain basic ecological processes and to maintain biodiversity within the feature. Comment on any ecological indicators present e.g. riparian vegetation, presence/evidence of aquatic life etc.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p><b>No evidence of aquatic life. Vegetation consistent with areas surrounding (outside of area of influence)</b></p>	

Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>a.</p> <p><b>Do the works constitute waterway barrier works as defined in FHMOP 008 2009 (Appendix 3)?</b></p>	<p>As well as dams and weirs the following are examples of developments that are considered to be waterway barrier works:</p> <ul style="list-style-type: none"> <li>▪ Temporary dams, barriers to flow</li> <li>▪ Culverts</li> <li>▪ Bed level waterway crossings</li> <li>▪ Causeways (water crossings slightly above stream bed)</li> <li>▪ Tidal or floodgates (including maintenance and repair)</li> <li>▪ Partial bunds (where the development will only partially block a waterway)</li> <li>▪ Levee banks</li> <li>▪ Silt curtains</li> <li>▪ Netting and screens</li> <li>▪ Litter booms or Trash racks</li> <li>▪ Riffle structure</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, complete Section 2b.</p> <p>If <b>No</b>, implement construction works in accordance with environmental protection measures as requires in Environmental Authority and other relevant environmental requirements.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	
<p>b.</p> <p><b>Is the waterway crossing self assessable under WWBW01 for Temporary Waterway Barrier Works</b></p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>▪ Waterway barriers that will be in place for less than 42 calendar days</li> <li>▪ Waterway barriers that are less than 20m in length across the waterway from bank to bank and;</li> <li>▪ 10m or less in width (at the widest point).</li> <li>▪ Waterway barriers that are at least 500m distance from any existing natural or artificial waterway barrier (upstream or downstream) unless:               <ul style="list-style-type: none"> <li>○ the barrier is being constructed in order to perform maintenance or repairs on, or removal of, the existing barrier, or</li> <li>○ the barrier is being constructed in order to facilitate dewatering between the new and existing barriers, or</li> <li>○ the barrier is a silt curtain for control of sediment.</li> </ul> </li> <li>▪ Disturbance to the bed and banks of a waterway less than 5m from the toe of the barrier on either side.</li> <li>▪ Construction at the time of the year when the flows are lowest or have completely stopped.</li> <li>▪ A waterway barrier where there will be no ponding of water upstream.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW01 in addition to waterway crossing design and environmental protection measures as required in CEMP, Environmental Authority, EIS and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p> <p>If <b>No</b>, go to Section 2c.</p>	

Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>c.</p> <p>Is the waterway crossing self assessable under WWBW02 for Minor Waterway Barrier Works</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>• New waterway barrier works at <b>least 100m</b> from any other permanent waterway barrier works on same waterway.</li> <li>• Construction that is <b>not</b> on a bend or rapid section of a waterway.</li> <li>• Construction perpendicular to the water flow (within 10°).</li> <li>• Construction of minor barriers must commence and finish within 60 calendar days.</li> <li>• Construction during times of low flow, base flow or no flow conditions.</li> <li>• And either one of either:               <ul style="list-style-type: none"> <li>• <u>Part 1, Dams and Weirs</u></li> </ul> </li> <li>• Construction of a new <b>dam or weir</b> or maintenance of existing one on a waterway with a stream order of 1 or 2</li> <li>• Maximum waterway barrier height is <b>one metre or less</b> above the lowest point of the waterway bed</li> <li>• Upstream and downstream disturbance area must not be more than <b>10 m</b> in total from the upstream and downstream toe of the barrier.</li> <li>• <u>Or, Part 3, Culverts</u></li> <li>• Construction of a new <b>culvert</b> crossing or replacement/ modification or maintenance of existing culvert where the bankfull width of the waterway <b>is not</b> greater than 20m.</li> <li>• Construction of <b>culverts</b> where the <b>maximum</b> upstream/downstream length of the culvert cells is 15m plus apron (3m scour protection for culverts) or less.</li> <li>• The maximum disturbance area outside barrier footprint of 10 m (scour protection is included in the barrier footprint (upstream and/or downstream).</li> <li>• <u>Or, Part 4, Bed Level Crossings</u></li> <li>• Construction of a new <b>bed level</b> crossing or replacement/ modification or maintenance of existing <b>bed level</b> waterway where the bankfull width of the waterway can be less than or greater than 20m.</li> <li>• <b>Bed level</b> crossing footprint is no more than <b>15 m wide</b> (upstream/downstream), with a maximum disturbance area outside crossing footprint of <b>10 m (25 m in total)</b>.</li> <li>• Installation of <b>bed level</b> crossings <b>no higher</b> than natural bed level.</li> <li>• Installation of a <b>bed level</b> crossing at the same gradient as the waterway bed gradient.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW02 in addition to waterway crossing design and environmental protection measures as required, Environmental Authority and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	

Part 3 - Water Definition Assessment (Water Act 2000) & Relevant Environmental Authority				
Environmental Value	Checklist	Y / N	Justification for Placement	Overall Outcome
<p>Does the feature fit the definition of a <b>Drainage Feature</b> under the Water Act 2000?</p> <p><b>Drainage feature</b> means a natural landscape feature, including a gully, drain, drainage depression or other erosion feature that—</p> <p>(a) is formed by the concentration of, or operates to confine or concentrate, overland flow water during and immediately after rainfall events; and</p> <p>(b) flows for only a short duration after a rainfall event, regardless of the frequency of flow events; and</p> <p>(c) commonly, does not have enough continuing flow to create a Riverine environment</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>1. Does the feature carrying water flow only for a short duration after a rainfall event?</p> <p>2. Does the feature lack the presence of a riverine environment? (i.e flow adequacy to support riverine species).</p> <p>3. Does the feature lack the presence of in-stream islands, benches or bars?</p>	<p><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If <b>Yes to all</b> of these questions then the feature does not constitute a watercourse and no further assessment is required for the Water Act.</p> <p>If <b>no to any</b> one of these questions then this feature constitutes a watercourse under the Water Act 2000</p>	<p><b>Drainage Feature UNDER the WATER ACT 2000?</b></p> <p><input checked="" type="checkbox"/> <b>YES</b> <b>(NO APPROVAL REQUIRED)</b></p> <p>Implement environmental protection measures as required in Environmental authority and other relevant environmental requirements.</p> <p><input type="checkbox"/> <b>NO</b> <b>Determined a Watercourse – see below</b></p>
				<p><b>Watercourse under the WATER ACT 2000?</b></p> <p><input type="checkbox"/> <b>YES</b> <b>(APPROVAL/ LODGEMENT REQUIRED – DETERMINED A WATERCOURSE)</b></p> <p>Complete Pre and Post works checklists, and ensure appropriate lodgements are undertaken as per Environmental Authority Requirements.</p> <p><input checked="" type="checkbox"/> <b>NO</b> <b>Determined a drainage feature– see Above.</b></p>

**Part 4 - Water Act Requirements (only complete if works are to take place within or adjacent to the watercourse – refer to Section 2 (Water Act) outcomes)**

Environmental Value	Checklist	Y / N	Justification for Placement	Comments
<p><b>Do the works require approval under the Water Act?</b> (Refer to summary flowchart within Section 9 of watercourse manual)</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>Excavation or placing fill in a way that would interfere with the flow of water in a watercourse, lake or spring by impounding or redirecting the flow of water (referring to completed product, following construction works).</li> </ul>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b>, go to Part 5, works may require a Riverine Protection Permit under the Water Act. Provide evidence that waterway crossing design satisfies DEHP Guidelines (next section) including reference to design drawings. Attach/reference all records and store in relevant Environmental Drive. Complete paperwork and forward to FLUOR Environment Team for review.  <b>If No, adhere to EA requirements!</b></p>	

**Part 5 – DNRM Assessment Requirements (Guideline – activities in a watercourse, lake or spring associated with mining operations) (refer to Section 1 (Water Act) outcomes)**

<p>What type (if any) vegetation will be required to be removed and quantity (area). (no more than 0.25ha), how will the vegetation be removed?</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>List all species required for removal. Ensure FLUOR/SANTOS vegetation management plan and EA conditions are followed (indicate the requirements for this crossing).</p>	<p>See previous for a list of flora species present</p>
<p>Can the water crossing be located in a previously disturbed area?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If No, why not?</p>	<p>Adjacent to existing road crossing</p>
<p>Is the water course from groundwater origin?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>Determine upstream water sources</p>	

## Section 6 – Overall Assessment Outcome

<p>Has the stream order been assessed a watercourse (Water Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes, must comply with the "Guideline – activities in a watercourse, lake or spring associated with mining operations" – Ensure all of this checklist is completed and conveyed to all relevant staff, contractors are to ensure compliance with EA conditions – ensure lodgement of PREWORKS TO DEHP 10 Business prior to works commencing</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED, ASSESSED AS DRAINAGE FEATURE)</b></p>
<p>Has the stream order been assessed as a waterway (Fisheries Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete check boxes below          If <b>No</b> – no further assessment required</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED)</b></p>
<p>Is a development approval required (i.e. the self assessable code can not be adhered to)?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> Contact FLUOR Environment Team.</p>	
<p>Was the crossing assessed as a 'minor waterway barrier?', either:</p>		<p>If <b>Yes</b> complete the relevant 'Minor Waterway Barrier Works Self-Assessment Sheet' lodge to FLUOR Environment Team.</p>	
<p>Part 1 – Dams and Weirs</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 3 – Culverts</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 4 – Bed Level Crossings</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Was the crossing assessed as a 'temporary waterway barrier'?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete a Temporary Waterway Barrier Works Self-Assessment Sheet lodge to FLUOR Environmental Team for review.</p>	
<p><b>Were any EVNT species listed under the EPBC Act and/or NC Act present within the riparian zone of the waterway crossing</b></p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes GPS the position of individuals/populations, flag on site and contact FLUOR Environmental Team for review.          If No – no further assessment required</p>	
<p><b>Were any vegetation mapping discrepancies identified within the riparian zone of the waterway crossing</b></p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>If Yes undertake a quaternary level RE assessment and GPS the extent of the mapped community assemblage where applicable. Contact FLUOR Environment Team for review.          If No – no further assessment required</p>	<p>Mapped as 11.3.2/11.3.25. Ground-truthed as 11.10.7/11.10.1</p>

## WC 2 Pre-works Photographs

Photo A – Looking across the waterway at the proposed site works



Photo B – Looking downstream of the proposed site of works



Photo C – Looking upstream of the proposed site of works



Road crossing looking downstream



Road crossing looking upstream





## WORKS WITHIN A WATERCOURSE ASSESSMENT

This watercourse assessment is to be filled out for all watercourse crossings to ensure compliance with environmental requirements and to ensure appropriate approvals are obtained.

### FIELD ASSESSMENT

Inspected by: Company:	Peter Wagner	GHD	Inspected Date: Time:	8/11/2013
				2:30pm

Crossing Name:	Un-named watercourse	CWP Number	
Watercourse ID	WC 3	Crossing Type (E.g. pipeline/road)	Pipeline
Lot/Plan:	20FTY1805	Location Reference	
Site	R-HCS-02 <input type="checkbox"/> F-HCS-04 <input type="checkbox"/> F-HCS-05 <input checked="" type="checkbox"/> other/area:		
Land Tenure:	Freehold / Leasehold / other :	Petroleum Tenure	
Crossing Disturbance Status:	Existing crossing with no upgrade required: <input type="checkbox"/> Existing crossing with upgrade required: <input type="checkbox"/> New crossing in previously disturbed area: <input checked="" type="checkbox"/> New crossing in undisturbed area: <input type="checkbox"/>		
Land Access Approval to undertake assessment:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Cultural Heritage Approval to undertake assessment:	Yes <input type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Anticipated commencement date:		Can the crossing be installed within 10 days? If No, development approval and other approvals may be required.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

### HEALTH AND SAFETY

Have you completed a Safety Task Assessment (STA)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If No, cease inspection and complete.
Do you have appropriate PPE for the task?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Do you have adequate amount of water – at least 10 litres?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

### GENERAL ENVIRONMENTAL CONDITIONS

Temp: Cold (<5°C) <input type="checkbox"/> Cool (<15°C) <input type="checkbox"/> Mild (<25°C) <input type="checkbox"/> Warm (<35°C) <input checked="" type="checkbox"/> Hot (>35°C) <input type="checkbox"/>	Weather now: Clear/Fine <input checked="" type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input type="checkbox"/>
	Past 24 hrs: Clear/Fine <input checked="" type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input type="checkbox"/>
Wind: Still <input type="checkbox"/> Slight breeze <input checked="" type="checkbox"/> Windy <input type="checkbox"/> Strong Wind <input type="checkbox"/>	Air now: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>
	Air past 24hrs: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>

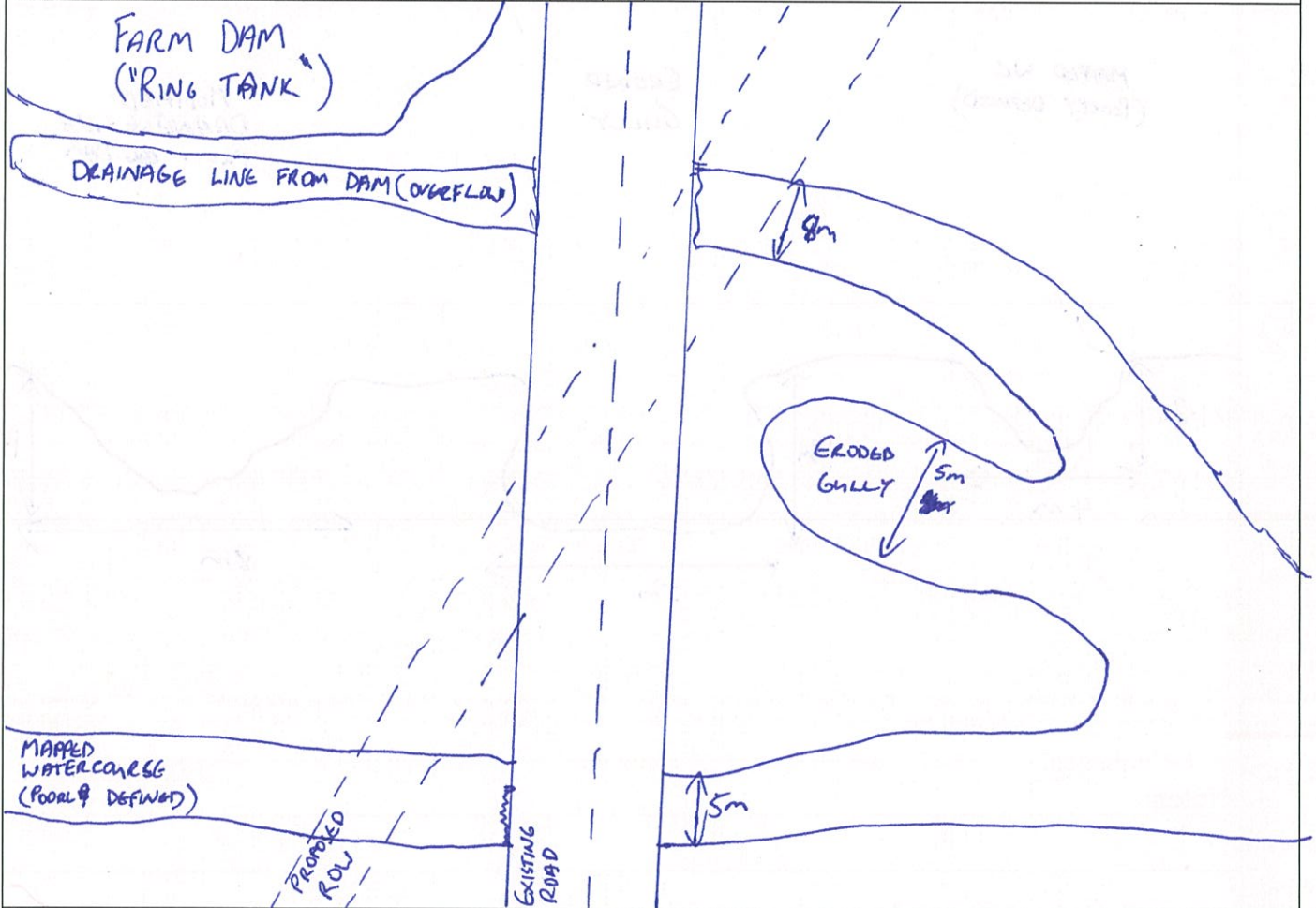
CROSSING LOCATION (REFER SECTION 8.2)					
GPS Coordinates - Latitude/Longitude (E – 6 Figs, N – 7 Figs) GDA94					
Latitude (E)	701642	Longitude (S)	7163275		
Bankfull Width (m)	4 - 8 m	Bank Width (m):	Left Bank: 1 – 1.5 m Right Bank: 1 – 2 m		
Stream Width at Water Surface (m):	NA	Baseflow Stream Width (m):	1 - 4 m		
Bank Height: Baseflow and water surface height difference:	<b>Note modified surrounds attributed to nearby dam. Two drainage gullies and one eroded washout.</b> Downstream left Bank: 1.8 – 2 m / NA  Downstream Right Bank 1.5 - 2 m / NA	<b>Photographs of site</b> Provide photos looking upstream and downstream from crossing location, as well as relevant to watercourse / waterway determination. Label photos.	Location	Latitude (E)	Longitude (S)
			A		
			B		
			C		
			D	NA	NA
E	NA	NA			
Water Present:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Water Type:	Flowing <input type="checkbox"/> Pool(s) present <input type="checkbox"/> Dry <input checked="" type="checkbox"/>				
Sample Site Length: 50 m	Water Surface Depth to Bed: NA				
CHANNEL DETERMINATION (REFER TO SECTION 8.3)					
Stream Order: 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 4+ <input type="checkbox"/>	Functional Zone Type - Sediment	Supply <input type="checkbox"/> Transfer <input checked="" type="checkbox"/> Storage <input type="checkbox"/>			
Identify Channel Type:	Braided				
Channel Modifications:	Infilled at existing road crossings (upstream)				
Bed Sediment Character:	Tight <input type="checkbox"/> Packed <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low 1 <input type="checkbox"/> Low 2 <input type="checkbox"/>				
Bank Sediments Composition:	Bedrock % Boulder % Cobble % Pebble 10 % Gravel 10 % Sand Fines 80 %				
Bed Material Angularity:	Very Angular <input type="checkbox"/> Angular <input type="checkbox"/> Sub-angular <input checked="" type="checkbox"/> Rounded <input type="checkbox"/> Well-rounded <input type="checkbox"/> Cobble pebble and gravel fractions not present <input type="checkbox"/>				
Bank Predominant Shape:	Concave <input checked="" type="checkbox"/> Convex <input checked="" type="checkbox"/> Stepped <input type="checkbox"/> Wide lower bench <input type="checkbox"/> Undercut <input type="checkbox"/>				
Bank Slope Downstream Right:	Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input checked="" type="checkbox"/> Moderate 30-60° <input checked="" type="checkbox"/> Low 10-30° <input type="checkbox"/> Flat <10° <input type="checkbox"/>				
Bank Slope Downstream Left:	Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input checked="" type="checkbox"/> Moderate 30-60° <input checked="" type="checkbox"/> Low 10-30° <input type="checkbox"/> Flat <10° <input type="checkbox"/>				
Channel Shape:	Wide Box and Flat U-shapes				
Bed Stability:	Severe Erosion <input type="checkbox"/> Moderate Erosion <input checked="" type="checkbox"/> Bed Stable <input type="checkbox"/> Moderate Deposition <input type="checkbox"/> Severe Deposition <input type="checkbox"/>				
Potential Fish Habitat Class:	Class1 <input type="checkbox"/> Class2 <input type="checkbox"/> Class3 <input type="checkbox"/> Class4 <input checked="" type="checkbox"/>				
Fish Migratory Passage Potential:	Nil <input checked="" type="checkbox"/> Very Restricted <input type="checkbox"/> Moderately Restricted <input type="checkbox"/> Partly Restricted <input type="checkbox"/> Good Passage <input type="checkbox"/> Unrestricted Passage <input type="checkbox"/>				

FLORA/FAUNA ASSESSMENT (REFER TO SECTION 8.4)		
Does any vegetation need to be removed?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>If Yes, no more than 0.25 Ha can be removed Estimate how much needs to be removed</b>
<b>Vegetation community description</b>		
Has an Aquatic and Ecological Assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, reference Report No:

Has a pre-disturbance assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If no, a pre-disturbance assessment may be required
Does the riparian zone at the watercourse fall within a mapped extent of a Regional Ecosystem and/ or TEC? (refer to Dekho maps)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If Yes, detail mapped RE code (biodiversity status) and TEC where applicable: Mapped as a mixed Of Concern RE 11.3.39/11.3.2.
Does the riparian zone at the watercourse fall within any Category A, B or C Environmentally Sensitive Areas (ESAs) and/or their primary or secondary primary protection (buffer) zones (refer to Dekho maps)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If Yes, detail ESA category: Category C ESA (State Forest)
If present, is the mapped RE/TEC community consistent with the vegetation community observed on the ground	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If no, Check whether discrepancies have already been recorded in previous reports and GIS layers updated. If not a pre-disturbance assessment or quaternary level assessment may be required.
Does the proposed development activity comply with the clearing/significant disturbance restrictions of the applicable EA (refer Table 3)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If, no then flag with FLUOR Environment Team for review.
Are there any Cultural Heritage sites located within the crossing location or nearby area (refer to Dekho maps)	Yes <input type="checkbox"/> No <input type="checkbox"/>	If Yes, detail site:
General Vegetation Community description: (including a list of dominant flora species within each stratum)	<b>Mixed Eucalypt Woodland Community</b> <b>T1 = <i>Corymbia citriodora</i> (dominant); <i>Eucalyptus fibrosa subsp. nubila</i>; and <i>E. melanophloia</i></b> <b>T2 = <i>Corymbia citriodora</i> (dominant); <i>Eucalyptus fibrosa subsp. nubila</i>; <i>E. melanophloia</i>; and <i>Callitris glaucophylla</i></b> <b>S1 = <i>Acacia leiocalyx</i>; <i>Dodonaea viscosa</i>; and <i>Petalostigma pubescens</i>.</b> <b>G = <i>Heteropogon contortus</i>; <i>Cenchrus ciliaris</i></b>	
Are there any declared weeds within the area of the crossing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, describe flag on the ground and GPS and provide on map.
Are there any conservation significant species (i.e ENV T or Type A flora) within the area of the crossing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Riparian vegetation cover: Trees > 10 m: Trees < 10 m: Shrubs: Grasses, herbs and sedges:		10 % 10 % 15 % 40 %
Riparian vegetation patchiness:		Occasional clumps
Describe the riparian vegetation condition:		VAST III - Transformed
Native woody vegetation regeneration:	Abundant <input type="checkbox"/> Present <input checked="" type="checkbox"/> Limited <input type="checkbox"/>	
<b>SAFETY CONSIDERATIONS</b>		
Are there any safety implications at the proposed crossing due to decreased Right of Way from Environmental Sensitive Areas or other constraints like topography?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>If Yes, Note concerns</b>

## SKETCH OF CROSSING (BIRDS EYE VIEW) (REFER SECTION 8.5)

Sketch birds eye view (i.e. view looking from above), depict how the stream curves, any vegetation, trees, areas of significance (cultural significance if known). Complete approx 10 times the Bankfull Width upstream and downstream of crossing site. Take photographs upstream and downstream (write photo locations on your sketch). Include any names of features (i.e. roads, farm house, power poles).



Notes:

Modified DRAINAGE SYSTEM DUE TO DAM



**ASSESSMENT OUTCOME**

LEGISLATIVE REQUIREMENTS DETERMINATION				
Part 1 - Waterway Definition Assessment ( <i>Fisheries Act 1994</i> )				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>Does the feature satisfy the waterway definition requirements of FHMOP 008 2009 (refer section 7.3.2) under the <i>Fisheries Act 1994</i>?</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>Does the feature have a defined bed and banks: The bed and banks need to be continuous rather than isolated and broken sections of a depression.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p> <p><b>Bed and banks not consistent</b></p>	<p><b>WATERWAY UNDER FISHERIES ACT 1994?</b></p> <p><input type="checkbox"/> <b>YES</b></p> <p><b>(APPROVAL/ LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have an extended, if non-permanent, period of flow: Flow must continue for a reasonable period after rain ceases and have some reliability commensurate with rainfall? Flow for several weeks after rainfall ceases does not constitute extended flow.</p> <p>Consider e.g. water present, catchment size, geomorphological features, and ecological indicators of sustained flow.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p>	<p><input checked="" type="checkbox"/> <b>NO</b></p> <p><b>(NO LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have sufficient flow adequacy: The flow needs to be sufficient to sustain basic ecological processes and to maintain biodiversity within the feature. Comment on any ecological indicators present e.g. riparian vegetation, presence/evidence of aquatic life etc.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p><b>No evidence of aquatic life. Vegetation consistent with areas surrounding (outside of area of influence)</b></p>	

Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>a.</p> <p><b>Do the works constitute waterway barrier works as defined in FHMOP 008 2009 (Appendix 3)?</b></p>	<p>As well as dams and weirs the following are examples of developments that are considered to be waterway barrier works:</p> <ul style="list-style-type: none"> <li>▪ Temporary dams, barriers to flow</li> <li>▪ Culverts</li> <li>▪ Bed level waterway crossings</li> <li>▪ Causeways (water crossings slightly above stream bed)</li> <li>▪ Tidal or floodgates (including maintenance and repair)</li> <li>▪ Partial bunds (where the development will only partially block a waterway)</li> <li>▪ Levee banks</li> <li>▪ Silt curtains</li> <li>▪ Netting and screens</li> <li>▪ Litter booms or Trash racks</li> <li>▪ Riffle structure</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, complete Section 2b.</p> <p>If <b>No</b>, implement construction works in accordance with environmental protection measures as requires in Environmental Authority and other relevant environmental requirements.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	
<p>b.</p> <p><b>Is the waterway crossing self assessable under WWBW01 for Temporary Waterway Barrier Works</b></p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>▪ Waterway barriers that will be in place for less than 42 calendar days</li> <li>▪ Waterway barriers that are less than 20m in length across the waterway from bank to bank and;</li> <li>▪ 10m or less in width (at the widest point).</li> <li>▪ Waterway barriers that are at least 500m distance from any existing natural or artificial waterway barrier (upstream or downstream) unless:               <ul style="list-style-type: none"> <li>○ the barrier is being constructed in order to perform maintenance or repairs on, or removal of, the existing barrier, or</li> <li>○ the barrier is being constructed in order to facilitate dewatering between the new and existing barriers, or</li> <li>○ the barrier is a silt curtain for control of sediment.</li> </ul> </li> <li>▪ Disturbance to the bed and banks of a waterway less than 5m from the toe of the barrier on either side.</li> <li>▪ Construction at the time of the year when the flows are lowest or have completely stopped.</li> <li>▪ A waterway barrier where there will be no ponding of water upstream.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW01 in addition to waterway crossing design and environmental protection measures as required in CEMP, Environmental Authority, EIS and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p> <p>If <b>No</b>, go to Section 2c.</p>	

Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>c.</p> <p>Is the waterway crossing self assessable under WWBW02 for Minor Waterway Barrier Works</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>New waterway barrier works at <b>least 100m</b> from any other permanent waterway barrier works on same waterway.</li> <li>Construction that is <b>not</b> on a bend or rapid section of a waterway.</li> <li>Construction perpendicular to the water flow (within 10°).</li> <li>Construction of minor barriers must commence and finish within 60 calendar days.</li> <li>Construction during times of low flow, base flow or no flow conditions.</li> <li>And either one of either:               <ul style="list-style-type: none"> <li><u>Part 1, Dams and Weirs</u></li> </ul> </li> <li>Construction of a new <b>dam or weir</b> or maintenance of existing one on a waterway with a stream order of 1 or 2</li> <li>Maximum waterway barrier height is <b>one metre or less</b> above the lowest point of the waterway bed</li> <li>Upstream and downstream disturbance area must not be more than <b>10 m</b> in total from the upstream and downstream toe of the barrier.</li> <li><u>Or, Part 3, Culverts</u></li> <li>Construction of a new <b>culvert</b> crossing or replacement/ modification or maintenance of existing culvert where the bankfull width of the waterway <b>is not</b> greater than 20m.</li> <li>Construction of <b>culverts</b> where the <b>maximum</b> upstream/downstream length of the culvert cells is 15m plus apron (3m scour protection for culverts) or less.</li> <li>The maximum disturbance area outside barrier footprint of 10 m (scour protection is included in the barrier footprint (upstream and/or downstream).</li> <li><u>Or, Part 4, Bed Level Crossings</u></li> <li>Construction of a new <b>bed level</b> crossing or replacement/ modification or maintenance of existing <b>bed level</b> waterway where the bankfull width of the waterway can be less than or greater than 20m.</li> <li><b>Bed level</b> crossing footprint is no more than <b>15 m wide</b> (upstream/downstream), with a maximum disturbance area outside crossing footprint of <b>10 m (25 m in total)</b>.</li> <li>Installation of <b>bed level</b> crossings <b>no higher</b> than natural bed level.</li> <li>Installation of a <b>bed level</b> crossing at the same gradient as the waterway bed gradient.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW02 in addition to waterway crossing design and environmental protection measures as required, Environmental Authority and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	



Part 3 - Water Definition Assessment (Water Act 2000) & Relevant Environmental Authority				
Environmental Value	Checklist	Y / N	Justification for Placement	Overall Outcome
<p>Does the feature fit the definition of a <b>Drainage Feature</b> under the Water Act 2000?</p> <p><b>Drainage feature</b> means a natural landscape feature, including a gully, drain, drainage depression or other erosion feature that—</p> <p>(a) is formed by the concentration of, or operates to confine or concentrate, overland flow water during and immediately after rainfall events; and</p> <p>(b) flows for only a short duration after a rainfall event, regardless of the frequency of flow events; and</p> <p>(c) commonly, does not have enough continuing flow to create a Riverine environment</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>1. Does the feature carrying water flow only for a short duration after a rainfall event?</p> <p>2. Does the feature lack the presence of a riverine environment? (i.e flow adequacy to support riverine species).</p> <p>3. Does the feature lack the presence of in-stream islands, benches or bars?</p>	<p><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If <b>Yes to all</b> of these questions then the feature does not constitute a watercourse and no further assessment is required for the Water Act.</p> <p>If <b>no to any</b> one of these questions then this feature constitutes a watercourse under the Water Act 2000</p>	<p><b>Drainage Feature UNDER the WATER ACT 2000?</b></p> <p><input checked="" type="checkbox"/> <b>YES</b> (NO APPROVAL REQUIRED)</p> <p>Implement environmental protection measures as required in Environmental authority and other relevant environmental requirements.</p> <p><input type="checkbox"/> <b>NO</b> <b>Determined a Watercourse – see below</b></p>
				<p><b>Watercourse under the WATER ACT 2000?</b></p> <p><input type="checkbox"/> <b>YES</b> (APPROVAL/ LODGEMENT REQUIRED – DETERMINED A WATERCOURSE)</p> <p>Complete Pre and Post works checklists, and ensure appropriate lodgements are undertaken as per Environmental Authority Requirements.</p> <p><input checked="" type="checkbox"/> <b>NO</b> <b>Determined a drainage feature– see Above.</b></p>

**Part 4 - Water Act Requirements (only complete if works are to take place within or adjacent to the watercourse – refer to Section 2 (Water Act) outcomes)**

Environmental Value	Checklist	Y / N	Justification for Placement	Comments
<p><b>Do the works require approval under the Water Act?</b> (Refer to summary flowchart within Section 9 of watercourse manual)</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>Excavation or placing fill in a way that would interfere with the flow of water in a watercourse, lake or spring by impounding or redirecting the flow of water (referring to completed product, following construction works).</li> </ul>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b>, go to Part 5, works may require a Riverine Protection Permit under the Water Act. Provide evidence that waterway crossing design satisfies DEHP Guidelines (next section) including reference to design drawings. Attach/reference all records and store in relevant Environmental Drive. Complete paperwork and forward to FLUOR Environment Team for review.  <b>If No, adhere to EA requirements!</b></p>	

**Part 5 – DNRM Assessment Requirements (Guideline – activities in a watercourse, lake or spring associated with mining operations) (refer to Section 1 (Water Act) outcomes)**

<p>What type (if any) vegetation will be required to be removed and quantity (area). (no more than 0.25ha), how will the vegetation be removed?</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>List all species required for removal. Ensure FLUOR/SANTOS vegetation management plan and EA conditions are followed (indicate the requirements for this crossing).</p>	<p>See previous for a list of flora species present</p>
<p>Can the water crossing be located in a previously disturbed area?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If No, why not?</p>	<p>Already located adjacent to road crossing within non-remnant vegetation</p>
<p>Is the water course from groundwater origin?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>Determine upstream water sources</p>	

## Section 6 – Overall Assessment Outcome

<p>Has the stream order been assessed a watercourse (Water Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes, must comply with the "Guideline – activities in a watercourse, lake or spring associated with mining operations" – Ensure all of this checklist is completed and conveyed to all relevant staff, contractors are to ensure compliance with EA conditions – ensure lodgement of PREWORKS TO DEHP 10 Business prior to commencing.</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED, ASSESSED AS DRAINAGE FEATURE)</b></p>
<p>Has the stream order been assessed as a waterway (Fisheries Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete check boxes below          If <b>No</b> – no further assessment required</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED)</b></p>
<p>Is a development approval required (i.e. the self assessable code can not be adhered to)?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> Contact FLUOR Environment Team.</p>	
<p>Was the crossing assessed as a 'minor waterway barrier'?, either:</p>		<p>If <b>Yes</b> complete the relevant 'Minor Waterway Barrier Works Self-Assessment Sheet' lodge to FLUOR Environment Team.</p>	
<p>Part 1 – Dams and Weirs</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 3 – Culverts</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 4 – Bed Level Crossings</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Was the crossing assessed as a 'temporary waterway barrier'?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete a Temporary Waterway Barrier Works Self-Assessment Sheet lodge to FLUOR Environmental Team for review.</p>	
<p><b>Were any EVNT species listed under the EPBC Act and/or NC Act present within the riparian zone of the waterway crossing</b></p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes GPS the position of individuals/populations, flag on site and contact FLUOR Environmental Team for review.          If No – no further assessment required</p>	
<p><b>Were any vegetation mapping discrepancies identified within the riparian zone of the waterway crossing</b></p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes undertake a quaternary level RE assessment and GPS the extent of the mapped community assemblage where applicable. Contact FLUOR Environment Team for review.          If No – no further assessment required</p>	

## WC 3 Pre-works Photographs

Photo A – Looking across the waterway at the proposed site works

Drainage Gully 1



Eroded Gully



Photo B – Looking downstream of the proposed site of works



Photo C – Looking upstream of the proposed site of works



## WORKS WITHIN A WATERCOURSE ASSESSMENT

This watercourse assessment is to be filled out for all watercourse crossings to ensure compliance with environmental requirements and to ensure appropriate approvals are obtained.

### FIELD ASSESSMENT

Inspected by: Company:	Peter Wagner	GHD	Inspected Date: Time:	8/11/2013
				1:20pm

Crossing Name:	Un-named watercourse	CWP Number	
Watercourse ID	WC 4	Crossing Type (E.g. pipeline/road)	Pipeline
Lot/Plan:	20FTY1805	Location Reference	
Site	R-HCS-02 <input type="checkbox"/> F-HCS-04 <input type="checkbox"/> F-HCS-05 <input checked="" type="checkbox"/> other/area:		
Land Tenure:	Freehold / Leasehold / other :	Petroleum Tenure	
Crossing Disturbance Status:	Existing crossing with no upgrade required: <input type="checkbox"/> Existing crossing with upgrade required: <input type="checkbox"/> New crossing in previously disturbed area: <input checked="" type="checkbox"/> New crossing in undisturbed area: <input type="checkbox"/>		
Land Access Approval to undertake assessment:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Cultural Heritage Approval to undertake assessment:	Yes <input type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Anticipated commencement date:		Can the crossing be installed within 10 days? If No, development approval and other approvals may be required.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

### HEALTH AND SAFETY

Have you completed a Safety Task Assessment (STA)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If No, cease inspection and complete.
Do you have appropriate PPE for the task?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Do you have adequate amount of water – at least 10 litres?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

### GENERAL ENVIRONMENTAL CONDITIONS

Temp: Cold (<5°C) <input type="checkbox"/> Cool (<15°C) <input type="checkbox"/> Mild (<25°C) <input type="checkbox"/> Warm (<35°C) <input checked="" type="checkbox"/> Hot (>35°C) <input type="checkbox"/>	Weather now: Clear/Fine <input checked="" type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input type="checkbox"/>
	Past 24 hrs: Clear/Fine <input checked="" type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input type="checkbox"/>
Wind: Still <input type="checkbox"/> Slight breeze <input checked="" type="checkbox"/> Windy <input type="checkbox"/> Strong Wind <input type="checkbox"/>	Air now: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>
	Air past 24hrs: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>

## CROSSING LOCATION (REFER SECTION 8.2)

GPS Coordinates - Latitude/Longitude (E – 6 Figs, N – 7 Figs) GDA94					
Latitude (E)	701167	Longitude (S)	7163518		
Bankfull Width (m)	5 m	Bank Width (m):	Left Bank: 1.5 m	Right Bank: 1.5 m	
Stream Width at Water Surface (m):	NA	Baseflow Stream Width (m):	2 m		
Bank Height: Baseflow and water surface height difference:	Downstream left Bank: 1.8 m/ NA  Downstream Right Bank 1.5 m/ NA	Photographs of site Provide photos looking upstream and downstream from crossing location, as well as relevant to watercourse / waterway determination. Label photos.	Location	Latitude (E)	Longitude (S)
			A	701167	7063518
			B	701166	7063515
			C	701166	7063515
			D	NA	NA
E	NA	NA			
Water Present:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Water Type:	Flowing <input type="checkbox"/> Pool(s) present <input type="checkbox"/> Dry <input checked="" type="checkbox"/>				
Sample Site Length: 50 m	Water Surface Depth to Bed: NA				
CHANNEL DETERMINATION (REFER TO SECTION 8.3)					
Stream Order: 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 4+ <input type="checkbox"/>	Functional Zone Type - Sediment	Supply <input type="checkbox"/>	Transfer <input checked="" type="checkbox"/>	Storage <input type="checkbox"/>	
Identify Channel Type:	Mildly sinuous				
Channel Modifications:	Infilled at existing road crossing (upstream)				
Bed Sediment Character:	Tight <input type="checkbox"/> Packed <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low 1 <input type="checkbox"/> Low 2 <input type="checkbox"/>				
Bank Sediments Composition:	Bedrock % Boulder 5% Cobble 5% Pebble 5% Gravel 15% Sand Fines 70%				
Bed Material Angularity:	Very Angular <input type="checkbox"/> Angular <input type="checkbox"/> Sub-angular <input checked="" type="checkbox"/> Rounded <input type="checkbox"/> Well-rounded <input type="checkbox"/> Cobble pebble and gravel fractions not present <input type="checkbox"/>				
Bank Predominant Shape:	Concave <input type="checkbox"/> Convex <input type="checkbox"/> Stepped <input type="checkbox"/> Wide lower bench <input checked="" type="checkbox"/> Undercut <input type="checkbox"/>				
Bank Slope Downstream Right:	Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input type="checkbox"/> Moderate 30-60° <input checked="" type="checkbox"/> Low 10-30° <input type="checkbox"/> Flat <10° <input type="checkbox"/>				
Bank Slope Downstream Left:	Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input checked="" type="checkbox"/> Moderate 30-60° <input type="checkbox"/> Low 10-30° <input type="checkbox"/> Flat <10° <input type="checkbox"/>				
Channel Shape:	Flat U-shape				
Bed Stability:	Severe Erosion <input type="checkbox"/> Moderate Erosion <input type="checkbox"/> Bed Stable <input type="checkbox"/> Moderate Deposition <input checked="" type="checkbox"/> Severe Deposition <input type="checkbox"/>				
Potential Fish Habitat Class:	Class1 <input type="checkbox"/> Class2 <input type="checkbox"/> Class3 <input type="checkbox"/> Class4 <input checked="" type="checkbox"/>				
Fish Migratory Passage Potential:	Nil <input checked="" type="checkbox"/> Very Restricted <input type="checkbox"/> Moderately Restricted <input type="checkbox"/> Partly Restricted <input type="checkbox"/> Good Passage <input type="checkbox"/> Unrestricted Passage <input type="checkbox"/>				

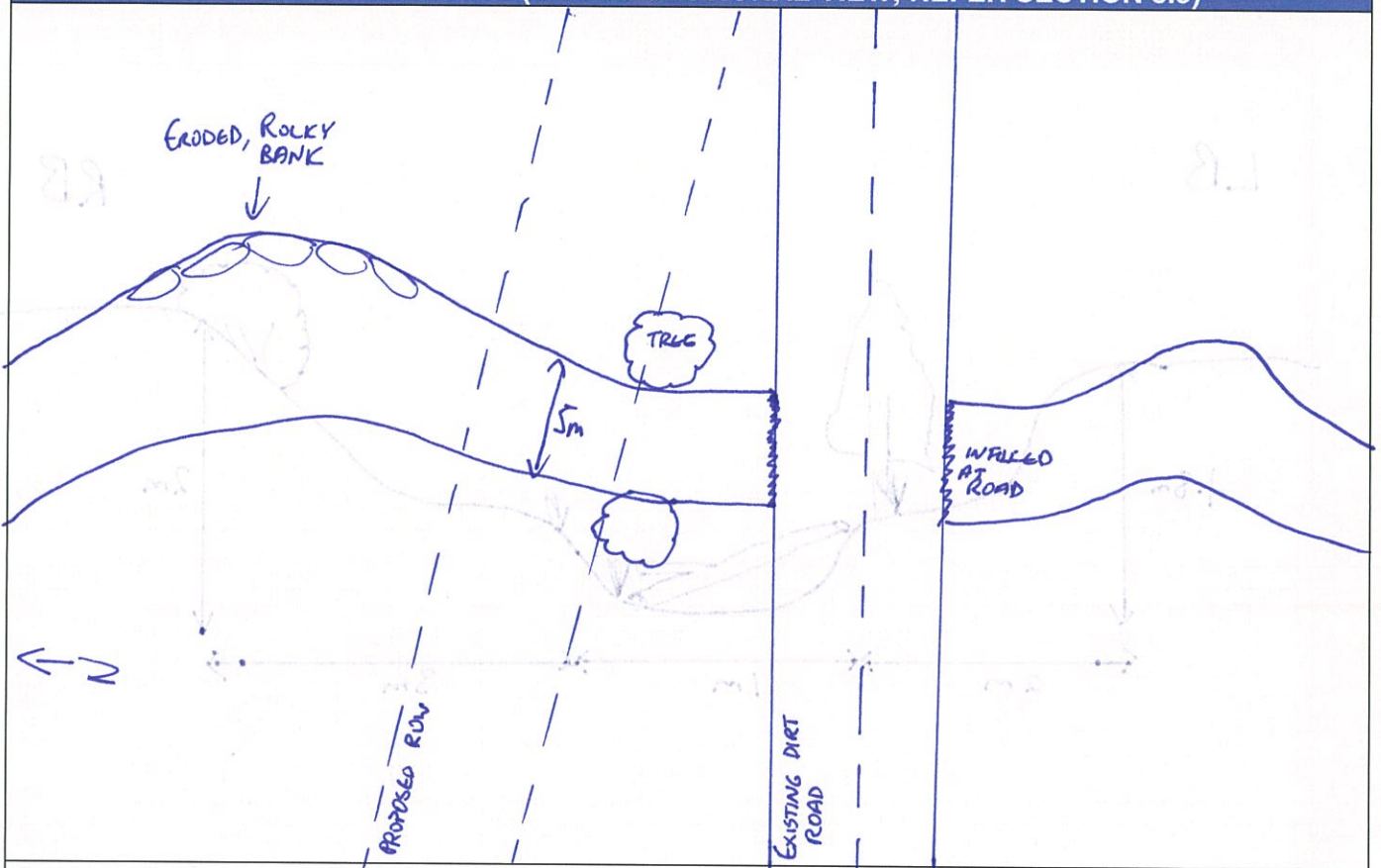
## FLORA/FAUNA ASSESSMENT (REFER TO SECTION 8.4)

Does any vegetation need to be removed?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>If Yes, no more than 0.25 Ha can be removed Estimate how much needs to be removed</b>
<b>Vegetation community description</b>		
Has an Aquatic and Ecological Assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, reference Report No:

Has a pre-disturbance assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If no, a pre-disturbance assessment may be required
Does the riparian zone at the watercourse fall within a mapped extent of a Regional Ecosystem and/ or TEC? (refer to Dekho maps)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If Yes, detail mapped RE code (biodiversity status) and TEC where applicable: Mapped as a mixed Of Concern RE 11.3.39/11.3.2.
Does the riparian zone at the watercourse fall within any Category A, B or C Environmentally Sensitive Areas (ESAs) and/or their primary or secondary primary protection (buffer) zones (refer to Dekho maps)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If Yes, detail ESA category: Category C ESA
If present, is the mapped RE/TEC community consistent with the vegetation community observed on the ground	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If no, Check whether discrepancies have already been recorded in previous reports and GIS layers updated. If not a pre-disturbance assessment or quaternary level assessment may be required.  Ground-truthed RE is 11.10.1/11.10.7 (Quaternary Assessment)
Does the proposed development activity comply with the clearing/significant disturbance restrictions of the applicable EA (refer Table 3)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If, no then flag with FLUOR Environment Team for review.
Are there any Cultural Heritage sites located within the crossing location or nearby area (refer to Dekho maps)	Yes <input type="checkbox"/> No <input type="checkbox"/>	If Yes, detail site:
General Vegetation Community description: (including a list of dominant flora species within each stratum)	<b>Woodland Community</b> <b>T1 = <i>Corymbia citriodora</i> (dominant), <i>Eucalyptus fibrosa subsp. nubila</i></b> <b>T2 = <i>C. citriodora</i>; <i>E. fibrosa subsp. nubila</i>; and <i>Callitris glaucophylla</i></b> <b>S1 = <i>Psydrax odorata</i>; <i>C. glaucophylla</i>; and <i>Petalostigma pubescens</i>.</b> <b>G = <i>Lomandra longifolia</i>; <i>Themeda avenacea</i>; <i>Arundinella nepalensis</i>; and <i>Wahlenbergia queenslandicum</i>.</b>	
Are there any declared weeds within the area of the crossing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If yes, describe flag on the ground and GPS and provide on map.
Are there any conservation significant species (i.e ENVNT or Type A flora) within the area of the crossing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Riparian vegetation cover: Trees > 10 m: Trees < 10 m: Shrubs: Grasses, herbs and sedges:		20 % 30 % 20 % 30 %
Riparian vegetation patchiness:		Occasional clumps
Describe the riparian vegetation condition:		VAST II - Modified
Native woody vegetation regeneration:	Abundant <input type="checkbox"/> Present <input checked="" type="checkbox"/> Limited <input type="checkbox"/>	
<b>SAFETY CONSIDERATIONS</b>		
Are there any safety implications at the proposed crossing due to decreased Right of Way from Environmental Sensitive Areas or other constraints like topography?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>If Yes, Note concerns</b>



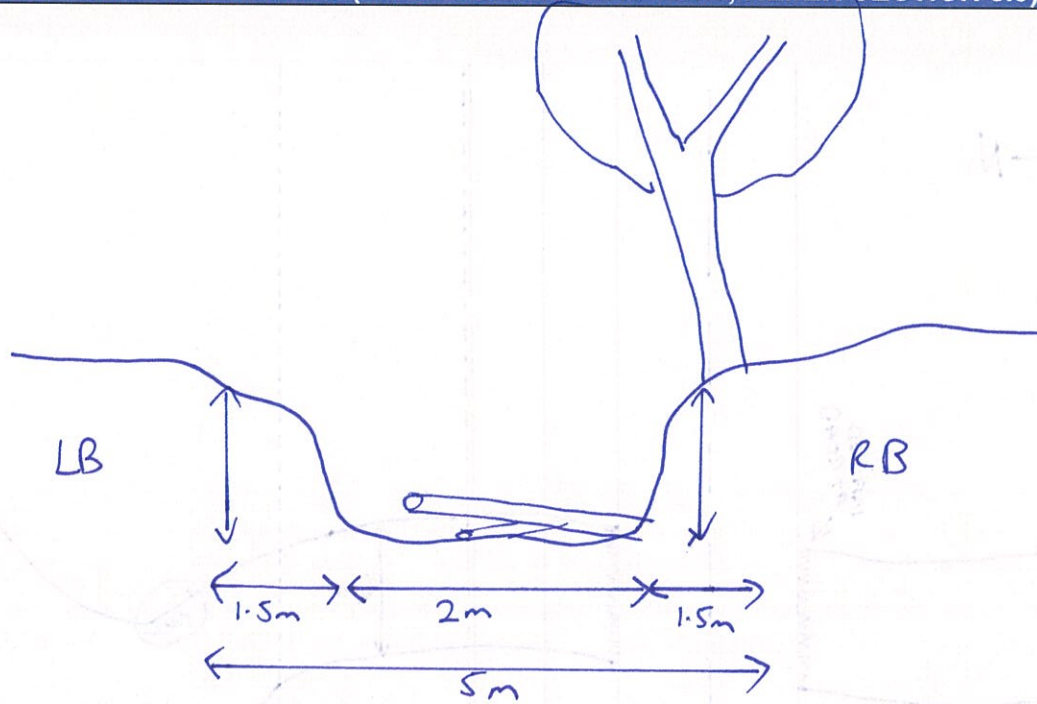
SKETCH OF CROSSING (CROSS-SECTIONAL VIEW, REFER SECTION 8.5)



Notes:

VERY SANDY BED  
ROCK RB FURTHER DOWNSTREAM

SKETCH OF CROSSING (CROSS-SECTIONAL VIEW, REFER SECTION 8.5)



Notes:

SANDY BED WITH SCATTERED DEBRIS

## ASSESSMENT OUTCOME

LEGISLATIVE REQUIREMENTS DETERMINATION				
Part 1 - Waterway Definition Assessment ( <i>Fisheries Act 1994</i> )				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>Does the feature satisfy the waterway definition requirements of FHMOP 008 2009 (refer section 7.3.2) under the <i>Fisheries Act 1994</i>?</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>Does the feature have a defined bed and banks: The bed and banks need to be continuous rather than isolated and broken sections of a depression.</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p>	<p><b>WATERWAY UNDER FISHERIES ACT 1994?</b></p> <p style="text-align: center;"><input type="checkbox"/> <b>YES</b></p> <p style="text-align: center;"><b>(APPROVAL/LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have an extended, if non-permanent, period of flow: Flow must continue for a reasonable period after rain ceases and have some reliability commensurate with rainfall? Flow for several weeks after rainfall ceases does not constitute extended flow.</p> <p>Consider e.g. water present, catchment size, geomorphological features, and ecological indicators of sustained flow.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p>	<p style="text-align: center;"><input checked="" type="checkbox"/> <b>NO</b></p> <p style="text-align: center;"><b>(NO LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have sufficient flow adequacy: The flow needs to be sufficient to sustain basic ecological processes and to maintain biodiversity within the feature. Comment on any ecological indicators present e.g. riparian vegetation, presence/evidence of aquatic life etc.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p><b>No evidence of aquatic life. Vegetation consistent with areas surrounding (outside of area of influence)</b></p>	

Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>a.</p> <p><b>Do the works constitute waterway barrier works as defined in FHMOP 008 2009 (Appendix 3)?</b></p>	<p>As well as dams and weirs the following are examples of developments that are considered to be waterway barrier works:</p> <ul style="list-style-type: none"> <li>▪ Temporary dams, barriers to flow</li> <li>▪ Culverts</li> <li>▪ Bed level waterway crossings</li> <li>▪ Causeways (water crossings slightly above stream bed)</li> <li>▪ Tidal or floodgates (including maintenance and repair)</li> <li>▪ Partial bunds (where the development will only partially block a waterway)</li> <li>▪ Levee banks</li> <li>▪ Silt curtains</li> <li>▪ Netting and screens</li> <li>▪ Litter booms or Trash racks</li> <li>▪ Riffle structure</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, complete Section 2b.</p> <p>If <b>No</b>, implement construction works in accordance with environmental protection measures as requires in Environmental Authority and other relevant environmental requirements.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	
<p>b.</p> <p><b>Is the waterway crossing self assessable under WWBW01 for Temporary Waterway Barrier Works</b></p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>▪ Waterway barriers that will be in place for less than 42 calendar days</li> <li>▪ Waterway barriers that are less than 20m in length across the waterway from bank to bank and;</li> <li>▪ 10m or less in width (at the widest point).</li> <li>▪ Waterway barriers that are at least 500m distance from any existing natural or artificial waterway barrier (upstream or downstream) unless:               <ul style="list-style-type: none"> <li>○ the barrier is being constructed in order to perform maintenance or repairs on, or removal of, the existing barrier, or</li> <li>○ the barrier is being constructed in order to facilitate dewatering between the new and existing barriers, or</li> <li>○ the barrier is a silt curtain for control of sediment.</li> </ul> </li> <li>▪ Disturbance to the bed and banks of a waterway less than 5m from the toe of the barrier on either side.</li> <li>▪ Construction at the time of the year when the flows are lowest or have completely stopped.</li> <li>▪ A waterway barrier where there will be no ponding of water upstream.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW01 in addition to waterway crossing design and environmental protection measures as required in CEMP, Environmental Authority, EIS and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p> <p>If <b>No</b>, go to Section 2c.</p>	

Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>c.</p> <p>Is the waterway crossing self assessable under WWBW02 for Minor Waterway Barrier Works</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>New waterway barrier works at <b>least 100m</b> from any other permanent waterway barrier works on same waterway.</li> <li>Construction that is <b>not</b> on a bend or rapid section of a waterway.</li> <li>Construction perpendicular to the water flow (within 10°).</li> <li>Construction of minor barriers must commence and finish within 60 calendar days.</li> <li>Construction during times of low flow, base flow or no flow conditions.</li> <li>And either one of either:               <ul style="list-style-type: none"> <li><u>Part 1, Dams and Weirs</u></li> </ul> </li> <li>Construction of a new <b>dam or weir</b> or maintenance of existing one on a waterway with a stream order of 1 or 2</li> <li>Maximum waterway barrier height is <b>one metre or less</b> above the lowest point of the waterway bed</li> <li>Upstream and downstream disturbance area must not be more than <b>10 m</b> in total from the upstream and downstream toe of the barrier.</li> <li><u>Or, Part 3, Culverts</u></li> <li>Construction of a new <b>culvert</b> crossing or replacement/ modification or maintenance of existing culvert where the bankfull width of the waterway <b>is not</b> greater than 20m.</li> <li>Construction of <b>culverts</b> where the <b>maximum</b> upstream/downstream length of the culvert cells is 15m plus apron (3m scour protection for culverts) or less.</li> <li>The maximum disturbance area outside barrier footprint of 10 m (scour protection is included in the barrier footprint (upstream and/or downstream).</li> <li><u>Or, Part 4, Bed Level Crossings</u></li> <li>Construction of a new <b>bed level</b> crossing or replacement/ modification or maintenance of existing <b>bed level</b> waterway where the bankfull width of the waterway can be less than or greater than 20m.</li> <li><b>Bed level</b> crossing footprint is no more than <b>15 m wide</b> (upstream/downstream), with a maximum disturbance area outside crossing footprint of <b>10 m (25 m in total)</b>.</li> <li>Installation of <b>bed level</b> crossings <b>no higher</b> than natural bed level.</li> <li>Installation of a <b>bed level</b> crossing at the same gradient as the waterway bed gradient.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW02 in addition to waterway crossing design and environmental protection measures as required, Environmental Authority and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	

Part 3 - Water Definition Assessment (Water Act 2000) & Relevant Environmental Authority				
Environmental Value	Checklist	Y / N	Justification for Placement	Overall Outcome
<p>Does the feature fit the definition of a <b>Drainage Feature</b> under the Water Act 2000?</p> <p><b>Drainage feature</b> means a natural landscape feature, including a gully, drain, drainage depression or other erosion feature that—</p> <p>(a) is formed by the concentration of, or operates to confine or concentrate, overland flow water during and immediately after rainfall events; and</p> <p>(b) flows for only a short duration after a rainfall event, regardless of the frequency of flow events; and</p> <p>(c) commonly, does not have enough continuing flow to create a Riverine environment</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>1. Does the feature carrying water flow only for a short duration after a rainfall event?</p> <p>2. Does the feature lack the presence of a riverine environment? (i.e flow adequacy to support riverine species).</p> <p>3. Does the feature lack the presence of in-stream islands, benches or bars?</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes to all</b> of these questions then the feature does not constitute a watercourse and no further assessment is required for the Water Act.</p> <p>If <b>no to any</b> one of these questions then this feature constitutes a watercourse under the Water Act 2000</p>	<p><b>Drainage Feature UNDER the WATER ACT 2000?</b></p> <p><input checked="" type="checkbox"/> <b>YES</b> (NO APPROVAL REQUIRED)</p> <p>Implement environmental protection measures as required in Environmental authority and other relevant environmental requirements.</p> <p><input type="checkbox"/> <b>NO</b> <b>Determined a Watercourse – see below</b></p>
		<input checked="" type="checkbox"/> yes <input type="checkbox"/> no		<p><b>Watercourse under the WATER ACT 2000?</b></p> <p><input type="checkbox"/> <b>YES</b> (APPROVAL/ LODGEMENT REQUIRED – DETERMINED A WATERCOURSE)</p> <p>Complete Pre and Post works checklists, and ensure appropriate lodgements are undertaken as per Environmental Authority Requirements.</p> <p><input checked="" type="checkbox"/> <b>NO</b> <b>Determined a drainage feature– see Above.</b></p>

**Part 4 - Water Act Requirements (only complete if works are to take place within or adjacent to the watercourse – refer to Section 2 (Water Act) outcomes)**

Environmental Value	Checklist	Y / N	Justification for Placement	Comments
<p><b>Do the works require approval under the Water Act?</b> (Refer to summary flowchart within Section 9 of watercourse manual)</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>Excavation or placing fill in a way that would interfere with the flow of water in a watercourse, lake or spring by impounding or redirecting the flow of water (referring to completed product, following construction works).</li> </ul>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b>, go to Part 5, works may require a Riverine Protection Permit under the Water Act. Provide evidence that waterway crossing design satisfies DEHP Guidelines (next section) including reference to design drawings. Attach/reference all records and store in relevant Environmental Drive. Complete paperwork and forward to FLUOR Environment Team for review.  <b>If No, adhere to EA requirements!</b></p>	

**Part 5 – DNRM Assessment Requirements (Guideline – activities in a watercourse, lake or spring associated with mining operations) (refer to Section 1 (Water Act) outcomes)**

<p>What type (if any) vegetation will be required to be removed and quantity (area). (no more than 0.25ha), how will the vegetation be removed?</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>List all species required for removal. Ensure FLUOR/SANTOS vegetation management plan and EA conditions are followed (indicate the requirements for this crossing).</p>	<p>See previous for a list of flora species present</p>
<p>Can the water crossing be located in a previously disturbed area?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If No, why not?</p>	<p>Already located adjacent to road crossing</p>
<p>Is the water course from groundwater origin?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>Determine upstream water sources</p>	

## Section 6 – Overall Assessment Outcome

<p>Has the stream order been assessed a watercourse (Water Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes, must comply with the "Guideline – activities in a watercourse, lake or spring associated with mining operations" – Ensure all of this checklist is completed and conveyed to all relevant staff, contractors are to ensure compliance with EA conditions – ensure lodgement of PREWORKS TO DEHP 10 Business prior to works commencing.</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED, ASSESSED AS DRAINAGE FEATURE)</b></p>
<p>Has the stream order been assessed as a waterway (Fisheries Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete check boxes below          If <b>No</b> – no further assessment required</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED)</b></p>
<p>Is a development approval required (i.e. the self assessable code can not be adhered to)?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> Contact FLUOR Environment Team.</p>	
<p>Was the crossing assessed as a 'minor waterway barrier?', either:</p>	<p>If <b>Yes</b> complete the relevant 'Minor Waterway Barrier Works Self-Assessment Sheet' lodge to FLUOR Environment Team.</p>		
<p>Part 1 – Dams and Weirs</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 3 – Culverts</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 4 – Bed Level Crossings</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Was the crossing assessed as a 'temporary waterway barrier'?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete a Temporary Waterway Barrier Works Self-Assessment Sheet lodge to FLUOR Environmental Team for review.</p>	
<p><b>Were any EVNT species listed under the EPBC Act and/or NC Act present within the riparian zone of the waterway crossing</b></p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes GPS the position of individuals/populations, flag on site and contact FLUOR Environmental Team for review.          If No – no further assessment required</p>	
<p><b>Were any vegetation mapping discrepancies identified within the riparian zone of the waterway crossing</b></p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>If Yes undertake a quaternary level RE assessment and GPS the extent of the mapped community assemblage where applicable. Contact FLUOR Environment Team for review.          If No – no further assessment required</p>	<p>Inconsistent RE mapped. Ground-truthed as 11.10.1/11.10.7 (No Concern at Present)</p>



## WC 4 Pre-works Photographs

Photo A - Looking across the waterway at the proposed site works



Photo B - Looking downstream of the proposed site of works



Photo C - Looking upstream of the proposed site of works



Left Bank



Right Bank



## WORKS WITHIN A WATERCOURSE ASSESSMENT

This watercourse assessment is to be filled out for all watercourse crossings to ensure compliance with environmental requirements and to ensure appropriate approvals are obtained.

### FIELD ASSESSMENT

Inspected by: Company:	Peter Wagner	GHD	Inspected Date: Time:	8/11/2013
				4:00pm

Crossing Name:	Un-named watercourse	CWP Number	
Watercourse ID	WC 5	Crossing Type (E.g. pipeline/road)	Pipeline
Lot/Plan:	20FTY1805	Location Reference	
Site	R-HCS-02 <input type="checkbox"/> F-HCS-04 <input type="checkbox"/> F-HCS-05 <input checked="" type="checkbox"/> other/area:		
Land Tenure:	Freehold / Leasehold / other :	Petroleum Tenure	
Crossing Disturbance Status:	Existing crossing with no upgrade required: <input type="checkbox"/> Existing crossing with upgrade required: <input type="checkbox"/> New crossing in previously disturbed area: <input checked="" type="checkbox"/> New crossing in undisturbed area: <input type="checkbox"/>		
Land Access Approval to undertake assessment:	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Cultural Heritage Approval to undertake assessment:	Yes <input type="checkbox"/> No <input type="checkbox"/>	Approval No:	
Anticipated commencement date:		Can the crossing be installed within 10 days? If No, development approval and other approvals may be required.	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>

### HEALTH AND SAFETY

Have you completed a Safety Task Assessment (STA)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If No, cease inspection and complete.
Do you have appropriate PPE for the task?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	
Do you have adequate amount of water – at least 10 litres?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	

### GENERAL ENVIRONMENTAL CONDITIONS

Temp: Cold (<5°C) <input type="checkbox"/> Cool (<15°C) <input type="checkbox"/> Mild (<25°C) <input checked="" type="checkbox"/> Warm (<35°C) <input type="checkbox"/> Hot (>35°C) <input type="checkbox"/>	Weather now: Clear/Fine <input checked="" type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input type="checkbox"/>
	Past 24 hrs: Clear/Fine <input checked="" type="checkbox"/> Scattered Clouds <input type="checkbox"/> Cloudy <input type="checkbox"/>
Wind: Still <input type="checkbox"/> Slight breeze <input checked="" type="checkbox"/> Windy <input type="checkbox"/> Strong Wind <input type="checkbox"/>	Air now: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>
	Air past 24hrs: Dry <input checked="" type="checkbox"/> Humid <input type="checkbox"/> Rain (Steady) <input type="checkbox"/> Rain (Heavy) <input type="checkbox"/>

CROSSING LOCATION (REFER SECTION 8.2)					
GPS Coordinates - Latitude/Longitude (E – 6 Figs, N – 7 Figs) GDA94					
Latitude (E)	699270	Longitude (S)	7163835		
Bankfull Width (m)	6 m	Bank Width (m):	Left Bank: 2 m Right Bank: 3 m		
Stream Width at Water Surface (m):	NA	Baseflow Stream Width (m):	1 m		
Bank Height: Baseflow and water surface height difference:	<b>Note modified surrounds attributed to nearby dam. Two drainage gullies and one eroded washout.</b> Downstream left Bank: 1.8 m/ NA  Downstream Right Bank 2 m/ NA	<b>Photographs of site</b> Provide photos looking upstream and downstream from crossing location, as well as relevant to watercourse / waterway determination. Label photos.	Location	Latitude (E)	Longitude (S)
			A	699270	7163835
			B		
			C		
			D	NA	NA
E	NA	NA			
Water Present:	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>				
Water Type:	Flowing <input type="checkbox"/> Pool(s) present <input type="checkbox"/> Dry <input checked="" type="checkbox"/>				
Sample Site Length: 100 m	Water Surface Depth to Bed: NA				
CHANNEL DETERMINATION (REFER TO SECTION 8.3)					
Stream Order: 1 <input checked="" type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 4+ <input type="checkbox"/>	Functional Zone Type - Sediment	Supply <input type="checkbox"/> Transfer <input checked="" type="checkbox"/> Storage <input type="checkbox"/>			
Identify Channel Type:	Irregular meanders				
Channel Modifications:	Natural; in-filled at road crossing				
Bed Sediment Character:	Tight <input type="checkbox"/> Packed <input type="checkbox"/> Moderate <input checked="" type="checkbox"/> Low 1 <input type="checkbox"/> Low 2 <input type="checkbox"/>				
Bank Sediments Composition:	Bedrock % Boulder 65 % Cobble 10 % Pebble 5 % Gravel 5 % Sand Fines 15 %				
Bed Material Angularity:	Very Angular <input type="checkbox"/> Angular <input checked="" type="checkbox"/> Sub-angular <input type="checkbox"/> Rounded <input type="checkbox"/> Well-rounded <input type="checkbox"/> Cobble peddle and gravel fractions not present <input type="checkbox"/>				
Bank Predominant Shape:	Concave <input type="checkbox"/> Convex <input type="checkbox"/> Stepped <input checked="" type="checkbox"/> Wide lower bench <input type="checkbox"/> Undercut <input type="checkbox"/>				
Bank Slope Downstream Right:	Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input type="checkbox"/> Moderate 30-60° <input checked="" type="checkbox"/> Low 10-30° <input type="checkbox"/> Flat<10° <input type="checkbox"/>				
Bank Slope Downstream Left:	Vertical 80-90° <input type="checkbox"/> Steep 60-80° <input type="checkbox"/> Moderate 30-60° <input checked="" type="checkbox"/> Low 10-30° <input type="checkbox"/> Flat<10° <input type="checkbox"/>				
Channel Shape:	Two stepped				
Bed Stability:	Severe Erosion <input type="checkbox"/> Moderate Erosion <input type="checkbox"/> Bed Stable <input type="checkbox"/> Moderate Deposition <input checked="" type="checkbox"/> Severe Deposition <input type="checkbox"/>				
Potential Fish Habitat Class:	Class1 <input type="checkbox"/> Class2 <input type="checkbox"/> Class3 <input type="checkbox"/> Class4 <input checked="" type="checkbox"/>				
Fish Migratory Passage Potential:	Nil <input checked="" type="checkbox"/> Very Restricted <input type="checkbox"/> Moderately Restricted <input type="checkbox"/> Partly Restricted <input type="checkbox"/> Good Passage <input type="checkbox"/> Unrestricted Passage <input type="checkbox"/>				

FLORA/FAUNA ASSESSMENT (REFER TO SECTION 8.4)		
Does any vegetation need to be removed?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<b>If Yes, no more than 0.25 Ha can be removed Estimate how much needs to be removed</b>
<b>Vegetation community description</b>		
Has an Aquatic and Ecological Assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, reference Report No:

Has a pre-disturbance assessment been undertaken previously that encompasses the watercourse crossing point (both for flora and fauna characteristics).	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If no, a pre-disturbance assessment may be required
Does the riparian zone at the watercourse fall within a mapped extent of a Regional Ecosystem and/ or TEC? (refer to Dekho maps)	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	If Yes, detail mapped RE code (biodiversity status) and TEC where applicable:
Does the riparian zone at the watercourse fall within any Category A, B or C Environmentally Sensitive Areas (ESAs) and/or their primary or secondary primary protection (buffer) zones (refer to Dekho maps)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If Yes, detail ESA category: Category C Primary Buffer ESA (Of Concern RE), State Forest
If present, is the mapped RE/TEC community consistent with the vegetation community observed on the ground	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If no, Check whether discrepancies have already been recorded in previous reports and GIS layers updated. If not a pre-disturbance assessment or quaternary level assessment may be required.
Does the proposed development activity comply with the clearing/significant disturbance restrictions of the applicable EA (refer Table 3)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If, no then flag with FLUOR Environment Team for review.
Are there any Cultural Heritage sites located within the crossing location or nearby area (refer to Dekho maps)	Yes <input type="checkbox"/> No <input type="checkbox"/>	If Yes, detail site:
General Vegetation Community description: (including a list of dominant flora species within each stratum)	<b>Non-remnant grazing pasture with scattered shrubs</b> <b>S1 = <i>Callitris glaucophylla</i>; <i>Opuntia tomentosa</i>; <i>Eucalyptus melanophloia</i>.</b> <b>G = <i>Heteropogon contortus</i>; <i>Cenchrus ciliaris</i>; <i>Themeda triandra</i></b>	
Are there any declared weeds within the area of the crossing?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	If yes, describe flag on the ground and GPS and provide on map. <i>Opuntia tomentosa</i> (LP Act Class 2; WONS)
Are there any conservation significant species (i.e ENVT or Type A flora) within the area of the crossing?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	
Riparian vegetation cover: Trees > 10 m: Trees < 10 m: Shrubs: Grasses, herbs and sedges:	0 % 0 % 5 % 90 %	
Riparian vegetation patchiness:	Occasional clumps	
Describe the riparian vegetation condition:	VAST IV – Replaced (Grazing pasture)	
Native woody vegetation regeneration:	Abundant <input type="checkbox"/> Present <input checked="" type="checkbox"/> Limited <input type="checkbox"/>	
<b>SAFETY CONSIDERATIONS</b>		
Are there any safety implications at the proposed crossing due to decreased Right of Way from Environmental Sensitive Areas or other constraints like topography?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	<b>If Yes, Note concerns</b>





## ASSESSMENT OUTCOME

LEGISLATIVE REQUIREMENTS DETERMINATION				
Part 1 - Waterway Definition Assessment ( <i>Fisheries Act 1994</i> )				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>Does the feature satisfy the waterway definition requirements of FHMOP 008 2009 (refer section 7.3.2) under the <i>Fisheries Act 1994</i>?</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>Does the feature have a defined bed and banks: The bed and banks need to be continuous rather than isolated and broken sections of a depression.</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p>	<p><b>WATERWAY UNDER FISHERIES ACT 1994?</b></p> <p style="text-align: center;"><input type="checkbox"/> <b>YES</b></p> <p style="text-align: center;"><b>(APPROVAL/LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have an extended, if non-permanent, period of flow: Flow must continue for a reasonable period after rain ceases and have some reliability commensurate with rainfall? Flow for several weeks after rainfall ceases does not constitute extended flow.</p> <p>Consider e.g. water present, catchment size, geomorphological features, and ecological indicators of sustained flow.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes to all</b> , complete Section 2</p> <p>If <b>No to any of these, the feature does not constitute a waterway and no further assessment is required for the Fisheries Act.</b> Implement waterway crossing design and environmental protection measures as required in Environmental Authority and other relevant environmental requirements.</p>	<p style="text-align: center;"><input checked="" type="checkbox"/> <b>NO</b></p> <p style="text-align: center;"><b>(NO LODGEMENT REQUIRED)</b></p>
	<p>Does the feature have sufficient flow adequacy: The flow needs to be sufficient to sustain basic ecological processes and to maintain biodiversity within the feature. Comment on any ecological indicators present e.g. riparian vegetation, presence/evidence of aquatic life etc.</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p><b>No evidence of aquatic life. Vegetation consistent with areas surrounding (outside of area of influence)</b></p>	



Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>a.</p> <p><b>Do the works constitute waterway barrier works as defined in FHMOP 008 2009 (Appendix 3)?</b></p>	<p>As well as dams and weirs the following are examples of developments that are considered to be waterway barrier works:</p> <ul style="list-style-type: none"> <li>▪ Temporary dams, barriers to flow</li> <li>▪ Culverts</li> <li>▪ Bed level waterway crossings</li> <li>▪ Causeways (water crossings slightly above stream bed)</li> <li>▪ Tidal or floodgates (including maintenance and repair)</li> <li>▪ Partial bunds (where the development will only partially block a waterway)</li> <li>▪ Levee banks</li> <li>▪ Silt curtains</li> <li>▪ Netting and screens</li> <li>▪ Litter booms or Trash racks</li> <li>▪ Riffle structure</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, complete Section 2b.</p> <p>If <b>No</b>, implement construction works in accordance with environmental protection measures as requires in Environmental Authority and other relevant environmental requirements.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	
<p>b.</p> <p><b>Is the waterway crossing self assessable under WWBW01 for Temporary Waterway Barrier Works</b></p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>▪ Waterway barriers that will be in place for less than 42 calendar days</li> <li>▪ Waterway barriers that are less than 20m in length across the waterway from bank to bank and;</li> <li>▪ 10m or less in width (at the widest point).</li> <li>▪ Waterway barriers that are at least 500m distance from any existing natural or artificial waterway barrier (upstream or downstream) unless:               <ul style="list-style-type: none"> <li>○ the barrier is being constructed in order to perform maintenance or repairs on, or removal of, the existing barrier, or</li> <li>○ the barrier is being constructed in order to facilitate dewatering between the new and existing barriers, or</li> <li>○ the barrier is a silt curtain for control of sediment.</li> </ul> </li> <li>▪ Disturbance to the bed and banks of a waterway less than 5m from the toe of the barrier on either side.</li> <li>▪ Construction at the time of the year when the flows are lowest or have completely stopped.</li> <li>▪ A waterway barrier where there will be no ponding of water upstream.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW01 in addition to waterway crossing design and environmental protection measures as required in CEMP, Environmental Authority, EIS and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p> <p>If <b>No</b>, go to Section 2c.</p>	

Section 2 - Waterway Barrier Works Requirements (Only complete if works are to take place within a waterway)				
Environmental Value	Checklist	Y / N	Justification for Placement	Field Comments
<p>c.</p> <p>Is the waterway crossing self assessable under WWBW02 for Minor Waterway Barrier Works</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>• New waterway barrier works at <b>least 100m</b> from any other permanent waterway barrier works on same waterway.</li> <li>• Construction that is <b>not</b> on a bend or rapid section of a waterway.</li> <li>• Construction perpendicular to the water flow (within 10°).</li> <li>• Construction of minor barriers must commence and finish within 60 calendar days.</li> <li>• Construction during times of low flow, base flow or no flow conditions.</li> <li>• And either one of either:               <ul style="list-style-type: none"> <li>• <u>Part 1, Dams and Weirs</u></li> </ul> </li> <li>• Construction of a new <b>dam or weir</b> or maintenance of existing one on a waterway with a stream order of 1 or 2</li> <li>• Maximum waterway barrier height is <b>one metre or less</b> above the lowest point of the waterway bed</li> <li>• Upstream and downstream disturbance area must not be more than <b>10 m</b> in total from the upstream and downstream toe of the barrier.</li> <li>• <u>Or, Part 3, Culverts</u></li> <li>• Construction of a new <b>culvert</b> crossing or replacement/ modification or maintenance of existing culvert where the bankfull width of the waterway <b>is not</b> greater than 20m.</li> <li>• Construction of <b>culverts</b> where the <b>maximum</b> upstream/downstream length of the culvert cells is 15m plus apron (3m scour protection for culverts) or less.</li> <li>• The maximum disturbance area outside barrier footprint of 10 m (scour protection is included in the barrier footprint (upstream and/or downstream).</li> <li>• <u>Or, Part 4, Bed Level Crossings</u></li> <li>• Construction of a new <b>bed level</b> crossing or replacement/ modification or maintenance of existing <b>bed level</b> waterway where the bankfull width of the waterway can be less than or greater than 20m.</li> <li>• <b>Bed level</b> crossing footprint is no more than <b>15 m wide</b> (upstream/downstream), with a maximum disturbance area outside crossing footprint of <b>10 m (25 m in total)</b>.</li> <li>• Installation of <b>bed level</b> crossings <b>no higher</b> than natural bed level.</li> <li>• Installation of a <b>bed level</b> crossing at the same gradient as the waterway bed gradient.</li> </ul>	<input type="checkbox"/> yes <input type="checkbox"/> no	<p>If <b>Yes</b>, comply with all applicable requirements of WWBW02 in addition to waterway crossing design and environmental protection measures as required, Environmental Authority and other relevant environmental requirements.</p> <p>Provide evidence that waterway crossing design satisfies DAFF self assessment codes including reference to design drawings.</p> <p>Attach/reference all records and place in Z:\653R_Environmental</p> <p>Complete paperwork and forward to FLUOR Environment Team for review.</p>	

Part 3 - Water Definition Assessment (Water Act 2000) & Relevant Environmental Authority				
Environmental Value	Checklist	Y / N	Justification for Placement	Overall Outcome
<p>Does the feature fit the definition of a <b>Drainage Feature</b> under the Water Act 2000?</p> <p><b>Drainage feature</b> means a natural landscape feature, including a gully, drain, drainage depression or other erosion feature that—</p> <p>(a) is formed by the concentration of, or operates to confine or concentrate, overland flow water during and immediately after rainfall events; and</p> <p>(b) flows for only a short duration after a rainfall event, regardless of the frequency of flow events; and</p> <p>(c) commonly, does not have enough continuing flow to create a Riverine environment</p> <p>Refer to Section 7 of Watercourse Assessment Manual</p>	<p>1. Does the feature carrying water flow only for a short duration after a rainfall event?</p> <p>2. Does the feature lack the presence of a riverine environment? (i.e flow adequacy to support riverine species).</p> <p>3. Does the feature lack the presence of in-stream islands, benches or bars?</p>	<p><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p> <p><input checked="" type="checkbox"/> yes <input type="checkbox"/> no</p>	<p>If <b>Yes to all</b> of these questions then the feature does not constitute a watercourse and no further assessment is required for the Water Act.</p> <p>If <b>no to any</b> one of these questions then this feature constitutes a watercourse under the Water Act 2000</p>	<p><b>Drainage Feature UNDER the WATER ACT 2000?</b></p> <p><input checked="" type="checkbox"/> <b>YES</b> (NO APPROVAL REQUIRED)</p> <p>Implement environmental protection measures as required in Environmental authority and other relevant environmental requirements.</p> <p><input type="checkbox"/> <b>NO</b> <b>Determined a Watercourse – see below</b></p>
				<p><b>Watercourse under the WATER ACT 2000?</b></p> <p><input type="checkbox"/> <b>YES</b> (APPROVAL/ LODGEMENT REQUIRED – DETERMINED A WATERCOURSE)</p> <p>Complete Pre and Post works checklists, and ensure appropriate lodgements are undertaken as per Environmental Authority Requirements.</p> <p><input checked="" type="checkbox"/> <b>NO</b> <b>Determined a drainage feature– see Above.</b></p>

**Part 4 - Water Act Requirements (only complete if works are to take place within or adjacent to the watercourse – refer to Section 2 (Water Act) outcomes)**

Environmental Value	Checklist	Y / N	Justification for Placement	Comments
<p><b>Do the works require approval under the Water Act?</b> (Refer to summary flowchart within Section 9 of watercourse manual)</p>	<p>Do the works involve:</p> <ul style="list-style-type: none"> <li>Excavation or placing fill in a way that would interfere with the flow of water in a watercourse, lake or spring by impounding or redirecting the flow of water (referring to completed product, following construction works).</li> </ul>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b>, go to Part 5, works may require a Riverine Protection Permit under the Water Act. Provide evidence that waterway crossing design satisfies DEHP Guidelines (next section) including reference to design drawings. Attach/reference all records and store in relevant Environmental Drive. Complete paperwork and forward to FLUOR Environment Team for review.  <b>If No, adhere to EA requirements!</b></p>	

**Part 5 – DNRM Assessment Requirements (Guideline – activities in a watercourse, lake or spring associated with mining operations) (refer to Section 1 (Water Act) outcomes)**

<p>What type (if any) vegetation will be required to be removed and quantity (area). (no more than 0.25ha), how will the vegetation be removed?</p>	<input checked="" type="checkbox"/> yes <input type="checkbox"/> no	<p>List all species required for removal. Ensure FLUOR/SANTOS vegetation management plan and EA conditions are followed (indicate the requirements for this crossing).</p>	<p>See previous for a list of flora species present</p>
<p>Can the water crossing be located in a previously disturbed area?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If No, why not?</p>	<p>Non-remnant grazed pastures</p>
<p>Is the water course from groundwater origin?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>Determine upstream water sources</p>	

## Section 6 – Overall Assessment Outcome

<p>Has the stream order been assessed a watercourse (Water Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes, must comply with the "Guideline – activities in a watercourse, lake or spring associated with mining operations" – Ensure all of this checklist is completed and conveyed to all relevant staff, contractors are to ensure compliance with EA conditions – ensure lodgement of PREWORKS TO DEHP 10 Business prior to works commencing.</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED, ASSESSED AS DRAINAGE FEATURE)</b></p>
<p>Has the stream order been assessed as a waterway (Fisheries Act)</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete check boxes below          If <b>No</b> – no further assessment required</p>	<p><input type="checkbox"/> YES  <b>(APPROVAL REQUIRED)</b>  <input checked="" type="checkbox"/> NO  <b>(NO LODGEMENT REQUIRED)</b></p>
<p>Is a development approval required (i.e. the self assessable code can not be adhered to)?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> Contact FLUOR Environment Team.</p>	
<p>Was the crossing assessed as a 'minor waterway barrier'?, either:</p>		<p>If <b>Yes</b> complete the relevant 'Minor Waterway Barrier Works Self-Assessment Sheet' lodge to FLUOR Environment Team.</p>	
<p>Part 1 – Dams and Weirs</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 3 – Culverts</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Part 4 – Bed Level Crossings</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no		
<p>Was the crossing assessed as a 'temporary waterway barrier'?</p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If <b>Yes</b> complete a Temporary Waterway Barrier Works Self-Assessment Sheet lodge to FLUOR Environmental Team for review.</p>	
<p><b>Were any EVNT species listed under the EPBC Act and/or NC Act present within the riparian zone of the waterway crossing</b></p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes GPS the position of individuals/populations, flag on site and contact FLUOR Environmental Team for review.          If No – no further assessment required</p>	
<p><b>Were any vegetation mapping discrepancies identified within the riparian zone of the waterway crossing</b></p>	<input type="checkbox"/> yes <input checked="" type="checkbox"/> no	<p>If Yes undertake a quaternary level RE assessment and GPS the extent of the mapped community assemblage where applicable. Contact FLUOR Environment Team for review.          If No – no further assessment required</p>	

## WC 5 Pre-works Photographs

Photo A – Looking across the waterway at the proposed site works



Photo B – Looking downstream of the proposed site of works



Photo C – Looking upstream of the proposed site of works



Right Bank



Left Bank



Wetlands Rapid assessment				
Site: WA 1		Date: 4/11/13		Observers: LM
Infrastructure reference: adj to row 129				
Photo nos: North: 80		East: 82		South: 81 West: 83
			GPS coords: (easting, northing) 699732 7162119	
<b>Wetland class (tick one):</b>				
Riverine		Estuarine		Palustrine
Not a wetland under GLNG EA ✓				Lacustrine
				Marine
<b>Where not a wetland select a reason (tick one):</b>				
<b>Modified (tick one below if so)</b>				
<input type="checkbox"/> H2M1 Riverine or ex-riverine (lacustrine) water bodies associated with dams and weirs located in a channel				
<input type="checkbox"/> H2M3p Ponded pastures;				
<input type="checkbox"/> H2M5 Palustrine / lacustrine water bodies where ecological character has changed due to gross mechanical disturbance (eg cropping);				
<input type="checkbox"/> H2M6 Palustrine / lacustrine water bodies that have been converted, completely or mostly, to a ring tank or other controlled storage;				
<input type="checkbox"/> H2M7 Riverine water bodies that have been converted mostly to canals or irrigation channels;				
<input checked="" type="checkbox"/> H3C1 Artificial stand-alone water storages not within a natural water body or channel; or				
<input type="checkbox"/> H3C2 Artificial Channel drain / canal –bore drains, swales, bores and irrigation channel overflows/ponding				
<b>Within outer banks of watercourse</b>				
<b>Spring</b>				
<b>Does not meet hydrology criterion</b>				
<b>Meets hydrology criterion but doesn't meet other criteria</b>				

**Notes** (additional description or map area of wetland):

This is a farm dam not on a channel, modified, fish present in water.

**Photos**

North



South



East



West





Wetlands Rapid assessment				
Site: WA 2		Date: 4/11/13		Observers: LM
Infrastructure reference: adj to row 129				
Photo nos: North: 86		East: 85		South: 84 West: 87
			GPS coords: (easting, northing) 700787 7161472	
<b>Wetland class (tick one):</b>				
Riverine		Estuarine		Palustrine
Not a wetland under GLNG EA ✓				Lacustrine
				Marine
<b>Where not a wetland select a reason (tick one):</b>				
<b>Modified (tick one below if so)</b>				
<input type="checkbox"/> H2M1 Riverine or ex-riverine (lacustrine) water bodies associated with dams and weirs located in a channel				
<input type="checkbox"/> H2M3p Ponded pastures;				
<input type="checkbox"/> H2M5 Palustrine / lacustrine water bodies where ecological character has changed due to gross mechanical disturbance (eg cropping);				
<input type="checkbox"/> H2M6 Palustrine / lacustrine water bodies that have been converted, completely or mostly, to a ring tank or other controlled storage;				
<input type="checkbox"/> H2M7 Riverine water bodies that have been converted mostly to canals or irrigation channels;				
<input checked="" type="checkbox"/> H3C1 Artificial stand-alone water storages not within a natural water body or channel; or				
<input type="checkbox"/> H3C2 Artificial Channel drain / canal –bore drains, swales, bores and irrigation channel overflows/ponding				
<b>Within outer banks of watercourse</b>				
<b>Spring</b>				
<b>Does not meet hydrology criterion</b>				
<b>Meets hydrology criterion but doesn't meet other criteria</b>				

**Notes** (additional description or map area of wetland):

This is a farm dam not on a channel, modified, fish present in water.

**Photos**

North



South



East



West



Wetlands Rapid assessment				
Site: WA 3		Date: 4/11/13		Observers: LM
Infrastructure reference: row118				
Photo nos: North: 93		East: 91		South: 90 West: 92
			GPS coords: (easting, northing) 699850 7160279	
<b>Wetland class (tick one):</b>				
Riverine		Estuarine		Palustrine
				Lacustrine
				Marine
Not a wetland under GLNG EA ✓				
<b>Where not a wetland select a reason (tick one):</b>				
<b>Modified (tick one below if so)</b>				
<input type="checkbox"/> H2M1 Riverine or ex-riverine (lacustrine) water bodies associated with dams and weirs located in a channel				
<input type="checkbox"/> H2M3p Poned pastures;				
<input type="checkbox"/> H2M5 Palustrine / lacustrine water bodies where ecological character has changed due to gross mechanical disturbance (eg cropping);				
<input type="checkbox"/> H2M6 Palustrine / lacustrine water bodies that have been converted, completely or mostly, to a ring tank or other controlled storage;				
<input type="checkbox"/> H2M7 Riverine water bodies that have been converted mostly to canals or irrigation channels;				
<input checked="" type="checkbox"/> yes	<input type="checkbox"/> H3C1 Artificial stand-alone water storages not within a natural water body or channel; or			
	<input type="checkbox"/> H3C2 Artificial Channel drain / canal –bore drains, swales, bores and irrigation channel overflows/ponding			
<input type="checkbox"/> <b>Within outer banks of watercourse</b>				
<input type="checkbox"/> <b>Spring</b>				
<input type="checkbox"/> <b>Does not meet hydrology criterion</b>				
<input type="checkbox"/> <b>Meets hydrology criterion but doesn't meet other criteria</b>				

**Notes** (additional description or map area of wetland):  
 Shallow dam scrape, no water present, not on water course

**Photos**

North



South



East



West



Wetlands Rapid assessment				
Site: WA 4		Date: 5/11/13	Observers: LM	
Infrastructure reference: row 115				
Photo nos: North: 118		East: 117	South: 116	West: 119
		GPS coords: (easting, northing) 701518 7163262		
<b>Wetland class (tick one):</b>				
Riverine	Estuarine	Palustrine	Lacustrine	Marine
Not a wetland under GLNG EA ✓				
<b>Where not a wetland select a reason (tick one):</b>				
	<b>Modified (tick one below if so)</b>			
	H2M1 Riverine or ex-riverine (lacustrine) water bodies associated with dams and weirs located in a channel			
	H2M3p Ponded pastures;			
	H2M5 Palustrine / lacustrine water bodies where ecological character has changed due to gross mechanical disturbance (eg cropping);			
	H2M6 Palustrine / lacustrine water bodies that have been converted, completely or mostly, to a ring tank or other controlled storage;			
	H2M7 Riverine water bodies that have been converted mostly to canals or irrigation channels;			
yes	H3C1 Artificial stand-alone water storages not within a natural water body or channel; or			
	H3C2 Artificial Channel drain / canal –bore drains, swales, bores and irrigation channel overflows/ponding			
	<b>Within outer banks of watercourse</b>			
	<b>Spring</b>			
	<b>Does not meet hydrology criterion</b>			
	<b>Meets hydrology criterion but doesn't meet other criteria</b>			

**Notes** (additional description or map area of wetland):  
Farm dam in non rem area, earth banks, not a wetland

**Photos**

North



South



East



West





## Microbat Call Identification Report

<b>Prepared for ("Client"):</b>	GHD
<b>Survey location/project name:</b>	Fairview, Lot 20
<b>Survey dates:</b>	6-9 November 2013
<b>Client project reference:</b>	412712503
<b>Job no.:</b>	GHD-1310
<b>Report date:</b>	18 November 2013

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## Methods

### Data receipt and processing

Bat calls were recorded over four nights (6<sup>th</sup> – 8<sup>th</sup> November 2013) using two Anabat detectors (Titley Scientific, Brisbane). The two Anabat data files were downloaded from the detectors by the client and submitted to *Balance! Environmental* for analysis.

The data files were processed using CFCread (Corben 2012) to yield 3211 Anabat sequence files (zero-crossing analysis, or ZC, format): 455 files from 'Anabat 1' (CF 01018); and 2756 files from 'Anabat 2' (CF 00935).

### Species identification

The Anabat sequence files were viewed using *AnalookW* (Corben 2013) and a subset of files containing representative samples of all observed call types were selected for further analysis. Calls with fewer than four clearly-defined, non-fragmented pulses were excluded from the analysis.

Species identification was achieved manually by comparing the sonograms of the selected calls with those of reference calls from southern and central Queensland and with reference to published call descriptions (e.g. Reinhold *et al.* 2001; Pennay *et al.* 2004).

Call identification was also guided by considering probability of occurrence based on general distribution information (Churchill 2008; van Dyck & Strahan 2008) and/or database records obtained from Wildlife Online (<http://www.ehp.qld.gov.au/wildlife/wildlife-online/index.html>) and the Atlas of Living Australia (<http://www.ala.org.au>).

### Reporting standard

The format and content of this report follows Australasian Bat Society standards for the interpretation and reporting of bat call data (Reardon 2003), available on-line at <http://www.ausbats.org.au/>.

Species nomenclature follows Churchill (2008).

## Results & Discussion

### Species identified

At least thirteen and as many as nineteen species were recorded during the Fairview Lot 20 surveys (see Table 1). The majority of recorded calls were of good quality, which allowed for reliable species identification in most cases; however, some calls could not be reliably identified, due to low recording quality and/or inter-specific call similarities.

A number of species that are likely to occur in the study area produce very similar calls that can be difficult to differentiate. Where calls were encountered that could not be resolved to species, all potential candidates were listed as possibly present. The characteristics of these unresolved calls and likelihood of species' presence is discussed further below Table 1.

**Table 1. Microbat species recorded during the Fairview Lot 20 survey, 6-9 November 2013.**

- ◆ = species positively identified from call data
- = species possibly present, but not reliably identified

Detector:	Anabat 1			Anabat 2		
	Date:	6-Nov	7-Nov	8-Nov	6-Nov	7-Nov
<b>Total sequence files:</b>	235	123	97	1923	31	802
<b>No. calls identified:</b>	144	79	64	361	24	242
<b>SPECIES</b>						
<i>Chalinolobus dwyeri</i>				□		
<i>Chalinolobus gouldii</i>	◆	◆	□	◆	□	◆
<i>Chalinolobus morio</i>		□	□	□	□	□
<i>Chalinolobus picatus</i>	□	□	□	◆	◆	◆
<i>Nyctophilus species</i>			◆	◆		◆
<i>Scotorepens balstoni</i>	□	□	□	◆	□	◆
<i>Scotorepens greyii</i>	□	◆	□	◆	□	◆
<i>Vespadelus baverstocki</i>				□	□	□
<i>Vespadelus troughtoni</i>	◆	◆	◆	◆	◆	◆
<i>Vespadelus vulturinus</i>		□	□	□	□	□
<i>Miniopterus schreibersii</i>	◆	◆	◆	◆	□	◆
<i>Austronomus australis</i>	◆	◆	◆	◆		◆
<i>Mormopterus beccarii</i>	□	□		◆		◆
<i>Mormopterus ridei</i>	◆	◆	◆	◆	◆	◆
<i>Mormopterus species 3</i>	◆	□	□	◆	□	□
<i>Saccolaimus flaviventris</i>	◆	◆	◆	◆		◆
<i>Taphozous troughtoni</i>	◆	□		□		□

## Species/groups not reliably identified

Technical terms used in the following discussion are described in the Glossary, below.

### ***Chalinolobus dwyeri***

This bat is listed as **Vulnerable** under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) and the Queensland *Nature Conservation Act 1992* (NCA). Its call is generally easy to identify, having a steep FM-qCF pulse type with moderate frequency sweep (3-5 kHz) and, usually, a hooked pulse body and alternating characteristic frequency (Fc) in the range 20-25 kHz.

The species was not positively identified from this data set; however, several brief and weak calls recorded by Anabat 2 on the 6<sup>th</sup> November had most features consistent with the above description, so were considered to be potentially from *C. dwyeri*. *Mormopterus beccarii* produces calls within the same frequency range and was recorded during the same time period as the suspect *C. dwyeri* calls, but the calls in question had steeper pulses of shorter duration than is typical for *M. beccarii*.

*Chalinolobus dwyeri* is very likely to be present in the study area, as it is known to occur in the Expedition National Park and nearby areas, where steep sandstone escarpment country provides suitable caves and crevices for the species to roost in.

### ***Chalinolobus gouldii* and *Mormopterus* species 3**

Characteristic frequencies (Fc) overlap in the range 27-31 kHz; with *C. gouldii* typically producing steep, broad-band FM-qCF pulses that alternate in frequency, compared with generally flat or slightly-curved, low bandwidth calls (qCF pulses) at uniform frequency in *Mormopterus* sp 3. However, calls can vary considerably in these species, depending on habitat and behaviour (e.g. *C. gouldii* pulses can have low bandwidth when it is foraging in open space; and *Mormopterus* often have steeper broad-band pulses when flying in more cluttered habitats).

Most calls in the frequency range were reliably identified to *C. gouldii* and *Mormopterus* sp. 3 was positively identified from a small number of calls recorded on 6<sup>th</sup> November (both detectors). Numerous intermediate-type calls could not be attributed to either species, so both were listed as possible for all nights if they were not otherwise positively identified.

### ***Chalinolobus morio*, *Vespadelus troughtoni* and *Vespadelus vulturinus***

The two *Vespadelus* species have steep FM-qCF pulses with Fc overlapping around 48-51 kHz; however, *V. troughtoni* calls mostly have longer pulse duration, often with higher Fc (52-54 kHz), and call sequences tend to be more uniform than *V. vulturinus*. These features were used to reliably identify numerous *V. troughtoni* calls from all nights on both detectors. Many calls had Fc of 49-51 kHz and intermediate pulse duration so could have been from either of these *Vespadelus* spp.

*Chalinolobus morio* calls have Fc that overlaps entirely with these *Vespadelus* spp., but some calls have a straighter pulse body with down-sweeping tail, rather than the curved pulse body with no tail or up-swept tail typical of *Vespadelus* spp. Numerous calls from this study had mixed and/or intermediate pulse shapes and could have been from any of these three species.

### ***Chalinolobus picatus* and *Scotorepens greyii***

*Chalinolobus picatus* is listed as **Near Threatened** under the NCA.

Both species produce a steep FM-qCF pulse with broad frequency sweep and curved or hooked body. Characteristic frequency (Fc) overlaps substantially (*C. picatus* 39-43 kHz; *S. greyii* 36-41 kHz), but *C. picatus* calls generally have distinctive frequency alternation, *cf.* uniform frequency in *S. greyii*.

A number of calls were reliably attributed to *C. picatus*, based on frequency alternation, and to *S. greyii* based on frequency differential (i.e.  $F_c < 39$  kHz). Many calls in the frequency overlap range, however, were weak, fragmented or had inconsistent features and could have been either species.

### ***Nyctophilus* species**

Long-eared bat calls are usually easy to distinguish from those of other bats; however, the species within the genus cannot be reliably differentiated. Three species potentially occur in the study area, including *N. geoffroyi*, *N. gouldi* and *N. corbeni*.

*Nyctophilus corbeni* is listed as **Vulnerable** under both the EPBC Act and the NCA. It is known to occur in the Expedition Range National Park, so is a potential candidate for the calls recorded in this study. It is generally restricted to extensive tracts of remnant or old regrowth vegetation, but may venture into more disturbed areas along vegetated water courses or other linear remnants.

### ***Vespadelus baverstocki* and *Miniopterus orianae oceanensis***

These two species produce FM-qCF calls with Fc overlapping around 44-46 kHz. *Vespadelus baverstocki* generally has shorter-duration pulses with more curved body; whereas *M. o. oceanensis* pulses tend to be longer duration with straighter pulse body. The latter species was positively identified from a number of calls based on these characteristics; however, some calls with Fc in the overlap zone had intermediate pulse shapes and could have been from either species.

### ***Taphozous troughtoni* and *Mormopterus beccarii***

*Taphozous troughtoni* Fc (22-25 kHz) lies entirely within the range of *M. beccarii* (Fc=18-26 kHz), although *M. beccarii* pulses tend to be steeper and of longer duration in the frequency overlap zone. Most calls in the relevant frequency range were attributed to the latter species; however, a number of calls with uniform, flat (qCF) pulses around 23-24 kHz were positively identified to *T. troughtoni* for Anabat 1 on the first night (6/11). A few other calls from other sessions had pulses of intermediate duration and shape and could have been from either species.



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## Glossary

Technical terms used in this report are described in the following table.

Approach phase	The part of a bat <i>call</i> emitted as the bat starts to home in on a detected prey item; a transitional series of <i>pulses</i> between the <i>search phase</i> and <i>feeding buzz</i> , that become progressively steeper and shorter in duration.
Call	Refers to a single bat call, made up of a series of individual sound <i>pulses</i> in one or more <i>phases</i> ( <i>search, approach, feeding buzz</i> ).
CF (=Constant Frequency)	A type of <i>pulse</i> in which the dominant component consists of a more-or-less 'pure tone' of sound at a Constant Frequency; with <i>shape</i> appearing flat on the sonogram. Often also contains a brief <i>FM</i> component at the beginning and/or end of the CF component ( <i>viz.</i> FM-CF-FM).
Characteristic frequency (Fc)	The frequency of the flattest part of a <i>pulse</i> ; usually the lowest frequency reached in the <i>qCF</i> component of a pulse. This is often the primary diagnostic feature for species identification.
Duration	The time period from the beginning of a <i>pulse</i> to the end of the pulse.
Feeding buzz	The terminal part of a <i>call</i> , following the <i>approach phase</i> , emitted as the bat catches a prey item; a distinctive, rapid series of very steep, very short-duration pulses.
FM (=Frequency Modulated)	A type of <i>pulse</i> in which there is substantial change in frequency from beginning to end; <i>shape</i> ranges from almost vertical and linear through varying degrees of curvature.
FC range	Refers to the range of frequencies occupied by the <i>characteristic frequency</i> section of <i>pulses</i> within a call or set of calls.
Frequency sweep or "band-width"	The range of frequencies through which a <i>pulse</i> sweeps from beginning to end; Maximum frequency (Fmax) – minimum frequency (Fmin).
Knee	The transitional part of a <i>pulse</i> between the initial (usually steeper) frequency sweep and the <i>characteristic frequency</i> section (usually flatter); time to knee (Tk) and frequency of knee (Fk) can be diagnostic for some species.
Pulse	An individual pulse of sound within a bat <i>call</i> ; the <i>shape, duration</i> and <i>characteristic frequency</i> of a pulse are the key diagnostic features used to differentiate species.
Pulse body	The part of the <i>pulse</i> between the <i>knee</i> and <i>tail</i> and containing the <i>characteristic frequency</i> section.
Pulse shape	The general appearance of a <i>pulse</i> on the sonogram, described using relative terms related to features such as slope and degree of curvature. See also <i>CF, qCF</i> and <i>FM</i> .
qCF (=quasi Constant Frequency)	A type of <i>pulse</i> in which there is very little change in frequency from beginning to end; <i>shape</i> appears to be almost flat. Some pulses also contain an <i>FM</i> component at the beginning and/or end of the qCF component ( <i>viz.</i> FM-qCF).
Search phase	The part of a bat <i>call</i> generally required for reliable species diagnosis. A consistent series of <i>pulses</i> emitted by a bat that is searching for prey or and/or navigating through its habitat. Search phase pulses generally have longer duration, flatter slope and more consistent shape than <i>approach phase</i> and <i>feeding buzz</i> pulses.
Sequence	Literally, a sequence of <i>pulses</i> that may be from one or more bats; but generally refers to a <i>call</i> or part (e.g. <i>phase</i> ) of a call.
Tail	The final component of a <i>pulse</i> , following the <i>characteristic frequency</i> section; may consist of a short or long sweep of frequencies either upward or downward from the Fc; or may be absent.

**Appendix 1** Representative call sequences from the Fairview Lot 20 survey, November 2013.  
(Scale: 10msec per tick; time between pulses removed)







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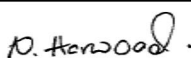

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