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AUSTRALIA PACIFIC LNG

REPORT

Ecology Assessment Report

Q-4200-15-RP-1015

Australia Pacific LNG Upstream Phase 1

Part Lot 25 on AB130, Part Lot 5 on AB50, and Part Lot 2 AB132.

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- **May** or **can** indicate a possible course of action.

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1. Introduction

Orogen (Qld) Pty Ltd (Orogen) was commissioned by Origin Energy Ltd (the client) to prepare an ecology assessment report (EAR) for an area identified as part of Lot 25 AB130, part of Lot 5 AB50, and part of Lot 2 AB132 (the Site) (**Appendix A**). This report is intended to guide the client in planning of the Australia Pacific Liquefied Natural Gas (LNG) Project (the Project).

Orogen has been approved by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (DSEWPaC) as per the letter dated 28 June 2011 for the purpose of undertaking ecological assessment works for the Project.

1.1. Definitions & abbreviations

Defined key terms and phrases used in the report are listed in **Tables 1 and 2** below.

1.1.1. Definitions

Table 1: Definitions

Term	Definition
Cryptic flora	Flora species that may be difficult to find due to its ecological lifecycle such as growth stages and flowering period, especially when the perennating organ is underground (eg. ground orchids)
Project	Australia Pacific LNG Upstream Phase 1 Project
Site	Part of Lot 25 AB130, part of Lot 5 AB50, and part of Lot 2 AB132.
Study Area	Specific areas of investigation with the site
Remnant vegetation	As defined by the Vegetation Management Act 1999 remnant vegetation is defined as vegetation, part of which forms the predominant canopy of the vegetation covering more than 50% of the undisturbed predominant canopy; and averaging more than 70% of the vegetation's undisturbed height.
Regional ecosystem	As defined by the Vegetation Management Act 1999 a Regional Ecosystem is a vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil.
Regrowth Regional Ecosystem	As defined by the Regrowth Vegetation Code regrowth vegetation is vegetation indicated on a map certified by the chief executive as the regrowth vegetation and includes endangered regional ecosystems, of concern regional ecosystem, a least concern regional ecosystem, vegetation not cleared since 31 December 1989, certain watercourses and areas deemed regrowth by the chief executive.
Threatened Ecological Community	Threatened ecological communities are those listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). An ecological community may be categorised as Critically endangered; Endangered or Vulnerable.
Referable Wetland	As defined by the Environmental Protection Regulation 2008, a referable wetland is an area shown as a wetland on a document called 'Map of referable wetlands' made available by the chief executive.
Watercourse	As defined by the Water Act 2000 a watercourse is a river, creek or other stream, including a stream in the form of an anabranch or a tributary, in which water flows permanently or intermittently, regardless of the frequency of flow event in a natural channel, whether artificially modified or not; or in an artificial channel that has changed the course of the stream.
Water feature	As defined by the Water Act 2000 a water feature means a natural landscape feature, e.g. gully, drain, drainage depression formed by the concentration of, or operates to confine or concentrate, overland flow water during and immediately

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Term	Definition
	after rainfall events. Such features only flow for a short duration after a rainfall event, regardless of the frequency of flow events; and commonly, does not have enough continuing flow to create a riverine environment.
Spring	A spring (as defined by the Water Act 2000) means the land to which water rises naturally from below the ground and the land over which the water then flows.
Declared Pest	Defined to mean a declared pest (flora and fauna) under the Land Protection (Pest and Stock Route Management) Act 2002
Matters of National Environmental Significance	As defined in the EPBC Act, matters of national environmental significance. Provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places.
Environmentally Sensitive Area	Environmentally Sensitive Areas (ESA's) are those defined as either category A, B or C ESA's within the Environmental Protection Regulation 2008.
Wetland	As defined from the Wetland Mapping & Classification Methodology a wetland is an area of permanent or periodic/intermittent inundation, with water that is static or flowing fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed 6 m. Wetlands must have one or more of the following; i. at least periodically the land supports plants or animals that are adapted to and dependent on living in wet conditions for at least part of their life cycle, or ii. the substratum is predominantly undrained soils that are saturated, flooded or ponded long enough to develop anaerobic conditions in the upper layers, or iii. the substratum is not soil and is saturated with water, or covered by water at some time.
Derived Grassland	Areas of former woodland vegetation, which have been cleared, typically for the purpose of providing grazing pasture.
Threatened Species	Species of flora and fauna that are vulnerable to endangerment in the near future. Federal and State (Qld) listings and conservation status of threatened species are defined under the EPBC Act and Nature Conservation Act 1992.

1.1.2. Abbreviations

Table 2: Abbreviations

Abbreviation	Description
AHD	Australian height datum
API	Aerial photo interpretation
BOM	Bureau of Meteorology
DERM	Department of Environment and Resource Management
DSEWPaC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
EAR	Ecology assessment report
e.g.	For example
EP Act	*Environmental Protection Act 1994*
EPA	Environmental Protection Agency
EPBC Act	*Environmental Protection Biodiversity and Conservation Act 1999*
ESA	Environmentally Sensitive Area

Abbreviation	Description
HVR	High value regrowth
km	Kilometre
LNG	Liquefied Natural Gas
LP Act	*Land Protection (Pest and Stock Route Management) Act 2004*
m	Metre
mm	Millimetres
MNES	Matters of national environmental significance
NC Reg	*Nature Conservation Regulation 2006*
NCA	*Nature Conservation Act 1992*
PGA	*Petroleum and Gas (Production and Safety) Act 2004*
PMAV	Property map of assessable vegetation
Project	Australia Pacific LNG
RE	Regional ecosystem
REDD	Regional Ecosystem Description Database
VMA	*Vegetation Management Act 1999*
WONS	Weed of national significance

1.1.3. Document references

Listed documents and references used to develop this report (e.g. legislation, regulatory documents, Origin directives and procedures).

Table 3: Associated Document References

Document Reference	Title
	Environmental Protection Act 1994. Office of the Queensland Parliamentary Counsel. Reprint No. 10G. 5 April 2012.
	Environment Protection and Biodiversity Conservation Act 1999. Australian Government.
	Nature Conservation Act 1992. Office of the Queensland Parliamentary Counsel. Reprint No. 6J. 2 March 2012.
	Nature Conservation (Wildlife) Regulation 2006. Office of the Queensland Parliamentary Counsel. Reprint No. 1C. 21 May 2010.
	Petroleum and Gas (Production and Safety Act) 2004. Office of the Queensland Parliamentary Counsel. Reprint No. 5D. 2 March 2012.
	Water Act 2000. Office of the Queensland Parliamentary Counsel. Reprint No. 8F. 2 March 2012.
	Declared Plants of Queensland. Department of Employment, Economic Development and Innovation, Brisbane http://www.dpi.qld.gov.au/4790_7005.htmhttp://www.dpi.qld.gov.au/4790_7005.htm
	Land Protection (Pest and Stock Route Management) Act 2002. Office of the Queensland Parliamentary Counsel. Reprint No 4A, 2 March 2012.

Document Reference	Title
	Vegetation Management Act 1999. Office of the Queensland Parliamentary Counsel. Reprint No. 4B. 4 November 2011.
BOM (2012)	*Climate statistics for Australian Locations - Miles Post Office*. Bureau of Meteorology, Australian Government. http://www.bom.gov.au/climate/averages/tables/cw_042023.shtml
DEH (2000)	*Taxon Summary -Cotton Pygmy-Goose*. Department of Environment and Heritage, Sydney NSW. http://www.environment.gov.au/biodiversity/threatened/publications/action/birds2000/pubs/cotton-pygmy-goose.pdf
DEH (2011)	*Tylophlora linearis - vulnerable species listing*. Department of Environment and Heritage, Sydney NSW. http://www.environment.nsw.gov.au/determinations/tylopheralinearisfd.htm
DERM (2009)	*Regrowth Vegetation Code - On freehold and indigenous land and leasehold land for agriculture and grazing - version 1*. The Department of Environment and Resource Management, Brisbane.
DERM (2012a)	*Regional Ecosystem and Remnant Map—version 6.1 for the purpose of the Vegetation Management Act 1999*. The Department of Environment and Resource Management, Brisbane.
DERM (2012b)	*Regional Ecosystem Land Zone definitions*, The Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/wildlife-ecosystems/biodiversity/regional_ecosystems/land_zone_definitions.html
DERM (2012c)	*Wildlife Online*. Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife_online
DERM (2012d)	*Wetland Maps* – Version 2.0. Department of Environment and Resource Management, Qld Brisbane. http://wetlandinfo.derm.qld.gov.au/wetlands/MappingFandD/WetlandMapsAndData/WetlandMaps.html
DERM (2012e)	*Map of Referable Wetlands*. Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/wildlife-ecosystems/ecosystems/referable-wetlands-form.php
DERM (2012f)	*Essential Habitat Map-version 3.1 for the purpose of the Vegetation Management Act 1999*. Online RE Maps, The Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/REMAP
DERM (2012g)	*Regrowth Vegetation Map—version 2.1* for the purpose of the Vegetation Management Act 1999. Online RE Maps, The Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/REMAP
DERM (2012h)	*Maps of Environmentally Sensitive Areas*. Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/ecoaccess/maps_of_environmentally_sensitive_areas.php
DERM (2012i)	*Regional Ecosystem Description Database (REDD)*. The Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/wildlife-ecosystems/biodiversity/regional_ecosystems/how_to_download_redd.html
DERM (2012j)	*Woma*, The Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/az_of_animals/woma.html
DERM (2012k)	*Golden-tailed gecko*. Department of Environment and Resource Management, Brisbane. http://www.derm.qld.gov.au/wildlife-

Document Reference	Title
	ecosystems/wildlife/threatened_plants_and_animals/near_threatened/goldentailed_gecko.html
DSEWPaC (1999)	*Taxon summary: Little Pied Bat* in The Action Plan for Australian Bats. Environment Australia. Department of Sustainability, Environment, Water, Population and Communities, Canberra ACT. http://www.environment.gov.au/biodiversity/threatened/publications/action/bats/21.html
DSEWPaC (2011)	Species Profile and Threats Database. Available on the Commonwealth Department of Sustainability, Environment, Water, Population and Communities. http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl
DSEWPaC (2012)	*Protected Matters Search Tool*. Commonwealth Department of Sustainability, Environment, Water, Population and Communities. Canberra ACT. http://www.environment.gov.au/epbc/pmst/index.html
EPA (2000)	*Bioregional Map of Queensland V0001*. Environmental Protection Authority, Queensland. http://www.derm.qld.gov.au/vegetation/pdf/bioregion_v0001.pdf
Eyre *et al*. (2011)	Eyre, T.J., Kelly, A.L, Neldner, V.J., Wilson, B.A., Ferguson, D.J., Laidlaw, M.J. and Franks, A.J. (2011). BioCondition: *A Condition Assessment Framework for Terrestrial Biodiversity in Queensland. Assessment Manual. Version 2.1*. Department of Environment and Resource Management, Biodiversity and Ecosystem Sciences, Brisbane.
Foster *et al*. (2000)	Foster K.R., Vecchia P., and Repacholi M.H., (2000). *Science and the Precautionary Principle*. Science 288: 979–981.
Geoscience Australia (2012)	*1:250'000 Geology Maps*, Department of Resources, Energy and Tourism, available from http://www.geoscience.gov.au/cgi-bin/mapserv?map=/nas/web/ops/prod/apps_www-c/mapserver/geoportal-geologicalmaps/index.map&mode=browse&layer=%20map250&layer=map250
Google Inc (2012)	Google Earth (version 6.2.2.6613) [software], available from http://www.google.com/earth/download/ge/agree.html.
Neldner *et al*. (2005)	Neldner, V.J., Wilson, B. A., Thompson, E.J. and Dillewaard, H.A. (2005). *Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland. Version 3.1*. Updated September 2005. Queensland Herbarium, Environmental Protection Agency, Brisbane. 128 pp.
NPWS (1999)	*Threatened Species Information – Glossy Black Cockatoo*, NSW National Parks and Wildlife Service, Hurstville NSW. http://www.environment.nsw.gov.au/resources/nature/tsprofileGlossyBlackCockatoo.pdf

2. Site Content

2.1. Background

This report presents detail on the ecological values of the Site. The intention of this report is to provide information to inform ultimate disturbance footprint selection and guide detailed project planning.

2.2. Location

The Site comprises part of Lot 25 AB130, part of Lot 5 AB50, and part of Lot 2 AB132. The Site covers an area of approximately 740 hectares and is located approximately 75 kilometres (km) north west of Miles in the Surat Basin in the Queensland Western Downs Region and Brigalow Belt bioregion (EPA, 2000) in central eastern Queensland (**Appendix A**).

Land use on the Site consists of a mosaic of historically cleared grazing country and forested areas of remnant and regrowth vegetation.

2.3. Topography

The topography of the Site is undulating between approximately 291 metres (m) and 339 m Australian Height Datum (AHD) (Google Inc., 2012). The Site generally drains in a divergent pattern via 1st, 2nd and 3rd order streams to a 5th order stream near that crosses through the Site.

Queensland geological mapping (Geoscience Australia, 2012) shows the geology of the subject site to consist of:

- Klm – Mooga Sandstone - Lower Cretaceous - Quartzose to labile sandstone, some clayey, some sandstone, conglomerate;
- Kly – Bungil Formation - Lower Cretaceous - Sandstone, siltstone, mudstone not subdivided easte of Yuleba; and
- T – Miocene – Quartzose sandstone, conglomerate.

2.4. Land Zones

The Department of Environment and Resource Management (DERM) regional ecosystem (RE) mapping depicts land zones 3, 9, 5, and 10 as occurring on the site (DERM, 2012a).

Land zone 3 is described as quaternary alluvial systems, including floodplains, alluvial plains, alluvial fans, terraces, levees, swamps, channels, closed depressions and fine textured palaeo-estuarine deposits (DERM, 2012b).

Land zone 5 is described as extensive, uniform near level or gently undulating Cainozoic plains with sandy or loamy soils. Includes dissected remnants of these surfaces. Also includes plains with sandy or loamy soils of uncertain origin, and plateau remnants with deep soils usually overlying duricrust (DERM, 2012b).

Land zone 9 is described as fine-grained sedimentary rocks, generally with little or no deformation, forming undulating landscapes with a broad range of fine textured soils of moderate to high fertility. Siltstones, mudstones, shales, calcareous sediments, and lithic and labile sandstones are typical rock types although minor interbedded volcanics may occur (DERM, 2012b).

Land zone 10 is described as medium to coarse-grained sedimentary rocks, with little or no deformation, forming plateaus, ledges and scarps. Includes siliceous sandstones, conglomerates and minor interbedded volcanics, and springs associated with these rocks (DERM, 2012b).

2.5. Climate

Climate statistics (BOM, 2012) for the nearest weather station at Miles post office (station number 042023) are:

- Mean annual temperature range of 27.1 – 12.2 degrees Celsius; and
- Mean annual rainfall of 653.2 millimetres (mm).

3. Methodology

3.1. Desktop and Literature Review

Sources used to obtain information for the desktop and literature review are as follows:

- *Nature Conservation (Wildlife) Regulation 2006* (NC Reg) and *Nature Conservation Act 1992 (NCA)* protected species lists;
- *Environmental Protection Biodiversity and Conservation Act 1999* (EPBC Act) protected matters search tool (DSEWPaC, 2012);
- Regional ecosystem mapping version 6.1 digital GIS layer (DERM, 2012a);
- Wildlife Online database (DERM, 2012c);
- WetlandMaps (DERM, 2012d);
- Map of referable wetlands (DERM, 2012e);
- Essential habitat map – version 3.1 (DERM, 2012f);
- Regrowth vegetation map – version 2.1 (DERM, 2012g);
- Aerial photography interpretation (API) using high resolution aerial photography; and
- Origin supplied constraints/context mapping (e.g. soils, geology, waterways/wetlands, slope).

The searches of the EPBC Act protected matters search tool and DERM's Wildlife Online database were undertaken using a 10 km and 25 km search radii respectively from the approximate centre of the Site (longitude: 26.247, latitude: 149.575).

A targeted literature review was undertaken for matters of ecological significance relevant to the Site, including threatened species and threatened ecological community profiles to guide field ecologists on the ecological elements of particular focus for the field survey.

3.2. Field Survey

Ecological surveys were conducted in general accordance with the *BioCondition - A Condition Assessment Framework for Terrestrial Biodiversity in Queensland - Assessment Manual - Version 2.1* (Biocondition Manual) (Eyre *et al*. 2011) and the Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland – Version 3.1(Neldner *et al*. 2005). The results of raw data collected during field surveys are summarised and presented in the appendices of this EAR.

The field surveys for this report were undertaken by Orogen between 20 September and 10 November 2011.

3.2.1. Vegetation Community Survey

General baseline botanical surveys were undertaken to describe dominant flora and vegetation community structure throughout the Site. Botanical surveys were consistent with the tertiary level of data collection as described in the Methodology for Survey and Mapping of Regional Ecosystems and Vegetation Communities in Queensland (Neldner *et al*. 2005).

Vegetation community surveys were undertaken within 50 m x 10 m plots for the purpose of typifying the ecosystem type under assessment. Vegetation community structural data was entered into the data fields provided by the Trimble® Nomad data capture system. A total of 26 formal vegetation community surveys were undertaken within the Site. The locations of the vegetation community survey sites are presented in **Appendix B**.

Relative abundance data was collected for each stratum within the community as per the data fields presented by the vegetation structure point data sheet of the Trimble® Nomad unit. Representative photo(s) were taken of the subject vegetation community via the Trimble® Nomad unit. A photo was taken at each vegetation survey site using the Trimble® Nomad unit, and photo aspect data was entered into the relevant data sheet within the Trimble® Nomad.

As a process of the vegetation community surveys, remnant vegetation community polygons were subsequently verified/identified and mapped in accordance with Queensland regional ecosystem (Biodiversity Status). Potential occurrence of EPBC Act threatened ecological communities was also recorded in general accordance EPBC Act criteria for each respective community type.

3.2.2. Habitat Survey

Habitat surveys were undertaken in conjunction with each vegetation community survey within the same 50 m x 10 m quadrat. A total of 26 formal habitat survey sites were undertaken across the Site (refer **Appendix B**).

Within each habitat survey site, a range of habitat features, such as log abundance, hollow tree size class and abundance, were entered into the respective Trimble® Nomad data sheet. Where deemed appropriate, representative photo(s) were taken of the given habitat patch via the Trimble® Nomad unit and photo aspect data was entered into the relevant data sheet within the Trimble® Nomad.

3.2.3. Threatened Flora and Fauna Survey

Threatened species are those listed under the EPBC Act and the NC Reg. Searches for threatened flora and fauna were undertaken within and adjoining each vegetation community/habitat survey plot where field ecologists deemed the given area to be of sufficient potential for harbouring threatened species. The searches were undertaken for one (1) person hour per plot location.

In addition, and at the field team leader's (a senior ecologist) discretion, opportunistic searches for threatened species were undertaken while traversing the Site. The target species and habitat features searched were determined according to the nature of the ecosystem observed.

Any observations of threatened species (whether within formal search areas or opportunistic) were recorded using the flora site or fauna site data sheet of the Trimble® Nomad. Where practicable, photo(s) were taken of the observed threatened species via the Trimble® Nomad unit and photo aspect data was entered into the relevant data sheet within the Trimble® Nomad.

3.2.4. Exotic Flora and Fauna Survey

Environmental and declared pests, as defined by the *Land Protection (Pest and Stock Route Management) Act 2002* (LP Act), were recorded via the respective Trimble® Nomad data collection sheet. In the case of exotic flora, infestations were recorded where occurring outside of a vegetation community survey plot when opportunistically detected while traversing the Site. Pest flora species, if observed within a vegetation structure point survey plot, were recorded on vegetation structure point data sheets within the Trimble® Nomad unit. Likewise, the occurrence of pest fauna was also recorded on the appropriate data sheet within the Trimble® Nomad unit.

3.2.5. Disturbance Survey

A disturbance survey was undertaken at each vegetation community/habitat survey site. Where evidence of disturbance was observed, it was categorised in terms of disturbance type (eg erosion, grazing), severity (eg minimal, severe), and the estimated time of the most recent occurrence for the disturbance event (eg current, > 20 years). The disturbance data was recorded using the Trimble® data capture system.

3.2.6. Survey Limitations

A number of factors are considered likely to influence survey results for particular species or species groups. These factors are:

- Timing (seasons) and duration of the survey period;
- Weather conditions in the preceding seasons; and
- Restricted spatial area of the habitats within the Site.

The surveys undertaken may not provide a true indication of seasonal habitat utilisation by fauna species within the Site, and some cryptic flora species may only be detected during particular flowering periods.

The field investigations undertaken were limited to passive techniques (e.g. no live trapping) undertaken during daytime hours, and the investigations were undertaken in spring, when some species may not be as active. Additional survey effort would be required to provide a more comprehensive inventory of species, both threatened and common.

Notwithstanding, the precautionary principle (Foster *et al*. 2000) was applied in determining a number of threatened species potentially utilising the habitats with the Site.

4. Results and Discussion

This section includes the results of desktop and field assessments associated with the Site and includes interpretation and discussion of key findings.

4.1. Desktop and Literature Review

The results of desktop searches relative to the Site are provided below for ecological matters of international, national and state significance. Data sources used for desktop searches in the context of the Site are listed in Section 3.1. A more detailed description regarding potential occurrences and respective ecological values of the Site, based on the results of field surveys, is provided in Section 4.2

4.1.1. Matters of National Environmental Significance (MNES)

4.1.1.1. Threatened Ecological Communities

Table 4 - below summarise the results of an online search using the EPBC Act protected matters search tool (DSEWPAC, 2012). It is noted that not every MNES or other matters listed by the search results specifically relate to flora, fauna or ecological communities and therefore are not dealt with in this EAR. The complete EPBC Act report generated by the online search is provided in **Appendix C**.

Table 4: EPBC Act Threatened Ecological communities predicted to occur at the Site.

Name	Status*	Type of Presence^
Brigalow (*Acacia harpophylla* dominant and co-dominant).	E	Community known to occur within area.
Coolibah – black box woodlands of the Darling riverine plains and the Brigalow Belt south bioregions	E	Community may occur within area.
Semi-evergreen vine thickets of the Brigalow Belt (north and south) and Nandewar bioregions	E	Community likely to occur within area.
Weeping myall woodlands.	E	Community likely to occur within area.

* Status under *EPBC Act 1999*: E = Endangered

^ Type of presence as listed by the protected matters search tool for the search area.

4.1.1.2. Listed Flora

Table 5: EPBC Act listed flora species predicted to occur at the Site

Scientific Name	Common Name	Status*	Type of Presence^
Cadellia pentastylis	ooline	V	Species or species habitat likely to occur within area.
Commersonia argentea		V	Species or species habitat likely to occur within area.
Homopholis belsonii	Belson's panic	V	Species or species habitat may occur within area.
Tylophora linearis		E	Species or species habitat may occur within area.

* Status under *EPBC Act 1999*: E = Endangered; V = Vulnerable

^ Type of presence as listed by the protected matters search tool for the search area.

4.1.1.3. Listed Fauna

Table 6: EPBC Act listed fauna species predicted to occur at the Site

Class	Scientific Name	Common Name	Status*	Type of Presence^
Birds	*Geophaps scripta scripta*	squatter pigeon (southern)	V	Species or species habitat likely to occur within area.
	Neochmia ruficauda ruficauda	star finch (eastern/southern)	E	Species or species habitat likely to occur within area.
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat.*)	Australian painted snipe	V	Species or species habitat may occur within area.
Fish	*Maccullochella peelii peelii*	Murray cod	V	Species or species habitat may occur within area.
Mammals	*Chalinolobus dwyeri*	large-eared pied bat	V	Species or species habitat may occur within area.
	Dasyurus hallucatus	northern quoll	E	Species or species habitat may occur within area.
	Nyctophilus corbeni [formally *N. timoriensis* (South-eastern form)]	south-eastern long-eared bat	V	Species or species habitat may occur within area.
Reptiles	*Delma torquata*	collared delma	V	Species or species habitat may occur within area.
	Denisonia maculata	ornamental snake	V	Species or species habitat may occur within area.
	Egernia rugosa	yakka skink	V	Species or species habitat may occur within area.
	Furina dunmalli	Dunmall's snake	V	Species or species habitat may occur within area.
	Paradelma orientalis	Brigalow scaly-foot	V	Species or species habitat may occur within area.
	Rheodytes leukops	Fitzroy River turtle	V	Species or species habitat may occur within area.

* Status under *EPBC Act1999*: E = Endangered; V = Vulnerable

^ Type of presence as listed by the protected matters search tool for the search area.

4.1.1.4. Migratory Species

Table 7 below presents the migratory species listed by the EPBC Act search results. It is noted that some species are listed more than once as they fall under more than one category for migratory species.

Table 7: EPBC Act listed migratory species predicted to occur at the Site

Group	Scientific Name	Common Name	Type of Presence^
Migratory Marine Birds	*Apus pacificus*	fork-tailed swift	Species or species habitat may occur within area.
	Ardea alba	great egret	Species or species habitat may occur within area.
	Ardea ibis	cattle egret	Species or species habitat may occur within area.
Migratory Terrestrial Species	*Haliaeetus leucogaster*	white-bellied sea-eagle	Species or species habitat likely to occur within area.
	Hirundapus caudacutus	white-throated needletail	Species or species habitat may occur within area.
	Merops ornatus	rainbow bee-eater	Species or species habitat may occur within area.
Migratory Wetland Species	*Ardea modesta* (formally *A. alba*, *Egretta alba*)	eastern great Egret	Species or species habitat may occur within area.
	Ardea ibis	cattle egret	Species or species habitat may occur within area.
	Gallinago hardwickii	Latham's snipe	Species or species habitat may occur within area.
	Nettapus coromandelianus albipennis	Australian cotton pygmy-goose	Species or species habitat may occur within area.
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat.*)	Australian painted snipe	Species or species habitat may occur within area.

^ Type of presence as listed by the protected matters search tool for the search area.

4.1.1.5. Wetlands of International Significance – Ramsar Wetlands

A total of one (1) Ramsar listed wetland was identified by the *EPBC Act* protected matters search. This wetland is Narran Lake Nature Reserve which is located over 400 km to the southwest of the Site, in New South Wales.

4.1.2. Other Matters

4.1.2.1. EPBC Act Listed Marine Species

Table 8 below provides a list of marine species identified by the protected matters search tool. It is noted that this is not a MNES, and rather falls under other matters provided by the protected matters search tool.

Table 8: EPBC listed marine species predicted to occur at the Site

Class	Scientific Name	Common Name	Type of Presence^
Birds	*Apus pacificus*	fork-tailed swift	Species or species habitat may occur within area.
	Ardea modesta (formally *A. alba, Egretta alba*)	eastern great egret	Species or species habitat may occur within area.
	Ardea ibis	cattle egret	Species or species habitat may occur within area.
	Gallinago hardwickii	Latham's snipe	Species or species habitat may occur within area.
	Haliaeetus leucogaster	white-bellied sea-eagle	Species or species habitat likely to occur within area.
	Hirundapus caudacutus	white-throated Needletail	Species or species habitat may occur within area.
	Merops ornatus	rainbow bee-eater	Species or species habitat may occur within area.
	Nettapus coromandelianus albipennis	Australian cotton pygmy-goose	Species or species habitat may occur within area.
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat.*)	Australian painted snipe	Species or species habitat may occur within area.

^ Type of presence as listed by the protected matters search tool for the search area.

4.1.3. Extra Information

Invasive Species

The following section presents a summary of extra information provided by the protected matters search tool and includes a list of invasive flora and fauna species identified by the desktop search. The invasive flora species identified by the protected matters search tool are provided in **Table 9** and include weeds of national significance (WONS) and '*other introduced plants that are considered by the States and Territories to pose a particularly significant threat to biodiversity*' (DSEWPaC, 2012).

Table 9: EPBC Act invasive flora species predicted to occur at the Site

Scientific Name	Common Name	Type of Presence^
*Acacia nilotica subsp. indica**	prickly acacia	Species or species habitat may occur within area.
*Lantana camara**	lantana	Species or species habitat likely to occur within area.
*Parthenium hysterophorus**	parthenium weed	Species or species habitat likely to occur within area.

* - Weed of National Significance

^ Type of presence as listed by the protected matters search tool for the search area.

The Invasive fauna species identified from the EPBC Act protected matters search tool are listed in **Table 10.**

Table 10: EPBC Act invasive fauna species predicted to occur at the Site

Scientific Name	Common Name	Type of Presence^
*Rhinella marinus (*formerly *Bufo marinus)*	cane toad	Species or species habitat likely to occur within area.
Felis catus	cat	Species or species habitat likely to occur within area.
Oryctolagus cuniculus	European rabbit	Species or species habitat likely to occur within area.
Sus scrofa	feral pig	Species or species habitat likely to occur within area.
Vulpes vulpes	red fox	Species or species habitat likely to occur within area.

^ Type of presence as listed by the protected matters search tool for the search area.

4.1.4. Nature Conservation Act 1992

The following sections summarise the results of the Wildlife Online database search (refer to **Table 11**). This involved searching the database for records of threatened flora and fauna listed by the NC Act within a 25 km radius from the approximate centre (longitude: 26.247, latitude: 149.575) of the site (DERM, 2012c). The raw search results are provided in **Appendix D**.

4.1.4.1. Listed Flora

No threatened flora species were listed by the Wildlife Online search tool results as being recorded within a 25 km radius of the Site.

4.1.4.2. Listed Fauna

Table 11: Wildlife Online search tool results for fauna

Class	Scientific Name	Common Name	Status*
Bird	*Calyptorhynchus lathami lathami*	glossy black-cockatoo	V
Mammals	*Chalinolobus picatus*	little pied bat	NT
Reptiles	*Aspidites ramsayi*	woma	NT
	Strophurus taenicauda	golden-tailed gecko	NT

* Status under *NC Reg 2006* : V = Vulnerable; NT = Near threatened

4.1.5. Environmentally Sensitive Areas

A search of DERM's RE mapping was undertaken to identify Environmentally Sensitive Areas (ESA) mapped over the Site (DERM, 2012a). A search of DERM's ESA mapping (DERM, 2012h) was also undertaken to identify ESAs (pertinent to Chapter 5A activities) defined by the *Environmental Protection Act 1994* (EP Act) mapped over the Site.

It is noted that the proposed petroleum and gas activities of Australia Pacific LNG (as defined and controlled under the *Petroleum and Gas (Production and Safety) Act 2004* and the EP Act, are exempt from assessment under the *Vegetation Management Act 1999* (VMA). As such, the VMA class assigned to areas of remnant vegetation is not applicable. Assessment of remnant vegetation for this ecological assessment is therefore based on the biodiversity status of a remnant regional ecosystem.

It was determined that the Site is designated as containing category B and category C ESAs. The category B ESAs align with endangered remnant REs (**Appendix E**) and the category C ESA's comprises a referable wetland situated near the western boundary of the Site (**Appendix F**) and also of concern remnant REs.

It is noted that DERM's RE mapping designates some of the category B ESAs as mixed polygons, consisting of concern remnant REs (category C ESA). DERMS RE mapping designations of the Site as identified

through the desktop searches is provided in **Appendix E**. A description of each RE type mapped as occurring on the Site is provided below in Table 12 - Table 14.

There is no essential habitat mapped by DERM for the Site.

4.1.5.1. Endangered Regional Ecosystems

Table 12: Endangered regional ecosystems mapped over the Site

RE	General Description^	Description^
11.9.5	*Acacia harpophylla* and/or *Casuarina cristata* open-forest on fine-grained sedimentary rocks.	Open-forest dominated by *Acacia harpophylla* and/or *Casuarina cristata* (10-20m) or *Acacia harpophylla* with a semi-evergreen vine thicket understorey. Open-forest dominated by *C. cristata* is more common in southern parts of the bioregion. A prominent low tree or tall shrub layer dominated by species such as *Geijera parviflora* and *Eremophila mitchellii*, and often with semi-evergreen vine thicket species is often present. The latter include *Flindersia dissosperma, Brachychiton rupestris, Excoecaria dallachyana, Macropteranthes leichhardtii* and *Acalypha eremorum* in eastern areas, and species such as *Carissa ovata, Owenia acidula, Croton insularis, Denhamia oleaster* and *Notelaea microcarpa* in south-western areas. *Melaleuca bracteata* may be present along watercourses.
11.9.10	*Eucalyptus populnea, Acacia harpophylla* open-forest on fine-grained sedimentary rocks.	*Eucalyptus populnea* predominates forming a distinct but discontinuous canopy (15-18 m tall). *Acacia harpophylla* and sometimes *Casuarina cristata* usually forms a lower tree layer (8-14 m tall) which occasionally becomes the dominant layer. An open to moderately dense layer of tall shrubs is usually present and dominated by *Eremophila mitchellii* and *Geijera parviflora* with *Acacia excelsa*, *Atalaya hemiglauca*, *Psydrax oleifolia*, *Alectryon oleifolius* frequent. Scattered low shrubs such as *Carissa ovata* and *Eremophila deserti* are frequently present. The ground cover is usually sparse, and dominated by the grasses *Aristida ramosa*, *Enteropogon acicularis*, *Bothriochloa decipiens* and *Paspalidium spp*. Occurs on Cainozoic to Proterozoic consolidated, fine-grained sediments. Occurs on lower parts of undulating plains often with deep texture-contrast soils. Occurs on sodic and saline soils which may act as a discharge area if adjacent to alluvium.

^ - Descriptions are from Regional Ecosystem Description Database (REDD) (DERM, 2012i).

4.1.5.2. Of Concern Regional Ecosystems

Table 13: Of concern regional ecosystems mapped over the Site

RE	General Description^	Description^
11.3.2	*Eucalyptus populnea* woodland on alluvial plains.	*Eucalyptus populnea* woodland to open-woodland. *E. melanophloia* may be present and locally dominant. There is sometimes a distinct low tree layer dominated by species such as *Geijera parviflora*, *Eremophila mitchellii*, *Acacia salicina*, *Acacia pendula*, *Lysiphyllum spp.*, *Cassia brewsteri*, *Callitris glaucophylla* and *Acacia excelsa*. The ground layer is grassy dominated by a range of species depending on soil and management conditions. Species include *Bothriochloa decipiens*, *Enteropogon acicularis*, *Aristida ramosa* and *Tripogon loliiformis*. Occurs on cainozoic alluvial plains with variable soil types including texture contrast, deep uniform clays, massive earths and sometimes cracking clays.
11.3.25	*Eucalyptus tereticornis* or *E. camaldulensis* woodland fringing drainage lines.	*Eucalyptus camaldulensis* or *E. tereticornis* open-forest to woodland. Other tree species such as *Casuarina cunninghamiana*, *E. coolabah*, *Melaleuca bracteata*, *Melaleuca viminalis*, *Livistona spp.* (in north), *Melaleuca spp.* and *Angophora floribunda* are commonly present and may be locally dominant. An open to sparse, tall shrub layer is frequently present dominated by species including *Acacia salicina*, *A. stenophylla* or *Lysiphyllum carronii*. Low shrubs are present, but rarely form a conspicuous layer. The ground layer is open to sparse and dominated by perennial grasses, sedges or forbs such as *Imperata cylindrica*, *Bothriochloa bladhii*, *B. ewartiana*, *Chrysopogon fallax*, *Cyperus dactylotes*, *C. difformis*, *C. exaltatus*, *C. gracilis*, *C. iria*, *C. rigidellus*, *C. victoriensis*, *Dichanthium sericeum*, *Leptochloa digitata*, *Lomandra longifolia* or *Panicum spp.* 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.
11.9.7	*Eucalyptus populnea*, *Eremophila mitchellii* shrubby woodland on fine-grained sedimentary rocks.	*Eucalyptus populnea* predominates forming a distinct but discontinuous canopy (10-20 m tall). Occasionally *E. melanophloia* is present in the canopy. Lower trees are absent or infrequent. An open to dense, tall shrub layer is always present, with *Eremophila mitchellii* often dominant. A patchy low shrub layer of varying density may be formed, where the tall shrub layer is more than 6 m tall. The ground layer is dominated by perennial grasses and varies from sparse to dense, depending on the shrub and tree density. *Bothriochloa decipiens, Enteropogon acicularis, Aristida ramosa* and *Aristida jerichoensis* are the most common dominants in the east with *Aristida calycina* var. *praealta, Aristida jerichoensis, Eragrostis* spp. and *Chloris pectinata* dominant further west. Forbs are seasonally abundant. Occurs on the lower and middle slopes of gently undulating lowlands and plains formed from Cainozoic to Proterozoic consolidated, fine-grained sediments.

^ - Descriptions are from Regional Ecosystem Description Database (REDD) (DERM, 2012i).

4.1.6. Other Environmental Values

4.1.6.1. No Concern at Present Regional Ecosystem

Table 14: No concern at present regional ecosystems mapped over the Site

RE	General Description^	Description^
11.5.1	*Eucalyptus crebra*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sandplains/remnant surfaces.	*Eucalyptus crebra* and/or *E. populnea* +/- *Angophora leiocarpa* +/- *E. woollsiana* (in south of bioregion) dominate the woodland (to open-woodland) canopy. A low tree layer dominated by *Allocasuarina luehmannii* +/- *Melaleuca decora* +/- *Callitris glaucophylla* +/- *C. endlicheri* is usually present. In some areas *Allocasuarina luehmannii* low woodland is the dominant layer. The ground cover is usually sparse and dominated by perennial grasses. Occurs on cainozoic sandplains, especially outwash from weathered sandstones. Duplex soils with sandy surfaces.
11.10.9	*Callitris glaucophylla* woodland on coarse-grained sedimentary rocks.	*Callitris glaucophylla* woodland to open-forest often associated with *Eucalyptus melanophloia* in the tree canopy and a sparse ground layer. Various other tree species may be present including *Corymbia clarksoniana*, *Eucalyptus populnea*, *C. tessellaris*, *E. chloroclada* and *Angophora leiocarpa* which may form a mono-specific open-woodland in places. Low tress such as *Allocasuarina luehmannii*, *Alphitonia excelsa*, *Lysicarpus angustifolius*, *Geijera parviflora* and *Acacia* spp. sometimes conspicuous in mid low tree to tall shrub layer. The ground layer is often sparse and dominated by grasses such as *Aristida echinata*, *A. jerichoensis*, *A. caput-medusae*, *Bothriochloa decipiens*, *Eriachne mucronata*, *Enneapogon* spp. and sometimes *Triodia mitchellii*. Occurs on deep uniform sandy and deep texture contrast soils on course grained sediments.

^ - Descriptions are from Regional Ecosystem Description Database (REDD) (DERM, 2012i).

4.1.6.2. High Value Regrowth

High value regrowth vegetation containing regional ecosystems (HVR) or regulated regrowth vegetation is defined under the VMA as either:

- Identified on the regrowth vegetation map as high value regrowth vegetation;
- Located within 50 m of a watercourse identified on the regrowth vegetation map as a regrowth watercourse (regrowth watercourse vegetation); or
- Contained in a category C or category 4 area on a property map of assessable vegetation (PMAV).

Further, in order to qualify as high value growth, the given vegetation polygon must not have been cleared since 31 December 1989 (DERM, 2009).

While it is acknowledged that the VMA is not applicable to projects regulated by the *Petroleum and Gas (Safety Production) Act 2004* (PGA), the desktop HVR designation over the Site is presented by this report to provide additional context around the Site.

Table 15 presents a summary of desktop HVR designation over the Site, while **Appendix E** presents the location of HVR polygons as per DERM HVR mapping (DERM, 2012g).

Table 15: High value regrowth vegetation mapped over the Site

HVR Category	Description
HVR containing endangered regional ecosystems	Woody regrowth greater than 20 years old
HVR containing of concern regional ecosystems	Woody regrowth greater than 20 years old

4.1.7. Wetlands and Watercourses

A review of DERM's RE mapping (DERM, 2012a), Wetland*Maps* (DERM, 2012d) and referable wetlands mapping (DERM, 2012e) was undertaken to identify wetland and watercourse designations within the Site. The results are summarised in Table 16. Desktop data-derived wetland and watercourse mapping for the Site is provided in **Appendix F**.

Table 16: Summary of wetland and watercourse mapping for the Site

Identified Wetlands and Watercourses	Mapped Occurrence
Watercourses	The site contains 1st, 2nd and 3rd order streams which drain to a 5th order stream within the western boundary of the Site (DERM, 2012a, DERM, 2012d).
Wetlands	A riverine system (wetland) is mapped as occurring within the western boundary of the Site (DERM, 2012d). These areas correspond to an RE mapping designation showing mixed polygons (endangered subdominant) containing RE 11.3.25/11.9.10 (DERM, 2012a).
Referable Wetlands	A referable wetland and trigger area is mapped near the western boundary of the Site (DERM, 2012e).

4.2. Field Survey

Field surveys were conducted by four (4) ecologists between 20 September and 10 November 2011. The results of these surveys have been summarised below. The field survey results present the outcome of Site-level investigation of the Site's desktop designations as described in Section 3.1. A cumulative list of flora and fauna detected during the survey is provided in **Appendices G** and **H** respectively.

4.2.1. Matters of National Environmental Significance

The following sections discuss the results of the field survey in the context of the protected matters search tool results (Sections 4.1.1 – 4.1.3).

4.2.1.1. EPBC Act Threatened Ecological Communities

The surveys recorded the presence of one (1) EPBC Act listed ecological community identified by the protected matters search tool. This community was Brigalow (*Acacia harpophylla* dominant and co-dominant). A summary of the occurrence of this ecological community is provided in **Table 17** below and the distribution of this community across the Site is provided in **Appendix I**.

Table 17: Threatened ecological communities occurring on the Site

Name	Status*	Occurrence on Site
Brigalow (*Acacia harpophylla* dominant and co-dominant)	E	Community known to occur within the Site.
Coolibah – black box woodlands of the Darling riverine plains and the Brigalow Belt south bioregions	E	Not recorded during survey.
Semi-evergreen vine thickets of the Brigalow Belt (north and south) and Nandewar bioregions	E	Not recorded during survey.
Weeping myall woodlands.	E	Not recorded during survey.
* Status under *EPBC Act 1999*: E = Endangered		

4.2.1.2. EPBC Listed Flora

There were no EPBC Act listed threatened flora species recorded during field survey. A discussion regarding the perceived habitat value of the Site for EPBC Act listed flora species identified by the protected matters search tool is provided below in Table 18.

Table 18: EPBC Act protected flora species recorded or potentially occurring on the Site

Scientific Name	Common Name	Status*	Likelihood of Occurrence
Cadellia pentastylis	ooline	V	**Potentially occurring.** Some parts of the Site, particularly areas supporting patches of Brigalow, represent potential habitat for this species (refer **Appendix I**) (DSEWPaC, 2011). **Low to moderate value.** Actual abundance cannot be determined prior to the undertaking of detailed surveys within clearing footprints (refer to recommendations in Section 5). Additional actions (e.g. relocation/seed collection) would be recommended if this species is subsequently identified within clearing footprints (refer Section 5).
Commersonia argentea		V	**Potentially occurring** Some parts of the Site, particularly areas supporting patches of Brigalow, represent potential habitat for this species (DSEWPaC, 2011). **Low to moderate value.** Actual abundance cannot be determined prior to the undertaking of detailed surveys within clearing footprints (refer to recommendations in Section 5). Additional actions (e.g. relocation/seed collection) would be recommended if this species is subsequently identified within clearing footprints (refer Section 5).
Homopholis belsonii	Belson's panic	V	**Potentially occurring.** The areas of the site which host Brigalow and Casuarina cristata forest on alluvial plains offer potential habitat for Belson's panic (DSEWPaC, 2011). **Moderate value** (depending on level of disturbance/condition of RE's present) Actual abundance cannot be determined prior to the undertaking of detailed surveys within clearing footprints (refer to recommendations in Section 5). Additional actions (e.g. relocation/seed collection) would be recommended if this species is subsequently identified within clearing footprints (refer Section 5).
Tylophora linearis		E	**Potentially occurring.** The Site offers potential habitat for *Tylophora linearis* which is known to be associated with dense shrubland that exhibits emergent *Eucalyptus spp.* and *Callitris glaucophylla* (DEH, 2011). **Low to moderate value** (depending on level of disturbance/condition of RE's present). Actual abundance cannot be determined prior to the undertaking of detailed surveys within clearing footprints (refer to recommendations in Section 5). Additional actions (e.g. relocation/seed collection) would be recommended if this species is subsequently identified within clearing footprints (refer Section 5).

* Status under the *EPBC Act 1999*: E = Endangered; V = Vulnerable

4.2.1.3. EPBC Listed Fauna

There was no EPBC Act listed threatened fauna species recorded during field survey. A discussion regarding the perceived habitat value of the Site for EPBC Act listed flora species identified by the protected matters search tool is provided below in Table 19.

Table 19: EPBC protected fauna species recorded or potentially occurring on the Site

Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
Birds	*Geophaps scripta scripta*	squatter pigeon (southern)	V	**Potentially occurring.** This species may occur within the Site, particularly around the riverine corridor within the eastern portion of the Site and other waterways throughout the Site (DSEWPaC, 2011). **Moderate value** around waterways. Low values in cleared or highly modified communities.
	Neochmia ruficauda ruficauda	star finch (eastern/southern)	E	**Potentially occurring.** The vegetation within the Site would provide suitable foraging and nesting habitat resources for this species, namely grasslands and grassy woodlands that are located close to bodies of fresh water (DSEWPaC, 2011). **Moderate value** given the small size of this species and expected home range.
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat.*)	Australian painted snipe	V	**Unlikely to occur.** The Site lacks substantial wetlands required for this species (DSEWPaC, 2011). **Low value to species.**
Fish	*Maccullochella peelii peelii*	Murray cod	V	**Unlikely to occur.** The Site lacks permanent waterways for this species. The riverine corridor on the eastern boundary and north western corner of the Site and other waterways within the Site may provide potential habitat during high flow periods (DSEWPaC, 2011). **Low value to species.**

Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
Mammals	*Chalinolobus dwyeri*	large-eared pied bat	V	**Potentially occurring.** This species is known to use a range of habitat types, including riparian corridors, sclerophyll forest and Brigalow. Accordingly, the Site represents potential foraging habitat for this species. It is noted that the Site was not found to offer roosting habitat resources such as arch caves with dome roofs (DSEWPaC, 2011). **Low to moderate value.** The vegetation represents a small area of habitat relative to the species large foraging range and mobility.
	Dasyurus hallucatus	northern quoll	E	**Potentially occurring.** It is likely that this species could traverse the Site due to its extensive home range, mobility and the availability of opportunistic food resource (roadside carrion) in nearby locations. There is also potential denning habitat provided by tree hollows and hollow logs shown to occur on Site (DSEWPaC, 2011). However, overall the Site represents lower value relative to core habitat in the wider landscape **Low to moderate value.**
	Nyctophilus corbeni [formally *N. timoriensis* (South-eastern form)]	south-eastern long-eared bat	V	**Potentially occurring.** The vegetation within the Site, namely Brigalow woodlands and dry sclerophyll forest, represents potential foraging habitat for this species (DSEWPaC, 2011). The Site also contains potential roosting habitat in the form of tree hollows (DSEWPaC, 2011). **Moderate to high value** in terms of potential roosting habitat, particularly within areas supporting remnant vegetation (given the relatively higher abundance of tree hollows in these communities). **Low to moderate value** in terms of foraging value. The vegetation represents a small area of habitat relative to the species large foraging range and mobility.

Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
Reptiles	*Delma torquata*	collared delma	V	**Potentially occurring** The site offers potential habitat for this species, namely, the alluvial and undulating areas of the site on fine-grained sedimentary rocks (land zones 3 and 9 respectively). The area of the site found to exhibit RE 11.9.10 (Brigalow) is also identified as a noteworthy potential habitat resource for collared delma (DSEWPaC, 2011). **Moderate value** in areas supporting REs. **Low values** in cleared or highly modified communities.
	Denisonia maculata	ornamental snake	V	**Potentially occurring.** Some parts of the Site, particularly areas supporting patches of Brigalow, represent potential habitat for this species (DSEWPaC, 2011). **Moderate value** in areas supporting Brigalow communities. **Low values** in cleared or highly modified communities.
	Egernia rugosa	yakka skink	V	**Potentially occurring.** The vegetation within the Site represents potential habitat for this species. In particular, parts of the Site supporting remnant vegetation are considered to represent higher quality habitat for the species (DSEWPaC, 2011). **Moderate value** in areas supporting remnant vegetation. **Low values** in cleared or highly modified communities.
	Furina dunmalli	Dunmall's snake	V	**Potentially occurring.** The vegetation within the Site represents potential habitat for this species. In particular, parts of the Site supporting remnant vegetation on black cracking clay as well as sandstone derived soils are considered to represent higher quality habitat for the species (DSEWPaC, 2011). **Moderate value** in areas supporting REs. **Low values** in cleared or highly modified communities.

Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
	Paradelma orientalis	Brigalow scaly-foot	V	**Potentially occurring.** The vegetation within the Site represents potential habitat for this species, namely the areas supporting Brigalow communities (DSEWPaC, 2011). **Moderate value** in areas supporting REs. **Low values** in cleared or highly modified communities.
	Rheodytes leukops	Fitzroy River turtle	V	**Unlikely to occur.** This species is only found in the Fitzroy River and its tributaries (DSEWPaC, 2011).

* Status under the *EPBC Act 1999*: E = Endangered; V = Vulnerable

4.2.1.4. EPBC Act Listed Migratory Species

One (1) EPBC Act listed migratory species was recorded during the survey, the rainbow bee-eater (*Merops ornatus*). The Site is however, considered to support potentially suitable habitat resources for some of the other listed migratory species identified by the protected matters search tool.

Despite this, the habitats within the Site are likely to comprise only a very small component of any migratory species range. Further, the Site does not contain intertidal or oceanic habitats. Although a portion of the Site is mapped as containing a referable wetland area, the Site is highly unlikely to contain an important area of habitat for migratory species.

A discussion regarding the perceived habitat value of the Site for EPBC Act listed migratory species identified by the protected matters search tool is provided below in Table 20.

It is noted that some species such as cattle egret (*Ardea ibis*) are listed under more than one migratory category (e.g. migratory marine species and migratory wetlands species) in the results of the protected matters search tool. Such duplications have been omitted from the following Table.

Table 20: EPBC Act protected migratory species recorded or potentially occurring on the Site

Class	Scientific Name	Common Name	Likelihood of Occurrence
Birds	*Apus pacificus*	fork-tailed swift	**Potentially occurring.** The open habitats including riparian vegetation observed on the Site would provide suitable habitat resources for the fork-tailed swift (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species' large foraging range and mobility.
	Ardea modesta (formally *A. alba, Egretta alba*)	eastern great egret	**Potentially occurring.** The areas of the site associated with wetlands (e.g. dams, alluvial flats, drainage lines) are deemed to provide suitable habitat resources for the eastern great egret (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species' large foraging range and mobility.
	Ardea ibis	cattle egret	**Likely to occur.** The grassland and wetland areas of the Site are identified as offering provide suitable habitat resources

Class	Scientific Name	Common Name	Likelihood of Occurrence
			for the cattle egret (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species' large foraging range and mobility.
	Haliaeetus leucogaster	white-bellied sea-eagle	**Potentially occurring** The Site does not contain large permanent water bodies or estuarine environments and therefore lacks preferred foraging habitat for the white-bellied sea-eagle (DSEWPaC, 2011). This species, may, however, forage over the Site opportunistically. This species may also utilise trees within the Site for nesting, however, this species usually chooses nest sites that are within proximity to large bodies of water. **Overall value generally low** given the species' large foraging range and mobility, and lack of preferred foraging habitat within the Site. **Potentially high value** should any nest sites be identified within the Site.
	Hirundapus caudacutus	white-throated needletail	**Potentially occurring.** Given the broad range of habitat types used by this species, including open forest and clearings, the Site is identified as providing suitable habitat resources for the white-throated needletail (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species large foraging range and mobility.
	Merops ornatus	rainbow bee-eater	**Known to occur.** Areas of the site, particularly those that are cleared or lightly timbered (e.g. open woodland) and with sandy embankments would provide suitable habitat resources for the rainbow bee-eater (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species large foraging range and mobility.
	Gallinago hardwickii	Latham's snipe	**Unlikely to occur.** The Site lacks substantial wetlands, a preferred habitat resource for the species (DSEWPaC, 2011).
	Nettapus coromandelianus albipennis	Australian cotton pygmy-goose	**Unlikely to occur.** The Site lacks substantial wetlands, a preferred habitat resource for the species (DEH, 2000).
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat.*)	Australian painted snipe	**Unlikely to occur.** The Site lacks substantial wetlands, a preferred habitat resource for the species (DSEWPaC, 2011).

4.2.1.5. Wetlands of National Significance – Ramsar Sites

The field surveys confirmed that the Site does not contain any Wetlands of National Significance. In addition, the Site was not found to contain habitat that could be classified as a Wetland of National

Significance according to classification under the EPBC Act. The one Ramsar site identified by the protected matters search tool, Narran Lake Nature Reserve, is located in NSW and is over 400 km to the south of the Site.

4.2.2. Other Matters

4.2.2.1. EPBC Act Listed Marine Species

One (1) EPBC Act listed protected marine species was recorded, rainbow bee-eater (*Merops ornatus*).Table 21briefly discusses the perceived habitat value of the Site for EPBC Act listed migratory species identified by the protected matters search tool.

Table 21: EPBC Act protected marine species recorded or potentially occurring on the Site

Class	Scientific Name	Common Name	Likelihood of Occurrence
Birds	*Apus pacificus*	fork-tailed swift	**Potentially occurring.** The open habitats including riparian woodland observed on the Site would provide suitable habitat resources for the fork-tailed swift (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species' large foraging range and mobility.
	Ardea modesta (formally *A. alba, Egretta alba*)	eastern great egret	**Potentially occurring.** The areas of the site associated with wetlands (e.g. dams, alluvial flats, drainage lines) are deemed to provide suitable habitat resources for the great egret (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species' large foraging range and mobility.
	Ardea ibis	cattle egret	**Likely to occur.** The grassland and wetland areas of the Site are identified as offering provide suitable habitat resources for the cattle egret (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species' large foraging range and mobility.
	Gallinago hardwickii	Latham's snipe	**Unlikely to occur.** The Site lacks substantial wetlands, a preferred habitat resource for the species (DSEWPaC, 2011).

Class	Scientific Name	Common Name	Likelihood of Occurrence
	Haliaeetus leucogaster	white-bellied sea-eagle	**Potentially occurring** The Site does not contain large permanent water bodies or estuarine environments and therefore lacks preferred foraging habitat for the white-bellied sea-eagle (DSEWPaC, 2011). This species, may, however, forage over the Site opportunistically. This species may also utilise trees within the Site for nesting, however, this species usually chooses nest sites that are within proximity to large bodies of water. **Overall value generally low** given the species' large foraging range and mobility, and lack of preferred foraging habitat within the Site. **Potentially high value** should any nest sites be identified within the Site.
	Hirundapus caudacutus	white-throated needletail	**Potentially occurring.** Given the broad range of habitat types used by this species, including open forest and clearings, the Site is identified as providing suitable habitat resources for the white-throated needletail (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species large foraging range and mobility.
	Merops ornatus	rainbow bee-eater	**Known to occur.** Areas of the site, particularly those that are cleared or lightly timbered (open woodland) and with sandy embankments would provide suitable habitat resources for the rainbow bee-eater (DSEWPaC, 2011). **Low value** as the vegetation represents a small area of habitat relative to the species large foraging range and mobility.
	Nettapus coromandelianus albipennis	Australian cotton pygmy-goose	**Unlikely to occur.** The Site lacks substantial wetlands, a preferred habitat resource for the species (DEH, 2000).
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat.*)	Australian painted snipe	**Unlikely to occur.** The Site lacks substantial wetlands, a preferred habitat resource for the species (DSEWPaC, 2011).

4.2.3. Extra Information

4.2.3.1. Invasive Species Identified by the Protected Matters Search Tool

As presented in **Table 22** below, no Weeds of National Significance or other weeds listed by the protected matters search tool were observed during the field survey. All other non-native flora observed during the field survey is listed in **Appendix G**.

Table 22: Pest flora species recorded or potentially occurring on the Site

Scientific Name	Common Name	Likelihood of Occurrence
*Acacia nilotica subsp. indica**	prickly acacia	Not detected Potentially occurring.
*Lantana camara**	lantana	Not detected Potentially occurring.
*Parthenium hysterophorus**	parthenium weed	Not detected Potentially occurring.

As presented in **Table 23** below, three (3) invasive pest fauna species listed by the protected matters search tool were detected during the survey. All other non-native fauna observed during the field survey is listed in **Appendix H**.

Table 23: Pest fauna species recorded or potentially occurring on the Site

Scientific Name	Common Name	Likelihood of Occurrence
Rhinella marinus (formerly *Bufo marinus)*	cane toad	**Known to occur**. Recorded on Site near the vicinity of the creek.
Felis catus	domestic cat	**Potentially occurring.** Not recorded during survey. Given the mobility and range of habitat that the species can tolerate, it is possible that this species traverses the Site if present in the locality.
Oryctolagus cuniculus	European rabbit	**Known to occur**. Recorded on Site.
Sus scrofa	feral pig	**Potentially occurring.** Not recorded during survey. Given the mobility and range of habitat that the species can tolerate, it is possible that this species traverses the Site if present in the locality.
Vulpes vulpes	red fox	**Known to occur**. Recorded on Site at a location of an active den site.

4.2.4. Nature Conservation Act 1992

Field survey results concerning flora and fauna species defined as threatened under the NC Act and listed by the NC Reg are provided in the following sub-headings.

4.2.4.1. Listed Flora

No flora species listed as threatened under the NC Reg were recorded during the field survey.

The Site is considered to provide potential habitat for a number of NC Act threatened flora. However, no records of threatened flora were identified on DERM's Wildlife Online database for the search area (25 km radius) (DERM,2012c).

4.2.4.2. Listed Fauna

No fauna species listed as threatened under the NC Regwere recorded during the field survey.

The Site is considered to provide potential habitat for other threatened fauna species. The threatened fauna species identified by the online search, with their likelihood of occurrence and a brief discussion on the perceived habitat value of the Site for these species is provided below in Table 24.

Table 24: Nature Conservation Regulation scheduled fauna recorded or potentially occurring on the Site

Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
Bird	*Calyptorhynchus lathami lathami*	glossy black-cockatoo	V	**Likely to occur.** The site contains genera of the glossy black-cockatoo's preferred food trees and potential nesting opportunities in larger hollows observed on the Site (NPWS 1999). However, the species is highly mobile and the Site contains a limited proportion of suitable habitat (typically of lower quality) relative to the surrounding area. **Low value to species.**
Mammal	*Chalinolobus picatus*	little pied bat	NT	**Potentially occurring.** Areas with *Callitris*/*Allocasuarina* forests and scattered *Eucalyptus* species with hollows would provide suitable habitat for the little pied bat (DSEWPaC, 1999). **Moderate value** as the species is relatively sedentary and may utilise the recorded RE's and hollow trees if present.
Reptiles	*Aspidities ramsayi*	woma python	NT	**Potentially occurring.** The Site contains areas with suitable habitat for the woma. The species is associated with *A. harpophylla* woodland and grassland and will shelter in logs and thick ground-cover. The region is near the southern limit of the species range (DERM, 2012j). **Moderate value** in the areas of Brigalow (with *A. harpophylla*) with logs and suitable grass coverage. **Low value** in remaining remnant, disturbed and cleared areas.
	Strophurus taenicauda	golden-tailed gecko	NT	**Potentially occurring.** The golden-tailed gecko has been recorded in similar vegetation types as those recorded on the Site. Similarly, the species utilises habitat features such as hollows and peeling bark which were recorded in varying densities (DERM, 2012k). **Moderate to high value** in areas supporting RE vegetation given the small size of this species, relatively limited mobility, and expected home range. **Low values** in cleared or highly modified communities with limited timber or bark resources.

* Status under *NC Reg 2006*: V = Vulnerable; NT = Near threatened

Two (2) species of type A restricted plant (as protected under the NC Act) were recorded during the surveys at 13 locations:

- *Brachychiton rupestris* (narrow-leaved bottle tree); and
- *Cymbidiumcanaliculatum* (tiger orchid).

4.2.5. Environmentally Sensitive Areas

The field surveys identified the presence of two ESA categories, being category B (endangered remnant) and category C (of concern remnant). In addition, the field surveys confirmed the location of a mapped referable wetland (category C ESA) (refer to Section 4.2.7 for more discussion of this wetland area).

Distribution of REs on site has been mapped by Orogen based on field survey data. Several RE polygons have been confirmed as different to those shown for the Site on DERMs mapping. Field results were assessed against the criteria for REs given by Neldner *et al.* (2005) such that vegetation must contain 50% pre-clearing cover and 70 % of the pre-clearing height for the vegetation type.

A brief summary regarding the occurrence of the RE identified within the Sites is provided in **Table 25** – Table 27 and the location of these communities is presented in **Appendix J**. The conservation status for the RE's is in accordance with the biodiversity status, not the status assigned under the VMA.

The field surveys identified that several RE polygons shown for the Site on DERMs mapping were not consistent with the vegetation occurring within respective areas onsite. The inconsistencies can be summarised as:

- On site vegetation assemblages often did not match the REs assigned by the mapping; and
- Some areas not currently mapped by DERM as containing remnant RE were found to contain vegetation that would satisfy the criteria for remnant classification.

4.2.5.1. Endangered Regional Ecosystems

The endangered REs identified during the field survey are provided in Table 25 below and the location of the polygons containing these REs is demonstrated in Appendix J.

Table 25: Endangered regional ecosystems identified on the Site

RE	General description^	Occurrence on Site
11.9.5	*Acacia harpophylla* and/or *Casuarina cristata* open-forest on fine-grained sedimentary rocks.	This RE was recorded at survey locations 1 and 2 on the south-eastern boundary. Approximately half occurred in the DERM mapping.

^ - Descriptions are from Regional Ecosystem Description Database (REDD) (DERM, 2012i).

4.2.5.2. Of Concern Regional Ecosystems

The of concern REs identified during the field survey are provided in Table 26 below and the location of the polygons containing these REs is demonstrated in Appendix J.

Table 26: Of concern regional ecosystems identified on the Site

RE	General description^	Occurrence on Site
11.3.2	*Eucalyptus populnea* woodland on alluvial plains.	Occurred as mixed polygons (dominant and sub-dominant) throughout the Site. The majority of the RE was associated with the main watercourse. Due to the highly transitional nature of the vegetation observed in the field, the exact boundary between RE types could not be verified.
11.9.7	*Eucalyptus populnea, Eremophila mitchellii* shrubby woodland on fine-grained sedimentary rocks	Occurred in a small polygon on the eastern boundary of the Site. The majority of this vegetation concurred in the DERM mapping.

^ - Descriptions are from Regional Ecosystem Description Database (REDD) (DERM, 2012i).

4.2.6. Other Environmental Values

Whilst not an ESA, the no concern at present REs and HVR may be used by threatened species as habitat. No concern at present REs and HVR identified during the survey are also discussed in order to provide context around the ecological condition of the Site.

4.2.6.1. No Concern at Present Regional Ecosystems

The no concern at present REs identified during the field survey are provided in Table 27 below and the location of the polygons containing these REs is demonstrated in Appendix J.

Table 27: No concern at present regional ecosystems identified on the Site

RE	General description^	Occurrence on Site
11.5.1	*Eucalyptus crebra, Callitris glaucophylla, Angophora leiocarpa, Allocasuarina luehmannii* woodland on Cainozoic sandplains/remnant surfaces.	Occurred as mixed polygons throughout the Site. Some of this vegetation occurred in the DERM mapping.
11.5.5	*Eucalyptus melanophloia, Callitris glaucophylla* woodland on Cainozoic sandplains/remnant surfaces. Deep red sands	Not recorded in the DERM mapping. The RE was recorded in a linear mixed polygon (dominant) to the south of the Site along two (2) minor watercourses in unmapped vegetation.
11.10.9	*Callitris glaucophylla* woodland on coarse-grained sedimentary rocks	This RE was the most prevalent type of remnant vegetation throughout the Site, occurring primarily in mixed polygons (dominant and sub-dominant). The majority of this vegetation concurred in the DERM mapping, including some identified as remnant in mapped HVR around the centre of the Site.

^ - Descriptions are from Regional Ecosystem Description Database (REDD) (DERM, 2012i).

4.2.6.2. High Value Regrowth

Table 28 describes where ground-truthing identified the occurrence of remnant vegetation in areas of the Site currently designated as HVR. Refer to **Appendix J** for the location of such polygons.

Table 28: Remnant vegetation currently mapped as Regrowth or unmapped on the Site

Mapped Regrowth Category	Ground-truthed Remnant Regional Ecosystem	Occurrence on Site
HVR vegetation containing endangered regional ecosystems	11.9.5 (dominant)- Endangered	Occurred as a small polygon adjoining remnant RE to the south-east boundary of the Site.
HVR vegetation containing of concern regional ecosystems	11.3.2/11.10.9 (dominant and subdominant) – of concern 11.9.7/11.5.1 (dominant) – of concern	Occurred as linear areas associated with the main creek and a watercourse to the south-east of the creek.
Unmapped	11.5.5/11.3.2 (sub-dominant) – of concern	Linear polygon following two (2) minor watercourses towards the south-east corner of the Site.

4.2.7. Wetlands and Watercourses

The field surveys noted the presence of various water features located throughout the site. Initial desktop assessment indicated the presence of 1st, 2nd, 3rd and 5th order watercourses (**Appendix F**), subsequent field assessment found a number of these watercourses were in fact more similar to drainage features (as defined by the *Water Act 2000*).

Field assessment also verified water features captured via DERM's watercourse mapping. **Appendix F** indicates the Site's wetlands, watercourses (mapped and unmapped) and water features identified during surveys and desktop assessment.

The extent of disturbance of wetland and watercourse features observed during field survey varied. The primary disturbance included erosion and degradation of stream banks, with contributing factors such as historic clearing and access by stock.

A referable wetland area occurs along the western edge of the Site and flows through the middle of the northern half (**Appendix F**). This wetland follows Horse Creek and appeared to correspond with an area mapped by DERM as an endangered (sub-dominant) polygon containing RE 11.3.25 (of concern) and 11.9.10 (endangered). The field surveys identified that the vegetation within this area of the Site is more analogous to of concern RE 11.3.2 and no concern at present RE 11.10.9.

The surveys identified that the vegetation within the areas mapped as a referable wetland within the site contained some wetland vegetation but comprised primarily of dry woodland to forest RE (11.3.2 and 11.10.9). There were hydrophytes an obvious inland creek system to indicate wetland habitat within these portions of the site. It should be noted that the remaining areas corresponding with the mapped wetland occurred outside of the Site and were therefore not surveyed.

4.2.8. Declared Weeds

Weed species observed onsite that are declared under the LP Act are listed in **Table 29** below. Other non-native (introduced) flora species recorded during fieldworks are presented in **Appendix G**.

Table 29: Declared flora species recorded during the ecological field survey

Scientific Name	Common Name	Occurrence
Bryophyllum delagoense	mother of millions	Present but uncommon on the Site.
Opuntia aurantica	tiger pear	Present but uncommon on the Site.
Opuntia stricta	common prickly pear	Present but uncommon on the Site.
Opuntia tomentosa	woolly tree pear	Common across the Site

4.2.9. Declared Fauna

Fauna species observed onsite that are declared under the LP Act are listed in **Table 30**below.

Table 30: Declared fauna species recorded during the ecological field survey

Scientific Name	Common Name	Occurrence
Vulpes vulpes	red fox	Evidence of Site utilisation (den site) recorded at 1 location.

4.2.10. Disturbance

In general, the Site was found to have been subject to varying levels of disturbance at each survey site. The disturbance types most commonly recorded across the Site were grazing and logging. Evidence of thinning, flooding and fire was also observed, including within remnant vegetation.

Time frames for the respective disturbance events were noted to range from currently occurring to occurring greater than 20 years ago. Recent or currently active disturbances typically occurred in the form of grazing. Historical fires, logging and clearing is evident throughout most of the Site, including within cleared areas as well as within existing RE polygons. Such disturbance is likely to be associated with past agricultural practices and prescribed or wildfire burns, given the context of the Site.

5. Conclusions and Recommendations

In conclusion, the desktop data review and ecological field surveys identified that the Site offers a varying level of ecological constraint. Some areas within the site have been identified to offer a high level of ecological constraint, while other areas offer low level ecological constraint. The varying level of ecological constraint is largely attributed to the occurrence of high value remnant vegetation (of which some communities are aligned with EPBC Act listed communities), while other areas of the site have been significantly degraded due to historic land use, including broad scale clearing, blade ploughing, fire and grazing.

The known and potential elements of ecological value within the Site identified by this study and associated recommendations include:

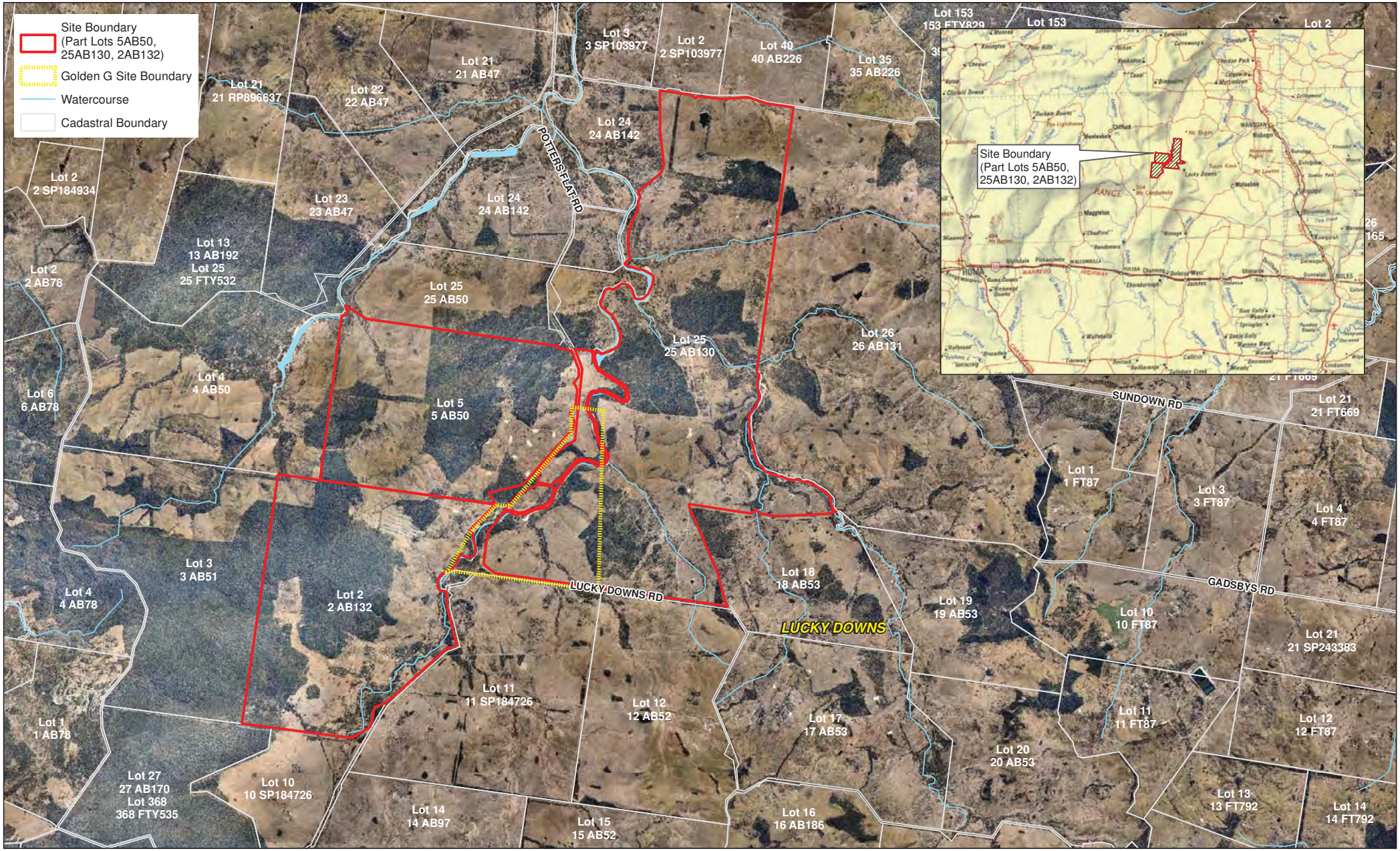
- Occurrence of one (1) ecological community protected under the EPBC Act within the Site as listed below. It is recommended that avoidance of disturbance of these communities is made a priority. Any unavoidable impacts are to be mitigated.
  - Brigalow (*Acacia harpophylla* dominant and co-dominant);
- Potential habitat resources for a variety of threatened flora and fauna species listed by the EPBC Act and/or NC Reg. It is recommended that impacts to threatened species habitat are avoided and minimised as far as practicable.
- Occurrence of the following three (3) ESA designations within the Site. It is recommended that impacts to ESAs be avoided wherever practicable and mitigated where impacts are unavoidable.
  - category B (endangered remnant)
  - category C (of concern remnant).
  - category C (referable wetland)
- Whilst not an ESA, the site was also found to contain no concern at present RE types. These communities were identified to be in relatively good condition and were found to contain a variety of high value habitat resources (e.g. hollow bearing trees), including potential resources for threatened flora and fauna species listed by the EPBC Act and/or NC Reg. Accordingly, it is recommended that disturbance to no concern at present RE types is avoided as far as practicable with any unavoidable impacts to be mitigated.
- Watercourses (as defined by the *Water Act 2000*) at various locations within the Site, including 1st, 2nd, 3rdand 5th order streams. Accordingly, it is recommended that waterway buffers, which are based on the functional objective of a given buffer as well as approval condition requirements, are factored into development planning.
- Recorded occurrence of the type A restricted plants listed below. It is recommended that these plants are managed in accordance with an approved translocation management plan if within a disturbance area.
  - narrow-leaved bottle tree (*Brachychiton rupestris*); and
  - tiger orchid (*Cymbidium canaliculatum*).
- Varying levels of existing and historic disturbances, with the most commonly recorded disturbance events being: grazing and logging. It is recommended that development activities are centred around the more disturbed and cleared areas of the site as far as practicable.
- Recorded occurrence of four (4) species listed as declared plants under the LP Act as presented below. It is recommended that these are managed in accordance with an approved weed management plan.
  - mother of millions (*Bryophyllum delagoense*);
  - tiger pear (*Opuntia aurantiaca*);
  - common prickly pear (*Opuntia stricta*); and

  - woolly tree pear (*Opuntia tomentosa*).
- Recorded occurrence of one (1) species listed as a declared animal under LP Act as presented below. It is recommended that feral animals are managed in accordance with an approved environmental management plan.
  - red fox (*Vulpes vulpes*).

It is recommended the findings of this report are considered during any detailed development planning works such that disturbance to the ecological values of the Site and locality may be minimised. All mitigation measures are to be implemented in accordance with an approved site environmental management plan and regulatory approval conditions.

Uncontrolled when printed unless issued and stamped Controlled Copy.

6. Appendix A: Locality Map



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GIS Section - HSSE

APPENDIX A

Locality Map

Date: 26/05/2012

State: Queensland
Project:
Permit: ATP606
Map No: 1 of 1
Map ID:
Doc ID: 1056-GOLDEN_G_APPENDIX_A_LOCALITY_120526

REVISIONS		
0	LOCALITY	26/05/2012
REV	DESCRIPTION	DATE

	NAME	SIGNATURE
DRAWN	AV	
CHECK	BE	
QA		
APP		

N

Locations indicative and subject to change
Digital Cadastral Database © The State of Queensland (DERM) 2012.

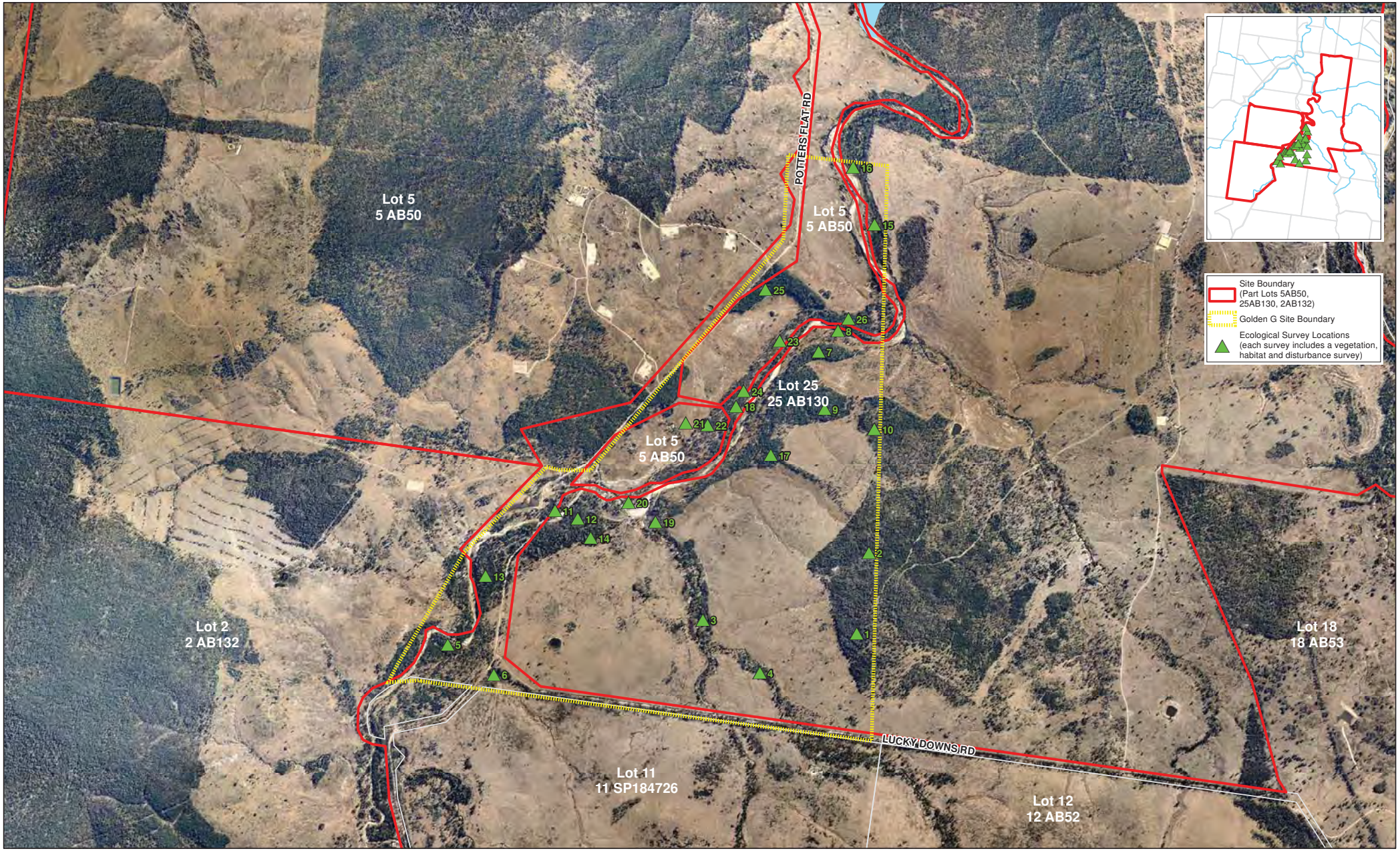
0 1 2 3 4 5
Kilometers

1:80,000 at A3

Projection: MGA94 Z55 Units: Kilometres Scale 1:40,000 @ A3

GDA

7. Appendix B: Ecological Survey Locations Map



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GIS Section - HSSE

APPENDIX B

Ecological Survey Locations

Date: 27/05/2012

State: Queensland
Project:
Permit: ATP606
Map No: 1 of 1
Map ID:
Doc ID: 1056-GOLDEN_G_APPENDIX_B_SURVEY_LOCATIONS_120527

REVISIONS		
0	ECOLOGICAL SURVEY LOCATIONS	27/05/2012
REV	DESCRIPTION	DATE

	NAME	SIGNATURE
DRAWN	AV	
CHECK	BE	
QA		
APP		

N

Locations indicative and subject to change
Digital Cadastral Database © The State of Queensland (DERM) 2012.

0 1,000 2,000
Metres

1:25,000 at A3

Projection: MGA94 Z55 Units: metres Scale 1:25,000 @ A3

GDA

8. Appendix C: Results from EPBC Protected Matters Search Tool

Australian Government
Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report

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

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

Information about the EPBC Act including significance guidelines, forms and application process details can be found at http://www.environment.gov.au/epbc/assessmentsapprovals/index.html

Report created: 27/06/12 14:07:43

Summary
Details
- Matters of NES
- Other Matters Protected by the EPBC Act
- Extra Information

Caveat
Acknowledgements

This map may contain data which are ©Commonwealth of Australia (Geoscience Australia), ©PSMA 2010

Coordinates
Buffer: 10.0Km

Summary

Matters of National Environment Significance

This part of the report summarises the matters of national environmental significance that may occur in, or may relate to, the area you nominated. Further information is available in the detail part of the report, which can be accessed by scrolling or following the links below. If you are proposing to undertake an activity that may have a significant impact on one or more matters of national environmental significance then you should consider the Administrative Guidelines on Significance - see http://www.environment.gov.au/epbc/assessmentsapprovals/guidelines/index.html

World Heritage Properties:	None
National Heritage Places:	None
Wetlands of International	1
Great Barrier Reef Marine Park:	None
Commonwealth Marine Areas:	None
Threatened Ecological Communities:	4
Threatened Species:	19
Migratory Species:	10

Other Matters Protected by the EPBC Act

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

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

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

A permit may be required for activities in or on a Commonwealth area that may affect a member of a listed threatened species or ecological community, a member of a listed migratory species, whales and other cetaceans, or a member of a listed marine species. Information on EPBC Act permit requirements and application forms can be found at http://www.environment.gov.

Commonwealth Lands:	None
Commonwealth Heritage Places:	None
Listed Marine Species:	8
Whales and Other Cetaceans:	None
Critical Habitats:	None
Commonwealth Reserves:	None

Extra Information

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

Place on the RNE:	None
State and Territory Reserves:	None
Regional Forest Agreements:	None
Invasive Species:	8
Nationally Important Wetlands:	None

Details

Matters of National Environmental Significance

Wetlands of International Significance (RAMSAR) [Resource Information]

Name	Proximity
Narran lake nature reserve	Upstream from Ramsar

Threatened Ecological Communities [Resource Information]

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

Name	Status	Type of Presence
Brigalow (Acacia harpophylla dominant and co-	Endangered	Community known to

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

Name	Status	Type of Presence
dominant)		occur within area
Coolibah - Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	Endangered	Community may occur within area
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area

Threatened Species [Resource Information]

Name	Status	Type of Presence
BIRDS		
Erythrotriorchis radiatus		
Red Goshawk [942]	Vulnerable	Species or species habitat likely to occur within area
Geophaps scripta scripta		
Squatter Pigeon (southern) [64440]	Vulnerable	Species or species habitat likely to occur within area
Neochmia ruficauda ruficauda		
Star Finch (eastern), Star Finch (southern) [26027]	Endangered	Species or species habitat likely to occur within area
Rostratula australis		
Australian Painted Snipe [77037]	Vulnerable	Species or species habitat may occur within area
FISH		
Maccullochella peelii		
Murray Cod [66633]	Vulnerable	Species or species habitat may occur within area
MAMMALS		
Chalinolobus dwyeri		
Large-eared Pied Bat, Large Pied Bat [183]	Vulnerable	Species or species habitat may occur within area
Dasyurus hallucatus		
Northern Quoll [331]	Endangered	Species or species habitat may occur within area
Nyctophilus corbeni		
South-eastern Long-eared Bat [83395]	Vulnerable	Species or species habitat may occur within area
Phascolarctos cinereus (combined populations of Qld, NSW and the ACT)		
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) [85104]	Vulnerable	Species or species habitat may occur within area
PLANTS		
Cadellia pentastylis		
Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area
Commersonia argentea		
a shrub [82761]	Vulnerable	Species or species habitat likely to occur within area
Homopholis belsonii		
[2406]	Vulnerable	Species or species habitat may occur within area
Tylophora linearis		
[55231]	Endangered	Species or species habitat may occur within area
REPTILES		

Name	Status	Type of Presence
Delma torquata Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Denisonia maculata Ornamental Snake [1193]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa Yakka Skink [1420]	Vulnerable	Species or species habitat may occur within area
Furina dunmalli Dunmall's Snake [59254]	Vulnerable	Species or species habitat may occur within area
Paradelma orientalis Brigalow Scaly-foot [59134]	Vulnerable	Species or species habitat may occur within area
Rheodytes leukops Fitzroy River Turtle, Fitzroy Tortoise, Fitzroy Turtle [1761]	Vulnerable	Species or species habitat may occur within area

Migratory Species [Resource Information]

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

Name	Threatened	Type of Presence
Migratory Marine Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Migratory Terrestrial Species		
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Migratory Wetlands Species		
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Other Matters Protected by the EPBC Act

Listed Marine Species [Resource Information]

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

Name	Threatened	Type of Presence
Birds		
Apus pacificus Fork-tailed Swift [678]		Species or species habitat may occur within area
Ardea alba Great Egret, White Egret [59541]		Species or species habitat may occur within area
Ardea ibis Cattle Egret [59542]		Species or species habitat may occur within area
Gallinago hardwickii Latham's Snipe, Japanese Snipe [863]		Species or species habitat may occur within area
Haliaeetus leucogaster White-bellied Sea-Eagle [943]		Species or species habitat likely to occur within area
Hirundapus caudacutus White-throated Needletail [682]		Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Rostratula benghalensis (sensu lato) Painted Snipe [889]	Vulnerable*	Species or species habitat may occur within area

Extra Information

Invasive Species [Resource Information]

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

Name	Status	Type of Presence
Frogs		
Bufo marinus Cane Toad [1772]		Species or species habitat likely to occur within area
Mammals		
Felis catus Cat, House Cat, Domestic Cat [19]		Species or species

Name	Status	Type of Presence
		habitat likely to occur within area
Oryctolagus cuniculus Rabbit, European Rabbit [128]		Species or species habitat likely to occur within area
Sus scrofa Pig [6]		Species or species habitat likely to occur within area
Vulpes vulpes Red Fox, Fox [18]		Species or species habitat likely to occur within area
Plants		
Acacia nilotica subsp. indica Prickly Acacia [6196]		Species or species habitat may occur within area
Lantana camara Lantana, Common Lantana, Kamara Lantana, Large-leaf Lantana, Pink Flowered Lantana, Red Flowered Lantana, Red-Flowered Sage, White Sage, Wild Sage [10892]		Species or species habitat likely to occur within area
Parthenium hysterophorus Parthenium Weed, Bitter Weed, Carrot Grass, False Ragweed [19566]		Species or species habitat likely to occur within area

Coordinates

-26.2471 149.57553

Caveat

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

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

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

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

For species where the distributions are well known, maps are digitised from sources such as recovery plans and detailed habitat studies. Where appropriate, core breeding, foraging and roosting areas are indicated under 'type of presence'. For species whose distributions are less well known, point locations are collated from government wildlife authorities, museums, and non-government organisations; bioclimatic distribution models are generated and these validated by experts. In some cases, the distribution maps are based solely on expert knowledge.

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

- migratory and
- marine

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

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

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

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

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

Acknowledgements

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

-Department of Environment, Climate Change and Water, New South Wales
-Department of Sustainability and Environment, Victoria
-Department of Primary Industries, Parks, Water and Environment, Tasmania
-Department of Environment and Natural Resources, South Australia
-Parks and Wildlife Service NT, NT Dept of Natural Resources, Environment and the Arts
-Environmental and Resource Management, Queensland
-Department of Environment and Conservation, Western Australia
-Department of the Environment, Climate Change, Energy and Water
-Birds Australia
-Australian Bird and Bat Banding Scheme
-Australian National Wildlife Collection
-Natural history museums of Australia
-Museum Victoria
-Australian Museum
-SA Museum
-Queensland Museum
-Online Zoological Collections of Australian Museums
-Queensland Herbarium
-National Herbarium of NSW
-Royal Botanic Gardens and National Herbarium of Victoria
-Tasmanian Herbarium
-State Herbarium of South Australia
-Northern Territory Herbarium
-Western Australian Herbarium
-Australian National Herbarium, Atherton and Canberra
-University of New England
-Ocean Biogeographic Information System
-Australian Government, Department of Defence
-State Forests of NSW
-Other groups and individuals

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

Please feel free to provide feedback via the Contact Us page.

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9. Appendix D: Results from Wildlife Online Search

Queensland Government

Wildlife Online Extract

Search Criteria: Species List for a Specified Point
Species: All
Type: All
Status: Rare and threatened species
Records: All
Date: All
Latitude: 26.2473
Longitude: 149.5752
Distance: 25
Email: afreeman@thenewground.com.au
Date submitted: Wednesday 27 Jun 2012 14:33:11
Date extracted: Wednesday 27 Jun 2012 14:40:08

The number of records retrieved = 4

Disclaimer

As the DERM is still in a process of collating and vetting data, it is possible the information given is not complete. The information provided should only be used for the project for which it was requested and it should be appropriately acknowledged as being derived from Wildlife Online when it is used.

The State of Queensland does not invite reliance upon, nor accept responsibility for this information. Persons should satisfy themselves through independent means as to the accuracy and completeness of this information.

No statements, representations or warranties are made about the accuracy or completeness of this information. The State of Queensland disclaims all responsibility for this information and all liability (including without limitation, liability in negligence) for all expenses, losses, damages and costs you may incur as a result of the information being inaccurate or incomplete in any way for any reason.

Kingdom	Class	Family	Scientific Name	Common Name	I	Q	A	Records
animals	birds	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo		V		1
animals	mammals	Vespertilionidae	*Chalinolobus picatus*	little pied bat		NT		3
animals	reptiles	Boidae	*Aspidites ramsayi*	woma		NT		1
animals	reptiles	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko		NT		3

CODES

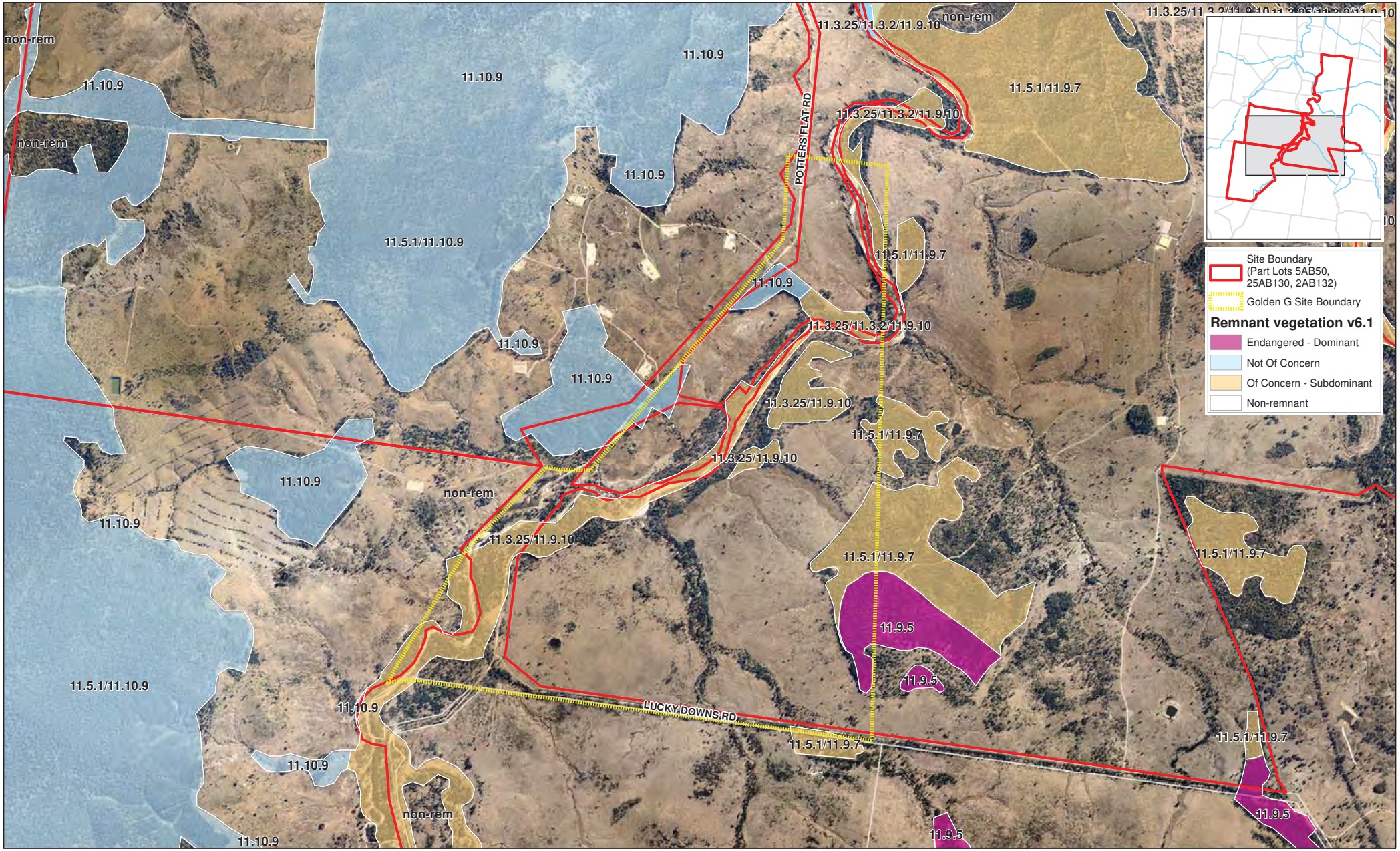
I - Y indicates that the taxon is introduced to Queensland and has naturalised.

Q - Indicates the Queensland conservation status of each taxon under the *Nature Conservation Act 1992.* The codes are Extinct in the Wild (PE), Endangered (E), Vulnerable (V), Near Threatened (NT), Least Concern (C) or Not Protected ( ).

A - Indicates the Australian conservation status of each taxon under the *Environment Protection and Biodiversity Conservation Act 1999.* The values of EPBC are Conservation Dependent (CD), Critically Endangered (CE), Endangered (E), Extinct (EX), Extinct in the Wild (XW) and Vulnerable (V).

Records – The first number indicates the total number of records of the taxon for the record option selected (i.e. All, Confirmed or Specimens).
This number is output as 99999 if it equals or exceeds this value. The second number located after the / indicates the number of specimen records for the taxon.
This number is output as 999 if it equals or exceeds this value.

10. Appendix E: DERM Regional Ecosystem Mapping for the Site



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origin

GIS Section - HSSE

APPENDIX E

DERM Regional Ecosystem Mapping

Date: 26/05/2012

State: Queensland
Project:
Permit: ATP606
Map No: 1 of 1
Map ID:
Doc ID: 1056-GOLDEN_G_APPENDIX_E_DERM_REGIONAL_ECO_120526

REVISIONS		
0	DERM REGIONAL ECOSYSTEM MAPPING	26/05/2012
REV	DESCRIPTION	DATE

	NAME	SIGNATURE
DRAWN	AV	
CHECK	BE	
QA		
APP		

N

Locations indicative and subject to change
Digital Cadastral Database © The State of Queensland (DERM) 2012.

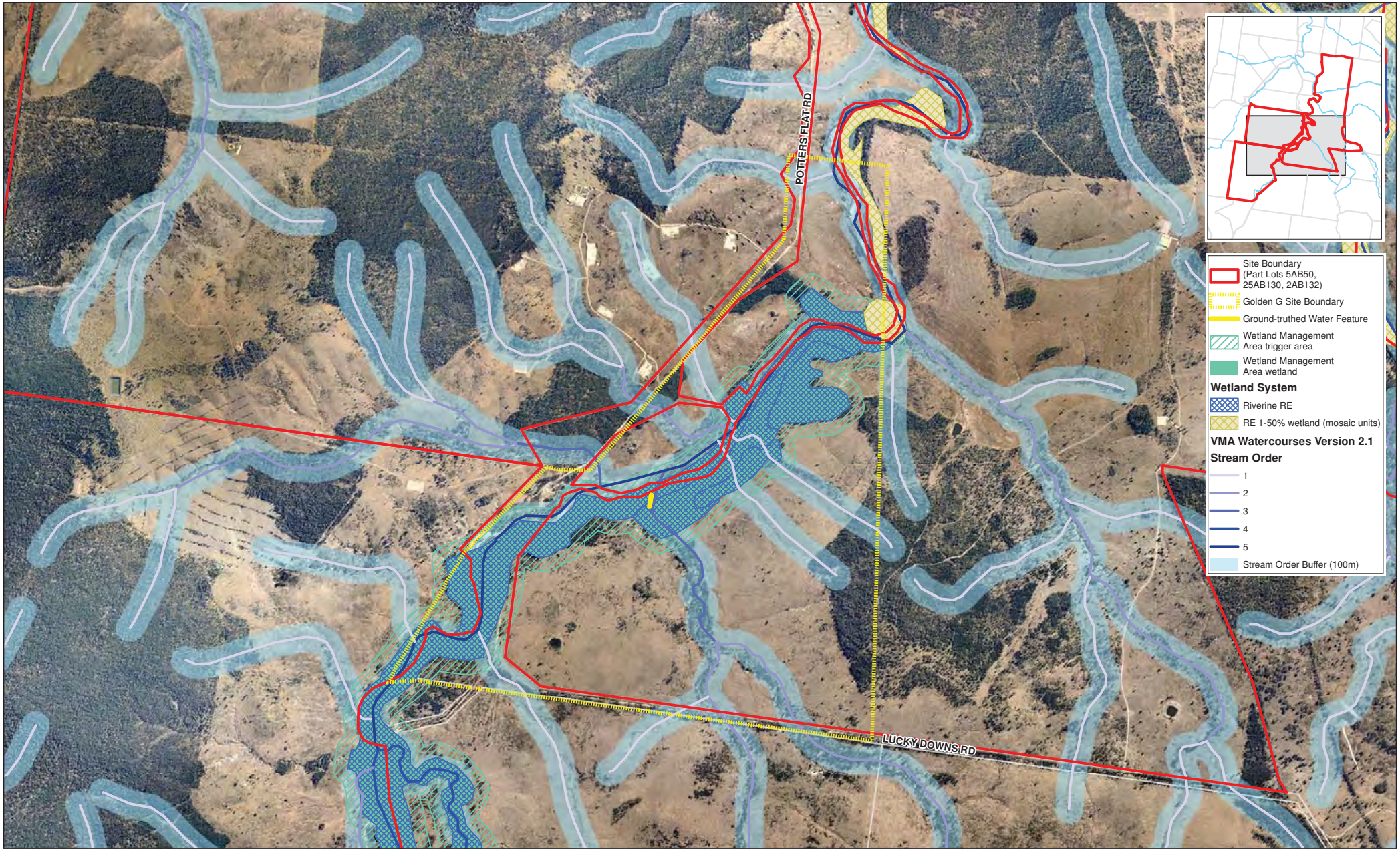
0 1,000 2,000
Metres

1:25,000 at A3

Projection: MGA94 Z55 Units: metres Scale 1:25,000 @ A3

GDA

11. Appendix F: Wetlands and Watercourses Map



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origin

GIS Section - HSSE

APPENDIX F

Wetlands and Watercourses Map

Date: 26/05/2012

State: Queensland
Project:
Permit: ATP606
Map No: 1 of 1
Map ID:
Doc ID: 1056-GOLDEN_G_APPENDIX_F_WETLANDS_AND_WATER_120526

REVISIONS		
0	DERM REGIONAL ECOSYSTEM MAPPING	26/05/2012
REV	DESCRIPTION	DATE

	NAME	SIGNATURE
DRAWN	AV	
CHECK	BE	
QA		
APP		

N

Locations indicative and subject to change
Digital Cadastral Database © The State of Queensland (DERM) 2012.

0 1,000 2,000
Metres

1:25,000 at A3

Projection: MGA94 Z55 Units: metres Scale 1:25,000 @ A3

GDA

12. Appendix G: Flora Species Recorded During Field Survey

APPENDIX G

Flora Species Recorded During Orogen Field Work

Scientific Name	Common Name
Abutilon sp.	lantern bush
Acacia blakei	Blake's wattle
Acacia decora	wattle
Acacia excelsa	ironwood
*Acacia farnesiana**	mimosa bush
Acacia harpophylla	Brigalow
Acacia implexa	lightwood
Acacia leiocalyx	black wattle
Acacia oswaldii	umbrella wattle
Acacia salicina	sally wattle
Acacia sp.	wattle
Acacia spectabilis	mudgee wattle
Acacia stenophylla	river myall
Achyranthes aspera	chaff flower
Allocasuarina luehmannii	bull oak
Alstonia constricta	quinine tree
Amyema sp.	mistletoe
Ancistrachne uncinulata	hooky grass
Angophora floribunda	rough-barked apple
*Argemone ochroleuca**	mexican poppy
Aristida caput-medusae	many-headed wiregrass
Aristida spp.	wiregrasses
Aristida personata	wiregrass
Asperula cunninghamii	twining woodruff
Auranticarpa rhombifolia	hollywood

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Scientific Name	Common Name
Austrostipa verticillata	slender bamboo grass
Bothriochloa bladhii	grass
Brachyachne convergens	spider grass
***Brachychiton rupestris*#**	**narrow-leaved bottle tree**
***Bryophyllum delagoense**[D]**	**mother of millions**
Callitris glaucophylla	white cypress pine
Calotis cuneifolia	purple burr daisy
Capparis loranthifolia	narrow-leaved bumble tree
Carissa ovata	currant bush
Casuarina cristata	belah
Cenchrus ciliaris (syn. *Pennisetum ciliare)**	buffel grass
Cenchrus spinifex (syn. *Cenchrus incertus*)*	spiny burrgrass
Cheilanthes distans	bristle cloak fern
*Chloris gayana**	rhodes grass
Chloris ventricosa	plump windmill grass
*Chloris virgata**	feathertop rhodes grass
Chrysocephalum apiculatum	yellow buttons
*Cirsium vulgare**	spear thistle
Citrus glauca	desert lime
***Cymbidium canaliculatum*#**	**tiger orchid**
Cymbopogon refractus	barbed-wire grass
Cynodon dactylon	couch
Cyperus spp.	sedges
Desmodium varians	slender tick-trefoil
Dianella sp.	blueflax lily
Digitaria sp.	grass
Dodonaea viscosa subsp. spatulata	hop bush
Einadia hastata	saltbush

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Scientific Name	Common Name
Austrostipa verticillata	slender bamboo grass
Bothriochloa bladhii	grass
Brachyachne convergens	spider grass
***Brachychiton rupestris*#**	**narrow-leaved bottle tree**
***Bryophyllum delagoense**[D]**	**mother of millions**
Callitris glaucophylla	white cypress pine
Calotis cuneifolia	purple burr daisy
Capparis loranthifolia	narrow-leaved bumble tree
Carissa ovata	currant bush
Casuarina cristata	belah
Cenchrus ciliaris (syn. *Pennisetum ciliare)**	buffel grass
Cenchrus spinifex (syn. *Cenchrus incertus*)*	spiny burrgrass
Cheilanthes distans	bristle cloak fern
*Chloris gayana**	rhodes grass
Chloris ventricosa	plump windmill grass
*Chloris virgata**	feathertop rhodes grass
Chrysocephalum apiculatum	yellow buttons
*Cirsium vulgare**	spear thistle
Citrus glauca	desert lime
***Cymbidium canaliculatum*#**	**tiger orchid**
Cymbopogon refractus	barbed-wire grass
Cynodon dactylon	couch
Cyperus spp.	sedges
Desmodium varians	slender tick-trefoil
Dianella sp.	blueflax lily
Digitaria sp.	grass
Dodonaea viscosa subsp. spatulata	hop bush
Einadia hastata	saltbush

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Scientific Name	Common Name
Einadia nutans	climbing saltbush
Elaeodendron australe	red olive berry
Eleocharis sp.	sedge
Enneapogon sp.	grass
Enteropogon ramosus	curly windmill grass
Enteropogon sp.	windmill grass
Entolasia stricta	wiry panic
Eragrostis brownii	brown's ovegrass
Eragrostis spp.	love grasses
Eremophila mitchellii	false sandalwood
Eremophila longifolia	emu bush
Eucalyptus camaldulensis	river red gum
Eucalyptus crebra	narrow-leaved ironbark
Eucalyptus melanophloia	silver-leaved ironbark
Eucalyptus populnea	poplar box
Eucalyptus tereticornis	Queensland blue gum
Fimbristylis sp.	sedge
Geijera parviflora	wilga
Glycine sp.	twiner
*Gomphocarpus physocarpus**	balloon cotton bush
Goodenia rotundifolia	herb
Heteropogon contortus	black speargrass
Imperata cylindrica	barb-wire grass
Jasminum sp.	vine
Juncus sp.	rush
*Lepidium bonariense**	herb
Lepidium sp.	herb
Lomandra longifolia	spikey mat rush

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Scientific Name	Common Name
Lomandra sp.	mat rush
Lotus australis	Australian trefoil
Maireana microphylla	small-leaf bluebush
Marsilea drummondii	nardoo
*Melinis repens**	red natal grass
Notelaea microcarpa	native olive
***Opuntia aurantiaca**[D]*	**tiger pear**
***Opuntia stricta**[D]*	**common prickly pear**
***Opuntia tomentosa**[D]*	**velvety tree pear**
Owenia acidula	emu apple
Pandorea pandorana	wonga vine
Panicum sp.	grass
Paspalidium sp.	grass
Paspalum sp.	grass
Perotis rara	comet grass
Petalostigma pubescens	Quinine bush
Phragmites australis	common reed
Podolepis jaceoides	showy copper-wire daisy
Podolepis sp.	herb
Pratia concolor	poison pratia
Psydrax oleifolium	myrtle tree
Sclerolaeana birchii	galvanised burr
Senecio sp.	herb
Sida sp.	herb
*Sida rhombifolia**	paddy's lucerne
Solanum esuriale	quena
*Solanum nigrum**	blackberry nightshade
Sporobolus caroli	fairy grass

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Scientific Name	Common Name
Sporobolus creber	slender rat's-tail grass
Sporobolis sp.	grass
Themeda triandra	kangaroo grass
Typha domingensis	narrow-leaved cumbungi
Urochloa sp.	grass
*Verbena aristigera**	Mayne's pest
*Verbena bonariense**	purpletop
Vittadinia sp.	herb
Wahlenbergia sp.	herb
Xerochrysum bracteatum	golden everlasting

Note: Table does not include a comprehensive list of pasture grassland species.

*** - Introduced species**
[D] – Declared plants under the Land Protection (Pest and Stock Route Management) Act 2002

 # - Type A restricted plants protected under the Nature Conservation Act 1992

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13. Appendix H: Fauna Species Recorded During Field Survey

APPENDIX H

Fauna Species Recorded During Orogen Field Work

	Scientific Name	Common Name
Amphibians		
	Rhinella marinus (formerly Bufo marinus)*	**Cane Toad**
Birds		
	Acanthagenys rufogularis	spiny-cheeked honeyeater
	Acanthiza pusilla	brown thornbill
	Aquila audax	wedge-tailed eagle
	Cacatua galerita	sulphur-crested cockatoo
	Calyptorhynchus funereus	yellow-tailed black-cockatoo
	Coracina novaehollandiae	black-faced cuckoo-shrike
	Corvus coronoides	australian raven
	Cracticus nigrogularis	pied butcherbird
	Cracticus tibicen	Australian magpie
	Cracticus torquatus	grey butcherbird
	Eolophus roseicapillus	galah
	Eurystomus orientalis	dollarbird
	Falco cenchroides	nankeen kestrel
	Geopelia humeralis	bar-shouldered dove
	Gerygone albogularis	white-throated gerygone
	Gerygone fusca	western gerygone
	Grallina cyanoleuca	magpie-lark
	Haliastur sphenurus	whistling kite
	Hirundo neoxena	welcome swallow
	Malurus lamberti	variegated fairy-wren
	Manorina melanocephala	noisy miner
	Meliphaga lewinii	Lewin's honeyeater
	***Merops ornatus**[#]*	**rainbow bee-eater**

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	Scientific Name	Common Name
	Pachycephala pectoralis	golden whistler
	Pachycephala rufiventris	rufous whistler
	Phalacrocorax sulcirostris	little black cormorant
	Phaps chalcoptera	common bronzewing
	Philemon citreogularis	little friarbird
	Pomatostomus temporalis	grey-crowned babbler
	Rhipidura leucophrys	willie wagtail
	Scythrops novaehollandiae	channel-billed cuckoo
	Smicrornis brevirostris	weebill
	Strepera graculina	pied currawong
	Struthidea cinerea	apostlebird
	Todiramphus sanctus	sacred kingfisher
	Vanellus miles	masked lapwing
Crustaceans		
	Cherax sp.	freshwater crayfish
Mammals		
	Canis familiaris dingo	dingo
	Lepus capensis*	**European hare**
	Macropus giganteus	eastern grey kangaroo
	***Vulpes vulpes**[D]*	**European fox**
Reptiles		
	Ctenotus robustus	eastern striped-skink
	Gehyra dubia	dubious dtella
	Heteronotia binoei	Bynoe's gecko

Note: Table does not include a comprehensive list of common fauna species.
#- protected under Environmental Protection and Biodiversity Conservation Act 1999
^- protected under Qld Nature Conservation Act 2000
*** - Introduced species**
[D] – Declared animals under the *Land Protection (Pest and Stock Route Management) Act 2002*

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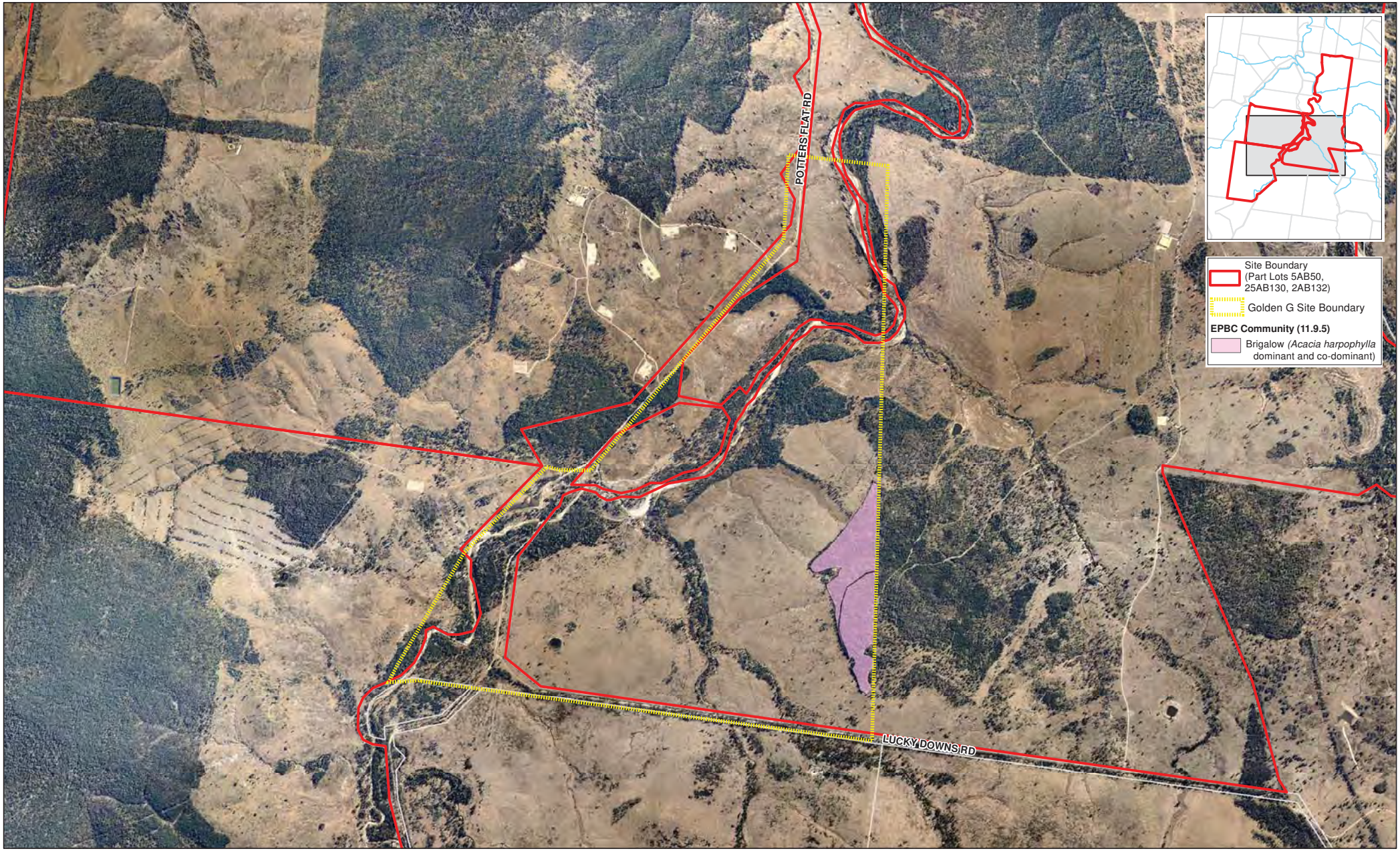
14. Appendix I: EPBC Vegetation Communities Identified on the Site



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APPENDIX I

EPBC Act Vegetation Communities Identified on Site

Date: 26/05/2012

State: Queensland
Project:
Permit: ATP606
Map No: 1 of 1
Map ID:
Doc ID: 1056-GOLDEN_G_APPENDIX_I_EPBC_ACT_VEGETATION_120526

REVISIONS		
0	EPBC ACT VEGETATION COMMUNITIES	26/05/2012
REV	DESCRIPTION	DATE

	NAME	SIGNATURE
DRAWN	AV	
CHECK	BE	
QA		
APP		

N

Locations indicative and subject to change
Digital Cadastral Database © The State of Queensland (DERM) 2012.

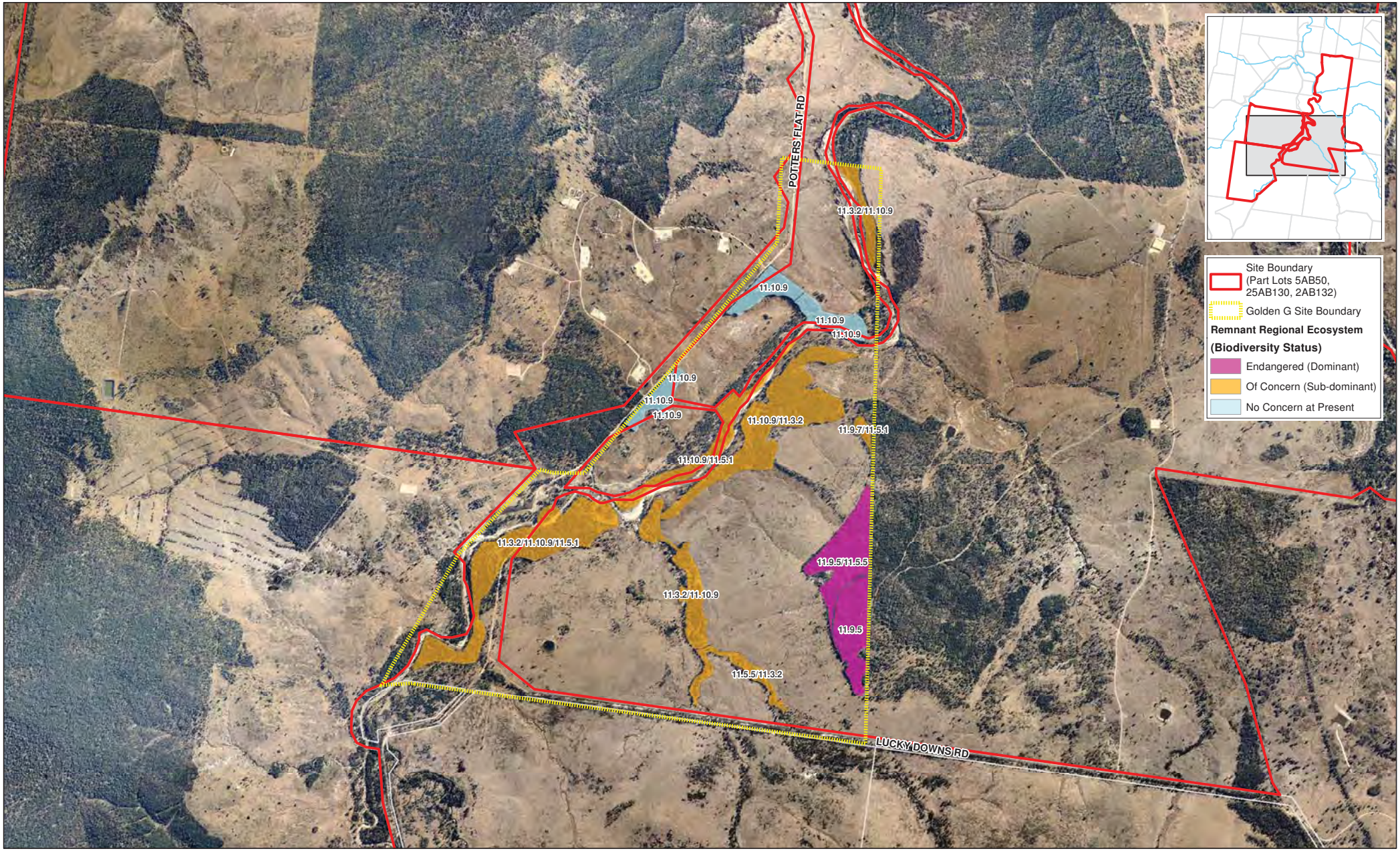
0 1,000 2,000
Metres

1:25,000 at A3

Projection: MGA94 Z55 Units: metres Scale 1:25,000 @ A3

GDA

15. Appendix J: Ground-truthed Remnant Regional Ecosystems



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APPENDIX J

Ground-truthed Remnant Regional Ecosystems Map

Date: 28/05/2012

State: Queensland
Project:
Permit: ATP606
Map No: 1 of 1
Map ID:
Doc ID: 1056-GOLDEN_G_APPENDIX_J_GROUND-TRUTHED-VEG_120528

REVISIONS		
0	EPBC ACT VEGETATION COMMUNITIES	28/05/2012
REV	DESCRIPTION	DATE

	NAME	SIGNATURE
DRAWN	AV	
CHECK	BE	
QA		
APP		

N

Locations indicative and subject to change
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0 1,000 2,000
Metres

1:25,000 at A3

Projection: MGA94 Z55 Units: metres Scale 1:25,000 @ A3

GDA