REPORT

Ecology Assessment Report

Q-4130-15-RP-0001

Australia Pacific LNG Upstream Phase 1

Lot 9 BWR38 and Lot 10 ROG3411

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1. Introduction

Orogen QLD Pty Ltd (Orogen) has been commissioned by Origin Energy Resources Limited (the client/Origin) to prepare an Ecology Assessment Report (EAR) pertaining to the investigation of ecological values within a defined area (study area) of Lot 10 on ROG3411 ('Lot 10'). This study is in relation to proposed underboring of the Condamine River (**Appendix A**). The report presents the ecological values noted within the study area and provides impact mitigation recommendations. The intent of this report is to provide the client with ecological data for consideration in detailed project planning.

Orogen was approved by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (SEWPAC) on 28 June 2011 for the purpose of undertaking ecological assessment works for the Australia Pacific Liquefied Natural Gas (APLNG) Project ('the Project').

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2. Site Context

2.1 Background

This EAR has been prepared in consideration of the proposed development of a water pipeline under the Condamine River. The purpose of the pipeline will be to transport produced water resulting from APLNG's coal seam gas activities. The water is to be transported from the 'Talinga' site (south of Condamine River) (incorporating Lot 10) and used for irrigation purposes on the 'Monreagh' property located north of Condamine River (incorporating Lot 9 on BWR38, 'Lot 9'). This EAR specifically relates to an assessment of ecological values within a defined study area within Lot 10 only. It is noted that Monreagh property (including Lot 9) was assessed through ecological surveys undertaken in May and June 2011 by Orogen (Orogen, 2011). It was found that the area adjacent to the Condamine River riparian zone is disturbed grazing/cropping land. As such, this report does not reiterate detail pertaining to the surrounds of potential infrastructure locations within Lot 9.

The ecological field data presented in this report was collected through a targeted ecological survey within the defined study area (refer **Appendix A** and at finer scale **Appendix B)**. The assessment focused on determining ecological values within the study area to assist in guiding development planning with respect to infrastructure placement.

2.2 Setting

The study area associated with the proposed underboring works is approximately 1000 m^2 in area. It is located approximately 35 km west-southwest of Chinchilla in the Surat Basin in the Queensland Western Downs region and Brigalow Belt bioregion (EPA, 2000) in central eastern Queensland (**Appendix A**).

Land use within the study area consists of forested areas, small wetland areas and cleared agricultural/grazing land containing areas of regrowth and sparsely scattered trees.

2.2.1 *Topography*

The topography of the study area is virtually flat across its entirety. Drainage is conveyed to the western boundary via three 1st order streams and a 2nd order stream within the study area into the Condamine River. The Condamine River forms the northern boundary to Lot 10 and the south-east boundary of the Lot 9 portion of the site (Monreagh property). Elevations within the Site are between approximately 290 m and 310 m AHD (DME, 1975).

Queensland geological mapping (DME, 2008) shows the geology of the study area to consist of:

- Qa - Qa-NSB – Quaternary - Clay, silt sand, gravel; flood plain alluvium - in the northern area of the Site; and
- Tc - Chinchilla Sand – Tertiary - Fluviatile labile sand grading into granule conglomerate and sandy clay, some pebbles - in the southern area of the Site.

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2.2.2 *Land Zones*

The Department of Environment and Resource Management (DERM) regional ecosystem (RE) mapping depicts land zones 3 and 4 as occurring in close proximity to the Site (DERM, 2011a).

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. Also includes estuarine plains currently under fresh water influence, inland lakes and associated dune systems (lunettes). Excludes talus slopes, colluvial deposits and pediments. Includes a diverse range of soils, predominantly Vertosols and Sodosols, also with Hydrosols in higher rainfall areas."

Land zone 4 is described as "Cainozoic clay deposits, usually forming level to gently undulating plains above current alluvial systems. Excludes clay plains and downs formed in-situ on bedrock. Mainly Vertosols with gilgai microrelief, but includes small areas of thin sandy or loamy surfaced Sodosols and Chromosols." (DERM, 2011b).

2.2.3 *Climate*

Climate statistics (BOM, 2011) for the nearest weather station of Miles Post Office (stn 042023) are:

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

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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).
- *Environmental Protection Biodiversity and Conservation Act 1999* (EPBC Act) protected matters search tool (SEWPAC, 2011a).
- Regional ecosystem version 6.1 digital GIS layer (DERM, 2011a).
- Wildlife Online database (DERM, 2011c).
- Wetland*Maps* (DERM, 2011d).
- Aerial photography interpretation (API).
- Origin supplied constraints/context mapping (e.g. soils, geology, waterways/wetlands, slope).
- Further literature sources as cited in the references section of this report.

The flora and fauna desktop searches were conducted according to the following search areas:

  - EPBC Act protected matters search tool using a 10 km search radius from the approximate centre of the study area.
  - *Nature Conservation Act 1992* (NC Act) wildlife online database using a 25 km search radius from the approximate centre of the study area.

A targeted literature review was conducted for matters of ecological significance relevant to the study area, including threatened species and threatened ecological community profiles. This review provided guidance to Orogen ecologists in field survey design, interpretation of data and the formulation of recommendations.

3.2 Field Survey

Scouting 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* (Neldner *et al.,* 2005).

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The field surveys for this report were undertaken by Orogen ecologists on 21 October 2011 to assess the ecological values of the study area located within Lot 10 for the purpose of infrastructure placement planning.

3.2.1 *Vegetation Community Survey*

General baseline botanical surveys were undertaken to describe dominant flora and vegetation community structure throughout the survey 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).

As a general rule, the vegetation community surveys conducted at survey sites 1 – 4 (**Appendix B**) were undertaken within 50 m x 10 m plots for the purpose of typifying the ecotype under assessment. Vegetation community data was entered into the data fields provided by the Trimble data capture system.

Representative photo(s) were taken via the Trimble unit. Photo aspect data was entered into the relevant data sheet within the Trimble. Vegetation community polygons were confirmed, mapped and identified in accordance with Queensland RE (biodiversity status) and general EPBC Act threatened ecological community criteria.

3.2.2 *Habitat Survey*

Habitat surveys were undertaken in conjunction with each vegetation community survey within the 50 m x 10 m quadrat at survey sites 1 – 4 (**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 data sheet. Where deemed appropriate, representative photo(s) were taken of the given habitat patch via the Trimble unit. Photo aspect data is entered into the relevant data sheet within the Trimble unit.

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 the vicinity of a vegetation structure survey/habitat survey plots described above. Searches were undertaken for one person hour per plot location. Searches of habitat features were not necessarily confined to within the vegetation community area/habitat feature quadrat. To account for the full hour allocated, the search area extended beyond but within the proximity of the survey plot.

In addition and at the field team leader's (a senior ecologist) discretion, opportunistic threatened species searches were undertaken while traversing the study area. Target species were determined according to the nature of the ecotype observed.

It is noted that any flora specimens deemed as potential threatened species and not conclusively identified by the Orogen ecologists were forwarded to the Queensland herbarium for conclusive identification.

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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*, were recorded via the respective Trimble 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 study area. Pest flora species, if observed within a vegetation structure point survey plot, were recorded on vegetation structure point data sheets within the Trimble. Likewise, the occurrence of pest fauna was also recorded on the appropriate data sheet within the Trimble.

3.2.5 *Disturbance Survey*

Evidence of disturbance at each vegetation community/habitat feature plot was recorded for type, severity and estimated time of most recent occurrence.

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.
- Restricted spatial area of the habitats within the study area.

The surveys undertaken may not provide a true indication of seasonal habitat utilisation by fauna species within the study area 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, such as reptiles, 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 was applied in determining a number of threatened species potentially utilising the habitats within the study area.

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4. Results and Discussion

This section includes the results of 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 study area are provided below for ecological matters of international, national and state significance. Data sources used in desktop searches over the Site are listed in **Section 3.1**. A more detailed description regarding potential occurrences and respective values of the study area is provided in **Section 4.2**.

4.1.1 *Matters of National Environmental Significance (MNES)*

Tables 1-7 below summarise the results of an online search using the EPBC Act protected matters search tool. It is noted that not every MNES or other matters listed by the search results specifically relates 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**.

EPBC Act Listed Threatened Ecological Communities

Table 1 - EPBC Act protected matters search tool results for threatened ecological communities predicted to occur at the study area

Name	Status*
Brigalow (*Acacia harpophylla* dominant and co-dominant).	E
Coolibah – Black Box Woodlands of the Darling Riverine Plains and the Brigalow Belt South Bioregions	E
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	CE
Weeping Myall Woodlands	E
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	CE

*Status under EPBC Act 1999: CE = Critically Endangered; E = Endangered

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EPBC Act Listed Flora

Table 2 - EPBC Act protected matters search tool results for listed flora species predicted to occur at the study area

Scientific Name	Common Name	Status*
Acacia wardellii	A wattle	V
Cadellia pentastylis	Ooline	V
Homopholis belsonii	Belson's Panic	V
Westringia parvifolia	A shrub	V

*Status under EPBC Act 1999: V = Vulnerable

EPBC Act Listed Fauna

Table 3 - EPBC Act protected matters search tool results for listed fauna species predicted to occur at the study area

Class	Scientific Name	Common Name	Status*
Birds	*Erythrotriorchis radiatus*	Red Goshawk	V
	Geophaps scripta scripta	Squatter Pigeon (southern)	V
	Lathamus discolor	Swift Parrot	E
	Neochmia ruficauda ruficauda	Star Finch	E
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat*.)	Australian Painted Snipe	V
Fish	*Maccullochella peelii peelii*	Murray Cod	V
Mammals	*Chalinolobus dwyeri*	Large-eared Pied Bat	V
	Nyctophilus timoriensis (South-eastern form)	Eastern Long-eared Bat	V
Reptiles	*Anomalopus mackayi*	Five-clawed Worm-skink	V
	Delma torquata	Collared Delma	V

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Class	Scientific Name	Common Name	Status*
	Egernia rugosa	Yakka Skink	V
	Furina dunmalli	Dunmall's Snake	V
	Paradelma orientalis	Brigalow Scaly-foot	V

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

EPBC Act Migratory Species

Table 4 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 4 - EPBC Act protected matters search tool results for listed migratory species predicted to occur at the study area

Group	Scientific Name	Common Name
Migratory Marine Birds	*Apus pacificus*	Fork-tailed Swift
	Ardea alba	Great Egret
	Ardea ibis	Cattle Egret
Migratory Terrestrial Species	*Haliaeetus leucogaster*	White-bellied Sea-Eagle
	Hirundapus caudacutus	White-throated Needletail
	Merops ornatus	Rainbow Bee-eater
Migratory Wetland Species	*Ardea alba*	Great Egret
	Ardea ibis	Cattle Egret
	Gallinago hardwickii	Latham's Snipe
	Nettapus coromandelianus albipennis	Australian Cotton Pygmy-goose
	Rostratula australis	Australian Painted Snipe

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Wetlands of International Significance – Ramsar Wetlands

One (1) wetland of international significance (Ramsar Wetlands) was identified through the EPBC Act protected matters search for the area in the proximity of the survey area – Narran Lake Nature Reserve - which is located over 400 km south of the Site.

4.1.2 *Other Matters*

EPBC Act Listed Marine Species

Table 5 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 5 - EPBC Act protected matters search tool results for listed marine species predicted to occur at the study area

Class	Scientific Name	Common Name
Birds	*Anseranas semipalmata*	Magpie Goose
	Apus pacificus	Fork-tailed Swift
	Ardea alba	Great Egret
	Ardea ibis	Cattle Egret
	Gallinago hardwickii	Latham's Snipe
	Haliaeetus leucogaster	White-bellied Sea-Eagle
	Hirundapus caudacutus	White-throated Needletail
	Lathamus discolor	Swift Parrot
	Merops ornatus	Rainbow Bee-eater
	Nettapus coromandelianus albipennis	Australian Cotton Pygmy-goose
	Rostratula benghalensis s. lat.	Painted Snipe

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4.1.3 *Extra Information*

EPBC Act Listed 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 6** 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'.*

Table 6 - EPBC Act protected matters search tool results for invasive flora species predicted to occur at the study area

Scientific Name	Common Name
*Hymenachne amplexicaulis**	Hymenachne
Lycium ferocissimum	African Boxthorn
*Parkinsonia aculeata**	Parkinsonia
*Parthenium hysterophorus**	Parthenium Weed
Pinus radiata	Radiata Pine
*Salvinia molesta**	Salvinia

* Weed of National Significance

The Invasive fauna species identified from the EPBC protected matters search tool are listed in **Table 7**.

Table 7 - EPBC protected matters search tool results for invasive fauna species predicted to occur at the study area

Scientific Name	Common Name
*Rhinella marinus (*formerly *Bufo marinus)*	Cane Toad
Felis catus	Domestic Cat
Oryctolagus cuniculus	European Rabbit
Sus scrofa	Feral Pig
Vulpes vulpes	Red Fox

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4.1.4 *Nature Conservation Act*

Provided below is a summary of the results of a desktop search obtained from the wildlife online database for flora and fauna recorded within a 25 km radius of the Site that is protected as threatened under the NC Act and listed by the NC Reg (**Appendix D**).

NC Act Listed Flora

Table 8 - Wildlife online search tool results for flora

Scientific Name	Common Name	Status*
Acacia tenuinervis	Scrub Wattle	NT
Acacia wardellii	Wardell's Wattle	V
Gonocarpus urceolatus	A herb	V
Rutidosis lanata	A herb	E

*Status under NC Act 1992: E = Endangered; V = Vulnerable; NT = Near Threatened

NC Act Listed Fauna

Table 9 - Wildlife online search tool results for fauna

Class	Scientific Name	Common Name	Status*
Amphibians	*Cyclorana verrucosa*	Rough Collared Frog	NT
Birds	*Accipiter novaehollandiae*	Grey Goshawk	NT
	Calyptorhynchus lathami	Glossy Black-Cockatoo	V
	Ephippiorhynchus asiaticus	Black-necked Stork	NT
	Grantiella picta	Painted Honeyeater	NT
	Lathamus discolor	Swift Parrot	E
	Lophoictinia isura	Square-tailed Kite	NT
	Melithreptus gularis	Black-chinned Honeyeater	NT
	Neophema pulchella	Turquoise Parrot	NT

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	Psephotus pulcherrimus	Paradise Parrot	PE
Mammals	*Chalinolobus picatus*	Little Pied Bat	NT
	Nyctophilus corbeni	Eastern Long-eared Bat	V
Reptiles	*Aspidites ramsayi*	Woma	NT
	Egernia rugosa	Yakka Skink	V
	Hemiaspis damelii	Grey Snake	E
	Paradelma orientalis	Brigalow Scaly Foot	V
	Strophurus taenicauda	Golden-tailed Gecko	NT

*Status under NC Act 1992: PE = Extinct in the Wild; E = Endangered; V = Vulnerable; NT = Near Threatened

4.1.5 *Environmentally Sensitive Areas*

A search of DERM's environmentally sensitive areas (ESA) mapping (DERM, 2011f) was undertaken to identify ESAs (pertinent to chapter 5A activities defined by the *Environmental Protection Act 1994* (EP Act) mapped over the Site. It was determined that the Site hosts category B ESAs (endangered remnant REs) and category C ESAs (of concern REs).

In summary, of concern RE 11.3.25/11.3.4/11.3.3 (80/10/10) is associated with the alluvial riparian zone of the Condamine River in the vicinity of the site, while endangered RE 11.4.12 is mapped as being adjacent to the of concern RE on Lot 10 (**Appendix E**).

It is noted that the proposed petroleum and gas activities of the project (as defined and controlled under the *Petroleum and Gas (Production and Safety) Act 2004* and 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 the remnant vegetation.

The individual component REs mapped by DERM as occurring on/adjacent to the subject site (**Appendix E**) are described below in **Tables 10** and **11**.

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Category B ESAs (Endangered Regional Ecosystems)

Table 10 - Endangered regional ecosystems mapped over the study area

RE code	General Description	Description
11.4.12	*Eucalyptus populnea* woodland on Cainozoic clay plains.	*Eucalyptus populnea* is predominant, forming a distinct but discontinuous canopy (12-19m high). Scattered *Eucalyptus spp.* may be present at some sites, but most frequently *E. populnea* alone forms the canopy. Scattered trees such as *Callitris glaucophylla* and *Acacia excelsa* may also be present and occasionally form a distinct low tree layer (8-10m high) There is generally a low tree/tall shrub layer (4-8m high) dominated by *Eremophila mitchellii*, *Acacia pendula* and *Geijera parviflora*. A low shrub layer may occur, particularly on upper slopes. The ground layer is generally open but may be moderately dense in disturbed areas. The perennial grasses *Aristida spp.* and *Eragrostis spp.* are usually dominant, and forbs are conspicuous. Occurs on eroding edge of Tertiary clay plains.

Table Notes –

- Table refers to the biodiversity status of a given RE type
- Descriptions are from regional ecosystem description database (REDD) (DERM, 2011f).

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Category C ESAs (Of Concern Regional Ecosystems)

Table 11 - Of concern regional ecosystems mapped over the study area

RE code	General Description	Description
11.3.3	*Eucalyptus coolabah* woodland on alluvial plains	*Eucalyptus coolabah* woodland to open-woodland with a grassy understorey. A mid layer is often absent but scattered tree or shrub species, such as *E. populnea*, *Melaleuca bracteata*, *Alectryon oleifolius*, *Terminalia oblongata* (in the north) and *Acacia pendula*, *A. cambagei*, and occasionally *Muehlenbeckia florulenta* may be present. The ground layer is dominated by a range of grass and forb species depending on season, soil and management conditions. Can include small areas of grassland with scattered trees. Occurs on Cainozoic alluvial plains or levees with clay or sometimes texture contrast soils.
11.3.4	*Eucalyptus tereticornis* and/or *Eucalyptus spp.* tall woodland on alluvial plains	*Eucalyptus tereticornis* woodland to open-forest. Other tree species that may be present and locally dominant include *E. camaldulensis*, *Corymbia tessellaris*, *E. coolabah*, *C. clarksoniana*, *E. populnea* or *E. brownii*, *E. melanophloia*, *E. platyphylla* or *Angophora floribunda*. *E. crebra* and *Lophostemon suaveolens* may be locally dominant (subregion 14). A shrub layer is usually absent, and a tall grassy ground layer is often prominent, and may include any of *Bothriochloa bladhii* subsp. *bladhii*, *Aristida spp.*, *Heteropogon contortus*, *Dichanthium spp.* and *Themeda triandra*. Heavily grazed areas tend to have shorter or annual grasses such as *Dactyloctenium radulans* or *Bothriochloa spp.* Occurs on Cainozoic alluvial plains and terraces. Occurs on variety of soils, including deep cracking clays, medium to fine textured soils, and deep texture-contrast soils.
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.

Table Notes –

- Table refers to the biodiversity status of a given RE type
- Descriptions are from regional ecosystem description database (REDD) (DERM, 2011f).

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4.1.6 *Wetlands and Watercourses*

A review of results obtained online from DERM's RE mapping (DERM, 2011a), Wetland*Maps* (DERM, 2011d) and referable wetlands mapping (DERM, 2011g) was undertaken to identify wetland and watercourse designations relevant to the Site. The results are summarised in **Table 12**. Desktop wetland and watercourse mapping for the study area is presented in **Appendix F**.

Table 12 – Summary of wetland and watercourse mapping for the study area

Identified Wetlands and Watercourses	Mapped Occurrence
Watercourses	Review of the results of an online search of RE mapping (DERM, 2011d) showed three 1st order and one 2nd order stream occur on the Site. The Condamine River (8th order stream) occurs along the northern boundary of the study area.
Wetlands	Wetland*Maps* (DERM, 2011d) concurs with the results of RE mapping above for streams. Wetland*Maps* also shows and area of Palustrine System and a polygon associated with a Riverine System Drainage Line in the north of the study area.
Referable Wetlands	No Referable Wetlands or associated trigger areas occur on the Site (DERM, 2011g).

4.2 Field Survey

The field surveys were conducted by two ecologists on 21 October 2011 to assess the ecological values within the surrounds of potential drill pad sites on Lot 10 for the purpose of infrastructure placement planning (**Appendix B**).

The results of site surveys have been summarised below. The field survey results present the outcome of study area-level investigation of the study area's desktop designations as described in **Section 4.1**.

4.2.1 *Matters of National Environmental Significance* (MNES)

MNES are defined under the EPBC Act and include threatened ecological communities, threatened species (flora and fauna), migratory and marine species, and invasive species (flora and fauna). Field survey results concerning MNES are provided below.

EPBC Act Listed Threatened Ecological Communities

The field surveys did not detect the presence of any threatened ecological communities listed under the EPBC Act and identified by the desktop searches in **Section 4.1.1**, **Table 1** above. Given the relatively small size of the study area and ease of access throughout, it is considered unlikely that any threatened ecological community would be detected subsequent to the current surveying effort.

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EPBC Act Listed Flora

No EPBC Act listed threatened flora species were recorded during field survey. EPBC Act listed flora species considered to potentially occur within the Site and a brief discussion on the perceived habitat value of the subject site are provided below in **Table 13**. A cumulative list of flora detected during the survey is provided in **Appendix G.**

Recommendations including mitigation of potential impacts to these species are discussed in **Section 5.**

Table 13 - EPBC Act listed flora species recorded or likelihood of occurring on the study area

Scientific Name	Common Name	Status*	Likelihood of Occurrence
Acacia wardellii	A wattle	V	Potentially occurring. This species has been noted to occur in areas of disturbance; in particular abundance is often greatest within areas subject to historic disturbance. (SEWPAC, 2011b). Given the disturbed nature of the study area and occurrence of the species in wider locality of the study area it is possible that this species might be recruited to the study area. **Moderate value to species.**
Cadellia pentastylis	Ooline	V	Potentially occurring. The study area was not found to support the core habitat requirements for this species, which are typically dry rainforest, semi-evergreen vine thickets and sclerophyll ecological communities (SEWPAC, 2011b). Nonetheless, dispersal from such habitats within the wider landscape to the study area is possible through actions such as flood or bird dispersal is possible. It is not expected that the Site will offer core habitat requirements for the establishment of extensive populations of this species. **Low value to species.**
Homopholis belsonii	Belson's Panic	V	Potentially occurring. The species has been associated with a variety of habitat values including "flat to gently undulating alluvial areas" (SEWPAC, 2011b) and species that occur on the study area. However, agricultural activities are considered a threat to persistence of the species. **Low to moderate value to species.**

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Scientific Name	Common Name	Status*	Likelihood of Occurrence
Westringia parvifolia	A shrub	V	Unlikely to occur. The study area isn't near the only known population of the species. The study area doesn't support associated species. The main threat to the species is broad-scale vegetation clearing and increase fragmentation and loss of remnants (SEWPAC, 2011b). **Low value to species.**

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

EPBC Act Listed Fauna

No EPBC Act listed threatened fauna species were recorded during field survey. EPBC listed species considered to potentially occur within the study area and a brief discussion on the perceived habitat value of the study area are provided below in **Table 14**. Recommendations including mitigation of potential impacts to these fauna species are discussed in more detail in **Section 5.**

Table 14 - EPBC Act listed fauna species recorded or likelihood of occurring on the study area

Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
Birds	*Erythrotriorchis radiatus*	Red Goshawk	V	Potentially occurring. Sparse in distribution, this species known to utilise open forest and woodland especially in proximity to rivers, wetlands and rainforest fringes (Pizzey and Knight, 1997). The Site represents a small area of potential habitat for the species relative to the species' large foraging range and mobility. **Low to moderate value to species.**
	Geophaps scripta scripta	Squatter Pigeon (southern)	V	Potentially occurring. The species prefers habitat including "grassy woodlands and plains or sand flats associated with riverine and wetland areas" (DECC, 2008). The Site represents only very limited potential habitat in association with its wetland areas and its proximity to riverine areas relative to the species' large foraging range and mobility. **Low value to species.**

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Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
	Lathamus discolor	Swift Parrot	E	Potentially occurring. Preferred foraging habit on the study area for the species includes wet sclerophyll (SEWPAC, 2011b). However, the study area represents only a small area of habitat relative to the species' large foraging range and mobility. **Low value to species.**
	Neochmia ruficauda ruficauda	Star Finch	E	Potentially occurring. Wetland areas and the proximity to riverine environments represent preferred habitat values for this species (SEWPAC, 2011b). However, the study area represents only a small area of habitat relative to the species' large foraging range and mobility. **Low to moderate value to species.**
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat*.)	Australian Painted Snipe	V	Potentially occurring. Wetland areas and the proximity to riverine environments represent habitat values for this species (SEWPAC, 2011b). However, the study area lacks the substantial wetlands preferred by this species and therefore represents only a small area of habitat relative to the species' large foraging range and mobility. **Low value to species.**
Fish	*Maccullochella peelii peelii*	Murray Cod	V	Does not occur. The study area does not support the riverine environment required for this species. **Low value to species.**
Mammals	*Chalinolobus dwyeri*	Large-eared Pied Bat	V	Potentially occurring. The study area lacks the geological substrates required by the species for roosting and nursing (SEWPAC, 2011b). Given the mobility of the species, the Site may provide limited foraging within forested areas. **Low value to species.**

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Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
	Nyctophilus timoriensis (South-eastern form)	Eastern Long-eared Bat	V	Potentially occurring. Sclerophyll forest on the study area provides limited foraging for the species but lack the condition representative higher quality habitat (DECC, 2008b). **Low value to species.**
Reptiles	*Anomalopus mackayi*	Five-clawed Worm-skink	V	Potentially occurring. The study area provides some of the preferred habitat values known to be preferred by the species (SEWPAC, 2011b), including forested and sparsely treed areas of higher moisture. However, the study area appears to lack the additional habitat of deeply cracking soils strongly associated with the species. **Low value to species.**
	Delma torquata	Collared Delma	V	Unlikely to occur. The study area does not host preferred habitat values for this species such as rocky hillsides, open eucalypt forest, acacia woodland or semi-evergreen vine thicket (DEWHA, 2009). The species has limited mobility to traverse the study area between any such areas of habitat in the vicinity. **Low value to species.**
	Egernia rugosa	Yakka Skink	V	Unlikely to occur. The study area lacks the dry forest types and associated habitat values and lack of inundation preferred by the species (SEWPAC, 2011b). The limited mobility of the species means it is unlikely to traverse the study area between areas of suitable habitat in the locality. **Low value to species.**

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Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
	Furina dunmalli	Dunmall's Snake	V	Unlikely to occur. The study area lacks the dry vegetation types and associated habitat values preferred by the species (SEWPAC, 2011b). Areas in close proximity to the Site "on clay loam soils" (DEWHA, 2009) represents potential habitat for this species creating the potential for the species to traverse the Site. **Low value to species.**
	Paradelma orientalis	Brigalow Scaly-foot	V	Potentially occurring. The species has been found within a wide variety of remnant, non-remnant and highly disturbed vegetation types (SEWPAC, 2011b). Some of these habitat values occur on the Site. However, the study area only represents a small area relative to the species range and variety of potential habitats. **Low to moderate value to species.**

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

EPBC Act Listed Migratory Species

No migratory species listed under the EPBC Act were recorded during field survey.

Notwithstanding, the study area is considered to support potentially suitable habitat resources for some migratory species identified by the protected matters search tool. However, the habitats present within the study area are likely to comprise only a very small component of any migratory species range. Further, the study area does not contain intertidal or oceanic habitats and do not contain any substantial wetlands. Overall, the study area is highly unlikely to contain an 'important area' of habitat for migratory species.

The EPBC listed migratory species identified by the online search, and a brief discussion on the perceived habitat value of the study area for these species is provided below in **Table 15**.

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.

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Table 15 - EPBC Act listed migratory species recorded or likelihood of occurring on the study area

Class	Scientific Name	Common Name	Likelihood of Occurrence
Birds	*Apus pacificus*	Fork-tailed Swift	Potentially occurring. The species is almost exclusively aerial (SEWPAC, 2011b). The study area would provide limited foraging resources relative to the species' large foraging range and mobility. **Low value to species.**
	Ardea alba	Great Egret	Potentially occurring. The study area would provide opportunities for roosting and foraging for the species especially in the vicinity of wetland and riverine environments on the Site (SEWPAC, 2011b). However, the study area would represent only a small area of habitat relative to the species' large foraging range and mobility. **Moderate value to species.**
	Ardea ibis	Cattle Egret	Likely to occur. Given the proximity to land under agricultural use and wetland and riverine environments the Site would provide suitable habitat resources for the species (SEWPAC, 2011b). However, the study area represents only a small area of habitat relative to the species' large foraging range and mobility. **Moderate value to species.**
	Gallinago hardwickii	Latham's Snipe	Unlikely to occur. The study area lacks substantial open wetlands preferred by the species (SEWPAC, 2011b). **Low value to species.**
	Haliaeetus leucogaster	White-bellied Sea-Eagle	Potentially occurring The forested areas adjacent to riverine environments are suitable habitat for roosting for the species with suitable foraging habitat provided by the adjacent riverine environments (SEWPAC, 2011b). However, the study area represents only a small area of habitat relative to the species' large foraging range and mobility. **Low to moderate value to species.**

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Class	Scientific Name	Common Name	Likelihood of Occurrence
	Hirundapus caudacutus	White-throated Needletail	Unlikely to occur. The species is almost exclusively aerial (SEWPAC, 2011b). The study area would provide limited foraging resources relative to the species' large foraging range and mobility. **Low value to species.**
	Merops ornatus	Rainbow Bee-eater	Potentially occurring. The study area would provide habitat resources for the species, especially due to the presence of forested areas adjacent to riverine environments (SEWPAC, 2011b). However, values within the study area would be limited relative to the species' large foraging range and mobility. **Low to moderate value to species.**
	Nettapus coromandelianus albipennis	Australian Cotton Pygmy-goose	Unlikely to occur. The study area lacks substantial open wetlands preferred by the species (SEWPAC, 2011b). **Low value to species.**
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat*.)	Australian Painted Snipe	Unlikely to occur. The study area lacks substantial open wetlands preferred by the species (SEWPAC, 2011b). **Low value to species.**

Wetlands of National Significance – Ramsar sites

The field surveys confirmed that the study area does not contain any wetlands of national significance. In addition, the study area was not found to contain habitat that could be classified as a wetland of national significance according to classification under the EPBC Act.

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4.2.2 *Other Matters*

EPBC Act Listed Marine Species

Table 16 - EPBC Act listed marine species recorded or likelihood of occurring on the study area

Class	Scientific Name	Common Name	Likelihood of Occurrence
Birds	*Anseranas semipalmata*	Magpie Goose	Potentially occurring. The study area contains a small area of suitable potential wetland, floodplain and riverine-associated habitat for the species (DECC, 2008b). However, this would only provide limited value relative to the species' large foraging range and mobility. **Low value to species.**
	Apus pacificus	Fork-tailed Swift	Potentially occurring. The species is almost exclusively aerial. (SEWPAC, 2011b). The study area would provide limited potential habitat resources relative to the species' large foraging range and mobility. **Low value to species.**
	Ardea alba	Great Egret	Potentially occurring. The study area would provide opportunities for roosting and foraging for the species especially in the vicinity of wetland and riverine environments on the Site (SEWPAC, 2011b). However, the study area would represent only a small area of habitat relative to the species' large foraging range and mobility. **Moderate value to species.**
	Ardea ibis	Cattle Egret	Likely to occur. Given the proximity to land under agricultural use and wetland and riverine environments the study area would provide suitable habitat resources for the species (SEWPAC, 2011b). However, the study area represents only a small area of habitat relative to the species' large foraging range and mobility. **Moderate value to species.**

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Class	Scientific Name	Common Name	Likelihood of Occurrence
	Gallinago hardwickii	Latham's Snipe	Unlikely to occur. The study area lacks substantial open wetlands preferred by the species (SEWPAC, 2011b). **Low value to species.**
	Haliaeetus leucogaster	White-bellied Sea-Eagle	Potentially occurring The forested areas adjacent to riverine environments are suitable habitat for roosting for the species with suitable foraging habitat provided by the adjacent riverine environments (SEWPAC, 2011b). However, the study area represents only a small area of habitat relative to the species' large foraging range and mobility. **Low to moderate value to species.**
	Hirundapus caudacutus	White-throated Needletail	Unlikely to occur. The species is almost exclusively aerial (SEWPAC, 2011b). The study area would provide limited potential habitat resources relative to the species' large foraging range and mobility. **Low value to species.**
	Lathamus discolor	Swift Parrot	Potentially occurring. Preferred habit on the study area for the species includes wet sclerophyll (SEWPAC, 2011b). However, the study area represents only a small area of habitat relative to the species' large foraging range and mobility. **Low value to species.**
	Merops ornatus	Rainbow Bee-eater	Potentially occurring. The study area would provide habitat resources for the species, especially due to the presence of forested areas adjacent to riverine environments (SEWPAC, 2011b). However, values on the study area would be limited relative to the species' large foraging range and mobility. **Low to moderate value to species.**

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Class	Scientific Name	Common Name	Likelihood of Occurrence
	Nettapus coromandelianus albipennis	Australian Cotton Pygmy-goose	Unlikely to occur. The study area lacks substantial open wetlands preferred by the species (SEWPAC, 2011b). **Low value to species.**
	Rostratula australis (formally *R. benghalensis australis* and *R. benghalensis s. lat*.)	Australian Painted Snipe	Unlikely to occur. The study area lacks substantial open wetlands preferred by the species (SEWPAC, 2011b). **Low value to species.**

4.2.3 *Extra Information*

EPBC Act Listed Invasive Species

As presented in **Table 17** 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 17 - Pest flora species recorded or potentially occurring on the study area

Scientific Name	Common Name	Occurrence
*Hymenachne amplexicaulis**	Hymenachne	Not detected
Lycium ferocissimum	African Boxthorn	Not detected
Parkinsonia aculeata	Parkinsonia	Not detected
*Parthenium hysterophorus**	Parthenium Weed	Not detected
Pinus radiata	Radiata Pine	Not detected
*Salvinia molesta**	Salvinia	Not detected

* - Weed of National Significance

As presented in **Table 18** below, no invasive pest fauna species listed by the protected matters search tool were detected during the survey.

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Table 18 - Pest fauna species recorded or potentially occurring on the study area

Scientific Name	Common Name	Likelihood of Occurrence
*Rhinella marinus (*formerly *Bufo marinus)*	Cane Toad	Potentially occurs. Aquatic environments occur in the vicinity of the study area.
Felis catus	Domestic Cat	Potentially occurs. Given the distribution of the species, its mobility and wide habitat tolerance range, it is possible that this species would traverse the study area from time to time.
Oryctolagus cuniculus	European Rabbit	Potentially occurs. Given the distribution of the species, its mobility and wide habitat tolerance range, it is possible that this species would traverse the study area from time to time.
Sus scrofa	Feral Pig	Potentially occurs. Given the distribution of the species, its mobility and wide habitat tolerance range, it is possible that this species would traverse the study area from time to time.
Vulpes vulpes	Red Fox	Potentially occurs. Given the mobility, range of habitat and availability of roadside carrion for the species it is highly likely that this species traverses the study area.

4.2.4 *Nature Conservation Act*

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. Recommendations relating to mitigation of potential impacts on threatened species are presented in **Section 5.**

NC Reg Listed Flora

No flora species scheduled as threatened under the NC Reg were recorded during the field survey. However, the study area is considered to provide potential habitat for threatened flora identified by DERM's wildlife online database for the search area (25 km radius). A brief discussion on the perceived habitat value of the study area for these species is provided below in **Table 19**.

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Table 19 - Nature Conservation Act listed flora recorded or likelihood of occurring on the study area

Scientific Name	Common Name	Status*	Likelihood of Occurrence
Acacia tenuinervis	Scrub Wattle	NT	Potentially occurring. Areas in the locality supporting 'red loamy ridges with Spotted Gum and Narrow-leaf Ironbark, and on edge of remnant dry-vine scrub" (Lithgow, 1997) represent preferred habitat for this species. The study area does not host these values. However, it is possible that this species might be recruited on the study area given that many acacia species regenerate within open disturbed areas. **Low value to species.**
Acacia wardellii	Wardell's Wattle	V	Potentially occurring. Areas in the locality supporting "gravelly soil on shallow weathered sandstone in eucalypt woodland" (SEWPAC, 2011b) represent preferred habitat for this species. The study area does not host these values. However, it is possible that this species might be recruited on the study area given that many acacia species regenerate within open disturbed areas. **Low value to species.**
Gonocarpus urceolatus	A herb	V	Potentially occurring. The species has previously been associated with "open woodland comprised of *Eucalyptus crebra, Allocasuarina luehmannii and Callitris glaucophylla"* (AECOM, 2009) indicating a relatively broad and dry habitat type common to the region. The study area provides a small area of habitat relative to its potential range. **Low value to species.**
Rutidosis lanata	A herb	E	Potentially occurring. The study area contains other species associated with known habitat for the species such as open woodland, *Eucalyptus populnea*, *Eremophila mitchellii*, *Acacia harpophylla* and *Casuarina cristata* (SEWPAC, 2011b). However, the study area represents only a small area relative to potential habitat in the region. **Low value to species.**

* Status under NC Act 1992: E = Endangered; V = Vulnerable; NT = Near Threatened

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NC Reg Listed Fauna

No fauna species listed as threatened by the NC Reg was identified during the field survey. However, the study area is considered to provide potential habitat for threatened fauna species identified by the online search. A brief discussion on the perceived habitat value of the study area for these species is provided below in **Table 20**.

Table 20 - Nature Conservation Act listed fauna recorded or likelihood of occurring on the study area

Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
Amphibians	*Cyclorana verrucosa*	Rough Collared Frog	NT	Potentially occurring. The species is known to be associated with small scale wetland environments in open grasslands and woodlands (Cogger, 2000). The areas of the Site which host 'wetland' Res (e.g. the drill pads of Lot 9 and survey sites 1-4) would provide suitable habitat for the species. However, these areas of the study area represent a small area of habitat relative to the potential range of the species. **Low to moderate value to species.**
Bird	*Accipiter novaehollandiae*	Grey Goshawk	NT	Potentially occurring. The species is known to occur over a large range but with greater habitat values associated with wet forest, open woodland and riverine areas (Olsen, 1995). The Site represents only a small area of potential habitat relative to the species range and mobility. **Low value to species.**
	Calyptorhynchus lathami	Glossy Black-Cockatoo	V	Potentially occurring. The study area contains Casuarina which represents potential foraging for the species in forested areas. However, the study area represents only a small area of lower value habitat relative to the species range and mobility. **Low value to species.**
	Ephippiorhynchus asiaticus	Black-necked Stork	NT	Potentially occurring. The wetland areas on the study area would provide suitable potential habitat for the

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Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
				species (DECC, 2008b). However, the study area is only a small area relative to the potential range of the species due to its preference for more substantial wetland areas. **Low value to species.**
	Grantiella picta	Painted Honeyeater	NT	Potentially occurring. The study area lacks a significant abundance of mistletoe, the preferred food of the species (DECC, 2008b) The species has been recorded at other sites in the vicinity. There is potential for the species to traverse the study area. However, the study area only represents a small area of lower quality potential habitat relative to the species range and mobility. **Low value to species.**
	Lathamus discolor	Swift Parrot	E	Potentially occurring. Preferred habit on the study area for the species includes wet sclerophyll (SEWPAC, 2011b). However, the Site represents only a small area of habitat relative to the species' large foraging range and mobility. **Low value to species.**
	Lophoictinia isura	Square-tailed Kite	NT	Potentially occurring. The species is found in a variety of timbered habitats especially those associated with watercourses (DECC, 2008b). The study area contains preferred habitat its proximity to the Condamine River. However, the study area represents only a small area of habitat relative to the species' large foraging range and mobility. **Low to moderate value to species.**
	Melithreptus gularis	Black-chinned Honeyeater	NT	Potentially occurring. The study area lacks the drier vegetation types and associated habitat values preferred by the species (DECC, 2008b). However, the forested areas of the study area may provide opportunity for the species to traverse the study area between areas of suitable habitat in the locality.

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Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
				Low value to species.
	Neophema pulchella	Turquoise Parrot	NT	Potentially occurring. The species is found in a variety of habitats including eucalypt woodland adjoining clearings and creeks on farmland (DECC, 2008b). The study area contains preferred habitat its proximity to the Condamine River. However, the study area represents only a small area of habitat relative to the species' large foraging range and mobility. **Low to moderate value to species.**
	Psephotus pulcherrimus	Paradise Parrot	PE	Presumed extinct in the wild.
Mammals	*Chalinolobus picatus*	Little Pied Bat	NT	Potentially occurring. The species prefers dry open forest and woodland and open water for foraging. The species requires caves, rock outcrops, mine shafts, tunnels and tree hollows for roosting (DECC, 2008b). The study area provides lower quality habitat relative to the species preferred habitat, range and mobility. **Low value to species.**
	Nyctophilus corbeni	Eastern Long-eared Bat	V	Potentially occurring. The species occurs in a range of inland woodland types and forests lining watercourses and lakes (SEWPAC, 2011b). The study area provides suitable potential habitat, especially in association with the forested wetland and riverine areas. However, the study area represents a small area of habitat relative to its range and mobility. **Low to moderate value to species.**
Reptiles	*Aspidites ramsayi*	Woma	NT	Unlikely to occur. Within the Brigalow Belt the species prefers black soils and stony ridges in *Acacia harpophylla* woodland and grasslands (Cogger, 2000). The study area does not contain preferred habitat values for the species. Given the limited mobility of the species it is unlikely to traverse the study area between areas of preferred habitat

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Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
				within the locality. **Low value to species.**
	Egernia rugosa	Yakka Skink	V	Potentially occurring. The species has been recorded 32km southwest of Chinchilla (SEWPAC, 2011b) and therefore in the vicinity of the study area. Preferred habitat includes rocky outcrops, sand plains, dense ground vegetation, open dry sclerophyll forest (ironbark) and woodland, brigalow forest and open shrubland. The study area lacks the preferred habitat of the species. Given the limited mobility of the species it is unlikely to traverse the study area between areas of preferred habitat within the locality. **Low value to species.**
	Hemiaspis damelii	Grey Snake	E	Potentially occurring. The study area occurs centrally to the core area for the species, between Dalby and Glenmorgan. The species favours woodlands, usually on heavier, cracking clay soils, particularly in association with water bodies, small gullies and ditches (Wilson, 2005). The study area does not provide optimal habitat for the species but there is a potential for the species to traverse the study area between areas of preferred habitat given its contracted core area. **Low to moderate value to species.**
	Paradelma orientalis	Brigalow Scaly Foot	V	Potentially occurring. The species has been found within a wide variety of remnant, non-remnant and highly disturbed vegetation types (SEWPAC, 2011b). Some of these habitat values occur on the study area. However, the study area only represents a small area relative to the species range and variety of potential habitats. **Low to moderate value to species.**
	Strophurus taenicauda	Golden-tailed Gecko	NT	Potentially occurs. The species has been recorded in a variety of drier vegetation communities in the locality containing sclerophyll forest, brigalow

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Class	Scientific Name	Common Name	Status*	Likelihood of Occurrence
				species and especially cypress pine. The study area does not contain preferred habitat values for the species. **Low value to species.**

* Status under NC Act 1992: PE = Extinct in the Wild; E = Endangered; V = Vulnerable; NT = Near Threatened

Other Significant Flora and Fauna

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

- *Brachychiton populneus* (Kurrajong) at survey site 3 (**Appendix B**);
- *Cymbidium canaliculatum* (Tiger Orchid) at survey site 1 (**Appendix B**).

4.2.5 *Environmentally Sensitive Areas*

One (1) category C (of concern REs) vegetation type was identified onsite during field surveys:

- Of concern RE 11.3.3

This general RE type occurred as a single polygon covering the northern portion of the study area. Within this polygon, the area abutting the Condamine River also contained vegetation representative of sub-group RE 11.3.3c. Consequently, this portion of the remnant area was assessed more specifically as RE 11.3.3/11.3.3c (80/20). **Table 21** provides a description of the REs. Refer to **Appendix H** for the distribution of vegetation on the study area as derived through ground truthing. It is noted that the endangered RE 11.4.12 as presented by DERM desktop mapping (**Appendix E**) was not observed onsite during Orogen surveys.

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Category B ESAs (Of Concern Regional Ecosystems)

Table 21 - Of concern regional ecosystems observed on the study area

RE code	General Description	Description
11.3.3	*Eucalyptus coolabah* woodland on alluvial plains	*Eucalyptus coolabah* woodland to open-woodland with a grassy understorey. A mid layer is often absent but scattered tree or shrub species, such as *E. populnea*, *Melaleuca bracteata*, *Alectryon oleifolius*, *Terminalia oblongata* (in the north) and *Acacia pendula*, *A. cambagei*, and occasionally *Muehlenbeckia florulenta* may be present. The ground layer is dominated by a range of grass and forb species depending on season, soil and management conditions. Can include small areas of grassland with scattered trees. Occurs on Cainozoic alluvial plains or levees with clay or sometimes texture contrast soils. 11.3.3c: Palustrine wetland (e.g. vegetated swamp). *Eucalyptus coolabah* woodland to open-woodland (to scattered trees) with a sedge or grass understorey in back swamps and old channels. The ground layer is dominated by a range of sedge or grass species depending on hydrological regime, soil and management conditions. Characteristic ground layer species include *Eleocharis spp.* or *Marsilea spp.* in more frequently inundated sites tending toward a grassy ground layer in less frequently flooded sites. Occurs in flooded back swamps and old channels on Cainozoic alluvial plains or levees. Generally clay or sometimes texture contrast soils.

4.2.6 *Wetlands and Watercourses*

Initial desktop assessment indicated the presence of three 1st order watercourses, a 2nd order watercourse and a Palustrine wetland within the study area and the Condamine River (**Appendix F**). Field surveys did not identify any additional watercourses, as defined under the *Water Act 2000*, within the study area. An additional area of Palustrine wetland was recorded during fieldworks at the north of Lot 10 (**Appendix I**).

4.2.7 *Declared Weeds*

One (1) Class 2 weed species listed as declared under the *Queensland Land Protection (Pest and Stock Route Management) Act 2002* was detected on the study area - *Senecio madagascariensis* (Fireweed). Other non-native (introduced) flora species recorded during fieldworks are presented in **Appendix G**.

4.2.8 *Declared Fauna*

No fauna species listed as declared under the *Queensland Land Protection (Pest and Stock Route Management) Act 2002* were observed on the study area.

4.2.9 *Disturbance*

Evidence of significant flooding was present within the forested areas of the study area. Generally, the study area has been subject to historic clearing, resulting in derived grassland through to regrowth Remnant vegetation.

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5. Recommendations

In conclusion, desktop data review and ecological field surveys identified that the site offers a low level of ecological constraint. This is attributed to the highly disturbed nature of the site, which is a result of historic vegetation clearing and land use. Notwithstanding, the site was found to host or be in close proximity to elements of known and potential ecological value.

These elements include:

- Of concern regional ecosystems (category C environmentally sensitive area), occurring within and adjacent to the study area,
- Presence of watercourses within and adjacent to the study area,
- Palustrine wetlands within the study area,
- Potential habitat resources for threatened flora and fauna species.

It is recommended that the findings of this report are considered during detailed development planning works such that disturbance to the ecological values of the site and locality may be avoided wherever practicable. Where disturbance is unavoidable, impact mitigation measures are to be implemented in accordance with the approved site environmental management plan and regulatory approval conditions.

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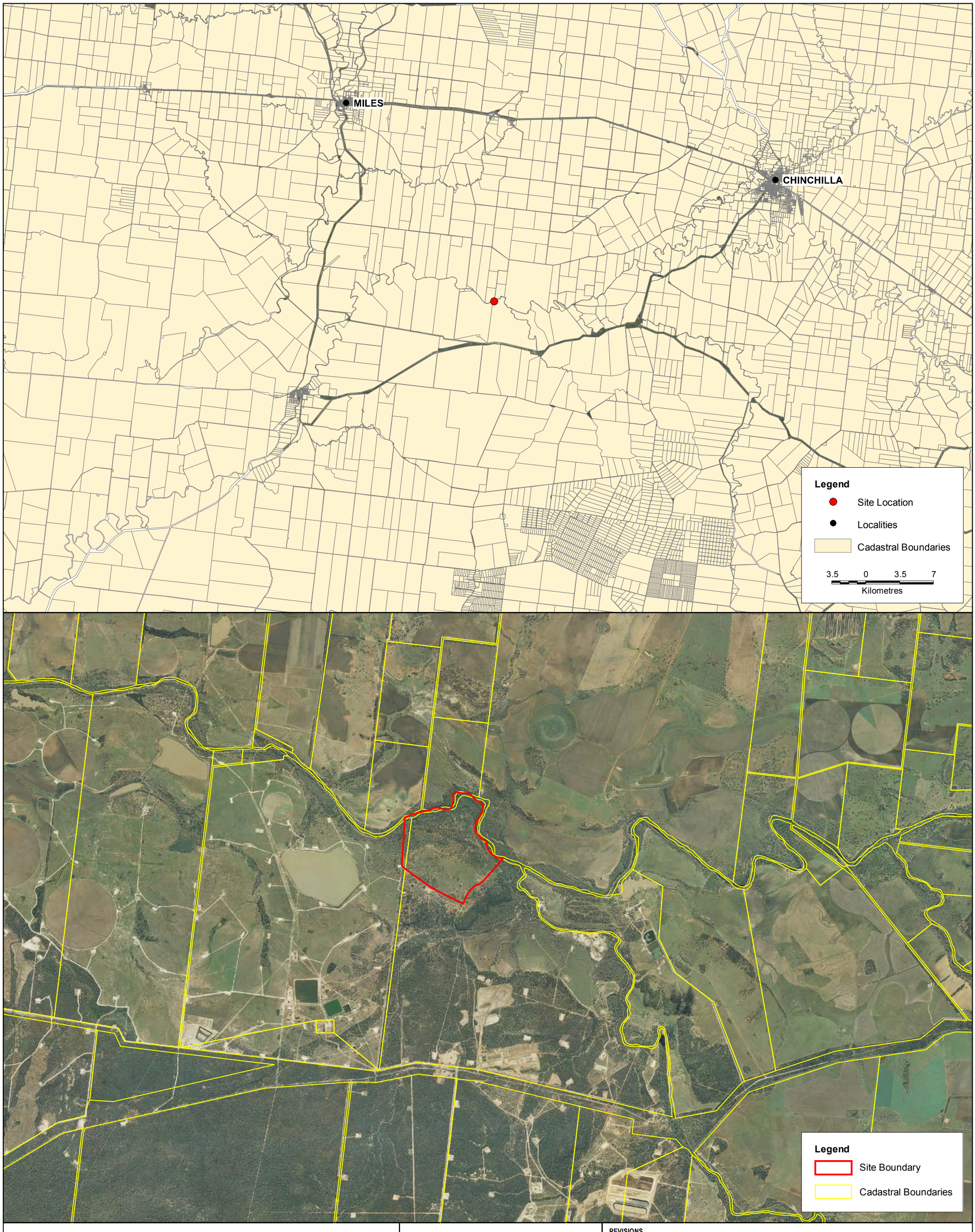
Appendix A

LOCALITY PLAN



GIS Section - HSSE

Condamine River Under-bore Locality Plan

Date: 20th January 2012

Project: Australia Pacific LNG

Locality: Lots 9BWR38, 10ROG3411

Rev: B

Map ID: GISWR_05098_LOCALITY

Doc ID:

REV	DESCRIPTION	DATE	DRAWN	CHECK	QA	APP
B	Removal of Drill Pads	2012-01-23	JKD			
A	Issued for Review	2011-12-02	KCG			

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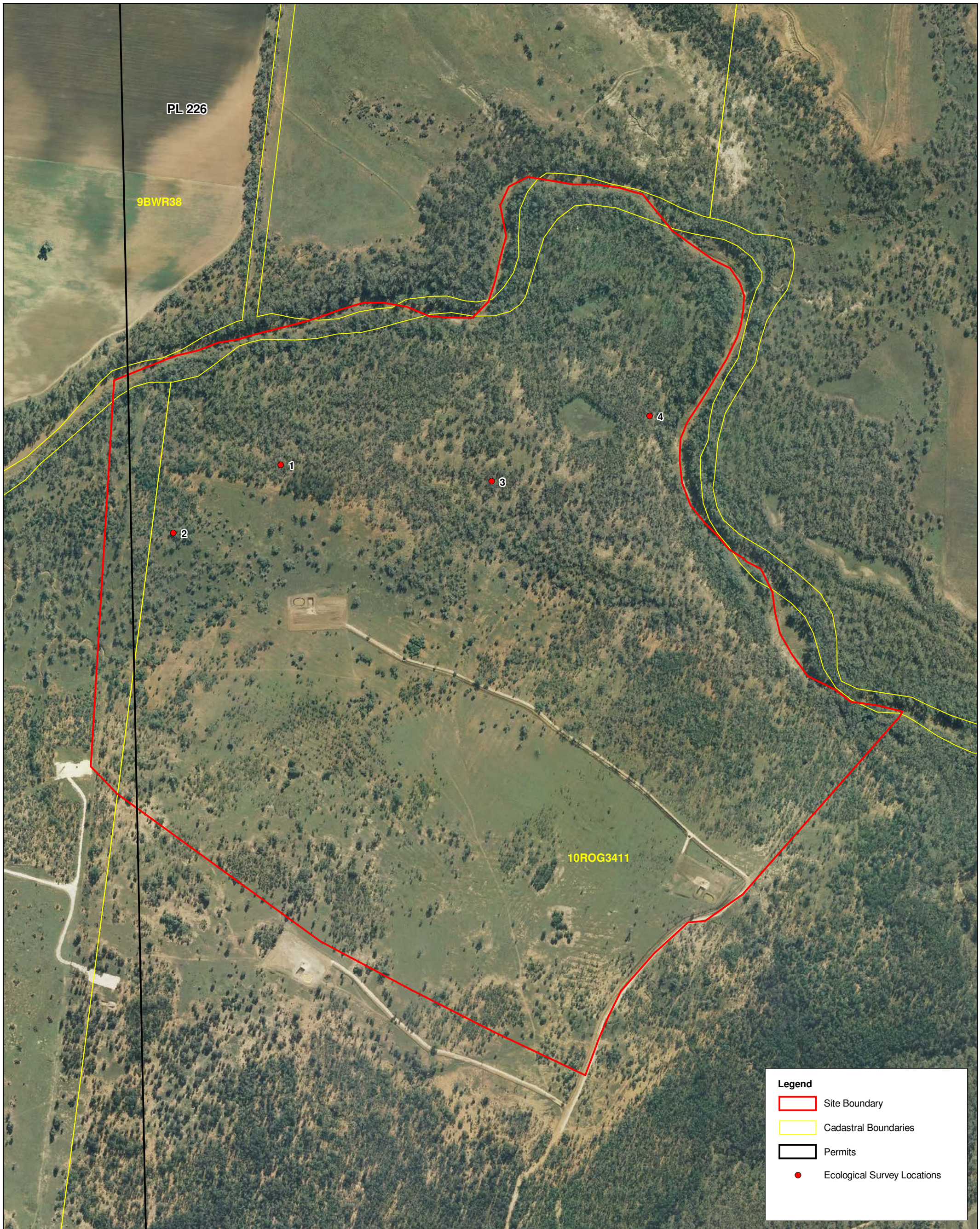
1.6 0 1.6 3.2 4.8

Datum: GDA 94 Z56 Units: Kilometres Scale 1:80,000 @ A3

Appendix B

ECOLOGICAL SURVEY LOCATIONS MAP



GIS Section - HSSE

Condamine River Under-bore Ecological Survey Locations Map

Date: 20th January 2012

Project: Australia Pacific LNG
Locality: Lots 9BWR38, 10ROG3411
Rev: B
Map ID: GISWR_05098_ECOSVY
Doc ID:

REVISIONS

REV	DESCRIPTION	DATE	DRAWN	CHECK	QA	APP
B	Removal of Drill Pads	2012-01-23	JKD			
A	Issued for Review	2011-12-14	KCG			

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Datum: GDA 94 Z56 Units: Metres Scale 1:7,500 @ A3

Appendix C

RESULTS FROM EPBC PROTECTED MATTERS SEARCH TOOL

Australian Government

Department of Sustainability, Environment, Water, Population and Communities

EPBC Act Protected Matters Report

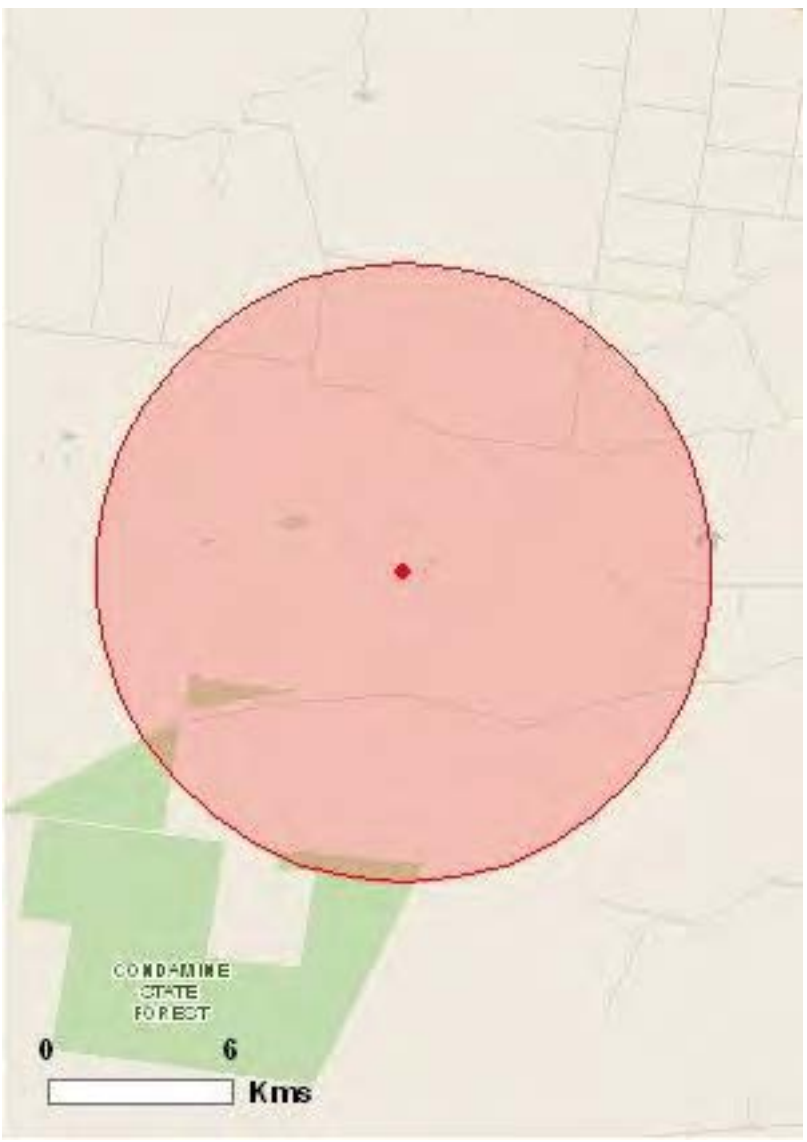
This report provides general guidance on matters of national environmental significance and other matters protected by the EPBC Act in the area you have selected.

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: 29/11/11 11:36:37

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



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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:	5
Threatened Species:	17
Migratory Species:	11

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:	11
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:	11
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 likely to occur within area
Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland	Critically Endangered	Community likely to occur within area
Weeping Myall Woodlands	Endangered	Community likely to occur within area
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland	Critically Endangered	Community may occur within area

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
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat may 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 peelii Murray Cod, Cod, Goodoo [68443]	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
Nyctophilus timoriensis (South-eastern form) Greater Long-eared Bat, South-eastern Long-eared Bat [66888]	Vulnerable	Species or species habitat may occur within area
PLANTS		
Acacia wardellii [3916]	Vulnerable	Species or species habitat may occur within area
Cadellia pentastylis Ooline [9828]	Vulnerable	Species or species habitat likely to occur within area
Homopholis belsonii [2406]	Vulnerable	Species or species habitat may occur within area
Westringia parvifolia [4822]	Vulnerable	Species or species habitat likely to occur within area
REPTILES		

Name	Status	Type of Presence
Anomalopus mackayi		
Five-clawed Worm-skink, Long-legged Worm-skink [25934]	Vulnerable	Species or species habitat may occur within area
Delma torquata		
Collared Delma [1656]	Vulnerable	Species or species habitat may occur within area
Egernia rugosa		
Yakka Skink [1420]	Vulnerable	Species or species habitat known to 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 known to 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
Nettapus coromandelianus albipennis		
Australian Cotton Pygmy-goose [25979]		Species or species habitat may occur within area
Rostratula benghalensis s. lat.		
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		
Anseranas semipalmata Magpie Goose [978]		Species or species habitat may occur within area
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
Lathamus discolor Swift Parrot [744]	Endangered	Species or species habitat may occur within area
Merops ornatus Rainbow Bee-eater [670]		Species or species habitat may occur within area
Nettapus coromandelianus albipennis Australian Cotton Pygmy-goose [25979]		Species or species habitat may occur within area
Rostratula benghalensis s. lat. 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 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		
Hymenachne amplexicaulis Hymenachne, Olive Hymenachne, Water Stargrass, West Indian Grass, West Indian Marsh Grass [31754]		Species or species habitat likely to occur within area
Lycium ferocissimum African Boxthorn, Boxthorn [19235]		Species or species habitat may occur within area
Parkinsonia aculeata Parkinsonia, Jerusalem Thorn, Jelly Bean Tree, Horse Bean [12301]		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
Pinus radiata Radiata Pine Monterey Pine, Insignis Pine, Wilding Pine [20780]		Species or species habitat may occur within area
Salvinia molesta Salvinia, Giant Salvinia, Aquarium Watermoss, Kariba Weed [13665]		Species or species habitat likely to occur within area

Coordinates

-26.8478 150.3422

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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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: 26.8478
Longitude: 150.3422
Distance: 25
Email: dconder@orogenqld.com.au
Date submitted: Tuesday 29 Nov 2011 10:35:11
Date extracted: Tuesday 29 Nov 2011 10:46:19

The number of records retrieved = 21

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	amphibians	Hylidae	*Cyclorana verrucosa*	rough collared frog		NT		3
animals	birds	Accipitridae	*Lophoictinia isura*	square-tailed kite		NT		4
animals	birds	Accipitridae	*Accipiter novaehollandiae*	grey goshawk		NT		2
animals	birds	Cacatuidae	*Calyptorhynchus lathami*	glossy black-cockatoo		V		4
animals	birds	Ciconiidae	*Ephippiorhynchus asiaticus*	black-necked stork		NT		4
animals	birds	Meliphagidae	*Grantiella picta*	painted honeyeater		V		8
animals	birds	Meliphagidae	*Melithreptus gularis*	black-chinned honeyeater		NT		3
animals	birds	Psittacidae	*Lathamus discolor*	swift parrot		E	E	2
animals	birds	Psittacidae	*Psephotus pulcherrimus*	paradise parrot		PE	EX	1
animals	birds	Psittacidae	*Neophema pulchella*	turquoise parrot		NT		1
animals	mammals	Vespertilionidae	*Nyctophilus corbeni*	eastern long-eared bat		V	V	6
animals	mammals	Vespertilionidae	*Chalinolobus picatus*	little pied bat		NT		9
animals	reptiles	Boidae	*Aspidites ramsayi*	woma		NT		1
animals	reptiles	Diplodactylidae	*Strophurus taenicauda*	golden-tailed gecko		NT		30/4
animals	reptiles	Elapidae	*Hemiaspis damelii*	grey snake		E		3/1
animals	reptiles	Pygopodidae	*Paradelma orientalis*	brigalow scaly-foot		V	V	3/1
animals	reptiles	Scincidae	*Egernia rugosa*	yakka skink		V	V	2
plants	higher dicots	Asteraceae	*Rutidosis lanata*			E		1/1
plants	higher dicots	Haloragaceae	*Gonocarpus urceolatus*			V		4/4
plants	higher dicots	Mimosaceae	*Acacia wardellii*			V	V	25/8
plants	higher dicots	Mimosaceae	*Acacia tenuinervis*			NT		8/8

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.

Appendix E

DERM REGIONAL ECOSYSTEM MAPPING FOR THE STUDY AREA

PL 226

9BWR38

11.3.3

11.3.25/11.3.4/11.3.3

11.4.12

10ROG3411

11.4.3

Legend

- Site Boundary
- Cadastral Boundaries
- Permits

Remnant REs (Biodiversity Status) (where applicable)

- Endangered
- Of Concern

GIS Section - HSSE

Monreagh Irrigation Development Lot 9 BWR38 and Lot 10 ROG3411

Date: 20th Janaury 2012

Project:	Australia Pacific LNG
Locality:	Lots 9BWR38, 10ROG3411
Rev:	B
Map ID:	GISWR_05098_RE
Doc ID:	

REVISIONS

REV	DESCRIPTION	DATE	DRAWN	CHECK	QA	APP
B	Removal of Drill Pads	2012-01-23	JKD			
A	Issued for Review	2011-12-14	KCG			

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Permit Boundaries - Copyright (C) The State of Queensland (Department of Employment, Economic Development and Innovation) 2011

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N

150 0 150 300 450

Datum: GDA 94 Z56 Units: Metres Scale 1:7,500 @ A3

Appendix F

WETLANDS AND WATERCOURSES MAP

PL 226

9BWR38

10ROG3411

Legend

- Site Boundary
- Cadastral Boundaries
- Permits

Wetlands and Watercourses

- Lacustrine
- Riverine
- Palustrine
- Watercourse
- Stream Order Buffer (100m)
- Flood Modelling
- Referable Wetlands

AUSTRALIA PACIFIC LNG

GIS Section - HSSE

Condamine River Under-bore Wetlands and Watercourses Map

Date: 20th January 2012

Project: Australia Pacific LNG
Locality: Lots 9BWR38, 10ROG3411
Rev: B
Map ID: GISWR_05098_WET
Doc ID:

REVISIONS

REV	DESCRIPTION	DATE	DRAWN	CHECK	QA	APP
B	Removal of Drill Pads	2012-01-23	JKD			
A	Issued for Review	2011-12-14	KCG			

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N

150 0 150 300 450

Datum: GDA 94 Z56 Units: Metres Scale 1:7,500 @ A3

Appendix G

FLORA SPECIES RECORDED DURING FIELD SURVEY

APPENDIX H

Flora Species Recorded During Orogen Field Survey

Scientific Name	Common Name
Abutilon sp.	A lantern bush
Acacia excelsa	Ironwood
Acacia harpophylla	Brigalow
Bothriochloa bladhii	Forest Blue Grass
Brachychiton populneus	Kurrajong
Callitris glaucophylla	White Cypress Pine
Casuarina cristata	Belah
*Cenchrus ciliaris (syn. Pennisetum ciliare)**	Buffel Grass
Cullen tenax	Emu Foot
Cymbidium canaliculatum	Tiger Orchid
Cyperus sp.	A sedge
Einadia hastata	Berry Salybush
Einadia sp.	A saltbush
Eremophila debilis	Winter Apple
Eriochloa pseudocrotricha	Perrenial Cup Grass
Eucalyptus coolabah	Coolibah
Eucalyptus populnea	Poplar Box
Geijera parvifolia	Wilga
Lomandra sp.	A mat rush
*Paspalum sp.**	A grass
*Phyla nodiflora**	Lippia
Sclerolaena birchii	Galvanised Burr
*Senecio madagascariensis**[D]	Fireweed
*Verbena aristigera**	Mayne's Pest

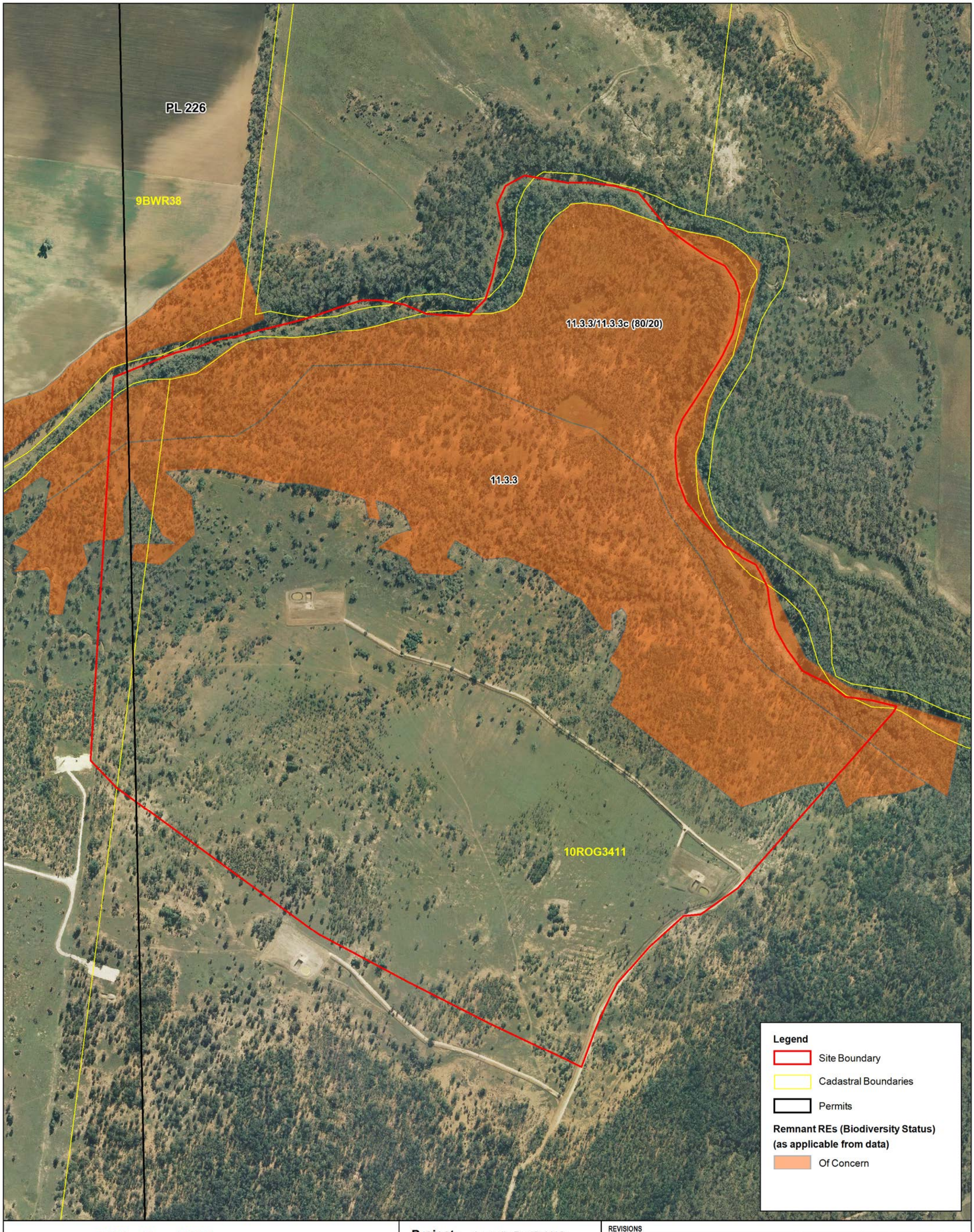
Note: Table does not include a comprehensive list of pasture grassland species.

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

Australia Pacific LNG Pty Limited ABN 68 001 646 331
Level 3, 135 Coronation Drive, Milton, Qld, 4064
GPO Box 148, Brisbane, Qld, 4001 • Telephone (07) 3858 0280• Facsimile 1300 863 446 • www.aplng.com.au

Appendix H

GROUND-TRUTHED REMNANT REGIONAL ECOSYSTEMS MAP



AUSTRALIA PACIFIC LNG

GIS Section - HSSE

Condamine River Under-bore

Ground-truthed Regional Ecosystems Map

Date: 20th January 2012

Project:	Australia Pacific LNG
Locality:	Lots 9BWR38, 10ROG3411
Rev:	B
Map ID:	GISWR_05098_GTRE
Doc ID:	

REVISIONS

REV	DESCRIPTION	DATE	DRAWN	CHECK	QA	APP
B	Removal of Drill Pads	2012-01-23	JKD			
A	Issued for Review	2011-12-14	KCG			

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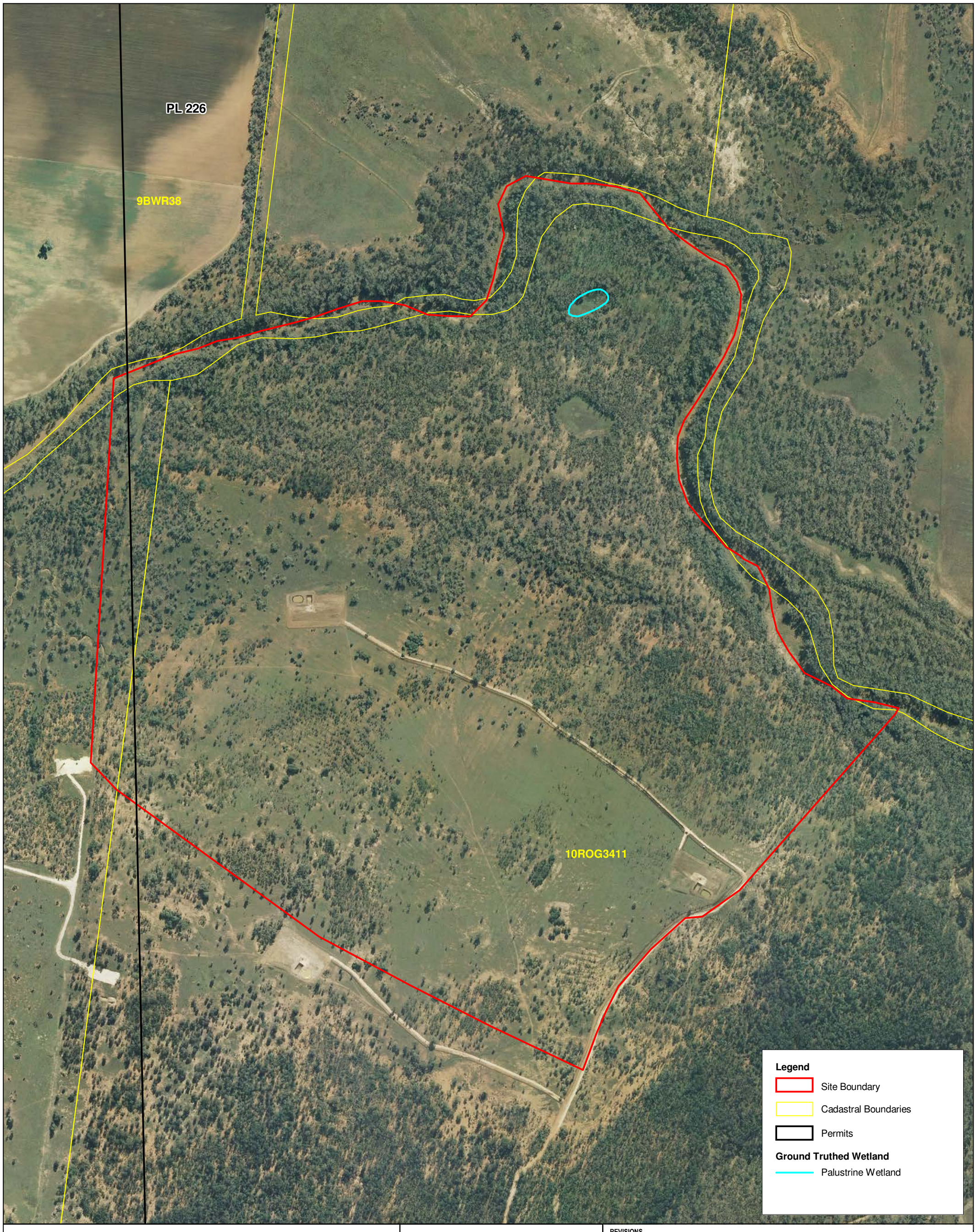
N

150 0 150 300 450

Datum: GDA 94 Z56 Units: Metres Scale 1:7,500 @ A3

Appendix I

GROUND-TRUTHED WETLANDS AND WATERCOURSES MAP



GIS Section - HSSE

Condamine River Under-bore Ground-truthed Wetlands and Water-courses Map

Date: 20th January 2012

Project: Australia Pacific LNG

Locality: Lots 9BWR38, 10ROG3411

Rev: B

Map ID: GISWR_05098_GTWET

Doc ID:

REV	DESCRIPTION	DATE	DRAWN	CHECK	QA	APP
B	Removal of Drill Pads	2012-01-23	JKD			
A	Issued for Review	2011-12-14	KCG			

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N

150 0 150 300 450

Datum: GDA 94 Z56 Units: Metres Scale 1:7,500 @ A3