Attachment B. EPBC Flora and Fauna Assessment – Dingo West

6/12/2010

Bandana Energy

EPBC Flora and Fauna Assessment - Dingo West

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1 December 2010

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Contents

List of Figures

List of Tables

List of Plates

List of Appendices

Appendix A – EPBC Protected Matters Report
Appendix B – Regional Ecosystems
Appendix C – Weed Species List

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1 Introduction

The Dingo West Project sits entirely within Exploration Permit Coal (EPC) 881 which is currently held by Dingo West Coal Pty Ltd, a wholly owned subsidiary of Bandanna Energy Pty Ltd. The project area is located around and to the west of the township of Dingo, Central Queensland (**Figure 1**).

Bandanna has commenced a mining study involving an open pit development and conceptual production in the range of 0.7 - 2.4 Mtpa Run of Mine (ROM) coal. Discussions with Bandanna Energy have indicated that the open cut areas and supporting infrastructure will most likely be located in the southern most sections of the EPC.

1.1 Purpose

This report assesses whether the proposed Ding West mine (the "action") has, will have, or has the potential to have a significant impact on species and ecological communities listed as threatened under the *Environment Protection and Biodiversity Act 1999* (EPBC Act).

The report describes the ecological values of the site, assesses the likelihood of listed species and communities being present and assesses the potential for the proposed mine to impact on the listed species and communities. The report also describes plans to mitigate and manage any potential impacts to the species and communities.

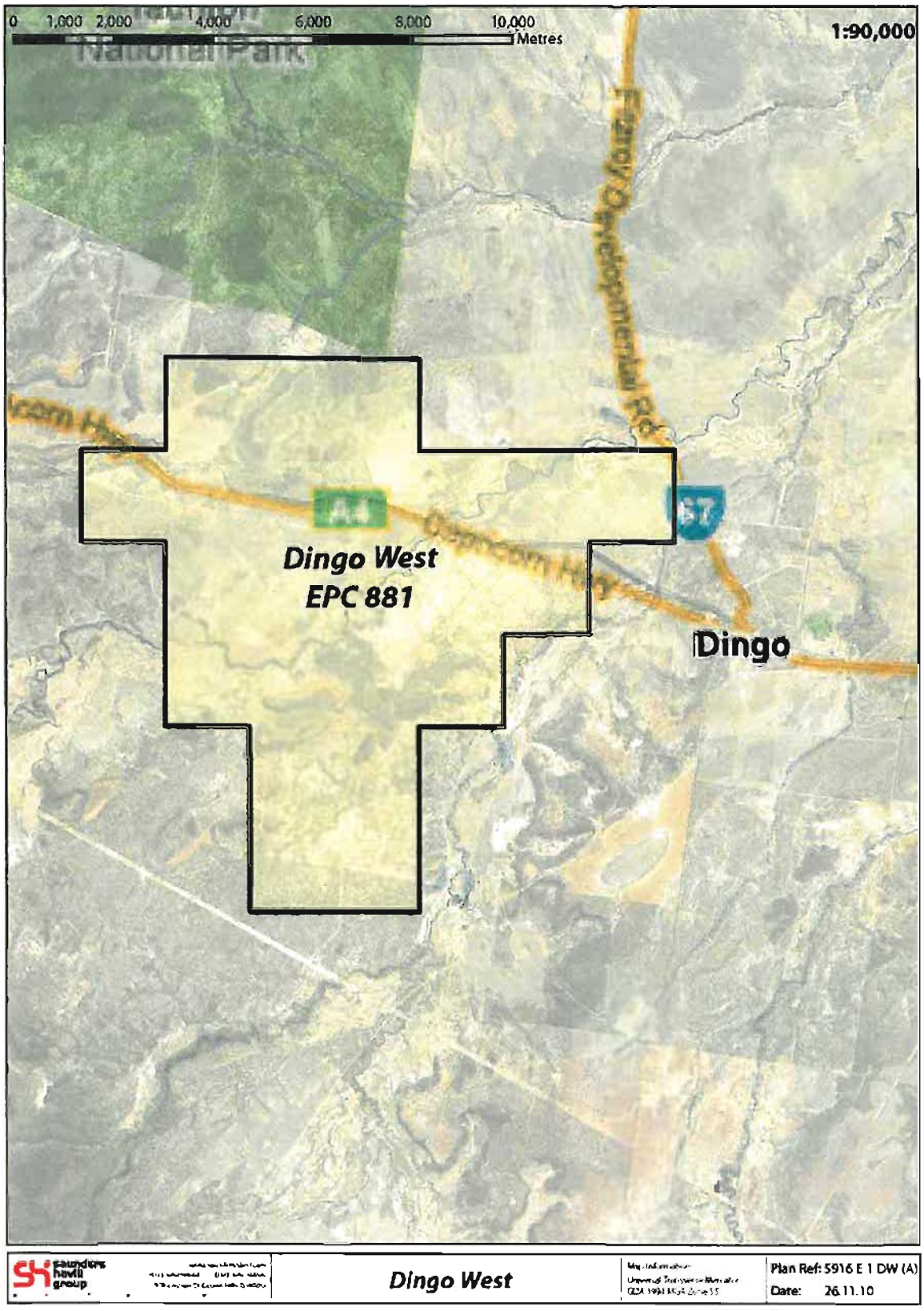

Figure 1: Location of EPC 881 (Dingo West)

2 Methods

The following steps were undertaken in the preparation of this assessment:

- Desktop review of publicly available databases and grey literature providing information on flora and fauna in the region;
- Review of relevant Federal and State legislation and policy;
- Targeted field surveys focusing on areas of interest identified through the desktop review; and
- Analysis of results including an assessment of potential impacts and recommendations for further investigations (if relevant).

2.1 Desktop Review

Prior to the commencement of the field surveys a desktop review was carried out to identify information relevant to the site. The purpose of the desktop review was to:

- Examine the environmental conditions at the site;
- Identify threatened ecological communities mapped on or near the site;
- Identify threatened species with the potential to occur on or utilise the site; and
- Focus field investigations on the most appropriate areas and species;

A range of information sources were included in the literature review such as:

- EPBC Act protected matters report for the site. The report was carried out based on a single point approximately in the centre of the EPC with a buffer of seven kilometres. The protected matter report is included as Appendix A;
- Queensland Government Wildlife Online database search;
- Queensland Regional Ecosystems (RE) mapping;
- Queensland Regrowth Vegetation mapping; and
- Other relevant Commonwealth and State Government environmental databases.

The review also included interpretation of recent aerial photography of the area within and surrounding EPC 881 as well as use of local knowledge from previous flora and fauna surveys carried out in the region.

The desktop review identified several flora and fauna species and threatened ecological communities with the potential to occur within and adjoining EPC 881.

2.2 Field Surveys

The field survey was carried out by two experienced ecologists from 18 – 22 November 2010. The survey was undertaken during a period of high rainfall with localised flooding of watercourses restricting access to large sections of the site. In addition access was not permitted to the northern section of the EPC, therefore field surveys could not be undertaken in these areas.

The survey effort was focussed toward habitats and micro-assemblages identified through the desktop survey as having the potential to support listed species. The following methods were used to describe on-site flora and fauna;

- **Targeted Flora surveys and species identification** – targeted assessment of flora was undertaken within the EPC to locate threatened species and ecological communities. Particular attention was paid to areas mapped as remnant vegetation communities, specifically REs 11.3.1 and 11.3.3, as these are associated with threatened ecological communities as listed under the EPBC Act.
- **Targeted Fauna assessment and habitat identification** – the site assessment included active searches for signs of reptiles, bats and mammals (e.g. scats, feeding remnants, remains and tracks), identification of birds from either direct observation or from calls, and the use of an ANABAT recording device.

A number of REs were identified through the desktop review and field surveys. While these are not protected under Federal legislation they are considered to be of high ecological values. Descriptions and field confirmations (where able to be carried out) of REs mapped within EPC 881 have been included as Appendix B.

2.3 Listed threatened species and ecological communities assessment criteria

An action will require assessment under the EPBC Act if has, will have, or is likely to have a significant impact on the following:

- Species extinct in the wild (the action will not impact on these species),
- Species listed as critically endangered, endangered or vulnerable under the EPBC Act; and
- Critically endangered or endangered communities.

An action is considered likely to have a significant impact on a critically endangered, endangered or vulnerable species if there is a real chance or possibility that it will:

- Lead to a long-term decrease in the size of a population;
- Reduce the area of occupancy of the species (or an important population of the species for vulnerable species);
- Fragment an existing population (or important population for vulnerable species) into two or more populations;
- Adversely affect habitat critical to the survival of a species;
- Disrupt the breeding cycle of a population (or important population for vulnerable species);
- Modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- Result in invasive species that are harmful to species becoming established in the endangered species' habitat;
- Introduce disease that may cause the species to decline; or
- Interfere with the recovery of the species.

An action is likely to have a significant impact on a critically endangered or endangered ecological community if there is a real chance or possibility that it will:

- Reduce the extent of an ecological community;
- Fragment or increase fragmentation of an ecological community, for example by clearing vegetation for roads or transmission lines;
- Adversely affect habitat critical to the survival of an ecological community;
- Modify or destroy abiotic (non-living) factors (such as water, nutrients, or soil) necessary for an ecological community's survival, including reduction of groundwater levels, or substantial alteration of surface water drainage patterns;
- Cause a substantial change in the species composition of an occurrence of an ecological community, including causing a decline or loss of functionally important species, for example through regular burning or flora or fauna harvesting;
- Cause a substantial reduction in the quality or integrity of an occurrence of an ecological community, including, but not limited to:
    - assisting invasive species, that are harmful to the listed ecological community, to become established, or
    - causing regular mobilisation of fertilisers, herbicides or other chemicals or pollutants into the ecological community which kill or inhibit the growth of species in the ecological community; or
- Interfere with the recovery of an ecological community.

3 Results

3.1 General

The Dingo West property is predominantly utilized for cattle grazing with many of the paddocks having undergone substantial clearing. The remaining vegetation is primarily composed of patches of 'Least Concern' remnant vegetation and re-growth (Plates 1 through 5). Appendix B summarises the location and type of remnant vegetation communities present on site.

Access restrictions to the site and poor weather conditions were a major factor during the survey period. Rainfall of approximately 150 - 200 mm was experienced during the survey with local flooding and the presence of unsealed roads limiting site accessibility.

The survey methodology focused on reviewing vegetation communities with the potential to contain species and communities listed under the EPBC Act. The following describes the results of desktop surveys and targeted field investigations over the property.

Plate 1: 'Least Concern' RE 11.7.2 Monospecific stands of Acacia species

Plate 2: 'Least Concern' RE 11.7.2 on road edge, with 11.5.2 beginning further into vegetation

Plate 3: RE 11.7.2 Monospecific Acacia species

Plate 4: Open paddock cleared of vegetation with 'Least Concern' RE 11.3.25 in distance

Plate 5: 'Least Concern' RE 11.5.2

3.2 EPBC Listed Flora Species

Desktop searches identified a number of listed species as potentially occurring within the local area. **Table 1** describes listed flora species identified through the Protected Matters Search Tool and Wildlife On-line database searches as potentially occurring on the site. The table indicates the species, description and preferred habitat.

The desktop assessment identified limited potential for these species to occur on-site due to the lack of habitat availability. The majority of species listed occur within soil conditions and amongst vegetation assemblages that are not typically found within EPC 881.

Species considered most likely to occur on-site include Dicanthium (Bluegrass) species which are often present along alluvial deposits within the Emerald region. The site assessment paid particular attention to the presence of these species (where access was available). The survey did not identify the presence of this species and due to the highly disturbed nature of the site did not locate conditions or habitat deemed suitable to support these species.

Table 1: EPBC listed Flora Species

Scientific Name	Common Name	Queensland Nature Conservation Regulation	EPBC Act	Description	Preferred Habitat	Potential to Occur
Aristidia annua	-	V	V	Tufted annual grass to 50cm tall with an inflorescence that is a compound open panicle.	Prefers a restricted area of Central Queensland on black earth and basalt soils.	**Low** RE's 11.8.5 and 11.8.11 not present on site.
Cadellia pentastylis	Ooline	V	V	Medium size spreading tree growing to 10m and rarely to 25m. Leaves are glossy green, paler and dull underneath, and 1-7 cm long, 1.5-2 cm wide, with broad rounded tips. Leaf venation	Grows in dry rainforest, semi-evergreen vine thickets and sclerophyll ecological communities, often locally dominant or as an emergent.	**Low** Brigalow communities not adjacent to evergreen vine thickets on site so likelihood of occurring is low.
Commersonia argentea	Silver Commersonia	C	V	Shrub to 1.5 – 4m with the above ground stems suckering from rhizomes. Stems and leaves are densely hairy with silvery stellate hairs. Leaf stalks are 4-8mm long and leaves are ovate in outline and 2.5-13cm long by 1-8 cm wide. Leaf margins is finely toothed.	Located at small area at Cadarga, near Chinchilla. Prefers rocky skeletal soils and has been located in other areas along Great Dividing Range from Injune to Tambo.	**Low** No habitat suitable for this species located on site.
Dicanthium queenslandicum	King Bluegrass	V	V	Perennial tufted grass to 80cm tall. Valuable fodder species.	Occurs on black clay soils around the Emerald district.	**Low** Preferred regional ecosystems 11.3.3, 11.4.9, 11.8.5 and 11.8.11. not present on site.

Digitaria porrecta	Finger Panic Grass	-	E	Loosely tufted perennial to 60cm tall. It has grey leaves, 2-3mm wide, with sharp hairs along the middle. Flowers appear in late summer in cylindrical clusters along the stalk and spread stiffly from the flowering stem, with the lower clusters arranged.	Located regionally in 4 disjunct areas. One in central highlands between springsure and Rolleston. Usually in grasslands on extensive basaltic plains, and in undulating woodlands and open forests with underlying basaltic geology.. It usually occurs on dark and fine textured soils with some degree of seasonal cracking. Persists in disturbed habitats such as fallow paddocks.	**Low** No regional ecosystems exist within study site as potential habitat for this species.
Dicanthium setosum	Bluegrass	-	V	Also known as Bluegrass, it is an upright perennial grass less than 1m tall. It has mostly hairless leaves about 2-3 cm wide. The flowers are densely hairy and clustered together along a stalk in a cylinder shape and appear mostly during summer.	Associated with heavy basaltic black soils and stony red-brown hard setting loams with clay subsoil. Found in moderately disturbed areas such as cleared woodlands, grassy roadside remnants, grazed land and highly disturbed pastures.	**Low** Species overlaps with RE 11.3.1 but preferred RE 11.8.11 and 11.8.5 not present on site.

3.3 Threatened Ecological Communities

Database searches identified the presence of three threatened ecological communities with the potential to occur within or around EPC 881. These are:

- Brigalow (*Acacia harpophylla* dominant and co-dominant);
- Weeping Myall Woodlands; and
- Natural Grasslands of the Queensland Central Highlands and the northern Fitzroy Basin.

Within Queensland, these ecological communities are associated with communities mapped as RE and Regrowth vegetation. The presence of an RE associated with a threatened ecological community does not necessarily mean that community is present on site as the vegetation may not meet threshold conditions for that community. These databases were reviewed during the desktop assessment and used to target field surveys towards areas potentially containing threatened ecological communities.

Table 2 lists the descriptions and **Figure 2** identifies the location of mapped vegetation communities with the potential to contain threatened Brigalow or Weeping Myall ecological communities. It is noted that REs depicting the presence of Natural Grasslands of the Queensland Central Highlands and the Northern Fitzroy Basin are not mapped within the vicinity of EPC 881. Although this community was considered unlikely to occur consideration was given to the presence of the species during site investigations.

Table 2: EPBC Threatened Ecological Communities

EPBC Threatened Community	Associated RE	RE Description	EPBC Status	RE Status	likelihood of occurrence
Brigalow (*Acacia harpophylla* dominant and co-dominant)	11.3.1	Open-forest dominated by *Acacia harpophylla* and/or *Casuarina cristata* (particularly in southern parts), with or without scattered emergent *Eucalyptus* spp. such as *E. coolabah, E. largiflorens, E. populnea, E. orgadophila, and E. pilligaensis*. The vegetation sometimes occurs as low open-forest or woodland. Associated with Cainozoic alluvial plains which may be occasionally flooded. Landforms range from level to very gently sloping plains, alluvial flats, drainage floors, back-swamps and abandoned channels. Associated soils are predominantly deep to very deep cracking clays, sometimes with gilgai or texture contrast soils with sandy surface (particularly where Eucalyptus populnea is present).	Endangered	Endangered	Likely in northern section of EPC 881
Weeping Myall Wetlands	11.3.2	*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*. Occurs on Cainozoic alluvial plains with variable soil types including texture contrast, deep uniform clays, massive earths and sometimes cracking clays.	Endangered	Of Concern	*Acacia pendula* likely present in areas mapped as RE 11.3.2 in southern section of EPC 881. However unlikely to meet threshold conditions to be considered a community.
Natural Grasslands of the Queensland Central Highlands and the Northern Fitzroy Basin	11.8.5 and 11.8.7	The regional ecosystems consistent with the description of Endangered Natural Grassland Communities include 11.8.5 and 11.8.7. These communities can also be found adjoining coolibah, brigalow and black tea tree areas on lower alluvial flats.	Endangered	Least Concern / Of Concern	Not present within EPC 881.

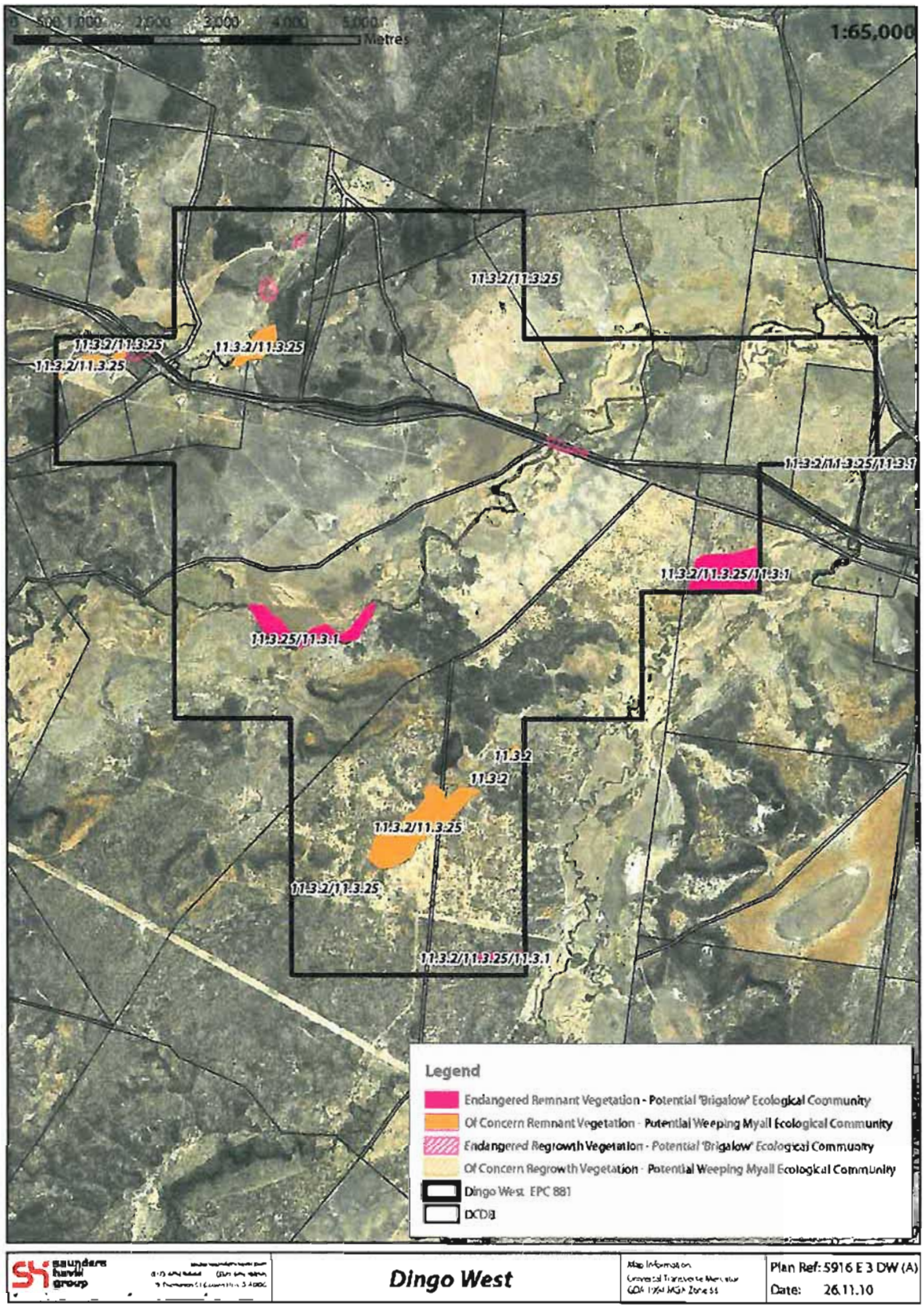

Figure 2: Potential Distribution of Threatened Ecological Communities on EPC 881

3.3.1 Brigalow Community

Vegetation communities potentially containing Brigalow, and within the vicinity of EPC 881, are mapped as RE 11.3.1 - *Acacia harpophylla Casuarina cristata* open forest on alluvial plains. Mapping shows that this regional ecosystem is restricted to the northern section of EPC 881, within alluvial areas associated with Charlevue Creek (refer to Figure 2).

Threshold Conditions

Brigalow ecological communities are listed and characterised by the presence of Brigalow (*Acacia harpophylla*) as one on the three most abundant tree species in the community (Butler 2007). Brigalow is usually dominant in the tree layer or co-dominant with other tree species such as *Casuarina cristata* (Belah), other species of *Acacia*, or species of *Eucalyptus*. Occasionally Belah, or species of *Acacia* or *Eucalyptus* may be more common than Brigalow within the broad matrix of Brigalow vegetation.

Butler (2007) considers that a "Brigalow" ecological community can be excluded from the list of Brigalow communities if it meets any one of the following three criteria:

- Vegetation has been comprehensively cleared (not thinned) within the past 15 years;
- Vegetation in which the exotic perennial plants have more than 50% cover, assessed in a minimum area of 0.5 ha (100 m by 50 m); and
- Individual patches of "Brigalow" that are smaller than 0.5 ha.

Assessment of Condition

Brigalow communities were mapped in the northern sections of the EPC; however, due to access restrictions the presence and condition of these communities could not be confirmed on site. Plate 6 shows a representative Brigalow community encountered within the Emerald Region. Generally, RE mapping is relatively consistent with the Federal Governments definition of a 'Brigalow Ecological Community'.

Given mine infrastructure is expected to be located in the southern section of the EPC Brigalow Communities are unlikely to be affected by the development.

Plate 6: Representative Brigalow Community on EPC 881

3.3.2 Weeping Myall Woodlands Community

The Queensland RE that indicates the potential presence of Weeping Myall Woodland within the proximity of the subject site is 11.3.2 - *Eucalyptus populnea* woodland on alluvial plains. This RE is mapped within the southern sections of EPC 881 and is associated with alluvial areas. It should be noted that RE 11.3.2 does not directly correlate to a Weeping Myall Woodland Ecological Community however it indicates that *Acacia pendula* individuals may be present. This RE type is generally dominated by *Eucalyptus populnea*.

The EPBC description of a Weeping Myall Woodland Ecological Community differs to RE 11.3.2. Under the EPBC description Weeping Myall Woodlands range from open woodlands to woodlands generally 4 - 12 m high. The overstorey is dominated by weeping myall (*Acacia pendula*) trees and in some cases it may be the only canopy species. Other woodland species may also form part of the overstorey of the ecological community including western rosewood (*Alectryon oleifolius subsp. elongates*); poplar box (*Eucalyptus populnea*); or black box (*Eucalyptus largiflorens*). The Weeping Myall Woodlands ecological community can naturally occur either as a grassy or shrubby woodland. However, the understorey often includes an open layer of shrubs over a ground layer which includes a diversity of grasses and forbs. There are over 80 species of plants that could be part of the ecological community.

In determining the presence of a Weeping Myall Ecological Community the EPBC identified threshold conditions must be considered.

Threshold Conditions

Weeping Myall goes through regular cycles of senescence and regeneration. As such, percentage canopy cover will fluctuate from very sparse to 30 percent. The death of canopy trees is not considered to be an indicator of poor condition.

Consequently, a patch must fit the following criteria in order to be included in the listed ecological community:

- The tree canopy is dominated (at least 50% of trees present) by living, dead or defoliated Weeping Myall trees; and
- The overstorey must have at least 5% tree canopy cover or at least 25 dead or defoliated mature Weeping Myall trees/ha; and
- The area is at least 0.5 ha in size; and
- The patch has either:
    - more than two layers of regeneration of Weeping Myall present; or
    - the tallest layer of living, dead or defoliated Weeping Myall trees is at least 4 m tall and of the vegetative cover present, 50% is comprised of native species.

Areas of leaf litter and cryptogams or soil crusts may be evident and acceptable as part of this ecological community.

Assessment of a patch must be done when 10% or more of the area is covered with either native or exotic vegetation, whether dead or alive, (this accounts for situations such as drought). Assessment timing must also consider the seasonality of understorey species. For example; in areas dominated by winter growing grass species, such as the southern extent of the community, sampling should be performed in winter. Whereas, areas dominated by summer growing grass species, such as the northern extent of the community, should be sampled in late spring to summer.

A patch is defined as a continuous area that entirely consists of an ecological community. Areas of other ecological communities such as woodlands dominated by other species are not included in a patch. The patch extends over the area up to 10 m beyond the dripline of the outermost trees where the understorey criteria are satisfied.

Areas where the understorey is not native, or areas that have been cultivated more than once in the last 30 years are considered to be so highly degraded

that they cannot be returned to a state in which they could be considered part of the listed ecological community. Such areas would include single paddock trees. However, although these trees are excluded from the listed ecological community, they retain their importance as habitat for many species, and could be managed with the goal of improving fauna habitat.

Assessment of Condition

RE 11.3.2 was located in the southern portion of the site with the largest part formed from a composite community with 11.3.25 – *Eucalyptus tereticornis* or *E. Camaldulensis* woodland fringing drainage lines. Access to the area's mapped as RE 11.3.2 was extremely limited due to heavy rainfall during the survey period. Weeping Myall plants were observed in this location, however the limited observations did not identify the presence of areas consistent with a Weeping Myall Ecological Community (i.e. vegetation observed contained some *Acacia pendula* individuals; however, they did not appear to be present at a high enough density to meet the threshold conditions).

Plate 7 shows an example of the RE 11.3.2 communities viewed on site.

Plate 7: Woodlands with Eucalyptus populnea viewed on site. Very few Acacia pendula were viewed in this area

3.3.3 Natural Grasslands of the Queensland Central Highlands and the Northern Fitzroy Basin.

The desktop assessment did not identify conditions suitable for the presence of natural grassland communities. These grassland communities generally occur on fertile cracking formed from tertiary basalt and on Permian shales. This community was not observed and is not considered likely to occur on site.

3.4 EPBC listed Fauna Species

Table 3 lists EPBC species identified as having the potential to be present on or utilise the site based on EPBC protected matters search tool as well as an assessment of the likelihood of these species occurring on the Dingo West site.

Detailed assessment of extant habitats was difficult due to access issues and weather constraints therefore a broad contextual site assessment of the study area has been conducted. The current investigations indicate that most of the listed species identified through the search are unlikely to be affected by the proposed mine.

Table 3: EPBC Listed Fauna Species

Common Name	Scientific Name	EPBC Status	Database searches		Likelihood of Occurrence / Impact
			EPBC Search Tool	WildNet records	
Fork-tailed Swift	*Apus pacificus*	M	x		This aerial species was not recorded from the subject site. The common species has few local records and is unlikely to be dependant on habitats within the study area. Overall there is little to no potential for any significant impact on this species.
Great Egret	*Ardea alba*	M	x		Known from the study area. This wide spread and common species was observed utilising flooded pastures and waterways. The proposed actions would not remove any significant or critical habitats. It has ability to move large distances and the local landscape provides a range of suitable habitats, many of which are outside of the disturbance area. Overall there is little to no potential for any significant impact on this species from proposed actions.
Cattle Egret	*Ardea ibis*	M	x		This introduced and common species was recorded in low numbers in association with domestic stock. There is no potential for significant impact on this species or its long term security in the local landscape.

Common Name	Scientific Name	EPBC Status	Database searches		Likelihood of Occurrence / Impact
			EPBC Search Tool	WildNet records	
Red Goshawk	*Erythrotriorchis radiatus*	V	x	x	Not recorded during the site visit. There are records in the wider landscape and the species could occur on or over the study area. This species prefers forest and woodland with a mosaic of vegetation types, large prey populations (birds), and permanent water. The vegetation types include eucalypt woodland, open forest, tall open forest, gallery rainforest, swamp sclerophyll forest, and rainforest margins. The study area has some vegetated portions and waterways which hold some value for the species. Although there is a potential for occurrence there is only a low likelihood of the subject area having any significant value. The proposed actions are not expected to result in any significant impact on this species or its long term presence in the local landscape.
Latham's Snipe, Japanese Snipe	*Gallinago hardwickii*	M	x		This common species has potential to utilise the wetter/swampier habitats within the study area. Latham's Snipe is a non-breeding visitor to south-eastern Australia, and is a passage migrant through northern Australia. There is little to no potential for any significant impact on this species.

Common Name	Scientific Name	EPBC Status	Database searches		Likelihood of Occurrence / Impact
			EPBC Search Tool	WildNet records	
Squatter Pigeon	*Geophaps scripta scripta*	V	x		Recorded from the study area. The Squatter Pigeon (southern) occurs mainly in grassy woodlands and open forests that are dominated by eucalypts. It has also been recorded in sown grasslands with scattered remnant trees, disturbed habitats (i.e. around stockyards, along roads and railways, and around settlements) and acacia growth, and remains relatively common in heavily-grazed country north of the Tropic of Capricorn (EPA 2006). The species is commonly observed in habitats that are located close to bodies of water. The Squatter Pigeon has been observed foraging along roads and railway lines (as in the study area) and around settlements with domestic fowl. The proposed action will remove some potential habitat and result in increased threats (e.g. increased vehicular movements). Although present in the study are this species is expected to remain within the study area and no significant impact is expected on the species or its long term presence in the local landscape.
White-bellied Sea-Eagle	*Haliaeetus leucogaster*	M	x		Known from the study area. Although present in the local landscape the study area has little to no suitable feeding resources (large water bodies or waterways) and the proposed actions will not remove any notable habitats or known breeding sites. No significant impact is expected.
White-throated Needletail	*Hirundapus caudacutus*	M	x		A wide ranging aerial species for which the study area and proposed actions have little to no relevance.
Barn Swallow	*Hirundo rustica*	M	x		Not known from the local area and unlikely to be present or dependant on local habitats. Overall this species should not be viewed as holding relevance to the study area or its extent habitats.

Common Name	Scientific Name	EPBC Status	Database searches		Likelihood of Occurrence / Impact
			EPBC Search Tool	WildNet records	
Rainbow Bee-eater	*Merops ornatus*	M	x		Known from the study area and recorded from site visits. This common widespread species is primarily an aerial species which although present in the local area is unlikely to be reliant or dependant on the extant habitats. The species may use some of the study area for breeding; however, overall there is little to no likelihood of any significant impact and the proposed actions will not result in any significant impact on the species or its occurrence in the local landscape.
Black-faced Monarch	*Monarcha melanopsis*	M	x		This species was recorded utilising the denser vegetated portions of the study area. This common species is relatively wide spread and no significant impact is expected from proposed actions.
Satin Flycatcher	*Myiagra cyanoleuca*	M	x		The Satin Flycatcher is primarily recorded in eucalypt forests, especially wet sclerophyll forest and they are widespread and common in Queensland. The study area has only low value for this species and the higher value habitats are outside of the proposed disturbance area. No significant impacts are expected on this species or its long term presence.
Star Finch	*Neochmia ruficauda ruficauda*	E	x		The star finch is not known from the study area and is unlikely / unexpected to occur. The proposed actions are not considered to have relevance to this species. No impacts expected.
Australian Cotton Pygmy-goose	*Nettapus coromandelianus albipennis*	M	x		This species is restricted to water bodies with fringing lilies. There is a water body of potential, outside of the proposed disturbance area, which could provide some habitat for this species if present in the local area. Overall it is unlikely to be present and no direct impacts are expected on the species or key habitat values.

Common Name	Scientific Name	EPBC Status	Database searches		Likelihood of Occurrence / Impact
			EPBC Search Tool	WildNet records	
Australian Painted Snipe	*Rostratula australis*	V, M	x	x	This species has potential to utilise the habitats within the study area. The Australian Painted Snipe generally inhabits shallow terrestrial freshwater (occasionally brackish) wetlands, including temporary and permanent lakes, swamps and claypans. They also use inundated or waterlogged grassland or saltmarsh, dams, rice crops, sewage farms and bore drains. Typical sites include those with rank emergent tussocks of grass, sedges, rushes or reeds. There are very few local records, although this species is somewhat cryptic. It is unlikely to be present within the study area and the disturbance area has little to no direct value. Overall there is only a low potential for any significant impact on this species.
Black-breasted Button-quail	*Turnix melanogaster*	V	x		The broad survey did not identify any habitats which hold potential for this species. The Black-breasted Button-quail is endemic to eastern Australia. It is restricted to coastal and near-coastal regions of south-eastern Queensland and north-eastern New South Wales. The main populations occur within south-east Queensland. The study area is unlikely to support this species and no direct impacts are expected to occur.
Large-eared Pied Bat	*Chalinolobus dwyeri*	V	x		No local records and not detected by anabat. In south-eastern Queensland the species has primarily been recorded from higher altitude moist tall open forest adjacent to rainforest recordings from site survey. The study area has little habitat of direct value and no significant impacts are expected on this species.
Northern Quoll	*Dasyurus hallucatus*	E	x		There are no local records of this species and the extant habitats have only low value. The waterways may provide short term habitat for movement within the local landscape. Overall, the species is unlikely to be present or impacted by proposed actions.

Common Name	Scientific Name	EPBC Status	Database searches		Likelihood of Occurrence / Impact
			EPBC Search Tool	WildNet records	
Greater Long-eared Bat,	*Nyctophilus timoriensis (South-eastern form)*	V	x		No local records and not detected during bat detection from the study area. It should be noted that the level of assessment has not been sufficient to completely dismiss the species presence in the local landscape. However, given the low likelihood of its presence and the relatively small disturbance area, and its highly modified environment, there is little to no likelihood of significant impact on this species.
Bridled Nail-tail Wallaby	*Onychogalea fraenata*	E	x		Not recoded from the site visit. The species was rediscovered near Dingo, Qld in 1973 and confirmed to be present on a few properties within a 10 km radius of Taunton (Gordon & Lawrie 1980). The only known significant population occurs in Taunton NP (Scientific), located near the town of Dingo (Davidson 1991; Lundie-Jenkins 2001). Although not recorded on the study area the survey effort was restricted and further work would be required to establish if the species is present. Given the potential for the species to occur, as suitable habitat is present, there is some potential for detrimental impact on this species or its habitat/s. Although potential to occur, if present suitable mitigation and management responses would see potential for direct impacts reduced to a relatively low level.
Collared Delma	*Delma torquata*	V	x		No local records and the extant habitats appear to be of relatively low value. Although there is some potential for the species to occur it should be noted this is relatively low, based on habitat values observed from preliminary site visit.

Common Name	Scientific Name	EPBC Status	Database searches		Likelihood of Occurrence / Impact
			EPBC Search Tool	WildNet records	
Ornamental Snake	*Denisonia maculata*	V	x	x	This species occurs in Brigalow *Acacia harpophylla* woodland growing on clay and sandy soils, riverside woodland, and open forest growing on natural levees (Shine 1983; Cogger *et al.* 1993). The species shows a preference for moist areas (Wilson & Knowles 1988). A known site in Brigalow woodland near Nebo had ample ground cover in the form of fallen timber, thick *Carissa ovata* bushes and small tussock grasses. Snakes at this site were only found in the vicinity of a complex of flooded gilgai. The species has also been caught within a small dry sandy creek bed, fringed by scattered River Red Gums (*Eucalyptus camaldulensis*) within a Poplar Box (*Eucalyptus populnea*) and Poplar Gum (*Eucalyptus platyphylla*) woodland with very small pockets of Brigalow (*Acacia harpophylla*) and Belah (*Casuarina cristata*) woodland (of <1 ha) some distance from the creek on cracking clays. The study area has potential habitats and although there is potential to occur, if present suitable mitigation and management responses would see potential for direct impacts reduced to a relatively low level.

Common Name	Scientific Name	EPBC Status	Database searches		Likelihood of Occurrence / Impact
			EPBC Search Tool	WildNet records	
Yakka Skink	*Egernia rugosa*	V	x		The Yakka Skink is usually found in open dry sclerophyll forest or woodland (Cogger 2000; Wilson & Knowles 1988). The core habitat of this species is within the Mulga Lands and Brigalow Belt South Bioregions. Other populations have been recorded throughout the Brigalow Belt North (east to the Rockhampton area) and Einasleigh Uplands bioregions. This species, and other similar skinks, often take refuge among dense ground vegetation, large hollow logs, cavities in soil-bound root systems of fallen trees and beneath rocks (Cogger 2000; Wilson & Knowles 1988). Alternatively, this species may also excavate burrow systems among low vegetation or below logs. The study area does contain habitats which hold potential for the species to occur and detailed survey work and targeted methodologies are required to establish if the species is present. In regard to the study the only habitats of relevance are the more vegetated woodland portions. The pastoral areas have little habitat value.
Dunmall's Snake	*Furina dunmalli*	V	x		No local records. Dunmall's snake is endemic to Queensland and occurs in the south-eastern interior of Queensland, especially the Darling Downs This species is generally associated with open forest and woodland, particularly Brigalow forest and woodland growing on floodplains of deep-cracking black clay and clay loam soils. The species is restricted almost entirely to the southern half of the Brigalow Belt bioregion. The study area has some habitats of potential. The actual likelihood of occurrence is relatively low and it is not expected to be present within the study area. The proposed disturbance area is unlikely to have importance to this species and no significant impacts are expected.

Common Name	Scientific Name	EPBC Status	Database searches		Likelihood of Occurrence / Impact
			EPBC Search Tool	WildNet records	
Allan's Lerista,	*Lerista allanae*	E	x		This species is not expected to be present within the study area. It is known from only three localities in central Queensland: Clermont, 55 km north-east of Clermont and 30 km north-west of Capella (Covacevich et al. 1996a). The entire range falls within the area boundary 22°50' – 23°06' S and 147°38' – 147°54'. Overall the site is unlikely to provide suitable habitat and no impacts are expected on this species. It should be noted that this species is considered as likely to be extinct.
Brigalow Scaly-foot	*Paradelma orientalis*	V	x		This Brigalow Scaly-foot is found in a wide variety of open forest habitats on several soil types and is known to occur within brigalow and acacia woodlands as well as eucalypt dominated forests. The study area holds habitats of some potential and the species could be present within the local landscape. It should be noted that the proposed disturbance area is unlikely to hold high value habitats and there is only a low potential for any direct impacts on this species. No significant impacts are expected.
Fitzroy River Turtle,	*Rheodytes leukops*	V	x	x	This turtle was first described in 1980 and is only found in the Fitzroy River and its tributaries, around Rockhampton in eastern central Queensland. The species occurs within permanent freshwater riverine reaches and large, isolated permanent waterholes. Although known within the broader landscape the study area has few portions where there is potential for the species to occur. Protection of suitable waterways and downstream habitats will mitigate any potential impacts on this species. No significant impacts are likely on this species.

3.5 Other Flora and Fauna

Remnant native vegetation on the site is predominantly associated with waterways in the northern and southern sections of the EPC. Most of these vegetation communities are mapped as Regional Ecosystems (REs) of 'Least Concern' under the *Queensland Vegetation Management Act 1999.*

The dominant vegetation communities in the region are woodlands dominated by *Eucalyptus crebra*, *Corymbia clarksoniana*, *C. citriodora* and *E. Moluccana* mixed with monospecific stands of *Acacia* spp (REs 11.5.2, 11.5.9 and 11.7.2). A large patch of these woodlands exist to the south of the EPC area.

During the field investigations a number of rapid assessments were carried out to confirm whether the vegetation met the criteria required to be considered and RE. The quality of the REs located was highly variable with some areas in a relatively intact state while other areas were infested with weed species. Exotic grasses were observed in the understorey of all RE types viewed. This is likely a result of edge effect caused by the surrounding land uses (i.e. clearing for cattle grazing and agriculture).

No fauna species of concern were noted from the desktop and field surveys outside of those listed under section 3.1(d).

3.6 Weeds

A weed species list for the EPC 881 area is included in Appendix C. The list comprises of observations within the EPC and surrounding areas. These species were identified during general and contextual ecological surveys and therefore should not be considered an exhaustive list of all weeds on the site. Generally speaking the understoreys of most areas of vegetation located on the EPC were impacted by weed species. Most weed species observed were exotic grasses and bushes.

4 Impact Potential and Conclusions

Targeted field surveys were conducted within EPC 881 (Dingo West) to identify the presence / absence of threatened species and ecological communities listed under the EPBC Act. The survey identified several matters that have the potential to be affected by future mining operations when assessed against the impact criteria for species and ecological communities listed as threatened under the EPBC Act (refer section 2.3 of this document). However, the majority of these impacts can be avoided or mitigated through consideration of site design and putting in place best practice management measures during construction and operational of the mine. The matters requiring consideration include:

- Potential presence of 'Brigalow' ecological communities limited to areas in the north of EPC 881 associated with Charlevue Creek;
- Potential for the presence of Weeping Myall ecological communities within alluvial areas in the south of EPC 881;
- Presence of Squatter Pigeons and associated habitats; and
- Habitats holding limited potential for the following fauna species:
    - Bridled Nail-tail Wallaby – limited potential to be located within wooded areas adjoining rocky outcrops adjoining the north and south west of EPC 881;
    - Collared Delma – limited potential to be located within vegetated / wooded areas near rocky outcrops;
    - Ornamental Snake – potentially occurring within Brigalow areas and complex flooded gilgai; and
    - Yakka Skink – limited potential within wooded areas with good ground cover (logs, etc).

Discussions with the client suggest that the proposed mining operation will be limited to the southern sections of EPC 881. Locating the mining operation within this area will limit the potential for the activity to impact on matters of National Environmental Significance. Specifically, locating the mining operation within the southern area will limit the ability to impact on 'Brigalow' communities potentially present within the north of the site associated with Charlevue Creek. In addition this limits the potential for the activity to impact on any Ornamental Snakes that may be present within 'Brigalow' areas. It is noted that there is a very limited potential for this species to occur on-site.

The location of the mining operation within the southern sections of EPC 881 will also limit the potential for impacts on EPBC listed species and communities highlighted within this survey, provided supporting infrastructure is appropriately placed to avoid areas of concern. Specifically the following surveys and

management measures should be considered for each of the potentially occurring EPBC species and communities.

- **Weeping Myall** – Figure 2 identifies the potential location of Weeping Myall woodlands on-site. The results of the preliminary site observations indicate that it is unlikely that any significant areas of Weeping Myall ecological community will be present on site. If present the mining operation (footprint) should be located to avoid impacts on these areas.

- **Squatter Pigeon** – the site survey confirmed the presence of and habitat for Squatter Pigeons over EPC 881. The proposed action is likely to remove some habitat and result in increased threats (vehicular movements). However this species is highly mobile and often observed foraging around disturbed areas adjoining road and rail lines. Overall the mining operation is unlikely to have a significant impact on this species or its long term presence in the local landscape.

- **Bridled Nail-tail Wallaby** – the site survey did not identify the presence of this species, however it has previously been recorded within Taunton National Park located to the north of the site. The EPC potentially provides fringing habitat for this species, which can be found in wooded areas adjoining rocky outcrops. Potential habitat is located to the north and south west of the site and therefore there is a limited potential that vegetation within EPC 881 could provide an extension of this habitat. Given the sites location and level of disturbance it is unlikely that the mining operation would have any impacts to this species.

- **Collared Delma** – This species has a low potential of occurring on-site based on site investigations. Given these habitat requirements it is very unlikely that the mining operation would impact on habitat for this species.

- **Ornamental Snake** – This species is unlikely to be impacted by the proposed mining operation given its habitat preference for Brigalow areas and complex flooded gilgai. Given the majority of the mining operation will be located in the southern parts of EPC 881 it is unlikely that the activity will result in impacts to this species (if present).

- **Yakka Skink** – This species is unlikely to be impacted by the proposed mining operation given its habitat requirements for wooded areas with good ground cover (logs, etc). The southern portions of EPC 881 where the proposed mining operation is intended contains limited habitat potential for this species.

In summary, when assessed against the criteria for having a significant impact on listed threatened species and ecological communities, the proposed Dingo West mining operation has limited potential to impact on the listed species and ecological communities identified above. Supporting infrastructure such as haul roads should be located to avoid direct impacts to these species and ecological communities. Management measures such as exclusion fencing around communities with high ecological values and erosion and sediment controls around works areas will potentially significantly reduce if not completely mitigate all offsite impacts. These management measures are considered standard at most work sites and are highly effective if implemented correctly.

It is unlikely that the majority of the species and ecological communities identified are actually present on site. Regardless, if present mine site design and operation could be undertaken in a manner that avoids and minimises any impacts to these species and communities.

5 References

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