Condobolin Ethanol Production Facility Ecological Impact Assessment Report

Final Report

for Agri Energy Limited

June 2007

0056132

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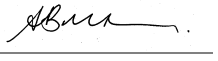
Prepared by:	*Amanda Bilton*
Position:	Ecologist
Signed:	
Date:	*June 2007*
Approved by:	*Jacqui Coughlan*
Position:	Principal Ecologist
Signed:	
Date:	*June 2007*

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FINAL REPORT

Agri Energy Limited

Condobolin Ethanol Production Facility
Ecological Impact Assessment

June 2007

Environmental Resources Management Australia
Building C, 33 Saunders Street
Pyrmont, NSW 2009
Telephone +61 2 8584 8888
Facsimile +61 2 8584 8800
www.erm.com

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1 INTRODUCTION

1.1 PURPOSE

Agri Energy Limited (AEL) seeks project approval for the development of an ethanol production facility at Condobolin, New South Wales (NSW), under Part 3A of the *Environmental Planning and Assessment Act, 1979 (*EP&A Act). Environmental Resources Management Australia Pty Ltd (ERM) has been engaged by AEL to prepare an ecological impact assessment for the construction and operation of the ethanol production facility.

Specifically, this ecological assessment describes flora and fauna within and surrounding the proposed facility at Condobolin and identifies potential or known habitat for threatened species and endangered ecological communities listed under the NSW *Threatened Species Conservation Act 1995* (TSC Act) and Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This report describes potential impacts to these threatened species and communities from the construction and operation of the proposed ethanol production facility and the significance of impacts is assessed by conducting an assessment of significance as described in the *Draft Guidelines for Threatened Species Assessment for developments assessed under Part 3A of the EP&A Act 1979* (DEC and DPI 2005). Safeguards and strategies to avoid, mitigate and/or ameliorate potential impacts are described.

1.2 SITE LOCATION

The site of the proposed ethanol production facility is wholly within the local government area of Lachlan. It is located along Micabil Road approximately five kilometres west of Condobolin, as shown in *Figure 1.1*. Condobolin is situated in the Central West region of NSW, approximately 460km west of Sydney and 100km west of Parkes. The site is within the Lachlan Catchment Area within the South Western Slopes Bioregion of NSW (Thackway and Cresswell 1995).

The subject site and surrounds and the proposed development are shown in *Figure 1.2*. The subject site comprises two parts:

- the *property* comprising one land parcel approximately 96 hectares (ha) in size, identified as Lot 32 of Deposited Plan (DP) 752093, where the ethanol production facility and associated holding dams and irrigation area will be positioned; and

- the *pipeline corridor* within which a subsurface raw water pipeline is to be constructed from the Lachlan River, running up the east side of Gum Bend Lake, across Crown Reserve 98048, Travelling Stock Reserve No. 54826 and the Orange – Broken Hill Railway easement, and an extension to the potable water pipeline from the Condobolin township adjacent to the raw water pipeline within Travelling Stock Reserve No. 54826 and the Orange – Broken Hill Railway easement.

Legend

Subject Site

Figure 1.1

Location of Subject Site

Client:	Agri Energy Limited	
Project:	Condobolin Ethanol Production Facility	
Drawing No:	0056132_ECO_GIS04	
Date:	19.02.2007	Drawing Size: A4
Drawn By:	DH	Reviewed By: -
Source:	Aerial: Department of Lands NSW	
Scale:	Refer to Scale Bar	

N

0 500 1000m

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Legend

- 200Ml Raw Water Dam
- 2Ml Stormwater Dam
- 40Ml Effluent Dam
- Irrigation Area
- Water Pump Station (existing) & Pipeline
- Subject Site
- Potable Water Pipeline - proposed
- Potable Water Pipeline - existing
- Internal Access Road
- Future Rail Siding
- Realigned Transmission Line

Figure 1.2

Subject Site and Proposed Site Layout

Client:	Agri Energy Limited	
Project:	Condobolin Ethanol Production Facility	
Drawing No:	0056132_ECO_GIS05	
Date:	24.05.2007	Drawing Size: A4
Drawn By:	DH	Reviewed By: -
Source:	Aerial: Department of Lands NSW Plant Layout: PDF DWG No: M06075-0311	
Scale:	Refer to Scale Bar	

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0 200 400m

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1.3 SITE DESCRIPTION

1.3.1 Historical Landuse And Existing Environment

The property is bounded by open agricultural cropping/ rural land to the north, east and west, and there are scattered rural residences to the east, including a residence approximately 100m from the eastern site boundary. It is bounded by Micabil Road and the Orange - Broken Hill Railway line along part of its southern boundary, on the other side of which is a Travelling Stock Reserve (Route 17), Gum Bend Lake, which is an artificial recreational waterway located approximately 330m to the south and the Gum Bend Lake Recreation Reserve. The Lachlan River is located approximately 830m south of the property.

The property comprises former agricultural cropping land and, as such, the majority of the site has been cleared of native vegetation. As a result of former agricultural cropping practices, the property currently supports primarily open grassland dominated by agricultural cropping species such as Barley (*Hordeum leporinum*) and Rye Grass (*Lolium perenne*). Stands of native trees (Eucalyptus and Acacia) are located around the periphery of the property, with a larger stand of native vegetation existing in the south-western corner of the property.

The Orange - Broken Hill Railway line passes through the south-west corner of the property. There is a relatively small area in the north of the property that is used for the storage of agricultural and farm machinery, inclusive of a steel framed farm materials and machinery shed. Two shallow farm dams are located respectively in the south-east and south-west corners of the property.

Historic agricultural cropping and the current agricultural storage have greatly modified the indigenous vegetation and considerably diminished ecological value of the property.

The land along the pipeline corridor, within the Travelling Stock Reserve and in the vicinity of Gum Bend Lake has been subject to land clearing and soil disturbance. However, this area generally supports a greater abundance of native tree species than the property.

1.3.2 Landform, Soil Type And Vegetation Communities.

Native vegetation mapping by the NSW Department of Land and Water Conservation (2002) indicates the subject site is located on landform characterised by alluvial plains, plains, peneplains and floodplains. A large portion of the property has been mapped as heavily modified (NV) comprising non-native, non-vegetated area supporting standing crops or bare ground. The remainder of the property comprises drainage depressions and river terraces (Map unit code GRL2), with light sandy clay loam soils to medium/heavy clays; typically heavier textured soils. These soils support vegetation dominated by grassland and herbaceous communities and trees are generally sparse. This community type generally displays evidence of previous cropping.

The land around Gum Bend Lake has also been mapped as supporting grassland/herbaceous communities of the floodplains and alluvial plains (GRL1), however, there is no evidence of cropping within this community.

The land adjacent to the Lachlan River has been mapped as supporting riparian woodlands and open forests on floodplains and alluvial plains of fine sandy loam to medium clay soils (grey clays and red-brown clays).

Patches of woodland and open forest of the floodplains (FLP3), occurring on sandy clay loams to medium clays, have been mapped immediately to the south and east of the subject site.

1.4 THE PROPOSAL

The proposal includes the construction of an ethanol production plant including grain storage bunkers, water and effluent storage dams and an irrigation area on the property. The layout of the proposed development is shown in *Figure 1.2*.

The ethanol production plant will be positioned in the northern portion of the site. It will have a footprint of approximately 300m x 300m and will include:

- a bunded storage building where all chemicals and products (other than grain and ethanol) stored on the site will be kept;
- a maintenance workshop and store which also includes a crop services facility;
- two 7000 tonne grain storage silos with a maximum height of 35m (these will be the tallest buildings on the site);
- a 1300 tonne shift silo;

- a milling section including two hammermills;
- a fermentation structure;
- a liquefaction and saccharification area;
- a distillation structure and tower;
- a boiler building;
- a cooling tower;
- a two storey building which houses the ring dryer for drying WDGS to produce DDGS;
- a bunded ethanol storage area which houses two anhydrous ethanol storage tanks, an off-spec storage tank and a gasoline storage tank; and
- a bunded storage building where WDGS and DDGS are stored.

A grain storage area comprising six grain bunkers will be located adjacent to the main buildings. These bunkers will be circumnavigated by a one-way road that is surfaced with a prepared road base foundation.

Site access off Micabil Road will be upgraded and internal roads will be sealed and sufficiently wide to accommodate passing vehicles. There will be a weigh bridge, a light vehicle parking area with 40 spaces and a truck standing area. An office/ administration area will be constructed adjacent to the weighbridge and will comprise a reception area, offices, meeting rooms, bathroom facilities and a first aid room. Once the plant is operational the option of rail transportation of grain and ethanol product may be investigated. This would require on-site construction of a rail siding to connect with the Orange - Broken Hill Railway.

Three dams will be constructed on the property as follows:

- *2Ml stormwater dam* – located adjacent to the production buildings to hold and evaporate runoff from the buildings and hard surface areas;
- *40Ml effluent dam* - located south of the production buildings to store process wastewater from the facility, for pumping to the irrigation area; and
- *200Ml raw water dam* – located immediately west of the production buildings to store water pumped from the Lachlan River and supply all plant water needs (approximately 5.06Ml per day).

A salt evaporation system will be located adjacent to the ethanol plant and effluent dam to manage process wastewater with a high salt content that is discharged from the facility.

A subsurface pipeline will be constructed from the existing water pumping station (owned and maintained by Council) adjacent to the Lachlan River, to the raw water dam on the property. An extension from Condobolin's piped town water supply will be constructed to supply potable water to the site.

AEL proposes to establish approximately 55ha of cropping (refer *Figure 1.2*), which will be irrigated with plant wastewater. The irrigation area will provide a future crop resource and its irrigation will facilitate reuse of any plant wastewater not recycled back into the process.

Ethanol product will be transported from the site by truck to the Sydney, and to a lesser extent, Canberra market.

2 METHODOLOGY

2.1 DESKTOP ASSESSMENT

Preliminary background literature reviews and database searches were undertaken to obtain information on flora and fauna species and vegetation communities likely to occur on the subject site or surrounding area. This included searches for threatened species listed under the TSC Act and the EPBC Act previously recorded within a 10km radius of the site (the 'locality'). Sources of information included:

- the NSW Department of Environment and Conservation (DEC) Wildlife Atlas Database;
- the Department of Environment and Heritage (DEH) online search for Matters of National Environmental Significance (NES);
- BioNet online search tool for records of threatened species locations in NSW within the DEC, Australian Museum and Department of Primary Industries databases;
- aerial photographs; and
- the NSW Department of Land and Water Conservation Native Vegetation Map (Condobolin – 8331) (2002).

2.2 FIELD INVESTIGATIONS

A field investigation of the subject site was undertaken by two ecologists on 10 October 2006. The entire area was traversed on foot to identify flora, fauna and fauna habitat within and surrounding the proposed development.

2.2.1 *Flora*

A random meander search was used to collect information regarding species presence over the majority of the subject site including along the proposed pipeline route. Areas of the subject site that were found to support a higher diversity of native groundcover and canopy tree species were subject to a more thorough investigation. Two 20m x 20m quadrats were established within these areas and all flora species within the quadrats were identified. The location of the quadrats is shown in *Figure 3.2.*

2.2.2 *Fauna And Fauna Habitat*

The subject site was assessed for its potential to provide habitat for threatened fauna species by recording the occurrence of the following habitat characteristics:

- the presence of nesting / shelter sites such as tree hollows, litter, fallen timber and logs, and rocks;
- the cover/abundance of ground, shrub and canopy layers;
- the presence of free water or waterbodies; and
- rocks and basking sites for reptiles.

Opportunistic observations of fauna were noted and thorough searches for traces such as tracks, scats, scratches on and around trees were also conducted.

3 RESULTS

3.1 DESKTOP ASSESSMENT

3.1.1 Vegetation Mapping

Vegetation within the majority of the subject site has been mapped by NSW Department of Land and Water Conservation (2002) as being a highly modified, non-native/non-vegetated area supporting standing crop or bare ground dominated by exotic species.

The remainder of the property has been mapped as supporting a non-woody vegetation community comprising grassland/herbaceous communities of the floodplains and alluvial plains (GRL2). This community supports medium to high, tall to closed tussock grasslands with a dense groundcover comprised of tussock and sod grasses, native and exotic forbs, ferns and sedges. The shrub stratum within this community is described as very sparse, comprising chenopod species where present, and trees are rare, providing less than 5% cover. The presence of agricultural crop species and evidence of previous cropping are also features of this community.

The land around Gum Bend Lake has been mapped as GRL1, supporting grassland/herbaceous communities floristically similar to that of the property. However, this community type has generally not been subject to cropping.

The land adjacent to the Lachlan River has been mapped as supporting riparian woodlands and open forests (FLP1) dominated by the tree species River Red Gum (*Eucalyptus camaldulensis*) and /or *E. melliodora* with scattered *E. populnea* subsp. *bimbil* and Black Box (*E. largiflorens*). The shrub stratum in this community is described as patchy to very sparse with an even to dense groundcover dominated by tussock and sod grasses, native and exotic forbs, rushes and sedges.

Patches of woodland and open forest of the floodplains (FLP3), have been mapped immediately to the south and east of the subject site. This community is dominated by Black Box with scattered River Red Gum and *Casuarina cristata* rarely with *E. Populnea* subsp. *bimbil*. The shrub stratum in this community supports a number of Acacia and chenopod species including Weeping Myall (*Acacia pendula*).

3.1.2 *Threatened Species*

Database searches revealed three threatened fauna species, Brolga, (*Grus rubicunda*), Brush-tailed Phascogale (*Phascogale tapoatafa*) and the Superb Parrot (*Polytelis swainsonii*), and one threatened flora species, the spear grass *Austrostipa wakoolika*, listed under the TSC Act and previously recorded within the locality. The Superb Parrot is also listed as vulnerable and *A. wakoolica* is listed as Endangered under the EPBC Act. The location of these records is shown in *Figure 3.1.*

The DEH search for matters of NES listed under the EPBC Act revealed a further five threatened flora species, five threatened fauna species and four migratory species, or their habitat, as having the potential to occur within the locality. These species are shown in *Table 3.1.*

Table 3.1 EPBC Act listed flora and fauna species or their habitat considered likely to occur in the locality.

Species name	Common name	Status
Threatened Flora		
Diuris sheaffiana	Tricolour Diuris	Vu
Eleocharis obicis		Vu
Lepidium monoplocoides	Winged Pepper-cress	En
Stipa metatoris		Vu
Swainsona murrayana	Slender Darling-pea, Slender Swainsona, Murray Swainson-pea	Vu
Threatened Fauna		
Birds		
Leipoa ocellata	Malleefowl	Vu, Mi
Rostratula australis	Australian Painted Snipe	Vu
Mammals		
Nyctophilus timoriensis (South-eastern form)	Eastern Long-eared Bat	Vu
Fish		
Maccullochella peelii peelii	Murray Cod	Vu
Macquaria australasica	Macquarie Perch	En
Migratory Species		
Haliaeetus leucogaster	White-bellied Sea-Eagle	Mi
Hirundapus caudacutus	White-throated Needletail	Mi
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	Mi
Rostratula benghalensis s. lat.	Painted Snipe	Mi

1. Vu = vulnerable, En = endangered, Mi = migratory

The likelihood of these threatened and migratory species occurring at the subject site was assessed by comparing the known habitat requirements of these species with habitat availability at the subject site, following the results of the field investigation. The results of this assessment are presented in *Table 3.3.*

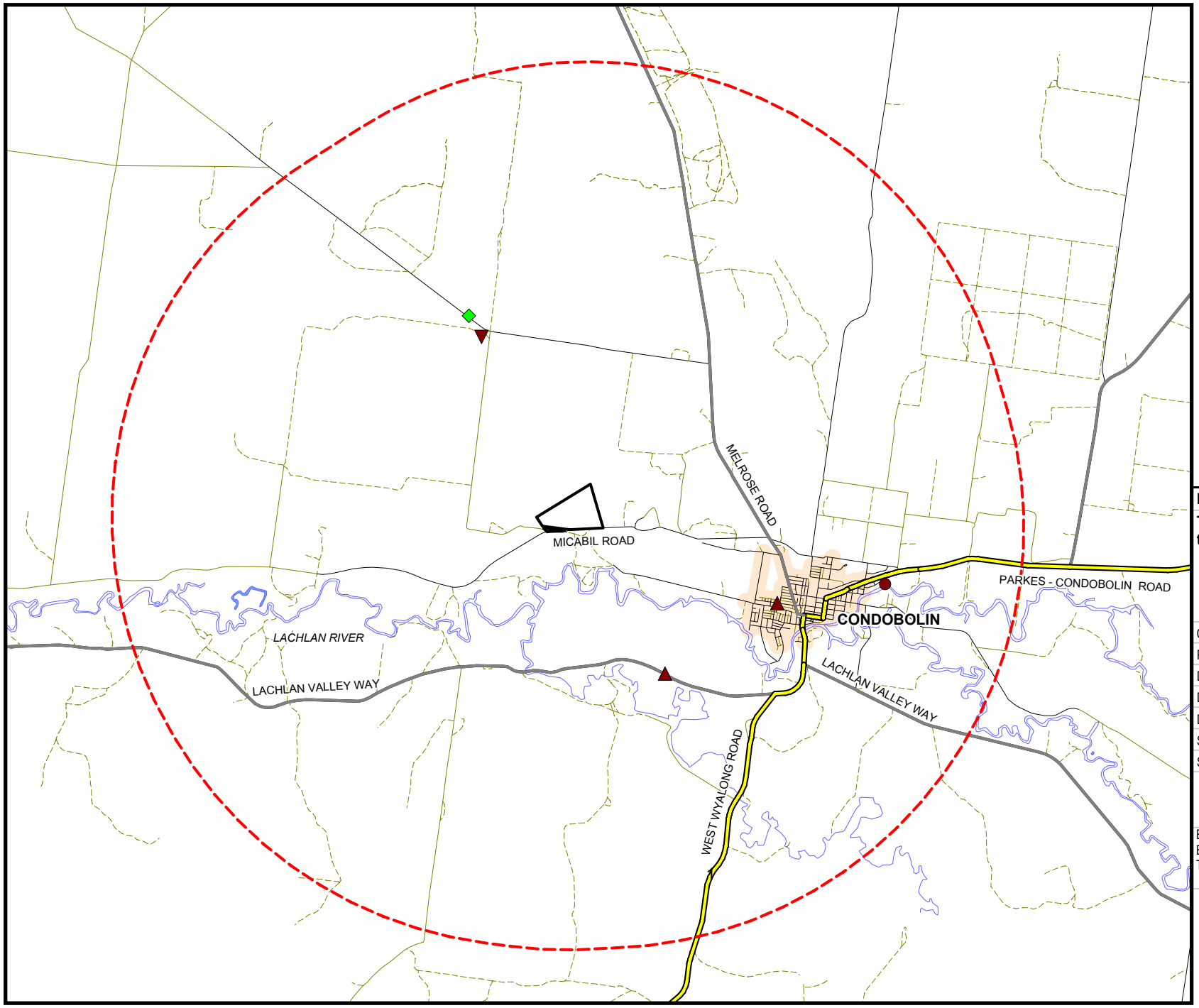
3.1.3 Endangered Ecological Communities

The DEH and DEC database searches indicated the potential presence of the following three endangered ecological communities (EECs) within the locality:

- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland* - critically endangered (EPBC Act; TSC Act);

- *Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South-Western Slopes* (TSC Act). *Weeping Myall Open Woodlands of the Riverina, NSW South-Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions* is also currently nominated for listing under the EPBC Act; and

- *Fuzzy Box Woodland on alluvial Soils of the South Western Slopes, Darling Riverine Plains and Brigalow Belt South Bioregions* (TSC Act).



Legend

- Site Boundary
- Approximate 10km Radius
- *Austrostipa wakoolica*
- Brolga
- Brush-tailed Phascogale
- Superb Parrot

Figure 3.1

Threatened Species Recorded within the Locality (DEC)

Client:	Agri Energy Limited	
Project:	Condobolin Ethanol Production Facility	
Drawing No:	0056132_ECO_GIS02	
Date:	06.02.2007	Drawing Size: A4
Drawn By:	DH	Reviewed By: -
Source:	DEC	
Scale:	Refer to Scale Bar	

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3.2 FIELD INVESTIGATIONS

3.2.1 Flora

Property

Site photographs are shown in *Annex A.* Flora identified across the property was consistent with that mapped by the Department of Land and Water Conservation (2002). That is, the majority of the property was found to be highly disturbed, consisting of ploughed pasture dominated by exotic grass and groundcover species *(refer to Photograph A.1*). The exotic ground cover species Barley Grass, Rye Grass and Oats (*Avena fatua*) were present and dominated the ground cover vegetation across the majority of the property. Additional native species present across the property included *Whalenbergia* sp., Wallaby Grass (*Austrodanthonia* sp), Speargrass (*Stipa* sp) and Umbrella Wattle (*Acacia oswaldii*).

Shrubs were largely absent across the property, but relatively more abundant within the areas supporting canopy vegetation. Shrub species included African Boxthorn (*Lycium ferocissimum*).

Canopy vegetation was present, and virtually continuous along the length of the northern (refer to *Photograph A.2*) and southern boundaries of the property. Canopy species along the northern boundary included White Cypress Pine (*Callitris glaucophylla)*, Bimble Box (*Eucalyptus populnea*) and a few Weeping Myall and *Eremophila mitchelli*. Canopy species along the southern boundary comprised the eucalypts Bimble Box and Black Box. A small, monotypic stand of large and mature Black Box was present in the south-eastern corner of the property. Groundcover vegetation in this area was disturbed and dominated by exotic species.

The south-western corner of the property was relatively more heavily timbered and supported overstorey vegetation dominated by Weeping Myall with a few White Cypress Pine and Bimble Box trees scattered throughout. The mistletoe species *Amyema quandang* was present within many of the Weeping Myall trees. Ground cover species within this woodland was disturbed and dominated by exotic species but included native ground cover species such as Wallaby Grass and Speargrass.

The presence of Weeping Myall as the dominant canopy species within the south-western portion of the property and along the northern boundary indicates that the woodlands are a remnant of the EEC *Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South-Western Slopes.*

No threatened flora species were recorded during the site inspection.

Pipeline Corridor

Vegetation surrounding the existing pumping station on the banks of the Lachlan River consisted of canopy vegetation dominated by River Red Gum, with a highly disturbed understorey dominated by exotic ground cover species including *Bromus* sp, Rye Grass, Oats and Barley Grass (refer to *Photograph A.3*), Sowthistle (*Sonchus oleraceus*) and African Boxthorn. Only a few native species, including *Vittadinia cuneata*, Wallaby Grass and *Austrostipa* sp., were recorded within this area.

Vegetation along the proposed pipeline corridor was mainly cleared (refer to *Photograph A.4)* and supported ground layer vegetation dominated by exotic species with an overstorey of scattered canopy trees including mature Black Box and a few River Red Gums, as well as some eucalypt regrowth adjacent to the banks of the lake.

3.2.2 Endangered Ecological Communities

One EEC, *Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South-Western Slopes* was identified as occurring on the property. This community is listed as endangered under the TSC Act and is currently listed for nomination under the EPBC Act. The distribution of this community across the subject site is shown in *Figure 3.2.* and photographs are given in *Photograph A.5* and *Photograph A.6*.

The presence of this community on the subject site was identified primarily by the presence of mature Weeping Myall as the dominant canopy tree species. The ground cover was generally sparse and disturbed, due to past agricultural cropping activities, and dominated by exotic species. A number of native species characteristic of this community were recorded within the ground and shrub layers of the remnant patches of this vegetation community.

3.2.3 Fauna

A list of fauna species recorded on the subject site is provided in *Table 3.2*.

No mammal, reptile or amphibian species were observed on the subject site during the field investigation. The presence of Eastern Grey Kangaroos on the subject site was determined through the presence of scats.

A total of 15 bird species were recorded on the property. The majority of these were common woodland species (including Galahs, Apostlebirds, Red-rumped Parrots, Australian Magpies, Noisy Miners and White-winged Choughs) and were recorded within the patches of remnant woodland in the south-west of the property and within trees around the periphery of the site. The Apostlebirds were observed to be nesting within the woodland in the south-western portion of the property.

One threatened fauna species, the Grey-crowned Babbler (*Pomatostomus temporalis temporalis*), was recorded within the woodland in the south-west of the property (refer *Figure 3.2*) and another group of Babblers was heard calling to the west of the subject site. The Grey-crowned Babbler is listed as vulnerable under the TSC Act. The online resource BioNet was used to search for records of this species outside of the immediate locality and revealed a further five records of this species within 12 – 20 km of the subject site.

Thirteen bird species were recorded on Gum Bend Lake, eight of which were waterbirds.

Four species of common woodland birds were also recorded within the vicinity of the pumping station.

Table 3.2 Fauna recorded during the site inspection.

Common Name	Species Name	Location			
		Property	Within immediate vicinity of the Property	Gum Bend Lake	Pumping Station
Birds					
Apostlebird*	*Struthidea cinerea*	x			
Australian Magpie	*Gymnorhina tibicen*	x	x		
Australian Raven	*Corvus coronoides*	x	x		
Black Kite	*Milvus migrans*			x	
Black Swan	*Cygnus atratus*			x	
Black-shouldered Kite*	*Elanus notatus*	x			
Black-winged Stilt	*Himanoptus himanoptus*			x	
Blue Bonnet*	*Psephotus haematogaster*	x			
Brown Songlark	*Cinclorhamphus cruralis*	x			
Crested Pigeon	*Ocyphaps lophotes*	x			
Galah*	*Cacatua roseicapilla*	x		x	
Grey Butcherbird	*Cracticus torquatus*	x			
Grey Heron	*Ardea cinerea*			x	
Grey-crowned Babbler*	***Pomatostomus temporalis temporalis***	**x**	**x**		
Gull-billed Tern	*Sterna nilotica*			x	
Kookaburra	*Dacelo novaeguineae*				x
Little Friar Bird	*Philemon citreogularis*				x
Little Pied Cormorant	*Phalacrocorax melanoleucos*			x	
Little Raven	*Corvus mellori*		x	x	
Magpie-lark	*Grallina cyanoleuca*			x	
Mistletoebird	*Dicaeum hirundinaceum*	x			
Noisy Miner	*Manorina melaocephala*	x	x		x
Pacific Black Duck	*Anas superciliosa*			x	
Pelican	*Pelecanus conspicillatus*			x	
Red-rumped parrot	*Psephotus haematonotus*	x			x
Striated Pardalote	*Pardalotus striatus*		x		
Variegated Wren*	*Malurus assimilis*	x			
White-winged Chough	*Corcorax melanorhamphos*		x		
Willy Wagtail*	*Rhipidura leucophrys*	x		x	
Yellow-billed Spoonbill	*Platalea flavipes*			x	
Mammals					
Eastern Grey Kangaroo#	*Macropus giganteus*	x			

* located within woodland in the south-western portion of the **property**

identified from scats

Bold = threatened species (TSC Act)

Figure 3.2

Location of Vegetation Quadrats, Grey-crowned Babblers and Myall Woodland across the Subject Site

Client:	Agri Energy Limited	
Project:	Condobolin Ethanol Production Facility	
Drawing No:	0056132_ECO_GIS03	
Date:	24.05.2007	Drawing Size: A4
Drawn By:	DH	Reviewed By: -
Source:	Aerial: Department of Lands NSW Plant Layout: PDF DWG No: M06075-0311	
Scale:	Refer to Scale Bar	

N

0 200 400m

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3.2.4 Fauna Habitat

Given that the majority of the property has been cleared of native vegetation and supports open grassland dominated by exotic species, there is only limited habitat for native fauna. Fauna habitat was primarily present in the form of mature canopy trees which may provide nesting / shelter and foraging habitat for native species. These were mainly present as scattered stands of trees located around the periphery of the property and within the remnant patches of Myall Woodland. Almost all of the bird species recorded at the property were located within the woodland areas and areas supporting trees.

A number of large, mature trees (Black Box) located within the south-east corner of the property had numerous hollows, of various sizes, providing suitable nesting habitat for birds. Many stick nests were also observed in the trees in the woodland section in the south-west of the property and within the trees along the northern boundary of the property.

Two water bodies, in the form of small, shallow farm dams were located on the property (see *Figure 3.2*). Both dams were completely exposed and had eroded, earthen banks with little or no emergent, trailing or surrounding vegetation or shelter sites. For these reasons they are unlikely to provide suitable habitat for aquatic species such as native frog species, and possibly only marginal habitat for waterbirds, such as the Pacific Black Duck, two of which were recorded on the dam in the south-east of the property.

Gum Bend Lake, located to the south of the property and adjacent to the pipeline corridor is a man-made, recreational area that is used for camping and water sports. Seven species of waterbird were recorded at the lake during the site inspection. The banks of the lake are predominantly maintained as landscaped, mown grassy areas with little to no trailing, emergent or bankside vegetation (see *Photograph A.7* and *Photograph A.8*) and thus provide only minimal breeding and shelter habitat for waterbirds and aquatic fauna such as frogs. Many of the birds were observed foraging on the shores of an island in the middle of the lake. The island is relatively more heavily vegetated and subject to relatively little human disturbance and thus may provide more suitable breeding and shelter habitat for aquatic fauna. However, goats were also observed on the island.

Leaf litter, ground debris, logs or fallen trees that may provide shelter and foraging habitat for ground-dwelling native reptiles and mammals and foraging habitat for insectivorous birds were absent across the majority of the subject site. However, fallen woody debris was relatively abundant within the woodland area in the south-west of the property.

Fauna habitat within the pipeline corridor was largely limited to canopy trees providing nesting/roosting and foraging resources. The location of the pumping station supports a few large, River Red Gums, with many hollows of various sizes. These trees provide important nesting/roosting and breeding habitat for native birds such the Galahs, Red-rumped Parrots, Noisy Miners, and Kookaburras observed in the area. A number of large, mature, hollow-bearing trees (mainly Black Box and River Red Gums) were also located within the Gum Bend Reserve in the vicinity of the pipeline corridor.

3.2.5 Likely Occurrence Of Threatened And Migratory Species

Table 3.3 provides an assessment of the likely occurrence of threatened and migratory species (identified from the database searches as recorded or potentially occurring within the locality) within the subject site. The requirement to undertake an assessment of significance of potential impacts from the proposal was determined based on the likelihood of occurrence of the threatened species at the site and the extent of the proposed development.

The likely occurrence of threatened and migratory species on the subject site was considered to be low for the majority of species. The Grey-crowned Babbler was recorded on the subject site and an assessment of significance was conducted for this species (*Annex B*). An assessment was also conducted for the areas identified as Myall Woodland which is listed as an Endangered Ecological Community under the NSW TSC Act (*Annex B*).

Whilst the Macquarie Perch is known from the Lachlan River catchment, there are no records of this species from within a 10km radius of the site. Since there will be no additional water extracted from the Lachlan River under this proposal (an existing licence will be purchased) and no other impacts to potential habitats in the Lachlan River, impacts on the fish if it were to occur in this reach of the river were considered unlikely.

Table 3.3 Assessment of Likely Occurrence of Threatened and Migratory Species within the Subject Site and Requirement for Impact Assessment.

Scientific Name	Common Name	Conservation Status TSC Act	Conservation Status EPBC Act	Preferred Habitat	Likelihood of Occurrence	Assessment of Significance Required?
Flora						
Austrostipa wakoolica		En	En	Floodplains of the Murray River tributaries in open woodland on grey, silty clay or sandy loam soils. Edges of lignum swamps with Box and mallee; creek banks in grey, silty clay; mallee and lignum sandy-loam flat; open cypress Pine forest on low sandy range, low rocky rise. Associated species include *Callitris glaucophylla, Eucalyptus microcarpa, E. populnea, Austrostipa eremophila, A. drummondii, Austrodanthonia eriantha, Einadia nutan*s (DEC 2006).	Low. Due to disturbed nature of subject site. Not identified during site inspection or as part of known species composition of remnant Myall Woodland recorded on subject site (DEC 2006).	No
Diuris sheaffiana	Tricolour Diuris	Vu	Vu	Associated species include *Callitris glaucophylla, Eucalyptus populnea, E. intertexta*, Ironbark and Acacia shrubland. Understorey often grassy with herbaceous plants such as Bulbine species. Sclerophyll forest among grass, often with native Cypress Pine (*Callitris* spp.). Sandy soils, either on flats or small rises. Also recorded from a red earth soil in a Bimble Box community (DEC 2006).	Moderate. Not previously recorded from the locality (DEC 2006), however, potential habitat within remnant woodland on subject site.	No. Remnant woodland areas to be retained within proposal.

Scientific Name	Common Name	Conservation Status TSC Act	Conservation Status EPBC Act	Preferred Habitat	Likelihood of Occurrence	Assessment of Significance Required?
Eleocharis obicis	Spike-rush	Vu	Vu	Ephemerally wet situations such as roadside mitre drains and depressions, usually in low-lying grasslands. Sites include depressions with heavy clay soils on the Lachlan River floodplain, with *Eragrostis australasica, Atriplex vesicaria* and *A. nummularia* shrublands, low-lying claypans near an irrigation channel, and a shallow open ditch on a low ridge with *Eucalyptus populnea* in red sandy soil over clay (DEC 2006).	Low. Due to disturbed nature of subject site. Not previously recorded within the locality (DEC 2006) and not identified during site inspection or as part of known species composition of remnant Myall Woodland recorded on subject site (DEC 2006).	No
Lepidium monoplocoides	Winged Pepper-cress	En	En	Seasonally moist to waterlogged sites, on heavy fertile soils. Predominant vegetation usually open woodland dominated by *Allocasuarina luehmannii* (Bulloak) and/or eucalypts, particularly *Eucalyptus largiflorens* (Black Box) or *E. populnea* (Poplar Box). The field layer of the surrounding woodland is dominated by tussock grasses. Recorded in a wetland-grassland community comprising *Eragrostis australasicus, Agrostis avenacea, Austrodanthonia duttoniana, Homopholis proluta, Myriophyllum crispatum, Utricularia dichotoma* and *Pycnosorus globosus*, on waterlogged grey-brown clay (DEC 2006).	Moderate. Not previously recorded from the locality (DEC 2006), however, potential habitat within remnant woodland on subject site.	No. Remnant woodland areas to be retained within proposal.
Stipa metatoris	A spear grass	Vu	Vu	Grows in sandy areas of the Murray Valley; habitats include sandhills, sandridges, undulating plains and flat open mallee country, with red to red-brown clay-loam to sandy-loam soils (DEC 2006).	Low. Lack of suitable habitat on subject site. Not previously recorded within the locality (DEC 2006).	No

Scientific Name	Common Name	Conservation Status TSC Act	Conservation Status EPBC Act	Preferred Habitat	Likelihood of Occurrence	Assessment of Significance Required?
Swainsona murrayana	Slender Darling-pea, Slender Swainson, Murray Swainson-pea	Vu	Vu	Clay-based soils, ranging from grey, red and brown cracking clays to red-brown earths and loams. Grows in a variety of vegetation types including bladder saltbush, black box and grassland communities on level plains, floodplains and depressions and is often found with Maireana species. Plants have been found in remnant native grasslands or grassy woodlands that have been intermittently grazed or cultivated (DEC 2006).	Low. Due to disturbed nature of subject site. Not previously recorded within the locality (DEC 2006) and not identified during site inspection or as part of known species composition of remnant Myall Woodland recorded on subject site (DEC 2006).	No
Fauna						
Birds						
Grus rubicunda	Brolga	Vu	-	Freshwater swamps, flooded grasslands, margins of billabongs, lagoons, dry grasslands, floodplains, irrigated pastures (Morcombe 2004). Often feed in dry grassland, ploughed paddocks, desert claypans but also dependant on wetlands, especially shallow freshwater swamps for foraging and breeding habitat (DEC 2006).	Low. Potential foraging habitat on subject site but lack of suitable aquatic habitat. Potential occurrence within Gum Bend Lake.	No. Suitable habitat within Gum Bend Lake unlikely to be impacted by the proposal.
Polytelis swainsonii	Superb Parrot	Vu	Vu	Box-Gum, Box-Cypress-Pine, Borree Woodlands and River Red Gum Forest. In Riverina - nest in hollows of large trees mainly in tall riparian River Red Gum Forest. In South-west Slopes region - nest in Box-Gum Woodland or isolated paddock trees. Known nest trees include Blakeley's Red Gum, Yellow Box, Apple Box and Red Box (DEC 2006).	Low. Lack of suitable nesting and foraging habitat on site. Optimal habitat located nearby along banks of the Lachlan River. Potential occurrence within area of pumping station and pipeline route.	Yes. Pipeline construction may require removal of a few isolated, hollow-bearing trees.

Scientific Name	Common Name	Conservation Status TSC Act	Conservation Status EPBC Act	Preferred Habitat	Likelihood of Occurrence	Assessment of Significance Required?
Leipoa ocellata	Malleefowl	En	Vu, Mi	Mallee communities, preferring tall, dense, floristically-rich mallee found in higher rainfall (300-450 mm mean annual rainfall) areas. Less frequently found in other eucalypt woodlands (e.g mixed Western Grey Box and Yellow Gum or Bimble Box, Ironbark-Callitris Pine, Callitris Pine, Mulga (*Acacia aneura*), and Gidgee(*A. cambagei*). Prefer areas of light sandy to sandy loam soils and habitats with a dense but discontinuous canopy, dense and variable shrub and herb layers (DEC 2006).	Low. Lack of suitable habitat and not previously recorded in the locality (DEC 2006).	No
Rostratula australis	Australian Painted Snipe	Vu	Vu, Mi	Prefers fringes of swamps, dams and marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on ground amongst tall vegetation, such as grasses, tussocks or reeds (DEC 2006).	Low. Not previously recorded within the locality (DEC 2006). Lack of suitable habitat on subject site and around Gum Bend Lake.	No. Potential habitat at Gum Bend Lake unlikely to be impacted by proposal.
Haliaeetus leucogaster	White-bellied Sea-Eagle	-	Mi	Usually coastal. Also occur within seasonally flooded inland swamps, lagoons and floodplains; inland on large pools of major rivers.	Low. Lack of suitable habitat on subject site. Potential occurrence within locality of Gum Bend Lake and Lachlan River.	No. Potential habitat within Gum Bend Lake/Lachlan River unlikely to be impacted by the proposal.
Hirundapus caudacutus	White-throated Needletail	-	Mi	High open spaces above almost any habitat. Breeds in northern Asia (Morcombe 2004).	Moderate.	No. Subject site unlikely to provide area of significant habitat and potential habitat within Gum Bend Lake unlikely to be impacted by the proposal.

Scientific Name	Common Name	Conservation Status TSC Act	Conservation Status EPBC Act	Preferred Habitat	Likelihood of Occurrence	Assessment of Significance Required?
Gallinago hardwickii	Latham's Snipe, Japanese Snipe	-	Mi	Low vegetation around wetlands in shallows, sedges, reeds, heaths, saltmarsh, irrigated crops. Breeds in Japan (Morcombe 2004).	Low. Lack of suitable habitat on subject site and around Gum Bend Lake.	No. Locally common in optimum habitats and potential habitat at Gum Bend Lake unlikely to be impacted by proposal.
Rostratula benghalensis	Painted Snipe	-	Mi	Prefers fringes of swamps, dams and marshy areas where there is a cover of grasses, lignum, low scrub or open timber. Nests on ground amongst tall vegetation, such as grasses, tussocks or reeds (DEC 2006).	Low. Lack of suitable habitat on subject site and around Gum Bend Lake.	No
Mammals						
Phascogale tapoatafa	Brush-tailed Phascogale	Vu	-	Dry sclerophyll open forest with sparse ground cover or leaf litter. May also inhabit heathland, swamps, rainforest and wet sclerophyll forest. Nests and shelters in small tree hollows (DEC 2006).	Low. Lack of suitable habitat at subject site.	No
Nyctophilus timoriensis (South-eastern form)	Eastern Long-eared Bat	Vu	Vu	Variety of vegetation types, including mallee, bulloke (*Allocasuarina leuhmanni)* and box eucalypt dominated communities, but it is distinctly more common in box/ironbark/cypress-pine vegetation (DEC 2006).	Low. Lack of suitable habitat at subject site.	No

Scientific Name	Common Name	Conservation Status TSC Act	Conservation Status EPBC Act	Preferred Habitat	Likelihood of Occurrence	Assessment of Significance Required?
Fish						
Maccullochella peelii peelii	Murray Cod, Goodoo	-	Vu	Waterways of the Murray–Darling Basin in a wide range of warm water habitats that range from clear, rocky streams to slow flowing turbid rivers and billabongs. The upper reaches of the Murray and Murrumbidgee Rivers are considered too cold to contain suitable habitat (DEH 2006).	Moderate within Lachlan River.	No. Species not listed as threatened in NSW. Identified as member of listed EEC *Aquatic Ecological Community in the Natural Drainage System of the Lower Murray (Fisheries management Act 1994)*, which does not occur within the locality.
Macquaria australasica	Macquarie Perch	Vu	E	Murray-Darling Basin (particularly upstream reaches) of the Lachlan, Murrumbidgee and Murray rivers (DEC 2006). A riverine, schooling species. It prefers deep, rocky holes with considerable cover. Spawning occurs just above riffles (shallow running water). Populations may survive in impoundments if able to access suitable spawning sites.	Med. However, not previously recorded in the locality (DEC 2006).	No. Habitat will not be impacted.

Vu = vulnerable, En = endangered, Mi = migratory

4 IMPACT ASSESSMENT

4.1 DIRECT IMPACTS

The proposed facility and related infrastructure are situated within the cleared, highly disturbed areas of the property. The areas of native vegetation around the boundary of the property and within the remnant patches of the Myall Woodland EEC will be retained by the proposal and thus impacts to flora and fauna at the property are considered to be minimal. The plant layout provides a buffer of greater than 15m from the remnant Myall Woodland EEC which will minimise potential impacts due to edge effects.

Installation of the water pipeline from the Lachlan River and potable water pipeline to the property will result in disturbance within the pipeline corridor, approximately five metres in width including a trench of approximately 0.5-1m width. The vegetation along the pipeline corridor is highly modified, consisting of scattered paddock trees and disturbed ground layer vegetation dominated by exotic species. The proposed raw water pipeline route to the east of Gum Bend Lake supports some mature trees and eucalypt regrowth adjacent to the banks of the lake. The ecological value within this area is largely restricted to the presence of mature eucalypt trees, some of which are hollow-bearing and may provide foraging and nesting resources for native fauna species including threatened birds that have been previously recorded within the locality. Construction of the water pipelines will follow the previously disturbed route of the Orange – Broken Hill railway easement, roads around Gum Bend Lake and the existing pipeline which runs from the Lachlan River to the abandoned abattoir to the east of the subject site. The pipelines are therefore unlikely to require the removal of mature trees that may be utilised as habitat by native fauna. During the construction of the pipelines, trenching activities will be temporarily fenced and rehabilitation of the route will occur progressively to reduce the potential impacts on local fauna.

Establishment of the proposed irrigation area and realignment of a low voltage electricity transmission line on previously cropped areas is unlikely to impact on the ecological value of the subject site.

The significance of impacts on threatened species and endangered ecological communities listed under the TSC Act and recorded or considered likely to occur at the site was assessed by conducting an assessment of significance as described in the *Draft Guidelines for Threatened Species Assessment for developments assessed under Part 3A of the EP&A Act 1979* (DEC and DPI 2005). An assessment of significance was carried out for the Grey-crowned Babbler, the Superb Parrot and the remnant Myall Woodland. However, the Superb Parrot is also listed as threatened under the EPBC Act. The criteria for assessing significant impacts under Part 3A addresses the criteria for assessing significant impacts to threatened species and ecological communities listed under the EPBC Act (Significance Guidelines 1.1). Therefore, an additional

assessment of significance of impacts as described under the EPBC Act was not considered necessary. Details of the impact assessment are provided in *Annex B*.

The assessment concluded that the proposal was unlikely to have a significant impact on the Grey-crowned Babbler or the remnant Myall Woodland ecological community. This was largely due to the low quality of habitat areas being removed as a result of the proposal and retention of the Myall Woodland EEC and habitat for the Grey-crowned Babbler on the site. Similarly, the proposal was considered unlikely to have a significant impact on the survival of the Superb Parrot given that only a relatively small area of very marginal foraging and nesting habitat may be disturbed. If hollow-bearing trees require removal for construction of the pipeline, this may have an immediate impact on the roosting and nesting habitat of individual animals. However, there is abundant high quality foraging and nesting habitat available in the surrounding area. Measures to mitigate impacts to the Superb Parrots (and other arboreal fauna) that may be using tree hollows are outlined in *Chapter 5*.

The assessment for the Superb Parrot concluded that impacts to this species would not be significant and therefore it is considered that this matter need not be referred to the Department of Environment and Water Resources.

4.2 OFF-SITE/INDIRECT IMPACTS

Construction and operation of the facility has the potential to impact on the quality of habitat for native fauna (including threatened species) in areas within and surrounding the property.

Potential noise, dust and lighting generated by construction and operation of the facility may deter birds from utilising the stands of mature, hollow-bearing trees adjacent to the development. These trees represent important foraging and particularly breeding resources for mobile fauna in a landscape that has been largely cleared of native vegetation, and where native vegetation is highly fragmented. For example, these trees may be utilised by the threatened Grey-crowned Babbler and the Superb Parrot, and other threatened bird species that have been recorded within the locality.

Mitigation measures have been incorporated into the proposal to reduce the potential noise and air quality impacts on surrounding land uses, while lighting of the facility will use structures that will direct light away from surrounding areas.

As the nutrient characteristics of the process wastewater to be irrigated are very low, there will not be any impact on adjacent native vegetation due to runoff from the irrigation area.

4.3 POTENTIAL IMPACTS TO FISH IN LACHLAN RIVER

Water will be pumped from the Lachlan River via a 'high security' water licence sought from DNR under the *Water Act 1912* and in accordance with the *Water Sharing Plan for the Lachlan Regulated River Water Source 2003*.

Whilst the Macquarie Perch was identified as potentially being present within the nearby Lachlan River it is unlikely that the proposal would significantly impact this species or other fish species within the river. This is based on the fact that licence to pump water from the Lachlan River will be sought from existing licences along the river meaning that no additional water to that currently permitted is likely to be removed as a result of the proposal. In addition the pipeline would use an existing pump station and so impacts resulting from construction of a pump station are not anticipated.

5 MITIGATION MEASURES

Measures to mitigate potential impacts of the construction and operation of the proposed facility to flora and fauna are described below.

5.1 IMPACTS TO ENDANGERED ECOLOGICAL COMMUNITY

- A 15m buffer will be maintained and a fence will be erected around the remnant Myall Woodland areas to restrict vehicular and pedestrian access and encourage natural regeneration of this community.

5.2 LOSS OF FAUNA HABITAT

- Construction of the proposed pipeline along the Orange – Broken Hill railway easement and adjacent to the existing abattoir pipeline and roads around Gum Bend Lake. The pipeline should be aligned to avoid the removal of mature, hollow-bearing trees wherever possible.

- If hollow-bearing trees are to be removed, fauna boxes should be installed in retained mature trees to mitigate their removal (the number of fauna boxes installed should equal the number of hollows that are removed and boxes should be installed prior to any trees being removed).

- Pre-clearance surveys of any trees to be removed should be undertaken by a certified animal handler, to ensure that no fauna species are utilising the trees as habitat and an appropriately qualified person should be on site while trees are removed, so that any fauna inhabiting the trees can be captured and relocated.

- If existing native trees cannot be avoided for construction of the pipeline, then any removal should be offset by replacing with the same species on-site. At least two seedlings should be planted for every tree removed to account for death of trees through natural attrition and herbivory.

5.3 IRRIGATION AREA

If there is potential for runoff from the irrigation area to adversely affect adjacent native vegetation, a 15m buffer zone between this vegetation and the irrigation area will be established. This potential would be assessed by evaluation of nutrient balances of the wastewater to be used on the irrigation area, to ensure nitrogen and phosphorus loadings are appropriate.

5.4 CONSTRUCTION

- The potential for any adverse impacts resulting from introduction of new weed species to the site from imported building materials (such as sand and gravel) can be minimised by use of certified weed-free building materials.

- Progressive rehabilitation of the pipeline routes, with temporarily fencing around trenched areas to reduce the potential impacts on local fauna.

6 CONCLUSION

The proposed ethanol plant at Condoblin is situated within a highly disturbed and modified environment. There is little to no habitat for native fauna on the subject site. Remnant vegetation on the property will be retained. No additional impacts on the Lachlan River are considered likely and therefore habitat for the Macquarie Perch is unlikely to be affected. An assessment of significance concluded that the proposal was unlikely to have a significant impact on the Myall Woodland EEC or the Grey-crowned Babbler.

Installation of the subsurface water pipeline from the Lachlan River to the property will result in disturbance within the pipeline corridor. The pipeline route has been selected to minimise disturbance to native vegetation, however some isolated native trees may require removal for construction of the water pipeline. Some of the mature eucalypt trees within this area were identified as being hollow-bearing and may provide foraging and nesting resources for native fauna species including threatened birds previously recorded within the locality. Mitigation measures recommended in *Section 5.2* will manage and offset the removal of any mature trees, including hollow-bearing trees.

Impacts to native flora and fauna are thus considered to be minimal and aside from impacts associated with construction of the water pipeline, limited to potential off-site impacts such as disturbance from construction and operation of the facility (such as noise, dust and lighting) that may deter birds from utilising the native trees surrounding the subject site. The plant's position away from the boundary trees, directional lighting and noise and air quality mitigation measures should appropriately mitigate such impacts.

Therefore, in regards to addressing the key thresholds for assessing potential impacts of the proposal on threatened species or ecological communities (DEC and DPI 2005), it is concluded that the proposed development:

- will not significantly impact on biodiversity values of the subject site;
- will not reduce the long-term viability of a local population of any threatened species, population or endangered ecological community;
- will not accelerate the extinction of threatened species, populations or ecological communities; and
- will not adversely affect critical habitat.

REFERENCES

DEC (2005) ***BioBanking – A Biodiversity Offsets and Banking Scheme*** **Conserving and restoring biodiversity in NSW Working Paper Department of Environment and Conservation NSW** Department of Environment and Conservation Hurstville NSW.

DEC and DPI (2005) **Draft Guidelines for Threatened Species Assessment for development applications assessed under Part 3A of the Environmental Planning and Assessment Act 1979.** Department of Environment and Conservation Hurstville NSW.

DEH (2006) ***Threatened Species Information***
http://deh.gov.au/biodiversity/threatened/species

DEC (2006) ***Threatened Species Profiles in Threatened Species: species, populations and ecological communities of NSW***
http://threatenedspecies.environment.nsw.gov.au/tsprofile/

Harden G (2000) **Flora of New South Wales** University of New South Wales Press Ltd Sydney

Morcombe M (2004) **Field Guide to Australian Birds** Steve parish Publishing Pty Ltd Queensland Australia.

Thackway and Cresswell (1995) **An interim biogeographic regionalisation for Australia: a framework for setting priorities in the National Reserves System Cooperative Program Version 4.0** Australian Nature Conservation Agency Canberra.

Annex A

Site Photographs

Photograph A.1

Open, ploughed grassland typical of the majority of the Property

Photograph A.2

Corridor of trees, including *Acacia pendula*, along northern boundary of the Property

Photograph A.3

Vegetation around existing pump station adjacent to Lachlan River

Photograph A.4

Proposed pipeline route through travelling stock reserve and Gum Bend Lake

Photograph A.5

Remnant Myall Woodland in South-west of Property

Photograph A.6

Remnant Myall Woodland in South-west of Property

Photograph A.7

Habitat at Gum Bend Lake

Photograph A.8

Island habitat at Gum Bend Lake

Annex B

Assessment Of Significant Impacts On Threatened Species And EECs

B.1 ASSESSMENTS OF SIGNIFICANCE

Identifying potential effects of the proposal on threatened species, populations or ecological communities, or their habitats.

The Grey-crowned Babbler and the Superb Parrot are listed as threatened species under the NSW TSC Act. The Superb Parrot is also listed as threatened under the Commonwealth EPBC Act. Myall Woodland is listed as an Endangered Ecological Community under the NSW TSC Act. These threatened species and ecological community are considered to have potential habitat within the study area and have the potential to be impacted by development of the site.

Myall Woodland in the Darling Riverine Plains, Brigalow Belt South, Cobar Peneplain, Murray-Darling Depression, Riverina and NSW South-Western Slopes This ecological community is scattered across the eastern parts of the alluvial plains of the Murray-Darling river system. The structure of the community varies from low woodland and low open woodland to low sparse woodland or open shrubland, depending on site quality and disturbance history. The tree layer grows up to a height of about 10 metres and invariably includes *Acacia pendula* (Weeping Myall or Boree) as one of the dominant species or the only tree species present. The understorey includes an open layer of chenopod shrubs and other woody plant species and an open to continuous groundcover of grasses and herbs. The community is scattered across the eastern parts of alluvial plains of the Murray Darling river system.

Grey Crowned Babbler (*Pomatostomus temporalis).* Grey-crowned Babbler inhabit open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains. Use of road verges and linear plantings is not uncommon among local populations. Birds are generally unable to cross large open areas. They live in family groups that consist of a breeding pair and young from previous breeding seasons. A group may consist of up to fifteen birds. All members of the family group remain close to each other when foraging. A soft 'chuck' call is made by all birds as a way of keeping in contact with other group members. The species feeds on invertebrates, either by foraging on the trunks and branches of eucalypts and other woodland trees or on the ground, digging and probing amongst litter and tussock grasses (DEC 2005).

These birds build and maintain several conspicuous, dome-shaped stick nests about the size of a football. A nest is used as a dormitory for roosting each night. Nests are usually located in shrubs or sapling eucalypts, although they may be built in the outermost leaves of low branches of large eucalypts. Nests are maintained year round, and old nests are often dismantled to build new ones (DEC 2005).

Territories range from one to fifty hectares (usually around ten hectares) and are defended all year. Territorial disputes with neighbouring groups are frequent and may last up to several hours, with much calling, chasing and occasional fighting (DEC 2005).

The species occurs throughout large parts of northern Australia and in south-eastern Australia. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Hay. It also occurs in woodlands in the Hunter Valley and in several locations on the north coast of NSW. It may be extinct in the southern, central and New England tablelands.

Superb Parrot (*Polytelis swainsonii).* The Superb Parrot is distributed throughout east inland NSW, where it primarily occurs in Box-Gum, Box Cypress Pine and River Red Gum Forest. The species core breeding habitat is roughly bounded by Cowra and Yass to the east and Cootamundra, Coolac and Grenfell to the west. Other main breeding areas are along the corridors of the Murray, Edward and Murrumbidgee Rivers (DEC 2005).

The species nests in the hollows of large trees (dead or alive) often in small colonies and feeds in grassy woodlands on fruit, seeds and blossoms of acacias, eucalypts and mistletoes.

The following section addresses the significance of impacts on threatened species according to criteria set out in the draft guidelines for threatened species assessment (DEC and DPI 2005)

How is the proposal likely to affect the lifecycle of a threatened species and/or population?

a) displaces or disturbs threatened species and/or populations

Myall Woodland

N/A

Grey Crowned Babbler

The proposal is unlikely to displace or significantly disturb a local population of the Grey Crowned Babbler. The species was identified within the study area indicating that the site is likely to represent part of the home range of a local family group. However, core habitat for the species is likely to be within the vegetated areas on and surrounding the site. This habitat would be retained within the site and surrounding area while the proposed development area is unlikely to represent appropriate habitat for the species.

Superb Parrot

Potential foraging and nesting habitat for the Superb Parrot occurs within the vicinity of the pumping station and proposed pipeline corridor and thus the proposal has the potential to disturb/displace feeding and/or nesting birds.

Installation of the water pipeline from the Lachlan River to the property will result in disturbance within the pipeline corridor. The vegetation along the pipeline corridor is highly modified, consisting of scattered paddock trees and disturbed ground layer vegetation dominated by exotic species. The proposed route to the east of Gum Bend Lake supports some mature trees and eucalypt regrowth adjacent to the banks of the lake. The ecological value within this area is largely restricted to the presence of mature eucalypt trees, some of which are hollow-bearing and may provide foraging and nesting resources for the Superb Parrot. Construction of the water pipeline will follow the previously disturbed route of the Orange – Broken Hill railway easement, roads around Gum Bend Lake and the existing pipeline which runs from the Lachlan River to the abandoned abattoir to the east of the subject site. The pipeline is therefore unlikely to require the removal of mature trees that may be utilised as habitat by the Superb Parrot. Furthermore, the riparian River Red Gum Forest located along the banks of the Lachlan River adjacent to the subject site and within the surrounding area provides more suitable nesting and foraging habitat for this species.

The pipeline corridor will be aligned to avoid the removal of mature, hollow-bearing trees wherever possible. However, if hollow-bearing trees are to be removed, it is recommended that nest boxes should be installed in retained mature trees to mitigate their removal (the number of nest boxes installed should equal the number of hollows that are removed and boxes will be installed prior to any trees being removed). Pre-clearance surveys of trees to be removed should also be undertaken by a certified animal handler, to ensure that no fauna species are utilising the trees as habitat and an appropriately qualified person should be on site while trees are removed, so that any birds inhabiting the trees can be captured and relocated.

If removal of native trees cannot be avoided for construction of the pipeline, then any removal should also be offset by replacing with the same species on-site. At least two seedlings should be planted for every tree removed to account for death of trees through natural attrition and herbivory.

It is considered that construction of the pipeline along a pre-disturbed route that provides only minimal habitat resources of relatively poor quality for the Superb Parrot, together with implementation of the above mitigation measures, would cause negligible disturbance to/displacement of this species.

b) disrupts roosting behaviour

Myall Woodland

N/A

Grey Crowned Babbler

It is unlikely that a significant area of vegetation would be removed as a result of the proposal. No potential roosting habitat is being removed from within the proposed development area while vegetation and potential nesting habitat is being retained and protected within the site. In addition the pipeline route has been designed to avoid vegetated areas. Accordingly the proposal is unlikely to disrupt the nesting behaviour of this species.

Superb Parrot

As noted above, the proposal is unlikely to require the removal of mature trees that may be utilised as nesting and roosting habitat by the Superb Parrot. The installation of fauna boxes will mitigate the loss of roosting habitat should any hollow-bearing trees along the pipeline corridor require removal.

More suitable roosting habitat, in the form of tall, mature hollow-bearing River Red Gum trees is abundant within the riparian forest along the banks of the Lachlan River adjacent to the site. As a result, it is unlikely that the proposal would disrupt the roosting/nesting behaviour of this species.

c) changes foraging behaviour

Myall Woodland

N/A

Grey Crowned Babbler

The proposal is unlikely to alter the foraging behaviour of a local population of the species. Foraging habitat for the species would be retained on the site while the proposed development area is cleared and is unlikely to represent potential foraging habitat.

Superb Parrot

The Superb Parrot primarily feeds on grains, as well as the fruit of Eucalypt and Mistletoe. Only a small area of potential foraging habitat, in the form of disturbed grassland dominated by exotic species with scattered, predominantly immature eucalypts, located within the pipeline corridor is likely to be removed as a result of the proposal. Mistletoe were abundant in *Acacia pendula* trees in the remnant Myall Woodland in the south-west of the site and this area will be retained within the proposal. The mature eucalypts, which represent potential foraging resources for the Superb Parrot, along the boundary of the property will also be retained. As a result, the proposal is unlikely to have a significant impact on the foraging resources available to this species nor is it likely to result in changes to the foraging behaviour of the species.

d) affects migration and dispersal ability

Myall Woodland

N/A

Grey Crowned Babbler,

The site does not appear to offer any linkages between vegetation remnants within the local area and has predominately been cleared. Whilst the site may constitute part of a local families home range it is unlikely that the proposed development area would form an important function for migration and dispersal for the Grey Crowned Babbler. Accordingly the proposal is unlikely to significantly effect the migration and dispersal of this species.

Superb Parrot

The site has predominantly been cleared of native vegetation and supports only marginal potential foraging and nesting habitat for the Superb Parrot. Existing vegetation on the development area will be retained and there will only be minimal disturbance of vegetation within the pipeline corridor. The River Red Gum riparian forest and woodland along the banks of the Lachlan River to the south of the site supports abundant suitable foraging and nesting resources for this species. Foraging and nesting resources, of relatively poorer quality, are also available within the Travelling Stock Reserve and Crown Reserve of Gum Bend Lake adjacent to the development area and surrounding the pipeline corridor. It is therefore unlikely that the proposed development area would form an important function for migration and dispersal for the Superb Parrot. Accordingly the proposal is unlikely to significantly effect the migration and dispersal of this species.

e) disrupts pollination cycle;

It is unlikely that the proposal would disrupt pollination vectors currently operating within the Myall Woodland areas. This is based on the fact that the proposed development area is currently cleared and is unlikely to perform an important role for pollination occurring within the Myall Woodland areas. In addition the Myall woodland areas are to be retained potentially retaining pollination vectors such as ants within these areas.

f) disturbs seedbanks;

The proposed development area has a history of cultivation and cropping activity and as a result the seed bank within this area is unlikely to be a significant seed bank for Myall Woodland species. As a result it is unlikely that the proposal would significantly disturb the seed bank of this community.

g) disrupts recruitment (ie. germination and establishment of plants);

The proposed development area has a history of cultivation and cropping activity and it is unlikely that this area would represent significant future recruitment opportunities for this community within the site. The retention of Myall woodland within the site may potentially improve the recruitment opportunities for this community provided these areas are protected from future disturbance.

h) affects the interaction between threatened species and other species in the community (eg. pollinators, host species, mychorrizal associations).

Grey Crowned Babbler

It is unlikely that proposed development would result in impacts to any other species that the Grey Crowned Babbler may interact with. This conclusion is based on the low quality of the potential habitat that would be removed as a result of the proposal.

Superb Parrot

The site supports habitat of relatively poor quality compared to the surrounding riparian forest and woodland along the Lachlan River. Species with which the Superb Parrot interacts are therefore also more likely to be found within the surrounding habitat rather than within the subject site. Given the small area and low quality of the potential habitat that may be disturbed as a result of the proposal, and the presence of abundant suitable habitat adjacent to the site, the proposal is considered unlikely to impact on interactions between the Superb Parrot and other species in the community.

How is the proposal likely to affect the habitat of a threatened species, population or ecological community?

a) disturbs any permanent, semi-permanent or ephemeral water bodies;

It is unlikely that any permanent, semi-permanent or ephemeral waterbodies would be disturbed as a result of the proposal.

b) degrades soil quality;

The proposal will result in hardstand development within part of the site. Indirect impacts to soil quality in adjacent areas from development on the site are unlikely given that much of the area is currently being farmed. In addition soil quality could be improved within those areas of vegetation being retained including those areas containing Myall woodland as a result of this area no longer being used for agricultural purposes.

c) clears or modifies native vegetation;

The extent of native vegetation that would be removed as a result of the proposal is limited due to the fact that the proposed development area is predominately cleared while vegetated areas on the site would be retained. In addition the pipeline route has been designed to avoid the loss of native vegetation. Areas of higher quality native vegetation are likely to be retained within the site including areas mapped as Myall Woodland. Accordingly the proposal is unlikely to significantly impact any of the threatened species or EEC's under consideration.

d) introduces weeds, vermin or feral species or provides conditions for them to increase and/or spread;

Given the previous agricultural land uses within the site and currently within surrounding properties it is unlikely that the proposal would significantly contribute to the further introduction of weeds, vermin or feral species to the local area.

e) removes or disturbs key habitat features such as trees with hollows, caves and rock crevices, foraging habitat;

Grey Crowned Babbler

It is unlikely that any key habitat features would be removed from within the proposed development area as it has been cleared, while the pipeline route has been designed to avoid vegetation loss. Key habitat areas are to be conserved within those areas of vegetation to be retained on the site.

Superb Parrot

Hollow-bearing trees represent key habitat features of the Superb Parrot within the site. The pipeline corridor has been located to avoid/minimise vegetation loss, particularly with respect to hollow-bearing trees.

As discussed above, if any hollow-bearing trees are to be removed, it is recommended that nest boxes should be installed in retained mature trees to mitigate their removal. Also, the Red Gum forest and woodland surrounding the site supports abundant hollow-bearing trees and thus the proposal is considered unlikely to significantly impact on the nesting resources available to this species.

f) affects natural revegetation and recolonisation of existing species following disturbance; and

The site is already disturbed as a result of past agricultural land uses and appears to be undergoing little natural regeneration. Given current land use within the site, it is unlikely that many areas would successfully regenerate due to ongoing disturbance. It is likely that the retention and protection of the vegetated areas within the western portion of the site, including areas mapped as Myall Woodland, would enhance the natural regeneration of these areas.

Does the proposal affect any threatened species or populations that are at the limit of its known distribution?

None of the threatened species or EEC under consideration are at the limit of their known distribution at the site.

How is the proposal likely to affect current disturbance regimes?

a) modifies the intensity and frequency of fires;

With the exception of the construction of the ethanol facility, the majority of the site will continue to be used for agricultural purposes (as an irrigation area) while the Myall Woodland vegetation in the south-west of the site will be retained. Appropriate fire prevention and emergency procedures will be in place for the proposed facility in accordance with the findings of the preliminary hazard assessment prepared for the site. It is unlikely that the proposal would significantly alter the fire regime of the local area.

b) modifies flooding flows.

Due to the proximity of the site to the Lachlan River, there is potential for the site to be subject to flooding during a 1 in 100 year Average Recurrence Interval flood event (*Chapter 4*). Existing flood levels of the site are unknown, however, as the site is small relative to the floodplain and flood velocities will be low, potential impacts of the development on flood levels were assessed as being very small (*Chapter 4).* Retention of the majority of the extant native vegetation across the will also serve to minimise potential impacts of the development on flooding flows.

How is the proposal likely to affect habitat connectivity?

a) creates a barrier to fauna movement;

The site exists within a highly fragmented rural landscape. Existing native vegetation on the boundary of the property and within the remnant Myall Woodland areas on the site will be retained, thus allowing for the continued movement of fauna within and across these areas. The proposal will potentially require the removal of scattered trees within the pipeline corridor. The pipeline corridor exists within the Crown Reserve and Travelling Stock Reserve that supports numerous scattered paddock trees. Given the highly fragmented nature of the habitat available, the potential removal of a few scattered trees within the pipeline corridor is unlikely to cause a barrier to the movement of the highly mobile threatened bird species that may utilise that habitat (the Grey-crowned Babbler and the Superb Parrot) or other locally occurring fauna species.

b) removes remnant vegetation or wildlife corridors;

Current fauna movement within the local area is likely to occur primarily along and between the riparian corridor along the length of the Lachlan River and the Travelling Stock Reserve to the south of the site, and to a lesser extent within the remnant vegetation on the site.

The trees around the boundary of the site and within the Myall Woodland on the site provide continuity of a linear corridor of trees that extends to the north-east of the site and to vegetation within the Travelling Stock Reserve to the south of the site. These areas provide known habitat for threatened species of fauna (the Grey-crowned Babbler) and ecological communities (Myall Woodland) and provide habitat for other more common native flora and fauna species. As mentioned above, this existing native vegetation on the boundary of the property and within the remnant Myall Woodland areas on the site will be retained and thus will not impact on the value of the site as a wildlife corridor.

Some remnant vegetation in the form of paddock trees within the pipeline corridor may be removed as a result of the proposal. The pipeline corridor is located within the Travelling Stock Reserve and Crown Reserve around Gum Bend Lake which supports scattered canopy trees over disturbed vegetation consisting of little to no shrub layer and a ground layer dominated by exotic species. The majority of the pipeline corridor has already been cleared of native vegetation and therefore the potential removal of a limited number of trees within the pipeline corridor itself is unlikely to impact on the value of the Travelling Stock Reserve and Crown Reserve area as a wildlife corridor. This potential movement corridor is unlikely to be significantly impacted by the proposal.

c) modifies remnant vegetation or wildlife corridors.

As above.

How is the proposal likely to affect critical habitat?

There is no critical habitat that will be directly or indirectly affected by the proposal.

ERM consulting services worldwide **www.erm.com**

Environmental Resources Management Australia
Building C, 33 Saunders Street
Pyrmont NSW 2009
Telephone (02) 8584 8888
Facsimile (02) 8584 8800