

## Maules Creek Mine Project

EPBC 2010/5566

### Satisfaction of Condition 6 - Disturbance Area Approach

#### Context

The Honourable Tony Burke MP, Minister for Sustainability, Environment, Water, Population and Communities (now Department of the Environment) granted the Maules Creek Pty Ltd approval (EPBC 2010/5566) to proceed with the Maules Creek Project on 11 February, 2013. The approval contained some forty conditions.

Condition 6 states:

*The person taking the action must submit to the Minister for approval, within three months of the commencement of the action, an approach that:*

- a. *Limits the maximum disturbance (in hectares) specified for each of the years 5, 10, 15 and 21 from the date of approval of the White Box - Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community and the habitat of potential habitat for the regent honeyeater, swift parrot and greater long-eared bat.*
- b. *Incorporates an analysis undertaken by independent ecological experts approved by the Department that demonstrates the maximum disturbance limits which will minimize any impacts on relevant matters of national environmental significance.*
- c. *Demonstrates collaboration with the person taking the action to develop and operate the Boggabri Coal project (EPBC 2009/5256), in order to minimise progressive area project disturbance limits across both sites. The progressive disturbance limits are to be reflected in the development of the Leard Forest Mining Precinct Biodiversity Strategy.*

The purpose of this approach is to present the forecast of the limits of progressive maximum disturbance at particular milestones over the mine life.

Included within the document is an analysis prepared by independent ecological experts approved by the Department (i.e. Cumberland Ecology – Attachment C) which demonstrates that any impacts on relevant matters of national environmental significance are minimised.

In addition, Whitehaven Coal Limited (Whitehaven) has collaborated with Idemitsu Australia Resources (Boggabri Coal Pty Ltd) in regard to its future projected mining operations and its impact on relevant matters of national environmental significance. The results of that collaboration are also presented in this document.

## **Overview of Disturbance Areas Throughout the Life of the Maules Creek Mine Project.**

Throughout the life of the Maules Creek Mine Project, the site activities progress through a number of phases. These include:

- Mobilisation of construction resources.
- Construction of infrastructure.
- Excavation of the box cut.
- Establishment of the external overburden dump.
- Initiation and ramp up of mining activities.
- Mining at the approved production level.
- Establishment of the internal overburden dump.
- Extensive rehabilitation of the mining area.
- Mine closure.

Under the EPBC approval, the Maules Creek Mine Project is permitted to clear no more than 544 hectares of the EPBC Act listed White Box-Blakely's Red Gum, Grassy Woodland and Derived Native Grassland Critically Endangered Ecological Community (Box-Gum Woodland CEEC) within the Maules Creek Mine Project area of disturbance.

The total area to be cleared over the life of the Maules Creek Mine Project is 2,177 hectares as presented in Table 4.1, Volume 3 of the Maules Creek Coal Mine Environmental Assessment.

The total area of within the Maules Creek Mine Project boundary is 3,551 hectares. In other words the clearance of vegetation over the life of the mine represents some 60% of the vegetation within the Maules Creek Mine Project area. This will be significantly counterbalanced by the progressive rehabilitation of the disturbed areas which is tightly regulated by the NSW Division of Resources and Energy via the required Mining Operations Plan.

## **Sequential Development of the Maules Creek Mine Project**

Throughout the life of the mine, the mine develops in a systematic way to minimise the disturbance footprint and to enhance the efficiency of the mining operation. Initially the mine is developed in a south-easterly direction toward the southern lease boundary and then progresses in a north-easterly direction. In the early stages, the overburden removed is placed in an external overburden dump until such time as the mine is sufficiently developed to allow for placement of overburden within the mine excavation.

The current mine plan for the Maules Creek Mine Project represents the results of detailed mine planning and scheduling and is generally in accordance with the mine plan presented in the Maules Creek Coal Mine Environmental Assessment.

The progressive mine developments at years 5, 10, 15 and 21 from the EPBC Act approval (11 February 2013) are shown in Attachment A.

The table below provides a correlation between the years from EPBC Act approval and years in the mine life.

Year	Years from EPBC Act Approval (11 February 2013)	Year in Life of Mine (as per the Mining Operations Plan)
February 2018	Year 5	Year 4
February 2023	Year 10	Year 9
February 2028	Year 15	Year 14
February 2034	Year 21	Year 20

### Maximum Disturbance as the Mine Progresses

Based on the mine and infrastructure footprints shown in Attachment A, the maximum progressive clearance in hectares has been calculated for the Box-Gum Woodland CEEC and the habitat or potential habitat, for the Regent Honeyeater, Swift Parrot and Greater Long-Eared Bat are indicated below.

Years from EPBC Act Approval (11 February 2013)	Maximum Disturbance* (ha)	Approximate Percentage of Total Project Area
5	1,306 ha (1,220 ha woodland and forest and 86 ha of Box-Gum Woodland CEEC [in derived grassland form])	36
10	1,431 ha (1,345 ha woodland and forest and 86 ha of Box-Gum Woodland CEEC [in derived grassland form])	40
15	1,546 (1,460 ha woodland and forest and 86 ha of Box-Gum Woodland CEEC [in derived grassland form])	43
21	1,651 (1,565 ha woodland and forest and 86 ha of Box-Gum Woodland CEEC [in derived grassland form])	49

\* Box-Gum Woodland CEEC and the habitat or potential habitat, for the Regent Honeyeater, Swift Parrot and Greater Long-Eared Bat are indicated below. These values exclude the Biodiversity Corridor.

In accordance with the EPBC Act Approval, no more than 1,665 ha of potential woodland and forest habitat for the Regent Honeyeater, Swift Parrot and Greater Long-Eared Bat will be cleared, which includes 458 ha of Box-Gum Woodland CEEC (in woodland form). In accordance with the EPBC Act Approval, no more than 544 ha of Box-Gum Woodland CEEC will be cleared, of which 86 ha is in derived grassland form.

In assessing the figures in the table above, it needs to be recognised that these disturbed areas will be offset by the progressive rehabilitation of the disturbed areas. For instance at Year 15 it is forecast that some 440 ha of previously disturbed area will be under rehabilitation, which reduces the total disturbed area to 1,020 ha being less than 30% of the Maules Creek Mine Project area. At year 21 the rehabilitated area will be greater again.

### **Basis of Assessment of Disturbance Area**

A summary description of the vegetation in the Maules Creek Mine Project area is presented in Attachment B.

The analysis undertaken by independent ecological expert, Dr. David Robertson (Cumberland Ecology), who was approved by the Department (6 May 2013) (Attachment C). The analysis is provided in Attachment D.

The independent ecological expert reviewed the progressive clearance plans for the Maules Creek Mine Project over its mine life and compared those plans with the distribution of vegetation mapped for the mine, and mine related infrastructure footprint, in particular Box-Gum Woodland CEEC and potential habitat for the Regent Honeyeater, Swift Parrot and Greater Long-eared Bat.

The independent ecological expert concurs with the forecasts of disturbance presented in this approach and agrees that the forecasts of disturbance represent the minimum practical disturbance at each time period over the mine life.

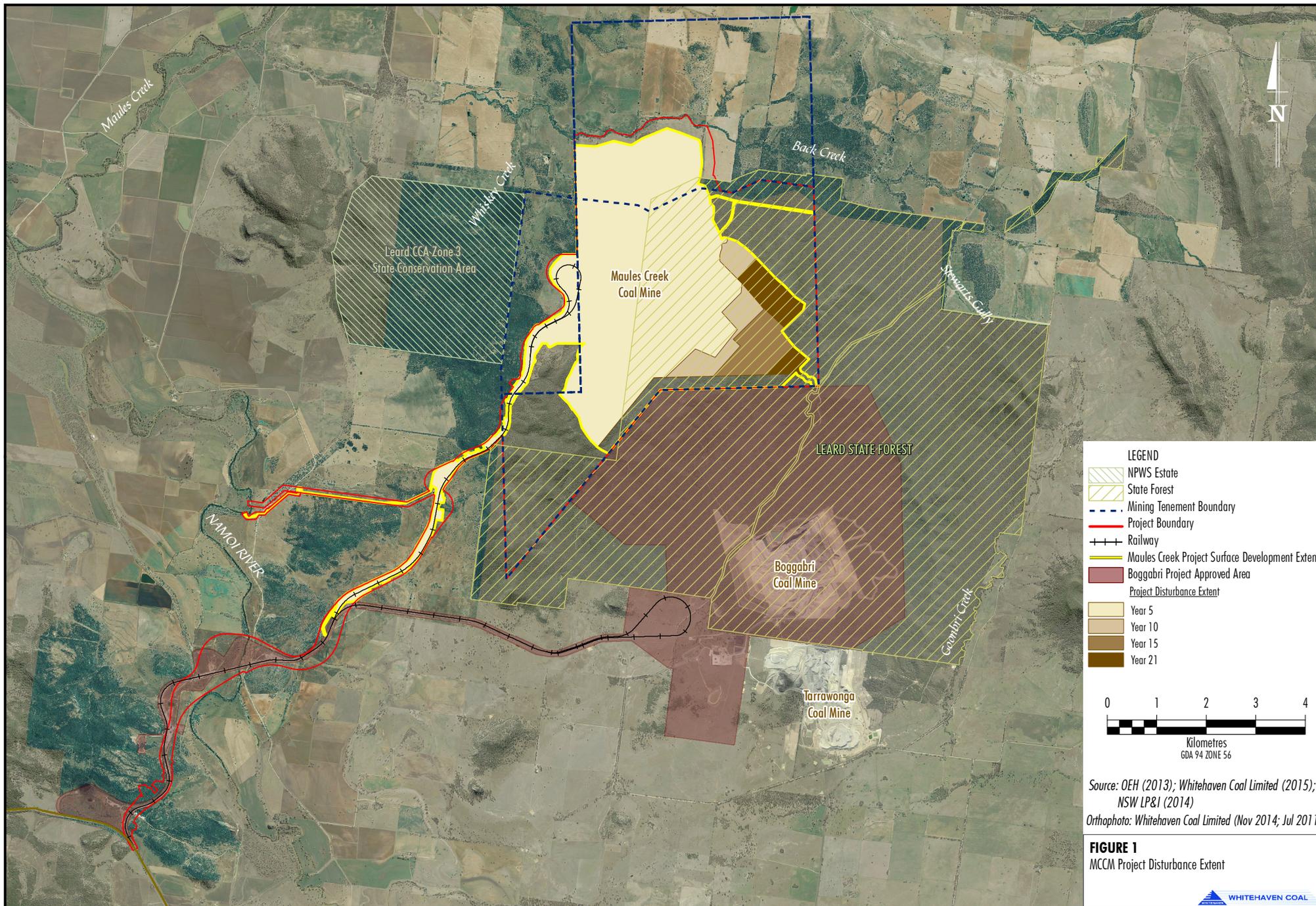
### **Maules Creek Coal Clearance Plans Combined with the Boggabri Coal Project**

Whitehaven has collaborated with Idemitsu Australia Resources (Boggabri Coal Pty Ltd) to produce a series of combined clearance plans which indicate the progressive disturbance limits over the life of the mines as they gradually and progressively extend toward each other retaining considerable vegetation between the mines for several years. Copies of communications between Idemitsu Australia Resources (Boggabri Coal Pty Ltd) and Whitehaven are presented in Attachment E.

It is intended that the progressive disturbance limits will be reflected in the development of the Leard Forest Mining Precinct Biodiversity Strategy.

**Attachment A**

**Progressive Development of Maules Creek Mine Project**



**Attachment B**

**Vegetation within the Maules Creek Mine Project area**

## Results

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The Project Boundary is predominantly forested by native vegetation communities. The original character of the vegetation has been greatly altered as a result of previous land uses including agricultural and forestry activities. The vegetation has also been shaped by mining exploration, and weed and feral animal invasion.

Comprehensive lists of flora and fauna recorded within the Project Boundary during the survey are provided in **Appendix B** and **Appendix C**. The majority of threatened fauna species detected are associated with the box and ironbark woodland communities of Leard State Forest. Small patches of remnant vegetation occur throughout the predominantly cleared northern portion of the Project Boundary, especially the riparian vegetation along Back Creek. This is also likely to provide valuable habitat for a range of flora and fauna species, albeit to a lesser extent than for the more extensive woodland habitats of Leard State Forest.

### 3.1 Vegetation Communities

The broad vegetation formations within New South Wales have been mapped and described by Keith (2004). Vegetation formations are broad classes of vegetation that include a few to many recognisable vegetation communities. Within the locality of the Project Boundary, two of the formations described by Keith predominate:

- 1 Western Slopes Grassy Woodlands; and
- 2 Western Slopes Dry Sclerophyll Forests.

The Western Slopes Grassy Woodlands were once dominant and widespread across the fertile soils throughout the western slopes of the Great Dividing Range. Often referred to as "grassy white box woodlands" they occur in areas with between 550 and 800 mm annual rainfall on lands below 700 m elevation. The tree canopy is generally up to 20 metres tall and tussock grasses dominate the ground stratum (Keith, 2004). Soil fertility is the most important environmental factor influencing the distribution of this vegetation formation.

The dominant trees within the various communities of the Western Slopes Grassy Woodlands formation include White Box (*Eucalyptus albens*), Kurrajong (*Brachychiton populneus*), White Cypress Pine (*Callitris glaucophylla*), Blakely's Red Gum (*E. blakelyi*), Yellow Box (*E. melliodora*) and Narrow-leaved Grey Box (*E. pillagaensis*) (Keith, 2004).

The Western Slopes Grassy Woodland formation has been extensively cleared for agriculture. This formation includes the critically endangered Box Gum Woodland and Derived Native Grassland community listed by the TSC Act and EPBC Act.

Western Slopes Dry Sclerophyll Forests occur on sandstone peneplains and granite outcrops that produce shallow, sandy, infertile soils. These soils produce a broad array of forest types. These communities generally occur between 500 and 800 mm rainfall (Keith, 2004).

The Western Slopes Dry Sclerophyll Forests are characterised by trees with straight trunks including ironbark eucalypts and cypress pines 10-25 metres in height. The abundance of sclerophyll shrubs and scarcity of grasses and herbs typify this formation type and differentiate them from the grassy woodlands (Keith, 2004).

Trees that are typical of this formation within the locality of the Project Boundary include Black Cypress Pine (*Callitris endlicheri*), White Cypress Pine and Narrow-leaved Ironbark (*E. crebra*) (Keith, 2004).

The main economic value of the Western Slopes Dry Sclerophyll Forests was as a timber source and so such forests have been extensively harvested for timber and firewood (Keith, 2004). Despite this, they are relatively well conserved and well represented in conservation reserves. Such plant communities are not endangered, but they do provide habitat for threatened species, particularly threatened birds.

### 3.1.1 General Vegetation Associations

The vegetation within the Project Boundary is characterised by a mixture of grassy and shrubby open forests and woodland types that typify the wider landscape of the Namoi Valley. Earlier ecological studies recognised that there are three broad associations that represent the vegetation of Leard State Forest: ironbark/cypress pine forests, box woodlands and box/Belah woodlands (James B. Croft & Associates, 1979, Dames & Moore, 1985). An array of intermediate associations was described by various authors and includes a mixture of ironbark, cypress pine and box units as well as rarer pockets of scrub vegetation on outcrops containing rainforest elements such as *Ficus*, *Alphitonia*, *Alectryon* and *Atalaya* species (James B. Croft & Associates, 1979, Dames & Moore, 1985, RACAC, 2000). In broad terms, there are several associations that frequently occur within the Project Boundary:

- Ironbark/Cypress Pine (*Eucalyptus crebra*, *E. melanophloia*, *Callitris glaucophylla* and *C. endlicheri*);
- Red Gum/Ironbark (*E. dwyeri* and *E. crebra*);
- Pilliga Box/Poplar Box/Belah (*E. pilligaensis*, *E. populnea* and *Casuarina cristata*);
- White Box/Belah (*E. albens* and *Casuarina cristata*);
- White Box/Cypress Pine (*E. albens* and *C. glaucophylla*); and

✧ Yellow Box/Red Gum (*E. melliodora* and *E. blakelyi*).

The distribution of the associations is controlled largely by soil type and topography. Ironbarks and cypress pines are largely found on well-drained soils, particularly on ridges and rises, whilst the box species have an affinity with the lower-lying parts of the landscape on more fertile soil derived from colluvial wash off the sandstone hills in the Project Boundary. The presence of Belah trees (*Casuarina cristata*) typically indicates black soils derived from basalts and/or alluvium and, since much has been cleared for croplands, is commonly observed as fragmented remnant vegetation on the fringes of cropping land.

**3.1.2 Vegetation Communities Recorded in the Project Boundary**

There is a suite of forest and woodland units that have been mapped across the Project Boundary (Figure 3.1). Cultivated areas and grasslands derived from the clearing of native forests and woodlands have also been distinguished to provide an indication of the historical extent of native vegetation across the Project Boundary.

The most extensive vegetation communities within the Project Boundary are *Narrow-leaved Ironbark - White Cypress Pine shrubby open forest* and *White Box - Narrow-leaved Ironbark - White Cypress Pine grassy open forest* (Table 3.1). The latter community conforms to the CEEC Box Gum Woodland and Derived Grasslands, which is a protected ecological community under both the EPBC Act and TSC Act. Other variants of the CEEC have been mapped but are represented by minor occurrences only. The units that conform to the CEEC Box Gum Woodland and Derived Grasslands are indicated in Figure 3.2 and Table 3.1 below.

Associations	Vegetation Communities	Area (ha)
Red Gum/Ironbark forests	Dwyer's Red Gum woodland	3.59
	Dwyer's Red Gum - Ironbark woodland	159.75
	Narrow-leaved Ironbark - White Cypress Pine shrubby open forest	1008.14
	Silver-leaved Ironbark heathy woodland	394.52
RF elements	Cliff and scree Thickets (Rainforest Species)	0.13
Riparian forests	Melaleuca riparian forest	11.44
	River Red Gum riparian woodlands and forests	11.96
	White Box - Blakely's Red Gum - Melaleuca riparian forest <sup>^</sup>	17.20
White Box, Yellow Box, Blakely's Red Gum woodlands	White Box - Narrow-leaved Ironbark - White Cypress Pine grassy open forest <sup>^</sup>	766.82
	White Box - Narrow-leaved Ironbark - White Cypress Pine shrubby open forest	261.44

**Table 3.1 Vegetation Communities Within The Project Boundary**

Associations	Vegetation Communities	Area (ha)
	White Box - White Cypress Pine grassy woodland <sup>^</sup>	1.30
	Yellow Box - Blakely's Red Gum grassy woodland <sup>^</sup>	25.92
Belah associations	Belah woodland	4.21
	Pilliga Box - Poplar Box - White Cypress Pine grassy open woodland	27.22
	White Box - Wiga - Belah woodland <sup>^</sup>	34.11
<b>Total forest and woodland</b>		<b>2727.77</b>
Grasslands	Plains Grassland*	0.99
	Derived Native Grassland <sup>^</sup>	98.99
	Derived Native Grassland (Low Diversity - Ironbark Woodland)	11.74
	Derived Native Grassland (Low Diversity - White Box Woodland)	365.40
	Derived Native Grassland (Low Diversity - with scattered Poplar Box trees)	167.85
	Exotic grassland	63.57
<b>Total native grasslands</b>		<b>644.97</b>
Cultivated areas	Wheat Field (with scattered Ironbark trees)	14.22
	Wheat Field (with scattered Poplar Box trees)	32.13
	Wheat Field (with scattered White Box trees)	6.54
	Crop land on basalt soil (with scattered White Box)	61.61
<b>TOTAL AREA</b>		<b>3550.80</b>

<sup>^</sup>Conforms to Box Gum Woodland and Derived Grasslands, a Critically Endangered Ecological Community protected under the Commonwealth EPBC Act and the NSW TSC Act.

\*Conforms to EPBC Act listed Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland and NSW TSC Act Native vegetation on cracking clay soils of the Liverpool Plains.

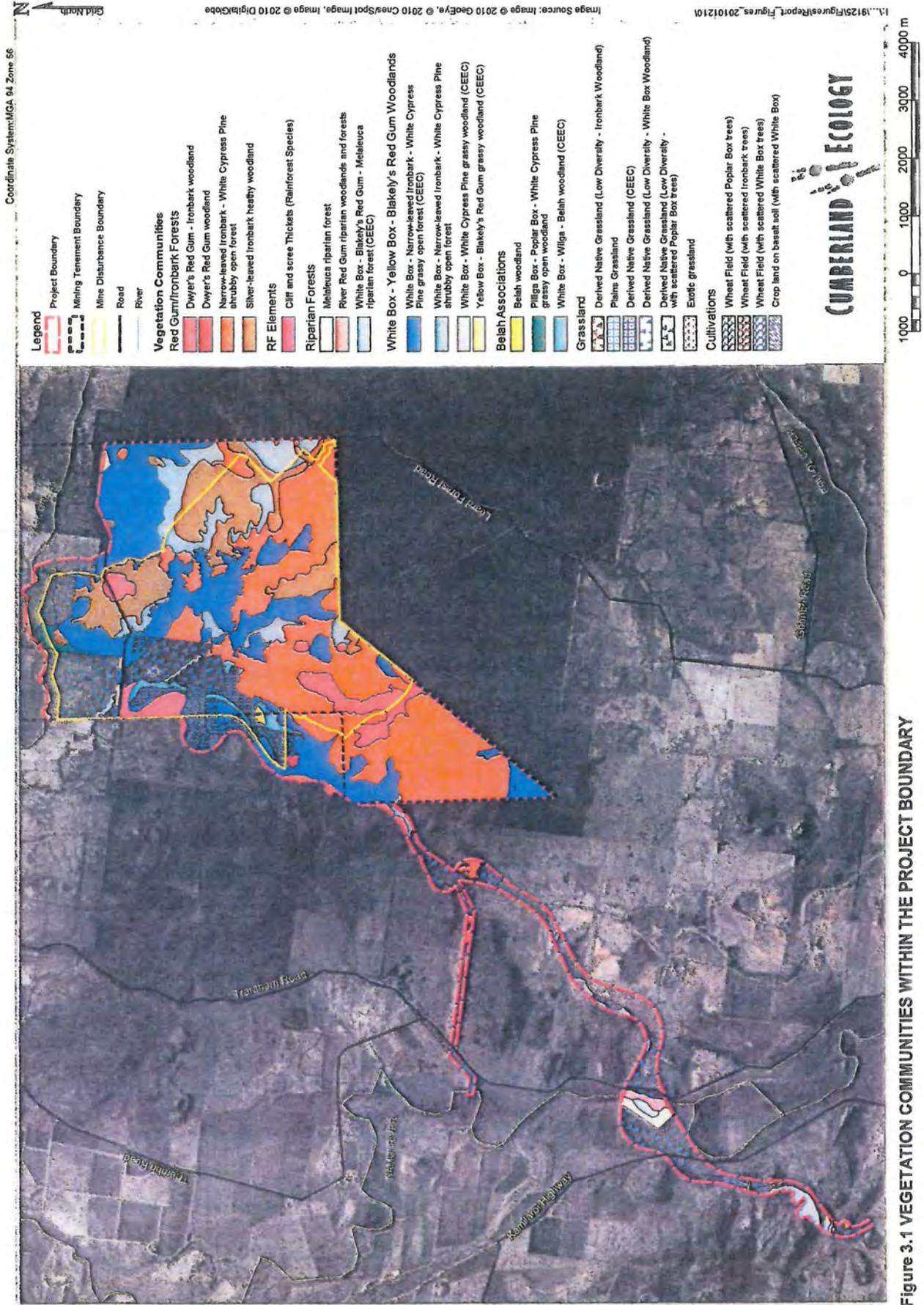


Figure 3.1 VEGETATION COMMUNITIES WITHIN THE PROJECT BOUNDARY

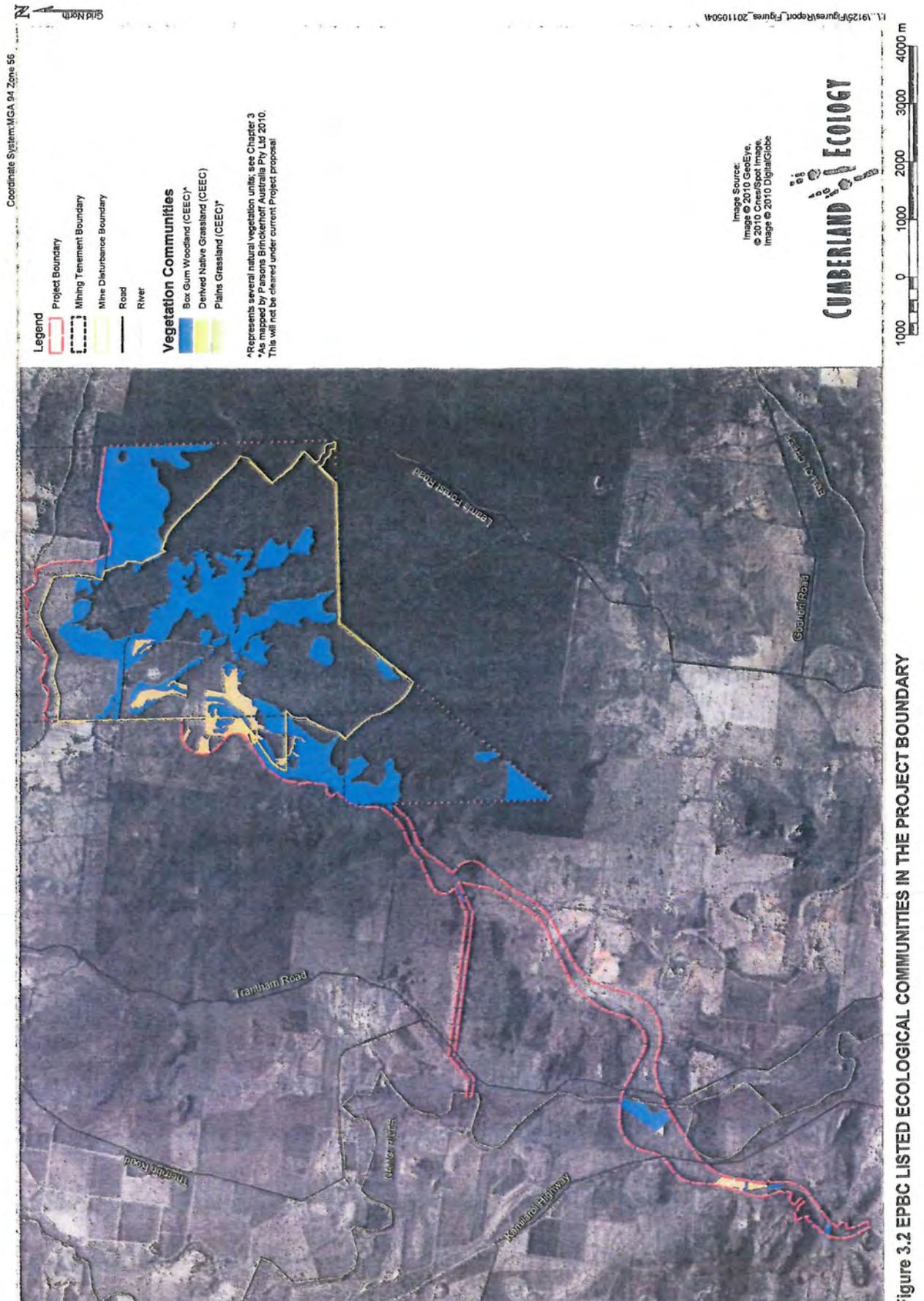


Figure 3.2 EPBC LISTED ECOLOGICAL COMMUNITIES IN THE PROJECT BOUNDARY

### 3.2 Vegetation Community Descriptions

#### 3.2.1 *White Box, Yellow Box, Blakely's Red Gum Woodlands and Open Forests*

The White Box, Yellow Box and Blakely's Red Gum woodland/open forest (Box Gum Woodland) complex is a floristically diverse complex of communities that occupy a range of landscape positions on a gradation of semi-fertile to fertile soils. These communities are dominated by one or a combination of the following tree species: *Eucalyptus albens* (White Box), *E. melliodora* (Yellow Box) and *E. blakelyi* (Blakely's Red Gum).

*Eucalyptus albens* largely occupies gentle slopes and more elevated areas on valley floors. Generally, *Callitris glaucophylla* (White Cypress Pine) was found to co-occur with *E. albens* on alluvial flats and valley floors where there are deeper soils; whilst *E. crebra* (Narrow-leaved Ironbark) was found as a subdominant constituent on lower to mid-valley slopes with shallower soils. *Eucalyptus melliodora* and *E. blakelyi* are generally confined to low points within the landscape, including on terraced flats above creek lines and drainages.

The understorey across these communities is variable. At lower points in the landscape, the understorey is largely grassy with a sparse shrub stratum dominated by *Swainsona galegifolia* (Smooth Darling Pea), *Geijera parviflora* (Wilga) and *Dodonea viscosa* ssp. *angustifolia* (Sticky Hop-bush). At higher reliefs approaching shallower soils on ridgelines, the understorey becomes denser as it grades into ironbark open forests.

The ground stratum is generally contiguous but varies in the frequency and abundance of grassy cover over topographical and geological gradients. The ground stratum comprises a diversity of forbs such as *Eremophila debilis* (Winter Apple), *Brunoniella australis* (Blue Trumpet), *Stackhousia viminea* (Slender Stackhousia), *Calotis lappulacea* (Yellow Burr-daisy) and *Rostellularia adscendens* var. *adscendens*. The dominant grass species present are *Cymbopogon refractus* (Barb-wire Grass), *Dichanthium sericeum* (Silky Blue-grass), *Austrodanthonia induta* (Wallaby Grass) and *Aristida vagans* (Three-awn Speargrass); although a number of other grass species are present in low numbers.

Brief descriptions of the defining characteristics of each community are presented in the following sections.

i. *White Box - Narrow-leaved Ironbark - White Cypress Pine grassy open forest*

**Status:** Critically Endangered Ecological Community (EPBC Act)

Endangered Ecological Community (TSC Act)

This community is one of the most extensive communities occurring within the Project Boundary and is recorded on mid to lower valley slopes on sedimentary or basaltic soils. In the Project Boundary, it comprises semi-mature woodlands as a result of past logging and contains few hollow-bearing or old growth trees (**Photograph 3.1**). It has a predominantly grassy understorey with localised patches of shrubs, with *Geijera parviflora*, *Notelaea microcarpa* var. *microcarpa* (Native Olive) and *Callitris glaucophylla* in the small tree stratum.

This community is consistent with the CEEC Box Gum Woodland and Derived Grasslands, which is listed under the EPBC Act and TSC Act.



**Photograph 3.1** *White Box - Narrow-leaved Ironbark - White Cypress Pine grassy open forest*

ii. *White Box - Narrow-leaved Ironbark - White Cypress Pine shrubby open forest*

**Status:** Not listed.

This community occurs on the mid-upper slopes on skeletal soils. It is generally recorded upslope of *White Box - Narrow-leaved Ironbark - White Cypress Pine grassy open forest* and grades into *Narrow-leaved Ironbark - White Cypress Pine shrubby open forest* on the ridgetops. It is marked by a dense shrub stratum of *Dodonea viscosa* ssp. *angustifolia* and/or *Beyeria viscosa* (Sticky Wallaby Bush) occurring in frequencies above 30% projective foliage cover (**Photograph 3.2**). Due to the density of the shrub cover, this community does not conform to the EPBC Act and TSC Act listings for CEEC Box Gum Woodland and Derived Grasslands (Gibbons and Boak, 2000, NSW Scientific Committee, 2004k).



**Photograph 3.2**

**White Box - Narrow-leaved Ironbark - White Cypress Pine shrubby open forest**

iii. *White Box - White Cypress Pine grassy woodland*

**Status:** Critically Endangered Ecological Community (EPBC Act)

Endangered Ecological Community (TSC Act)

This grassy woodland is much less extensive than the aforementioned box communities and is largely restricted to valley floors and floodplain flats, where soils are relatively more fertile. It is dominated by *Eucalyptus albens* and supported by a sub canopy of *Callitris glaucophylla* but is conspicuous in the absence of ironbarks. It is sparsely shrubby, containing localised patches of *Geijera parviflora*, *Notelaea microcarpa* var. *microcarpa* and *Acacia decora*.

In the Project Boundary, it comprises semi-mature woodlands as a result of past logging and contains few hollow-bearing or old growth trees (**Photograph 3.3**).

This community is consistent with the CEEC Box Gum Woodland and Derived Grasslands, which is listed under the EPBC Act and TSC Act.



**Photograph 3.3** *White Box - White Cypress Pine grassy woodland*

iv. *Yellow Box - Blakely's Red Gum grassy woodland*

**Status:** Critically Endangered Ecological Community (EPBC Act)

Endangered Ecological Community (TSC Act)

The community occurs within the Project Boundary as small, narrow pocket remnants in association with ephemeral creek lines and alluvial soils on higher points on flood plains. It is dominated by *E. melliodora*, with occasional occurrences of *E. blakelyi*, *E. albens* and *Callitris glaucophylla*. It is characterised by a low density shrub storey that is dominated by *Geijera parviflora* (Wilga). Other occasional shrub species include *Notelaea microcarpa*, *Acacia decora* (Western Golden Wattle) and *Indigofera australis* (Australian Indigo) (Photograph 3.4).

Occurrences of this community are generally in moderate to good condition with a high proportion of native plant species and few weeds. However, it has been fragmented and occurs as patches or corridors. The canopy has been logged and many trees are young, although some numbers of trees with hollows still remain.

This community is consistent with the CEEC Box Gum Woodland and Derived Grasslands, which is listed under the EPBC Act and TSC Act.



Photograph 3.4 *Yellow Box - Blakely's Red Gum grassy woodland*

### 3.2.2 Red Gum/Ironbark Forests

The Red Gum/Ironbark association is a group of communities recognised for the ubiquitous occurrence of *E. crebra* or *E. melanophloia* (Silver-leaved Ironbark). These Red Gum/Ironbark communities generally occupy the upper slope to ridgetop positions within the Project Boundary on fairly skeletal, bleached soils. In broad terms, the ironbark forests are located upslope of the box woodlands and share very similar understorey floristics, differing largely in the dominant canopy species and in the openness of the mid to small tree strata. *Callitris endlicheri* (Black Cypress Pine) is the common subdominant canopy species in these ironbark forests.

The presence of a mixture of red gum species, namely *E. dwyeri* (Dwyer's Red Gum) but also *E. dealbata* (Tumbledown Red Gum) tends to phase in and out of the ironbark forests but become locally dominant where very shallow soils on large rock sheets produce grassy woodlands or occasionally mallee woodland.

#### i. Narrow-leaved Ironbark - White Cypress Pine shrubby open forest

**Status:** Not listed

This is floristically similar to *White Box - Narrow-leaved Ironbark - White Cypress Pine grassy open forest* and *White Box - Narrow-leaved Ironbark - White Cypress Pine shrubby open forest* (Photograph 3.5). It was recorded on upper slopes on skeletal soils over conglomerate. Generally, the subdominant species recorded was *Callitris endlicheri*; although *E. albens* was recorded in low densities in areas such as drainage heads with locally deeper soils it was observed to be largely absent.

At points of higher relief, the community becomes very shrubby (above 35% projective foliage cover) but can be quite open and grassy on gentler grades. Common shrub species include *Acacia cheelii*, *Melichrus urceolatus*, *Canthium odoratum*, *Dodonea viscosa* and *Bursaria spinosa*.

This community does not conform to the description of CEEC Box Gum Woodland and Derived Grasslands since *E. albens* occurs as a scattered component and not as a co-dominant species.



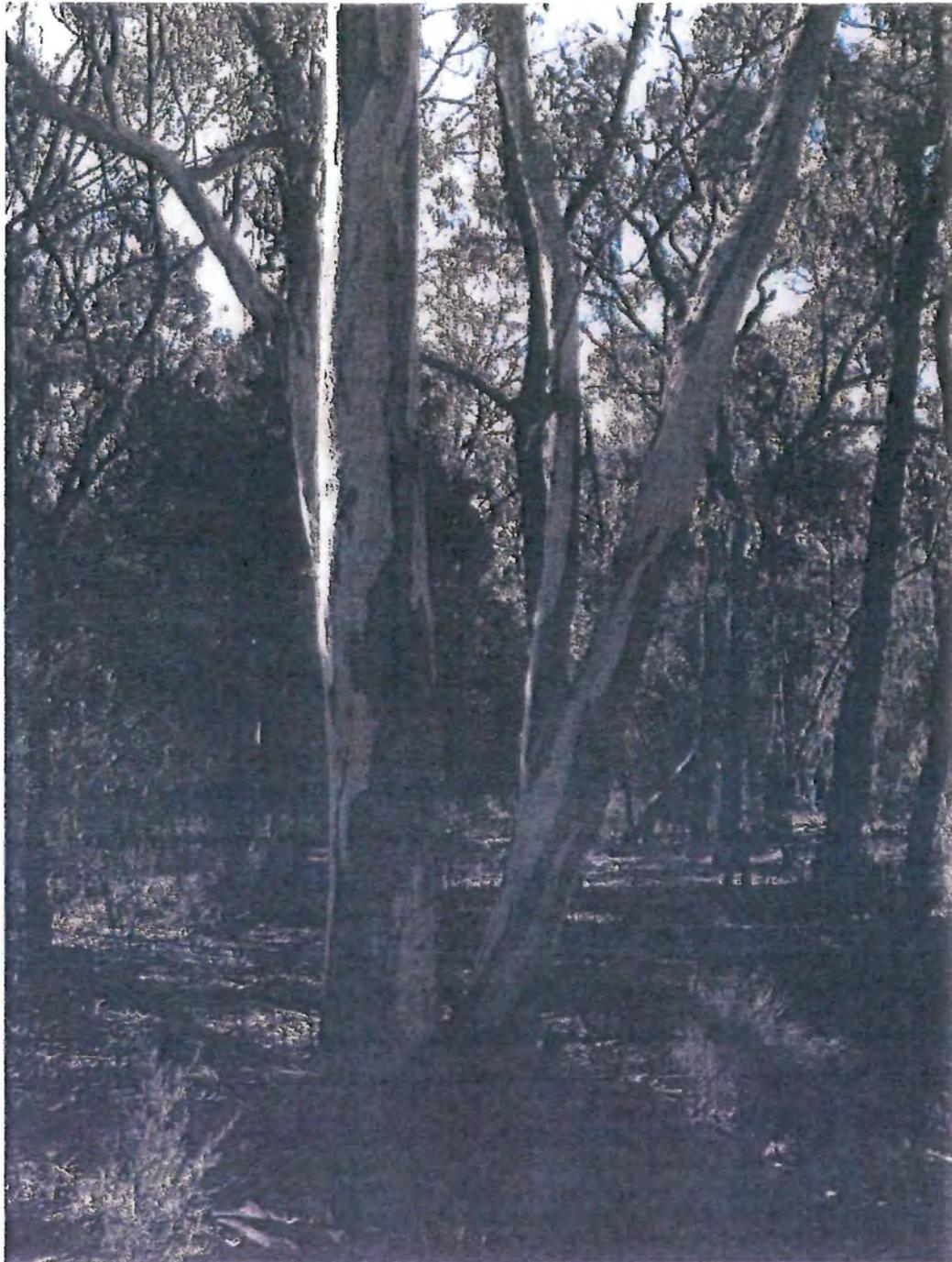
**Photograph 3.5**      **Narrow-leaved Ironbark - White Cypress Pine shrubby open forest**

ii.      *Dwyer's Red Gum - Ironbark woodland*

**Status:** Not listed

This community appears to be an intermediate between *Narrow-leaved Ironbark - White Cypress Pine shrubby open forest* and areas of *Dwyer's Red Gum woodland* and is dominated by a mixture of *E. crebra*, *E. dwyeri* (*Dwyer's Red Gum*) and possibly occurrences of *E. dealbata* (*Tumbledown Red Gum*). The red gum species were recorded in variable densities in open woodland areas on fairly skeletal soils (**Photograph 3.6**).

The small tree stratum ranges from scattered individuals or localised groups of *Acacia cheelii*, *Brachychiton populneus* (*Kurrajong*) and regenerating canopy trees to dense stands of *Acacia cheelii* and *Dodenaea viscosa*. In some areas there was locally dense regeneration of *E. crebra* and scattered occurrences of *Alphitonia excelsa* (*Red Ash*), particularly on the volcanics along ridgetops in the south west within the Project Boundary.



Photograph 3.6 Dwyer's Red Gum - Ironbark woodland

iii. *Dwyer's Red Gum woodland*

**Status:** Not listed

A much localised occurrence of this grassy woodland was recorded on the upper slopes of within the Project Boundary. It was markedly distinguishable from *Dwyer's Red Gum - Ironbark woodland* by the dominance of *E. dwyeri* and the absence of any other canopy tree species. The ridgetop in this area, by nature of its gentle grade, forms a plateau on which shallow soils resulted in areas of exposed rock sheets.

iv. *Silver-leaved Ironbark heathy woodland*

**Status:** Not listed

*Eucalyptus melanophloia* (Silver-leaved Ironbark) woodland and open forest occurs on the steeper slopes in the eastern and northern half of the Project Boundary (**Photograph 3.7**). The understorey is contiguous with adjacent areas of *White Box - Narrow-leaved Ironbark - White Cypress Pine grassy open forest* and *Narrow-leaved Ironbark - White Cypress Pine shrubby open forest*. The vegetation mapping (**Figure 3.1**) shows small remnant pockets of this community surrounded by larger areas of *E. crebra - Callitris glaucophylla* woodland and open forest and suggests that the occurrence of these two ironbark species may be mixed in many areas.

This community does not correspond to the description of Box Gum Woodland as *E. albens* does not occur as a co-dominant species. Occurrences of this community are generally in good condition with a high proportion of native plant species and few weeds. Many trees within the canopy were found to be young, although substantial numbers of trees with hollows still remain.



Photograph 3.7 Silver-leaved Ironbark heathy woodland

### 3.2.3 *Belah Associations*

#### i. *Belah woodland*

**Status:** Not listed

This woodland type occurs on heavier soils that are suitable for cropping and has been heavily cleared in the past. It is poorly represented in conservation reserves and of conservation significance. A patch of this community occurs on fine-textured black soil associated with basalt or quaternary alluvium geology. It is restricted to the flats and low slope areas on the western side of the Project Boundary at the fringes of existing cropping fields. As the slope increases, this community grades into *White Box - Wilga - Belah woodland*.

The main canopy species is *Casuarina cristata* (Belah). There is up to 25% cover of shrubs including *Geijera parviflora* but the distribution of shrubs is patchy (Photograph 3.8). The diversity of this community is generally low, with a sparse understorey of weeds and natives like *Sclerolaena birchii* (Galvanised Burr), *Einadia hastata* (Berry Saltbush), *Chondrilla juncea* (Skeleton Weed) and *Sonchus oleraceus* (Common Sowthistle). Only one grass species was recorded, *Lachnagrostis filiformis*.

Occurrences of this community are generally in poor condition with a high proportion of weeds in the ground stratum. The community has been heavily cleared for agriculture and the patches that remain are impacted by weeds, erosion and fragmentation. The canopy was found to contain many young trees, although a substantial number of trees with hollows still remain. It would have once contained a diversity of shrub and small tree species.



**Photograph 3.8** Belah woodland

ii. *Pilliga Box - Poplar Box - White Cypress Pine grassy open woodland*

**Status:** Not listed

This is a variable community that occurs as tall woodland to open forests and is co-dominated by *E. populnea* (Poplar Box) and *E. pilligaensis* (Narrow-leaved Grey Box) (**Photograph 3.9**). It is associated with alluvial flats and generally occupies similar areas as *Yellow Box - Blakely's Red Gum grassy woodland* and *White Box - White Cypress Pine grassy woodland*. It occurs within the Project Boundary and surrounds in low-lying areas, such as south of Back Creek and along the southern and south western margins of Leard State Forest (**Figure 3.1**).

On better drained red-brown soils, *Callitris glaucophylla* is usually present as a subdominant tree species along with *Geijera parviflora*. On heavy dark soils, the community exhibits a distinctive assemblage of supporting shrub and small tree species, including *Casuarina cristata*, *Allocasuarina luehmanii* (Bulloak), *Capparis mitchellii* (Native Orange), *Eremophila*

*mitchelli* (Budda), *Alectryon oleifolius* (Western Rosewood) and *Ventilago viminalis* (Supple Jack), which are characteristic species found on the basaltic or rich alluvial cracking clays. Occurrences of this community are generally in good condition with a high proportion of native plant species and few weeds. Many trees within the canopy were found to be young, although substantial numbers of trees with hollows still remain.



**Photograph 3.9** Pilliga Box - Poplar Box - White Cypress Pine grassy open woodland

iii. *White Box - Wilga - Belah woodland*

**Status:** Critically Endangered Ecological Community (EPBC Act)

Endangered Ecological Community (TSC Act)

This community is found on heavy black soils on the plains and is floristically very similar to *Pilliga Box - Poplar Box - White Cypress Pine grassy open woodland* where the latter occurs on heavy basalt soils. *Eucalyptus albens* replaces *E. populnea* and *E. pilligaensis* the canopy but is otherwise supported by the same suite of shrub and small tree species, including *Casuarina cristata*, *Geijera parviflora*, *Eremophila mitchelli*, *Alectryon oleifolius* and *Ventilago viminalis* (Supple Jack). As with other communities that occur on fertile heavy soils, this community has been extensively cleared for cultivation in the past and current occurrences consist of young trees, largely without tree hollows.

This community is consistent with the CEEC Box Gum Woodland and Derived Grasslands, which is listed under the EPBC Act and TSC Act.

### 3.2.4 Riparian Forests

#### i. *Melaleuca riparian forest*

**Status:** Not listed

The riparian areas of Back Creek and its tributaries in the northern section of the Project Boundary are dominated by *Melaleuca bracteata* over a grassy understorey that is contiguous with the surrounding vegetation communities. This riparian (stream bank) vegetation occurs where the *Melaleuca* can be sustained by extra water from ephemeral flows within these creeks. The community does not appear to be sustained by groundwater and much of the understorey and ground stratum is similar to the surrounding communities that occur on the lower slopes of nearby hillsides. Field observations made by Cumberland Ecology suggest that it is probable that the dominant shrub *Melaleuca bracteata* draws water from perched water tables amid the alluvium of the dry creek systems. The root systems appear to be relatively shallow and concentrated in the top 1-2 m of soil/alluvium. For this reason it is not considered to be a groundwater dependent ecosystem that is dependent upon the groundwater system, which is located at a depth greater than 2 metres (see further discussion of potential impacts to this community in Section 4.5.7 that deals with potential impacts to Groundwater Dependent Ecosystems).

Shrub species present include *Geijera parviflora*, *Notelaea microcarpa* and *Pimelea linifolia*, whilst common groundcover species include *Daucus glochidiatus* (Native Carrot), *Calotis lappulacea* (Yellow Burr-daisy), *Vittadinia sulcata*, *Xerochrysum viscosum* (Sticky Everlasting), *Wahlenbergia communis*, *Dichondra repens* (Kidney Weed) and *Geranium solanderi* (Native Geranium). Common grasses recorded were *Austrodanthonia racemosa* (Wallaby Grass), *Austrostipa scabra* (Speargrass), *Austrostipa verticillata* (Slender Bamboo Grass), *Cymbopogon refractus* (Barbed Wire Grass), *Bothriochloa macra* (Red-leg Grass), *Chloris truncata* (Windmill Grass), *Microlaena stipoides* (Weeping Meadow Grass) and *Poa sieberiana*.

#### ii. *River Red Gum riparian woodlands and forests*

**Status:** Not listed

*Eucalyptus camaldulensis* (River Red Gum) forms a riverine woodland on floodplains and around billabongs in association with the Namoi River. This community usually suffers from degradation due to trampling and erosion of the creek banks by livestock and hence, the understorey is largely comprised of a mixture of native and exotic sedges and rushes, pasture weeds and other exotics imported either by livestock or on the water. Very few shrubs are present in this community.

#### iii. *White Box - Blakely's Red Gum - Melaleuca riparian forest*

**Status:** Critically Endangered Ecological Community (EPBC Act)

Endangered Ecological Community (TSC Act)

This community is very similar to *Melaleuca riparian forest* but contains *Eucalyptus albens* and occasional occurrences of *E. blakelyi* and *Callitris glaucophylla*. It is not present within Leard State Forest but was recorded as degraded woodland along a small tributary of Maules Creek to the west of the Leard State Forest. A shrub layer is absent, with a sparse small tree stratum of *Geijera parviflora*. The groundcover is predominantly grassy but is largely influenced by surrounding agricultural activities. In the Project Boundary, the groundcover was mostly native but was species-poor due to a history of cultivation on the property.

This community is consistent with the CEEC Box Gum Woodland and Derived Grasslands, which is listed under the EPBC Act and TSC Act.

### 3.2.5 Native Grasslands

#### i. Plains Grassland

**Status:** Critically Endangered Ecological Community (EPBC Act)

Endangered Ecological Community (TSC Act)

Plains Grassland is a natural grassland community that occurs on deep alluvial cracking clay-loam soils derived from basalts. The extensive black soil plains, undulating volcanic hills and alluvial floodplains of the Namoi Valley once supported large tracts of closed grasslands dominated by *Austrostipa aristiglumis* (Plains Grass) together with an array of sub-dominant grasses (*Panicum* spp., *Austrodanthonia* spp., *Dichanthium* spp., *Bothriochloa* spp. and *Chloris* spp.). As these areas are highly fertile, much of these lands have been cleared for cultivation, grazing and other agricultural activities.

An area of Plains Grassland is located next to the proposed rail transport corridor (Parsons Brinckerhoff Australia Pty Ltd, 2010) to the south west of the Project Boundary. It is currently grazed but is in moderate condition.

The community is consistent with the EEC *Native vegetation on cracking clay soils of the Liverpool Plains*, which is listed under the TSC Act. It is also consistent with the EPBC Act equivalent, *CEEC Natural grasslands on basalt and fine-textured alluvial plains of northern New South Wales and southern Queensland*.

ii. *Derived Native Grasslands*

**Status:** Critically Endangered Ecological Community (EPBC Act)

Endangered Ecological Community (TSC Act)

Much of the native grasslands around Leard State Forest have historically been derived from the clearing of trees and shrubs to create pasture for livestock. Derived grassland (also known as secondary grassland or understorey) can remain relatively intact, but by nature, the floristic composition of these grasslands will vary according to the forest or woodland community from which it originated. The slope, aspect, soil, underlying geology and land use also heavily influences the floristic composition.

Native grasslands within the Project Boundary that were derived from the clearing of grassy communities dominated by White Box, Yellow Box, or Blakely's Red Gum were mapped and referred to as Derived Native Grasslands (**Figure 3.1**). To be identified as Derived Native Grasslands, at least 12 native forbs with one being a recognised "important" species must be present within a 0.1 ha plot (see explanation in **Appendix A**). Most occurrences of Derived Native Grassland were restricted to the fringes of extant woodland and forest vegetation; the diversity of the grassland decreased quite quickly with distance from the forest and woodland margins.

This community is consistent with the CEEC Box Gum Woodland and Derived Grasslands, which is listed under the EPBC Act and TSC Act.

iii. *Low Diversity Derived Native Grasslands*

**Status:** Not listed

Much of the native grassland within the Project Boundary is generally degraded to varying degrees across its extent by past clearing, grazing practices and exploration and mining activities. Therefore, most areas of native grasslands contain a very low diversity of native species. These are referred to as *Low Diversity Derived Native Grasslands*.

Of these grasslands, those areas that have been derived from grassy communities dominated by White Box, Yellow Box, or Blakely's Red Gum do not conform to the CEEC Box Gum Woodland and Derived Grasslands listed under the EPBC Act and TSC Act. This is because the diversity of the groundcover herb assemblage is too low to meet the condition criteria under legislated definitions of the community.

Notwithstanding this, there is an inherent value in derived native grasslands, particularly where rehabilitation objectives require the re-establishment of an ecological community. This is because it is generally recognised that re-establishing understorey is very difficult. To this end, this vegetation unit has been mapped and differentiated according to the original community from which it was derived (**Figure 3.1**).

**Attachment C**

**Approval of Independent Ecologist**

## Brian Cole

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**To:** Brian Cole  
**Attachments:** SEWPaC Letter - Eco Experts.pdf; Cumberland Ecology.pdf

**From:** Gowland, Kate [<mailto:Kate.Gowland@harbourtrust.gov.au>]  
**Sent:** Monday, 6 May 2013 8:14 AM  
**To:** Brian Cole  
**Cc:** Manaia Rehu; Taylor, Mahani; Sharma, Renu; Lindell, Lisa  
**Subject:** FW: Maules Creek Coal - Request Independent Ecological Experts [SEC=UNCLASSIFIED]

Hi Brian

We will follow with a more formal response to Manaia, but in the meantime – note the department approves the use of Cumberland Ecology as the ecologist for the purposes of undertaking the work in relation to **Condition 6** attached to the Approval of the Maules Creek coal mine (2010/5566).

Regards

Kate



4 April 2013

**Mining Section**

Department of Sustainability, Environment, Water, Population and Communities  
PO BOX 787  
CANBERRA ACT 2601

Attention: Ms Kate Gowland

Dear Kate,

**Maules Creek – Independent Ecological Experts**

The Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) recently granted Approval for the Maules Creek Coal Mine Project (EPBC 2010/5566). It approved the construction and operation of an open cut coal mine located approximately 18 km to the north east of Boggabri within the Narrabri Shire Council (NSC) Local Government Area.

The Approval requires Maules Creek Coal to fulfil specified conditions as set down by SEWPaC. Consultation and approval is therefore sought from SEWPaC in relation to the appointment of independent ecological experts, as stated in the approval. The relevant condition states:

*"6. The person taking the action must submit to the Minister for approval, within three months of the commencement of the action, an approach that:*

*(a) limits the maximum disturbance (in hectares) specified for each of the years 5, 10, 15 and 21 from the date of this approval of the White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland ecological community and the habitat or potential habitat for the regent honeyeater, swift parrot and greater long-eared bat;*

*(b) incorporates an analysis, undertaken by independent ecological experts approved by the Department, that demonstrates the maximum disturbance limits which will minimise any impacts on relevant matters of national environmental significance."*

Maules Creek Coal wishes to put forward Cumberland Ecology for the position of independent ecological experts. Attached is their CV and the nominated personal for the role.

Could you please review and approve, so that Maules Creek Coal may meet SEWPaC's expectations. Should you have any queries in relation to this letter, please do not hesitate to contact myself on 02 6749 7821 or

[hpobin@whitehavencoal.com.au](mailto:hpobin@whitehavencoal.com.au)



**WHITEHAVEN COAL**

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[www.whitehavencoal.com.au](http://www.whitehavencoal.com.au)

**Yours faithfully**  
**MAULES CREEK COAL**

**Brian Cole**  
*EGM Projects Delivery*

**Att:** *Cumberland Ecology CV (April 2013)*

**Attachment D**

**Analysis from the Independent Ecologist**

14 September 2015

Executive General Manager, Project Delivery  
Brian Cole  
Whitehaven Coal Ltd  
121 Merton St  
Boggabri NSW 2382

**MAULES CREEK COAL - EPBC APPROVAL – CONDITION 6 B**

Dear Brian,

Cumberland Ecology  
PO Box 2474  
Carlingford Court 2118  
NSW Australia  
Telephone (02) 9868 1933  
Mobile 0425 333 466  
Facsimile (02) 9868 1977  
Web: [www.cumberlandecology.com.au](http://www.cumberlandecology.com.au)

We have undertaken an analysis in which we have reviewed the progressive clearance plans for the Maules Creek Mine over its mine life and compared those plans with the distribution of vegetation mapped for the mine and mine related infrastructure footprint, in particular White Box – Yellow Box- Blakely's Red Gum Grassy Woodland and Derived Native Grassland and native vegetation communities and/or potential habitat for the Regent Honeyeater, Swift Parrot and Greater Long-eared Bat.

We are aware that the clearing for the mine will occur progressively and be in accordance with the approved Mine Operations Plan, which limits clearing at any one time to the immediate vicinity of the mine.

Based on this analysis, we concur with the forecasts of disturbance presented in this report and agree that they represent the minimum practical disturbance at each time period over the mine life.

Yours sincerely,



Dr. David Robertson  
Project Director  
[david.robertson@cumberlandecology.com.au](mailto:david.robertson@cumberlandecology.com.au)

**Attachment E**

**Collaboration between Whitehaven Coal and Idemitsu  
Australia Resources**



**WHITEHAVEN COAL**

11 September 2015

Dr Jan Green  
Manager Corporate Sustainability and Environment  
Idemitsu Resources Australia Pty Ltd  
GPO Box 1127  
BRISBANE QLD 4001

Dear Jan,

**Re: EPBC Approval (2010/5566) – Condition 6 and EPBC Approval (2009/5256) – Condition 5**

Thank you for providing the staged drawings showing the interaction between the Boggabri Coal Mine and the Maules Creek Coal Mine as they develop over the next twenty years (letter dated 17 February 2014).

Please find included a plan which set out the progressive development of Maules Creek Coal Mine over the same period..

The staged plan indicates how the mine will develop over the coming years and also the progression of vegetation clearance ahead of mine development.

Aston Coal 2 Pty Ltd (Aston), a related corporate entity of Whitehaven Coal Limited, consents to the staged plan being submitted by Idemitsu Australia Resources Pty Ltd in its submission supporting satisfaction of Condition 5c of the Boggabri Coal Mine EPBC Approval (2009/5256). Likewise, Aston will submit the same plan in its submission in supporting satisfaction of Condition 6c of the Maules Creek Coal Mine EPBC Approval (2010/5566).

Yours sincerely

A handwritten signature in black ink, appearing to be "Craig Simmons", written over a horizontal line.

Craig Simmons  
Area Manager Services - Maules Creek  
Maules Creek Coal Project



**Idemitsu Australia Resources Pty Ltd**

ABN 45 010 236 272

Level 1, AM60 60 Albert Street, Brisbane, QLD 4000 Australia

(Postal Address: PO Box 15136, City East, QLD 4002)

TEL +61-7-3222-5600 FAX +61-7-3222-5665

17 September 2015

Mr Craig Simmons

Area Manager Services – Maules Creek

Maules Creek Coal Project

121 Merton Street,

Boggabri NSW 2382

Dear Craig

**Re: EPBC Approval (2010/5566) – Condition 6 and EPBC Approval (2009/5256) – Condition 5**

Thank you for providing the staged drawings showing the interaction between Boggabri Mine and Maules Creek Mine as they develop over the next twenty years.

Idemitsu considers that, in relation to Boggabri Mine, at this time the staged drawings provide a practical representation of how the mine will develop over the coming years and also the vegetation clearance ahead of mine development.

Idemitsu consents to the staged drawings being submitted by Maules Creek supporting Condition 6 of EPBC 2010/5566.

Yours sincerely

Jan Green

Group Manager Environment and Sustainability

Idemitsu Australia Resources