

**PEABODY**

**WILPINJONG COAL  
BIODIVERSITY MANAGEMENT PLAN**

WI-ENV-MNP-0035

August 2020

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WI-ENV-MNP-0035	5	September 2019	WCPL	DPIE	Revision of BMP to update Completion & Performance Criteria (as approved by OEH & DP&E), revise 3-year BMP schedule, monitoring, inspection frequencies & incorporate IEA recommendations and Update mgt plan to include revised disturbance footprint boundary in Pit 8
WI-ENV-MNP-0035	6	August 2020	WCPL	DPIE	Revision of BMP to include ML1795 and update figures accordingly

## CONTENTS

<b>1</b>	<b>Purpose</b>	<b>1</b>
1.1	Background and Location Setting	1
1.2	Statutory Requirements	3
1.3	Development Consent and Licence Requirements	3
1.3.1	Relevant Legislation and Guidelines	3
1.4	Purpose and Scope	3
1.5	Overall Objectives of this Plan	4
1.6	Consultation	4
<b>2</b>	<b>Existing Environment</b>	<b>7</b>
2.1	Climate	7
2.2	Geology and Soils	7
2.3	Landform and Hydrology	8
2.4	Land Use and History	8
2.5	Vegetation	9
<b>3</b>	<b>Baseline Data</b>	<b>10</b>
3.1	Flora	10
3.1.1	Wilpinjong Coal Project (2005)	10
3.1.2	Modification 5 (2013)	10
3.1.3	Wilpinjong Extension Project (2015)	14
3.2	Fauna	18
3.2.1	Wilpinjong Coal Project (2005)	18
3.2.2	Modification 5 (2013)	18
3.2.3	Wilpinjong Extension Project (2015)	18
<b>4</b>	<b>Biodiversity Offset Strategy</b>	<b>22</b>
4.1	Background	22
4.1.1	Wilpinjong Coal Project EIS (2005)	22
4.1.2	Modification 5 (2014)	25
4.1.3	Wilpinjong Extension Project EIS (2015)	25
4.2	Enhancement and Conservation Areas	26
4.3	Regeneration Areas	27
4.4	Rehabilitation Areas	27
4.5	Summary of Biodiversity Offset Strategy	30
4.6	Security of the Biodiversity Offset Areas	30
4.7	Conservation Bond	31
<b>5</b>	<b>Biodiversity Management Domains and Zones</b>	<b>32</b>
5.1	Overview	32
5.1.1	Biodiversity Offset Areas	32
5.1.2	Enhancement and Conservation Areas	32

5.1.3	Regeneration Areas	33
5.1.4	Rehabilitation Areas	33
5.1.5	Residual Areas	33
5.2	Resilience Mapping	33
5.3	Management Domains	34
5.3.1	Biodiversity Offset Areas	34
5.3.2	Enhancement and Conservation Areas	36
5.3.3	Regeneration Areas	37
<b>6</b>	<b>Interim, Performance &amp; Completion Criteria</b>	<b>39</b>
6.1	Biometric Assessment	39
6.1.1	Rehabilitation Interim Performance Criteria	41
6.1.2	Rehabilitation BioMetric Performance Criteria	42
6.1.3	Rehabilitation Biometric Completion Criteria	42
6.2	Landscape Function Analysis	44
6.3	Limitations for Meeting Completion Criteria in Easements	45
<b>7</b>	<b>Biodiversity Management Measures and Strategies</b>	<b>46</b>
7.1	Management Measures for Management Domains	46
7.1.1	Enhancement and Conservation Areas	46
7.1.2	Regeneration Areas	46
7.1.3	Rehabilitation Areas	46
7.1.4	Residual Areas	47
7.2	Interim, Performance and Completion Management Strategy	47
7.3	Three Year Management Schedule	49
7.3.1	Activities Commenced Prior to the Wilpinjong Extension Project Approval	49
7.3.2	Activities Commenced Post Wilpinjong Extension Project Approval	49
7.4	General Land Management Strategies	49
7.4.1	Cultural Heritage Management	50
7.4.2	Fencing, Gates and Signage	50
7.4.3	Access Tracks	50
7.4.4	Waste Management	51
7.4.5	Erosion, Sedimentation and Soil Management	51
7.4.6	Grazing and Stock Management	51
7.4.7	Seed Collection and Propagation	51
7.4.8	Habitat Augmentation	52
7.4.9	Revegetation Techniques	53
7.4.10	Weed Management	56
7.4.11	Vertebrate Pest Management	57
7.4.12	Management of <i>Phytophthora cinnamomi</i>	58
7.4.13	Bushfire Management	58

7.5	Eastern Bentwing-Bat Management Strategies	59
7.6	Regent Honeyeater Management Strategies	60
7.7	Wilpinjong Creek Management Strategies	60
7.8	Ground Disturbance Permits	61
7.9	Inspections	61
<b>8</b>	<b>Risk Assessment and Management</b>	<b>62</b>
<b>9</b>	<b>Biodiversity Monitoring Program</b>	<b>62</b>
9.1	Vegetation Monitoring (BioMetric)	62
9.1.1	Methodology	63
9.2	Landscape Stability (LFA)	63
9.2.1	Methodology	63
9.3	Fauna	64
9.3.1	Methodology	64
9.4	Monitoring of Unexplained Vegetation Dieback	64
9.5	Biodiversity Monitoring Program Summary	65
9.6	Data Management and Review	69
<b>10</b>	<b>Contingency Plans and Emergency Response</b>	<b>69</b>
10.1	Trigger Action Response Plans	69
10.2	Management and Incidents and Non-compliances	71
<b>11</b>	<b>Training and Awareness</b>	<b>72</b>
<b>12</b>	<b>Complaints Response Protocol</b>	<b>72</b>
<b>13</b>	<b>Reporting</b>	<b>73</b>
13.1	Incident and Non-compliance Reporting	73
13.2	Annual Review	73
13.3	Independent Environmental Audit	74
13.4	Website Updates	74
<b>14</b>	<b>Review</b>	<b>75</b>
<b>15</b>	<b>Responsibilities</b>	<b>75</b>
<b>16</b>	<b>Acronyms</b>	<b>77</b>
<b>17</b>	<b>References</b>	<b>79</b>

## TABLES

Table 1	Relevant Statutory Approvals.....	3
Table 2	Soil Landscapes of the Mine Area.....	8
Table 3	Vegetation Disturbance and Biodiversity Offset Areas .....	13
Table 4	Box-gum Woodland EEC – Disturbance and Biodiversity Offset Areas .....	14
Table 5	Ecosystem Credits Required for the WEP .....	15
Table 6	Biodiversity Offset Strategy (WCPL, 2005) .....	25
Table 7	Biodiversity Offset Strategy .....	30

Table 8 Management Zones .....	34
Table 9 BioMetric Site Attributes and Measurement Parameters .....	40
Table 10 Site Value Scores and Condition States .....	41
Table 11 Interim Performance .....	41
Table 12 Biometric Performance & Completion Criteria .....	43
Table 13 Soil Surface Condition Indicators .....	44
Table 14 Short, Medium and Long Term Strategy .....	48
Table 15 Revegetation (Direct seeding) Management Cycle.....	54
Table 16 Rehabilitation Management Cycle.....	55
Table 17 Weed Management Program .....	57
Table 18 Biodiversity Monitoring Program .....	66
Table 19 Interim Rehabilitation Performance Criteria (Years 1-10) TARP .....	69
Table 20 Performance and Completion Criteria (Post 10 Years) TARP .....	70
Table 21 Landscape Stability (LFA) TARP .....	71
Table 22 <i>Phytophthora cinnamomi</i> TARP .....	71
Table 23 Management Plan Roles and Responsibilities .....	75
Table 24 List of Acronyms .....	77

## FIGURES

Figure 1	Regional Location
Figure 2	Project Area and Biodiversity Offset Strategy
Figure 3	Threatened Ecological Communities – Mine Site
Figure 4	Mapped Vegetation Communities the Modification 5 Project Area– 2014
Figure 5	Mapped Vegetation Communities the Extension Project Area – 2015
Figure 6	Threatened Flora Species
Figure 7	Threatened Birds
Figure 8	Threatened Mammals and Amphibian
Figure 9	Threatened Ecological Communities – Biodiversity Offset Areas 1 and 2
Figure 10	Threatened Ecological Communities – Biodiversity Offset Areas 3, 4, 5, D and E
Figure 11	Conceptual Final Rehabilitation and Regeneration

## PLATES

Plate 1	Rock Debris Pile at the Entrance of the Mine Adit
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## **APPENDICES**

Appendix 1	Biodiversity Management Plan Requirements
Appendix 2	Key Biodiversity Management Plan Consultation Records
Appendix 3	Offset Area Correspondence with National Parks and Wildlife Service
Appendix 4	Resilience Method Analysis
Appendix 5	Resilience Mapping
Appendix 6	Three Year Management Schedule
Appendix 7	Wilpinjong Creek Management Strategy

# 1 Purpose

## 1.1 Background and Location Setting

The Wilpinjong Coal Mine (the Mine) is owned and operated by Wilpinjong Coal Pty Ltd (WCPL), a wholly owned subsidiary of Peabody Energy Australia Pty Ltd (Peabody).

The Mine is an existing open cut coal mining operation situated approximately 40 kilometres (km) north-east of Mudgee, near the Village of Wollar, within the Mid-Western Regional Local Government Area, in central New South Wales (NSW) (**Figure 1**). The mine produces thermal coal products which are transported by rail to domestic customers for use in electricity generation and to port for export. Open cut mining operations are undertaken 24 hours per day, seven days per week.

The Mine originally operated under Project Approval 05-0021 that was granted by the NSW Minister for Planning under Part 3A of the NSW *Environmental Planning and Assessment Act 1979* (EP&A Act) on 1 February 2006.

The Biodiversity Management Plan (BMP) was previously developed in accordance with PA05-0021.

On 24 April 2017, WCPL was granted Development Consent (SSD-6764) (the Development Consent) for the Wilpinjong Extension Project (WEP) that provides for the continued operation of the Mine at rates of up to 16 million tonnes per annum (Mtpa) of run-of-mine (ROM) coal out to 2033, and access to approximately 800 hectares (ha) of open cut extensions. The Development Consent has superseded Project Approval 05-0021<sup>1</sup>.

As a component of the WEP, WCPL augmented the existing Biodiversity Offset Strategy to compensate for the additional biodiversity impacts. The Biodiversity Offset Strategy developed by WCPL addresses unavoidable impacts on threatened species, populations and communities that are listed under the NSW *Threatened Species Conservation Act, 1995* (TSC Act) and the *Commonwealth Environment Protection and Biodiversity Conservation Act, 1999* (EPBC Act).

The Biodiversity Offset Strategy comprises a package of Biodiversity Offset Area properties that has been set aside for conservation and is to be managed in perpetuity via inclusion in the National Parks and Wildlife Service estate. In addition, the Biodiversity Offset Strategy also includes on-site rehabilitation to establish the biometric vegetation types (BVTs) and fauna habitat as required in the Development Consent, a number of Enhancement and Conservation Areas (ECAs) and residual Regeneration Areas that will strengthen the linkages between the woodland rehabilitation areas, and the Goulburn River National Park and Munghorn Gap Nature Reserve. The Biodiversity Offset Strategy will also assist in the faunal recolonisation of Project rehabilitation areas and regeneration areas.

Peabody and its subsidiaries, WCPL and Peabody Pastoral Holdings Pty Ltd, is a major landholder owning adjacent rural properties and land to the east and south-east of the Mine. Land to the west of the Mine is owned by adjacent mining companies, whilst the National Parks and Wildlife Service estate own significant land to the north and south-west of the Mine.

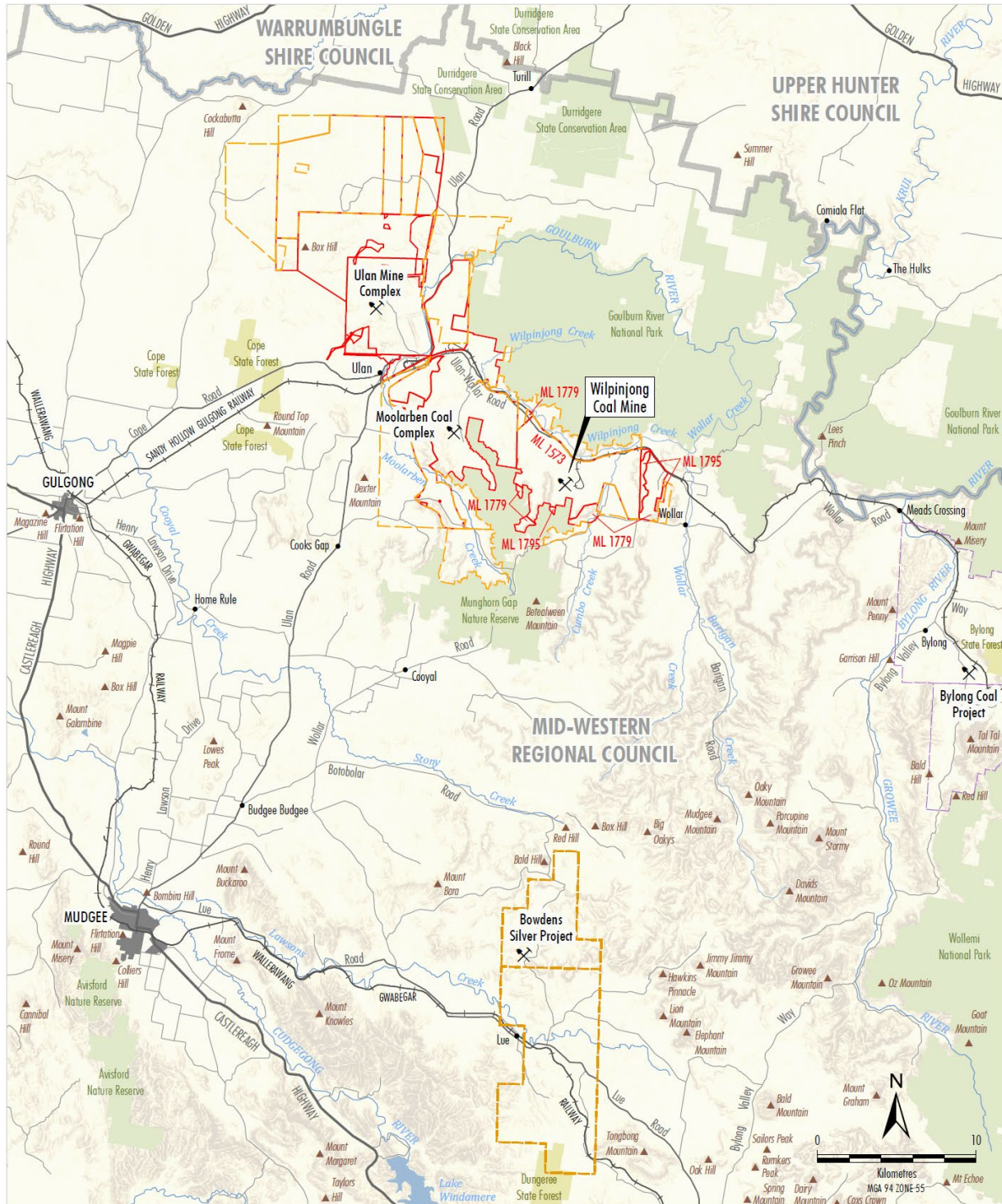
Private properties are located predominantly to the east of the village of Wollar along Mogo Road to the north of the Mine.

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<sup>1</sup> PA05-0021 was surrendered on the 28 April 2020 as required by Condition 9, Schedule 2 of SSD-6764.



Figure 1 Regional Location



- LEGEND**
- Mining Lease Boundary
  - Exploration Licence Boundary
  - Authorisation Boundary
  - Local Government Boundary
  - NSW State Forest
  - National Park, Nature Reserve or State Conservation Area
  - Coal Mining Operation

Source: NSW Spatial Services (2020)

**Peabody**  
 WILPINJONG COAL MINE  
 Regional Location

Figure 1

## 1.2 Statutory Requirements

This Management Plan has been prepared to fulfil the requirements of the Development Consent and EPBC Approval, with a reconciliation table against these requirements provided in **Appendix 1**.

WCPL will implement all reasonable and feasible measures to prevent and/or minimise any material harm to the environment that may result from the construction, operation, or rehabilitation of the Mine.

## 1.3 Development Consent and Licence Requirements

**Table 1** summarises WCPL's main statutory approvals relevant to this Management Plan.

**Table 1 Relevant Statutory Approvals**

Approval Licence No.	Description	Date of Approval	Agency
SSD-6764	Development Consent	24 April 2017	DPIE
2015/7431	EPBC Approval	8 August 2017	DoEE

PA05-0021 was surrendered on 28 April 2020 in accordance with Condition 9, Schedule 2 of Development Consent SSD-6764.

### 1.3.1 Relevant Legislation and Guidelines

The legislation and guidelines considered during the preparation of this Management Plan includes:

- EP&A Act;
- EPBC Act;
- *NSW Mining Act 1992*;
- *NSW Native Vegetation Act 2003*;
- *NSW National Parks and Wildlife Act 1974*;
- TSC Act;
- *NSW Fisheries Management Act 1994*;
- *NSW Rural Fires Act 1997*; and
- Hunter Valley Coal Mines - Best Practice Guidelines for Biodiversity Offset Management Plans (NSW Department of Planning and Environment [DP&E], 2013).

## 1.4 Purpose and Scope

The purpose of this Management Plan is to describe the management strategies, procedures, controls and monitoring programs required to manage flora and fauna within the ECA, Biodiversity Offset Areas (BOAs), Regeneration and Rehabilitation Areas in accordance with the Development Consent and the EPBC Approval.

This Management Plan has been prepared to address the requirements detailed in the Development Consent for biodiversity management and provides management actions for those areas of the WEP identified in **Figure 2**. Whilst this Management Plan includes general information on bushfire management, a separate Bushfire Management Plan has been prepared as part of WCPL's broader Environmental Management System.

The intent of this Management Plan is that it will be used to manage both the State and Commonwealth offset requirements and that the land based offsets that have been approved by the NSW Government also account for the Commonwealth offset liability.

Detailed information on rehabilitation management and completion criteria is contained in the WCPL Mining Operations Plan (MOP), which has also been revised to meet the requirements of Schedule 3, Condition 64 of the Development Consent (Rehabilitation Management Plan).

In consultation with OEH, Performance and Completion Criteria developed in accordance with Schedule 3, Condition 37 of Development Consent SSD 6764 was approved in April 2019 by DPIE.

The biodiversity monitoring program for the rehabilitation areas is included in **Section 9** of this Management Plan. Stream health monitoring and associated triggers for aquatic ecosystems are included in WCPL's Water Management Plan (WMP).

## 1.5 Overall Objectives of this Plan

The overall objectives of this Management Plan are to:

- Identify the land that will be required to be managed in accordance with this Management Plan;
- Provide a framework suitable for the management of biodiversity in the ECAs, BOAs and residual Regeneration Areas, including facilitating rapid transfer of the Biodiversity Offset Areas to National Parks Estate;
- Provide a clear, concise set of management actions and a schedule for the coordinated and effective delivery of biodiversity enhancement;
- Implement management measures to enhance ECAs and residual Regeneration Areas, focussing on Poor to Moderate Resilient areas and quantitatively evaluate through a seasonally based monitoring program;
- Develop suitable Performance and Completion Criteria for prescribed Biometric Vegetation Types (BVTs) and Regent Honeyeater habitat for WCPL's final mine rehabilitation and land use;
- Define the Establishment, Interim, Performance and Completion management actions that will support achievement of WCPL's Performance and Completion Criteria;
- Identify key environmental and regulatory risks to the implementation of this Management Plan;
- Define a seasonally based monitoring program suitable for determining management success or otherwise;
- Provide suitable contingency measures and associated Trigger Action Response Plans (TARPs) that adequately address any deviation from the Completion Criteria or Interim Performance Targets; and
- Define the responsibilities for implementing, reviewing and reporting on the Management Plan

## 1.6 Consultation

This Management Plan has been prepared in consultation with relevant stakeholders, including the NSW Office of Environment and Heritage (OEH) and the Department of the Environment and Energy (DoEE). Copies of key correspondence are included in **Appendix 2**.

It is noted that consultation has also been undertaken with the DPIE on the development of the WCPL MOP (Peabody, 2019), which was recently updated<sup>2</sup> to incorporate the relevant requirements of Schedule 3, Conditions 37, 60 to 67 of the Development Consent (rehabilitation requirements).

This Management Plan was also prepared with consideration of the MOP. Consultation with all relevant agencies with regards to any future revisions to this Management Plan and the MOP, which relate to rehabilitation and/or biodiversity, will continue as required as by Development Consent SSD-6764.

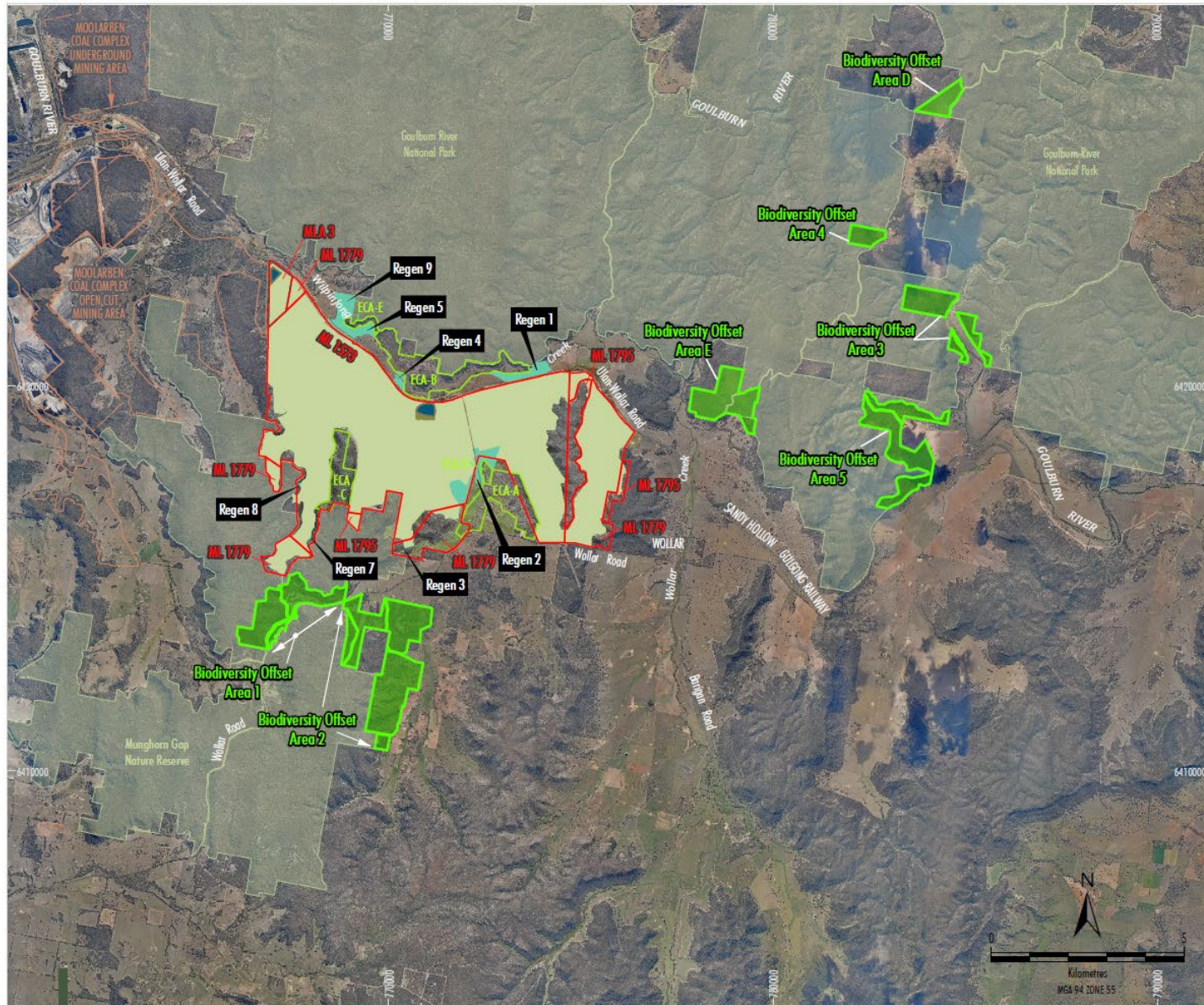
On the 8 August 2019, WCPL commenced consultation with the DPIE to request a minor variation to increase the disturbance footprint and open cut boundary to Pit 8, arising from refinement to the Pit 8 detailed design. On the 23 August 2019, WCPL received approval from the DPIE that the proposed minor changes to the footprint area of Pit 8 are generally in accordance with the WEP and project approval. Accordingly, WCPL have updated all relevant management plans required by SSD-6764 to reflect this change, as discussed with the DPIE.

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<sup>2</sup> The MOP was recently reviewed in May 2019 as a result of the approved performance and completion criteria for Biometric Vegetation Types (BVT) and the Regent Honeyeater Habitat by the DP&E. The MOP was submitted for approval into the Division of Resources and Geoscience within the DP&E on the 24 May 2019 and approved on the 11<sup>th</sup> June 2019.



Figure 2 Project Area & Biodiversity Offset Strategy



- LEGEND
- Mining Lease Boundary
  - Mining Lease Application Boundary
  - Final Void
  - Rehabilitation Area #
  - Regeneration Area
  - Enhancement and Conservation Area
  - Biodiversity Offset Area
  - National Park/Nature Reserve

# Inclusive of the agreed minor changes to the footprint confirmed by DPIE 23rd April and 23rd August 2019.

Note: Detailed mapping of Regeneration Areas is provided in Appendix 5.

Source: WCPL (2020); NSW Spatial Services (2020) Orthophoto Mosaic; WCPL (April 2020, March 2018)

**Peabody**  
 WILPINJONG COAL MINE  
 Project Area and  
 Biodiversity Offset Strategy

Figure 2

## 2 Existing Environment

### 2.1 Climate

Australian Bureau of Meteorology (BOM) data from Wollar (BOM, 2017) shows the local area to have an overall low rainfall with the long-term monthly mean ranging from about 38 millimetres (mm) to 67 mm. The months of April to September are the driest with a consistent monthly mean of around 40 mm, with rain then increasing from October to January, then decreasing to April. Annual average rainfall is 590 mm with median being 597.8 mm (BOM, 2017). Regional temperatures are warmest from November through March and coolest from May through September. Average daily temperatures peak in January (31 degrees Celsius [°C]) whilst the average daily minimum temperatures are lowest in July (1.3°C).

Wind speeds during the colder months have a greater spread between the 9 am and 3 pm conditions compared to the warmer months. Mean 9 am wind speeds range from 4.4 kilometres per hour (km/h) in June to 9.1 km/h in October and November. Mean 3 pm wind speeds range from 7.8 km/h in April to 11.7 km/h in August.

The average annual evapotranspiration at the Mine is estimated to be approximately 1,730 mm, with monthly evapotranspiration highest in December (235 mm) and January (220 mm) and lowest in June (65 mm) and July (70 mm). Evapotranspiration rates differ markedly between summer and winter.

### 2.2 Geology and Soils

Geology across the low lying areas of Mining Leases (MLs) are Permian, Sydney Basin, Illawarra Coal Measures expressed on the surface as quartz-lithic sandstone. An exception is a narrow band of Quaternary sediments along the course of Cumbo Creek in the eastern part of ML 1573 and Wilpinjong Creek to the north. The elevated ridges within and outside of the lease are Triassic, Sydney Basin, Narrabeen group. At the south-east is a small area of Permian, Sydney Basin Shoalhaven group (WCPL, 2013).

The Soil Landscapes of the Dubbo 1:250,000 Sheet (Department of Land and Water Conservation, 1998) identifies three main soil landscapes within the Project area – Barigan Creek, Ulan and Lees Pinch. The Barigan Creek and Ulan soil landscapes cover the majority of the Project Area (WCPL, 2013). These soil landscapes are summarised in Table 2. According to the assessment, levels of salinity in the soils are generally low (WCPL, 2005).

Further information on geology and soils can be found in the *Wilpinjong Coal Project Environmental Impact Statement* (WCP EIS) (WCPL, 2005), MOD 5 Wilpinjong Coal Mine Modification Environmental Assessment (EA) (WCPL, 2013), the MOP (Peabody, 2017) and the *Wilpinjong Extension Project Environmental Impact Statement* (WEP EIS) (WCPL, 2015).



**Table 2 Soil Landscapes of the Mine Area**

Soil landscape unit	Soil types present	Likely constraints for agricultural production based on these descriptions
<b>Ulan</b>	Yellow Podzolic Soils on lower slopes and drainage lines with patches of yellow Solodic Soils Solonetz in association with salt scalds. Yellow and Brown Earths on footslopes with minor areas of Earthy Sands.	Seasonal waterlogging on lower slopes; moderate to high erosion hazard under cultivation; moderate available water holding capacity.
<b>Barigan Creek</b>	Yellow Podzolic Soils are common on lower slopes and along drainage lines. Red Podzolic Soils on colluvial slopes, benches and rises.	High erosion hazard under cropping or where there is low surface cover; salinity in localized areas in drainage depressions.
<b>Lees Pinch</b>	Slopes 15-40 percent (%); shallow sandy soils with extensive rock outcrop, boulder debris slopes and sandstone cliffs.	Steep slopes, very low fertility, very low waterholding capacity.

Source: WCPL (2015)

## 2.3 Landform and Hydrology

The majority of MLs are situated in a wide valley floor between hills and escarpments of the Goulburn River National Park to the north and Munghorn Gap Nature Reserve to the south (Figure 2). In the vicinity of the Mine, elevations range from approximately 350 metre (m) at Wilpinjong Creek and Wollar Creek to 610 m Australian Height Datum (AHD) to the immediate south of the Mine.

The Mine is located in the Upper Goulburn River catchment, which forms part of the Hunter River Basin. The Hunter River Basin drains some 22,000 km<sup>2</sup> of central-eastern NSW to the Pacific Ocean at Newcastle. The Mine is located directly south of Wilpinjong Creek, a headwater tributary of Wollar Creek which joins the Goulburn River approximately 8 km to the north east of the Mine. At a local level, the Mine lies in the Wilpinjong Creek catchment. A number of local watercourses are tributaries of Wilpinjong Creek including Cumbo Creek, Planters Creek, Spring Creek and Bens Creek. Detailed water quality data including background water quality and associated triggers are included in WCPL's Water Management Plan.

Water that comes into contact with mining operations is managed in accordance with WCPL's water management system, which is detailed in the WCPL Water Management Plan. Clean water diversions also form part of the WCPL water management strategy.

Further information on landform and hydrology can be found in the WCP EIS (WCPL, 2005), MOD 5 EA (WCPL, 2013), the WEP EIS (WCPL, 2015) and WCPL's Water Management Plan.

## 2.4 Land Use and History

Land use in the vicinity of the Mine is characterised by a combination of open cut and underground coal mining operations (Ulan Coal Mines Limited and Moolarben Coal Operations), agricultural landuses (primarily grazing) and rural residential development (evident in the local villages of Wollar, Ulan and the localities of Cumbo, Slate Gully and Araluen).

Some of WCPL's Residual Land is currently leased for agricultural purposes. WCPL foresees no potential land use conflicts for the BOAs based on adjacent land uses.

Prior to mining operations commencing, the Wollar area was typical of early (around the 1800s) European settlement where lands deemed arable were cleared of most vegetation including the Mine areas, primarily for grazing purposes and dryland cropping. A rural land capability assessment determined that the land capability within the Mine disturbance area is of greater than 5 which indicates that the land is suitable for a limited set of land uses (grazing, forestry, nature conservation and some horticulture (WCPL, 2015). The post mining land use will be entirely woodland (**Section 4.4**).

The Goulburn River National Park adjoins the Mine to the north and covers an area of approximately 71,000 ha. As the National Park covers part of the Great Dividing Range, it extends into both the Hunter and Cudgong River Catchments. Some 90 km of the Goulburn River lies within the National Park (Hill, 1999; 2000). The Munghorn Gap Nature Reserve covers an area of some 5,900 ha and straddles the Great Dividing Range.

Further information on pre-mining land use can be found in the WEP EIS (WCPL, 2005), MOD 5 EA (WCPL, 2013) and the WEP EIS (WCPL, 2015).

## 2.5 Vegetation

The Mine is located in a relatively sensitive area in the Wilpinjong Valley between the Goulburn River National Park and the Munghorn Gap Nature Reserve. European settlers cleared the flat valley floor to graze stock and cultivate pastures. The land clearing resulted in a loss of vegetation linkage between the escarpment areas which have now become isolated for the most part.

The condition of native vegetation within the Wilpinjong area and surrounds varies, with the most disturbed areas generally occurring along watercourses and on flat and undulating areas which have been cleared for agriculture. Most natural vegetation is restricted to the steep hills and slopes outside of the Mine disturbance area. There are, however, small uncleared areas of remnant vegetation scattered throughout the Mine area and surrounds and these are mainly associated with stony outcrops (WCPL, 2015).

The Mine lies almost entirely in the Upper Goulburn Valleys and Escarpment Mitchell Landscape, designated as 57% cleared (OEH, 2017). Areas of remnant forest are generally restricted to sandstone hills and escarpments that were historically difficult to clear. Dry sclerophyll eucalypt forest is the dominant form. Some areas with access to irrigation water have been subject to some cropping.

Remnant vegetation in the Mine area is dominated by eucalypt woodland and forests. Widespread and common tree species included Narrow-leaved Ironbark (*Eucalyptus crebra*), Coast Grey Box (*E. moluccana*), Black Cypress Pine (*Callitris endlicheri*) and Rough-barked Apple (*Angophora floribunda*), which associate with other species. Yellow Box (*E. melliodora*), Blakely's Red Gum (*E. blakelyi*), White Box (*E. albens*) and Grey Gum (*E. punctata*) were also dominant tree species (Section 3.1).

Further information on vegetation communities in the Mine area can be found in the WCP EIS (WCPL, 2005), MOD 5 EA (WCPL, 2013) and the WEP EIS (WCPL, 2015).



## 3 Baseline Data

### 3.1 Flora

The WCPL Mine area has been subject to a number of biodiversity studies, including:

- A Flora Assessment completed by FloraSearch (2005) as part of the WCP EIS (WCPL, 2005);
- Survey undertaken as part of the MOD 5 EA (WCPL, 2013); and
- A Biodiversity Assessment Report and Biodiversity Offset Strategy prepared by Hunter Eco (2015) for the WEP EIS (WCPL, 2015).

All studies deployed systematic sampling techniques to identify the vegetation communities associated with the Mine area with a specific focus on identifying threatened flora species and vegetation communities.

#### 3.1.1 Wilpinjong Coal Project (2005)

In 2005, FloraSearch surveyed an area of approximately 2,300 ha within ML 1573 and surrounding areas. The study recorded a total of 401 flora species; the most common species identified were Asteraceae (daisies) and Poaceae (grasses). Seven remnant vegetation communities were described along with two derived communities. Two vegetation communities (Yellow Box and Blakely's Red Gum Woodland [community 1] and Grassy White Box Woodland [community 5a]) listed under both the TSC Act and the EPBC Act were identified across the study area (**Figure 3**). *Eucalyptus cannonii* (Capertee Stringybark) was the only threatened flora species recorded during the original flora survey<sup>3</sup>. The communities mapped during the study are shown on **Figure 4**.

A Biodiversity Offset Strategy was developed as part of the WCP EIS (WCPL, 2005) to compensate for the 290 ha of remnant woodland approved to be cleared as a result of the Mine. This strategy included the establishment of three ECAs (480 ha), an off-site offset area (384 ha) at Nullo Mountain, mine Regeneration Areas (380 ha) as well as 1,920 ha of Rehabilitation Areas. Some of these areas have been altered by subsequent modifications, including the Wilpinjong Extension Project. Further details on the current Biodiversity Offset Strategy are provided in **Section 4**.

#### 3.1.2 Modification 5 (2013)

During the Terrestrial Flora Assessment (Hunter Eco, 2013) for the MOD 5 EA, 154 flora species from 52 families were recorded; 26 of which were weeds with Poaceae and Asteraceae observed as the most common species. 34 species not previously recorded were identified during the MOD 5 Terrestrial Flora Assessment. No threatened flora species were identified in the MOD 5 extension areas.

Detailed field investigation and subsequent analysis resulted in ten vegetation communities being identified: six woodland/forest communities and four open grassland communities (**Figure 4**).

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<sup>3</sup> Further investigations conducted in 2015 by the Sydney Herbarium concluded that this species was in fact a hybrid of *Eucalyptus cannonii* and *Eucalyptus macrorhyncha*. This hybrid is not listed as a threatened species.

**Figure 3 Threatened Ecological Communities – Mine Site**

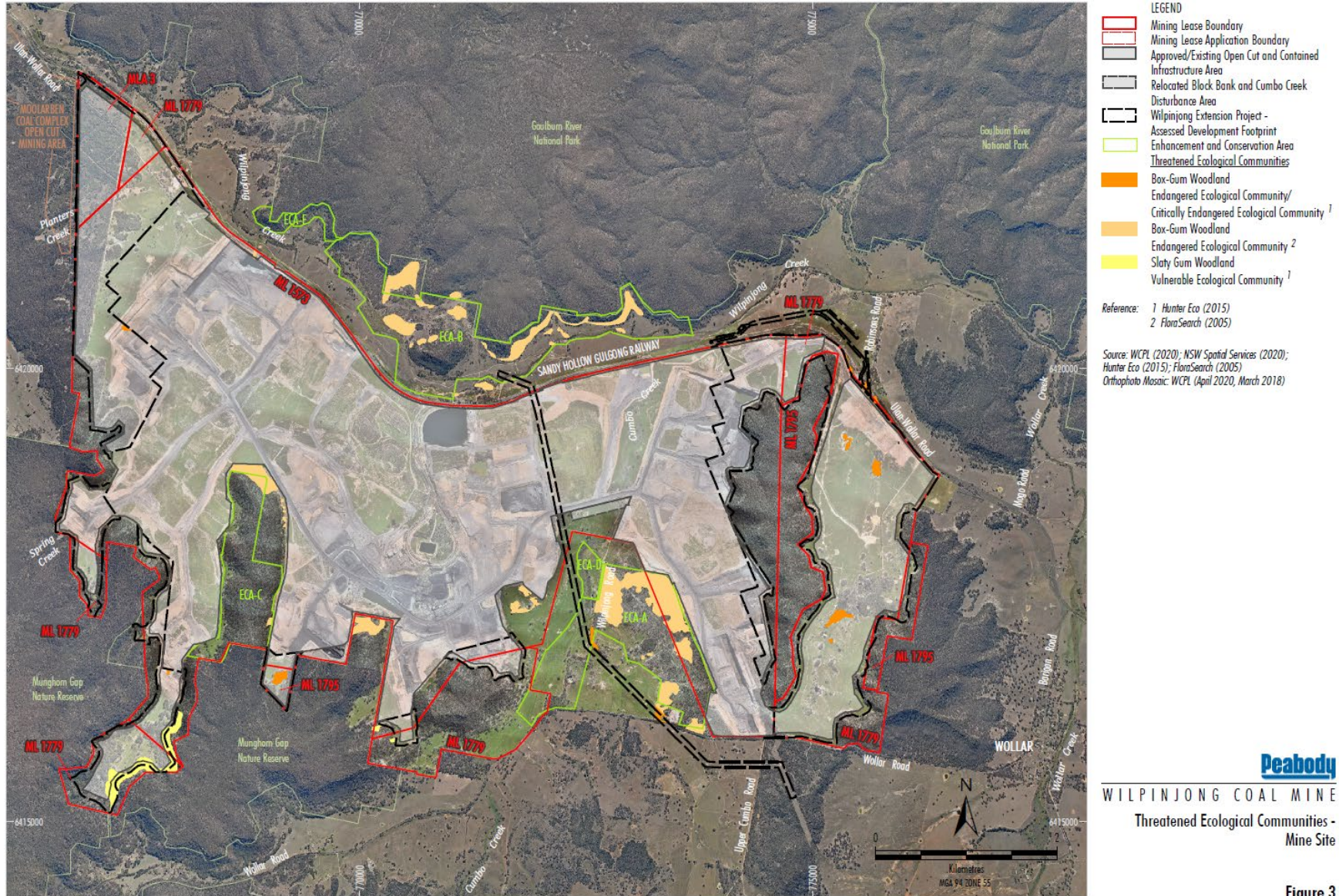
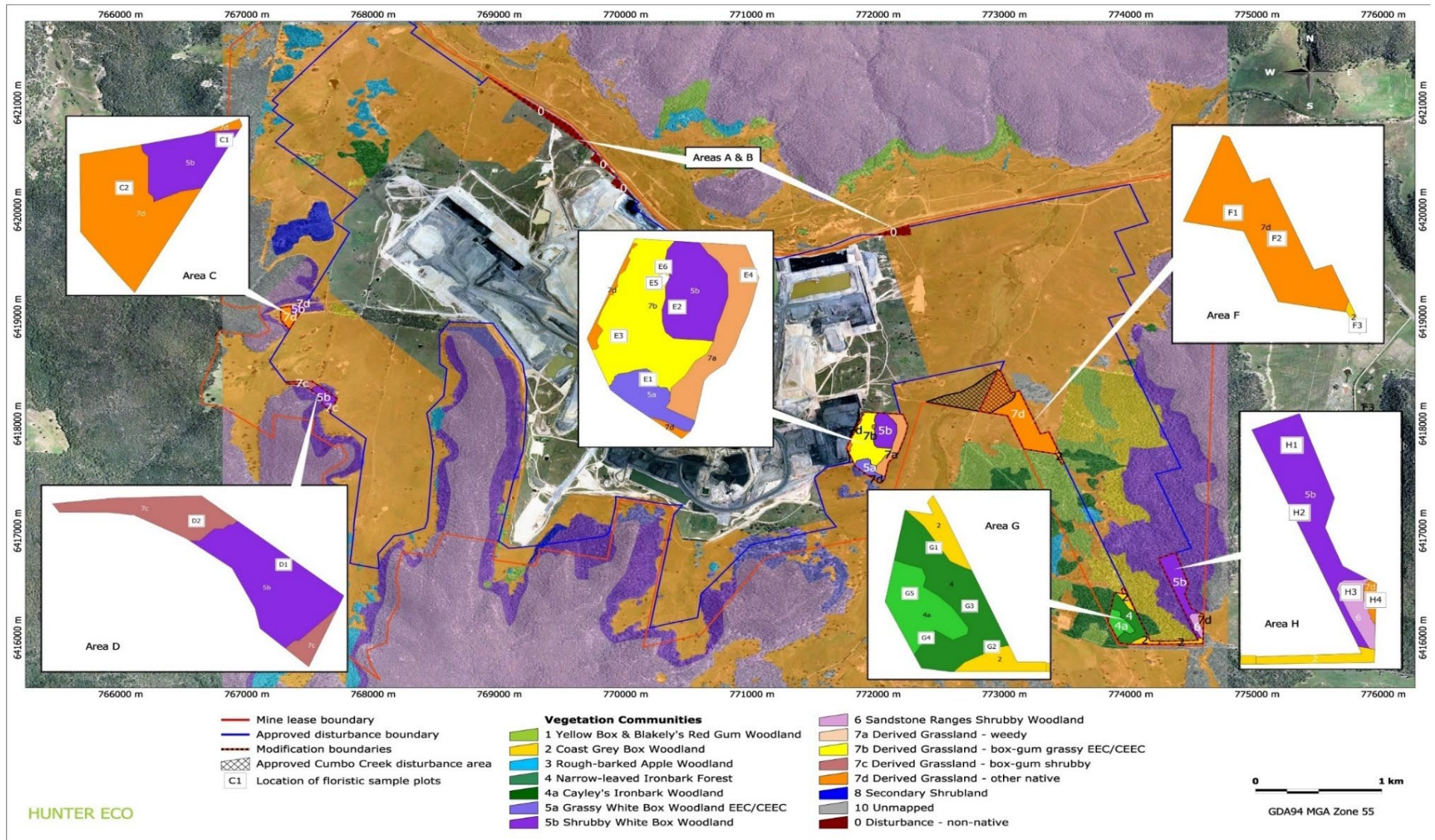




Figure 4 Mapped Vegetation Communities the Modification 5 Project Area– 2014



One threatened ecological community was identified as being representative of both the NSW *Endangered Ecological Community (EEC) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland* and the Commonwealth *Critically Endangered Ecological Community (CEEC) White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland*. Statistical analysis undertaken as part of the Hunter Eco (2013) assessment led to the following conclusions being made:

- Several of the individual communities mapped by FloraSearch (2005) at the Mine at a local scale could not be statistically distinguished from one another;
- The shrubby white box communities were statistically separated from the grassy white box communities;
- The communities that are allocated as being part of the Box-gum Woodland EEC/CEEC are statistically similar; and
- The majority of the local woodland communities from both the MOD 5 open cut extension areas and the Biodiversity Offset Areas are statistically similar.

Hunter Eco (2013) then used the classes as described by Keith (2004) to determine the biodiversity offset for the MOD 5 Extension as detailed in **Table 3**. **Table 3** presents a comparison of the area of Box-gum Woodland EEC/CEEC recorded in the BOAs and in the MOD 5 extension areas.

**Table 3 Vegetation Disturbance and Biodiversity Offset Areas**

Code	Community		Class (Keith, 2004)	Disturbance Area (ha)	Biodiversity Offset Area (ha)
2	Coast Grey Woodland		Coastal Valley Grassy Woodlands	3.5	35.2
15	Narrow-leaved Ironbark – Box Woodland				
16	Rough-barked Apple Woodland		North Coast Dry Sclerophyll Forests	-	1.6
9	Broombush Scrub		Pilliga Outwash Dry Sclerophyll Forests	-	3.3
4	Narrow-leaved Ironbark Forest		Western Slopes Dry Sclerophyll Forests	24.1	101.9
4a	Caley's Ironbark Woodland				
5b	Shrubby White Box Woodland				
6	Sandstone Range Scrubby Woodland				
12	Grey Gum – Narrow-leaved Stringybark Forest				
13	Ironbark-Bloodwood-Redgum Woodland				
5a	Grassy White Box Woodland (EEC/CEEC)		Western Slopes Grassy Woodlands	24.1	55.2
7b	Derived Grassland – box-gum grassy (EEC/CEEC)	Derived Native Grassland (Biodiversity Offset)			
7c	Derived Grassland – box-gum shrubby				
7d	Derived Grassland – other native				
8	Blakely's Red Gum Woodland (EEC/CEEC)				
14	Inland Grey Box Woodland				
17	Yellow Box Woodland (EEC/CEEC)		-	-	-
18	Shrubby Regeneration		-	-	13.6
<b>Total</b>				<b>51.7<sup>1</sup></b>	<b>210.8<sup>2</sup></b>

**Notes:** <sup>1</sup> Excludes approximately 17.8 ha of Derived grassland – weedy, approved mine disturbance and a dam. <sup>2</sup> Excludes a 0.2 ha dam.

Approximately 10.6 ha of Box-gum Woodland EEC/CEEC (comprising 8.4 ha of grassland and 2.2 ha of woodland) was approved to be cleared for MOD 5. Approximately 47.8 ha of Box-Gum Woodland EEC/CEEC was mapped in the Biodiversity Offset Areas (excluding areas of derived grassland that may equate to the EEC/CEEC) (**Table 4**).

Detailed descriptions and vegetation mapping of each of the communities recorded in the Biodiversity Offset Areas are provided in the Flora Assessment for MOD 5 EA (WCPL, 2013). Further detail on the results of this survey can be found in the Hunter Eco (2013), Appendix E of the MOD 5 EA (WCPL, 2013).

**Table 4 Box-gum Woodland EEC – Disturbance and Biodiversity Offset Areas**

Box-gum Woodland EEC	Disturbance Area (ha)	Biodiversity Offset Area (ha)
Woodland	2.2	47.8
Grassland <sup>1</sup>	8.4	0
<b>Total</b>	<b>10.6</b>	<b>47.8</b>

**Notes:**<sup>1</sup> The Biodiversity Offset contains areas of derived grassland that equate to the White Box Yellow Box Blakely's Red Gum Woodland EEC and White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland CEEC, however these have been conservatively excluded from the EEC calculations. In contrast, within the disturbance area, derived grassland adjacent to the woodland form of the Box-gum Woodland EEC has been conservatively included in the EEC calculations.

### 3.1.3 Wilpinjong Extension Project (2015)

Hunter Eco (2015) surveyed the vegetation within the open cut extension and infrastructure areas and surrounds. The vegetation surveys included sampling of floristic plots, collection of BioMetric data (OEH, 2014a) and targeted searches for threatened ecological communities listed under the TSC Act and EPBC Act that could potentially occur.

Twelve native vegetation communities were identified in the open cut extension and infrastructure areas (**Figure 5**). Of these, three are listed as threatened ecological communities under the TSC Act and/or EPBC Act.

Small patches of Blakely's Red Gum Woodland (grassy) and Yellow Box Woodland (grassy) were assessed to equate to (Figure 3):

- *White Box - Yellow Box - Blakely's Red Gum Woodland Endangered Ecological Community* (Box-Gum Woodland EEC) under the TSC Act;
- *White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland Critically Endangered Ecological Community* (Box-Gum Woodland CEEC) under the EPBC Act; and
- Slaty Box Forest (in the south-west corner of the Project open cut extension areas) was assessed to equate to the *Hunter Valley Foothills Slaty Gum Woodland in the Sydney Basin Bioregion Vulnerable Ecological Community* (Slaty Gum VEC) under the TSC Act.

One threatened flora species occurs within the open cut extension and infrastructure areas, namely *Ozothamnus tessellatus*, listed as 'Vulnerable' under both the TSC Act and EPBC Act. Three areas of *Ozothamnus tessellatus* were found equating to a direct count of 1,090 plants (**Figure 6**).

The WEP requires clearance of approximately 354 ha of native vegetation in the open cut extension and infrastructure areas, including the clearance of 9.5 ha of Box-Gum Woodland EEC/CEEC.

The WEP includes a Biodiversity Offset Strategy which accounts for a total of 16,924 ecosystem credits.



**Table 5** includes the disturbance areas and ecosystem credit requirements for the WEP. Further detail on the results of these surveys can be found in Hunter Eco (2015).

The BOAs alone will not satisfy the credits required listed in **Table 5**, however the residual credits will be generated through the establishment of woodland rehabilitation at the Mine site (**Section 4.4**).

**Table 5 Ecosystem Credits Required for the WEP**

Native Vegetation Communities	Disturbance Area (ha)	Ecosystem Credits Required
<b>Listed Ecological Communities</b>		
Slaty Box Forest <sup>1</sup>	9.5	519
Box Gum Woodland <sup>2</sup>		
Blakely's Red Gum Woodland	6	258
Yellow Box Woodland (Grassy)	3.5	119
<b>Total Listed Ecological Communities</b>	<b>19</b>	<b>896</b>
<b>Other Forest and Woodland</b>		
Fuzzy Box Woodland	1.5	37
Rough-barked Apple Woodland	126	5,995
Blakely's Red Gum Woodland (Shrubby)	4	197
Grey Gum – Narrow-leaved Stringybark Forest	42.5	2,250
Red Ironbark Forest	39.5	2,161
White Box Woodland (Shrubby)	98	4,590
Western Grey Box Woodland	3	76
Narrow-leaved Ironbark Forest	20.5	722
<b>Total Other Forest and Woodland</b>	<b>335</b>	<b>16,028</b>
<b>Total Native Vegetation</b>	<b>354</b>	<b>16,924</b>

Source: DP&E (2016)

**Notes:** <sup>1</sup> Listed as a Vulnerable Ecological Community (VEC) under the NSW TSC Act as "Hunter Valley Footslopes Slaty Gum Woodland in the Sydney Basin Bioregion" <sup>2</sup> Listed as an EEC under the TSC Act as 'White Box – Yellow Box – Blakely's Red Gum (Box Gum) Woodland' and listed as CEEC under the EPBC Act.

Figure 5 Mapped Vegetation Communities in the Extension Project Area 2015

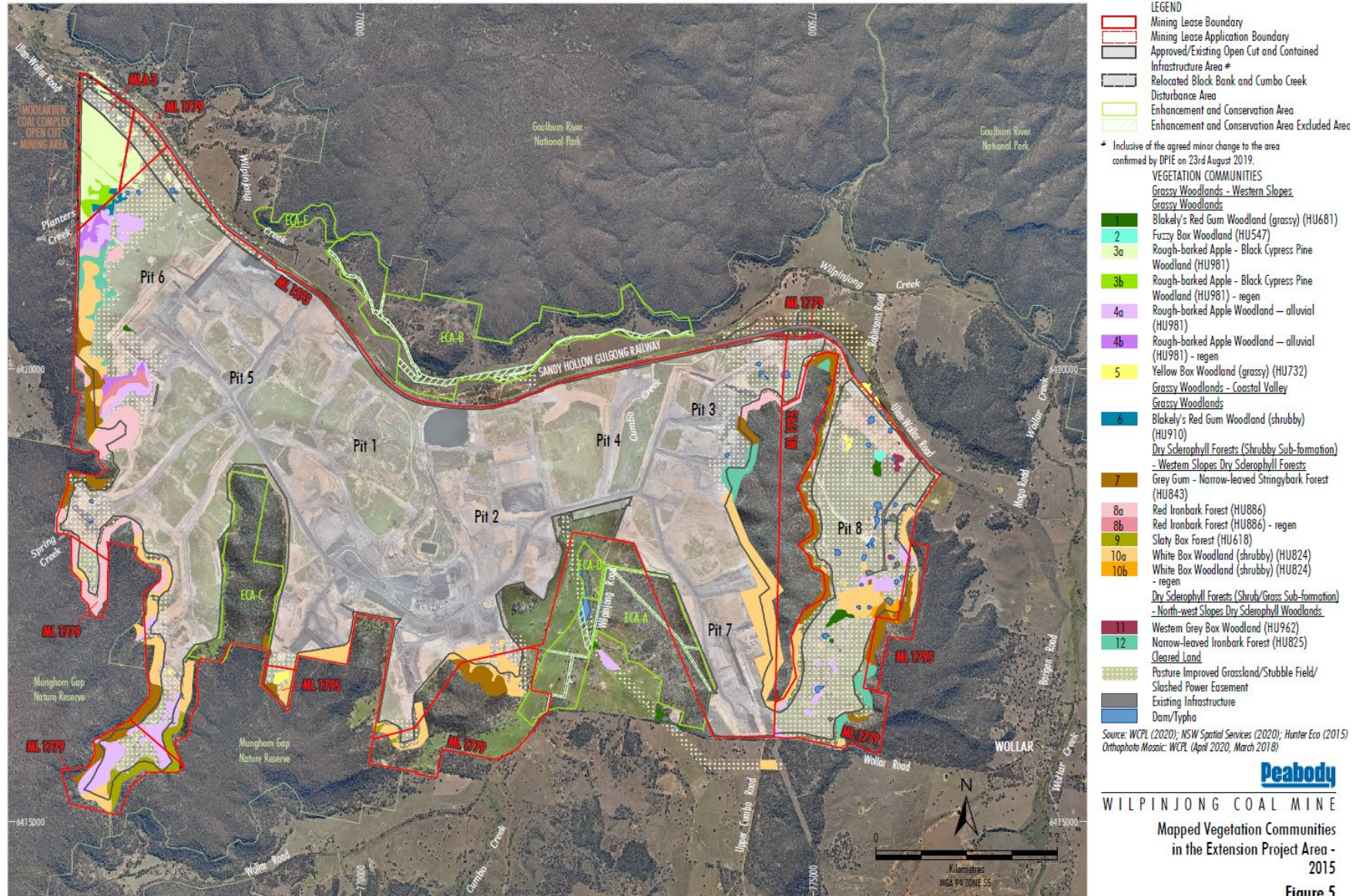




Figure 6 Threatened Flora Species

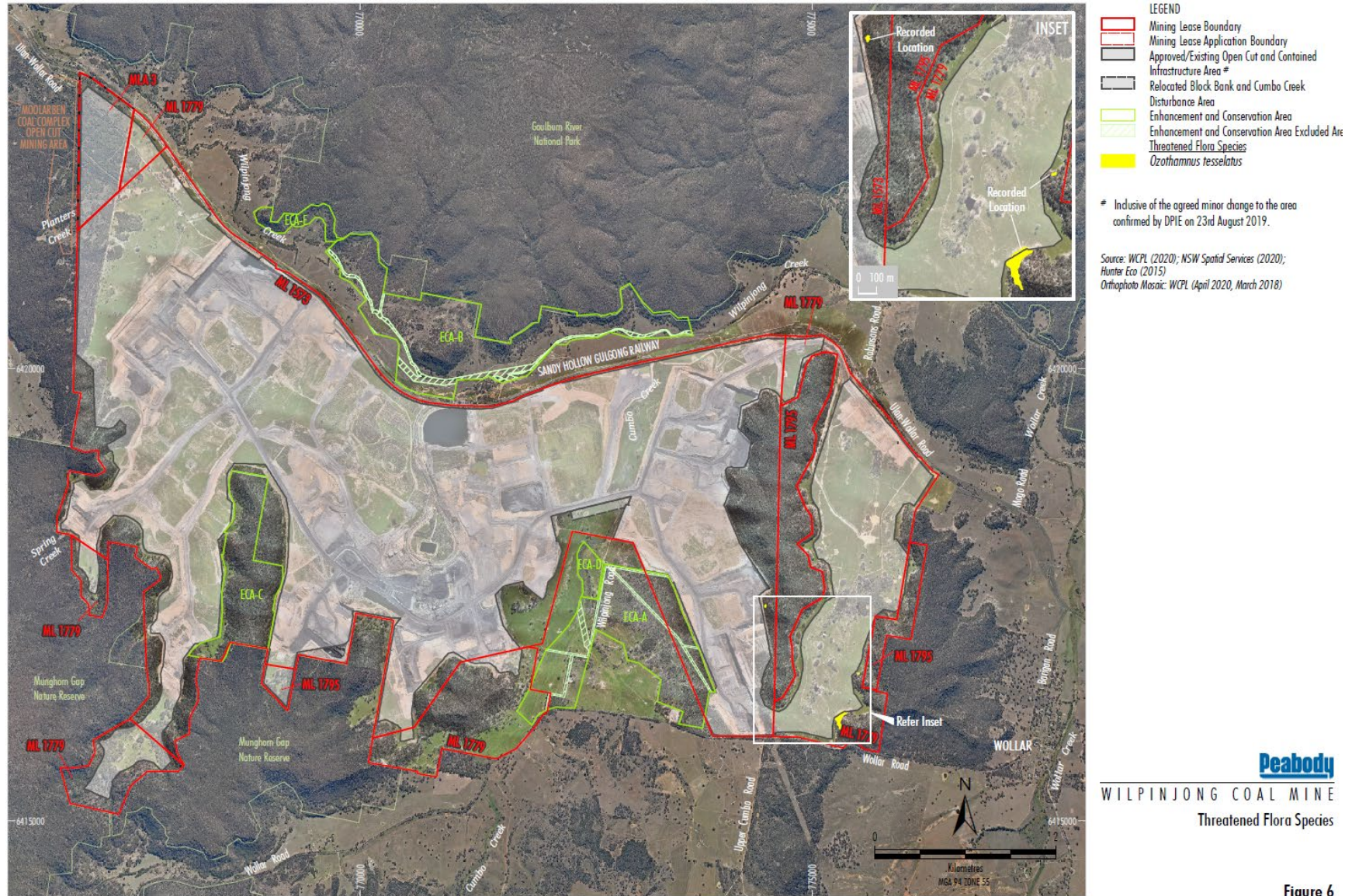


Figure 6



## 3.2 Fauna

### 3.2.1 Wilpinjong Coal Project (2005)

Mount King Ecological Surveys (2005) conducted fauna surveys for birds, mammals, reptiles and amphibians for the Mine in autumn and spring 2004. Twelve survey sites were sampled for the autumn survey with 23 sites sampled for the spring survey. Bat species were surveyed separately by Greg Richards and Associates (2005). Seventeen bat sampling sites were sampled for the autumn survey with 11 sites sampled for the spring survey.

Remnant vegetation in the Mine area provides habitat for a number of woodland birds. No cave structures were identified in the Mine area. There are caves located in the Munghorn Gap Nature Reserve and Goulburn River National Park, as well as rock shelters/caves in sandstone escarpments and rock shelters associated with isolated tors on slopes proximal to the Mine (WCPL, 2005).

The aquatic impact assessment for the WCP EIS (2005) observed aquatic habitats in the Mine area to be in poor condition; reflective of the degraded nature of their immediate catchments. No significant aquatic habitat was identified within the Mine disturbance area.

In total, 29 native mammals were recorded including the Short-beaked Echidna (*Tachyglossus aculeatus*), Yellow-footed Antechinus (*Antechinus flavipes*), Common Wombat (*Vombatus ursinus*), Squirrel Glider (*Petaurus norfolcensis*), Sugar Glider (*Petaurus breviceps*), Common Brushtail Possum (*Trichosurus vulpecula*), Common Ringtail Possum (*Pseudocheirus peregrinus*), Southern Bush Rat (*Rattus fuscipes*), four macropods (kangaroos and wallabies) and 17 bat species. Twenty fauna species listed as threatened under the TSC Act including one species also listed under the EPBC Act were recorded within the Mine area and surrounds (**Figures 7 and 8**).

### 3.2.2 Modification 5 (2013)

Biodiversity Monitoring Services recorded a range of vertebrate fauna species during surveys of the BOAs in 2013 (**Figures 7 and 8**). A total of 124 fauna species, comprising six amphibians, six reptiles, 85 birds (including one introduced species) and 27 mammals (including seven introduced species) were located during the surveys.

Nine threatened fauna species were identified, namely the Large-eared Pied Bat, Eastern False Pipistrelle, Eastern Bentwing-bat, Eastern Cave Bat, Little Eagle, Brown Treecreeper (eastern subspecies), Grey-crowned Babbler (eastern subspecies), Speckled Warbler and Diamond Firetail. Most of these species identified were closely associated with woodland habitats, with the Little Eagle also utilising open areas for foraging and woodland for roosting and nesting.

There were many similarities between the vertebrate species present within the BOAs and the MOD 5 extension areas, including vertebrate fauna species represented by amphibians, reptiles, woodland and forest birds and arboreal and ground dwelling mammals (WCPL, 2013). Actual records or potential habitat for all threatened fauna species recorded within the MOD 5 open cut extension areas or their surrounds have also been recorded in the BOAs or immediate surrounds.

### 3.2.3 Wilpinjong Extension Project (2015)

In 2014 and 2015 fauna surveys were undertaken by Biodiversity Monitoring Services (2015) which included a range of fauna survey techniques consistent with relevant State and Commonwealth guidelines (Department of Environment and Conservation [DEC], 2004; Department of Environment and Climate Change, 2009; Department of the Environment, Water, Heritage and the Arts, 2010a; 2010b; 2010c; Department of Sustainability, Environment, Water, Population and Communities [SEWPaC], 2011a; 2011b).

A total of 20 threatened fauna species listed under the TSC Act have been recorded within the open cut extension and infrastructure areas during the current and previous surveys, comprising 13 birds and seven bats. Under the NSW Offset Policy (OEH, 2014b), these threatened fauna species are classed as ecosystem species (i.e. species that can be predicted to be present based on a habitat assessment).

No threatened fauna species which are credit species have been recorded inside the open cut extension and infrastructure areas. Potential habitat occurs in the open cut extension and infrastructure areas for the following two threatened fauna species which are species credit species:

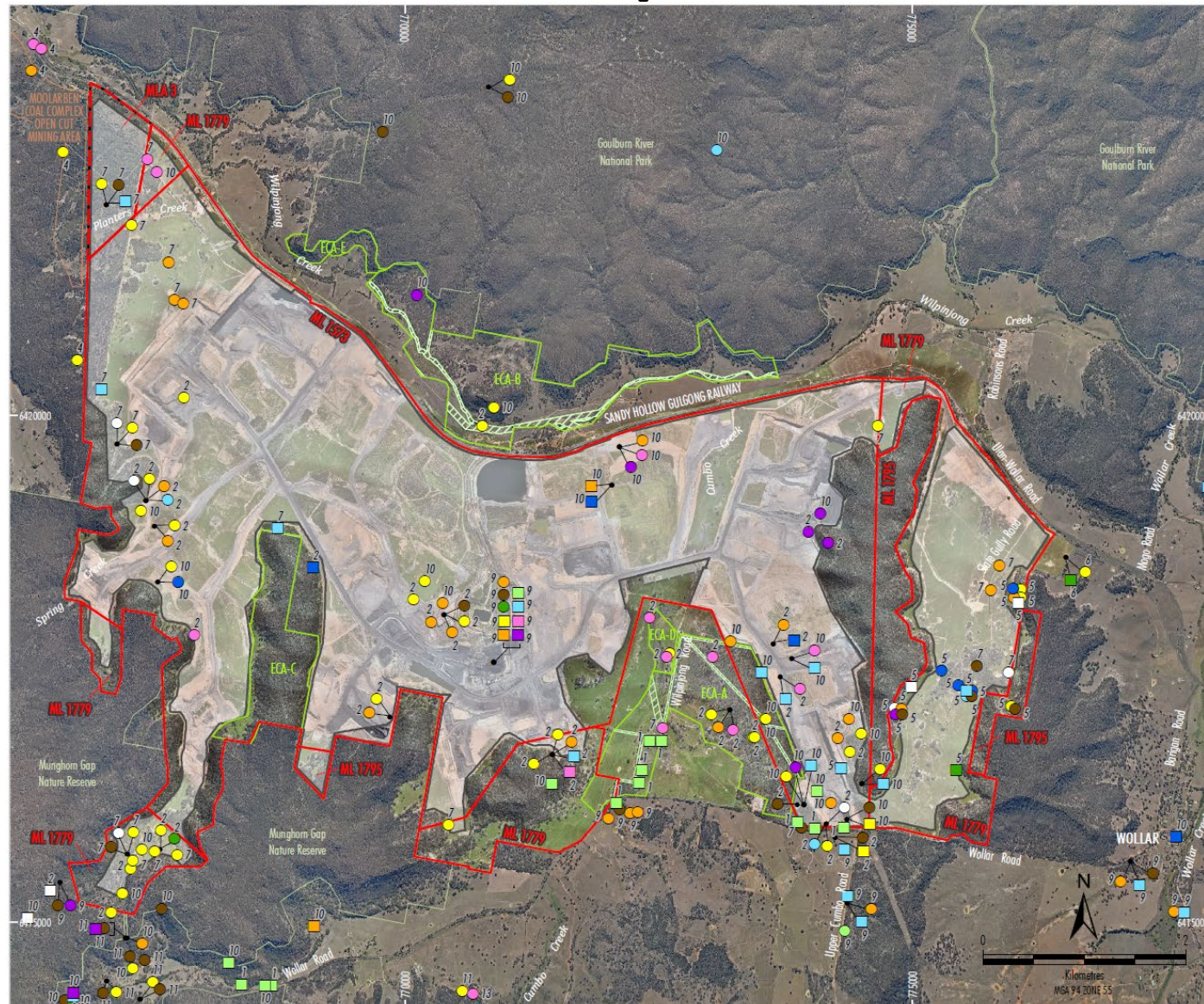
- Regent Honeyeater (*Anthochaera phrygia*) (listed as 'Critically Endangered' under both the TSC Act and EPBC Act<sup>4</sup>); and
- Koala (*Phascolarctos cinereus*) (listed as 'Vulnerable' under both the TSC Act and EPBC Act).

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<sup>4</sup> Listed as 'Endangered' under the EPBC Act at the time of the controlled action decision (12 March 2015) and therefore assessed under the Commonwealth offset policy as 'Endangered' not 'Critically Endangered' (refer section 158A of the EPBC Act).



Figure 7 Threatened Birds



**LEGEND**

- Mining Lease Boundary
- Mining Lease Application Boundary
- Approved/Existing Open Cut and Contained Infrastructure Area\*
- Relocated Block Bank and Cumbo Creek Disturbance Area
- Enhancement and Conservation Area
- Enhancement and Conservation Area Excluded Area

**Threatened Birds**

- Black-chinned Honeyeater (eastern subspecies)
- Brown Treecreeper (eastern subspecies)
- Diamond Firetail
- Flame Robin
- Gang-gang Cockatoo
- Glossy Black-Cockatoo
- Grey-crowned Babbler (eastern subspecies)
- Hooded Robin (south-eastern form)
- Little Eagle
- Little Lorikeet
- Masked Owl
- Painted Honeyeater
- Powerful Owl
- Regent Honeyeater
- Scarlet Robin
- Speckled Warbler
- Square-tailed Kite
- Turquoise Parrot
- Varied Sittella

**Reference:**

- 1 DECC (2005)
- 2 Mount King Ecological Surveys (2005)
- 4 EcoVision (2006)
- 5 Leslyk Environmental Consultants (2013)
- 6 Biodiversity Monitoring Services (2013)
- 7 Biodiversity Monitoring Services (2015a)
- 9 BirdLife (2014)
- 10 DEH (2015)
- 11 Biodiversity Monitoring Services (2015b)

*Note: There are no references 3 or 8 on this figure.*

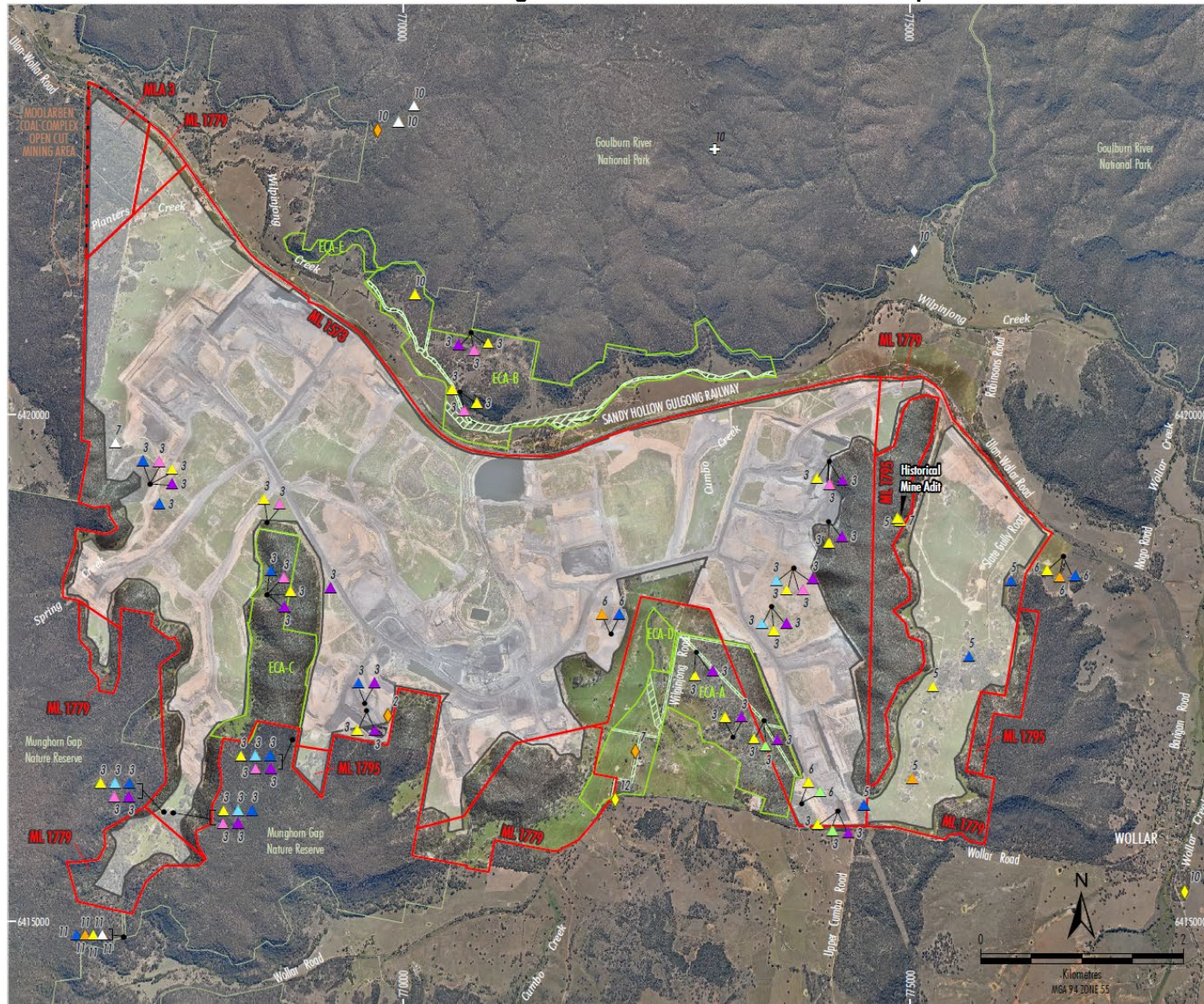
\* Inclusive of the agreed minor change to the area confirmed by DPIE on 23rd August 2019.

Source: WCPL (2020); NSW Spatial Services (2020)  
 Orthophoto Mosaic: WCPL (April 2020, March 2018)

Figure 7



**Figure 8 Threatened Mammals and Amphibians**



- LEGEND**
- Mining Lease Boundary
  - Mining Lease Application Boundary
  - Approved/Existing Open Cut and Contained
  - Infrastructure Area #
  - Relocated Block Bank and Cumber Creek Disturbance Area
  - Enhancement and Conservation Area
  - Enhancement and Conservation Area Excluded A Threatened Mammals
  - ◇ Brush-tailed Rock-wallaby
  - ◇ Koala
  - ◇ Squirrel Glider
  - △ Corben's Long-eared Bat
  - △ Eastern Bentwing-bat
  - △ Eastern Cave Bat
  - △ Eastern False Pipistrelle
  - △ Eastern Freetail-bat
  - △ Large-eared Pied Bat
  - △ Little Bentwing-bat
  - △ Yellow-bellied Shearwater
  - △ Threatened Amphibian
  - ⊕ Giant Barred Frog

**Reference:**

- 2 Mount King Ecological Surveys (2005)
- 3 Greg Richards and Associates Pty Ltd (2005)
- 5 Leszyk Environmental Consultants (2013)
- 6 Biodiversity Monitoring Services (2013)
- 7 Biodiversity Monitoring Services (2015a)
- 10 DEH (2015)
- 11 Biodiversity Monitoring Services (2015b)
- 12 Incidental Sighting (2013)

*Note: There are no references 1, 4, 8 or 9 on this figure.*

\* Inclusive of the agreed minor change to the area confirmed by DPIE on 23rd August 2019.

Source: WCPL (2020); NSW Spatial Services (2020)  
Orthophoto Mosaic: WCPL (April 2020, March 2018)

**Figure 8**



## 4 Biodiversity Offset Strategy

WCPL recognises that vegetation clearance associated with the Mine has the potential to fragment vegetation remnants and habitats, impact on the continuity of vegetation corridors and regional linkages and affect the movement and dispersal of fauna. As such, WCPL has developed the Biodiversity Offset Strategy to compensate for the biodiversity impacts associated with the Mine. The Biodiversity Offset Strategy has been amended and augmented over time to reflect additional mining extension approvals. The Biodiversity Offset Strategy addresses unavoidable impacts on threatened species, populations and communities that are listed under the TSC Act and/or EPBC Act.

The Biodiversity Offset Strategy comprises a package of BOAs that will be set aside for conservation and managed in perpetuity, and WCPL's rehabilitation strategy. In addition, the Biodiversity Offset Strategy includes a number of ECAs and residual Regeneration Areas associated with the original Wilpinjong Coal Project that will strengthen the linkages between the woodland rehabilitation areas and the Goulburn River National Park and Munghorn Gap Nature Reserve. The Biodiversity Offset Strategy will also assist in the faunal recolonisation of the Mine's Rehabilitation Areas and residual Regeneration Areas.

Additional objectives and targets include:

- Contributing to and enhancing the existing network of protected vegetation within Mid-Western Region;
- Improving fauna movement and flora dispersal opportunities within the surrounding disturbed landscape;
- Increasing the extent, condition and value of the Box Gum Woodland EEC (**Figures 9 and 10**) within:
  - the western extent of the Hunter Local Land Service area (formally the Hunter Central Rivers Catchment Management Authority), Kerrabee sub-region;
  - the north western extent of the Sydney Basin Bioregion, Kerrabee sub-region; and
  - the Central Western Slopes Botanical Division;
- Providing refuge and core habitat for local fauna populations and transient species, particularly threatened species; and
- Providing an extension of protected reserve for threatened fauna species, including Box Gum Woodland EEC dependent species and other threatened fauna species known to occur in the area.

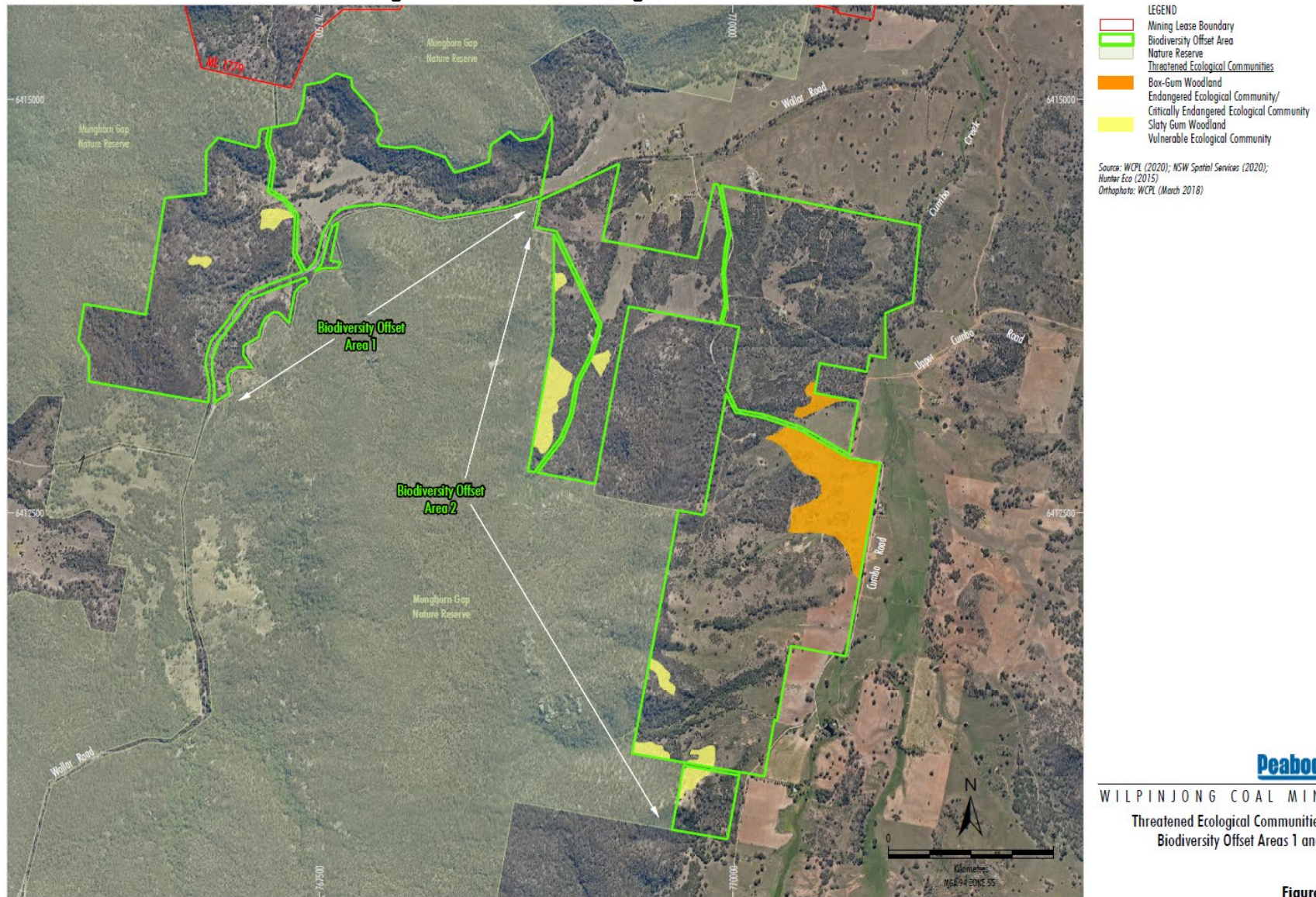
**Section 4.1** provides a brief description of the development of the Biodiversity Offset Strategy and **Section 4.5** provides a summary of the Biodiversity Offset Strategy as required by the Development Consent (SSD-6446).

### 4.1 Background

#### 4.1.1 Wilpinjong Coal Project EIS (2005)

As a commitment of the WCP EIS (WCPL, 2005), WCPL proposed to implement a Biodiversity Offset Strategy to compensate for the 290 ha of remnant woodland which will be cleared as a result of the project. The key components of the Biodiversity Offset Strategy are provided in **Table 6**.

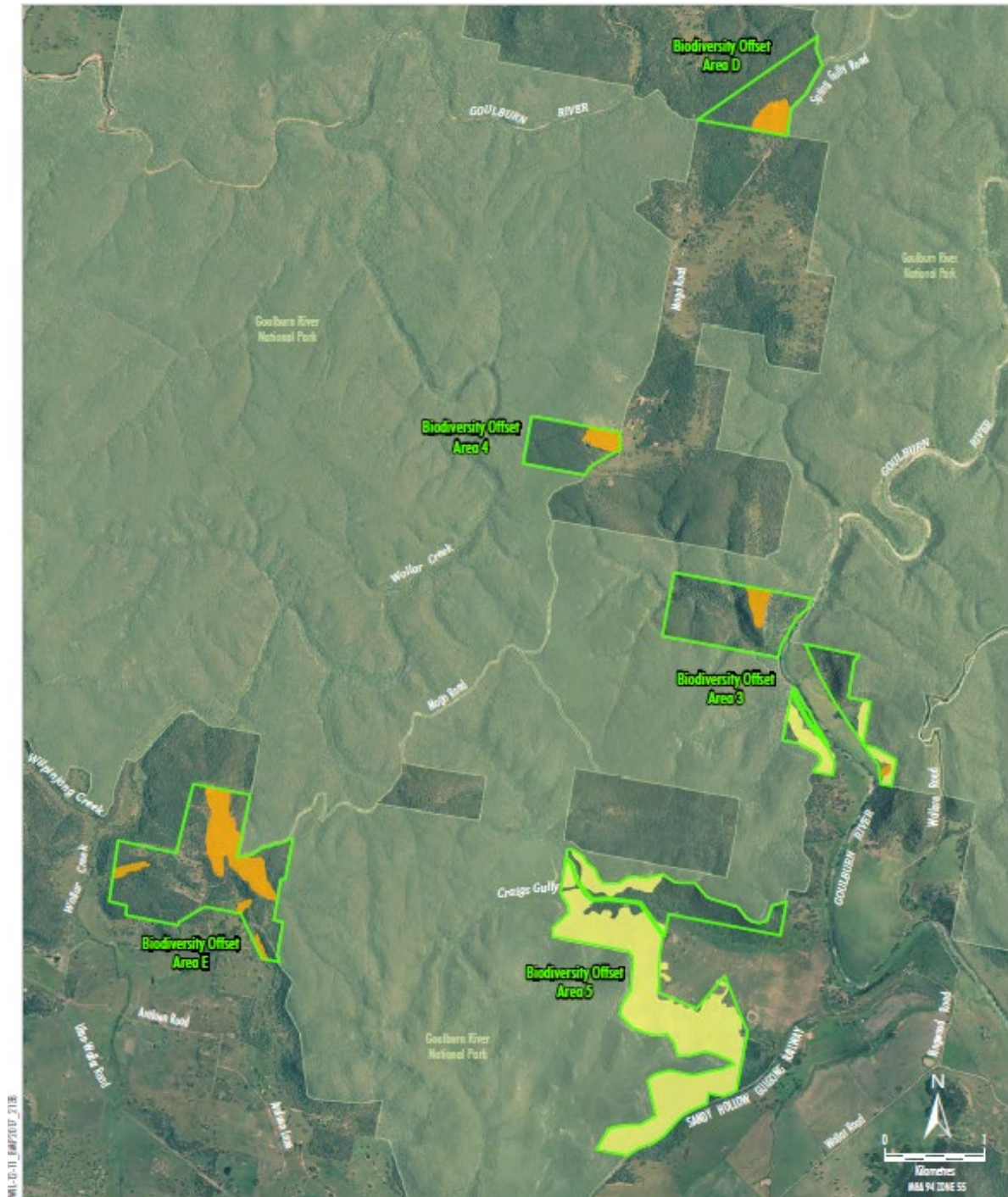
**Figure 9 Threatened Ecological Communities – BOAs 1 and 2**



**Figure 9**



Figure 10 Threatened Ecological Communities – BOAs 3, 4, 5, D and E



WI-CO-01\_ENV2010\_2118

- LEGEND**
- National Park
  - Biodiversity Offset Area
  - Threatened Ecological Communities**
  - Box-Gum Woodland Endangered Ecological Community/ Critically Endangered Ecological Community
  - Slaty Gum Woodland Vulnerable Ecological Community

Source: WCP (2017); NSW Land & Property Information (2016); Hunter Eco (2013, 2015)

**Peabody**  
**WILPINJONG COAL MINE**  
 Threatened Ecological Communities -  
 Biodiversity Offset Areas 3, 4, 5, D and E

Figure 10

The Biodiversity Offset Strategy for the Wilpinjong Coal Project resulted in a total of approximately 1,385 ha of woodland to replace the 290 ha to be cleared as a result of the Mine – an increase of 1,095 ha in the medium to long term

**Table 6 Biodiversity Offset Strategy (WCPL, 2005)**

Area	Area of Woodland Immediately Protected (ha)	Area of Woodland to be Established (ha)	Key Attributes
<b>ECAs</b>	295	185	<ul style="list-style-type: none"> <li>• 480 ha in total</li> <li>• 3 ECAs to be established on the site<sup>1</sup></li> <li>• woodland established through natural regeneration/selective planting</li> <li>• 80 ha of existing White Box EEC to be protected</li> <li>• 50 ha of White Box EEC to be re-established</li> </ul>
<b>Regeneration Areas</b>	30	350	<ul style="list-style-type: none"> <li>• 380 ha in total</li> <li>• Woodland established through natural regeneration/selective planting</li> </ul>
<b>Rehabilitation</b>	-	850	<ul style="list-style-type: none"> <li>• 1,920 ha in total</li> <li>• 850 ha woodland and 1,070 ha of woodland/pasture</li> <li>• Progressive rehabilitation with mining to minimise disturbance and reduce time for establishment of habitat</li> </ul>
<b>Total (ha)</b>	<b>325</b>	<b>1,385</b>	

**Notes:** <sup>1</sup> The ECAs have been established by WCPL, as shown on **Figure 2**.

During the assessment phase of the WEP, WCPL committed to providing an additional offset area comprising 384 ha of Shrubby White Box Woodland, of which 99 ha met the criteria to be mapped as the Box Gum EEC. This area was known as the Nullo Mountain property and has subsequently been incorporated into the Wollemi National Park.

#### 4.1.2 Modification 5 (2014)

During the MOD 5 EA, it was identified that 51.7 ha of native vegetation (29.8 ha of woodland and 21.9 ha of grassland) will be subject to direct disturbance by mining activities. To offset the potential impacts of MOD 5, WCPL proposed to permanently add two parcels of land to the adjoining Goulburn River National Park (Biodiversity Offset Areas D and E), one located approximately 3 km east of the site and the other, 12 km north-east of the site (**Figure 2**).

These parcels comprise approximately 210.8 ha of native vegetation, including:

- 192.8 ha of woodland;
- 13.6 ha of shrubby regeneration; and
- 4.4 ha of derived native grassland.

All land within Biodiversity Offset Areas D and E has been transferred to National Parks Estate (**Section 4.6**).

#### 4.1.3 Wilpinjong Extension Project EIS (2015)

The Biobanking Assessment Methodology 2014 (OEH, 2014c) and Credit Calculator were used to assess the biodiversity values of five land-based Biodiversity Offset Areas. Figure 2 shows the location of Biodiversity Offset Areas relative to the Project. These Biodiversity Offset Areas are located on land owned by Peabody.



The Biodiversity Offset Areas are strategically located next to the Goulburn River National Park and Munghorn Gap Nature Reserve, with the potential to increase the extent of these existing protected areas.

The Biodiversity Offset Areas total 1,100 ha in size, comprising approximately 996 ha of native vegetation (**Figure 2**).

The Biodiversity Offset Areas produce excess species credits (for *Ozothamnus tessellatus*, Scant Pomaderris, *Tylophora linearis* and *Phascolarctos cinereus* [Koala]) which are not specifically required for the Wilpinjong Extension Project. Under the Wilpinjong Extension Project Biodiversity Offset Strategy, these excess species credits will be retired, which will otherwise have not been included in the offset package under the *NSW Framework for Biodiversity Assessment* (OEH, 2014a).

NSW Offset Policy (OEH, 2014b) requires a total of 16,924 ecosystem credits to be retired for the Wilpinjong Extension Project. The Biodiversity Offset Areas and mine site rehabilitation produce 16,974 ecosystem credits (an excess of 50 ecosystem credits which will be retired).

In addition to the values described above, Offset Area 3 also includes some 2 km of sandstone escarpment with numerous caves which are likely to provide bat roosting habitat. This is despite no similar series of caves being cleared by the Wilpinjong Extension Project, the benefit of which is not recognised under the *NSW Framework for Biodiversity Assessment* (OEH, 2014a).

All species credit requirements will be met by the proposed Wilpinjong Extension Project Biodiversity Offset Strategy except the credit requirements for the Regent Honeyeater. The Biodiversity Offset Areas do not generate enough credits for this species according to the *NSW Framework for Biodiversity Assessment* (OEH, 2014a).

Notwithstanding, additional species credits for the Regent Honeyeater will be generated through mine site rehabilitation and monetary contributions to the Regent Honeyeater Recovery Plan captive breeding and release programs (**Section 4.5**).

## 4.2 Enhancement and Conservation Areas

In 2012, WCPL entered into a Conservation Agreement with the NSW Minister for the Environment, for three parcels of land surrounding ML 1573. ECAs A, B, and C have been established for conservation purposes. These 3 parcels of land currently make up the total 480 ha of land required by Condition 32 of the Development Consent.

The ECAs comprise of a variety of vegetation communities including those that will be disturbed by the Mine. Approximately 295 ha of remnant vegetation will be conserved and enhanced by the ECAs, including more than 80 ha of the Box Gum Woodland EEC. In addition, approximately 185 ha of woodland vegetation will be established in the ECAs through natural regeneration/selective planting, including 50 ha of the Box Gum Woodland EEC.

Enhancement of the ECAs will be achieved by the implementation of appropriate land management practices such as weed control, management of livestock access to encourage natural regeneration and selective planting. WCPL will exclude future open cut mining in the ECAs, unless, in the opinion of the Minister for Planning, WCPL has demonstrated that there is a clear justification for this on social, economic and/or environmental grounds, at which time any losses would be subject to the prevailing offset requirements.

The ECAs aim to contribute to the continuity of woodland vegetation by establishing links between the Regeneration and Rehabilitation Areas, and existing remnant vegetation in Munghorn Gap Nature Reserve, Goulburn River National Park. Further, two of the three ECAs have been positioned on the margins of Goulburn River National Park or Munghorn Gap Nature Reserve, which is considered beneficial in terms of the strategic role of the ECAs in the region.

In accordance with Schedule 3, Condition 33 of the Development Consent, WCPL has made an amendment to the ECAs as needed to facilitate the approved TransGrid Wollar to Wellington 330 kilovolt (kV) electricity transmission line (ETL) relocation:

*Within one year of the commencement of development under this consent, unless the Secretary agrees otherwise, the Applicant must amend the Conservation Agreement for the Enhancement and Conservation Areas to remove the areas proposed to be incorporated into the re-alignment of the Transmission Line and include an additional area to ensure that the total area of the Enhancement and Conservation Area remains at 480 hectares.*

### 4.3 Regeneration Areas

Regeneration Areas have been established on areas of WCPL owned land situated proximal to the Mine’s disturbance/rehabilitation areas. These areas were established as part of the WCP EIS (WCPL, 2005). The Regeneration Areas contain predominantly cleared agricultural land in which woodland vegetation will be established through natural regeneration and selective planting.

The WEP EIS resulted in a reduction to the size of the Regeneration Areas as they occurred within the open cut extension and infrastructure areas. The original purpose of the Regeneration Areas is still being satisfied as the land within the open cut extension and infrastructure areas will be rehabilitated to woodland.

### 4.4 Rehabilitation Areas

Rehabilitation of the mining area will be undertaken in accordance with Performance and Completion Criteria (Table 12) and Schedule 3, Conditions 36 and 37 of the Development Consent (see below).

#### 36. Biodiversity Rehabilitation Offsets

*Within 10 years of the completion of mining operations under this consent, unless otherwise agreed by the Secretary, the Applicant must demonstrate that there are sufficient biodiversity credits of a number and class specified in Tables 8 and 9 below.*

Table 8: Ecosystem Credit Requirements

<b>Vegetation Community</b>	<b>Code (BVT)</b>	<b>Biometric Vegetation Type</b>	<b>Area (hectares)</b>	<b>Credits Required</b>	<b>BVTs that can be used to meet credits</b>
<i>Fuzzy Box Woodland</i>	<i>HU547</i>	<i>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion.</i>	<i>9</i>	<i>37</i>	<i>HU547</i>
<i>Rough Barked Apple Woodland</i>	<i>HU981</i>	<i>Rough-barked Apple grassy tall woodlands of the Brigalow Belt South</i>	<i>880</i>	<i>3,716</i>	<i>HU981 HU732</i>
<i>Whitebox Woodland Shrubby</i>	<i>HU824</i>	<i>White Box-Black Cypress Pine shrubby woodland of the Western Slopes</i>	<i>575</i>	<i>2,417</i>	<i>HU824</i>

Table 9: Species Credit Requirements

Species	Code (BVT) <sup>1</sup>	Biometric Vegetation Type	Area (ha)	Credits Required <sup>2</sup>
Regent Honeyeater	HU697, HU732, HU824  or additional BVT's as otherwise agreed by the Secretary in consultation with OEH	Mugga Ironbark-Black Cypress Pine shrub/ grass open forest of the upper Hunter Valley  Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion.  White Box-Black Cypress Pine shrubby woodland of the Western Slopes	2,897	8,650

Notes:

1. The BVT's are required to be planted as Regent Honeyeater habitat
2. The following rehabilitation types may generate up to 3.55 Regent Honeyeater credits / hectare:
  - Wilpinjong Extension Project open cut and ancillary areas rehabilitated to woodland
  - Wilpinjong Coal Project approved agricultural areas rehabilitated to woodland

The following rehabilitation types may generate up to 1.775 Regent Honeyeater credits / hectare:

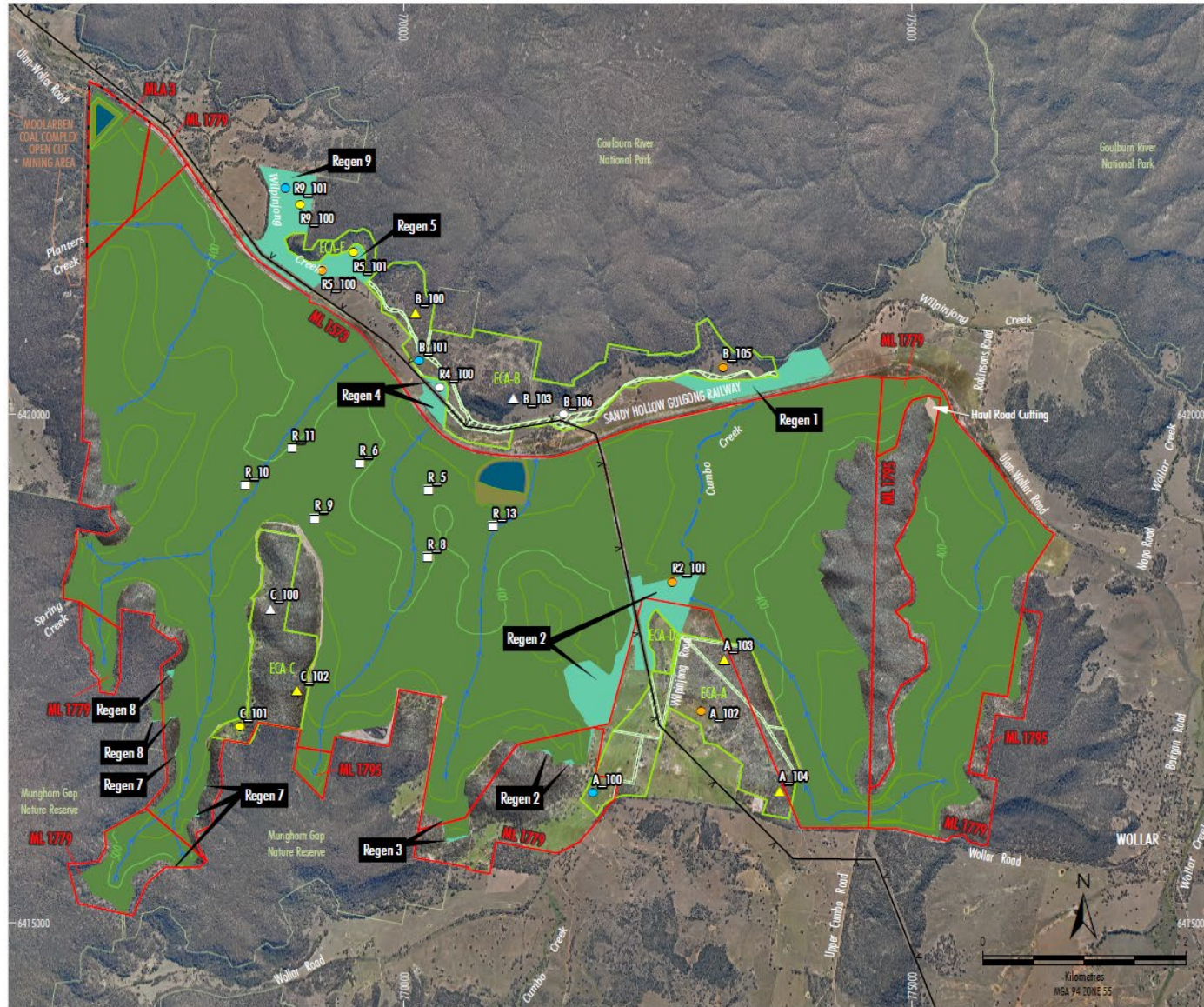
- Wilpinjong Coal Project approved area woodland rehabilitated to BVT woodland
37. Within 6 months of the commencement of development under this consent, or as otherwise agreed by the Secretary, the Applicant must, in consultation with OEH, the Department and DoEE and to the satisfaction of the Secretary, develop suitable rehabilitation performance and completion criteria for:
    - (a) the BVTs in Tables 8 and 9; and
    - (b) Regent Honeyeater habitat.

The performance and completion criteria must include consideration of the effect of climatic conditions, such as drought, and the NSW Biodiversity Offsets Policy for Major Projects 2014 and the associated Fact sheet: Mine Site Rehabilitation (OEH, 2014).

The conceptual final landform for the mining area is shown on **Figure 11**.



Figure 11 Conceptual Final Rehabilitation and Regeneration



- LEGEND**
- Mining Lease Boundary
  - Mining Lease Application Boundary
  - Enhancement and Conservation Area
  - Enhancement and Conservation Area Excluded Area
  - Woodland #
  - Regeneration Area
  - Final Void Batter
  - Final Void
  - Conceptual Cumba Creek Realignment
  - Realigned TransGrid 330 kV ETL \*
  - Biodiversity Monitoring Sites
  - △ Native Vegetation - Good Resilience, Western Slopes Dry Sclerophyll Forest
  - △ Native Vegetation - Good Resilience, Western Slopes Grassy Woodland
  - Regeneration - No Resilience, Western Slopes Grassy Woodland
  - Regeneration - Moderate Resilience, Western Slopes Dry Sclerophyll Forest
  - Regeneration - Moderate Resilience, Western Slopes Grassy Woodland
  - Regeneration - Poor Resilience, Western Slopes Grassy Woodland
  - Rehabilitation, Woodland

\* Note: TransGrid 330 kV Electricity Transmission Line as adjusted to final design by TransGrid.

# Inclusive of the agreed minor changes to the footprint confirmed by DPIE on 23rd April and 23rd August 2019.

Source: WCPL (2020); NSW Spatial Services (2020) Hunter Eco (2014); Niche (2014) Orthophoto Mosaic: WCPL (April 2020, March 2018)

**Peabody**  
**WILPINJONG COAL MINE**  
 Conceptual Final Rehabilitation and Regeneration

Figure 11

It is noted that, in accordance with Schedule 3, Condition 38 of the Development Consent, if at the end of 10 years after landform establishment or 10 years after completion of mining operations the rehabilitation does not meet the performance or completion criteria to the satisfaction of the Secretary, WCPL will retire the relevant number of credits in accordance with the *NSW Biodiversity Offsets Policy for Major Project 2014* to the satisfaction of OEH.

#### 4.5 Summary of Biodiversity Offset Strategy

**Table 7** provides a summary of the Biodiversity Offset Strategy for the Project, consistent with Schedule 3, Condition 32 of the Development Consent.

**Table 7 Biodiversity Offset Strategy**

Area	Offset	Area (ha)
<b>Existing Offsets</b>	Enhancement and Conservation Areas	480
	Biodiversity Offset Areas D and E	211
<b>Additional Offsets</b>	Offset Area 1	199
	Offset Area 2	416.5
	Offset Area 3	124.5
	Offset Area 4	38
	Offset Area 5	218
<b>Regeneration Areas</b>		148
<b>Rehabilitation Areas</b>		2,906
<b>Total</b>		<b>4,741</b>

**Note:** WCPL has also provided an additional offset area comprising 384 ha of Shrubby White Box Woodland, of which 99 ha met the criteria to be mapped as the Box Gum EEC. This area was known as the Nullo Mountain property and has subsequently been incorporated into the Wollemi National Park.

In addition to the above, WCPL will contribute funds to OEH towards the Regent Honeyeater Recovery Plan captive breeding and release programs, or any alternative Regent Honeyeater recovery initiative agreed by OEH, in accordance with the payment outlined in Schedule 3, Condition 39 of the Development Consent as shown below:

*Table 10: Contributions to the Regent Honeyeater Recovery Plan – Payment Schedule*

<i>Timeframe</i>	<i>Funds Allocated</i>
<i>Within 1 year from the commencement of development under this consent</i>	<i>\$120,000</i>
<i>Annually thereafter for 9 years</i>	<i>\$60,000 per year</i>

#### 4.6 Security of the Biodiversity Offset Areas

All land within Biodiversity Offset Areas D and E were transferred to the National Parks Estate on the 13 January 2016. Similarly, WCPL will proceed at the earliest opportunity to secure the additional

Biodiversity Offset Areas 1-5 by transfer into the National Park Estate in accordance with Schedule 3, Conditions 32 and 35 that read as follows:

32. *The Applicant must implement the biodiversity offset strategy as summarised in Table 7 and shown conceptually in Appendix 7, to the satisfaction of the Secretary.*

Table 7: Biodiversity Offset Strategy

Area	Offset	Minimum Size (hectares)
<b>Existing Offsets</b>	<i>Enhancement and Conservation Areas</i>	480
	<i>Biodiversity Offset Areas D and E</i>	211
<b>Additional Offsets</b>	<i>Offset Area 1</i>	199
	<i>Offset Area 2</i>	416.5
	<i>Offset Area 3</i>	124.5
	<i>Offset Area 4</i>	38
	<i>Offset Area 5</i>	218
<b>Regeneration areas</b>		148
<b>Rehabilitation Areas</b>		2,906
	<b>TOTAL</b>	<b>4,741</b>

35. *Within 3 years of the commencement of the development under this consent, unless the Secretary agrees otherwise, the Applicant must secure Offset Areas 1 to 5 by:*
- (a) transferring the land to National Park estate; or*
  - (b) entering into a Biobanking Agreement; or*
  - (c) a combination of (a) and (b).*

*The Applicant must use its best endeavours to secure Offset Areas 1 to 5 by transferring the land to adjoining National Park estate, in consultation with OEH.*

In 2017, WCPL commenced consultation with NSW National Parks and Wildlife Services (NPWS) with respect to the transfer of Biodiversity Offset Areas 1-5, including requesting a Financial Impact Statement (**Appendix 3**).

WCPL has sought an extension in time from the Secretary for an additional 12 months to complete the transfer before the 19 September 2021. Extension sought due to the additional time required to negotiate the necessary land subdivisions for the transfer of BOAs 1 – 5 and the temporary cessation of ‘in person’ meetings due to COVID 19.

#### **4.7 Conservation Bond**

In accordance with Schedule 3, Condition 44 of the Development Consent, a Conservation Bond was lodged with the Department within 2 years of commencing development, unless otherwise agreed to by the Secretary. The Conservation Bond was accepted by the DPIE on 5 October 2017.

The Conservation Bond will only apply to the ECAs and Biodiversity Offset Areas 1-5, however, it is noted existing bonds paid for the ECAs will remain current.

The sum of the bond will be calculated to cover management measures prescribed within this Management Plan and include (for example) staff costs, fencing, fire management, weed management, feral animal control, seed collection, replanting/revegetation, monitoring, auditing and reporting until the Biodiversity Offset Areas are transferred to NPWS as described above.



## 5 Biodiversity Management Domains and Zones

### 5.1 Overview

The terms 'Management Domain' and 'Management Zone' have been used to identify the management area for the purpose of management action implementation and monitoring. A description of each Management Domain and associated Management Zones are provided below.

Five distinct Biodiversity Management Domains, hereafter referred to as Management Domains, are described in this Management Plan. These are:

1. Biodiversity Offset Areas (BOAs);
2. ECAs;
3. Regeneration Areas;
4. Rehabilitation Areas; and
5. Residual Areas.

#### 5.1.1 Biodiversity Offset Areas

As detailed in **Section 4.6**, all land within BOAs D and E have been transferred to National Parks Estate, with BOAs 1-5 in transition for transfer to the National Parks Estate.

In accordance with Schedule 3, Condition 42 of the Development Consent, this BMP will not apply to BOAs if and when they are transferred into National Park Estate.

WCPL recognises that the formal process of incorporating the areas into the National Park may take some time, and as a result interim management measures will be implemented until the transfer has occurred. WCPL will undertake the following works prior to the transfer of the BOAs 1-5 (**Appendix 6**):

- Removal of internal fencing;
- Demolition and removal of any houses and/or buildings that are not required by the NPWS;
- Completion of general weed and pest control;
- Formal survey of any BOA boundaries that do not follow existing cadastral boundaries (and any necessary lot subdivision with the assistance of the Mid-Western Regional Council); and
- Select fauna monitoring as described in **Section 9.3**.

Given the BOAs comprise significant areas of largely undisturbed remnant vegetation and these works are relatively minor, the BOAs are not subject to the ongoing management described throughout this section. These works are however detailed in a three-year management schedule in **Appendix 6**

#### 5.1.2 Enhancement and Conservation Areas

Three ECAs (A, B and C) have been established on areas of WCPL-owned land containing remnant vegetation and grazing land, as shown on **Figure 2**. The ECAs have been placed under a voluntary conservation agreement (VCA) with the NSW Minister of the Environment, allowing for the enhancement and conservation of existing remnant vegetation, including the Box Gum Woodland EEC. Ongoing management and monitoring of the ECAs is required to be undertaken in accordance with this Management Plan (**Sections 7 and 9**).

### 5.1.3 Regeneration Areas

The purpose of these Regeneration Areas is to link the ECAs with woodland established in the Rehabilitation Areas and adjoining Goulburn River National Park and Munghorn Gap Nature Reserve, thereby enhancing wildlife connectivity in the area. Residual Regeneration Areas are illustrated on **Figure 2**. Ongoing management and monitoring of the residual Regeneration Areas is required to be undertaken in accordance with this Management Plan (**Sections 7 and 9**).

### 5.1.4 Rehabilitation Areas

Rehabilitation of disturbed areas is undertaken on a progressive basis in accordance with the approved MOP. Rehabilitation of disturbed areas commenced in 2008, with 10 ha of land being rehabilitated for final land use (grazing and wildlife corridors).

As at December 2018, approximately 556 ha of completed landforms were rehabilitated. As part of the WEP EIS, WCPL identified an opportunity to create woodland within the existing mine rehabilitation areas where rehabilitation to date has focussed on the establishment of productive pasture for grazing.

As such, WCPL will conduct a re-evaluation of the previous rehabilitation areas against contemporary BVT classifications in order to determine the best approach to creating Regent Honeyeater habitat within existing mine rehabilitation areas (**Section 7.1.3**).

### 5.1.5 Residual Areas

Residual areas are identified as all remaining areas of WCPL owned land outside of the approved disturbance area/rehabilitation areas, Regeneration Areas, ECAs and BOAs. Residual areas will be managed in accordance with recognised land management practices and may include a number of management measures identified in this Management Plan.

Peabody Pastoral's land holdings are subject to individual farm lease arrangements and are therefore not considered further in this Management Plan.

## 5.2 Resilience Mapping

In May 2014 a background review of all previous and prescribed actions within Annual Environmental Monitoring Reports, the Rehabilitation Management Plan (now incorporated in the MOP), the Bushfire Management Plan<sup>5</sup> and the conditions of the previous Project Approval, was completed by Niche Environment and Heritage (Niche) (2014) for each of the ECAs, residual Regeneration Areas, and Rehabilitation Areas.

As part of this review, Niche also undertook a site assessment to identify Management Zones within the Management Domains for the purpose of developing appropriate management actions. These Management Zones are based on qualitative ecosystem resilience mapping completed in May 2014 (**Appendix 4**). Management Zones were delineated as follows (Niche, 2014):

- Good resilience;
- Moderate resilience;
- Poor resilience; and
- No resilience (areas where natural regeneration pathways have been lost).

Resilience mapping was prepared by Niche (2014) using a modified version of Jones and Brodie (1999), *Blue Space, The Method. Assessment of Environmental Condition and Weed Invasion*, which uses qualitative criteria to assign resilience classes to bushland areas. The level of resilience indicates the vegetation communities level of susceptibility to disease, pests and weed invasion. Resilience mapping

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<sup>5</sup> Bushfire Management Plan not required under SSD-6764, however WCPL continue to implement this management plan.



for each 'Management Domain' are provided in **Appendix 5**. Management Zones are summarised in **Table 8**.

**Table 8 Management Zones**

Management Domain	Area	Management Zone (ha)				Total
		Good Resilience	Moderate Resilience	Poor Resilience	No Resilience	
ECA	ECA-A	88.86	66.22	34.48	-	189.56
	ECA-B	97.61	64.47	39.63	14.66	216.37
	ECA-C	85.50	10.72	-	-	96.22
<b>Subtotal for ECAs</b>		<b>271.97</b>	<b>141.41</b>	<b>74.11</b>	<b>14.66</b>	<b>502.15</b>
Regeneration Area*	Regeneration Area 1	2.18	3.02	23.13	-	28.33
	Regeneration Area 2	-	58.61	3.21	-	61.82
	Regeneration Area 3	-	0.59	-	-	0.59
	Regeneration Area 4	-	-	-	6.53	6.53
	Regeneration Area 5	7.70	11.14	2.83	1.00	22.67
	Regeneration Area 7	-	0.26	-	-	0.26
	Regeneration Area 8	-	0.49	-	-	0.49
	Regeneration Area 9	9.18	7.10	11.29	-	27.57
<b>Subtotal for Regeneration Areas</b>		<b>19.06</b>	<b>81.21</b>	<b>40.46</b>	<b>7.53</b>	<b>148.26</b>
<b>Total</b>		<b>291.03</b>	<b>222.62</b>	<b>114.57</b>	<b>22.19</b>	<b>650.41</b>

Source: Niche (2014)

\* It should be noted that Regeneration Area 6 has been removed with the approval of the Wilpinjong Extension Project.

^ These areas include easements which transect the ECAs.

## 5.3 Management Domains

### 5.3.1 Biodiversity Offset Areas

#### BOA 1

Offset Area 1 is located immediately south of the Mine in a narrow valley surrounded on three sides by the Munghorn Gap Nature Reserve. Approximately 86% of the offset is vegetated with evidence of past timber harvesting. The valley floor has been mostly cleared with remnants indicating the vegetation would have been dominated by *Angophora floribunda* and *Eucalyptus blakelyi*. This habitat remains on the lower slopes, merging into shrubby White Box on the mid-slopes and Grey Gum – Stringybark on the upper slopes. At the southern end there is a wide colluvial basing with Rough-barked Apple and Blakely's Redgum and adjoining Scribbly Gum. There are also small patches of Slaty Box and Mugga Ironbark.

BOA 1 includes known habitat for threatened species including the Little Eagle, Gang-gang Cockatoo, Little Lorikeet, Turquoise Parrot, Brown Treecreeper, Speckled Warbler, Black-chinned Honeyeater, Regent Honeyeater, Painted Honeyeater, Hooded Robin, Pink Robin, Varied Sittella, Diamond Firetail, Eastern Bentwing-bat, Corben's Long-eared Bat, Large-eared Pied Bat, Eastern Cave Bat. There are three unoccupied residences with associated sheds and access tracks. There are no signs of recent livestock grazing. Offset 1 is approximately 201 hectares in size. (WCPL, 2015)

## **BOA 2**

Offset 2 is located approximately 1.5km south of the mine. The western boundary adjoins the Munghorn Gap Nature Reserve. Approximately 55% of the offset is vegetated, a large amount being advanced regeneration from prior clearing. Caley's Ironbark mixed with Red Stringybark occurs in the north eastern section where abundant Black Cypress Pine indicates previous clearing. A long alluvial valley to the west is dominated by Rough-barked Apple and Blakely's Red Gum that continues up the lower slopes, merging into shrubby White Box on the mid-slopes and Grey Gum - Stringybark on the upper slopes. The central eastern part contains a small amount of Yellow Box Woodland with a larger area of Yellow Box Woodland derived native grassland (equivalent to the Box-Gum Woodland EEC/CEEC). Elsewhere on the side slopes are patches of Slaty Box merging into Grey Gum - Stringybark on the upper slopes.

BOA 2 includes known habitat for threatened species including the Little Eagle, Little Lorikeet, Brown Treecreeper, Hooded Robin, Grey-crowned Babbler, Diamond Firetail, Koala, Squirrel Glider, Eastern Bentwing-bat, Corben's Long-eared Bat, Large-eared Pied Bat, Eastern Cave Bat. There is one unoccupied dwelling and associated sheds as well as three dams. There are several natural springs. Offset Area 2 has been recently grazed by livestock and is approximately 441ha in size. (WCPL, 2015)

## **BOA 3**

Offset Area 3 is located approximately 8.5km east of the mine. A mix of high ridges, steep sandstone escarpments with numerous caves and shelters and incised gorges. This area is surrounded on three sides by the Goulburn River National Park and is split by just 2km of the Goulburn River itself. Approximately 75% is vegetated most of which is largely undisturbed. There is an area of old growth dry rainforest dominated by Grey Myrtle. The ridge tops and upper side slopes contain predominantly Red Ironbark - Brown Bloodwood with Grey Gum - Stringybark in the more sheltered upper slopes. There is a small area (1 ha) of Tumbledown Red Gum - Spinifex woodland in the south eastern portion. A wide alluvial flat on the eastern side of the Goulburn River has been fully cleared and pasture improved and is dominated by exotic species. A northern ridge has remnant White Box Grassy Woodland on basalt with evidence of past clearing resulting in a dominant shrub layer of *Bursaria spinosa* and *Beyeria viscosa* which has flourished due to lack of fire.

BOA 3 includes known habitat for threatened species including the Glossy Black-Cockatoo, Sooty Owl, Brown Treecreeper, Koala, Squirrel Glider, Eastern Bentwing-bat, Large-eared Pied Bat. Offset Area 3 is 164ha in size. (WCPL, 2015)

## **BOA 4**

Offset Area 4 is located approximately 7.5km east north-east of the mine. This area is surrounded on three sides by the Goulburn River National Park. Just over 7ha has been partially cleared but still retains characteristics of White Box Grassy Woodland. The land is generally flat with a central incised gully system extending to the west which is dominated by Grey Gum – Stringybark. The flat areas are dominated by Red Ironbark – Brown Bloodwood with a small area of Western Grey Box.

BOA 4 includes known habitat for threatened species including the Little Lorikeet, Turquoise Parrot, Speckled Warbler, Eastern Bentwing-bat, Large-eared Pied Bat. There are low sandstone escarpments along this system. There are two unoccupied dwellings and associated sheds. There are no signs of recent livestock grazing. Offset Area 4 is 39ha in size. (WCPL, 2015)

## **BOA 5**

Offset Area 5 is located approximately 7km east of the mine. This area is surrounded on three sides by the Goulburn River National Park. Over 80% is vegetated with evidence of some prior clearing and timber harvesting. This offset area consists of colluvial lower slopes surrounding an alluvial cultivated valley floor. The dominant community is Slaty Box forest with White Box mixed to varying degrees. White

Box shrubby woodland is present on the northern slopes and a central alluvial valley contains Rough-barked Apple and Blakely's Red Gum. It is partially grazed by livestock in more cleared areas.

BOA 5 includes known habitat for threatened species including the *Ozothamnus tessellatus*, Scant Pomaderris, *Tylophora linearis*, Little Lorikeet, Powerful Owl, Brown Treecreeper, Speckled Warbler, Black-chinned Honeyeater. Offset Area 5 is 255ha in size. (WCPL, 2015)

### 5.3.2 Enhancement and Conservation Areas

#### ECA-A

ECA-A is located between Pits 2 and 7 in the south-eastern portion of the Mine area (**Figure 5**). ECA-A is characterised by Yellow Box and Blakely's Red Gum Woodlands, which represents the Box Gum Woodland EEC; and Coastal Grey Box Woodlands, Rough-barked Apple Woodlands and Narrow-leaved Ironbark Forest. ECA-A includes known habitat for threatened species including the Brown Treecreeper, Diamond Firetail, Regent Honeyeater, Hooded Robin, Yellow-bellied Sheath-tail Bat and Large Bentwing Bat.

Potential habitat for a number of other threatened species (e.g. the Square-tailed Kite, Speckled Warbler, Glossy Black-Cockatoo and Painted Honeyeater) also exists. A representative photo of ECA-A is included in **Appendix 5**.

The condition of ECA-A is characterised by mostly moderate and good resilience vegetation. Moderate resilience areas correspond to regenerating native pasture with substantial recruitment of over-storey species. The alluvial area along Cumbo Creek is in poor condition with some native herbs, sedges and rushes but is mostly dominated by common couch (*Cynodon dactylon*). Some sporadic incursions of the environmental weed, spiny rush (*Juncus acutus*), also exist. There is little or no recruitment of native over-storey species within the alluvial zone (Niche, 2014).

#### ECA-B

ECA-B is located across the northern section of the Mine area, between Wilpinjong Creek and the common boundary with Goulburn River National Park to the immediate north (**Figure 2**). ECA-B is characterised by the Box Gum Woodland EEC represented by the Yellow Box and Blakely's Red Gum Woodlands; Coastal Grey Box Woodlands, Rough-barked Apple Woodlands and Sandstone Range Shrubby Woodlands. ECA-B includes known habitat for threatened fauna species such as the Brown Treecreeper, Yellow-bellied Sheath-tail Bat, Large Bentwing Bat and Little Bentwing Bat. Potential habitat for a number of other threatened species (e.g. the Diamond Firetail, Hooded Robin and Turquoise Parrot) also exists. A representative photo of ECA-B is included in **Appendix 5**.

The condition of ECA-B is characterised by mostly moderate and good resilience box-gum and rough-barked apple woodland with native pasture (Niche, 2014). Moderate resilience areas correspond to regenerating native pasture with substantial recruitment of over-storey species. Poor resilience native pasture with a moderate cover of native grasses and herbaceous perennial weeds, such as thistles, Paterson's curse and fire weed, exists within over-grazed paddocks adjacent to Wilpinjong Creek (Niche, 2014).

Highly degraded exotic pasture areas exist within and adjacent to the high voltage power easement. These pastures exhibit little or no resilience, probably due to both the disturbance associated with the construction of the transmission line and historic pasture improvement practices. The required maintenance of the easement represents a key constraint to restoration within this zone. Some gully erosional areas exist along Wilpinjong Creek however, for the most part, the gullying is naturally slumping and stabilising with native vegetation. Key weed threats along the creek include blackberry and spiny rush.



## **ECA-C**

ECA-C is located in between Pits 1 and 5 and adjoining the Munghorn Gap Nature Reserve. ECA-C is characterised by the occurrence of the Box Gum Woodland EEC represented by the Yellow Box and Blakely's Red Gum Woodlands and Grassy White Box Woodlands; Rough-barked Apple Woodlands, Shrubby White Box Woodlands and Sandstone Range Shrubby Woodlands (**Figure 2**). ECA-C includes known habitat for threatened fauna species such as the Large-eared Pied Bat, Yellow-bellied Sheathtail Bat, Large Bentwing Bat, Little Bentwing Bat and East-coast Freetail Bat. Potential habitat for a number of other threatened species (e.g. the Regent Honeyeater, Black-chinned Honeyeater, Masked Owl and Squirrel Glider) also exists. A representative photo of ECA-C is included in **Appendix 5**.

The condition of ECA-C is characterised by mostly good resilience box-ironbark and rough-barked apple forest. Moderate resilience native pasture fringes these forested areas with good recruitment of native over-storey species. Few, if any weed threats exist within ECA-C (Niche, 2014).

### **5.3.3 Regeneration Areas**

Regeneration Areas have been established on areas of WCPL owned land situated in close proximity to the Mine's disturbance and Rehabilitation Areas (**Figure 2**). The Regeneration Areas contain predominantly cleared agricultural land in which woodland vegetation will be established through natural regeneration and implementation of proactive management actions. A number of representative photos of the Regeneration Areas and detail mapping of these areas are included in **Appendix 5**.

#### ***Regeneration Area 1***

The condition of Regeneration Area 1 is characterised by mostly moderate and good resilience box-gum and rough-barked apple woodland with native pasture (Niche, 2014). Moderate resilience areas correspond to regenerating native pasture with substantial recruitment of over-storey species. Poor resilience native pasture with a moderate cover of native grasses and herbaceous perennial weeds, such as thistles, Paterson's curse and fire weed, exists within over-grazed paddocks adjacent to Wilpinjong Creek (Niche, 2014). A substantial area of highly degraded exotic pasture exists to the south of Wilpinjong Road and exhibits little or no resilience, most likely due to historic pasture improvement practices. Some gully erosional areas exist along Wilpinjong Creek however, for the most part, the gullying is naturally slumping and stabilising with native vegetation. Key weed threats along the creek include blackberry and spiny rush (Niche, 2014).

The size of Regeneration Area 1 has been significantly reduced with approval of the Wilpinjong Extension Project open cut extensions and infrastructure areas (**Figure 2**).

#### ***Regeneration Area 2***

Regeneration Area 2 is located on the western side of ECA-A. The condition of Regeneration Area 2 is characterised by mostly moderate resilience native pasture with a zone of poor resilience swamp herbfield along Cumbo Creek (Niche, 2014). The moderate resilience native pasture areas have moderate levels of recruitment of native over-storey species and low levels of weed incursion. A severe infestation of spiny rush exists along the poor resilience zone of Cumbo Creek. Erosional landslip scars are present in the steeper western portion of the site but have slumped and are slowly recovering to good resilience native pasture with little or no weed incursions (Niche, 2014).

The size of Regeneration Area 2 has been significantly reduced with approval of the Wilpinjong Extension Project open cut extensions and infrastructure areas (**Figure 2**).

#### ***Regeneration Areas 3, 7 and 8***

Regeneration Areas 3, 7 and 8 are located adjacent to the south and south western boundary of the approved disturbance area. The condition and prescribed management of Regeneration Areas 3, 7 and 8 is the same and therefore they are described together. Collectively, these three Regeneration Areas

are characterised by mostly moderate and good resilience box-gum and rough-barked apple woodland (Niche, 2014). Moderate resilience areas correspond to regenerating native pasture with substantial recruitment of over-storey species (Niche, 2014). Key weed threats within these areas include blackberry and tree-of-heaven (both of which are currently being managed).

Regeneration Areas 3, 7 and 8 have been almost completely removed with approval of the Wilpinjong Extension Project open cut extensions and infrastructure areas (**Figure 2**).

#### ***Regeneration Area 4***

Regeneration Area 4 is located on the north side of the Mine, between the approved disturbance boundary and ECA-B. The condition of Regeneration Area 4 is characterised by highly degraded exotic pasture areas within and adjacent to the high voltage power easement and exhibits little or no resilience (Niche, 2014). The required maintenance of the easement represents a key constraint to ecological restoration within this zone.

The size of Regeneration Area 4 remains largely unchanged with approval of the WEP open cut extensions and infrastructure areas (**Figure 2**).

#### ***Regeneration Area 5***

Regeneration Area 5 is located towards the western end of ECA-B and has a similar suite of ecological pressures as Regeneration Area 4. It is characterised by mostly moderate and good resilience box-gum and rough-barked apple woodland with native pasture (Niche, 2014).

Highly degraded exotic pasture areas exist within and adjacent to the high voltage power easement and exhibit little or no resilience (Niche, 2014). The required maintenance of the easement represents a key constraint to restoration within this zone. Some gully erosional areas exist along Wilpinjong Creek however, for the most part, the gulying is naturally slumping and stabilising with native vegetation. Key weed threats along the creek include blackberry and spiny rush. Pig rutting was observed along the creek in various places (Niche, 2014).

The size of Regeneration Area 5 remains largely unchanged with approval of the WEP open cut extensions and infrastructure areas (**Figure 2**).

#### ***Regeneration Area 6***

Regeneration Area 6 has been removed with approval of the WEP open cut extensions and infrastructure areas.

#### ***Regeneration Area 9***

Regeneration Area 9 is located in the northern part of the Wilpinjong exploration lease and is characterised by good resilience box-gum, rough-barked apple and box-ironbark woodland and forest surrounding moderate resilience native pasture areas with little or no weed cover (Niche, 2014). A substantial area of poor resilience native pasture with a moderate cover of native grasses and herbaceous perennial weeds occurs where there have been previous pasture improvement practices (Niche, 2014).

The size of Regeneration Area 9 remains largely unchanged with approval of the WEP open cut extensions and infrastructure areas (**Figure 2**).

## 6 Interim, Performance & Completion Criteria

During the WEP approval process, the NSW Government revised WCPL final mine rehabilitation and land use. As a result, and in accordance with Condition 37, Schedule 3 of Development Consent SSD 6764, WCPL has developed suitable performance and completion criteria<sup>6</sup> for prescribed Biometric Vegetation Types (BVTs) and Regent Honeyeater habitat in consultation with the OEH, DoEE and DPE.

The criteria and monitoring program has been developed based on the BioMetric methodology for assessing ecosystem function (Gibbons *et al.*, 2009). Landscape Function Analysis (LFA) will be used for assessing rehabilitation progress and success (Tongway and Hindley 2004).

OEH benchmark condition states of the Performance and Completion Criteria BVTs are described in **Table 12**. These condition states are based on theoretical site attribute scores for the specified vegetation types. WCPL will develop site-specific scores using local benchmark data following the completion of the first round of monitoring in external and internal reference sites in consultation with Dubbo OEH by September 2020. With local benchmark sites identified and endorsed, WCPL will comparatively monitor local benchmark sites to mining rehabilitation domains for performance evaluation and effective management.

Prescribed BVTs and Regent Honeyeater habitat include;

- HU547 – Fuzzy Box Woodland
- HU697 – Mugga Ironbark-Black Cypress Pine Open Forest
- HU732 – Yellow Box Grassy Woodland
- HU824 – White Box-Black Cypress Pine Shrubby Woodland
- HU825 – Narrow-leaved Ironbark-Black Cypress Pine Grass Woodland

### 6.1 Biometric Assessment

BioMetric (Gibbons *et al.*, 2009) is proposed as the Model for determining meaningful, quantitative, biodiversity focused Performance and Completion Criteria along with Interim Performance monitoring. BioMetric, a NSW Government endorsed biodiversity assessment method (developed for the NSW BioBanking Assessment Methodology), provides a useful decision making framework founded on a standardised repeatable measurement method readily applicable to a monitoring program.

Management measures can be performance tested through the BioMetric process, thereby providing an appropriate evidence-based mechanism for optimising future management decisions. Evidence-based adjustments made to a predefined management regime are central to maximising the likelihood of a successful outcome.

BioMetric is a quantitative method developed to comparatively assess the condition of vegetation and habitat values of native vegetation against pre-defined benchmarks (i.e. pre-European settlement). Vegetation and habitat condition are quantitatively evaluated by ten readily measurable 'site attributes' considered to reflect the relative health or level of disturbance of a specific vegetation class. These site attributes provide meaningful ecological information useful in management decisions. Site attributes measured in a BioMetric assessment are listed in **Table 9**.

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<sup>6</sup> On the 24 April 2019 the Secretary approved the performance and completion criteria for Biometric Vegetation Types (BVT) and the Regent Honeyeater.



**Table 9 BioMetric Site Attributes and Measurement Parameters**

Site Attribute	Measurement parameter
<b>Native Plant Species Richness (NSR)</b>	Species within 400 square metres (m <sup>2</sup> ) plot (count) (20 x 20 m plot)
<b>Native Over-storey Cover (NOC)</b>	Projected foliage cover above 10 m height along a 50 m transect (%) – measured every 5 m
<b>Native Mid-storey Cover (NMC)</b>	Projected foliage cover between 1 and 10 m height along a 50 m transect (%) – measured every 5 m
<b>Native Ground Stratum Cover (grasses) (NGCG)</b>	Cover below 1 m along a 50 m transect (%) – measured every metre (m)
<b>Native Ground Stratum Cover (shrubs) (NGCS)</b>	Cover below 1 m along a 50 m transect (%) – measured every metre
<b>Native Ground Stratum Cover (other) (NGCO)</b>	Cover below 1 m along a 50 m transect (%) – measured every metre
<b>Exotic Plant Cover (EC)</b>	Cover along a 50 m transect (%) – measured every metre
<b>Over-storey Regeneration (OR)</b>	Overstorey canopy species <5 centimetre (cm) diameter at breast height (DBH) within a 1,000 m <sup>2</sup> plot (score 0 to 1)
<b>Number of Trees With Hollows (NTH)</b>	Number of trees containing hollows within a 1,000 m <sup>2</sup> plot (count) [20 x 50 m plot]
<b>Total Length of Fallen Logs (FL)</b>	Log length touching ground >10 cm diameter and >0.5 m in length within a 1,000 m <sup>2</sup> plot (m) [20 x 50 m plot]

BioMetric is suited to a rigorous, statistically valid monitoring program where evidence-based adaptive management is a realistic expectation. Management measures can be performance tested against specified targets either by individually examining each site attribute or through calculated site value scores. A site value score is calculated from all site attributes using a specified algorithm (as detailed in [DECCW, 2011]), thus allowing a collective quantitative evaluation of condition against a desired outcome. Site value scores range from one (i.e. low condition) to a maximum of 100 (i.e. benchmark condition).

The site value scores used to determine condition state thresholds are broadly defined in **Table 10**.

**Table 10 Site Value Scores and Condition States**

Site Value Score	Description
<34	Lands having low condition, requiring substantial management intervention. Low condition vegetation lacks the basic building blocks for a functioning ecosystem. Such vegetation is characterised by having few site attributes in addition to moderate EC.
34-70	Lands having moderate to good condition with capacity for continued improvement. Sub-categories include: <ul style="list-style-type: none"> <li>Moderate to good – poor (site value score &gt;34-45)</li> <li>Moderate to good – medium (site value score &gt;45-56)</li> <li>Moderate to good – good (site value score &gt;56-70)</li> </ul> Vegetation and habitat in this condition generally requires targeted management intervention to restore ecological function to a self-sustaining level.
>70	Lands having high condition approaching a benchmark state, with continued improvement restricted to the long term development of specific habitat features (i.e. development of hollow bearing trees, larger woody debris and species richness). Sub-categories include: <ul style="list-style-type: none"> <li>High (site value score 71-78)</li> <li>High – benchmark (site value score &gt;78)</li> </ul> Vegetation and habitat in this condition generally comprises sufficient ecological function similar to an undisturbed patch belonging to the same vegetation class. Such vegetation is considered to require limited management intervention as ongoing improvement will be largely passive (e.g. tree hollow development). A site value score of 78 denotes vegetation and habitat in benchmark condition for all site attributes with the exception of trees with hollows. As it takes up to 120 years to develop hollow bearing trees (in the absence of nest boxes) it is considered unrealistic to expect a site value score above 78 where the management period is not of this timeframe or a significant proportion thereof.

### 6.1.1 Rehabilitation Interim Performance Criteria

While there are no interim rehabilitation performance criteria required under the Development Consent prior to 10 years of landform establishment, WCPL will monitor the performance of rehabilitation by conducting the following monitoring as outlined in **Table 11**.

**Table 11 Interim Performance**

Year	Monitoring Method
1 to 10	Landform Function Analysis (LFA) and drone/aerial surveillance for any material areas of vegetation establishment failure
Years 3-4	Single FBA plot in each BVT (randomly selected)
Years 5-9	FBA plots required in accordance with vegetation zone size.

This approach is to provide for the early detection of any material areas of rehabilitation failure, track progress against the Performance and Completion Criteria and allow for the implementation of corrective measures as detailed in the Mining Operations Plan (MOP), where this may be required.

### 6.1.2 Rehabilitation BioMetric Performance Criteria

Performance Criteria applies to rehabilitation domains which have been established and rehabilitated 10 years post landform establishment. Performance Criteria is to show that progress is being made towards the Completion Criteria and has been developed on the basis of approximately 50% of a minimum Completion Criteria or up to two times a maximum Completion Criteria.

**Table 12** presents the approved Performance Criteria for mine rehabilitation at 10 years after landform establishment. With respect to the Regent Honeyeater habitat the relevant criteria is suitable progress against the Native Over-Storey Performance Criteria.

The site attribute values for each FBA plot will be averaged in order to determine the site value if a vegetation zone and the average Overall Site Value Score should be equal to or greater than **7** based on *Generating biodiversity credits for ecological rehabilitation of previously mined land* (OEH, 2015)

### 6.1.3 Rehabilitation Biometric Completion Criteria

Achieving Benchmark and Local Benchmark conditions for the specific rehabilitation BVTs across the mine represents the ultimate management target. However, such completion criteria is considered unrealistic for the management period as the timeframe is insufficient for the development of habitat features such as tree hollows (which require 120 years or more) in the absence of nesting boxes.

A lesser target that demonstrates capacity for passive improvement towards benchmark condition is considered a more suitable and feasible context for establishing performance targets and completion criteria in degraded landscapes. The approved Completion Criteria has been set in accordance with Section 12.2 of the FBA (OEH, 2014a) and in consultation with OEH, DoEE and DPIE.

**Table 12** presents the approved Completion Criteria for mine rehabilitation at 10 years after the completion of mining. With respect to the establishment of Regent Honeyeater habitat BVTs, the relevant criteria for 10 years after completion of mining is suitable progress against the Native Over-Storey and Regeneration Criteria.

Site attribute values for each FBA plot will be averaged in order to determine the site value of a vegetation zone and the Overall Site Value Score should be equal to or greater than **17** based on *Generating biodiversity credits for ecological rehabilitation of previously mined land* (OEH, 2015)



**Table 12 Biometric Performance & Completion Criteria**

Attribute (OEH, 2017)	BVT	Native Plant Species Richness (No. species)		Native Over Storey Cover MIN-MAX (%) <sup>7</sup>		Native Mid – Storey Cover MIN-MAX (%)		Native Ground Cover Grass MIN-MAX (%)		Native Ground Cover Shrubs MIN-MAX (%)		Native Ground Cover Other MIN-MAX (%)		Number of Trees with Hollows	Total Length Fallen Logs (m)	
		Comp.	Perf.	Comp.	Perf.	Comp.	Perf.	Comp.	Perf.	Comp.	Perf.	Comp.	Perf.			
<b>BVT Benchmark (OEH, 2017)</b>	HU547	23		10-45		5-60		5-45		2-10		5-35		2	50	
	HU732	35		10-50		2-10		10-60		2-10		5-30		1.5	25	
	HU697	25		20-50		10-60		5-15		5-10		5-15		0.8	46	
	HU824	25		20-50		10-60		5-15		5-10		5-15		0.8	66	
	HU825	35		25-40		11-50		5-45		5-30		5-20		3	73	
<b>Completion Criteria</b>		<b>1</b>		<b>1</b>		<b>1</b>		<b>1</b>		<b>1</b>		<b>1</b>		<b>0</b>	<b>0.5</b>	
<b>Allowable Future Attribute Score Increases Relative to Benchmark (After OEH, 2014b, 2015)</b>		<b>&gt;50%</b>		<b>&gt;25&lt;200%</b>		<b>&gt;25&lt;200%</b>		<b>&gt;25&lt;200%</b>		<b>&gt;25&lt;200%</b>		<b>&gt;25&lt;200%</b>		<b>N/A</b>	<b>&gt;25%</b>	
<b>WCPL Criteria</b>	<b>BVT</b>	<b>Comp.</b>	<b>Perf.</b>	<b>Comp.</b>	<b>Perf.</b>	<b>Comp.</b>	<b>Perf.</b>	<b>Comp.</b>	<b>Perf.</b>	<b>Comp.</b>	<b>Perf.</b>	<b>Comp.</b>	<b>Perf.</b>	<b>NIL</b>	<b>Comp.</b>	<b>Perf.</b>
	HU547	11.5	6	2.5-90	1-90	1.25-100	1-100	1.25-90	1-90	0.5-20	0-10	1.25-70	0.5-70		12.5	6
	HU732	17.5	9	2.5-100	1-100	0.5-20	0-20	2.5-100	1-100	0.5-20	0-10	1.25-60	0.5-60		6.25	3
	HU697	12.5	6	5-100	3-100	2.5-100	1-100	1.25-30	1-60	1.25-20	1-10	1.25-30	0.5-60		11.5	6
	HU824	12.5	6	5-100	3-100	2.5-100	1-100	1.25-30	1-60	1.25-20	1-10	1.25-30	0.5-60		16.5	8
	HU825	17.5	9	6.25-80	3-80	2.75-100	1-100	1.25-90	1-90	1.25-60	1-30	1.25-40	0.5-80	18.25	9	
<b>Attribute (OEH, 2017)</b>	<b>Exotic Plant Cover (% of total cover)</b>						<b>Regeneration<sup>7</sup></b>						<b>Overall Site Value Score (OEH, 2015)</b>			
							<b>(% of over-storey species that are naturally regenerating)</b>						<b>(average of plots in vegetation zone)</b>			
<b>Completion Criteria</b>	<b>1</b>						<b>0.5</b>						<b>16.93</b>			
<b>Allowable Future Attribute Score Increases Relative to Benchmark (After OEH, 2014b, 2015)</b>	<b>&lt;45%</b>						<b>25%</b>									
<b>WCPL Criteria</b>	<b>Comp.</b>		<b>Perf.</b>		<b>Comp.</b>		<b>Perf.</b>		<b>Comp.</b>		<b>Perf.</b>		<b>Comp.</b>		<b>Perf.</b>	
<b>All relevant BVTs</b>	<b>&lt;45%</b>		<b>&lt;90%</b>		<b>To be determined based on number of OS species</b>				<b>No regeneration</b>				<b>17</b>		<b>7</b>	

<sup>7</sup> Relevant Regent Honeyeater habitat criteria  
 Comp. = Completion Criteria  
 Perf. = Performance Criteria at 10 years after landform establishment  
 Wilpinjong Coal – Biodiversity Management Plan  
 Document Number: WI-ENV-MNP-0035

## 6.2 Landscape Function Analysis

LFA is a rapid and reliable technique used for managing and monitoring of landscape rehabilitation (Tongway and Hindley, 2004). The method assesses how biological and physical resources are stored, transported, cycled and lost from a landscape. LFA will be used in conjunction with BioMetric at rehabilitation and regeneration sites, in accordance with the monitoring program in Section 9.

Data relating to the eleven LFA Soil Surface Condition Indicators (SSCIs) will be collected along the 50 m transect established within the BioMetric plots to ensure consistency and repeatability of monitoring data. LFA monitoring will be undertaken in accordance with the methodology described in Tongway and Hindley (2004).

Eleven SSCIs (**Table 13**), each focusing on specific biological and/or physical processes, are used to develop three LFA indices:

1. Soil Stability;
2. Soil Infiltration; and
3. Nutrient Cycling.

**Table 13 Soil Surface Condition Indicators**

SSCI	Description	Relevant LFA Index		
		Stability	Infiltration	Nutrient Cycling
<b>Rainsplash Protection</b>	Percentage cover of perennial vegetation to a height of 0.5 m. plus rocks > 2 cm and woody material > 1 cm in diameter or other long-lived, immovable objects.	X		
<b>Perennial Vegetation Cover</b>	Percentage perennial vegetation cover.		X	X
<b>Litter</b>	Percentage cover of annual grasses and ephemeral herbage (both standing and detached) as well as detached leaves, stems, twigs, fruit, dung, etc.	X	X	X
<b>Cryptogam Cover</b>	Percentage cover of algae, fungi, lichens, mosses, liverworts and fruiting bodies of mycorrhizas.	X		X
<b>Crust Brokenness</b>	Categorises soil crusts from 0-4 where 0 refers to 'no crust present' and 4 refers to an 'intact and smooth' soil crust.	X		
<b>Soil Erosion Type and Severity</b>	Categorises the aerial extent and severity of various erosion types from 'Insignificant' to 'Severe'.	X		
<b>Deposited Materials</b>	Categorises the extent and depth of deposited alluvial material.	X		
<b>Soil Surface Roughness</b>	Categorises the depth of surface depressions from 'smooth' to 'deep depressions'.		X	X
<b>Surface Resistance to Disturbance</b>	Categorises the soils capacity to resist disturbance based on the soils 'hardness' or 'brittleness'.	X	X	
<b>Slake Test</b>	Categorises the soils stability when exposed to water.	X	X	
<b>Texture</b>	Categorises the soils water infiltration capacity from 'very slow' to 'high'.		X	

During the first round of monitoring, the three LFA indices will be assigned scores of between 0 and 100 (based on the indicators listed in **Table 13**) representing the ecosystem function of the monitoring site. These scores will provide quantitative measures that can be used to compare rehabilitation and regeneration areas with local benchmark sites throughout the course of the monitoring program i.e. performance indicators.

The ongoing use of LFA will be result-based, with achievement of a self-sustaining stable landform no longer requiring further monitoring. A self-sustaining stable landform is deemed to have been achieved when a LFA score of 50 or more is recorded. Incremental improvement toward that target is anticipated in each successive monitoring season with achievement of a stable landform expected 10 years post landform establishment. Failure to achieve an increase of 5 % in the annual LFA scores represents a trigger for further investigation (**Section 10**).

### **6.3 Limitations for Meeting Completion Criteria in Easements**

WCPL's capacity to comply with the proposed completion criteria specified in the previous section are, in some circumstances, limited by conflicting constraints, namely the TransGrid Wollar to Wellington 330 kV electricity easement which was passing through portions of WCPL's mine rehabilitation areas.

This easement will be managed by TransGrid in a manner consistent with their management policy for the provision of uninterrupted power supply. Given this, the TransGrid Wollar to Wellington 330 kV electricity easement has been excised from the ECAs and regeneration areas so as not to limit the ability of WCPL to carry out the proposed management measures that relate to those domains in this Management Plan.

In addition, the portions of the residual Regeneration Areas that are located underneath existing powerlines will not be required to meet the management measures set out in this Management Plan.



## 7 Biodiversity Management Measures and Strategies

### 7.1 Management Measures for Management Domains

#### 7.1.1 Enhancement and Conservation Areas

Management measures to be implemented within the ECAs include enhancement strategies focussing on Poor to Moderate Resilient areas such as selective planting if required, weed and animal pest control, fence maintenance and bushfire management, as detailed in **Section 7.4**.

In addition to these general management measures, WCPL will implement a range of specific management measures to protect the ECAs, including:

- Conserve and manage the land in the ECAs in accordance with the MOP and Voluntary Conservation Agreement (VCA); and
- Exclude all stock grazing.

#### 7.1.2 Regeneration Areas

Management measures to be implemented within the residual Regeneration Areas to improve biodiversity values and develop areas resilience include:

- Promotion of natural regeneration and revegetation;
- Stock control;
- Selective active revegetation and habitat enhancement;
- Supplementary planting of native over-storey tubestock and/or direct drilling;
- Control of weeds; and
- Pest management.

#### 7.1.3 Rehabilitation Areas

##### *Existing Rehabilitation Areas*

Management measures to be implemented in the Rehabilitation Areas to improve biodiversity values include:

- Weed management;
- Pest management; and
- Supplementary planting of native over-storey tubestock and/or direct drilling.

In accordance with Schedule 3, Condition 36 of the Development Consent, WCPL will create Regent Honeyeater habitat within existing mine rehabilitation areas where rehabilitation previously had focussed on the establishment of a mix of open woodland and pasture areas for grazing, as required by the former PA05-0021.

In these areas, WCPL will commence control of non-native species and re-seeding to a combination of suitable native plant species as a rehabilitation priority (**Appendix 6**). Local benchmark sites (as opposed to regional benchmark data) will be used to satisfy Schedule 3, Condition 37 of the Development Consent.

These pasture areas are already at final landform levels, are typically gently sloping, have been topsoiled and are still accessible to mobile equipment or farm machinery without new clearing. Subject to climatic conditions, this may offer an opportunity to prioritise the staged trial establishment of Regent

Honeyeater habitat associated with the Mine. In parallel, WCPL will conduct re-evaluation of the previous woodland revegetation areas against contemporary BVT classifications. The results of the re-evaluation will assist WCPL in identifying any remedial actions that would need to be implemented in order to establish Regent Honeyeater habitat within these areas.

With this in mind, WCPL has engaged an ecological consultancy company to assist in monitoring of a fire management (prescribed burn) trial on a section of WCPL's existing wooded rehabilitation areas, in order to investigate the effectiveness of fire as a tool for reducing exotic pasture cover and assisting with regeneration of native ground cover. The program will also involve spraying for weeds before spreading seeds by hand.

The monitoring program aims to:

- Investigate the effectiveness of prescribed burning as a tool to reduce exotic pasture cover.
- Assess the response of canopy species (eucalypts) in varying-aged rehabilitation to prescribed burning.
- Assess the impact of prescribed burning on flora species composition.
- Investigate the potential use of fire to create conditions suitable for native species germination and establishment.

#### ***Future Rehabilitation Areas***

Future rehabilitation areas will be undertaken in accordance with Schedule 3, Conditions 36 and 37 of the Development Consent (**Section 4.4**), aligning to the Mining Operations Plan (MOP) and Rehabilitation Plan. Future rehabilitation areas will be prepared and seeded with cover crops and species specific to BVTs listed in **Table 12**.

#### **7.1.4 Residual Areas**

Aside from ongoing weed and pest management and maintenance of fencing, no active management is proposed in residual areas.

### **7.2 Interim, Performance and Completion Management Strategy**

WCPL has developed an overarching biodiversity management strategy for the final mine rehabilitation, with clear objectives and management actions to measure success towards mine closure (interim, performance and completion term). This strategy is summarised in **Table 14**.

**Table 14 Short, Medium and Long Term Strategy**

Objectives	Management Action	Area	Interim Period <sup>8</sup>	Performance Period <sup>9</sup>	Completion Period <sup>10</sup>
<b>To increase overall NSR where required</b>	Supplementary seeding	Moderate Resilience	X	X	
		Poor to No Resilience	X	X	
		Rehabilitation <sup>11</sup>	X	X	
<b>To boost tree and shrub cover</b>	Supplementary tree and shrub planting	Moderate Resilience	X	X	
		Poor to No Resilience	X	X	
		Rehabilitation <sup>11</sup>	X	X	
<b>Establish basal plant species richness evenly across the mine rehabilitation</b>	Direct drilling	Rehabilitation <sup>11</sup>	X		
<b>Minimise the risk of failure in seeding activity</b>	Soil amelioration (e.g. fertiliser and lime applications)	Rehabilitation <sup>11</sup>	X		
	Build soil carbon	Rehabilitation <sup>11</sup>	X	X	
<b>Minimise risk of failure in native plant establishment and <i>in-situ</i> recruitment</b>	Erosion management and mitigation	Poor to No Resilience	X	X	
		Rehabilitation <sup>11</sup>	X	X	
<b>To reduce overstorey canopy projection to near benchmark, prevent growth inhibition and increase fallen log length</b>	Stand thinning	Rehabilitation <sup>11</sup>	X	X	
<b>Minimise risk of failure in native plant establishment and <i>in-situ</i> recruitment</b>	Undertake routine weed management	Moderate Resilience		X	
		Poor to No Resilience	X	X	
		Rehabilitation <sup>11</sup>	X	X	
<b>Stabilise weed cover to comply</b>	Undertake targeted weed management	Good Resilience		X	X
		Moderate Resilience		X	X
		Poor to No Resilience		X	X
		Rehabilitation <sup>11</sup>		X	X
<b>To reduce the effect of herbivory on regeneration rehabilitation</b>	Feral animal control	Good Resilience		X	X
		Moderate Resilience		X	X
		Poor to No Resilience		X	X
		Rehabilitation <sup>11</sup>		X	X
<b>To maintain vegetation structure and project to local benchmark conditions and stimulate native plant species recruitment</b>	Controlled burn	Rehabilitation <sup>11</sup>			X

The overall objectives of the Biodiversity Offset Strategy have been developed to ensure WCPL progresses towards the Completion Criteria (and meets the Interim & Performance Criteria) established in **Section 6**.

<sup>8</sup> Interim Period – Rehabilitation Domains – 10 Years Prior to Landform Establishment Period, Resilience Areas 0-10 Years

<sup>9</sup> Performance Period – Rehabilitation Domains - 10 Years Post Landform Establishment, Resilience Areas 10-15 Years

<sup>10</sup> Completion Period – Rehabilitation Domains 10 Years Post Completion of Mining. Management Actions identified will continue until final mine closure and or rehabilitation domain relinquishment. Resilience Areas 15-20 Years

<sup>11</sup> Action undertaken in mine rehabilitation area to meet Interim and Performance Criteria Targets



Management actions adhere to core land management principles such as minimising disturbance and allowing the pace of regeneration to dictate the pace of work, integrated pest management and 'maintain or improve' (that landscapes can achieve an improvement and/or maintenance in ecosystem function over time with sound management). These management actions are targeted to achieve the BioMetric Performance & Completion Criteria along with achieving LFA Scores (**Section 6**).

### 7.3 Three Year Management Schedule

WCPL has developed a detailed three-year management schedule to enable progression towards the Performance and Completion Criteria established for the sites BVT Rehabilitation domains. The three-year management schedule consolidates activities commenced prior to the WEP Approval and activities commenced upon WEP Approval (**Appendix 6**).

The progress of the management actions described in the three-year management schedule will be informed by annual and opportunistic inspections (**Section 7.9**) which will assist in identifying key areas which require additional management.

#### 7.3.1 Activities Commenced Prior to the Wilpinjong Extension Project Approval

The activities commenced prior to the WEP approval applicable to Management Domains as well as targeted actions within selected Management Areas included;

- Direct seeding;
- Soil improvement (e.g. organic matter, nutrients, pH);
- Tubestock planting;
- Broadacre weed management;
- Pest management; and
- Biodiversity monitoring.

#### 7.3.2 Activities Commenced Post Wilpinjong Extension Project Approval

A three-year management schedule pertaining to the activities that are to commence post WEP approval has been prepared by WCPL and is provided in **Appendix 6**. This management schedule focuses on the key measures that would be implemented from 2019-2021, including:

- Management of Biodiversity Offsets 1-5 (**Section 5.1.1**);
- Early establishment of Regent Honeyeater habitat in available areas (**Section 7.6**);
- Rehabilitation of the Mine site to recognised habitat and ecosystem values (**Section 4.4**);
- Propagation of *Ozothamnus tessellatus* (**Section 7.4.7**); and
- Revegetation works along Cumbo and Wilpinjong Creeks (**Section 7.7**).

### 7.4 General Land Management Strategies

WCPL will implement a range of management actions throughout the various Management Domains and these are identified in **Appendix 6**. WCPL has identified those actions as being required and likely to be effective using risk management principles and with consideration to the practicality of implementing such actions. Given the proximity of the ECAs, and Regeneration areas to the Goulburn River National Park and Munghorn Gap Nature Reserve and the fact that local seed stock will be preferentially used in regeneration works, WCPL does not believe further consideration of management of disease and hygiene is required beyond the *Phytophthora cinnamomi* measures outlined in **Section**

**7.4.12.** Where specific issues of such nature arise, WCPL will seek technical ecological or biological advice on the most appropriate course of action.

#### **7.4.1 Cultural Heritage Management**

The management of cultural heritage items within the Mine area, ECAs, Regeneration and Rehabilitation Areas is undertaken in accordance with the WCPL Aboriginal Cultural Heritage Management Plan (ACHMP). The requirements of the ACHMP will be considered when implementing any ecological or rehabilitation actions that will require disturbance to the ground surface, or disturbance to other features of potential or known heritage significance.

In accordance with Condition 46 of the Development Consent, WCPL have carried out an investigation into the Aboriginal cultural heritage values in BOAs 1 – 5. This was conducted over 12 days from 19<sup>th</sup> November 2018 to 1<sup>st</sup> December 2018 by South East Archaeology (SEA) accompanied by representatives of the Registered Aboriginal Parties (RAPs). WCPL will manage cultural heritage items in the BOAs in accordance with the *National Parks and Wildlife Act, 1974*.

WCPL's Ground Disturbance Permit (GDP) process will be the primary tool used to identify potential cultural heritage requirements and detail appropriate management actions. The use of GDPs is described further in **Section 7.8**. WCPL will implement relevant Cultural Heritage Management actions throughout the various Management Domains and are identified in **Appendix 6**.

#### **7.4.2 Fencing, Gates and Signage**

Fencing is currently in place around the perimeter of the ECAs. Boundary fence integrity will be inspected opportunistically as well as annually and maintained during all management periods to exclude livestock and unauthorised human access.

New fencing erected within or on the boundary (including repairs to existing fence lines where required) of the ECAs will use post and two or three strand non-barbed (plain) wire only. If required boundary fences to these areas may use a barbed wire or electric fencing to protect the fence from neighbouring grazing cattle. The number of wire strands will be limited in order to reduce potential for native fauna entanglement. Suitable gates and signage will be erected at all access points to the ECAs. Signs will state that permission to access the area must be sought from the WCPL Environment and Community Manager (ECM).

Temporary fencing may be required around the perimeter of Revegetation Areas adjacent to active grazing paddocks (where cattle are used as a weed management tool) and it is anticipated that this will be in the form of electric fencing using tape or braid. In order to reduce the risk of injury to native fauna, existing fencing within the boundaries of the ECAs will be removed in areas where it is providing no benefit to revegetation outcomes.

WCPL will implement management actions relevant to fencing, gates and signage throughout the various Management Domains identified in **Appendix 6**.

#### **7.4.3 Access Tracks**

WCPL has undertaken a baseline audit of all access tracks (including creek crossings) in ECAs and Regeneration Areas to identify redundant access tracks to be rehabilitated (or allowed to naturally regenerate) and strategic access tracks to be retained and managed. Data will be collected and mapped on a figure.

Access tracks in these areas will be kept to a minimum to reduce secondary impacts such as edge effects, weed encroachment and erosion. Strategic tracks will be maintained to allow access for the implementation of management actions (including monitoring) and for bushfire control and asset protection. These tracks will be clearly defined to prevent inadvertent rerouting, inspected on an annual and opportunistic basis with maintenance implemented as required.

According to the NSW Rural Fire Service (RFS) (NSW RFS, 2006), tracks identified for emergency vehicle use (e.g. registered fire trails suitable for CAT 1 tankers) should:

- Be at least six metres wide, including strips of vegetation each side;
- Be not more than 10 degrees (if unsealed);
- Be clear of overhanging obstructions for at least four metres;
- Not have cross fall of more than 10 degrees;
- Have capacity for passing vehicles and have turning bays; and
- Ideally be trafficable under all weather conditions.

WCPL will implement management actions relevant to key access tracks throughout the various Management Domains as identified in **Appendix 6**.

#### **7.4.4 Waste Management**

Commencement of the removal of disused farm and associated buildings/structures within the BOA's, ECA's and Regeneration Areas has occurred, and will continue as part of WCPL's three year management schedule (**Appendix 6**).

Routine inspections of the BOA's, ECA's and Regeneration Areas will include monitoring of potential waste management issues, including illegal dumping of waste, and removal of waste if/when required. All waste removed from these areas will be managed in accordance with WCPL's Waste Management Plan.

#### **7.4.5 Erosion, Sedimentation and Soil Management**

In 2016, WCPL conducted an erosion and sedimentation assessment across several ECAs and Regeneration Areas to identify specific areas requiring remedial works as described in the three-year management schedule (**Appendix 6**). WCPL will continue to conduct opportunistic and annual inspections across these areas to identify areas requiring erosion and sedimentation management. All erosion and sediment control works will be carried out in accordance with WCPL's Erosion and Sediment Control Plan (ESCP).

WCPL will undertake targeted revegetation of the flats adjacent to Cumbo Creek and Wilpinjong Creek in some areas to provide wildlife corridors and assist in the prevention of erosion along the creek banks. As part of the three-year management schedule outlined in **Appendix 6**, WCPL will prepare a works program to detail the activities proposed to be conducted along Cumbo Creek and Wilpinjong Creek. The works proposed to be undertaken along Wilpinjong Creek are further described in **Section 7.7**.

#### **7.4.6 Grazing and Stock Management**

WCPL has currently excluded all domestic stock from the ECAs and Regeneration Areas. It is not practicable to remove grazing impacts of native fauna in these areas, however grazing from native animals generally has a much lower impact on native vegetation, and is not likely to substantially impede the revegetation/regeneration of these areas. In revegetation areas where grazing by native fauna is affecting the success of revegetation works, plantings may be protected from grazing by the use of tree guards (or similar) if deemed necessary.

WCPL will implement management actions relevant to grazing and stock management throughout the various Management Domains and are identified in **Appendix 6**.

#### **7.4.7 Seed Collection and Propagation**

WCPL has implemented a native seed collection and propagation program, to ensure that the genetic integrity, structure and composition of local vegetation types are maintained throughout the broader



landscape. Where available, the collection and propagation of locally sourced native seed will be carried out opportunistically by a suitably qualified, licensed provider, who is trained in plant identification, seed collection, data recording, seed storage techniques and propagation.

WCPL's seed collection provider will follow best practice principles, with the FloraBank guidelines (FloraBank, 2013) to be used to guide the seed collection process.

A lag of between six months to a year may be required depending on the timing of revegetation. This is to allow the supplier adequate time to collect and propagate from local seed sources. Further details on the seed collection and propagation program are provided in WCPL's MOP.

The seed collection program will take into account the seasonality of seed availability and the specific target seed lists required to establish the various Biometric Vegetation Types (BVTs) as specified in **Section 6**.

WCPL will implement management actions relevant to seed collection and propagation management throughout the various Management Domains and are identified in WCPL's three-year management schedule (**Appendix 6**).

#### ***Ozothamnus tessellatus***

As described in **Section 3.1.3**, three populations of *Ozothamnus tessellatus* (equating to a direct count of 1,090 plants) were found within the Project open cut extension and infrastructure areas during the Hunter Eco (2015) surveys of the WEP.

Seeds of the threatened *Ozothamnus tessellatus* will be collected and propagated for use in the rehabilitation and Regeneration Areas. Seeds from *Ozothamnus tessellatus* will be collected during November (or other relevant times that seed is available) from the known populations within the open cut extension and infrastructure areas and throughout the BOAs (where the species is also known to occur).

Propagation trials will be undertaken by WCPL in germination trays with various soils and treatments. As this species produces thistle-type seeds, tube stock is anticipated to be the most appropriate method for propagation. WCPL may contact suitable third-party nursery providers to assist with the propagation trials.

The three-year management targets for the propagation of *Ozothamnus tessellatus* is detailed in **Appendix 6**.

#### **7.4.8 Habitat Augmentation**

Habitat augmentation involves the establishment of habitat structures within selected Management Domains. This includes the relocation of surplus trees removed from the Mine footprint that are not required for mine site rehabilitation and re-establishment as log habitat or the establishment of nest boxes. Procedures, monitoring methodology, performance criteria and recording requirements will be developed for the re-establishment of logs and establishment of nest boxes and stags within selected Management Domains prior to their installation. The requirement for installation of such features will be determined by appropriately trained and licensed ecologists and will be provided as recommendations through the biodiversity monitoring program (**Section 9**).

WCPL will implement management actions relevant to habitat augmentation throughout selected Management Domains as identified in **Appendix 6**.

#### ***Fallen logs***

Fallen logs, felled trees and other habitat features (e.g. rocks, stag trees) will be used to improve habitat values in rehabilitation areas. Materials (e.g. stags) will be salvaged during the clearing stage of development and used in the appropriate management domains. Logs will be sourced from the revegetation / rehabilitation works, once they have been successfully established. The main harvesting

period is anticipated to be in the period 10-15 years where tree thinning will be undertaken to yield fallen logs with a minimum diameter of 10 cm. Shrub species such as *Acacia linearifolia* may also be used for this purpose, especially given their capacity to generate significant amounts of stem biomass of greater than 10 cm diameter in short timeframes.

WCPL have set aside a log stockpile area within the Mine for the stockpiling of felled timber from WCPL land and externally sourced logs for later use in rehabilitation areas.

### **Nest boxes**

Nest boxes suitable for woodland birds and microchiropteran bats will be installed in suitable trees located in the regeneration/rehabilitation areas where sufficient vegetation structure has been established to accommodate these habitat features. Nest boxes would be durable and all boxes would be monitored annually and maintained as required. The rate at which these nest boxes will be installed will be determined through consultation with WCPL's ecologists. Consideration of benchmark conditions for hollow bearing trees will also be considered by an appropriately qualified ecologist during the first round of ecological monitoring.

### **Mistletoe establishment**

The direct introduction of mistletoe species to the management area is not considered feasible within the framework of this Management Plan. *Acacia linearifolia* provides high value habitat for Grey Mistletoe (*Amyema quandang*). Locally, the combination of these two species in a regenerating shrubland is known to provide breeding habitat for the Painted Honeyeater.

Other plant species known to host mistletoe include:

- *Eucalyptus melliodora*;
- *Eucalyptus moluccana*;
- *Acacia ixiophylla*;
- *Eucalyptus crebra*; and
- *Eucalyptus albens*.

These species will be established within the rehabilitation areas in the appropriate target BVTs identified in Condition 36 of the Development Consent. As detailed in **Section 7.4.7**, the detailed species list (for seed collection and propagation) will be determined once the performance and completion criteria are resolved for the establishment of BVTs and Regent Honeyeater habitat.

## **7.4.9 Revegetation Techniques**

### **Assisted Natural Regeneration**

Natural regeneration is reliant upon seedlings germinating from seed naturally distributed from existing remnant vegetation. This approach will be utilised in areas where there is potential for increased density and extension of existing remnant vegetation or where after a short time period it is obvious that there is a viable seed bank of native species present within the topsoil of cleared areas. Some areas of the Regeneration Areas are currently exhibiting evidence of natural regeneration (emerging seedlings from parent trees) that requires protection from stock, feral animal control and weed management in order for existing seedlings to reach maturity.

Depending on site conditions, the pace of natural regeneration and germination rates may be improved by preparation of a receptive seed bed through intensive weed management, scarification and/or ripping of the surface around parent trees; however ripping may not be appropriate in areas of high weed infestation due to the potential for weed species to colonise disturbed ground.

As part of the biodiversity monitoring program (**Section 9**), proposed natural regeneration sites will be monitored for the presence of naturally occurring seedlings. Where seedlings are not evident and are considered unlikely to occur, planting of tubestock or direct seeding may be implemented. In most areas, weed management and the exclusion of stock is required in order to facilitate natural regeneration of the remnant bushland.

**Direct Seeding**

Direct seeding combines a two-step operation involving residue management (e.g. ‘harvesting’) and seeding. It is based on the ‘no till’ farming concept; a low disturbance method designed to enhance revegetation success through the conservation of soil structure and moisture.

This methodology will be employed within the ECA and Regeneration areas to minimise ground disturbance. In the management area it is assumed that the direct seeding will be applied to areas already saturated with grass cover (e.g. Redleg Grass [*Bothriochloa macra*], Wire Grass [*Aristida* sp.], Barbed-wire Grass [*Cymbopogon refractus*] and Kangaroo Grass [*Themeda triandra*]), meaning that a supplementary plant species mix is all that is required to improve species richness. The proposed management cycle is described in **Table 15** and detailed in **Appendix 6**.

**Table 15 Revegetation (Direct seeding) Management Cycle**

Actions	Autumn	Spring
<b>Interim</b>	Slash grass cover after grass seed set: 1. For collection and use as an organic matter/seed ameliorant in rehabilitation; and or 2. Reduce competition with spring direct seeding.  Tillage for weed problems and management of high moisture and heavy clay soil conditions	
<b>Seeding</b>		Seed with selected supplementary mix using minimal soil disturbance techniques (i.e. no tilling)

Depending on the scale of the areas involved, direct seeding will involve either hand broadcasting or machinery application of a local native seed mix directly on to prepared ground. Preparation of the seed bed will be the key to the success of this method.

Prior to ground preparation works commencing, a review by WCPL Environmental Representative to consider if weed control/management is required (**Section 7.4.10**).

Ground preparation will involve contour ripping and/or scarification, with seeding to occur immediately following ground preparation works. In the event rainfall occurs prior to seeding, the substrate may need to be re-prepared to ensure that the surface is rough so that seed is not washed away in subsequently rainfall events.

A similar process is proposed for rehabilitation areas although a greater degree of soil disturbance and management is required to manage growth medium suitability for native species (e.g. ripping, liming etc). The proposed management cycle is described in **Table 16**.



**Table 16 Rehabilitation Management Cycle**

Actions	Autumn	Spring
<b>Interim</b>	Conduct a broadacre spray program to control exotic pastures and undesirable species within BVT rehabilitation Domains.	Incorporate organic matter ameliorant such as 'green manures', fertilisers and lime.  Conduct a secondary broadacre weed control program (as necessary) to suppress seed bank and any secondary germination of undesirable flora species within the specified BVT Rehabilitation Domain
<b>Seeding</b>	Seed using low cover crop seeding ratio of sterile C3 plant species such as Oats and Millet to boost organic matter production.	Seed using low ratio cover crop seeding ratio of sterile C3 plant species such as Oats and Millet to boost organic matter production, oversowing with a BVT seed mix specific to Performance and Completion Criteria

One of the easiest ways of enhancing biodiversity is through the improvement of native plant species richness (NSR). Improved NSR should, over the medium to long term, result in the establishment of various habitat features (e.g. fallen logs and tree hollows) and structure (e.g. canopy % cover) similar to natural conditions.

### ***Tubestock Planting***

Tubestock planting will be utilised where it is considered natural regeneration of native species is unlikely to occur in a timely manner and to establish a staging in plant ages. Species composition and stems per hectare rates for tubestock planting will be reflective of the adjacent communities, pre-clearing vegetation community types and Performance and Completion Criteria Rehabilitation BVTs with seedlings propagated from local provenance seed stock where possible (**Section 7.4.7**).

Where appropriate, ripping will be undertaken in revegetation areas prior to planting. Areas close to weed infestations will be assessed to determine if ripping is likely to result in further weed infestation. In such cases, further weed management will be undertaken prior to ripping taking place. The spacing of rip lines will be determined by the required planting density of the tube stock.

Ripping with a dozer (or similar piece of equipment) and single tine will be the preferred method, with planting to be conducted within the ripped line shortly after. This method minimises the proportion of the site that is disturbed and exposed to further weed infestation. Preferably, ripping will be undertaken prior to any forecasted rainfall to build up the moisture prior to planting.

In sloping areas of the site, rip lines will be designed to follow the contours of the site as ripping down slope is likely to form erosion channels, resulting in topsoil loss. In order to achieve maximum effect when ripping, where possible, all ripping will be conducted whilst the soil is moist but not saturated. This will ensure that the soil and sub-soil shatters, providing cracks in which seedling roots can penetrate. Ripping saturated soil is likely to have a slicing effect that will create channels in the soil profile and provide limited fracturing into which the roots of developing seedlings can penetrate. Operating a dozer or similar piece of heavy equipment on wet areas will be avoided as this will also result in excessive soil compaction.

Tubestock will be propagated at a nursery using site harvested and local seed where possible. 'Hiko' cells (or similar) will be used as this method results in good root structure, and allows for large numbers of seedlings to be planted in short time periods. Alternatively 50 mm forestry tubes may be used in some circumstances. Forestry tubes provide the advantage of a more mature seedling than 'Hiko' cells, and this will be beneficial when planting within areas where weed density is a concern. 'Hiko' cells will be utilised within areas where weed density is currently low.

The use of long-stemmed tubestock (seedlings greater than one metre in height prior to planting out) may be trialled in areas of high weed density (and areas that are currently dominated by sifton bush) as this will allow seedlings to develop a root network that is able to access nutrients below weed species. Long-stem planting will also protect the root structure of seedlings from weather extremes such as high temperatures and frosts.

The need for watering and maintenance regimes will be considered during annual and opportunistic inspections, dependant on adverse weather conditions, performance and establishment of vegetation. Maintenance tasks may include; targeted weed control surrounding tubestock, replacement of weed control jute mats and stakes/guards for immature tubestock, targeted irrigation and watering during extended dry period after planting.

#### **7.4.10 Weed Management**

WCPL accepts that effective weed management is critical to the ongoing sustainability of the various Management Domains. WCPL's weed management program will involve regular inspections throughout the year of the BOAs (until such time that they are transferred to NPWS), ECAs, Rehabilitation and Regeneration Areas.

WCPL's weed management program will also consider exotic pasture species if they are identified as a potential issue, in regards to achieving WCPL's Performance and Completion Criteria (**Section 6**) and take into account local and recent weather conditions and soil moisture.

The GIS database will be updated where significant weed outbreaks are identified, and a suitable plan of management will be developed and implemented. In addition to this, an annual routine weed management program will be implemented whereby herbaceous weed species are treated to prevent further spread. Treatment of all weeds will be undertaken by suitably qualified and experienced personnel abiding to chemical labels for application.

WCPL has a legal responsibility to control Noxious Weeds under the *Noxious Weeds Act 1993*. Any noxious weeds identified will be prioritised for treatment during the next round of weed treatment. WCPL's weed management program is summarised in **Table 17**.

Other legislation and government policies that may considered during the preparation of weed management activities include:

- *Biosecurity – Weed Management Policy* (Policy Number: IND-O-214);
- *Biosecurity Act 2015*;
- *Biosecurity Regulation 2017*; and
- *Local Land Services Act 2013*.

**Table 17 Weed Management Program**

Target Weed Species	Program
<b>Herbaceous exotic perennials and pasture species such as African Lovegrass, Rhodes Grass and thistles</b>	Annual program of visitations with operators sweeping through treatment areas with spray packs of a knock-down herbicide (e.g. glyphosate). The chosen herbicide will be mixed with water at the rate specified on the label, a Safety Data Sheet (SDS) will be available on site at all times and operators will be at least Chemcert-qualified and ideally a trained bush regenerator. This last requirement is to ensure accurate identification of weed species on site.
<b>Blackberry and Spiny Rush</b>	Annual program of treatments with operators sweeping through domains with spray packs of a herbicide suitable for treatment of (e.g. metsulfuron-methyl and/or glyphosate). The chosen herbicide will be mixed with water at the rate specified on the label, an SDS will be available on site at all times and operators will be at least Chemcert-qualified and ideally a trained bush regenerator. This last requirement is to ensure accurate identification of weed species on site.
<b>Herbaceous weeds</b>	<p>Treatment of herbaceous weeds will be undertaken in accordance with the 3 Year Management Schedule. This will allow herbaceous weeds within the treatment areas to be targeted without impacting on native pasture grasses and native pasture grasses to flower and seed during summer and early autumn. While it is anticipated that this initial, double season treatment will be sufficient to enable native pasture grasses to gain a competitive advantage monitoring works will be required to confirm success or otherwise. Additional prescriptions may be required in unsuccessful circumstance.</p> <p>A calibrated boom spraying method will be utilised where possible and a reel-hose utilised where access is more difficult. The chosen herbicide (e.g. a phenoxy herbicide) will be mixed with water at the rate specified on the label, an SDS will be available on-site at all times and operators will be at least Chemcert-qualified and ideally a trained bush regenerator. This last requirement is to ensure accurate identification of weed species on site. Calibration of a boom sprayer will be carried out by an experienced operator to ensure that the dosage does not result in overspray.</p>

#### 7.4.11 Vertebrate Pest Management

Feral fauna (including pigs and rabbits) and pest species (including kangaroos) recorded during recent surveys are likely to directly affect the success of revegetation/regeneration works. Feral goats, deer and foxes were also identified. A number of introduced herbivores have been recorded within the Management Domains and are likely to be competing with native species and causing considerable damage to vegetation. Feral and pest herbivores have the potential to significantly impact the revegetation and regeneration of native vegetation, particularly when at a young age. Fencing of the revegetation/ regeneration areas will assist in excluding some larger feral species, however it will not exclude all feral species from these areas. Emphasis will therefore be placed on the continued implementation of management actions for feral and pest fauna species.

Control of the feral fauna populations is considered essential to the success of any revegetation/ regeneration works as these species have the potential to damage establishing vegetation through grazing and/or trampling.

WCPL have implemented targeted management programs to control feral pigs and rabbits in close consultation with the Local Land Services (LLS). Where deemed appropriate, baiting programs will be supplemented by open-range shooting and ripping of rabbit warrens with a bulldozer or similar piece of equipment where suitable access can be achieved whilst avoiding impacts to native vegetation. Feral predators such as dogs, cats, foxes will also be targeted by 1080 poisoning, trapping and shooting. Annual fauna monitoring will be conducted by appropriately trained and experienced personnel in order to determine if feral animal controls are adequate. Where deemed inadequate, WCPL will consult with LLS regarding a specific plan of action for the species of concern.

#### 7.4.12 Management of *Phytophthora cinnamomi*

*Phytophthora cinnamomi* (phytophthora root rot) is an introduced plant pathogen (disease causing organism) that can cause disease and plant death in native vegetation. The disease caused by *Phytophthora cinnamomi* is listed as a key threatening process under the NSW TSC Act and the EPBC Act.

*Phytophthora cinnamomi* is increasingly likely to occur in areas of greater than 600 mm annual rainfall. As detailed WCPL (2015), the closest weather station to the Mine receives less than 600 mm average annual rainfall and, although other sites in the region record over 600 mm, they only record up to approximately 650 mm. Furthermore the Mine lies outside the bounds of the known distribution of the pathogen (O’Gara et al 2005).

O’Gara et al (2005) states:

*Anecdotal evidence suggests that sites that receive less than 600 mm average annual rainfall are not vulnerable to the threat of P. cinnamomi. Beyond that, and because of the apparently cryptic nature of the disease in NSW & ACT, a precautionary approach should be adopted and the pathogen assumed to be absent unless it can be proven to be present (McDougall and Summerell, 2003).*

During comprehensive vegetation surveys for Modification 5 (2013) and the WEP (2015), as well as across all Peabody-owned land in the local area (2016), no evidence of *Phytophthora cinnamomi* induced dieback was encountered (C. Driscoll pers. obs.). Given the local annual rainfall, it is doubtful that the pathogen would become established even if it were inadvertently introduced. However, the possibility of a localised infection should not be discounted. For this reason, monitoring of areas with unexplained dieback will be included in field monitoring requirements with observed dieback included in the Trigger Action Response Plans (**Section 10.1**).

#### 7.4.13 Bushfire Management

A Bushfire Management Plan has also been developed in consultation with the NSW RFS to reduce the risk of bushfire within WCPL landholdings, including the identification of assets, assessment of fire risk and identification of management strategies to reduce the risk of fire to people and property (Eco Logical, 2013).

Operationally, the objectives of the Bushfire Management Plan are to:

- Reduce fire ignition potential; and
- Reduce the risk of fire spreading within and beyond WCPL’s landholdings.

From a conservation perspective, the objectives of the Bushfire Management Plan are to:

- Reduce the risk to flora and fauna communities within WCPL’s landholding from inappropriate fire regimes and unplanned fire events; and
- Utilise fire as a management tool to maintain and enhance native ecosystems, where applicable.

The Bushfire Management Plan contains:

- A Bushfire Hazard Assessment – to assess terrain, vegetation and fuel loading and potential fire intensity;
- A Bushfire Risk Assessment – to assess fire risks (i.e. the chance of a fire igniting, spreading and causing damage to assets) and assets at risk of fire;
- Management Approaches for the three identified and mapped bushfire management zones (Asset Protection Zone, Strategic Fire Advantage Zone and Land Management Zone);



- Details regarding tasks for bushfire management across WCPL landholdings; and
- Information to assist in the preparation of prescribed burn programs (if required in consultation with the RFS) for bushfire management zones.

## 7.5 Eastern Bentwing-Bat Management Strategies

Vibration from mine-related blasting has the potential to indirectly impact the Eastern Bentwing-bat in a historical mine adit which is located more than 150 m west of Pit 8. The current stability of the adit appears to be adversely affected by a large tree root which is breaking through the adit roof and causing rockfall around the entrance. To mitigate the potential for future collapse of the entrance, the following works have been undertaken in 2019:

- The rock debris pile at the entrance of the adit removed; and
- A pipe culvert was inserted in front of the adit with a diameter of 900mm suitable to allow bats free access in 2019 (**Plate 1**).

Notes: The pipe was inserted into the opening of the adit to support the unstable section and extends beyond any rock fall potential (and to allow water to drain away). The area around the pipe was backfilled to minimise the potential for rockfall to collapse the pipe.

WCPL have implemented a monitoring program to assess the impacts on the Eastern Bentwing-bat which will include collecting more quantitative data in relation to bat usage of the adit site over the three seasons (e.g. Summer, Winter and Spring) and will be undertaken as follows:

- Bat counts will be undertaken at the start of each survey to assess the total number of bats roosting within the workings. An Anabat detector will also be utilised to assess activity of the target species throughout the night.
- Bats re-entering the roost will be captured via harp trap (or similar equipment) to assess the species composition as well as sexual composition and breeding status of residing bats.

Video analysis using thermal infra-red cameras or low backlighting of the entrance has commenced to determine the number and species of bat using the adit. Any additional methods proposed to be implemented by WCPL to estimate the number of bats using the adit would be determined in consultation with OEH.

- A monitoring report will be prepared (including recommended actions) on the results of each survey.

### Plate 1 Rock Debris Pile “Before: and Inserted Culvert “After” at the Entrance of the Mine Adit



This monitoring program will provide a basis for assessing the value of the adit for the residing microbat species. It will also allow a program to be developed for future monitoring of the bat populations within the adit and provide a basis for formulating actions to minimise disturbance from nearby mining operations (i.e. scheduling blasting in the vicinity of the adit).

In addition, WCPL will implement blast management practices which includes measures specific to maintaining blast and vibration below 80 mm/s at the adit in accordance with WCPL's Blast Management Plan.

Further to the above, artificial lighting sources may impede bats in a number of ways including disrupting insect prey resources and changing seasonal and nightly activity. It is possible that predation on bats may also increase under higher light levels (Fly By Night Bat Surveys Pty Ltd, 2017).

To minimise the potential lighting impacts on the Eastern Bentwing-bat residing in the adit, WCPL will (whilst ensuring that operational safety is not compromised) minimise light emissions from the Mine by select placement, configuration and direction of lighting so as to reduce off-site nuisance effects where practicable. Noting that the distance between the top of the pit and the adit entrance is approximately 150 m, the distance and natural shielding by a combination of terrain and vegetation will assist to minimise any potential lighting impacts. Where practical (and safe), WCPL will also prioritise the selective use of Light Emitting Diode (LED) based lighting plants in the Pit 8 area that produce zero UV output and are already operating onsite.

## 7.6 Regent Honeyeater Management Strategies

The Regent Honeyeater (*Anthochaera phrygia*) has only been recorded outside the Mine footprint but is assumed to have potential habitat that will be removed by the Mine. In addition to the Biodiversity Offset Strategy, WCPL will implement the following management measures of relevance to the Regent Honeyeater:

- Plant communities proposed to be established on the post-mine landform will provide habitat for the Regent Honeyeater in accordance with Condition 36 of the Development Consent (**Section 4.4**) and to specific vegetation communities as listed in **Table 12**;
- WCPL will prioritise the staged trial establishment of Regent Honeyeater habitat within the Rehabilitation Areas (**Section 7.1.3**);
- WCPL will contribute funds to OEH towards the Regent Honeyeater Recovery Plan captive breeding and release programs (**Section 4.5**);
- WCPL will implement vertebrate pest management within the management domains (**Section 7.4.11**);
- WCPL will implement a bushfire management program (**Section 7.4.13**);
- WCPL will avoid direct and indirect impacts to the Munghorn Gap Nature Reserve through detailed mine planning and delineation of areas to be cleared as part of the vegetation clearance protocol (**Section 7.8**).

## 7.7 Wilpinjong Creek Management Strategies

The banks of Wilpinjong Creek have been subject to erosion, grazing by cattle and invasion by weeds such as Blackberry (*Rubus fruticosus*) and Rush (*Juncus acutus*). Generally, the riparian trees are sparse and discontinuous. There are patches of Typha and Phragmites rushes, both water dependent species, within Wilpinjong Creek. Other than these species, the vegetation along these creeks has been substantially cleared.

Riparian vegetation will be established along Wilpinjong Creek in the residual Regeneration Areas and the ECAs through natural regeneration/selective planting. This will increase the quantity of riparian vegetation along Wilpinjong Creek and improve the condition of habitats available to aquatic biota. Approximately 10 km of the creek line along Wilpinjong Creek will be the subject of revegetation and enhancement works by WCPL over a period of approximately 10 years.

Appended to this BMP, is the Wilpinjong Creek Management Strategy (**Appendix 7**) which details a three-year program to address identified environmental degradation of the Wilpinjong Creek. Strategies include overstorey and groundcover tubestock planting, bank stabilisation through enhancement of vegetation and flow line velocity reduction.

## 7.8 Ground Disturbance Permits

Direct and indirect impacts to the Munghorn Gap Nature Reserve will be avoided by detailed mine planning and delineation of areas to be cleared as part of the vegetation clearance protocol (including GDP). In accordance with Schedule 3, Condition 40 of the Development Consent, all open cut pits will be set back at least 20 m from the boundary of the Munghorn Gap Nature Reserve. Noting that mine support infrastructure (required for site access and water management purposes) is allowable within the 20 m set back area.

A GDP is required to be completed prior to the commencement of new projects or activities requiring ground disturbance within the Mine site. Where required, a site-specific erosion and sediment control plan is required to be developed as part of this process. The GDP must be approved by the ECM (or delegate) prior to works commencing. Ground disturbing activities are not authorised to proceed without an approved GDP. Pre-clearance surveys will be undertaken as required, in accordance with WCPL's Pre Clearance Protocol.

In addition to the GDP, WCPL will, in accordance with Schedule 3, Condition 41 of the Development Consent:

- (a) *undertake a survey of the boundary of the Munghorn Gap Nature Reserve where it adjoins operational mining areas;*
- (b) *ensure that the boundary is clearly delineated in the field and in Geographic Information Systems (GIS); and*
- (c) *provide relevant Geographic Information System data to the Department and OEH.*

Regular inspections of clearance areas will be undertaken by respective project managers and WCPL's Environmental Representatives to ensure adequate controls are implemented and maintained during the disturbance activity. Inspection frequency will be determined based on the scale of the disturbance and with consideration to the environmental risks. Controls may need to be amended to accommodate changes in construction activities, disturbance areas, drainage paths and other conditions. Such changes are to be approved by the ECM (or delegate).

The occurrence of drilling within any of the Management Domains will be for the purpose of undertaking detailed assessment of geological and geotechnical conditions to ensure safe mining practices. All exploration activities will be undertaken in accordance with WCPL's Exploration Site Preparation Procedure and Exploration Site Rehabilitation Procedure. These procedures will be the subject of a review upon final acceptance of this Management Plan to ensure a consistent management approach.

## 7.9 Inspections

Annual and opportunistic inspections of BOAs, ECAs and Regeneration Areas will be undertaken by WCPL Environmental Representative in accordance with the three-year management schedule (**Section 7.3** and **Appendix 6**).

These inspections will identify potential fencing, access track, weed and pest management and maintenance requirements. Records of inspections will be maintained by the Environmental

Representative and actions will be assigned in the Mine's Compliance Management System and/or the Mine's Action Management System to relevant personnel as required.

The results of these inspections will be used to monitor the performance of the three-year management strategy (provided in **Appendix 6**). Inspections will identify whether additional management actions may be required or where additional management is not required as the performance is on track (i.e. they will identify the key areas where management should be focussed).

Annual and opportunistic inspections along with biodiversity monitoring will be undertaken for Rehabilitation Areas in accordance with the MOP.

## 8 Risk Assessment and Management

In June 2014 WCPL and Niche participated in a risk assessment workshop to identify key environmental and regulatory risks to the implementation of the previous version of this Management Plan. The risk assessment was undertaken in accordance with WCPL's Risk Management Plan.

WCPL have updated the risk assessment, incorporating the WEP in order to contemporise the key environmental risks associated with the Mine. WCPL plan to review the risk assessment in 2019 in consideration of resolving the performance and completion criteria in accordance with Condition 36 of the Development Consent (within 6 months of project commencement).

## 9 Biodiversity Monitoring Program

WCPL's Biodiversity Monitoring Program includes annual monitoring of flora and fauna, and a range of landscape function indicators. This monitoring program will be used to evaluate ecosystem function and performance and the success of specific management actions implemented across the various Management Domains.

Established reference sites which have been monitored historically to compare benchmark and local benchmark vegetation communities to the previous mine rehabilitation criteria and land use under the former PA05\_0021, have been removed due to their incompatibility with the approved Performance and Completion Criteria (**Section 6.1**) and the WEP's final mine rehabilitation and land use.

Local Benchmark sites specific to BVTs listed in **Table 12** are to be established in the local area (in consultation with OEH), predominately within close proximity to WCPL, by September 2020 to compare the performance and progression of mining rehabilitation to local benchmark status.

The strategic objective of the monitoring is to obtain assurance that WCPL's biodiversity management program is ensuring the Mine's rehabilitation is progressing towards its Completion Criteria and other management domains such as ECAs and Regeneration Areas developing in site resilience.

WCPL's monitoring program includes recognised methods to assess native vegetation and habitat complexity (BioMetric), landscape stability (LFA), and faunal diversity. Using both Biometric and LFA assessment methods will enable assessment of overall rehabilitation success in terms of sustainable ecosystems in addition to self-sustaining stable landforms.

Monitoring sites established within ECA and Regeneration Management Domains prior to the approval of SSD-6764 will continue to be monitored.

WCPL will also develop an annual works program based on the results of the annual monitoring which will be detailed in the Annual Review.

### 9.1 Vegetation Monitoring (BioMetric)

The BioMetric assessment method has been adopted for the purposes of measuring and comparing native vegetation and habitat complexity against the quantitative interim, performance and completion



criteria established in **Section 6**. The BioMetric methodology is a standardised, repeatable and recognised approach to biodiversity assessment in NSW.

WCPL propose to adopt the BioMetric assessment process and have undertaken a rapid assessment process to determine the most likely and suitable monitoring locations which will incorporate Local Benchmark sites upon approval from OEH. Monitoring locations have been selected based on their representativeness as either reference or treatment sites. Treatment sites, being those selected from the various Management Domains across the Mine. A number of these treatment sites will be located in the riparian zones of Wilpinjong and Cumbo Creeks.

### 9.1.1 Methodology

BioMetric plots, comprising a 20 m x 20 m flora plot nested within a larger 20 m x 50 m (1,000 m<sup>2</sup>) habitat complexity plot will be established at each monitoring site. Each end of the 50 m transect will be permanently identified for repeatability.

#### **Flora plot**

Flora plots (20 m x 20 m) will be used to systematically collect floristic data. NSR data, a full species list, and Braun-Blanquet 1-6 cover/abundance scores be recorded in each plot. The flora plot is to coincide with the origin of the central 50 m transect with measurements occurring along the 0-20 section and 10 m either side of the central transect. NSR data will be collected along the transect, in accordance with the methodology described in Gibbons *et al.* (2009).

#### **Habitat complexity plot**

Habitat complexity plots (1000 m<sup>2</sup>), consistent with those used to assess vegetation condition and habitat, will be used to sample all vegetation structure and habitat features including EC. Data will be collected for all site attributes, described in **Table 9**, in the habitat complexity plot, with the exception of NSR (which will be collected in the flora plots), in accordance with the methodology described in Gibbons *et al.* (2009).

## 9.2 Landscape Stability (LFA)

LFA will be adopted as the primary monitoring methodology to assess the landscape stability of regeneration and rehabilitation areas across the Mine. WCPL have undertaken a rapid assessment process to determine the most likely and suitable LFA monitoring locations (**Section 9.5**).

### 9.2.1 Methodology

Data relating to the eleven LFA SSCIs, described in **Table 13** will be collected along the 50m transect established within the BioMetric plots to ensure consistency and repeatability of monitoring data. LFA monitoring will be undertaken in accordance with the methodology described in Tongway and Hindley (2004).

#### **Fauna**

Fauna monitoring will be used to qualitatively validate BioMetric and LFA monitoring results (i.e. self-sustaining stable landforms and vegetation structure have been successfully recreated or reintroduced and are being inhabited or frequented by local fauna).

Terrestrial fauna surveys will be conducted to sample fauna species diversity and abundance in each Management Domain. Systematic surveys sites will monitor amphibians, reptiles, birds and mammals (including bats) at a selection of representative sites already established for BioMetric monitoring (**Section 9.5**).

Corresponding survey sites will also be established in areas of equivalent habitat type adjacent to the Management Domains to provide reference sites. Reference sites will provide comparative data so that the long-term progress of the Management Domains can be determined.

## 9.3 Fauna

### 9.3.1 Methodology

The monitoring methods detailed in the following subsections will also be selectively undertaken within BOAs 1 to 5 until such time that they are transferred to NPWS (e.g. Anabat monitoring). Monitoring will also be selectively undertaken within Rehabilitation Areas and local reference sites which may reside within existing management domains such as ECAs and Regeneration areas.

#### **Birds**

Each fauna monitoring site will be surveyed across three seasons (e.g. Summer, Winter and Spring) for the presence of bird species. Observers will spend 10 minutes recording all birds seen and heard within a 50 m radius (0.8 ha) of a central point, followed by a further 10 minutes searching the balance of a 2 ha plot. The total numbers of birds observed (heard and seen) will be recorded during the 20 minute sampling period. Birds observed outside of the formal survey time, or off the 2 ha sampling plot, will also be recorded as present however these observations will not be used in subsequent analyses.

#### **Ground fauna (amphibians, mammals and reptiles)**

WCPL will undertake monitoring for amphibians, mammals and reptiles across the management domains. Ground fauna monitoring will utilise a number of survey techniques in an attempt to capture various fauna species (such as amphibians, mammals and reptiles). Survey mechanisms will be selected to target potentially occurring species based on the presence of potential habitat and nearby records. WCPL proposes to only commence monitoring in the Rehabilitation Areas after 5 years from rehabilitation establishment.

#### **Bats**

Bat monitoring will be undertaken at selected BioMetric monitoring sites (**Section 9.5**) using Anabat Detectors. Monitors will be established at each site for one night to record any bat calls. Bat calls will be analysed by a suitably qualified and experienced ecologist.

In addition to the BioMetric monitoring sites, video monitoring at the entrance of the adit to record if bats leave the adit as a result of blasting will be conducted in accordance with WCPL's Blast Management Plan. The use of video recording will continue for such time as there is no evidence to suggest that blasting causes a measurable disruption to the bats using the adit as a roosting site.

Management measures for the Eastern Bentwing-bat are detailed in **Section 7.5**.

## 9.4 Monitoring of Unexplained Vegetation Dieback

WCPL will undertake monitoring of any areas of unexplained vegetation dieback within the ECAs, Rehabilitation Areas and Regeneration Areas as part of the annual monitoring of these areas (**Section 9**) to identify whether *Phytophthora cinnamomi* caused the dieback to occur.

The monitoring of unexplained dieback will focus on identifying the known signs of *Phytophthora cinnamomi* infection, including (DotE, 2014):

- Plants become visibly diseased;
- Signs of water-stress (roots are a primary site of infection and therefore uptake of water is one of the first functions affected);
- Crown decline symptoms;
- Leaf yellowing and death of primary leaf-bearing branches;
- Epicormic branches with smaller leaves; and

- Areas of necrosis, bark at the base of trees just above or below the soil.

Should the above symptoms be identified in areas of unexplained dieback, WCPL will consult with local experts to confirm whether *Phytophthora cinnamomi* is present. If *Phytophthora cinnamomi* is confirmed the actions outlined in **Section 10.1** will be implemented.

## **9.5 Biodiversity Monitoring Program Summary**

The following Biodiversity Monitoring Program has been revised in consideration to the recent approval of the Performance and Completion Criteria. Existing monitoring sites may be retained and continue based on suitability for comparison between monitoring site and Rehabilitation BVT Domains. Local Benchmark Reference Sites specific to Rehabilitation BVTs are to be established in local proximity to the mine in consultation with OEH by September 2020.

A summary of WCPL's current Biodiversity Monitoring Program is provided in **Table 18**. Monitoring locations are shown on **Figure 11**.

**Table 18 Biodiversity Monitoring Program**

Area	Site	Coordinates		Management Zone	Vegetation Class	Monitoring Method			
		Easting	Northing			BioMetric	LFA	Fauna	Bats
ECA-A	A_100	771861	6416276	Regeneration (poor resilience)	Western Slopes Grassy Woodland	X	X	X	
	A_102	772926	6417078	Regeneration (moderate resilience)		X		X	
	A_103*	773154	6417587	Native vegetation (good resilience)		X			
	A_104*	773695	6416293	Native vegetation (good resilience)		X		X	X
ECA-B	B_100*	770111	6420997	Native vegetation (good resilience)	Western Slopes Grassy Woodland	X		X	
	B_101	770542	6420592	Regeneration (moderate resilience)		X		X	X
	B_103*	771072	6420157	Native vegetation (good resilience)	Western Slopes Dry Sclerophyll Forest	X		X	
	B_105	773141	6420468	Regeneration (moderate resilience)		X		X	
	B_106	771571	6420001	Regeneration (no resilience)	Western Slopes Grassy Woodland	X	X		
ECA-C	C_100*	768682	6418083	Native vegetation (good resilience)	Western Slopes Dry Sclerophyll Forest	X		X	X
	C_101	768377	6416929	Regeneration (moderate resilience)		X		X	
	C_102*	768940	6417281	Native vegetation (good resilience)	Western Slopes Grassy Woodland	X		X	
Regeneration Area 2^	R2_101	772639	6418355	Regeneration (moderate resilience)	Western Slopes Grassy Woodland	X		X	
Regeneration Area 4^	R4_100	770347	6420268	Regeneration (no resilience)	Western Slopes Grassy Woodland	X	X	X	
Regeneration Area 5^	R5_100	769191	6421422	Regeneration (moderate resilience)	Western Slopes Grassy Woodland	X		X	
	R5_101	769500	6421595	Regeneration (moderate resilience)	Western Slopes Dry Sclerophyll Forest	X		X	



**Table 18 Biodiversity Monitoring Program (Continued)**

Area	Site	Coordinates		Management Zone	Vegetation Class	Monitoring Method			
		Easting	Northing			BioMetric	LFA	Fauna	Bats
<b>Regeneration Area 9<sup>^</sup></b>	R9_100	768975	6422067	Regeneration (moderate resilience)	Western Slopes Dry Sclerophyll Forest	X			
	R9_101	768828	6422230	Regeneration (poor resilience)	Western Slopes Grassy Woodland	X			
<b>Rehabilitation</b>	R5	770234	6419256	Rehabilitation – to be reclassified	To be classified	X	X		
	R6	769562	6419517	Rehabilitation	BVT824 – White Box Shrubby Woodland	X	X	X	
	R8	770231	6418596	Rehabilitation			X		
	R9	769118	6418973	Rehabilitation		X	X	X	
	R13	770872	6418901	Rehabilitation	BVT824 – White Box Shrubby Woodland		X		
<b>Biodiversity Offset Area</b>	BOA1_100	766963	6414300	Native vegetation (good resilience)	Western Slopes Dry Sclerophyll Forest			X	X
	BOA1_101	767441	6414516	Regeneration (moderate resilience)	Western Slopes Grassy Woodland			X	
	BOA2_100	769440	6413937	Native vegetation (good resilience)	Western Slopes Dry Sclerophyll Forest			X	X
	BOA2_101	769050	6413570	Native vegetation (good resilience)	Western Slopes Grassy Woodland			X	
	BOA3_100	764649	6421025	Native vegetation (good resilience)	Western Slopes Grassy Woodland			X	X
	BOA3_101	784714	6422246	Native vegetation (good resilience)	Western Slopes Grassy Woodland			X	
	BOA3_102	784258	6421909	Native vegetation (good resilience)	Dry Rainforest			X	
	BOA4_100	782475	6424100	Native vegetation (good resilience)	Western Slopes Grassy Woodland			X	
	BOA4_101	782527	6423888	Native vegetation (good resilience)	Western Slopes Dry Sclerophyll Forest			X	X

Area	Site	Coordinates		Management Zone	Vegetation Class	Monitoring Method			
		Easting	Northing			BioMetric	LFA	Fauna	Bats
	BOA5_100	784073	6417976	Native vegetation (good resilience)	Western Slopes Dry Sclerophyll Forest			X	X
	BOA5_101	783192	6419415	Native vegetation (good resilience)	Western Slopes Grassy Woodland			X	
	BOA5_102	784493	6419150	Native vegetation (good resilience)	Western Slopes Dry Sclerophyll Forest			X	
<b>Reference Site (Local Benchmark Sites)</b>				<b>To be established by September 2020 in consultation with OEH specific to Performance and Completion Criteria – BVTs (listed in Section 6)</b>					

^ It should be noted that the size of these Regeneration Areas has been significantly reduced with the approval of the Wilpinjong Extension Project.

## 9.6 Data Management and Review

Monitoring results will be collated after each monitoring round and compared against the Completion Criteria and Performance Targets in **Section 6**. If monitoring results show that targets are not being met, the TARPs in **Section 10** will be implemented.

All monitoring results are filed by the ECM and/or Environmental Representative within the document control system and maintained at the Mine for at least four years after the monitoring or event to which they relate took place. All records are to be kept in a legible form, or in a form that can readily be reduced to a legible form. These records will be produced to any authorised DPIE officer if requested.

## 10 Contingency Plans and Emergency Response

### 10.1 Trigger Action Response Plans

WCPL has developed a number of TARPs that will be implemented in the event that annual monitoring results show:

- The Rehabilitation Interim Performance Criteria (**Table 19**) for years 1-10 are not being met; or
- The Rehabilitation Performance and/or Completion Targets (**Table 20**) for native vegetation and habitat complexity are not being met; or
- Landscape stability (LFA) is not incrementally improving toward the Completion Criteria (**Table 21**) (LFA Score  $\geq$  50); or
- Identification of *Phytophthora cinnamomi* within the ECAs, Rehabilitation Areas and Regeneration Areas (**Table 22**).

Additional TARPs are included in the MOP for rehabilitation areas.

**Table 19 Interim Rehabilitation Performance Criteria (Years 1-10) TARP**

TARP	
<b>Trigger</b>	<ul style="list-style-type: none"> <li>• Score obtained during annual monitoring round is less than Interim Criteria.</li> </ul>
<b>Action</b>	<ul style="list-style-type: none"> <li>• Review that Rehabilitation Domain is in Interim Performance Criteria Phase (1-10 Years Post Landform Establishment)</li> <li>• Notify the WCPL ECM.</li> <li>• Check and validate the data to ensure correct/accurate.</li> <li>• Review site attribute scores to determine which attributes are contributing to the lower than expected score.</li> <li>• Review management actions undertaken during previous 12 months (applicable to 'Establishment and Interim Period') to determine if actions have contributed to the lower than expected score.</li> <li>• Review previous monitoring scores and climatic conditions to establish whether external factors could be contributing to the lower than expected score.</li> </ul>
<b>Response</b>	<p><b>Site value score &lt;7 (Interim Performance Criteria Target):</b></p> <ul style="list-style-type: none"> <li>• Treat surface as if in the 'establishment period' and 'interim period'. Use management actions to improve condition. Refer to LFA results to determine if there are other causal factors.</li> <li>• Increase management effort to address identified lagging site attribute score.</li> <li>• Expand monitoring program to include additional treatment and reference sites.</li> </ul> <p>Site value score declines from expected performance target range to a preceding range:</p> <ul style="list-style-type: none"> <li>• Analyse data for potential reasons for decline.</li> <li>• Develop remedial actions to address declining biodiversity values.</li> <li>• Review LFA monitoring to examine for potential casual factors or start LFA monitoring if landform instability is detected.</li> </ul>

TARP	
	<ul style="list-style-type: none"> <li>Expand monitoring program to include additional treatment and reference sites</li> </ul>
<b>Plan</b>	<ul style="list-style-type: none"> <li>Review and revise the Management Schedule, targeting the specific site attribute/s contributing to the lower score</li> <li>Report monitoring results and management actions in the Annual Review</li> </ul>

**Notes:** As required by Condition 2 of the EPBC Approval: If at the end of five (5) years after *landform establishment* the *Minister* determines that the rehabilitation to address Conditions 36 and 37 of Schedule 3 of the *New South Wales development consent* does not meet the applicable interim performance criteria detailed in the rehabilitation management plan, the person taking the action must prepare and submit additional rehabilitation management measures, for the *Minister's* approval, no later than six (6) months after the *Minister's* determination. Once approved, the approved additional rehabilitation management measures must be implemented.

**Table 20 Performance and Completion Criteria (Post 10 Years) TARP**

TARP	
<b>Trigger</b>	<ul style="list-style-type: none"> <li>Score obtained during annual monitoring round is less than Performance and Completion Criteria.</li> </ul>
<b>Action</b>	<ul style="list-style-type: none"> <li>Review that Rehabilitation Domain is either in Performance Phase (10 Years Post Landform Establishment) or Completion Phase (10 Years Post Completion of Mining)</li> <li>Notify the WCPL ECM.</li> <li>Check and validate the data to ensure correct/accurate.</li> <li>Review site attribute scores to determine which attributes are contributing to the lower than expected score.</li> <li>Review management actions undertaken during previous 12 months (applicable to relevant Management Period) to determine if actions have contributed to the lower than expected score.</li> <li>Review previous monitoring scores and climatic conditions to establish whether external factors could be contributing to the lower than expected score.</li> </ul>
<b>Response</b>	<p><b>Site Value Score 17&gt; (Completion Criteria Target 17):</b></p> <ul style="list-style-type: none"> <li>Maintain management regime specified for 'Completion Period'.</li> <li>Maintain monitoring for three years and terminate if no significant decline observed (exclude reference sites).</li> </ul> <p><b>Site value score 7-16 (Performance Criteria Target 7):</b></p> <ul style="list-style-type: none"> <li>Review monitoring data against management actions applicable to the 'Performance Period'. Increase management effort to address identified lagging site attribute score and to ensure Site Value Score is tracking towards Performance and/or Completion Criteria Target</li> <li>Maintain monitoring until first site value score &gt;16.</li> </ul> <p><b>Site value score &lt;7 (Interim Performance Criteria Target):</b></p> <ul style="list-style-type: none"> <li>Treat surface as if in the 'interim period'. Use management actions to improve condition. Refer to LFA results to determine if there are other causal factors.</li> <li>Increase management effort to address identified lagging site attribute score.</li> <li>Expand monitoring program to include additional treatment and reference sites.</li> </ul> <p>Site value score declines from expected performance target range to a preceding range:</p> <ul style="list-style-type: none"> <li>Analyse data for potential reasons for decline.</li> <li>Develop remedial actions to address declining biodiversity values.</li> <li>Review LFA monitoring to examine for potential casual factors or start LFA monitoring if landform instability is detected.</li> <li>Expand monitoring program to include additional treatment and reference sites</li> </ul>
<b>Plan</b>	<ul style="list-style-type: none"> <li>Review and revise the Management Schedule, targeting the specific site attribute/s contributing to the lower score</li> <li>Report monitoring results and management actions in the Annual Review</li> </ul>



**Table 21 Landscape Stability (LFA) TARP**

TARP	
<b>Trigger</b>	<ul style="list-style-type: none"> <li>• &lt;5% annual improvement or significant decline in LFA Score (from previous monitoring round).</li> </ul>
<b>Action</b>	<ul style="list-style-type: none"> <li>• Notify the WCPL ECM.</li> <li>• Check and validate the data to ensure correct/accurate.</li> <li>• Review individual SSCI and LFA Index results to determine which SSCI or index result is contributing to the lower than expected score.</li> <li>• Review management actions undertaken during previous 12 months (applicable to relevant Management Period) to determine if actions have contributed to the lower than expected score.</li> <li>• Review previous monitoring scores and climatic conditions to establish whether external factors could be contributing to the lower than expected score.</li> </ul>
<b>Response</b>	<ul style="list-style-type: none"> <li>• Develop remedial actions to address stagnant or declining landscape stability, if stagnant or declining score not caused by external factors.</li> <li>• Maintain monitoring of affected site until first LFA score <math>\geq</math> 50 (i.e. stable landform).</li> <li>• Review monitoring program and consider expanding to include additional treatment and reference sites.</li> </ul>
<b>Plan</b>	<ul style="list-style-type: none"> <li>• Review and revise the Management Schedule, targeting the specific SSCI and LFA indices contributing to the lower score.</li> <li>• Report monitoring results and management actions in the Annual Review.</li> </ul>

**Table 22 *Phytophthora cinnamomi* TARP**

TARP	
<b>Trigger</b>	<ul style="list-style-type: none"> <li>• Identification of <i>Phytophthora cinnamomi</i> within the ECAs, Rehabilitation Areas and Regeneration Areas.</li> </ul>
<b>Action</b>	<ul style="list-style-type: none"> <li>• Notify the WCPL ECM.</li> <li>• Check and confirm the identification of <i>Pytophthora cinanmomi</i> is correct/accurate.</li> <li>• Review management actions undertaken during previous 12 months to determine if actions have contributed to the presence of <i>Pytophthora cinanmomi</i>.</li> <li>• Review previous climatic conditions to establish whether external factors could be contributing to the presence of <i>Pytophthora cinanmomi</i>.</li> <li>• Treat the infected area in an attempt to remove <i>Pytophthora cinanmomi</i>. This could be done through the use of phosphonic acids and selected fumigants as described in DotE (2014).</li> </ul>
<b>Response</b>	<ul style="list-style-type: none"> <li>• Develop remedial actions to control the spread of <i>Pytophthora cinanmomi</i>.</li> <li>• Develop a program to monitor the occurrence of <i>Pytophthora cinanmomi</i> within the ECAs, Rehabilitation Areas and Regeneration Areas.</li> </ul>
<b>Plan</b>	<ul style="list-style-type: none"> <li>• Report monitoring results and management actions in the Annual Review.</li> </ul>

## 10.2 Management and Incidents and Non-compliances

Environmental incidents at the Mine are managed in accordance with WCPL's Incident Management Procedure and the Pollution Incident Response Management Plan (PIRMP). In the event of an environmental incident, the cause of the incident is identified and the incident recorded in accordance with the Incident Management Procedure. Reporting will be consistent with all legislative and corporate requirements (**Section 13.1**).

Incidents are reported to the relevant supervisor and entered into the Mine's Environment, Health and Safety Management system which captures the incident electronically. The relevant Environmental Representative will conduct an investigation into each environmental incident, which will include reporting requirements and recommendations for corrective or preventative action. All actions arising from the investigation are to be signed off by the nominated management representative within the timeframe specified.

If a non-compliance of any approval condition is identified, WCPL will investigate the non-compliance and implement corrective actions as required. Reporting of non-compliances will be undertaken in accordance with the Development Consent (**Section 13.1**).

A review of the effectiveness of the corrective or preventative action will be undertaken within one month of the occurrence of the incident and the relevant procedures are to be updated as required.

Any changes to procedures as a result of these reviews are documented in accordance with WCPL's Change Management Procedure and communicated to all personnel.

## 11 Training and Awareness

Training forms an integral part of environmental management at WCPL. All personnel and contractors at the Mine undergo General Induction Training before being allowed to commence work at the Mine. This includes specific training in flora and fauna risks, the location of BOAs, ECAs and Regeneration Areas, land clearing procedures (including GDPs), cultural heritage and rehabilitation. Competency assessments are completed as part of this training.

Relevant employees and identified contractors also undergo specific training undertaken as tool-box talks. This type of training is provided on an as-needed basis, for example, when introducing a new procedure such as the GDP process, or following identification of a new environmental risk, relevant changes in legislation or a change in operations. The WCPL Environmental Representative in consultation with the ECM undertakes the identification of environmental training needs of personnel and the delivery method, including source material as appropriate.

## 12 Complaints Response Protocol

WCPL has developed a Complaint Response Protocol to reply to community concerns. WCPL operates a Community hotline (**1300 606 625**) for the purpose of receiving complaints from members of the public in relation to mining activities at the Mine. The hotline number is advertised on the WCPL website.

Response to a complaint will include:

1. Accurately recording all relevant details regarding the complaint in a Complaints Register, including:
  - The date and time of the complaint;
  - The method by which the complaint was made;
  - Any personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect;
  - The nature of the complaint;
  - The action taken by the licensee in relation to the complaint, including any follow-up contact with the complainant; and
  - If no action was taken by the licensee, the reasons why no action was taken.

2. Undertaking investigations into the likely cause of the complaint using relevant information;
3. Assessing and implementing additional control measures, if required; and
4. Monitoring and assessing the effectiveness of the additional controls.

Records of all complaints will be kept for at least four years after the complaint was made. Records will be produced to any authorised officer of the DPIE and Environmental Protection Authority (EPA) who asks to see them.

The Complaints Register will be uploaded to the WCPL website and updated monthly.

## 13 Reporting

The following external reporting will be undertaken by WCPL in accordance with the conditions of the Development Consent, Environmental Protection Licence (EPL) and MLs:

- Incident and Non-Compliance reporting;
- Annual Review;
- Independent Environmental Audit; and
- Website updates.

A copy of this Management Plan will be made available to on WCPL's website.

### 13.1 Incident and Non-compliance Reporting

WCPL will immediately notify the Secretary and any other relevant agencies of any incident that has caused, or threatens to cause, material harm to the environment, in accordance with the Development Consent and EPL 12425, as detailed within the Pollution Incident Response Management Plan. All other incidents and non-compliances with the Development Consent will be reported to DPIE and EPA and any other relevant agencies as soon as practicable.

Within seven days of the date of an incident or non-compliance, WCPL will provide a detailed report to the DPIE and EPA that:

1. describes the date, time, and nature of the non-compliance/incident;
2. identifies the cause (or likely cause) of the non-compliance/incident;
3. describes what action has been taken to date; and
4. describes the proposed measures to address the non-compliance/ incident.

### 13.2 Annual Review

At the end of March each year, WCPL will review the environmental performance of the Mine and submit an Annual Review report to the DPIE. This report will:

- a) describe the development (including any rehabilitation) that was carried out in the past year, and the development that is proposed to be carried out over the next year;
- b) include a comprehensive review of the monitoring results and complaints records of the project over the past year, which includes a comparison of these results against the:
  - relevant statutory requirements, limits or performance measures/criteria;
  - monitoring results of previous years; and
  - relevant predictions in the EA;

- c) identify any non-compliance over the last year, and describe what actions were (or are being) taken to ensure compliance;
- d) identify any trends in the monitoring data over the life of the project;
- e) identify any discrepancies between the predicted and actual impacts of the project, and analyse the potential cause of any significant discrepancies; and
- f) describe what measures will be implemented over the next year to improve the environmental performance of the project.

Specifically, the Annual Review will include a summary report on the Biodiversity Offset requirements and progress against the three-year management schedule.

A copy of the Annual Review will be made publicly available on the WCPL website.

### **13.3 Independent Environmental Audit**

Within a year of commencing development under the Development Consent, and every three years thereafter, unless the Secretary directs otherwise, WCPL will commission an Independent Environmental Audit of the Mine. This audit will:

- a) be conducted by a suitably qualified lead auditor and suitably qualified, experienced and independent team of experts in any field specified by the Secretary, whose appointment has been endorsed by the secretary;
- b) include consultation with the relevant agencies;
- c) assess the environmental performance of the development and assess whether it is complying with the requirements in the Development Consent and any relevant EPL or ML (including any assessment, plan or program required under these approvals);
- d) review the adequacy of strategies, plans or programs required under the abovementioned approvals;
- e) recommend appropriate measures or actions to improve the environmental performance of the development, and/or any strategy, plan or program required under the abovementioned approvals; and
- f) be conducted and reported the satisfaction of the Secretary.

Within three months of commissioning this audit, or as otherwise agreed by the Secretary, WCPL will submit a copy of the audit report to the Secretary, together with its response to any recommendation contained in the audit report, and a timetable for the implementation of these recommendations as required. WCPL will implement these recommendations, to the satisfaction of the Secretary.

A copy of the audit report (and WCPL's response to any recommendations) will be made publicly available on the WCPL website.

### **13.4 Website Updates**

A comprehensive summary of the biodiversity monitoring results will be made publicly available on WCPL's website. WCPL will also ensure that any information relevant to biodiversity management is uploaded to the website (and kept up to date). This includes:

- Current statutory approvals;
- Approved strategies, plans or programs required under the Development Consent;
- A summary of the monitoring results of the Mine;



- A complaints register (updated monthly);
- Minutes of CCC meetings;
- The last five Annual Reviews;
- A copy of any Independent Environmental Audits and WCPL’s response to any recommendations in any audit; and
- Any other matter required by the Secretary.

## 14 Review

Within three months of the submission of:

- the Annual Review;
- a biodiversity-related incident report;
- an Independent Environmental Audit; and
- any modification to the Development Consent relating to biodiversity.

WCPL will review, and if necessary revise, this Management Plan.

WCPL will also review, and if necessary revise, this Management Plan in response to a relevant change in technology, legislation, or operations.

WCPL will comply with any reasonable requirement/s of the Secretary arising from the Department’s assessment of:

- any reports, strategies, plans, programs, reviews, audits or correspondence that are submitted in accordance with the Development Consent; and
- the implementation of any actions or measures contained in these documents.

Where amendments to this Management Plan are made as a result of the review process, WCPL will submit the revised Management Plan to the DPIE for approval within four weeks.

## 15 Responsibilities

**Table 23 Management Plan Roles and Responsibilities**

Responsibility	Task	Timing
<b>General Manager</b>	Authorise this Management Plan	Prior to implementation and following reviews
	Ensure that adequate resources are available to effectively implement requirements of this Management Plan	During budget planning
<b>ECM</b>	Ensure that all regulatory reporting is undertaken in relation to this Management Plan	As required
	Coordinate relevant reviews of this Management Plan in accordance with Section 14	As required
	Implement contingency plans and incident management process (Section 10).	As required
	Establish conservation agreements and Bonds for Biodiversity Offset Areas	Within 2 years of commencing development
	Receive and respond to community complaints	As required

Responsibility	Task	Timing
<b>Environmental Representative</b>	Ensure all employees and contractors receive adequate training and awareness in the implementation of this Management Plan	As required
	Develop strategies to prevent or reduce environmental impacts	As required
	Update the WCPL website as per Section 13.4	As required
	Review the performance of the monitoring program and effectiveness of this Management Plan	As required
	Ensure monitoring is undertaken in accordance with the Monitoring Program as outlined in Section 9 of this Management Plan.	As required
	Prepare all statutory reports relating to this Management Plan	As required
	Conduct regular inspections of the site to monitor compliance with this Management Plan	As required
<b>Senior Leadership Team and Supervisors</b>	Support and assist Environmental Department in the implementation of this Management Plan	As required
	Provide feedback on the adequacy and effectiveness of this plan	As required
	Report any incidents or complaints immediately to the Environmental Department	Immediately
<b>Employees and contractors</b>	Ensure the implementation of this Management Plan with respect to their specific work practices	At all times
	Act in accordance with the management procedures or protocols outlined in this Management Plan	At all times
	Ensure any potential or actual issues, including environmental incidents, are reported to their immediate supervisor	Immediately

## 16 Acronyms

Table 24 provides a list of acronyms used throughout this Biodiversity Management Plan.

**Table 24 List of Acronyms**

Acronym	Definition
ACHMP	Aboriginal Cultural Heritage Management Plan
AHD	Australian Height Datum
BOA	Biodiversity Offset Area
BOM	Bureau of Meteorology
BVTs	Biometric Vegetation Types
°C	degrees Celsius
CCC	Community Consultative Committee
CEEC	Critically Endangered Ecological Community
cm	centimetres
DBH	Diameter at Breast Height
DAWE	Department of Agriculture, Water and the Environment (formally DoEE)
DEC	Department of Environment and Conservation
DNG	Derived Native Grassland
DoEE	Department of Environment and Energy
DotE	Department of the Environment
DP&E	Department of Planning and Environment
DPIE	Department of Planning, Industry and Environment (formerly DP&E)
DPI	Department of Primary Industries
EA	Environmental Assessment
EC	Exotic Plant Cover
ECA	Enhancement and Conservation Area
ECM	Environmental and Community Manager
EEC	Endangered Ecological Community
EP&A Act	Environmental Planning and Assessment Act
EPA	Environmental Protection Authority
EPBC Act	Environmental Protection and Biodiversity Conservation Act
EPL	Environment Protection Licence
ETL	Electricity Transmission Line
FBA	Framework for Biodiversity Assessment
FL	Total Length of Fallen Logs
GDP	Ground Disturbance Permit
ha	hectares
km	kilometres
km/h	kilometres per hour
km <sup>2</sup>	square kilometres
kV	kilovolt
LFA	Landscape Function Analysis
LLS	Local Land Services
m	metres

Acronym	Definition
m <sup>2</sup>	square metres
ML	Mining Lease
mm	millimetres
MOD 5 EA	MOD 5 Wilpinjong Coal Mine Modification Environmental Assessment
MOP	Mining Operations Plan
Mtpa	Million tonnes per annum
NGCG	Native Ground Stratum Cover (grasses)
NGCO	Native Ground Stratum Cover (other)
NGCS	Native Ground Stratum Cover (shrubs)
NMC	Native Mid-storey Cover
NOC	Native Over-storey Cover
NP	National Park
NPWS	National Parks and Wildlife Service
NSR	Native Plant Species Richness
NSW	New South Wales
NTH	Number of Tree with Hollow Logs
OEH	Office of Environment and Heritage
OR	Over-storey Regeneration
Peabody	Peabody Energy Australia Pty Ltd
RFS	Rural Fire Service
ROM	run-of-mine
SDS	Safety Data Sheet
SEWPaC	Department of Sustainability, Environment, Water, Population and Communities
SSCI	Soil Surface Condition Indicators
TARPs	Trigger Action Response Plans
the Mine	Wilpinjong Coal Mine
TSC Act	Threatened Species Conservation Act
VCA	Voluntary Conservation Agreement
VEC	Vulnerable Ecological Community
WCP EIS	Wilpinjong Coal Project Environmental Impact Statement
WCPL	Wilpinjong Coal Pty Ltd
WEP EIS	Wilpinjong Extension Project Environmental Impact Statement



## 17 References

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APPENDIX 1  
BIODIVERSITY MANAGEMENT PLAN REQUIREMENTS

**Table A1-1 Biodiversity Management Plan Requirements**

Approval/Licence	Condition	Requirement	Section																												
Development Consent	Schedule 3 Condition 32	<p><i>Biodiversity Land Based Offsets</i></p> <p><i>The Applicant must implement the biodiversity offset strategy as summarised in Table 7 and shown conceptually in Appendix 7, to the satisfaction of the Secretary.</i></p> <p><i>Table 7: Biodiversity Offset Strategy</i></p> <table border="1"> <thead> <tr> <th>Area</th> <th>Offset</th> <th>Minimum Size (hectares)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">Existing Offsets</td> <td>Enhancement and Conservation Areas</td> <td>480</td> </tr> <tr> <td>Biodiversity Offset Areas D and E</td> <td>211</td> </tr> <tr> <td rowspan="5">Additional Offsets</td> <td>Offset Area 1</td> <td>199</td> </tr> <tr> <td>Offset Area 2</td> <td>416.5</td> </tr> <tr> <td>Offset Area 3</td> <td>124.5</td> </tr> <tr> <td>Offset Area 4</td> <td>38</td> </tr> <tr> <td>Offset Area 5</td> <td>218</td> </tr> <tr> <td>Regeneration areas</td> <td></td> <td>148</td> </tr> <tr> <td>Rehabilitation Areas</td> <td></td> <td>2,906</td> </tr> <tr> <td></td> <td><b>TOTAL</b></td> <td><b>4,741</b></td> </tr> </tbody> </table>	Area	Offset	Minimum Size (hectares)	Existing Offsets	Enhancement and Conservation Areas	480	Biodiversity Offset Areas D and E	211	Additional Offsets	Offset Area 1	199	Offset Area 2	416.5	Offset Area 3	124.5	Offset Area 4	38	Offset Area 5	218	Regeneration areas		148	Rehabilitation Areas		2,906		<b>TOTAL</b>	<b>4,741</b>	Section 4
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	<b>TOTAL</b>	<b>4,741</b>																													
Development Consent	Schedule 3 Condition 33	<p><i>Within one year of the commencement of development under this consent, unless the Secretary agrees otherwise, the Applicant must amend the Conservation Agreement for the Enhancement and Conservation Areas to remove the areas proposed to be incorporated into the re-alignment of the Transmission Line and include an additional area to ensure that the total area of the Enhancement and Conservation Area remains at 480 hectares.</i></p>	Section 4.2																												
Development Consent	Schedule 3 Condition 34	<p><i>Biodiversity Long Term Security</i></p> <p><i>Within one year of the commencement of development under this consent, unless the Secretary agrees otherwise, the Applicant must make suitable arrangements to protect the Enhancement and Conservation Areas and Offset Areas D and E in Table 7 in perpetuity to the satisfaction of the Secretary.</i></p> <p><i>In relation to protecting Biodiversity Offset Areas D and E, the Applicant must use its best endeavours to add the relevant land to the adjoining National Park, in consultation with OEH.</i></p>	Section 4.6																												



**Table A1-1 Biodiversity Management Plan Requirements (Continued)**

Approval/Licence	Condition	Requirement	Section																								
Development Consent	Schedule 3 Condition 35	<p><i>Within 3 years of the commencement of the development under this consent, unless the Secretary agrees otherwise, the Applicant must secure Offset Areas 1 to 5 by:</i></p> <p>(a) <i>transferring the land to National Park estate; or</i></p> <p>(b) <i>entering into a Biobanking Agreement; or</i></p> <p>(c) <i>a combination of (a) and (b).</i></p> <p><i>The Applicant must use its best endeavours to secure Offset Areas 1 to 5 by transferring the land to adjoining National Park estate, in consultation with OEH.</i></p>	Section 4.6																								
Development Consent	Schedule 3 Condition 36	<p><b>Biodiversity Rehabilitation Offsets</b></p> <p><i>Within 10 years of the completion of mining operations under this consent, unless otherwise agreed by the Secretary, the Applicant must demonstrate that there are sufficient biodiversity credits of a number and class specified in Tables 8 and 9 below.</i></p> <p><i>Table 8: Ecosystem Credit Requirements</i></p> <table border="1"> <thead> <tr> <th><b>Vegetation Community</b></th> <th><b>Code (BVT)</b></th> <th><b>Biometric Vegetation Type</b></th> <th><b>Area (hectares)</b></th> <th><b>Credits Required</b></th> <th><b>BVTs that can be used to meet credits</b></th> </tr> </thead> <tbody> <tr> <td><i>Fuzzy Box Woodland</i></td> <td><i>HU547</i></td> <td><i>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion.</i></td> <td><i>9</i></td> <td><i>37</i></td> <td><i>HU547</i></td> </tr> <tr> <td><i>Rough Barked Apple Woodland</i></td> <td><i>HU981</i></td> <td><i>Rough-barked Apple grassy tall woodlands of the Brigalow Belt South</i></td> <td><i>880</i></td> <td><i>3,716</i></td> <td><i>HU981 HU732</i></td> </tr> <tr> <td><i>Whitebox Woodland Shrubby</i></td> <td><i>HU824</i></td> <td><i>White Box-Black Cypress Pine shrubby woodland of the Western Slopes</i></td> <td><i>575</i></td> <td><i>2,417</i></td> <td><i>HU824</i></td> </tr> </tbody> </table>	<b>Vegetation Community</b>	<b>Code (BVT)</b>	<b>Biometric Vegetation Type</b>	<b>Area (hectares)</b>	<b>Credits Required</b>	<b>BVTs that can be used to meet credits</b>	<i>Fuzzy Box Woodland</i>	<i>HU547</i>	<i>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion.</i>	<i>9</i>	<i>37</i>	<i>HU547</i>	<i>Rough Barked Apple Woodland</i>	<i>HU981</i>	<i>Rough-barked Apple grassy tall woodlands of the Brigalow Belt South</i>	<i>880</i>	<i>3,716</i>	<i>HU981 HU732</i>	<i>Whitebox Woodland Shrubby</i>	<i>HU824</i>	<i>White Box-Black Cypress Pine shrubby woodland of the Western Slopes</i>	<i>575</i>	<i>2,417</i>	<i>HU824</i>	Section 4.4
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**Table A1-1 Biodiversity Management Plan Requirements (Continued)**

Approval/Licence	Condition	Requirement	Section										
	Schedule 3 Condition 36 (Continued)	<p><i>Table 9: Species Credit Requirements</i></p> <table border="1" data-bbox="663 368 1827 635"> <thead> <tr> <th data-bbox="663 368 824 440">Species</th> <th data-bbox="824 368 1111 440">Code (BVT) <sup>1</sup></th> <th data-bbox="1111 368 1525 440">Biometric Vegetation Type</th> <th data-bbox="1525 368 1666 440">Area (ha)</th> <th data-bbox="1666 368 1827 440">Credits Required<sup>2</sup></th> </tr> </thead> <tbody> <tr> <td data-bbox="663 440 824 635">Regent Honeyeater</td> <td data-bbox="824 440 1111 635">HU697, HU732, HU824 or additional BVT's as otherwise agreed by the Secretary in consultation with OEH</td> <td data-bbox="1111 440 1525 635">Mugga Ironbark-Black Cypress Pine shrub/ grass open forest of the upper Hunter Valley Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion. White Box-Black Cypress Pine shrubby woodland of the Western Slopes</td> <td data-bbox="1525 440 1666 635">2,897</td> <td data-bbox="1666 440 1827 635">8,650</td> </tr> </tbody> </table> <p><i>Notes:</i></p> <ol style="list-style-type: none"> <li><i>The BVT's are required to be planted as Regent Honeyeater habitat</i></li> <li><i>The following rehabilitation types may generate up to 3.55 Regent Honeyeater credits / hectare:</i> <ul style="list-style-type: none"> <li><i>Wilpinjong Extension Project open cut and ancillary areas rehabilitated to woodland</i></li> <li><i>Wilpinjong Coal Project approved agricultural areas rehabilitated to woodland</i></li> </ul> </li> </ol> <p><i>The following rehabilitation types may generate up to 1.775 Regent Honeyeater credits / hectare:</i></p> <ul style="list-style-type: none"> <li><i>Wilpinjong Coal Project approved area woodland rehabilitated to BVT woodland</i></li> </ul>	Species	Code (BVT) <sup>1</sup>	Biometric Vegetation Type	Area (ha)	Credits Required <sup>2</sup>	Regent Honeyeater	HU697, HU732, HU824 or additional BVT's as otherwise agreed by the Secretary in consultation with OEH	Mugga Ironbark-Black Cypress Pine shrub/ grass open forest of the upper Hunter Valley Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion. White Box-Black Cypress Pine shrubby woodland of the Western Slopes	2,897	8,650	Section 4.4
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Development Consent	Schedule 3 Condition 37	<p><i>Within 6 months of the commencement of development under this consent, or as otherwise agreed by the Secretary, the Applicant must, in consultation with OEH, the Department and DoEE and to the satisfaction of the Secretary, develop suitable rehabilitation performance and completion criteria for:</i></p> <p><i>(a) the BVTs in Tables 8 and 9; and</i></p> <p><i>(b) Regent Honeyeater habitat.</i></p> <p><i>The performance and completion criteria must include consideration of the effect of climatic conditions, such as drought, and the NSW Biodiversity Offsets Policy for Major Projects 2014 and the associated Fact sheet: Mine Site Rehabilitation (OEH, 2014).</i></p> <p><i>Note: The rehabilitation offset performance and completion criteria form a component of the Rehabilitation Management Plan required under condition 63 of this schedule.</i></p>	Section 4.4										

**Table A1-1 Biodiversity Management Plan Requirements (Continued)**

Approval/Licence	Condition	Requirement	Section						
Development Consent	Schedule 3 Condition 38	<p><i>If at the end of 10 years after landform establishment the rehabilitation does not meet the performance criteria to the satisfaction of the Secretary or 10 years after completion of mining operations the rehabilitation does not meet the completion criteria to the satisfaction of the Secretary, the Applicant must retire the relevant number of credits in accordance with the NSW Biodiversity Offsets Policy for Major Project 2014 to the satisfaction of OEH and can be achieved by:</i></p> <p>(a) <i>acquiring or retiring credits under the Biobanking Scheme;</i>            (b) <i>making payments into an offset fund that has been established by the NSW Government; or</i>            (c) <i>providing supplementary measures.</i></p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> <li><i>Landform establishment is a recognised stage of rehabilitation when the final land shape has been developed prior to growth medium development and ecosystem development.</i></li> <li><i>Landform establishment stage will progressively occur across the mine site, the performance criteria for new areas progressing into landform establishment stage will need to be assessed by the Secretary on a regular basis, for example every 3 years, to determine whether the requirements of the condition are met.</i></li> <li><i>The rehabilitation offset performance and completion criteria form a component of the Rehabilitation Management Plan required under condition 63 of this schedule.</i></li> <li><i>In accordance with the NSW Biodiversity Offsets Policy for Major Projects, additional biodiversity credits can be generated for the ongoing management of the rehabilitation area to ensure its biodiversity values are continually improved. Any additional credits could be secured through a Biobanking Agreement and used to offset future developments.</i></li> </ul>	Section 4.4						
Development Consent	Schedule 3 Condition 39	<p><b>Additional Regent Honeyeater Measures</b></p> <p><i>The Applicant must contribute funds to OEH towards the Regent Honeyeater Recovery Plan captive breeding and release programs, or alternative Regent Honeyeater recovery initiative agreed by OEH, in accordance with the payment schedule in Table 10.</i></p> <p><i>Table 10: Contributions to the Regent Honeyeater Recovery Plan – Payment Schedule</i></p> <table border="1"> <thead> <tr> <th><b>Timeframe</b></th> <th><b>Funds Allocated</b></th> </tr> </thead> <tbody> <tr> <td><i>Within 1 year from the commencement of development under this consent</i></td> <td><i>\$120,000</i></td> </tr> <tr> <td><i>Annually thereafter for 9 years</i></td> <td><i>\$60,000 per year</i></td> </tr> </tbody> </table>	<b>Timeframe</b>	<b>Funds Allocated</b>	<i>Within 1 year from the commencement of development under this consent</i>	<i>\$120,000</i>	<i>Annually thereafter for 9 years</i>	<i>\$60,000 per year</i>	Section 4.5
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<i>Annually thereafter for 9 years</i>	<i>\$60,000 per year</i>								
Development Consent	Schedule 3 Condition 40	<p><b>Munghorn Gap Nature Reserve</b></p> <p><i>The Applicant must ensure that the edge of all open cut pits for the development are setback at least 20 metres from the boundary of the Munghorn Gap Nature Reserve.</i></p> <p><i>Note: It is accepted that some ancillary infrastructure would need to be retained for access and water management.</i></p>	Section 7.8						

**Table A1-1 Biodiversity Management Plan Requirements (Continued)**

Approval/Licence	Condition	Requirement	Section
Development Consent	Schedule 3 Condition 41	<p><i>Prior to carrying out any development under this consent, the Applicant must:</i></p> <p>(a) <i>undertake a survey of the boundary of the Munghorn Gap Nature Reserve where it adjoins operational mining areas;</i></p> <p>(b) <i>ensure that the boundary is clearly delineated in the field and in Geographic Information Systems(GIS); and</i></p> <p>(c) <i>provide relevant Geographic Information System data to the Department and OEH.</i></p>	Section 7.8
Development Consent	Schedule 3 Condition 42	<p><i>Biodiversity Management Plan</i></p> <p><i>Prior to carrying out any development under this consent, the Applicant must prepare a Biodiversity Management Plan for the development to the satisfaction of the Secretary. This plan must:</i></p>	This document
		<p>(a) <i>be prepared in consultation with OEH and DoEE;</i></p>	Section 1.6
		<p>(b) <i>describe the short, medium, and long term measures that would be implemented to:</i></p> <ul style="list-style-type: none"> <li>• <i>manage the remnant vegetation and fauna habitat on the site; and</i></li> <li>• <i>implement the biodiversity offset strategy;</i></li> </ul>	Section 7
		<p>(c) <i>include detailed performance and completion criteria for evaluating the performance of the biodiversity offset strategy, and triggering remedial action (if necessary);</i></p>	Section 6
		<p>(d) <i>include a detailed description of the measures that would be implemented to:</i></p> <ul style="list-style-type: none"> <li>• <i>minimise the impacts on fauna, including undertaking pre-clearance surveys;</i></li> <li>• <i>maximise the salvage of resources within the disturbance area;</i></li> <li>• <i>collect and propagate seed to be used for site rehabilitation, including the threatened species</i></li> <li>• <i>Ozothamnus tessellatus;</i></li> <li>• <i>undertake germination and propagation trials for Ozothamnus tessellatus for potential planting in rehabilitation and regeneration areas;</i></li> <li>• <i>protect vegetation and fauna habitat outside the approved disturbance area on-site including targeted measures to minimise impacts on the Eastern Bentwing-bat roost site, including detailed information on proposed engineering works at the adit entry;</i></li> <li>• <i>minimise lighting impacts on the Eastern Bentwing-bat roost site, including measures to prioritise the use of non-ultra violet lighting;</i></li> <li>• <i>ensure that open cut setback distances to the Munghorn Gap Nature Reserve are met;</i></li> <li>• <i>enhance the quality of existing vegetation and fauna habitat in the biodiversity offset areas;</i></li> </ul>	<p>Section 7</p> <p>Section 7</p>



**Table A1-1 Biodiversity Management Plan Requirements (Continued)**

Approval/Licence	Condition	Requirement	Section
	Schedule 3 Condition 42 (Continued)	<ul style="list-style-type: none"> <li>• <i>manage any potential conflicts between the proposed enhancement works in the biodiversity offset strategy areas and any Aboriginal heritage values (both cultural and archaeological) in these areas, as informed by the Aboriginal cultural heritage survey required under condition 46 of this schedule;</i></li> <li>• <i>manage salinity;</i></li> <li>• <i>avoid and mitigate the spread of <i>Phytophthora cinnamomi</i> (<i>P. cinnamomi</i>) with consideration of actions identified in relevant threat abatement plans;</i></li> <li>• <i>control weeds and feral pests;</i></li> <li>• <i>control erosion;</i></li> <li>• <i>control access; and</i></li> <li>• <i>manage bushfire risk;</i></li> </ul>	
		<p>(e) <i>include a program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria including:</i></p> <ul style="list-style-type: none"> <li>• <i>a monitoring program for the implementation of the biodiversity offset strategy;</i></li> <li>• <i>monitoring programs for the Eastern Bentwing-bat roost site to assess impacts from blasting and lighting;</i></li> <li>• <i>targeted monitoring of cave dwelling bats within offset areas to inform potential for roost/maternity sites; and</i></li> </ul>	Section 9
		<p>(f) <i>include details of who would be responsible for monitoring, reviewing, and implementing the plan.</i></p>	Section 15
		<p>Notes:</p> <ul style="list-style-type: none"> <li>• <i>The Biodiversity Management Plan would not apply to offset areas if they are transferred into National Park Estate, in accordance with conditions 34 and 35 of this schedule.</i></li> <li>• <i>A bond for the rehabilitation offsets within the Mining Lease will be required by the Secretary under its rehabilitation security deposits required under the Mining Act 1992.</i></li> <li>• <i>With the approval of the Secretary, the Biodiversity Management Plan may exclude offset areas secured under a Biobanking Agreement.</i></li> <li>• <i>The Biodiversity Management Plan and Rehabilitation Management Plan need to be substantially integrated for achieving biodiversity objectives for the rehabilitated mine site.</i></li> </ul>	Section 4.6
Development Consent	Schedule 3 Condition 43	<i>The Applicant must implement the approved Biodiversity Management Plan for the development.</i>	Noted

**Table A1-1 Biodiversity Management Plan Requirements (Continued)**

Approval/Licence	Condition	Requirement	Section
Development Consent	Schedule 3 Condition 44	<p><i>Within two years of commencing development under this consent, unless otherwise agreed by the Secretary, the Applicant must lodge a revised Conservation Bond with the Department to ensure that the Biodiversity Offset Strategy is implemented in accordance with the performance and completion criteria in the Biodiversity Management Plan. The sum of the bond shall be determined by:</i></p> <p><i>(a) calculating the full cost of implementing the biodiversity offset strategy (other than land acquisition costs) for the land in Table 7 identified as “Existing offsets” and “Additional offsets”; and</i></p> <p><i>(b) employing a suitably qualified quantity surveyor to verify the calculated costs, to the satisfaction of the Secretary.</i></p> <p><i>If the offset strategy is completed in accordance with the completion criteria in the Biodiversity Management Plan the Secretary will release the bond.</i></p> <p><i>If the offset strategy is not completed in accordance with the completion criteria in the Biodiversity Management Plan, the Secretary will call in all, or part of, the conservation bond, and arrange for the completion of the relevant works.</i></p> <p><i>Notes:</i></p> <ul style="list-style-type: none"> <li><i>• Existing bonds which have been paid for the existing Enhancement and Conservation Areas remain current and are satisfactory to fulfill the requirements of this condition for those areas.</i></li> <li><i>• Alternative funding arrangements for long-term management of the Biodiversity Offset Strategy, such as provision of capital and management funding as agreed by OEH as part of a Biobanking Agreement or transfer to National Park Estate can be used to reduce the liability of the conservation and biodiversity bond.</i></li> <li><i>• The sum of the bond may be reviewed in conjunction with any revision to the Biodiversity Offset Strategy and/or the Biodiversity Management Plan.</i></li> </ul>	Section 4.7

**Table A1-2 General Management Plan Requirements**

Approval/Licence	Condition	Requirement	Section
Development Consent	Schedule 5 Condition 3	<i>Management Plan Requirements</i> <i>The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:</i>	
		(a) <i>detailed baseline data;</i>	Section 3
		(b) <i>a description of:</i> <ul style="list-style-type: none"> <li>• <i>the relevant statutory requirements (including any relevant approval, licence or lease conditions);</i></li> <li>• <i>any relevant limits or performance measures/criteria;</i></li> <li>• <i>the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;</i></li> </ul>	Section 1.3 Section 6
		(c) <i>a description of the measures that would be implemented to comply with the relevant statutory requirements, limits or performance measures/criteria;</i>	Section 7
		(d) <i>a program to monitor and report on the:</i> <ul style="list-style-type: none"> <li>• <i>impacts and environmental performance of the development;</i></li> <li>• <i>effectiveness of any management measures (see c above);</i></li> </ul>	Section 9
		(e) <i>a contingency plan to manage any unpredicted impacts to their consequences;</i>	Section 10
		(f) <i>a program to investigate and implement ways to improve the environmental performance of the development over time:</i>	Section 10.1
		(g) <i>a protocol for managing and reporting any:</i> <ul style="list-style-type: none"> <li>• <i>incidents;</i></li> <li>• <i>complaints;</i></li> <li>• <i>non-compliances with statutory requirements; and</i></li> <li>• <i>exceedances of the criteria and/or performance criteria; and</i></li> </ul>	Section 12 Section 13
		(h) <i>a protocol for periodic review of the plan.</i>	Section 14

**Table A1-3 EPBC Approval Conditions**

Approval/Licence	Condition	Requirement	Section																																																																																						
EPBC 2015/7431	Condition 1	<p>For the protection of <i>listed threatened species and communities</i> and <i>water resources</i>, the person taking the action must comply with the following conditions of the <i>New South Wales development consent</i>, where relevant to the Wilpinjong Extension Project (EPBC 2015/7431):</p> <table border="1"> <thead> <tr> <th>Schedule</th> <th>NSW Development Consent Condition</th> <th>Subject</th> </tr> </thead> <tbody> <tr> <td>2</td> <td>2</td> <td>requirement to undertake action generally in accordance with the Wilpinjong Extension Project EIS and the NSW Development Consent.</td> </tr> <tr> <td>3</td> <td colspan="2"><b>WATER</b></td> </tr> <tr> <td></td> <td>23</td> <td>requirement to ensure sufficient water supply for all stages of development otherwise to adjust scale of operations to match supply.</td> </tr> <tr> <td></td> <td>24</td> <td>requirement for compensatory water supply (as required).</td> </tr> <tr> <td></td> <td>29</td> 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Environmental Management Strategy (EMS) for NSW Conditions 1, 2, 3 &amp; 6</p>
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Approval/Licence	Condition	Requirement	Section
	2	If at the end of five (5) years after <i>landform establishment</i> the <i>Minister</i> determines that the rehabilitation to address Conditions 36 and 37 of Schedule 3 of the <i>New South Wales development consent</i> does not meet the applicable interim performance criteria detailed in the rehabilitation management plan, the person taking the action must prepare and submit additional rehabilitation management measures, for the <i>Minister's</i> approval, no later than six (6) months after the <i>Minister's</i> determination. Once approved, the approved additional rehabilitation management measures must be implemented.	Section 10.1
	3	Within fourteen (14) days after the <i>commencement of the action</i> , the person taking the action must advise <i>the Department</i> in writing of the actual date of <i>commencement of the action</i> .	EMS
	4	The person taking the action must maintain accurate substantiating all activities associated with or relevant to the conditions of approval, and make them available upon request to <i>the Department</i> . Such records may be subject to audit by <i>the Department</i> or an independent auditor in accordance with Section 458 of <i>the EPBC Act</i> , or used to verify compliance with the conditions of approval. Summaries of audits will be posted on <i>the Departments</i> website. The results of audits may also be publicised through the general media.	Section 9.6
	5	In accordance with Condition 4 and Condition 12 of Schedule 5 of the <i>New South Wales Development Consent</i> , the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to <i>the Department</i> at the same time as the compliance report is published. Reports must remain on the website for the length of this approval. Reports must continue to be published until all requirements of this approval are satisfied and the person taking the action has been advised otherwise by the <i>Minister</i> in writing.	Section 13.4
	6	The person taking the action must advise the Department of any potential non-compliance with any of these conditions of approval in writing within seven (7) days of becoming aware of the potential non-compliance.	Section 13.1
	7	Upon the direction of <i>the Minister</i> , the person taking the action must ensure that an independent audit of compliance with the conditions of approval is conducted and a report submitted to <i>the Minister</i> . The independent auditor must be approved by <i>the Minister</i> prior to the commencement of the audit. Audit criteria must be agreed to by <i>the Minister</i> and the audit report must address the criteria to the satisfaction of <i>the Minister</i> .	Section 13.3
	8	If, any time after two (2) years from the date of this approval, the person taking the action has not <i>commenced the action</i> , then the person taking the action must not <i>commence the action</i> without the written agreement of <i>the Minister</i> .	EMS
	9	Unless otherwise agreed to in writing by <i>the Minister</i> , the person taking the action must publish all management documents referred to in these conditions of approval on their website. This includes documents required indirectly through the <i>New South Wales development consent</i> . Each document must be published on the website within one (1) month of being approved by the <i>New South Wales Consent Authority</i> .	Section 13.4



APPENDIX 2

KEY BIODIVERSITY MANAGEMENT PLAN CONSULTATION RECORDS



Mr Ian Flood  
Manager – Project Development and Approvals  
Peabody Australia  
1434 Ulan-Wollar Road  
WILPINJONG NSW 2850

Via email: [iflood@peabodyenergy.com](mailto:iflood@peabodyenergy.com)

Dear Mr Flood

**Wilpinjong Coal Mine (SSD-6764)  
Management Plan Review**

I refer to your emails dated 27 September 2019 and 17 April 2020 submitting revised management plans for the Wilpinjong Coal Mine (SSD-6764), including the:

- Aboriginal and Cultural Heritage Management Plan (condition 47 of Schedule 3, version 6 dated September 2019);
- Air Quality Management Plan (condition 20 of Schedule 3, version 5 dated September 2019);
- Biodiversity Management Plan (condition 42 of Schedule 3, version 6 dated September 2019);
- Blast Management Plan (condition 14 of Schedule 3, version 6 dated September 2019);
- Environmental Management Strategy (condition 1 of Schedule 5, version 6 dated September 2019);
- Historical Heritage Management Plan (condition 49 of Schedule 3, version 3 dated September 2019); and
- Noise Management Plan (condition 5 of Schedule 3, version 4 dated September 2019).

The Department has reviewed the above plans and is satisfied that they meet the requirements of the relevant conditions of consent. Accordingly, the Secretary has approved these plans.

I also refer to the revised Water Management Plan which was submitted on 17 April 2020. The Department notes that substantial changes have been made to the site water balance component of this plan.

As such, the Department requests that this plan be submitted through the Major Projects portal for review by the Department and relevant agencies.

If you have any questions, please contact Jack Turner on 02 9995 5387 or [Jack.Turner@planning.nsw.gov.au](mailto:Jack.Turner@planning.nsw.gov.au)

Yours sincerely

A handwritten signature in black ink, appearing to be 'SOD'.

19/6/20

Stephen O'Donoghue  
**Director**  
**Resource Assessments**  
as nominee of the Secretary



Contact: Chris Schultz  
Phone: 02 4224 9478  
Fax: 02 4224 9470  
Email: [Christopher.Schultz@planning.nsw.gov.au](mailto:Christopher.Schultz@planning.nsw.gov.au)

Mr Kieren Bennetts  
Environment and Community Manager  
Wilpinjong Coal Mine  
Locked Bag 2005  
MUDGEES NSW 2850

Dear Mr Bennetts,

**Wilpinjong Coal Mine (PA 05\_0021)  
Approval of Management Plans**

I refer to the following Management Plans required under Project Approval 05\_0021 (the approval), submitted to the Department for consideration:

- Air Quality Management Plan – Document No. WI-ENV-MNP-004 dated March 2016 Version 1; and
- Biodiversity Management Plan – Document No. WI-ENV-MNP-008 dated December 2015 Version 2.

The Department has reviewed the plans and is satisfied that they generally address the requirements set out in the relevant conditions of the approval. Accordingly the Secretary has approved the management plans.

Please ensure a copy of these management plans is placed on your website in accordance with Schedule 5, Condition 11 of the approval within one month of the date of this letter.

Should you wish to discuss the above matter, please contact Chris Schultz, Senior Compliance Officer, on 02 4224 9478 or [Christopher.Schultz@planning.nsw.gov.au](mailto:Christopher.Schultz@planning.nsw.gov.au).

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Katrina', followed by the date '5/4/16'.

Katrina O'Reilly  
**Team Leader Compliance Southern Region**  
*as nominee of the Secretary*



**Resource Assessments**

Contact: Stephen Shoosmith  
Phone: 9274 6164  
Email: [stephen.shoosmith@planning.nsw.gov.au](mailto:stephen.shoosmith@planning.nsw.gov.au)

Mr Ian Flood  
Manager Project Development & Approvals –  
Peabody Energy  
Wilpinjong Extension Project

By email to: [IFlood@peabodyenergy.com](mailto:IFlood@peabodyenergy.com)

Dear Mr Flood

**Wilpinjong Extension Project (SSD-6764)  
Approval of Environmental Management Plans**

I refer to the management plans submitted to the Department, seeking the Secretary's review and approval for the Wilpinjong Extension Project (WEP).

The Department has completed a detailed review of the management plans, which were subsequently revised to address the Department's comments including the:

- Noise Management Plan (Version 3, dated August 2017);
- Air Quality Management Plan (Version 3, dated August 2017);
- Blast Management Plan (Version 3, dated August 2017);
- Historic Heritage Management Plan (Version 3, dated August 2017);
- Aboriginal Cultural Heritage Management Plan (Version 3, dated August 2017);
- Biodiversity Management Plan (Version 3, dated August 2017); and
- Environmental Management Strategy (Version 3, dated August 2017).

As part of its review, the Department also considered Peabody's request to submit the Historic Heritage Management Plan on a staged basis in accordance with Condition 6, Schedule 5 of the WEP Development Consent (SSD-9794).

The Department is satisfied that the proposed staging of the Historic Heritage Management Plan, as described in Section 1.4 of the HHMP, is reasonable and that the plans have been prepared in consultation with the relevant agencies and address the requirements of Conditions 5, 14, 20, 42, 47 and 49, in Schedule 2 and Condition 1, in Schedule 5 of SSD-9794. Accordingly, the Secretary approves the revised management plans.

Please ensure that all new monitoring sites proposed for the WEP, where establishment dates have not been nominated with the respective management plan are established within 60 days of the date of this letter and that a copy of the approved plans is placed on your website as soon as possible following the commencement of the WEP.

If you require further information, please contact Stephen Shoosmith on 9274 6164

Yours sincerely

Steve O'Donoghue  
**A/Director**  
**Resource and Energy Assessments**  
As nominee of the Secretary

**Department of Planning & Environment**

Level 22, 320 Pitt Street Sydney NSW 2000 | GPO Box 39 Sydney NSW 2001 | [www.planning.nsw.gov.au](http://www.planning.nsw.gov.au)



## Planning & Environment

Planning Services  
Resource & Energy Assessments  
Contact: Paul Freeman  
Tel: 9274 6587  
Email: [paul.freeman@planning.nsw.gov.au](mailto:paul.freeman@planning.nsw.gov.au)

Mr Ian Flood  
Manager Project Development and Approvals  
Wilpinjong Coal Pty Limited  
Locked Bag 2005  
Mudgee NSW 2850

Via email: [iflood@peabodyenergy.com](mailto:iflood@peabodyenergy.com)

Dear Mr Flood

### **Wilpinjong Extension Project (SSD 6764) Rehabilitation Offsets Performance and Completion Criteria**

I refer to your letter dated 12 April 2019 asking for the Secretary's approval of performance and completion criteria for Biometric Vegetation Types (BVT) and Regent Honeyeater, as required under condition 37 of Schedule 3 of the development consent for the Wilpinjong Extension Project (SSD 6764).

The Department has carefully considered the information you provided to support the request. As advised by the Department on 22 March 2019, the Department and Office of Environment and Heritage agree in principle to the interim criteria you have developed, as shown in Enclosure 1 to your letter. Further, the Department notes that you have committed to the following actions:

- developing local BVT benchmarks, in consultation with OEHL, by September 2020 and to the satisfaction of the Secretary; and
- engaging a Regent Honeyeater expert to report on:
  - whether the rehabilitation is trending towards providing Regent Honeyeater habitat (at 10 years post landform establishment); and
  - whether the rehabilitation provides suitable Regent Honeyeater habitat 10 years after completion of mining.

Therefore, in accordance with condition 37 of Schedule 3 of SSD 6764, the Secretary has approved the interim performance and completion criteria for BVTs and Regent Honeyeater.

I would appreciate it if you could update the Rehabilitation Management Plan required under condition 64 of Schedule 3 of SSD 6764 to include the interim criteria, and the commitments made above, and submit it for the Secretary's approval as soon as possible.

If you wish to discuss the matter further, please contact Paul Freeman on 9274 6587.

Yours sincerely

A handwritten signature in blue ink, followed by the date '23/4/19' written in blue ink.

Steve O'Donoghue  
A/Director  
Resource and Energy Assessments  
as nominee of the Secretary



APPENDIX 3

OFFSET AREA CORRESPONDENCE WITH NATIONAL PARKS AND WILDLIFE SERVICE

5 May 2017

NSW National Parks and Wildlife Service  
Office of Environment and Heritage  
Blue Mountains Branch  
27 Inglis Street  
Mudgee NSW 2850

Attention: Lisa Menke  
Acting Area Manager

Dear Lisa,

**RE: WILPINJONG EXTENSION PROJECT (SSD 6764) – OFFSETS 1-5**

Wilpinjong Coal Pty Ltd (WCPL) has proposed and the NSW Government has accepted the proposed additional Biodiversity Offset Areas 1-5 as part of the biodiversity offset package for the Wilpinjong Extension Project (SSD 6764) that was approved by the Planning Assessment Commission on 24 April 2017.

Further to the determination by the NSW Government for the Wilpinjong Extension Project, WCPL intends to proceed at the earliest opportunity to secure the additional Offset Areas 1-5 by transfer into the National Park Estate in accordance with Conditions 32 and 35, Schedule 3 that read as follows:

32. *The Applicant must implement the biodiversity offset strategy as summarised in Table 7 and shown conceptually in Appendix 7, to the satisfaction of the Secretary.*

Table 7: Biodiversity Offset Strategy

Area	Offset	Minimum Size (hectares)
Existing Offsets	Enhancement and Conservation Areas	480
	Biodiversity Offset Areas D and E	211
Additional Offsets	Offset Area 1	199
	Offset Area 2	416.5
	Offset Area 3	124.5
	Offset Area 4	38
	Offset Area 5	218
Regeneration areas		148
Rehabilitation Areas		2,906
	<b>TOTAL</b>	<b>4,741</b>

35. *Within 3 years of the commencement of the development under this consent, unless the Secretary agrees otherwise, the Applicant must secure Offset Areas 1 to 5 by:*
- (a) *transferring the land to National Park estate; or*
  - (b) *entering into a Biobanking Agreement; or*
  - (c) *a combination of (a) and (b).*

*The Applicant must use its best endeavours to secure Offset Areas 1 to 5 by transferring the land to adjoining National Park estate, in consultation with OEH.*

Appendix 7 of the Development Consent is provided in Enclosure 1.

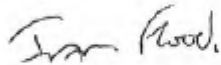
Consistent with the approach taken for Offset Areas D and E that are in the final stages of transfer to NPWS for Modification 5, WCPL intends to undertake the following works prior to the transfer of the Offset Areas 1-5 properties (refer Figures 1 and 2 in Enclosure 2):

- removal of internal fencing;
- demolition and removal of any houses and/or buildings that are not required by the NPWS;
- completion of general weed and pest control; and
- formal survey of any offset area boundaries that do not follow existing cadastral boundaries (and any necessary lot subdivision with the assistance of the Mid-Western Regional Council).

Given that David Crust has already inspected the proposed Offset Areas 1-5, to progress the process of securing these additional offsets by way of transfer into the National Park Estate WCPL requests that the NPWS now commence the Financial Impact Statement negotiation process.

Could you please provide a list of any materials that are required to be provided by WCPL, or contact me on (02) 6370 2528 to discuss.

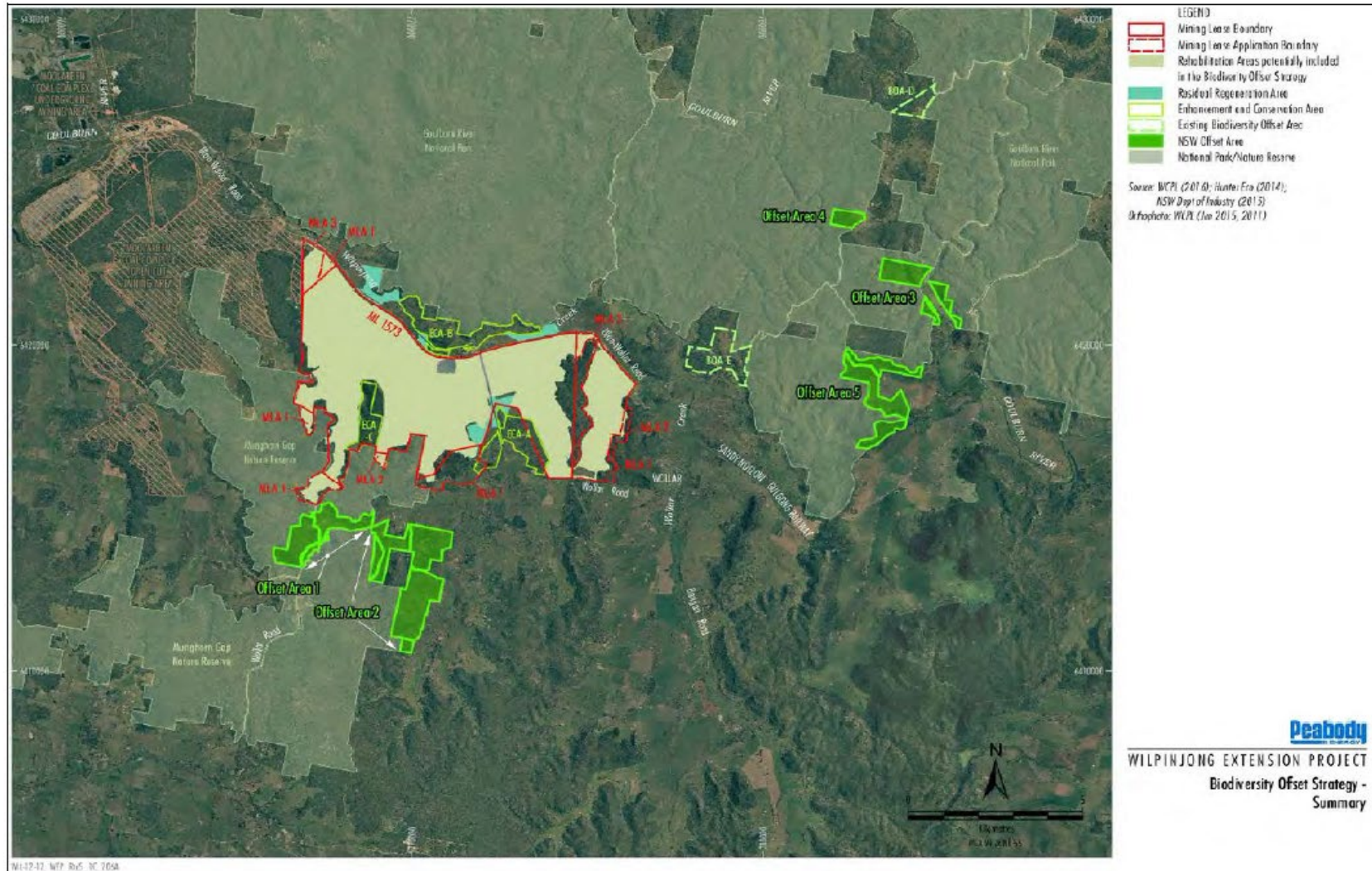
Yours sincerely,



**Ian Flood**  
Manager Project Development & Approvals  
Wilpinjong Coal Mine  
Peabody Energy Australia Pty Ltd

Enclosure 1 - Appendix 7, Development Consent SSD 6764  
Enclosure 2 – Figures 1 and 2

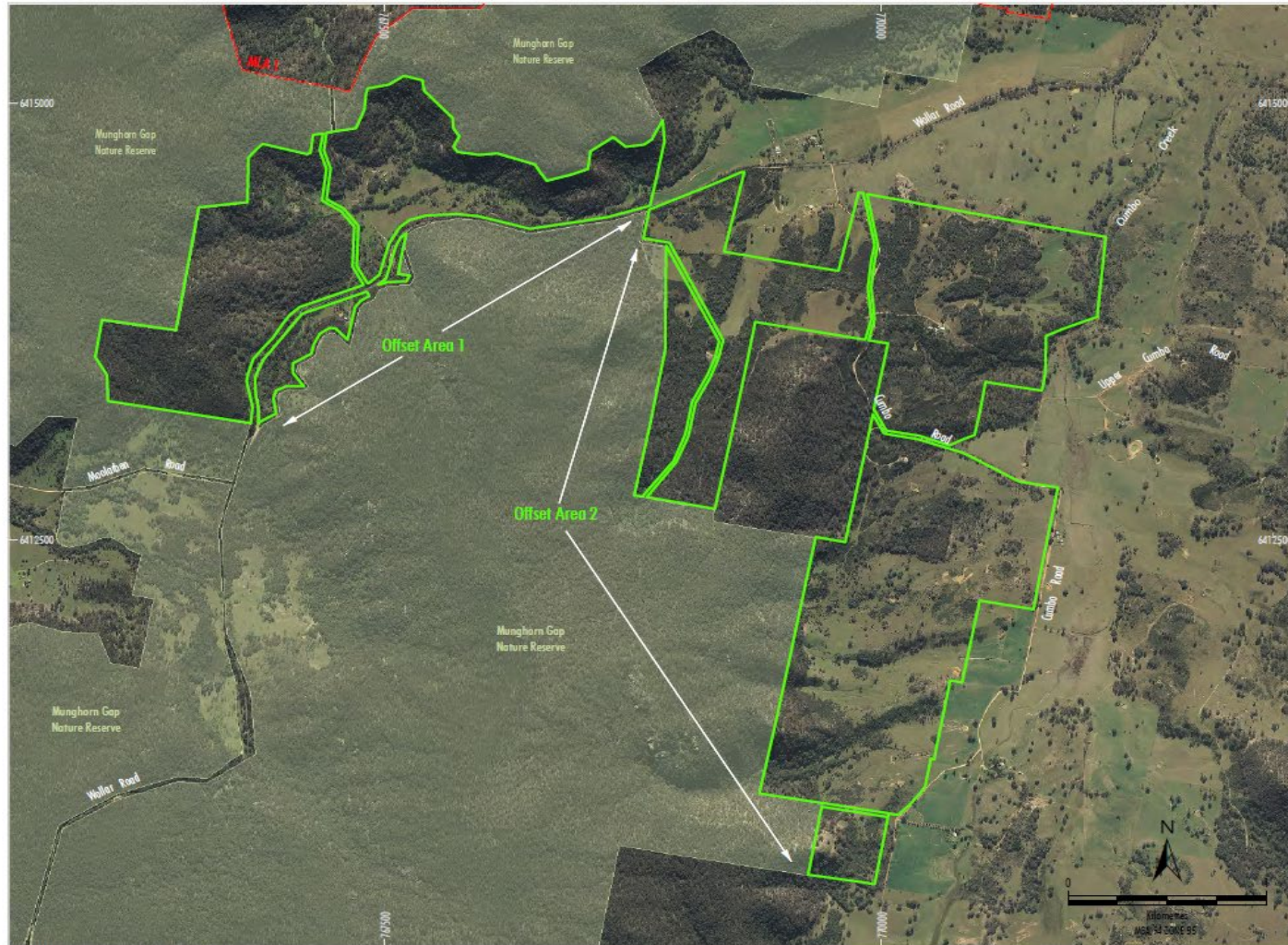
**ENCLOSURE 1**  
**APPENDIX 7**  
**DEVELOPMENT CONSENT SSD 6764**



APPENDIX 7  
BIODIVERSITY OFFSET STRATEGY



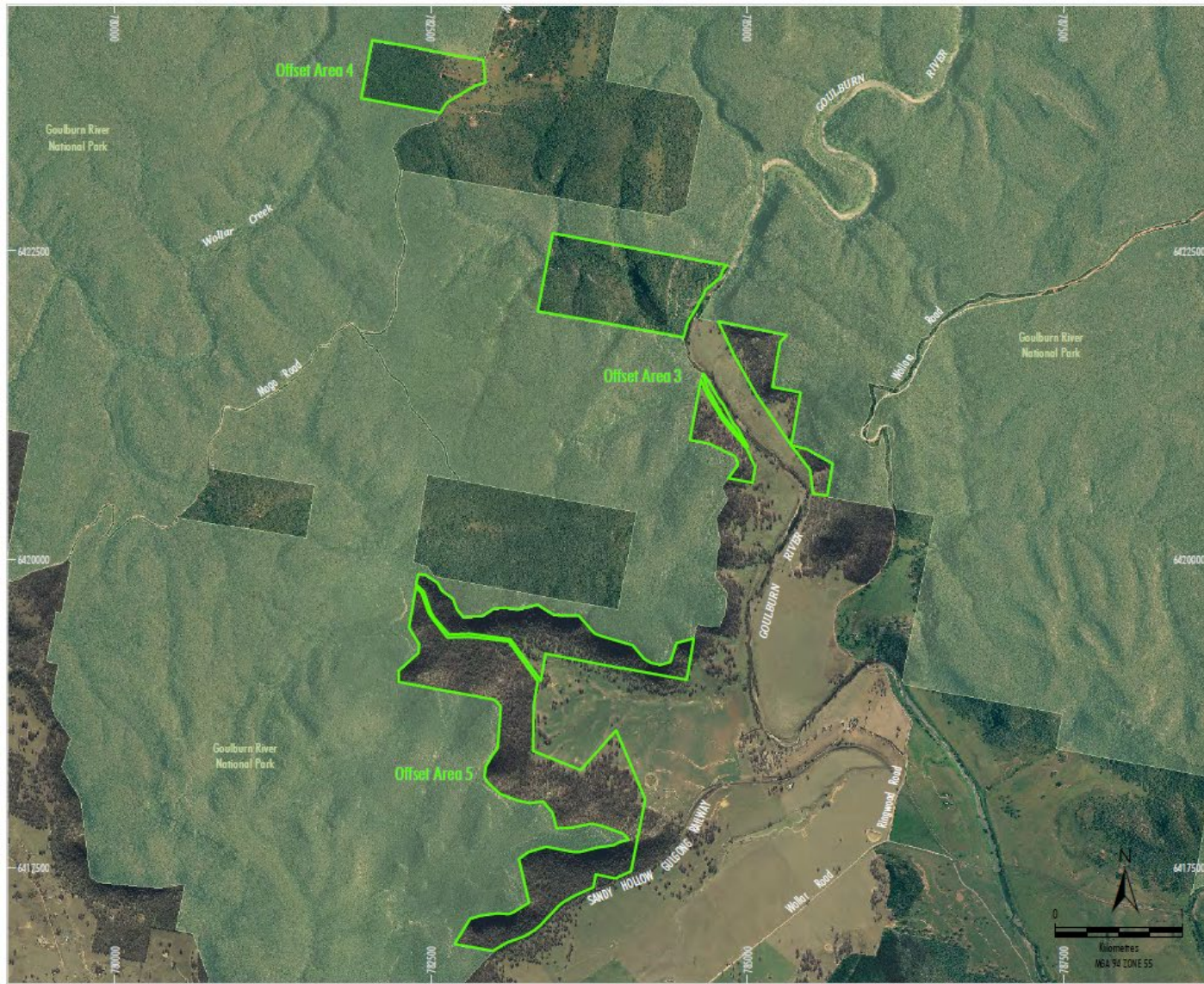
**ENCLOSURE 2  
FIGURES 1 AND 2**



WIL-12-12\_WEP\_Post EIS\_Reg Contd\_NPWS Offsets\_202A

Figure 1





  
**WILPINJONG EXTENSION PROJECT**  
 Offset Areas 3, 4 and 5

**Figure 2**

APPENDIX 4

RESILIENCE METHOD ANALYSIS

## Background review

A background review of all previous and prescribed actions within Annual Environmental Monitoring Reports, the Rehabilitation Management Plan, the Bushfire Management Plan and the Conditions of Approval was completed for each of the on-site Rehabilitation Areas, the Regeneration Areas, the ECAs for the original project approval in 2006, and the two new Biodiversity Offset Areas. Information gaps (i.e. management, monitoring and costing information) were identified necessitating site assessment.

## Collation of GIS data

Niche utilised GIS data as supplied by WCPL, which included:

1. Recent aerial imagery;
2. Satellite imagery with infra-red spectra (if available);
3. Digital terrain/elevation model or the like (e.g. Lidar imagery);
4. The digital boundaries of each of the conservation areas (Rehab Areas, ECAs and Biodiversity Offset Areas);
5. Previously recorded threatened biodiversity within each area;
6. Vegetation mapping from previous site assessments; and
7. Current monitoring locations or data collection sites (such as BioBanking plots).

Field maps were prepared detailing each of the above for use in the field by Niche. The maps were prepared at a scale deemed appropriate for site assessment purposes (say 1:10,000) and on A3.

## Qualitative resilience assessment

Vegetation condition was assessed using a modified version of Jones and Brodie (1999), *Blue Space, The Method. Assessment of Environmental Condition and Weed Invasion*, which uses qualitative criteria to assign resilience classes to bushland areas. The method is based on biological factors (e.g. vegetation structure, composition and level of exotic invasion) and the health of the soil profile, as distinct from other condition assessment methodologies which are almost always based on the level of weed invasion only.

The method was used to identify areas requiring management and therefore the basis for determining management input and expenditure. The categories for condition as assessed during the site assessment are provided in Table A4-1. Major isolated weed incursions were recorded (e.g. blackberry thickets and other noxious weeds, environmental weeds and also exotic perennial grasses).

## Quantitative condition assessment – BioBanking site scores

A quantitative assessment of condition was conducted at selected sites considered representative of the varying condition and treatment types observed throughout the conservation areas. These data can be used to align a BioMetric site value score for each vegetation zone. The score can inform, in terms of improve and maintain outcomes for biodiversity, which vegetation zones are likely to be in need of the greatest management input and expenditure. It was assumed that full BioMetric site attribute data (i.e., 20 x 50 metre plots and transects) have been conducted at each of the conservation sites and the data collected by Niche compliments this. BioMetric data were collected by Niche at the 12 sites listed in Table A4-2.



**Table A4-1 Qualitative assessment of bushland condition**

Resilience/Condition Class		Description
<b>RESILIENT AREAS</b> <i>Soil profile intact.</i> <i>Natural regeneration pathways facilitated.</i>	Good	<ul style="list-style-type: none"> <li>• Minor infestations of weeds or virtually weed free.</li> <li>• High species richness.</li> <li>• Low perimeter to core ratio and large adjacent patches.</li> <li>• All structural layers essentially intact or minor artificial modification has occurred but is not substantially impacting on ecological function.</li> <li>• Patch in benchmark condition or stable after disturbance.</li> <li>• Minimal input management required to facilitate regeneration.</li> </ul>
	Moderate	<ul style="list-style-type: none"> <li>• Minor infestations of weeds.</li> <li>• Moderate species richness.</li> <li>• Moderate perimeter to core ratio, large adjacent patches.</li> <li>• Structural absence or strong decline in condition of at least one vegetation layer due to previous artificial disturbance (e.g., regrowth from recent clearing event and subsequent loss of hollow-bearing trees).</li> <li>• Patch approaching benchmark condition.</li> <li>• Minimal input management required to facilitate regeneration.</li> </ul>
	Poor	<ul style="list-style-type: none"> <li>• Moderate to severe infestations of weeds.</li> <li>• Low species richness.</li> <li>• High perimeter to core ratio. Patches isolated or adjacent native vegetation fragmented.</li> <li>• Structural absence or strong decline in at least 2 vegetation layers (e.g., derived native pasture or grassland). Remaining native components under stress.</li> <li>• Original soil profile intact but patch well outside of benchmark condition.</li> <li>• Moderate levels of management required to facilitate regeneration.</li> </ul>
<b>NON-RESILIENT AREAS</b> <i>Soil profile permanently altered.</i> <i>Natural regeneration pathways unlikely.</i>	Disturbed	<u>Rehabilitation or revegetation areas</u> <ul style="list-style-type: none"> <li>• Moderate level of weed invasion.</li> <li>• Rehabilitation area – re-vegetation or previous soil translocation.</li> <li>• Soil profile may exhibit some regenerative potential though structure and composition unlikely to reach benchmark after treatment.</li> <li>• Limited natural regeneration capacity after treatment and high on-going inputs to achieve sustainable outcome.</li> </ul>
		<u>Unmanaged space and degraded bushland</u> <ul style="list-style-type: none"> <li>• Native vegetation almost totally replaced by weed species and, at best, a single structural layer intact (e.g., large trees in degraded riparian zone).</li> <li>• Soil profile disturbed and permanently altered resulting in loss of soil seed bank.</li> <li>• No regeneration capacity, natural regeneration pathways lost.</li> <li>• Management requires high input reconstruction and commitment to on-going maintenance.</li> </ul>
		<u>Not bushland</u> <ul style="list-style-type: none"> <li>• Potential regeneration suppressed by management practices (e.g., parkland, cropping or exotic pasture).</li> </ul>

**Table A4-2 BioMetric Site Attribute Data (Niche 2014)**

Survey point	Easting	Northing	Description	Condition	Photo and Bearing	NSR	NOC	NMC	NGCG	NGCS	NGCO	EC	NTH	OR	FL
011	209217	6419577	Exotic pasture	No resilience	5614_180	0	0	0	14	0	2	96	0	0	0
013	209073	6419862	Native pasture	Poor	5616_082	0	0	0	82	0	0	66	0	0	0
016	202743	6419230	Regrowth shrubland - Map unit 8	Moderate	5623_136	0	0	10	38	0	64	6	0	1	9.5
019	203065	6419622	Narrow-leaved Iron Bark	Good	5626_143	0	19.5	6.5	24	0	20	0	0	0	56
020	203039	6420196	Rough-barked Apple	Moderate	5627_165	0	25	0.5	88	0	14	4	1	0.5	3
024	209207	6418836	Native pasture	Very poor	5633_110	0	0	0	82	0	16	80	0	0	0
030	207249	6419853	Box Gum Woodland	Poor	5645_249	0	27	0	24	0	18	42	1	0	18
045	205746	6418865	Tailings dam rehab site - rhodes and smut	Rehab	5678_225	0	0	0	0	2	0	80	0	0	0
046	205674	6418771	Pit 1 rehab - unknown treatment - sapling eucalypts and wattles	Rehab	5681_214	0	0	9	0	0	0	82	0	0	0
048	203768	6417764	Translocated topsoil - 50/50 native to weed	Rehab	5684_350	0	0	0	46	0	0	48	0	0	0
050	204369	6418260	Pit 5 SE Rehab - Acacia shrubland	Rehab	5689_135	0	0	6	90	26	6	40	0	0	67
066	213785	6419216	Regenerating shrubland in NLIB - Blakelys	Moderate	5722_095	0	0	0	76	52	10	0	0	0	0

APPENDIX 5

RESILIENCE MAPPING

**Table A5-1 Niche Survey Points**

Management Domain	Area	Survey Points	Description	
ECAs	ECA-A	052	Regenerating native pasture	
		053	Recruitment of Blakelys Red Gum	
		057	Disturbed native pasture - adjacent box gum woodland	
		058	Disturbed native pasture - adjacent box gum woodland	
		089	Pig rutting	
	ECA-B	027	Gullying naturally stabilising with native herbs and sedges, some scars	
		028	Lomandra sedgeland	
		029	Riparian zone of Box Gum and with recovering gully scars	
		031	Carex sedgeland flood channel adjacent to Box Gum, 50/50 weed to native	
		032	Riparian zone of Box Gum and with recovering gully scars	
		033	Powerlines outside old homestead	
		034	Patersons curse under powerlines	
		036	Phragmites/Typha wetland	
		037	Native pasture	
		038	Regeneration on valley floor	
		039	Regenerating Box Gum	
		ECA-C	049	Regenerating woodland and pasture
		Regeneration Areas	Regeneration Area 1	010
	011			Exotic pasture
012	Patch of native groundcover with adjacent Box Gum in road reserve just outside of Regeneration Area			
013	Native pasture			
014	Riparian zone of Box Gum and with recovering gully scars just outside of Regeneration Area			
024	Native pasture			
025	Drainage swale in native pasture			
026	Erosion scar on steep slope, possibly over-grazing			
Regeneration Area 2	053		Recruitment of Blakelys Red Gum in ECA-A	
	054		Native pasture in YB, Angophora, Blakelys Red Gum	
	055		Disturbed native pasture in Box Gum	
	056		Recovering erosional scars on slope	
Regeneration Area 3	021		Native pasture (Regeneration Area 8)	

**Table A5-1 Niche Survey Points (Continued)**

Management Domain	Area	Survey Points	Description
	Regeneration Area 3 (Continued)	022	Native pasture (Regeneration Area 7)
		023	Box Gum recruitment on edge of forest stand with sifton bush (Regeneration Area 7)
	Regeneration Area 4	035	Degraded electricity easement
	Regeneration Area 5	040	Native pasture
		043	Exotic pasture under power lines
		044	Exotic pasture with Patersons curse
	Regeneration Area 6	015	Exotic pasture
		016	Regrowth shrubland - Map unit 8 (outside Regen Area 6)
		017	Native pasture
		018	Native pasture
	Regeneration Area 9	041	Box Gum knoll adjacent to grazed paddock
		042	Regenerating BGW



Representative photos of Management Domains (taken May 2014)

## Biodiversity Offset Area-D



## Biodiversity Offset Areas-E



ECA-A



ECA-B





## ECA-C



## Regeneration Area 1



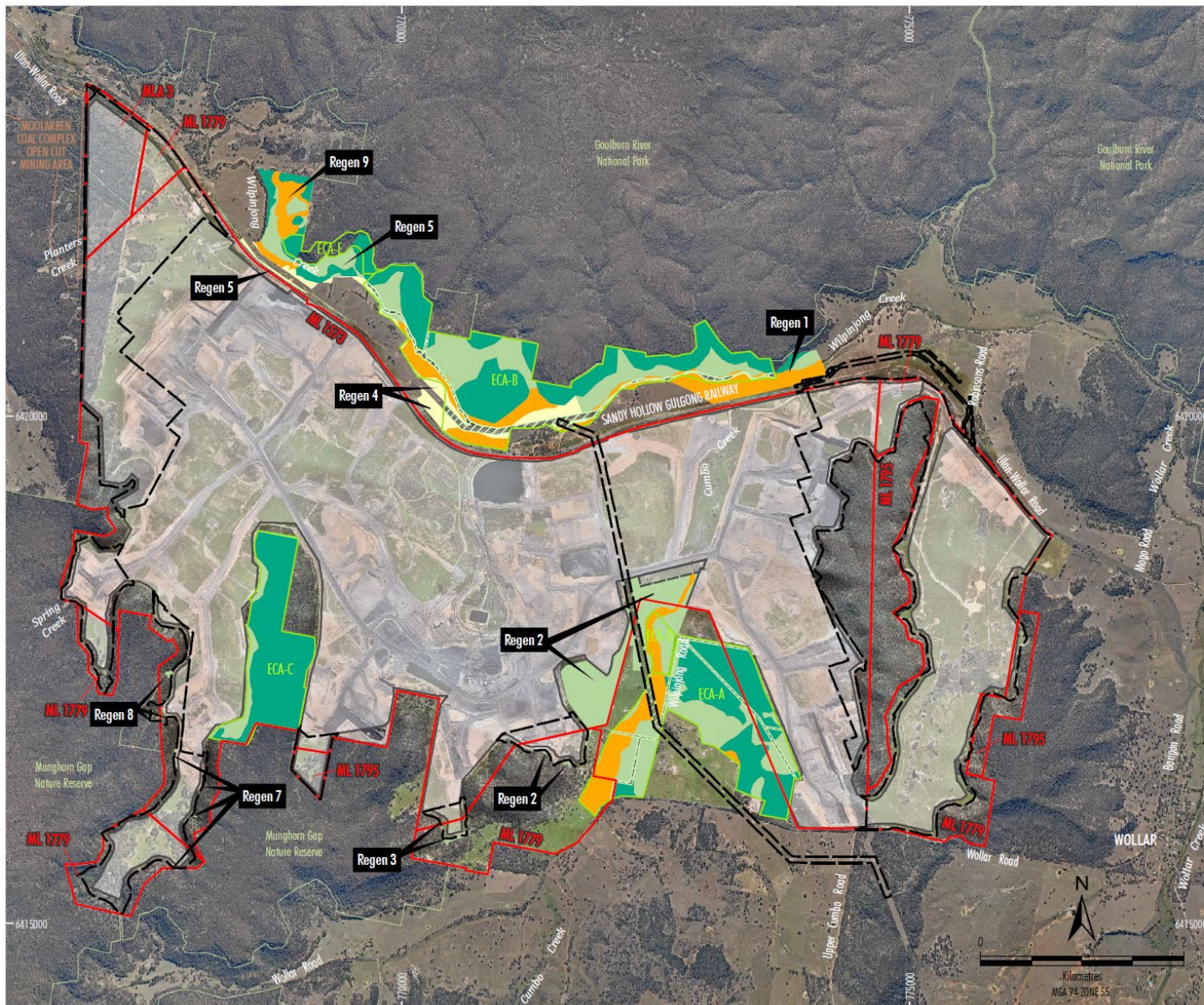
## Regeneration Area 2



## Regeneration Area 9







- LEGEND**
- Mining Lease Boundary
  - Mining Lease Application Boundary
  - Approved/Existing Open Cut and Contained Infrastructure Area #
  - Relocated Block Bank and Cumbo Creek Disturbance Area
  - Wilpinjong Extension Project - Assessed Development Footprint ##
  - Enhancement Conservation Areas
  - Enhancement Conservation Areas - Excluded Areas
  - Resilience Mapping**
  - Good
  - Moderate
  - Poor
  - No Resilience
  - Not mapped

# Inclusive of the agreed minor change to the area confirmed by DPIE on 23rd August 2019.  
 ## Inclusive of the agreed minor changes to the footprint confirmed by DPIE on 23rd April and 23rd August 2019.

Source: WCPL (2020); NSW Spatial Services (2020); Niche (2014)  
 Orthophoto Mosaic: WCPL (April 2020, March 2018)

**Figure A5-1**



APPENDIX 6

THREE YEAR MANAGEMENT SCHEDULE

**Table A6 Three Year Management Schedule**

Management Strategy	Objectives	2019	2020	2021
Cultural Heritage Management	Identification of cultural heritage sites within the Biodiversity Offset Areas to avoid potential harm	<ul style="list-style-type: none"> <li>Undertake Due Diligence cultural heritage surveys in accordance with Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW to identify cultural heritage sites if works are required.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake Due Diligence cultural heritage surveys in accordance with Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW to identify cultural heritage sites if works are required.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake Due Diligence cultural heritage surveys in accordance with Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW to identify cultural heritage sites if works are required.</li> </ul>
	Cultural heritage items within the approved disturbance area, ECAs, Regeneration and Rehabilitation Areas are managed in accordance with the WCPL ACHMP (within DA boundaries) and Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW for areas elsewhere	<ul style="list-style-type: none"> <li>Continue implementation of WCPLs ACHMP, Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW and WCPLs GDP Process</li> </ul>	<ul style="list-style-type: none"> <li>Continue implementation of WCPLs ACHMP, Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW and WCPLs GDP Process</li> </ul>	<ul style="list-style-type: none"> <li>Continue implementation of WCPLs ACHMP, Due Diligence Code of Practice for the Protection of Aboriginal Objects in NSW and WCPLs GDP Process</li> </ul>
Fencing, Gates and Signage	Clearly delineate all Biodiversity Offset Areas, ECAs and Regeneration Areas	<ul style="list-style-type: none"> <li>Identify appropriate locations for signage</li> </ul>	<ul style="list-style-type: none"> <li>Install signage</li> </ul>	
	Prevent unauthorised human access and exclude livestock from areas of native regeneration (unless being used as within management program i.e. crash grazing) to all Management Domains	<ul style="list-style-type: none"> <li>Identify failed fences and gates</li> <li>Develop a fence repair and replacement program</li> <li>Undertake annual and opportunistic security inspections (fences, gates and signage). Schedule and undertake necessary repairs</li> </ul>	<ul style="list-style-type: none"> <li>Repair, replace or install new fences</li> <li>Undertake annual and opportunistic security inspections (fences, gates and signage). Schedule and undertake necessary repairs</li> </ul>	<ul style="list-style-type: none"> <li>Undertake annual and opportunistic security inspections (fences, gates and signage). Schedule and undertake necessary repairs</li> </ul>
	Access to the Management Domains is retained for maintenance and safety purposes	<ul style="list-style-type: none"> <li>Identify and map all access gates</li> </ul>	<ul style="list-style-type: none"> <li>Repair, replace or install new gates</li> <li>Undertake annual and opportunistic security inspections. Schedule and undertake necessary repairs</li> </ul>	<ul style="list-style-type: none"> <li>Undertake annual and opportunistic security inspections. Schedule and undertake necessary repairs</li> </ul>

**Table A6 Three Year Management Schedule (Continued)**

Management Strategy	Objectives	2019	2020	2021
Access Tracks	Reduce and rehabilitate unnecessary access tracks in all Biodiversity Offset Areas, ECAs and Regeneration Areas	<ul style="list-style-type: none"> <li>Identify and map all unnecessary access tracks</li> </ul>	<ul style="list-style-type: none"> <li>Decommission and rehabilitate all unnecessary access tracks as required</li> <li>Undertake annual and opportunistic rehabilitation inspection. Schedule and undertake necessary repairs</li> </ul>	<ul style="list-style-type: none"> <li>Undertake annual and opportunistic rehabilitation inspection. Schedule and undertake necessary repairs</li> </ul>
	Provide safe, unimpeded access for monitoring and maintenance, bushfire management, and asset protection in all Biodiversity Offset Areas, ECAs and Regeneration Areas	<ul style="list-style-type: none"> <li>Identify and map all access tracks required for safe and ongoing access, including tracks suitable for a CAT 1 tanker</li> <li>Develop a repair and maintenance program for existing tracks that are proposed to remain</li> <li>Seek relevant authorisation to enable construction of new access tracks (as required)</li> </ul>	<ul style="list-style-type: none"> <li>Repair existing access tracks required for safe and ongoing access as required</li> <li>Construct new access tracks</li> <li>Undertake annual and opportunistic access track inspection. Schedule and undertake necessary repairs</li> </ul>	<ul style="list-style-type: none"> <li>Undertake annual and opportunistic access track inspection. Schedule and undertake necessary repairs</li> </ul>
Waste Management	All Biodiversity Offset Areas, ECAs and Regeneration Areas are free of waste, disused buildings and redundant farm equipment	<ul style="list-style-type: none"> <li>Undertake a detailed waste inspection for the presence of dumped waste, disused buildings and redundant farm equipment</li> <li>Continue removal of all identified waste, disused buildings and redundant farm equipment</li> <li>Rehabilitation of disused building sites</li> <li>Undertake annual and opportunistic waste inspections. Schedule and commission removal of all additional waste</li> </ul>	<ul style="list-style-type: none"> <li>Removal of all identified waste, disused buildings and redundant farm equipment as required</li> <li>Rehabilitation of disused building sites</li> <li>Undertake annual and opportunistic waste inspections. Schedule and commission removal of all additional waste</li> </ul>	<ul style="list-style-type: none"> <li>Undertake annual and opportunistic waste inspections. Schedule and commission removal of all additional waste</li> <li>Include disused building sites in annual and opportunistic inspections. Schedule and undertake necessary repairs</li> </ul>

**Table A6 Three Year Management Schedule (Continued)**

Management Strategy	Objectives	2019	2020	2021
Erosion, Sedimentation and Soil Management	Erosion, sediment or soil (ie. Salinity) risks are identified and mapped in all Biodiversity Offset Areas, ECAs and Regeneration Areas	<ul style="list-style-type: none"> <li>Undertake a detailed inspection of all Biodiversity Offset Areas, ECAs and Regeneration Areas and accurately map areas that present an erosion, sediment or soil (ie. Salinity) risk</li> </ul>	<ul style="list-style-type: none"> <li>Erosion, sediment or soil risks are categorised and included in WCPLs GIS database</li> <li>Undertake annual and opportunistic erosion, sediment and soil inspections. Update GIS database with necessary changes</li> </ul>	<ul style="list-style-type: none"> <li>Undertake annual and opportunistic erosion, sediment and soil inspections. Update GIS database with necessary changes</li> </ul>
	A risk based monitoring and management plan is developed for erosion, sediment and soil risks in all Biodiversity Offset Areas, ECAs and Regeneration Areas	<ul style="list-style-type: none"> <li>Undertake a detailed inspection of all Biodiversity Offset Areas, ECAs and Regeneration Areas and accurately map areas that present an erosion, sediment or soil (i.e. Salinity) risk</li> </ul>	<ul style="list-style-type: none"> <li>Develop a risk based monitoring and management plan for erosion, sediment or soil risks as part of WCPLs Erosion and Sediment Control Plan</li> <li>Implement management measures for high risk areas</li> <li>Undertake annual and opportunistic erosion, sediment or soil inspections. Schedule and undertake necessary repairs</li> </ul>	<ul style="list-style-type: none"> <li>Continue to implement WCPLs Erosion and Sediment Control Plan</li> <li>Undertake annual and opportunistic erosion, sediment or soil inspections. Schedule and undertake necessary repairs</li> </ul>
Grazing and Stock Management	Exclude livestock from areas of native regeneration in all Biodiversity Offset Areas, ECAs and Regeneration Areas (unless being used as within management program)	<ul style="list-style-type: none"> <li>Repair, replace or install new livestock exclusion fences</li> <li>Undertake opportunistic and annual inspections. Schedule and undertake necessary repairs</li> </ul>	<ul style="list-style-type: none"> <li>Repair, replace or install new livestock exclusion fences</li> <li>Undertake opportunistic and annual inspections. Schedule and undertake necessary repairs</li> </ul>	<ul style="list-style-type: none"> <li>Undertake opportunistic and annual inspections. Schedule and undertake necessary repairs</li> </ul>
	Consider livestock as a rehabilitation management tool	<ul style="list-style-type: none"> <li>Review rehabilitation performance towards completion criteria</li> <li>If deemed appropriate, seek technical advice regarding the use of livestock as a rehabilitation management tool</li> </ul>	<ul style="list-style-type: none"> <li>Review rehabilitation performance towards completion criteria</li> <li>If deemed appropriate, seek technical advice regarding the use of livestock as a rehabilitation management tool</li> </ul>	<ul style="list-style-type: none"> <li>Review rehabilitation performance towards completion criteria</li> <li>If deemed appropriate, seek technical advice regarding the use of livestock as a rehabilitation management tool</li> </ul>



**Table A6 Three Year Management Schedule (Continued)**

Management Strategy	Objectives	2019	2020	2021
Seed Collection and Propagation	All seed collectors are appropriately qualified and trained	<ul style="list-style-type: none"> <li>Confirm training records for engaged seed collectors</li> </ul>	<ul style="list-style-type: none"> <li>Confirm training records for engaged seed collectors</li> </ul>	<ul style="list-style-type: none"> <li>Confirm training records for engaged seed collectors</li> </ul>
	Local species are included in revegetation and rehabilitation seed mixes	<ul style="list-style-type: none"> <li>Identify available seed species</li> <li>Species collected to align with BVT species list and as required for site rehabilitation</li> </ul>	<ul style="list-style-type: none"> <li>Identify available seed species</li> <li>Species collected to align with BVT species list and as required for site rehabilitation</li> </ul>	<ul style="list-style-type: none"> <li>Identify available seed species</li> <li>Species collected to align with BVT species list and as required for site rehabilitation</li> </ul>
	Locally sourced seed is available for revegetation and rehabilitation works within all Management Domains	<ul style="list-style-type: none"> <li>Implement Seed Collection Program</li> </ul>	<ul style="list-style-type: none"> <li>Implement Seed Collection Program</li> </ul>	<ul style="list-style-type: none"> <li>Implement Seed Collection Program</li> </ul>
Habitat Augmentation	Habitat augmentation opportunities are identified and assessed	<ul style="list-style-type: none"> <li>Implement Habitat Augmentation Procedure and recommendations where applicable</li> </ul>	<ul style="list-style-type: none"> <li>Implement Habitat Augmentation Procedure and recommendations where applicable</li> </ul>	<ul style="list-style-type: none"> <li>Implement Habitat Augmentation Procedure and recommendations where applicable</li> </ul>

**Table A6 Three Year Management Schedule (Continued)**

Management Strategy	Objectives	2019	2020	2021
Revegetation and Regeneration	Increase overall native plant species richness in ECAs, Regeneration and Rehabilitation Areas	<p><b>ECA-B</b></p> <p>Revegetation of local native over-storey and shrub species within poor condition areas</p> <p><b>Regeneration Area 1</b></p> <p>Opportunistic supplementary tree planting</p> <p><b>Regeneration Area 9</b></p> <p>Opportunistic supplementary tree planting</p>	<p><b>ECA-B</b></p> <p>Continue revegetation works of local species</p> <p><b>Regeneration Area 1</b></p> <p>Opportunistic supplementary tree planting</p> <p><b>Regeneration Area 2</b></p> <p>Implement revegetation works of local native over-storey and shrub species within poor condition areas</p> <p><b>Regeneration Area 4</b></p> <p>Implement planting/seeding of mid-storey native plant species in areas of no to low resilience</p> <p><b>Regeneration Area 5</b></p> <p>Implement planting/seeding of mid-storey native plant species in areas of no to low resilience</p> <p><b>Regeneration Area 9</b></p> <p>Implement planting/seeding of native grasses, herbs and shrubs in poor condition areas</p> <p>Undertake annual and opportunistic revegetation and regeneration inspections.</p>	<p>Undertake annual and opportunistic revegetation and regeneration inspections.</p> <p>Schedule and undertake necessary maintenance including reapplication of seed or supplementary tree and shrub planting.</p>

**Table A6 Three Year Management Schedule (Continued)**

Management Strategy	Objectives	2019	2020	2021
Weed Management	Noxious and environmental weeds are identified and mapped in all Biodiversity Offset Areas, ECAs and Regeneration Areas	<ul style="list-style-type: none"> <li>Undertake a detailed inspection of all Biodiversity Offset Areas, ECAs and Regeneration Areas and accurately map (GIS) noxious and environmental weeds</li> </ul>	<ul style="list-style-type: none"> <li>Undertake quarterly weed inspections. Update GIS database with necessary changes</li> </ul>	<ul style="list-style-type: none"> <li>Undertake quarterly weed inspections. Update GIS database with necessary changes</li> </ul>
	A risk based weed management program is developed for all Biodiversity Offset Areas, ECAs, Regeneration and Rehabilitation Management Domains	<ul style="list-style-type: none"> <li>Implement weed management program</li> <li>Undertake weed inspections</li> <li>Schedule and undertake necessary weed treatment</li> </ul>	<ul style="list-style-type: none"> <li>Implement weed management program</li> <li>Undertake weed inspections</li> <li>Schedule and undertake necessary weed treatment</li> </ul>	<ul style="list-style-type: none"> <li>Implement weed management program</li> <li>Undertake weed inspections</li> <li>Schedule and undertake necessary weed treatment</li> </ul>
	Reduced presence of noxious and environmental weeds	<ul style="list-style-type: none"> <li>Implement management measures for high risk areas identified from weed inspection</li> </ul> <p>Specific Actions include:</p> <ul style="list-style-type: none"> <li>Continued Control of St Johns Wort, Blackberry and Juncus acutus (Spiny Rush) along Cumbo Creek within ECA-A and Regeneration Area 2</li> <li>Continued Control of St Johns Wort, Blackberry and Juncus acutus (Spiny Rush) along Wilpinjong Creek within ECA-B and Regeneration Areas 1, 5 and 9</li> <li>Broad-leaf weed treatment in poor condition native pastures within ECA-B, and Regeneration Areas 1 and 9</li> <li>Follow-up control of Blackberry and tree-of-heaven within Regeneration Area 7</li> <li>Implement control of St Johns Wort in 'pre-strip' areas 2 years ahead of mining</li> </ul>	<ul style="list-style-type: none"> <li>Implement weed management program</li> </ul> <p>Specific Actions include:</p> <ul style="list-style-type: none"> <li>Continued Control of St Johns Wort, Blackberry and Juncus acutus (Spiny Rush) along Cumbo Creek within ECA-A and Regeneration Area 2</li> <li>Continued Control of St Johns Wort, Blackberry and Juncus acutus (Spiny Rush) along Wilpinjong Creek within ECA-B and Regeneration Areas 1, 5 and 9</li> <li>Broad-leaf weed treatment in poor condition native pastures within ECA-B, and Regeneration Areas 1 and 9</li> <li>Targeted spraying of blackberry and Juncus acutus (Spiny Rush) along Wilpinjong Creek within ECA-B and Regeneration Areas 1 and 5</li> <li>Continue control of St Johns Wort in 'pre-strip' areas 2 years ahead of mining</li> </ul>	<ul style="list-style-type: none"> <li>Implement weed management program</li> </ul> <p>Specific Actions include:</p> <ul style="list-style-type: none"> <li>Continued Control of St Johns Wort, Blackberry and Juncus acutus (Spiny Rush) along Cumbo Creek within ECA-A and Regeneration Area 2</li> <li>Continued Control of St Johns Wort, Blackberry and Juncus acutus (Spiny Rush) along Wilpinjong Creek within ECA-B and Regeneration Areas 1, 5 and 9</li> <li>Targeted spraying of blackberry and Juncus acutus (Spiny Rush) along Wilpinjong Creek within ECA-B and Regeneration Areas 1 and 5</li> <li>Continue control of St Johns Wort in 'pre-strip' areas 2 years ahead of mining</li> </ul>

**Table A6 Three Year Management Schedule (Continued)**

Management Strategy	Objectives	2019	2020	2021
Vertebrate Pest Management	Control vertebrate pest species likely to pose a threat to the Biodiversity Offset Areas, ECAs and Regeneration and Rehabilitation Areas	<ul style="list-style-type: none"> <li>Consult with LLS in developing a vertebrate pest management program</li> <li>Implement management measures for high risk areas identified in the detailed inspection</li> </ul>	<ul style="list-style-type: none"> <li>Implement vertebrate pest management program</li> </ul>	<ul style="list-style-type: none"> <li>Implement vertebrate pest management program</li> </ul>
Bushfire Management	Maintain the environmental and habitat features of the Biodiversity Offset Areas, ECAs and Regeneration and Rehabilitation Areas	<ul style="list-style-type: none"> <li>In consultation with the NSW RFS, review and update the WCPL Bushfire Management to include management controls for all Management Domains</li> <li>Identify the need for Asset protection Zones (APZ) for the Biodiversity Offset Areas, ECAs and Regeneration and Rehabilitation Areas</li> <li>Establish APZ's as required</li> </ul>	<ul style="list-style-type: none"> <li>Implement WCPL Bushfire Management</li> <li>Install and maintain APZs</li> </ul>	<ul style="list-style-type: none"> <li>Implement WCPL Bushfire Management</li> <li>Maintain APZs</li> </ul>
Biodiversity Monitoring	Monitor biodiversity within the Biodiversity Offset Areas, ECAs and Regeneration and Rehabilitation Areas to assess progress against interim, performance and completion criteria	<ul style="list-style-type: none"> <li>Implement Biodiversity Monitoring Program and analyse results against interim, performance and completion criteria and undertake corrective actions where required.</li> </ul>	<ul style="list-style-type: none"> <li>Implement Biodiversity Monitoring Program and analyse results against interim, performance and completion criteria and undertake corrective actions where required.</li> <li>Establish Local Benchmark Sites in consultation with OEH by September 2020.</li> </ul>	<ul style="list-style-type: none"> <li>Implement Biodiversity Monitoring Program and analyse results against interim, performance and completion criteria and undertake corrective actions where required.</li> </ul>
Inspections and Document Control	Ensure implemented management actions are successful in progressing towards completion criteria	<ul style="list-style-type: none"> <li>Undertake and document Inspections</li> </ul>	<ul style="list-style-type: none"> <li>Undertake and document inspections</li> </ul>	<ul style="list-style-type: none"> <li>Undertake and document inspections</li> </ul>
	All actions, monitoring data and performance outcomes are documented and reported	<ul style="list-style-type: none"> <li>Document all actions, monitoring data and performance outcomes</li> </ul>	<ul style="list-style-type: none"> <li>Document all actions, monitoring data and performance outcomes</li> </ul>	<ul style="list-style-type: none"> <li>Document all actions, monitoring data and performance outcomes</li> </ul>

**Table A6 Three Year Management Schedule (Continued)**

Management Strategy	Objectives	2019	2020	2021
Management of Biodiversity Offsets 1-5	Manage Biodiversity Offset Areas 1-5 and facilitate their transfer to the National Parks Estate.	<ul style="list-style-type: none"> <li>Undertake general weed and pest control.</li> </ul>	<ul style="list-style-type: none"> <li>Remove internal fencing from the Biodiversity Offset Areas not required by the NPWS.</li> </ul>	<ul style="list-style-type: none"> <li>Demolition and removal of any houses and/or buildings that are not required by the NPWS.</li> <li>Undertake a survey of the Biodiversity Offset Area boundaries that do not follow existing cadastral boundaries (and any necessary lot subdivision with the assistance of the Mid-Western Regional Council).</li> </ul>
Early establishment of Regent Honeyeater habitat in available areas	Establish Regent Honeyeater habitat within existing mine rehabilitation areas where rehabilitation to date has focussed on the establishment of productive pasture for grazing.	<ul style="list-style-type: none"> <li>Develop suitable rehabilitation performance and completion criteria for the establishment of Regent Honeyeater habitat in consultation with OEH.</li> </ul>	<ul style="list-style-type: none"> <li>Commence the control of non-native species and re-seeding of select existing rehabilitation areas to a combination of suitable native plant species (e.g. key canopy species of recognised target BVTs).</li> </ul>	<ul style="list-style-type: none"> <li>Undertake monitoring of Rehabilitation Areas and determine initial success of non-native species control and re-seeding works.</li> <li>Continue to implement the control of non-native species and re-seeding of select existing rehabilitation areas to a combination of suitable native plant species (e.g. key canopy species of recognised BVTs).</li> </ul>
Rehabilitation of the Mine site to recognised habitat and ecosystem values	Establish recognised BVTs and Regent Honeyeater habitat in the Rehabilitation Areas.	<ul style="list-style-type: none"> <li>Develop suitable BVT performance and completion criteria in consultation with OEH.</li> </ul>	<ul style="list-style-type: none"> <li>Develop target post-mining BVT mapping across the Mine site to satisfy the credit requirements. Conduct BioMetric evaluation of select existing woodland rehabilitation areas to inform the implementation of residual measures.</li> </ul>	<ul style="list-style-type: none"> <li>Commence implementation of rehabilitation strategy to develop BVT and Regent Honeyeater habitat.</li> </ul>
Propagation of <i>Ozothamnus tessellatus</i>	Successfully propagate <i>Ozothamnus tessellatus</i> in suitable Mine site rehabilitation areas.	<ul style="list-style-type: none"> <li>Collect seeds of the threatened <i>Ozothamnus tessellatus</i> from the known populations within the open cut extension and infrastructure areas and throughout the Biodiversity Offset Areas.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake propagation trials in germination trays with various soils and treatments.</li> </ul>	<ul style="list-style-type: none"> <li>Undertake trial plantings of <i>Ozothamnus tessellatus</i> within potentially suitable rehabilitation areas.</li> </ul>
Revegetation works along Cumbo and Wilpinjong Creeks	Establish revegetation on sections of Cumbo and Wilpinjong Creeks in WCPL and Peabody ownership.	<ul style="list-style-type: none"> <li>Develop a works program detailing the revegetation activities to be conducted along Cumbo and Wilpinjong Creeks.</li> </ul>	<ul style="list-style-type: none"> <li>Commence implementation of the works program.</li> </ul>	<ul style="list-style-type: none"> <li>Continue to implement the works program with remedial measures as required.</li> </ul>



APPENDIX 7

WILPINJONG CREEK MANAGEMENT STRATEGY