



# DARTBROOK MINE

## FLORA AND FAUNA MANAGEMENT PLAN

*for Dartbrook Operations Pty Ltd*

*22 February 2024*

## DOCUMENT CONTROL

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# 1. INTRODUCTION

## 1.1 BACKGROUND

Dartbrook Mine is owned by an unincorporated Joint Venture (Dartbrook Joint Venture) between Australian Pacific Coal (AQC) and Tetra Resources Pty Ltd (Tetra). Dartbrook Operations Pty Ltd (Dartbrook Operations) is the appointed operating management company and the Mine Operator under Section 5 of the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2022*. The Dartbrook Joint Venture will acquire AQC Dartbrook Management Pty Ltd (ABN 62 007 377 577) which is the holder of the site Development Consent and Environment Protection Licence, and AQC Dartbrook Pty Ltd (ABN 46 000 012 813) which is the holder of the relevant mining and coal authorities.

Dartbrook Mine is located approximately 10 km north-west of Muswellbrook and 4.5 km south-west of the village of Aberdeen in New South Wales (see **Figure 1**). Dartbrook Mine operated as an underground longwall coal mine from 1993 until December 2006, when it was placed in care and maintenance by the previous owner, Anglo Coal (Dartbrook Management) Pty Ltd (ACDM). The mine was acquired by AQC in 2017 and remained in care and maintenance throughout AQC’s period of ownership.

Dartbrook Mine is authorised by Development Consent DA 231-07-2000 granted under the *Environmental Planning and Assessment Act 1979* (EP&A Act). DA 231-07-2000 was granted on 28 August 2001 and has been modified on seven occasions (as summarised in **Table 1**). DA 231-07-2000 enables mining operations to be carried out until 5 December 2027.

Dartbrook Operations is preparing to recommence mining activities in 2024, thereby transitioning Dartbrook Mine from care and maintenance back to an operational phase.

**Table 1** Modifications to DA 231-07-2000

Modification	Approval Date	Activities
MOD 1	19 June 2002	MOD1 was an administrative modification to DA 231-07-2000 that altered the conditions regarding blasting notifications and structural inspections.
MOD 2	16 June 2003	MOD2 approved the construction and operation of an additional emergency tailings storage cell at the Coal Handling and Processing Plant (CHPP).
MOD 3	4 November 2003	<p>MOD3 proposed the following changes to the site access arrangements:</p> <ul style="list-style-type: none"> <li>Continued use of Dartbrook Road to provide access to the West Site; and</li> <li>Use of local public roads by traffic associated with Dartbrook Mine.</li> </ul> <p>Prior to construction of the Kayuga Mine Access Road, access to the West Site was via Dartbrook Road. It was envisaged that Kayuga Mine Access Road would replace Dartbrook Mine as the primary access to the West Site. However, the Kayuga Mine Access Road was being used by trucks to haul coal to the CHPP. To avoid interactions between haul trucks and private vehicles, MOD3 proposed that Dartbrook Road should continue to be used as the primary access road for mine personnel.</p> <p>MOD3 also sought approval for locally based employees to access the West Site via local roads (Kayuga Road, Dartbrook Road and Blairmore Lane). For employees residing in the surrounding areas, these local roads provide more convenient access than the Western Access Road.</p>

Modification	Approval Date	Activities
MOD 4	30 March 2004	DA 231-07-2000 allowed for truck haulage of coal to the CHPP over an 18-month period. Truck haulage was to be discontinued upon completion of the conveyor system for the Kayuga Seam, which would enable coal to be transferred to the CHPP via the Hunter Tunnel. MOD 4 extended the duration of truck haulage by 3 months to allow for haulage to continue until the completion of the Kayuga Seam conveyor system.
MOD 5	4 May 2005	MOD 5 facilitated changes to the rejects disposal system at Dartbrook Mine. The approved rejects disposal system involved the commissioning of a pipeline and pumping system for the transportation and disposal of reject materials. Engineering studies indicated that this method would pose significant technical risks due to the variability in relative quantities of coarse and fine rejects produced by the CHPP. MOD5 obtained approval for rejects to be transported to the Rejects Emplacement Area (REA) using trucks.
MOD 6	16 November 2005	MOD 6 provided approval for the following activities: <ul style="list-style-type: none"> <li>Establishment of four new Run of Mine (ROM) coal stockpiles and expansion of the existing emergency ROM coal stockpile at the CHPP;</li> <li>Disposal of tailings within the Wynn Seam goaf; and</li> <li>Operation of a Nitrogen Injection Plant to prevent the oxidation of coal.</li> </ul>
MOD 7	11 March 2022	MOD 7 was determined by the NSW Independent Planning Commission (IPCN) on 9 August 2019. The IPCN approved the alternate mining method (bord and pillar mining) but not the proposed five-year extension to the duration of mining operations. Without the extension to operate under DA 231-07-2000 for a further five years, it was impractical to recommence mining at Dartbrook. In November 2019, an appeal was lodged against the IPCN's determination in the NSW Land and Environment Court. The court proceedings were resolved on 11 March 2022, with the proposed five-year extension of mining being approved. As a result, DA 231-07-2000 currently enables mining operations to be undertaken until 5 December 2027.

## 1.2 SITE LAYOUT

Dartbrook generally consists of the following main components:

- West Site surface facilities including workshop and maintenance facilities, administration building and underground mine portals;
- East Site surface facilities including the Coal Handling and Preparation Plant (CHPP), rail loop, train loading facilities and Rejects Emplacement Area (REA);
- Wynn Seam underground mine workings which are decommissioned and are used for tailings disposal and mine water storage;
- Kayuga Seam underground mine workings, which will be an active mining domain upon recommencement; and
- Hunter Tunnel which connects the underground mine workings to the East Site surface facilities.

Figure 2, Figure 3 and Figure 4 shows the location of the features of Dartbrook Mine.

### 1.3 PURPOSE

The Flora and Fauna Management Plan (FFMP) documents flora and fauna management strategies for areas that may be affected by Dartbrook operations. The primary objective of the plan is to manage and minimise the impact of Dartbrook on the ecological values of the site. This objective will be met through the implementation of the management measures specified in **Section 4**.

### 1.4 MANAGEMENT PLAN REQUIREMENTS

The FFMP has been developed in accordance with the development consent conditions for Dartbrook. The plan includes flora and fauna management strategies for all components of Dartbrook's Operations.

The specific requirements of the FFMP are contained in development consent condition 3.5 (a). These requirements are listed in **Table 2** with a reference to where each specific requirement is addressed in the management plan.

**Table 2** Flora and Fauna Management Plan Requirements

Development Consent Conditions	Status and Section of Document
<b>3.5 Flora and Fauna Assessment, Management and Monitoring</b>	
<b><u>Assessment and Management</u></b>	
(a) The Applicant must prior to recommencement of construction or Mining Operations prepare and implement a Flora and Fauna Management Plan for the management of flora and fauna issues for the DA area. The Plan is specifically required to outline procedures for clearing or disturbing vegetation and other habitat types, along with measures for habitat reinstatement and management.  The Plan must be prepared in consultation with DPIE Environment and to the satisfaction of the Secretary. The Plan must be prepared by an appropriately qualified and experienced ecologist. The ecologist must be responsible for providing advice to minimise potential impacts upon threatened and protected fauna species that may utilise the site and to provide expert advice on the regeneration and reconstruction of flora and fauna habitat on mined areas. The Plan must include but not be limited to:	This Plan  <b>Section 1.5</b>
(i) Details of strategic vegetation management, outlining timeframes for clearing and re-vegetation activities and a map illustrating the Plan. The Plan should aim to maximise scope for new vegetation to establish and restore ecological integrity;	<b>Section 4.2 and 4.3</b>
(ii) Details of the schedule for clearing activities incorporating seasonal habitat requirements for species such as bats and other mammals, with the objective of avoiding incidents during sensitive hibernation and breeding periods;	<b>Section 4.3.1</b>
(iii) Details of methods of how medium to large tree hollows (defined as being greater than 20 centimetres in diameter) and nests removed during construction are salvaged and replaced in adjacent vegetation; and	<b>Section 4.3.1</b> <b>Section 7</b>
(iv) Details of management measures to be applied if threatened species identified in the EIS are found on site.	<b>Section 4.3.2</b>

Development Consent Conditions	Status and Section of Document
(b) If threatened species, not identified in the EIS, are identified on the site during construction or operation of the coal mine, the Applicant must cease any work immediately which could adversely impact on the species, pending investigation and negotiation of ameliorative measures. The Applicant must advise the DPIE Environment and engage a suitable qualified person to investigate, and identify appropriate amelioration measures.	Section 4.3.2
(c) The Applicant must ensure that the construction and operation of ventilation shafts must not require the clearing of trees, where practicable.	Section 4.2.1
(d) The Applicant must ensure that any vegetated areas cleared for construction purposes and not utilised in the Mining Operations are restored at least to its original condition.	Section 4.3.3
(e) The Applicant must use locally endemic species for revegetation purposes.	Section 4.3.3
(f) The Applicant must during the life of the mine and until the revegetated areas are established to the satisfaction of the Resources Regulator, maintain revegetated areas. Maintenance must include, where necessary, but not limited to: <ul style="list-style-type: none"> <li>• Replanting failed or unsatisfactory areas;</li> <li>• Repairing erosion problems;</li> <li>• Fire management – fire suppression or fire encouragement;</li> <li>• Pest and weed control;</li> <li>• Control of feral animal populations;</li> <li>• Maintain and repair fencing;</li> <li>• Fertiliser application; and</li> <li>• Application of lime or gypsum to control pH and improve soil structure.</li> </ul>	Section 4.3.3
(g) As well as the requirements under subclause (g), the efforts and progress of the Flora and Fauna Management Plan must be documented in the Annual Review.	Section 6.1
(h) Measures to control invasion of weeds as a result of construction activities must be addressed and managed.	Sections 4.3.1, 4.3.3 and 4.3.4
(i) The Applicant must not clear vegetation in advance of the immediate area required for use during construction or operation of the rejects emplacement area.	Section 4.2.2
<b>Monitoring</b> (j) The restoration works must be monitored. The results of the monitoring and the effectiveness of the restoration must be reported as part of the Annual Review.	Section 5
(k) The Applicant must prepare a detailed monitoring program from habitat areas within the DA area, including any wetlands and aquatic habitats, during the development and for a period after the completion of the development to be determined by the Secretary in consultation with DPIE Environment. The monitoring program must be included in the	Section 5

Development Consent Conditions	Status and Section of Document
<p>Flora and Fauna Management Plan (Condition 3.5(a)) and a summary of the results must be provided in the Annual Review. The program must:</p> <ul style="list-style-type: none"> <li>(i) Monitor impacts attributable to the development and include monitoring of the success of any restoration or reconstruction works. The Applicant must carry out any further works required by the Secretary and Resources Regulator as a result of the monitoring;</li> <li>(ii) Establish an ongoing monitoring program of the existing and proposed revegetated areas to assess their floristics and structure and to propose contingency measures for improvements to revegetation if required; and</li> <li>(iii) Establish an ongoing monitoring program in the rejects emplacement area, of fauna species diversity and abundance and the effectiveness of reconstructed ecosystems in providing fauna habitat and contingency measures should impacts be identified as occurring.</li> </ul> <p><b>Note:</b> <i>The information obtained from the monitoring must be used to guide future revegetation efforts on the mine site.</i></p>	

## 1.5 STAKEHOLDER ENGAGEMENT

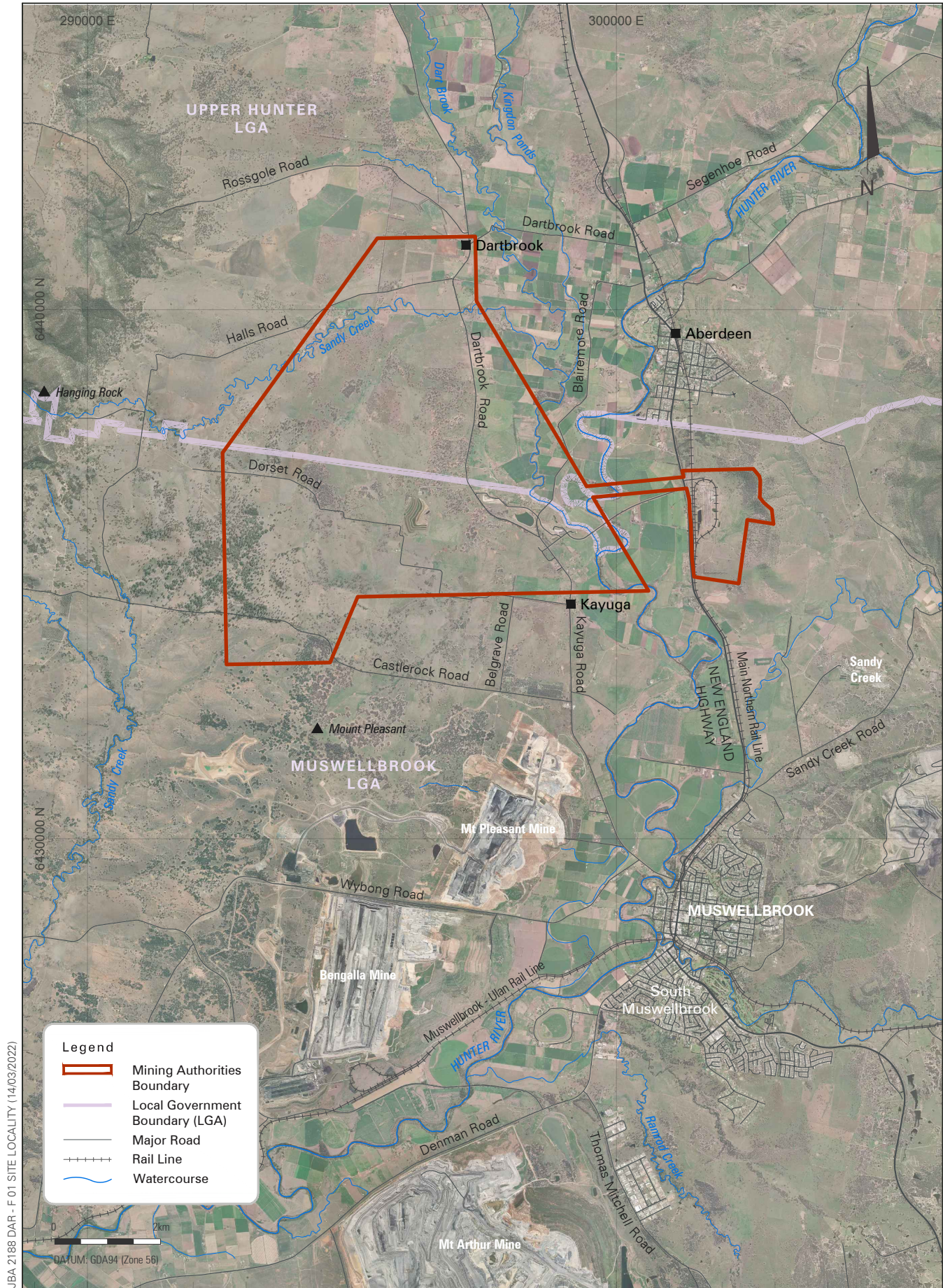
Condition 3.5 (a) of the Development Consent requires that the FFMP be prepared in consultation with the DPIE Environment (now known as the Department of Planning, Housing and Infrastructure (DPHI) and to the satisfaction of the Secretary. The plan must be prepared by an appropriately qualified and experienced ecologist.

The FFMP was initially prepared, revised and updated by environmental consultants, Hansen Consulting. This revision of the FFMP has been undertaken by duly qualified environmental consultants James Bailey and Associates (JBA) and represents a minor update to incorporate the recommencement of Bord and Pillar mining.

The draft FFMP was provided to the Biodiversity and Conservation Division (BCD) of DPE for comment on 14 November 2022. BCD recommended the addition of one listed species (Striped Legless Lizard, *Delma impar*) to the monitoring program. This recommendation has been adopted, as explained in **Section 4.3.2**.

Correspondence with DPE and BCD during the preparation of this plan is included in **Appendix A**.





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JBA 2188 DAR - F 02 EXISTING SITE LAYOUT (14/03/2022)

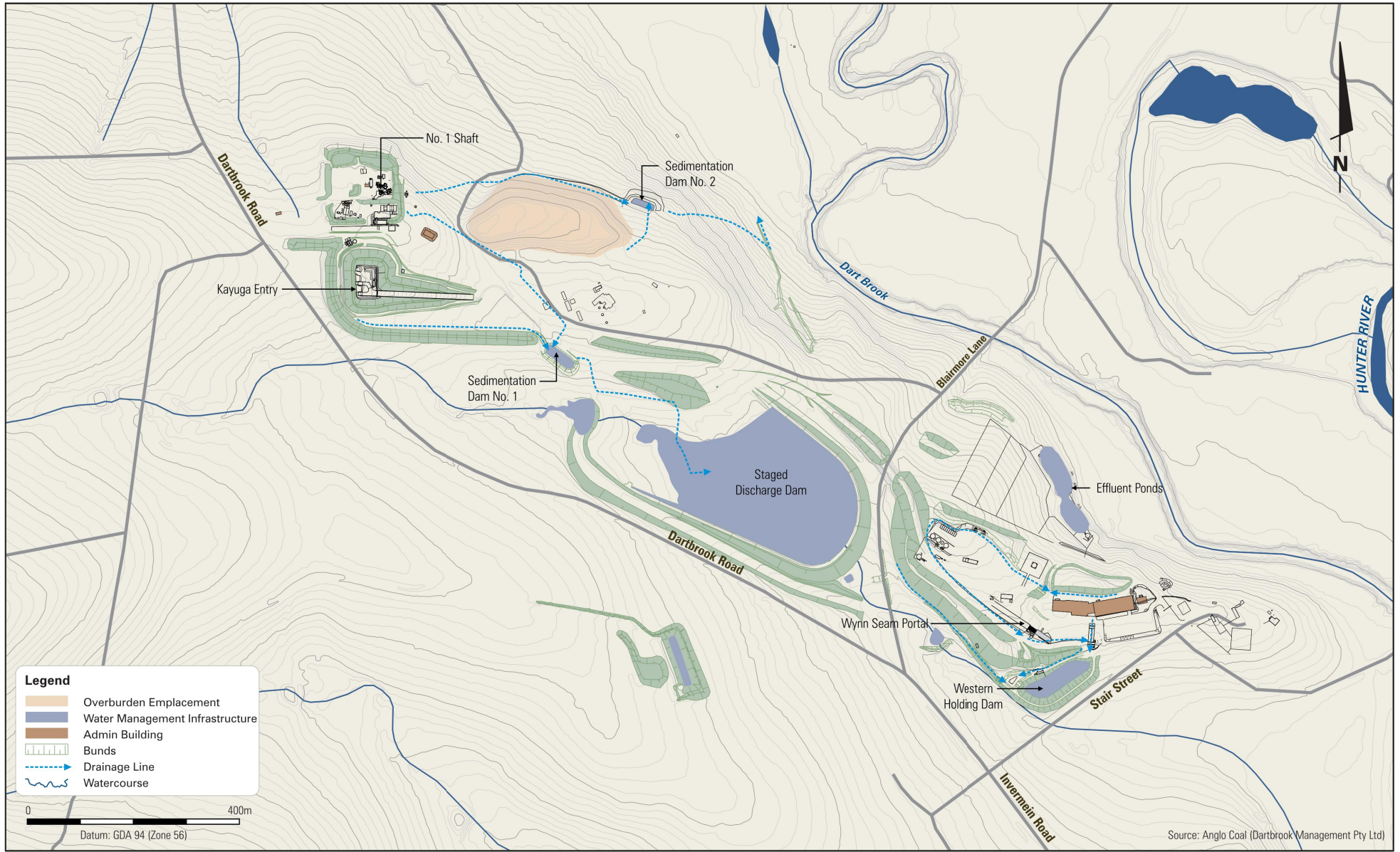
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Existing Site Layout

**FIGURE 2**



JBA 2188 DAR - F 03 EXISTING SITE LAYOUT (WEST) (25/02/2022)



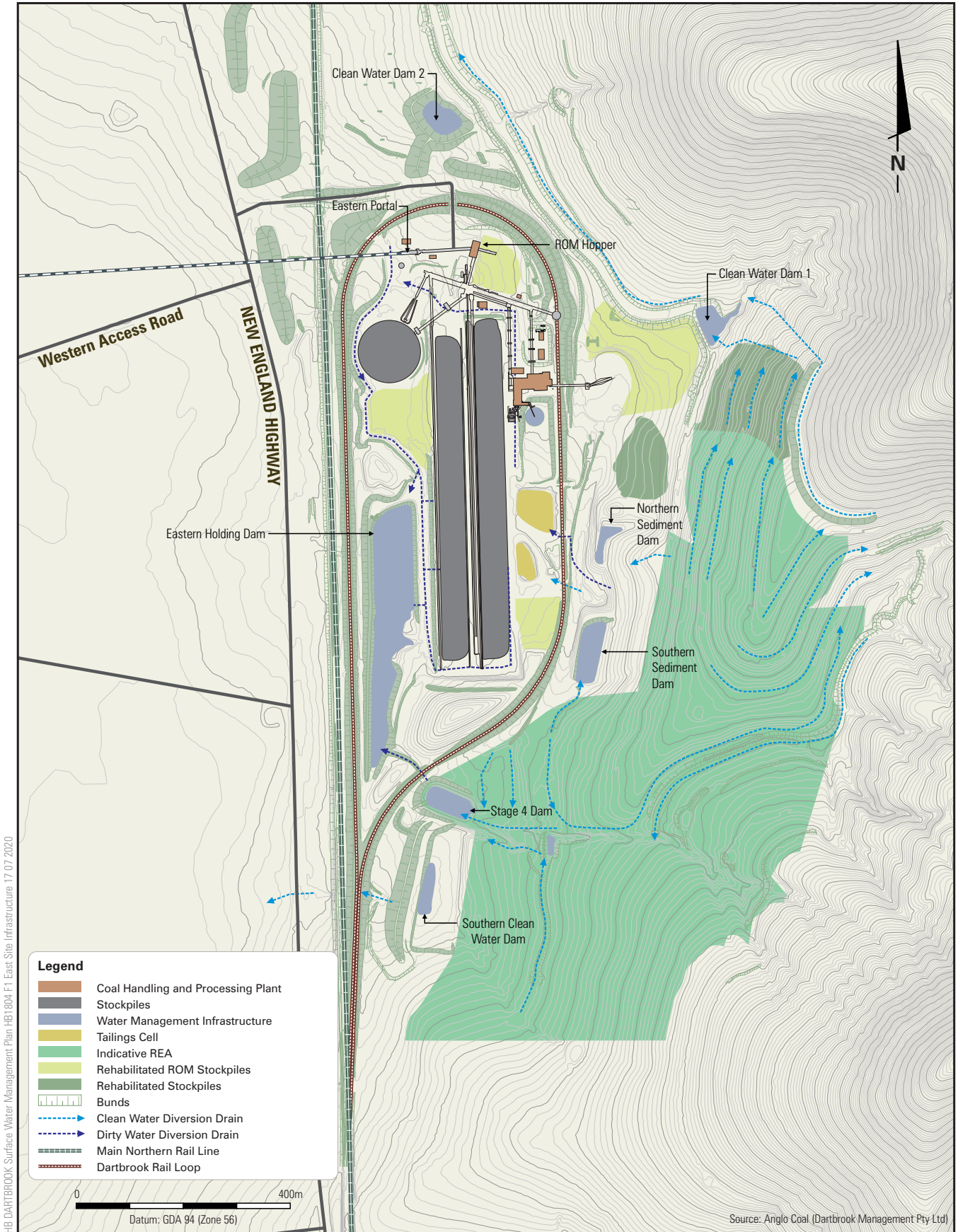
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Dartbrook Mine Layout - West Site

**FIGURE 3**







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Dartbrook Mine Layout - East Site

**FIGURE 4**

## 2. CRITERIA

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Relevant criteria and performance measures for Flora and Fauna is included in Table 1 of Condition 3.3 (d) and Table 3 of Condition 3.7 (a) (refer to **Table 3** below).

Performance measures included in Condition 3.3 (d) relate to subsidence impacts on natural and heritage features associated with second workings. More detailed performance criteria for performance measures associated with subsidence impacts will be included in the Extraction Plan required to be prepared for all second workings in accordance with Condition 3.3 of the Development Consent.

Table 3 of Condition 3.7 (a) pertains to Rehabilitation Objectives for the site. Management and controls measures to be implemented to ensure the performance measures and objectives are met, are detailed in **Section 4**.

**Table 3**      **Flora and Fauna Performance Measures and Objectives**

Development Consent Condition	Feature	Performance Measure / Objective
3.3 (d)	Threatened species, threatened populations, or endangered ecological communities	<ul style="list-style-type: none"> <li>Negligible environmental consequences</li> </ul>
3.7 (a)	Areas proposed for native ecosystem reestablishment	<ul style="list-style-type: none"> <li>Establish self-sustaining ecosystems comprising flora species selected to re-establish and complement local and regional biodiversity</li> </ul>

## 3. EXISTING ENVIRONMENT

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### 3.1 INTRODUCTION

A detailed Flora and Fauna Ecological Study and Aquatic Ecology Assessment of the Dartbrook Extended operations was included in the *Dartbrook Extended Environmental Impact Statement (EIS)* (HLA-Envirosciences, 2000). Subsequent studies have also been undertaken in 2012 and 2015 by Cumberland Ecology.

These studies included field surveys of surface areas within the Dartbrook and Dartbrook Extended mining lease boundaries (**Figure 1**). This section presents a summary of the existing environment based on the findings of these studies.

### 3.2 EXISTING ECOLOGY

The surface area within the boundary of the Dartbrook mining leases consists predominantly of pastoral grassland that has been extensively cleared in the past for grazing. Some areas of the pastoral grassland include relatively sparse and fragmented patches of woodland vegetation. These fragmented patches occur as sporadically distributed individual trees or clusters of trees. These fragmented woodland vegetation areas have little or no under-storey vegetation due to grazing and therefore have limited fauna habitat value.

There is a strip of intensive agriculture on the alluvial floodplain associated with the Hunter River and Dart Brook; along the eastern boundary of the western section of the mining lease area. This area is highly disturbed and largely devoid of natural vegetation or fauna habitat. Previous owners ACDM have carried out extensive plantings of River red Gums along the Hunter River and Dart Brook.

The eastern section of the mining lease area contains the existing CHPP facilities and the REA site. The majority of this area has been extensively cleared in the past for grazing and has limited habitat value. Part of the remnant woodland associated with the summit of Browns Mountain is located within the north-eastern corner of this area (**Figure 2**). This remnant woodland area is also devoid of any significant under-storey vegetation due to historical grazing which has been discontinued.

Trees found on the site include the Grey Box, Narrow-leaved Ironbark, Broad-leaved Ironbark, White Box, Spotted Gum, Blakely's Red Gum, Yellow Box, River Red Gum, Rough-barked Angophora, River Oak, Kurrajong and the Weeping Pittosporum. Exotic trees present are the Peppercorn Tree, White Cedar and Weeping Willows. Grey Box is the dominant tree species within the area. Trees on the site reach a maximum height of approximately 25 m.

No threatened flora or fauna species, populations, or communities, listed in the *Threatened Species Conservation Act 1995* (TSC Act) were identified in the Dartbrook mining leases during the EIS flora and fauna field surveys on areas that would be affected by the operations.

The EIS included a search of the National Parks and Wildlife Service (NPWS) GIS database for Muswellbrook and environs (covering an area of 1,600 km<sup>2</sup>) for threatened species. The database recorded a total of 8 threatened species in the region. The majority of these species are recorded from only one or two records. No threatened species were recorded on the Dartbrook mining leases. The Eight Part Test of Significance, specified in the TSC Act, was applied to threatened species recorded in the region, and to an additional 6 species that are not on the NPWS database but may occur in the region. The significance test results indicate that no significant effects or impacts on these species are anticipated as a result of Dartbrook's operations. The test results also indicated that the areas to be disturbed as a result of Dartbrook's operations do not represent critical habitat for any of these species.

The application of *State Environmental Planning Policy (SEPP) 44 – Koala Habitat Protection*, established that the vegetation on the site did not represent core Koala Habitat due to past clearing activities in the area. The last record of Koalas in proximity to the Dartbrook mining leases was in 1949 and therefore the probability of the species being present on the site is low.

There were no vulnerable or endangered aquatic species reported or expected within the Dartbrook mining leases or the surrounding region.

All surface drainage lines (except for the Hunter River and the Dart Brook) on the site are ephemeral, flowing only intermittently for short periods after rainfall. They do not support any permanent water bodies or aquatic habitat and lack riparian and in-stream vegetation.

More recent ecological studies at Dartbrook, undertaken in 2015 by Cumberland (*Dartbrook Mine Upper Hunter Strategic Assessment BCAM Project: Biodiversity Assessment Report. Prepared for Anglo American Metallurgical Coal Pty Ltd. (Cumberland Ecology, 2015)*) found that of the four broad vegetation types on site, there are two communities listed as Endangered under the *Threatened Species Conservation Act 1995 (TSC Act)* (now listed under the *Biodiversity Conservation Act, 2016 (BC Act)*). There are approximately 2,252 hectares (ha) of the Upper Hunter White box Grassy Woodland (Box Gum Woodland) community present within the approved underground mining footprint. There are also about 54 ha of Hunter Floodplain Red Gum Woodland in the NSW North Coast and Sydney Basin Bioregions (Hunter Floodplain Red Gum Woodland Complex) present within the mining authorities. The vegetation communities across the Dartbrook mining authorities are illustrated in **Figure 5**.

Three threatened plant species were also recorded as occurring within the mining authorities:

- Austral Toadflax (*Thesium australe*), listed as vulnerable under the BC Act and vulnerable under the *Commonwealth Environmental Protection and Biodiversity Act 1999 (EPBC Act)*;
- Black Orchid (*Cymbidium canaliculatum*) listed as an Endangered Population under the BC Act; and
- River Red Gum Population (*Eucalyptus camaldulensis*), listed as an Endangered Population under the BC Act.

The study also found 10 fauna species that are listed as either threatened under the BC Act or migratory under the EPBC Act, which have previously been recorded within the wider Authorisation Boundary and a further six species are considered likely to occur within the Authorisation Boundary (**Figure 6**).

The previously recorded fauna species include:

- Eastern Bentwing Bat (*Miniopterus schreibersii oceanensis*), listed as vulnerable under the BC Act;
- Yellow-bellied Sheath-tail-bat (*Saccolaimus flaviventris*), listed as vulnerable under the BC Act;
- Southern Myotis (*Myotis macropus*), listed as vulnerable under the BC Act;
- Speckled Warbler (*Chthonicola sagittata*), listed as vulnerable under the BC Act;
- Spotted Harrier (*Circus assimilis*), listed as vulnerable under the BC Act;
- Brown Treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*), listed as vulnerable under the BC Act;
- Little Lorikeet (*Glossopsitta pusilla*), listed as vulnerable under the BC Act;
- Little Eagle (*Hieraaetus morphnoides*), listed as vulnerable under the BC Act;
- Diamond Firetail (*Stagonopleura guttata*), listed as vulnerable under the BC Act; and
- White-throated Needletail (*Hirundapus caudacutus*), listed as marine and migratory under the EPBC Act.



These threatened fauna species comprise highly mobile avifauna and bats which are considered unlikely to occur within the mining disturbance area due to a lack of habitat. Any potential occurrences of these species would be limited to fly-overs by raptors or bats which can occur in cleared areas as part of a wider foraging or migratory range.

Similar to threatened flora, the areas where Dartbrook activities are undertaken have low significance in terms of threatened fauna distribution and habitat.

Previous aquatic surveys of areas within the lease also concluded that there are no significant aquatic habitats within the areas affected by previous mining operations.

### **3.2.1 MOD7 Ecology Assessment**

An Ecological Impact Assessment (EIA) was undertaken for MOD7 by Cumberland Ecology and included as Appendix G of the *Environmental Assessment, Modification 7, Kayuga Seam Bord and Pillar Mining Operations* (EA) (Hansen Bailey, 2018).

The majority of the elements of MOD7 will be contained within areas of existing development and infrastructure, with the proposed underground mining activities not resulting in perceptible subsidence. Therefore no further ecological assessments were required for the area overlying the underground mine workings or within the existing surface infrastructure area. However, a proposed new shaft site was initially proposed as part of MOD7, which was to be located outside of the approved footprint of Dartbrook Mine. Therefore an ecological assessment of this proposed surface infrastructure was warranted. The EIA identified the potential impacts of MOD7 on fauna, flora and ecological communities across any proposed new areas of disturbance, referred to as the Infrastructure Study Area.

#### ***Impact Assessment***

##### **Vegetation Communities**

Due to previous agricultural development, there are no native vegetation communities present within the Infrastructure Study Area. The Infrastructure Study Area consists primarily of exotic grassland, with some planted vegetation along the southern side of the Western Access Road.

The grassland areas are dominated by exotic species such as *Bromus catharticus* (Prairie Grass), *Urochloa* spp. and *Lolium rigidum* (Ryegrass). The occurrence of native grasses is limited to *Cynodon dactylon*, which is commonly used for improved pastures. The occurrence of native forbs is limited to scattered and isolated occurrences of *Einadia trigonos* (Fishweed), *Sida corrugata* (Corrugated Sida) and *Portulaca oleracea* (Pigweed). There are no trees within the paddocks to the north of the Western Access Road.

The treed vegetation within the Infrastructure Study Area consists of planted Eucalypts and *Casuarina cunninghamiana*.

##### **Flora**

The field survey identified 26 flora species within the Infrastructure Study Area. Much of these flora species (20) are exotic species.

No threatened species were recorded within the Infrastructure Study Area during the field survey. Three threatened flora species have previously been recorded at Dartbrook Mine, namely:

- *Thesium australe* (listed under BC Act and EPBC Act);
- *Cymbidium canaliculatum* (listed under BC Act); and
- *Eucalyptus camaldulensis* (listed under BC Act).

However, these species are unlikely to occur within the Infrastructure Study Area due to the removal of suitable habitat by past agricultural land uses.

#### Fauna

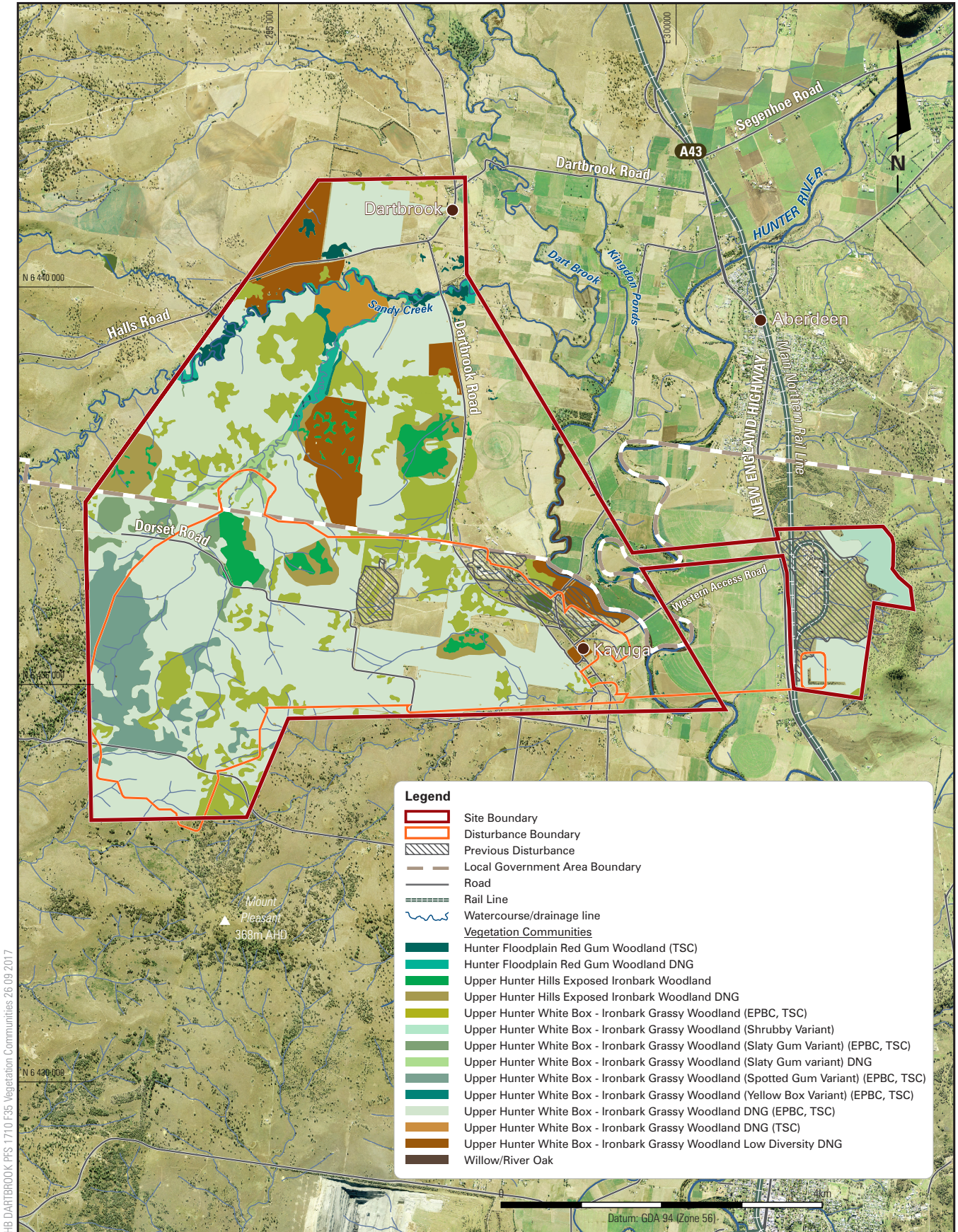
No fauna species were identified during the survey of the Infrastructure Study Area. Ten threatened fauna species have previously been recorded at Dartbrook Mine. The threatened fauna species that have the potential to occur at Dartbrook Mine are highly mobile species, such as avifauna and bats. These species may fly-over the Infrastructure Study Area as part of a wider foraging or migratory range. However, there is no breeding or roosting habitat for these species within the Infrastructure Study Area.

The exotic grassland within the Infrastructure Study Area provides limited habitat for fauna species. There are no ground level habitat features (such as logs, bush rock, soaks or dams) present within the Infrastructure Study Area.

#### Impacts

The proposed shaft site was not ultimately approved for construction under DA 231-07-2000 (MOD7) and therefore there will be no surface disturbance or clearing associated with this component of MOD7, nor any indirect impacts associated with construction and operation of the shaft.





HB-DARTBROOK PFS 1710 F35: Vegetation Communities 26 09 2017

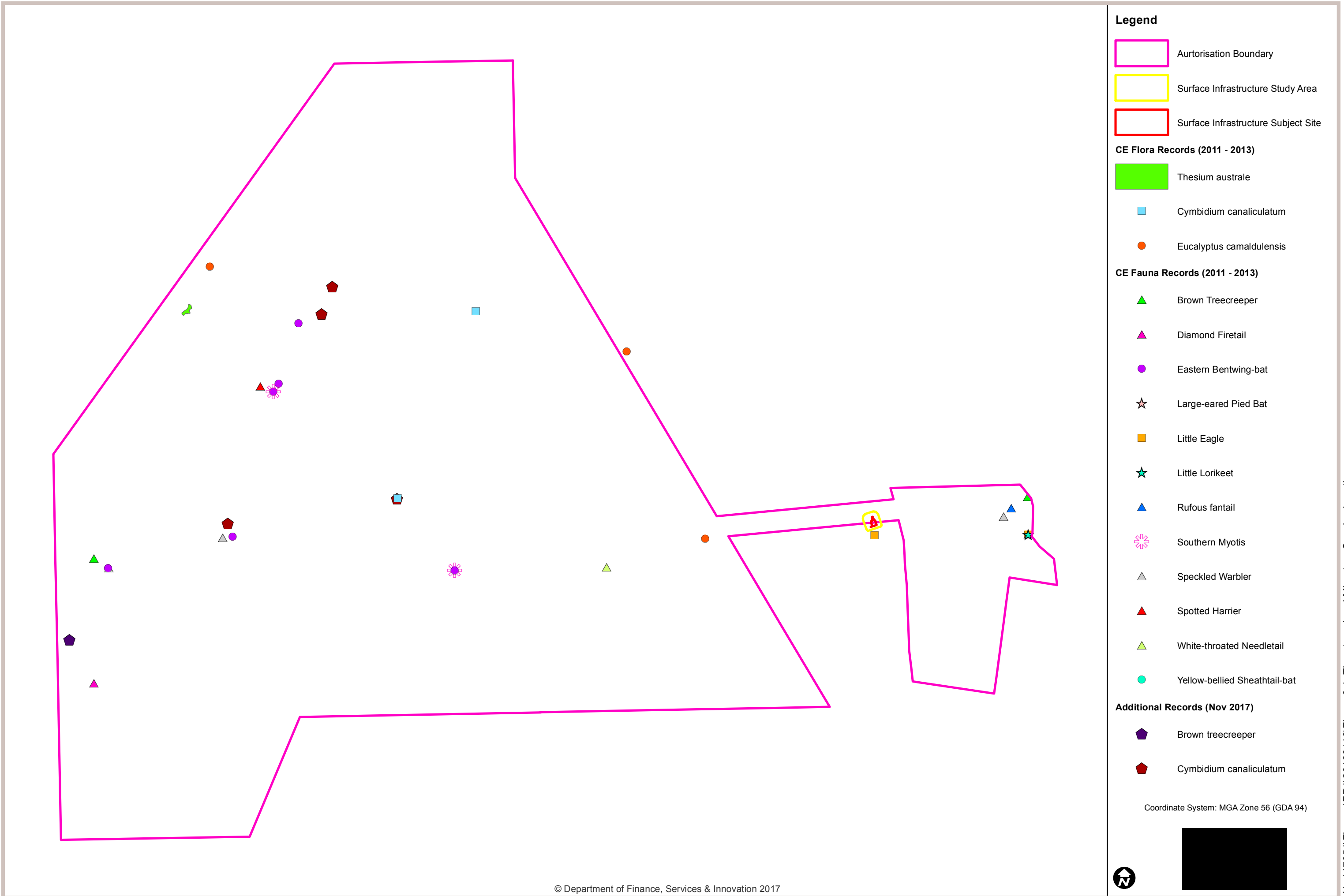
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Vegetation Communities



**FIGURE 5**





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Figure 6 Threatened and Migratory Species Locations

I:\...17054\Figures\RP1\20180416\Figure 3.1. Threatened and Migratory Species Locations

## 4. MANAGEMENT MEASURES

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### 4.1 INTRODUCTION

The Dartbrook operations addressed by this management plan involve the area of existing and surface infrastructure and underground mining operations. Apart from the disposal of rejects, operations will not involve any significant disturbance of vegetation, habitat, or flora and fauna. As discussed in **Section 2**, the surface area within the boundary of the underground mining leases is predominantly highly disturbed grazing land, which has very limited significant habitat areas, and has low ecological value. Furthermore, no subsidence impacts are anticipated by the proposed mining methodology. Consequently the potential for any significant impacts on flora and fauna from the Dartbrook's operations is considered minimal.

The management strategies discussed in this section are focussed on ensuring appropriate controls on any activities that could potentially involve vegetation clearing, and procedures to be implemented in the event that any threatened species are discovered on the site. **Section 4.2** includes specific management strategies that were and are being implemented for particular components of the mining operations. **Section 4.3** includes general management strategies applicable to all aspects of the Dartbrook operations.

Despite the low ecological significance of the site, Dartbrook seeks to minimise ground disturbance and vegetation destruction as much as possible. During operations, there will be minimal land disturbance. Prior to any land clearing, a Permit to Disturb system ensures that areas are checked for any significant flora or fauna.

It should be noted that significant surface areas within the boundaries of the underground mining leases are privately owned (**Figure 1**) and that any flora and fauna impact mitigation measures can only be implemented on these properties with the agreement of the landowner.

### 4.2 SPECIFIC MANAGEMENT STRATEGIES

This section describes the potential flora and fauna impacts and proposed management strategies for relevant components of the Dartbrook's operations. These are as follows:

- Operations at the Mine Surface Facilities and CHPP;
- Reconstruction and operations of the REA;
- Operation and maintenance of the ventilation shaft site, and other minor surface infrastructure areas; and
- Historical subsidence of surface areas due to underground mining.

#### 4.2.1 Mine Surface Facilities and CHPP

Flora and fauna impact management for the construction of the Kayuga Seam Entry and associated surface facilities was addressed in the Construction Flora and Fauna Management Plan. Clearing of the trees was conducted in accordance with the vegetation clearing procedures in **Section 4.3.1**.

No further disturbance or construction activities are proposed for recommencement of mining. It is expected that the operation of the Mine Surface Facilities will not result in any potential impacts on flora and fauna and hence no further mitigation or monitoring measures are necessary.

#### 4.2.2 Rejects Emplacement Area

Emplacement construction commenced in 1996 and rehabilitation was completed in 2007 following the Mine being placed into Care and Maintenance. This area is approximately 29 ha in area with native and exotic grass species sown into 100 mm of topsoil over approximately 1 metre of compacted clay over the disposed rejects.

Only grass species were used for rehabilitation in order to avoid the possibility that tree roots could penetrate the clay layer and potentially generate spontaneous combustion in the rejects.

Generally the lack of tree species for shelter and habitat has meant that local fauna has not settled in the REA which is used by transitory species and not as a permanent habitat.

During reconstruction of the REA, the management strategies in **Section 4.3** will be followed. Potential flora and Fauna impacts will be managed by clearing only the minimum area required to be disturbed for the immediate development of the REA and by progressively rehabilitating the REA with local endemic grass species. Rehabilitated areas will be inspected periodically and any necessary maintenance, including re-sowing and/or maintenance application of fertilisers will be conducted.

Should any threatened or protected species be found during the recommencement of the REA, the procedure described in **Section 4.3.2** will be applied.

### **4.2.3 Ventilation Shafts and Other Minor Surface Infrastructure Areas**

Two ventilation shafts were constructed within the underground mine layout prior to the site going to a care and maintenance. Each shaft has a relatively small surface footprint of approximately 25 m x 25 m. Other minor surface infrastructure, such as gas drainage boreholes and pipelines (which have been removed), mine dewatering boreholes and dropholes were also constructed. In accordance with development consent condition 3.5 (c), ventilation shafts and other minor surface infrastructure were located to ensure that their construction would not require the clearing of trees where practicable.

When any vegetation clearing is required for the construction of minor infrastructure the vegetation clearing procedure described in **Section 4.3.1** was applied.

Should any threatened or protected species be found during the operation of these minor works, the procedure described in **Section 4.3.2** will be applied.

### **4.2.4 Surface Areas Affected by Mining Subsidence**

Subsidence of land overlying longwall panels generally ceases 12 months following undermining. In some areas subsidence may have caused surface cracking, ponding, or erosion which could potentially affect flora and fauna. Where necessary, remedial measures were implemented to mitigate these effects. Remediation measures included, where required:

- Ripping and reseeded of surface cracks;
- Cut and/or fill drainage earthworks in ponding areas to re-establish free drainage; and
- Drainage works or stabilisation works to remediate any areas prone to erosion.

The areas of the site that will be undermined have been extensively cleared for grazing and have very limited habitat and ecological value. In addition to this, there is no subsidence impacts anticipated as a result of bord and pillar mining. Impacts on flora and fauna is therefore expected to be minimal.

#### ***Extraction Plan***

In accordance with Condition 3.3 (a) of the Development Consent, an Extraction Plan will be prepared to the satisfaction of the Secretary before any second workings are carried out on the site. An Extraction Plan would need to include a Biodiversity Management Plan which would have to be prepared in consultation with Department of Climate Change, Energy, the Environment and Water – Environment and Heritage. The BMP would provide for the management of any potential impacts and/or environmental consequences of the proposed second workings on aquatic and terrestrial flora and fauna, with a specific focus on threatened species, populations and their habitats, endangered ecological communities, and groundwater dependent ecosystems.

### 4.3 GENERAL MANAGEMENT STRATEGIES

The general flora and fauna management strategies specified in this section will be applied to all relevant aspects of the Dartbrook's operations. The general flora and fauna management strategies are as follows:

- Vegetation Clearing Procedure;
- Procedure to be followed should any threatened or protected flora or fauna species be found on the site; and
- Revegetation / Rehabilitation.

#### 4.3.1 Vegetation Clearing Procedure

Generally ongoing vegetation clearing is not required as part of Dartbrook's operations. If any clearing is required, the vegetation clearing procedure described below will be followed. In the development of the procedure, consideration has been given to minimising the impact on any sensitive fauna species that may be hibernating or breeding. Hibernating animals may be present in trees on the site during the winter period (May to September). Where possible, clearing will be scheduled to be conducted in the period from October to April to avoid potentially disturbing any hibernating species. Birds and mammals breed in the spring/summer and any clearing operations in these seasons could potentially disturb breeding animals. The pre-clearing tree survey included in the vegetation clearing procedure is specifically designed to identify and manage any breeding or hibernating species, prior to the commencement of clearing.

A Permit to Disturb must be approved prior to the commencement of any works.

The vegetation clearing procedure is as follows:

1. The area to be disturbed will be limited to the minimum area necessary.
2. The construction area will be fenced or clearly delineated to ensure that no disturbance occurs outside the area.
3. Prior to clearing commencing, all trees to be removed will be subjected to a pre-clearing survey, conducted by the Dartbrook Environmental Officer. Specific tasks will include:
  - Inspect trees for the presence of koalas, bats and other mammals;
  - Inspect trees for nesting birds especially the Turquoise Parrot; and
  - Inspect trees for den/roost/nest hollows.
4. If threatened species or other species are detected nesting in the trees, an ecologist will be consulted to develop management plans or mitigation procedures for the species and to determine whether nests can be relocated.
5. Any trees to be retained within the area will be flagged.
6. Trees and stags with (roost/den/nest) hollows will be identified and flagged so that these can be salvaged after felling.
7. Once felled, hollows within trees/stags (especially those greater than 20 cm diameter) will be inspected for fauna. Hollows containing fauna will be flagged. Any injured fauna will be recovered and transported immediately to the nearest veterinarian specialising in native fauna, the National Parks and Wildlife Services (NPWS) office or WIRES representative.
8. Felled trees will be allowed to lie for at least 24 hours to allow fauna within hollows to vacate.

9. Prior to salvage, flagged hollows will be inspected and if fauna is still present an ecologist will be consulted in relation to its relocation. Hollows will be relocated along with all denning, roosting or nesting material.
10. Remaining tree sections will either be relocated to remnant habitat areas to substitute for the absence of ground structures in these areas (i.e. fallen dead timber), where practicable, or mulched and used in site landscaping.

Weed and feral animal control measures for the Dartbrook are specified in the Land Management Plan.

### 4.3.2 Threatened & Protected Species

No threatened species were identified within the surface mining infrastructure area, although several threatened species have been recorded in the broader area. The Striped Legless Lizard (*Delma impar*) has not been targeted by previous ecological surveys at Dartbrook but has recently been recorded in the locality. The Striped Legless Lizard is listed as a vulnerable species under the BC Act and EPBC Act. Accordingly, this species will be included in the monitoring program described in **Section 5**.

Should threatened species be identified on the site during operations, any work which could adversely impact on the species will cease immediately. In such cases, an investigation to determine appropriate management or mitigation measures for the species will be conducted by an ecologist; if deemed appropriate by the ecologist the NPWS will be advised.

Work will not recommence until the management or mitigation measures for the species have been implemented and the potential for an adverse impact on the species has been removed.

### 4.3.3 Revegetation and Rehabilitation

There will be minimal areas of disturbance for the recommencement of mining and consequently only small areas to rehabilitate. Generally rehabilitation will involve:

- The final land surface is re-established to meet the specifics of the final landform, consistent with the surrounding topography to minimise visual impacts, ad incorporates relief patterns and design principles consistent with natural drainage, as shown in the Rehabilitation Management Plan;
  - A Rehabilitation Management Plan will be prepared for Dartbrook as per the Rehabilitation Reforms being administered under the *Mining Amendment (Standard Conditions of Mining Leases – Rehabilitation) Regulation 2020* administered by the NSW Resources Regulator. The reforms require mining operations to development a comprehensive suite of documents for rehabilitation and mine closure, including a Mine Forward Program, Rehabilitation Objectives and Completion Criteria and a Rehabilitation Management Plan.
- The area is covered with topsoil (or an acceptable substitute) to approximate 100 mm including appropriate ameliorants (generally gypsum to assist soil structure) and suitable fertiliser; and then
- Sown with plant species to suit the proposed final land use.

The proposed final land use affects the landform design and selection of vegetation species, such as herbs, shrubs, trees and / or native and exotic grasses, used to construct the final habitat.

The construction of the landform may also affect the choice of vegetation species such as the REA which has rejects below a designed layer of clay to prevent any subsurface leaching to the surface.

Once re-vegetated the areas are monitored, quarterly, for issues such as:

- Planting failure or unsatisfactory areas when the vegetation cover drops below 70%. Re-sowing is undertaken generally with fertiliser and other appropriate ameliorants;

- Repairing erosion problems is carried out as soon as erosion is identified as a restriction to plant growth. See Dartbrook’s Erosion and Sediment Control Plan;
- Fire management – fire management is undertaken when and where appropriate in accordance with Dartbrook’s Bushfire Management Plan;
- Pest and weed control regularly as per the Land Management Plan and in consultation with the Local Land Services (LLS);
- Control of feral animal populations as per the Land Management Plan and in consultation with the LLS; and
- Maintain and repair fencing as required to ensure the ongoing health of the rehabilitated areas and to exclude trespassers.

A field monitoring sheet that may be utilised to record inspections is provided in **Appendix B**.

#### 4.3.4 Biodiversity

Mine owned land has been divided into five units and given a biodiversity ranking as shown in the **Table 4** below. The units distinguish broad areas of different land use or vegetation types. Each area is then analysed to determine the overall perceived biodiversity value and its management and monitoring are tailored to suit.

**Table 4** Dartbrook’s Biodiversity Status

Unit Type	Conservation Status	Functional Status	Overall Value
1. River & Riparian Habitat	Very High	Very High	Very High
2. Browns Mountain	High	High	High
3. Alluvial Plains	Low	Low	Low
4. River Red Gum	High	High	High
5. Undulating Grazing Land	Low	Low	Low

The following key biodiversity and key management principles are implemented in each biodiversity unit:

- Sustainable agricultural practices;
- Management of groundwater resources, resulting from longwall mining subsidence;
- No disturbance of cultural heritage due to Dartbrook activities;
- Management of native flora and fauna;
- Protection of the Hunter River and Dart Brook ecosystems;
- Restoration of endangered ecosystems;
- Management of visual amenity and aesthetics; and
- Management of weed and pest invasions on Dartbrook managed land and leaseholder land.

## ***Biodiversity Unit 1 - River & Riparian Habitat***

### **Description**

Mine owned or related land includes approximately 15.7 km of property boundary onto the Hunter River and Dart Brook.

The Hunter River and Dart Brook riparian habitat includes the corridor adjacent to the riverbanks, generally within 20 m from the bank of the river. The vegetation along the corridor ranges from heavily timbered with trees to areas that are denuded of trees or vegetation. The riparian habitat shows varying degrees of degradation including erosion and sedimentation, stream bank instability, infestations of introduced environmental and noxious weeds, introduced willow trees and is also habitat to a number of introduced pest species such as rabbits and hares. The stream beds have also been lowered and become incised.

The Hunter River is a significant river in NSW, which covers an approximate distance of 450km. The Hunter River is considered the lifeblood of the Hunter Valley as it provides critical resources for various industries including dairy, equine, mining, and viticulture. The River is also widely used for recreational purposes.

The Dart Brook is a tributary of the Hunter River and is primarily used for agricultural purposes. Due to the infrequent flows and poorer water quality, the Dart Brook is not heavily relied upon for farming or agricultural but rather is utilized when conditions allow.

Dartbrook operations identified the opportunity to undertake river restoration works, in conjunction with the Hunter-Central Rivers Catchment Management Authority (CMA), along a 12.5km stretch of Hunter River and Dart Brook on the banks of Mine related property.

Extensive work has previously been undertaken along the ACDM stretch of the Hunter River. The work includes timber, block & cable structures, rock revetment, and revegetation with native species.

### **Management Objectives**

The management objectives for this area are to:

- Improve and enhance riparian biodiversity by increasing the density and diversity of native vegetation in the area;
- Creation of a habitat corridor for native fauna to increase the habitat and ecological value of the area;
- Improve water quality by reducing sedimentation and addressing erosion and bank instability;
- Improve bed stability to protect upstream reaches of the Hunter River and Dart Brook, and provide stability upstream in the Dart Brook;
- Assist in protecting the fragile Chain-of-Ponds geomorphic stream type that is known to be a very rare remnant feature (only known one left in the Hunter Valley); and
- Establishment of a seed bank for further establishment of native species suitable to the region.

### **Actions**

The key management activities being undertaken in the River and Riparian habitat areas as part of the River Restoration Project are summarised in **Table 5** below.

Table 5 Actions for the River and Riparian Habitat Areas

Management Activity	Description
Weed Infestation Management	All noxious weeds to be controlled as per the <i>Noxious Weeds Act, 1993</i> . Environmental weeds will also be controlled and replaced with native vegetation to improve the health of the riparian zone.
Willow Management	Introduced willow trees have been removed in strategic locations, in a staged process. The dead willows will be left in place to provide bank stability until native vegetation establishes.
Native Riparian Vegetation	Native riparian vegetation has been re-introduced in strategic locations through this stretch of the catchment. Vegetation was established using long stem tubestock, hydromulching and natural regeneration. Growth will be encouraged through stock management and weed control.
Woody Debris Structures	Woody debris was placed in strategic locations to assist in protecting further lowering of the Dart Brook system. Ultimately assists in protecting the intact Chain-of-Ponds system upstream in the Dart Brook.
Stock Management	Stock has been excluded from the riparian zone by fencing and establishment of off-stream watering points. Managed crash grazing will be used in some locations to assist in weed control and to encourage natural regrowth.
Feral Animal Control	Active and ongoing control of feral animals along the Hunter River and Dart Brook

Riparian areas outside the River Restoration Project are also actively managed for weeds and feral animals.

### ***Biodiversity Unit 2 – Browns Mountain***

#### **Description**

Browns Mountain covers an area of approximately 46 ha and is primarily undisturbed. The area can be described as open woodland with a limited species diversity including Narrow and Broad Leafed Ironbark, Grey Box, White Box, native olive, Wilga and Rough-barked Angophora. There are also a number of weed species introduced to the area such as prickly pear and African boxthorn.

The area provides habitat to a number of native wildlife species including kangaroos, wallabies and native birds including the Wedge-tailed Eagle, Eastern Rosella and Red-Rumped Parrot. Reptiles recorded in the area included the Green Tree Snake, Tree Skink and the Bearded Dragon. A number of frogs were also observed in the area.

The area also harbours a number of pest species including European Foxes, pigs, rabbits and hares and introduced bird species such as the Common Indian Myna bird.

#### **Management Objectives**

The management objectives for this area are to:

- Promote natural regeneration of the area by excluding stock and undertaking weed and feral animal control;
- Increase the habitat value of the area by creating a habitat corridor incorporating the Forestry Area established adjacent to Browns Mountain; and
- Reduce erosion and sedimentation of water run from the western side of Browns Mountain by maintaining a diversion system comprising of diversion banks and a series of dams.



### Actions

The key management activities being undertaken in the Browns Mountain area includes:

- Exclusion of stock and unauthorised access to promote native regeneration by ensuring the area remains fenced;
- Ongoing weed and feral animal control;
- Ongoing desilting of sediment structures and diversion drains on the western side of Browns Mountain, as required; and
- Maintenance of a 75ha Forestry Area adjacent to the Browns Mountain as detailed below in Biodiversity Unit 5.

### ***Biodiversity Unit 3 – Alluvial Plains***

#### Description

Alluvial plains are relatively flat and gently sloping landforms found at the base the hills. In the area surrounding Dartbrook the plains have been formed by the deposition of alluvial soil over a long period of time by the Hunter River and its tributaries coming from the hills and mountains. This land adjoins the Hunter River and Dart Brook and currently consists of highly fertile soil, which has been heavily cleared of vegetation. All alluvial land owned by Dartbrook is leased under a licence arrangement and is utilised for dairying and/or establishment of crops for hay or stock feed.

The land has a low conservation status and low functional status as it is primarily utilised for human related services such as livelihoods and agricultural purposes and is not generally used for recreational purposes or have a high aesthetic appeal.

#### Management Objectives

Dartbrook will continue to maintain Mine owned properties in a sustainable manner. A formal licence agreement will be implemented with leaseholders, which specifies specific actions to be undertaken to ensure this objective is achieved.

#### Actions

Dartbrook establish formal licence agreements for all land that is leased to an external party. Formal licence agreements include a list of conditions that must be complied with, such as:

The Licensee must:

- Not use the Property for any purpose other than the Agricultural Purpose;
- Not agist more than the number of livestock permitted by the Agreement;
- Not allow the agistment of any other type of livestock other than the type of livestock permitted by the Agreement; and
- Not farm more than the quantity of crop permitted by the Agreement.

The Licensee must, at its expense, maintain and manage the Property in accordance with:

- The Agreement (including the Appendices); and
- Good grazing, farming and land management practices in respect of the locality in which the Property is situated including, but not limited to:
  - The implementation of reasonable endeavours to prevent any soil erosion on the Property; and

- The maintenance and, where necessary, the repair of all fences, grids and other means of holding livestock.

### ***Biodiversity Unit 4 – River Red Gum***

#### **Description**

The *Eucalyptus camaldulensis* (River Red Gum) in the Hunter Valley is listed as an endangered population under Schedule 1, Part 2 of the BC Act, as there are only 23 known populations occupying at most 100 ha in total.

#### **River Red Gum Biodiversity Area**

Related entities own a parcel of agricultural land that consists of an original 4 ha stand of River Red Gums (RRGs), with some 60 mature trees. In 2005, Dartbrook identified the opportunity to protect the existing stand of trees and provide an additional 7.8ha to allow regeneration of the RRGs and other such complementary native species to establish a typical RRG population.

The majority of the mature RRGs within the population originally showed signs of stress with their long-term survival at risk. This was related to the lack of recent flooding in the area, as the RRGs require occasional flooding to survive. There was also little regeneration and some dieback of the trees is evident.

#### **River Red Gums in Russell Island Channel**

Dartbrook related entities own land that contains a meander cut-off that was once the original path of the river referred to as Russell Island Channel. There is significant bed difference between the Russell Island channel and the bed of the Hunter River, making it not feasible to reinstate the meander with the flow of the river. Despite this, the channel fills in flood conditions, making it an ideal location to establish a new RRG community.

#### **Management Objectives**

The main management objective is to protect and enhance the endangered RRG populations.

#### **River Red Gum Biodiversity Area**

The aim for the RRG Biodiversity Area is to restore the water balance of an existing stand of RRGs with the aid of artificial flooding events to recharge soil moisture levels. By increasing the amount of moisture available to existing trees an expected outcome of the project is to record an improvement in tree health and the establishment of a replacement generation of trees facilitated through natural regeneration. Furthermore, the specific objectives are to:

- Reintroduce periodic water inundation of the remnant;
- Facilitate the natural regeneration of the RRG community;
- Remove exotic plant species competing for resources with regeneration RRGs;
- Remove grazing impacts from the remnant; and
- Monitor the results of the project through changes in soil properties and vegetation patterns.

#### **River Red Gums in Russell Island Channel**

The project also has the objective of establishing a new self-sustaining RRG Population in the Russell Island Channel, which still receives flows during flood conditions. The establishment of trees in this location will result in the population receiving more frequent natural flooding and will perhaps be more viable than many other RRG populations that are now left high and dry by years of floodplain degradation and stream incision.

## Actions

The key management activities being undertaken in the RRG Biodiversity area are summarised in **Table 6** and **Table 7** below.

**Table 6**      **Actions for the River Red Gum Biodiversity Area**

Management Activity	Description
Original land use management strategy	Grazing paddock with minor weed control undertaken.
Current land use management strategy changes	Exclude stock access. Undertake slashing and spaying of perennial weeds for weed control and stem inject willows. A range of revegetation strategies were employed including leaving some areas to naturally regenerate, broadcasting seed and planting of tubestock.
Description of works undertaken	Area fenced out with stock proof (5 wire) fencing. Weeds controlled by spraying. Irrigation system installed which ensured a high success rate of regeneration & flooding re-introduced to the RRGs. Minor earthworks undertaken on the floodplain to encourage retention of water across the RRG area for short periods. Native tubestock planted and native seed broadcast. Ongoing maintenance of the tubestock and vermin control.
Environmental benefits	Protection & enhancement of existing stand of an endangered RRG Community. Established area for additional regrowth of RRG Community, leading to enhanced biodiversity and creating the second largest community of RRG in the Hunter Valley. Resulted in improved health of the RRG population.  Is the first project in the Hunter Valley to innovatively and artificially mimic the flood regime to simulate natural conditions for RRG communities.  Increased native vegetation density & diversity of the riparian corridor.

**Table 7**      **Actions for the River Red Gums in Russell Island Channel**

Management Activity	Description
Original land use management strategy	A grassed channel that was heavily grazed. Weed control was mainly by stock.
Current land use management strategy changes	Part of the channel is fenced off to exclude stock. A RRG community has been established through extensive revegetation. Drip irrigation supports the planted trees.
Description of works undertaken	Stock proof fencing established around the channel with access points to Russell Island. Significant planting in this location and an irrigation system installed. Weed control undertaken throughout the area.
Environmental benefits	The area provides a significant opportunity to establish a naturally flooding area of RRGs.

## ***Biodiversity Unit 5 – Undulating Grazing Land***

### Description

Land previously affected by underground mining can be described as being undulating grazing land with the primary use being cattle and/or sheep grazing. The areas have generally been previously cleared for agricultural

purposes and consist of grasslands with a few scattered remnants or groves of trees. Surface drainage consists of a number of minor ephemeral creek lines. There are no wetlands on these properties.

Some parts of this unit are classified as woodland or partially cleared woodland, while other parts have been cleared. Tree species include the Grey Box, Narrow and Broad-leaved Ironbark, White Box, Spotted Gum, Blakely's Red Gum, Yellow Box, RRG, Rough-barked Angophora, River Oak, Kurrajong and the Weeping Pittosporum.

Areas affected by the operations can be divided into two categories, the land where the surface CHPP infrastructure and mine is located and land that could be affected by underground longwall mining.

The surface infrastructure area covers approximately 117 ha and generally consists of:

- The western facilities (West Site), which are located west of the New England Highway and include the administration office, workshop, store and entrance to the underground mine; and
- The eastern facilities (East Site), which are located east of the New England Highway and includes the Coal Handling and Preparation Plant (CHPP), coal stockpiles and conveyors, rail load out facilities and Reject Emplacement Area (REA).

The surface infrastructure area is highly disturbed with minimal biodiversity value due to its very nature.

Land that is affected by mining and had been disturbed by subsidence (at the completion of underground mining in October 2006) totalled 805 ha. Private landholders own the majority of this land. The entire area, except for less than 1 ha has been rehabilitated, including 29.6 ha of REA.

In 2003, Anglo Coal Dartbrook commenced a joint project with State Forests NSW to establish a forestry plantation on undulating grazing land north of the Coal Handling and Preparation Plant (CHPP), and south of the town of Aberdeen. This project involved the establishment of a 75-ha forestry plantation consisting of a total of 75,000 native eucalypt trees planted within the area. The plantation is part of a regional plan to create a sustainable resource in the Upper Hunter Valley for the future on land that was previously grazed.

Various ecological and human-related functions exist in this unit including:

- Food;
- Agricultural production;
- Livelihoods;
- Aesthetic values; and
- Cultural heritage.

### Management Objectives

#### **Leased Undulating Grazing Land**

Management objectives for the undulating grazing land that is leased under a licence agreement is similar to the alluvial land that is also leased. To this end, Dartbrook aims to continue to maintain Mine owned properties in a sustainable manner, with the formal licence agreement in place, which specifies actions to be undertaken to ensure this aim is achieved.

#### **Forestry Plantation**

There are a number of management objectives for the forestry plantation, including:

- Establishment of a seed bank for forestry species suitable to the region;

- Provide study plots for further research into forestry species in the region;
- Link up to remnant vegetation on Brown's Mountain creating a habitat corridor and substantially increasing the habitat and ecological value of the area;
- Provide a visual screen for the CHPP and the Reject Emplacement Area, once the trees are mature; and
- Off-set the impact of greenhouse gas emissions once the trees are mature.

In addition, trial plots were established within the forestry plantation to understand the patterns of genetic variation in growth and quality traits, within and between populations of various Eucalyptus species collected from the species natural distribution. The trial series will also provide information on the stability of the species across a range of sites for selection of superior provenances families and individuals for commercial deployment and breeding objectives. One or more of the trials has the potential to be selected for thinning for commercial seed production as a seedling seed orchard.

#### Actions

Biodiversity actions for this unit include minimizing environmental harm, maintaining cultural heritage and increasing the biodiversity of certain areas.

## 5. MONITORING

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The flora and fauna monitoring specified in the vegetation clearing procedure in **Section 4.3.1** will be conducted if any clearing is required. Any clearing that is required, under operations, is likely to involve a small number of individual trees and the level of impact on the ecological value and biodiversity of the site will be minimal.

Detailed monitoring will be undertaken in restoration works and habitat areas across the Dartbrook mining leases, in accordance with Condition 3.3 (k) and (l) of the Development Consent. The monitoring program will:

- i) *Monitor impacts attributable to the development and include monitoring of the success of any restoration or reconstruction works. The Applicant must carry out any further works required by the Secretary and Resources Regulator as a result of the monitoring;*
- ii) *Establish an ongoing monitoring program of the existing and proposed revegetated areas to assess their floristics and structure and to propose contingency measures for improvements to revegetation if required; and*
- iii) *Establish an ongoing monitoring program in the rejects emplacement area, of fauna species diversity and abundance and the effectiveness of reconstructed ecosystems in providing fauna habitat and contingency measures should impacts be identified as occurring.*

**Note:** *The information obtained from the monitoring must be used to guide future revegetation efforts on the mine site.*

A summary of the monitoring results will be included in the Annual Review, as detailed in **Section 6**.

The monitoring program will include monitoring of any restoration works and the habitat areas described as the biodiversity units outlined in **Section 4.3.4**. Monitoring will involve quarterly inspections and covers the issues listed in **Section 4.3** by way of a Report and Action Field Sheet (**Appendix B**) which enables the tracking of the status of each of the relevant issues and identification of any shortfalls that need repair or remediation.

## 6. REPORTING

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### 6.1 ANNUAL REPORTING

In accordance with Condition 9.2 of the Development Consent, an Annual Review will be prepared by the end of March, each year and submitted to the Secretary. This review will:

- (i) *Describe the development (including any rehabilitation) that was carried out in the previous calendar year, and the development that is proposed to be carried out over the current calendar year;*
- (ii) *Include a comprehensive review of the monitoring results and complaints records of the development over the previous calendar year, including a comparison of these results against the:*
  - *Relevant statutory requirements, limits or performance measures/criteria;*
  - *Requirements of any plan or program required under the Development Consent;*
  - *Monitoring results of previous years; and*
  - *Relevant predictions in the documents referred to in Condition 1.1(a) of the Development Consent;*
- (iii) *Identify any non-compliance or incident which occurred in the previous calendar year, and describe what actions were (or are being) taken to rectify the non-compliance or incident and avoid reoccurrence;*
- (iv) *Evaluate and report on:*
  - *The effectiveness of the noise and air quality management systems;*
  - *Socio-economic impact of the development including the workforce characteristics of the previous calendar year; and*
  - *The surveillance of any prescribed dam on the site to the satisfaction of the DSC;*
  - *The outcome of the water budget for the year, the quantity of water used from water storages and details of discharge of any water from the site; and*
  - *Compliance with the performance measures, criteria and operating conditions in this consent;*
- (v) *Identify any trends in the monitoring data over the life of the development;*
- (vi) *Identify any discrepancies between the predicted and actual impacts of the development, and analyse the potential cause of any significant discrepancies; and*
- (vii) *Describe what measures will be implemented over the next calendar year to improve the environmental performance of the development.*

Specific to flora and fauna, the Annual Review will include:

- Details of any flora and fauna management conducted during operations;
- The efforts and progress of the FFMP;

- The results of flora and fauna monitoring and the effectiveness of restoration works during the period;
- A summary of the monitoring program conducted for habitat areas; and
- A summary of any flora or fauna incidents, non-compliances and/or complaints received from the public relating to the mine.

Copies of the Annual Review will be submitted to DPHI, Muswellbrook Shire Council, Upper Hunter Shire Council (UHSC) and made available to the Community Consultative Committee and any interested person upon request.

A comprehensive summary of flora and fauna monitoring results and the Annual Review will also be made publicly available on the Dartbrook Website, in accordance with Condition 13 of the Development Consent.

## **6.2 INCIDENT & NON-COMPLIANCE REPORTING**

In the event that an incident occurs, Dartbrook will immediately notify DPHI and other relevant authorities of the incident in accordance with Condition 9.3(a) of the Development Consent. An 'incident' is defined as *"an occurrence or set of circumstances that causes or threatens to cause material harm and which may or may not be or cause a non-compliance"*.

'Material Harm' is harm that involves actual or potential harm to the health or safety of human beings or to the environment that is not trivial, or results in actual or potential loss or property damage of an amount, or amounts in aggregate, exceeding \$10,000 (such loss includes the reasonable costs and expenses that would be incurred in taking all reasonable and practicable measures to prevent, mitigate or make good harm to the environment). This definition excludes 'harm' that is authorised under either the Development Consent or any other statutory approval.

In the event that a non-compliance occurs, Dartbrook will notify DPHI in accordance with Condition 9.3 (b) of the Development Consent.



## 7. RESPONSIBILITIES

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The key personnel with responsibility for environmental management on the mine site and ensuring that the requirements of this management plan are implemented during operations is the Environmental Officer.

Project Supervisor/s will be responsible for implementing mitigation measures specified in this plan under direction from the Environmental Officer.

### ***Environmental Officer***

Specific responsibilities of the Environmental Officer will include:

- Signing off on the Permit to Disturb;
- Ensuring that employees and contractors are given adequate training in environmental awareness, legal responsibilities, and the requirements of the management plan;
- In the event that clearing is required;
  - Conducting pre-clearing inspections in accordance with the vegetation clearing procedure (**Section 4.3.1**) and marking trees containing micro-habitat, nesting fauna etc; and
  - Ensuring that salvaged stags, hollow limb sections and tree sections are relocated to remnant habitat areas;
- In the event that a threatened species is identified on the site, arranging an investigation by an ecologist in accordance with **Section 4.3.2**; and
- Responding to all incidents.

### ***Contractor Supervisor/s***

Specific responsibilities of the Contractor Supervisor/s and workforce include:

- In the event that clearing is required:
  - Clearing in accordance with the vegetation clearing procedure; and
  - Salvage and relocation of flagged hollows, nests, and stags;
- In the event that a threatened species is identified, immediate notification of the Environmental Officer.

## 8. REVIEW REQUIREMENTS

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Condition 3.2(f)(viii) of the Development Consent requires that all management plans include a protocol for periodic review of the plan. Further to this, Condition 3.2 (k) requires:

*...the suitability of existing strategies, plans and programs be reviewed within three months of:*

- *The notification of an incident under Condition 9.3 (a);*
- *The submission of an Annual Review under Condition 9.2 (a);*
- *The submission of an Independent Environmental Audit (IEA) under Condition 8.1 (a); or*
- *The approval of any modification of the conditions of this consent (unless the condition specifies otherwise), the suitability of existing strategies, plans and programs required under this consent must be reviewed by the Applicant.*

Condition 3.2 (l) of the Development Consent, also states:

*... if necessary, to either improve the environmental performance of the development, cater for a modification or comply with a direction, the strategies, plans and programs required under this consent must be revised, to the satisfaction of the Secretary. Where revisions are required, the revised document must be submitted to the Secretary for approval within six weeks of the completion of the review on Condition 3.2 (j).*

*This is to ensure strategies, plans and programs are updated on a regular basis and to incorporate any recommended measures to improve the environmental performance of the development.*

This FFMP will be reviewed (and revised if necessary) in accordance with the above and/or prior to any changes in mining.

## REFERENCES

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- Cumberland Ecology (2015). *Dartbrook Mine Upper Hunter Strategic Assessment BCAM Project: Biodiversity Assessment Report. Prepared for Anglo American Metallurgical Coal Pty Ltd.*
- Hansen Bailey (2018). *Environmental Assessment, Modification 7, Kayuga Seam Bord and Pillar Mining Operations.*
- Hansen Bailey. (2021). *Modification 7 Updated Response to Contentions.*
- HLA-Envirosciences (2000), *Dartbrook Extended Environmental Impact Statement.*

## ABBREVIATIONS

Abbreviation	Meaning
BC Act	<i>Biodiversity Conservation Act 2016</i>
CCC	Community Consultative Committee
CHPP	Coal Handling and Preparation Plant
DA	Development Application
Dartbrook Operations	Dartbrook Operations Pty Ltd
DPE	Department of Planning & Environment (now DPHI)
DPHI	Department of Planning, Housing and Infrastructure
EIS	Environmental Impact Statement
EP&A Act	<i>Environmental Planning &amp; Assessment Act 1979</i>
EP&A Regulation	<i>Environmental Planning &amp; Assessment Regulations 2021</i> (repealed EP&A Regulation 2000 on 1 Mach 2022)
EPBC Act	Commonwealth <i>Environment Protection &amp; Biodiversity Conservation Act 1999</i>
EPI	Environmental Planning Instrument
GIS	Geographic Information System
ha	Hectare
IPCN	Independent Planning Commission NSW
m	metres
Mining Act	<i>Mining Act 1992</i>

**APPENDIX A**  
**STAKEHOLDER CONSULTATION**

Our ref: DA231-07-2000-PA-10

Jeff Beatty  
General Manager  
AQC Dartbrook Management Pty Ltd  
6 Stair Street  
Kayuga NSW 2333  
25/1/2023

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**Subject: Approval of Flora and Fauna Management Plan**

Dear Mr Beatty

I refer to the Dartbrook Flora and Fauna Management Plan (Version 8, dated November 2022), which has been prepared in accordance with condition 3.5 of DA231-07-2000.

The Department has carefully reviewed the Flora and Fauna Management Plan and is satisfied that it addresses the relevant requirements of the development consent.

Accordingly, the Planning Secretary has approved the Flora and Fauna Management Plan (Version 8, dated November 2022).

You are reminded that if there are any inconsistencies between the Flora and Fauna Management Plan and the conditions of approval, the conditions prevail.

Please ensure you make the document publicly available on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact Joe Fittell on 02 4908 6896.

Yours sincerely



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



Mr Jeff Beatty  
Tetra Resources  
GPO Box 3323  
BRISBANE QLD 4001

By email: [jeff.beatty@tetraresources.com.au](mailto:jeff.beatty@tetraresources.com.au)

Dear Mr Beatty

**Dartbrook Coal – Flora and Fauna Management Plan (DA231-07-2000-PA-10)**

On 14 November 2022 Planning and Assessment Group of the Department of Planning and Environment invited Biodiversity and Conservation Division (BCD) for advice in relation to the *Dartbrook Mine: Flora and Fauna Management Plan for Tetra Resources (FFMP)* for the Dartbrook Coal Mine (dated 25 October 2022). The FFMP was prepared by James Bailey & Associates Pty Ltd as a requirement of consent condition 3.5 'Flora and Fauna Assessment, Management and Monitoring' of DA231-07-2000.

BCD has reviewed the FFMP and from this review BCD recommends that Section 5 'Monitoring' includes monitoring for the striped legless lizard (*Delma impar*: or the recently-described *D. vescolineata*). This species was not considered in the recent Environmental Impact Statements for this project. However, recent surveys for this species around Muswellbrook have detected striped legless lizards, such as on the Mount Pleasant Mine site that adjoins the Dartbrook mining lease. Monitoring for the striped legless lizard will require particular survey techniques, and these are described in <https://www.dcceew.gov.au/environment/epbc/publications/survey-guidelines-australias-threatened-reptiles>

If you have any further questions about this issue, please contact Robert Gibson, Senior Regional Biodiversity Conservation Officer, on 4927 3154 or at [huntercentralcoast@environment.nsw.gov.au](mailto:huntercentralcoast@environment.nsw.gov.au)

Yours sincerely

A handwritten signature in black ink, appearing to read 'S. Crick'.

**Steven Crick**  
**Senior Team Leader Planning**  
**Hunter Central Coast Branch**  
**Biodiversity and Conservation Division**

22 November 2022

**APPENDIX B**  
**MONITORING FIELD SHEET**



**Table B1 Dartbrook Biodiversity Monitoring Report**

Date:

Inspected by:

Inspection Item	River & Riparian Habitat	Browns Mountain/Plantation	Alluvial Plains/RRG	Grazing Land	Rehabilitation Areas			Comment Rankings are 1 to 5 (with 1 being nil progress & 5 excellent)
					REA	Stockpiles	Other	
1. Evidence of soil profile development (e.g. leaf litter, decomposition, pedality etc.)								1= no litter or soil structure to 5 = soil organically enriched plus pedal development
2. Vegetative Cover								1= no cover to 5 = 100% cover
3. Evidence of erosion (e.g. sheet, rilling, gullying etc.)								1= rills & gullying to 5 = no erosion
4. Landform stability - Occurrence of potholing or slumping								1= pot holes & depressions to 5 = regular surface
5. Stability and function of erosion and sediment control structures								1= unable to function to 5 = well vegetated as built surface
6. Presence of undesirable vegetation cover (e.g. non target spp, noxious weeds)								1= 100% weeds to 5 = no weeds
7. Growth Rates								1= nil development (subject to rainfall, etc) to 5 = lush vegetation cover
8. Evidence of plant mortality or dieback / insect attack.								1= dead/dying plants to 5 = healthy plants

Inspection Item	River & Riparian Habitat	Browns Mountain/ Plantation	Alluvial Plains/ RRG	Grazing Land	Rehabilitation Areas			Comment Rankings are 1 to 5 (with 1 being nil progress & 5 excellent)
					REA	Stockpiles	Other	
9. Evidence of contamination or other limitations to vegetative establishment (e.g. surface crusting, nutrient deficiency, toxicity etc.)								1= no establishment / growth to 5 = evidence of limitation
10. Flora species diversity (e.g. evidence of target species present, generally sown naturalised & exotics with natives invading )								1= nil cover to 5 = diverse spp (seasonal)
11. Evidence of reproductive potential (flowering, seeds, etc)								1= no seeding to 5 = many self-established seedlings
12. Evidence of biological nutrient cycling								1= no leaf litter to 5 = leaf litter & decomposition evident
13. Evidence of spontaneous combustion								1= obvious smoke and heating to 5 = no visible evidence
14. Faunal activity observations (evidence or sightings)								1=no sighting 5 = obvious tracks and sighting
Fauna SPP Diversity								1= no evidence or sightings to 5 = evidence of habitat (invertebrates, vertebrates marsupials, birds.), scats etc & / or sightings
Noxious Animals								1=obvious tracks and sighting to 5 = no sightings / evidence
Faunal Abundance								1=no sighting 5 = many obvious tracks and sightings

Inspection Item	River & Riparian Habitat	Browns Mountain/Plantation	Alluvial Plains/RRG	Grazing Land	Rehabilitation Areas			Comment Rankings are 1 to 5 (with 1 being nil progress & 5 excellent)
					REA	Stockpiles	Other	
Fauna Habitat								1= bare to 5 = vegetation capable of providing habitat - invertebrates, vertebrates, macropods, marsupials, birds.

**RANKING:**

5	5 Excellent
4	4 Very good
3	3 Satisfactory i.e. meets target (progressive or final)
2	2 Poor
1	1 Nil progress

NB 1. The quality of the rehabilitation has been accepted by the Department of IINSW as satisfactory

NB 2. The Rejects Emplacement Area (REA) is a clay capped rejects and other washery waste emplacement. Tree establishment is not proposed for this area as their roots would have the potential to cause spontaneous combustion. As trees are one of the main components of habitat establishment for many fauna spp the REA is not planned to have a wide diversity of flora or fauna spp in this area but primarily to have long term surface stability with limited habitat opportunity for itinerant faunal communities.

**SUMMARY OF INSPECTION:**


**ACTIONS REQUIRED:**
