

## Addendum to the Environmental Assessment

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### 6.2 Ecology

This section provides a summary of an ecological study for the proposed modifications undertaken by Cumberland Ecology, which is presented in full in Appendix C.

#### 6.2.1 Existing environment

All available literature pertaining to ecology within the proposed modification areas was reviewed and relevant data collated.

Database analysis was conducted for the locality (within 10km) using both the DECCW Atlas of NSW Wildlife Database (DECCW, 2009) and DEWHA Protected Matters Search Tool (DEWHA, 2009a). The lists generated from these databases were used to assist in designing surveys for threatened species considered to have the potential to occur in the proposed modification areas, as well as structuring habitat assessments to further assist in the determination of the likelihood of occurrence.

Flora and fauna surveys were conducted in February 2010 focussing on the quality of fauna habitat within the proposed modification areas and vegetation mapping of the conveyor/service corridor envelope. It should be noted that no separate fauna surveys were undertaken within the proposed conveyor/service corridor and were not considered necessary due to the prevalence of previous surveys, low likelihood of occurrence of fauna species within the vegetation communities and the low level of clearing requirements due to the proposed conveyor/service corridor.

##### i Vegetation communities

The landscape of the proposed modification areas has been used for grazing since European settlement and as a result has been heavily cleared and disturbed historically. Notwithstanding this, the landscape is largely dominated by scattered patches of woodland of various sizes and ages, and broad expanses of what is referred to in this report as 'Derived Native Grassland', that is grassland dominated by native plants that has been derived from the clearing of the original tree cover.

As shown on Figure 6.6, other vegetation communities occurring commonly within the proposed modification areas comprise the Upper Hunter Hills Exposed Ironbark Woodland, Grey Box/White Box Intergrade Grassy Woodland, Low Diversity Derived Native Grassland and Exotic Pasture, Upper Hunter White Box – Ironbark Grassy Woodland, and Grassland (Upper Hunter Hills Exposed Ironbark Woodland).

The Derived Native Grassland, Grey Box/White Box Intergrade Grassy Woodland and Upper Hunter White Box – Ironbark Grassy Woodland are listed as EECs under the TSC Act.

##### ii Flora

Flora within the proposed modification areas is dominated by grasses (Poaceae) and other families of herbaceous ground cover plants. No species listed under the TSC Act have been identified within the proposed modification areas.

##### iii Fauna

The threatened species recorded within the Mount Pleasant Project area and those considered likely to use the modification areas include woodland birds, bats and non-flying mammals, as follows.

- Brown Treecreeper (*Climacteris picumnus*) (Vulnerable under the TSC Act).
- Grey-crowned Babbler (*Pomatostomus temporalis*) (Vulnerable under the TSC Act).
- Speckled Warbler (*Pyrrholaemus saggitatus*) (Vulnerable under the TSC Act).
- Diamond Firetail (*Stagonopleura guttata*) (Vulnerable under the TSC Act).
- Varied Sittella (*Daphoenositta chrysoptera*) (Vulnerable under the TSC Act).
- Black-chinned Honeyeater (*Melithreptus gularis*) (Vulnerable under the TSC Act).
- Squirrel Glider (*Petaurus norfolcensis*) (Vulnerable under the TSC Act).
- Eastern Bent-wing Bat (*Miniopterus schreibersii oceanensis*) (Vulnerable under the TSC Act).
- Large-eared Pied Bat (*Chalinolobus dwyeri*) (Vulnerable under EPBC and TSC Acts).
- Eastern Free-tail Bat (*Mormopterus norfolkensis*) (Vulnerable under the TSC Act).
- Little Bent-wing Bat (*Miniopterus australis*) (Vulnerable under the TSC Act).
- Large-footed Myotis (*Myotis macropus*) (Vulnerable under the TSC Act).
- Grey-headed Flying-fox (*Pteropus poliocephalus*) (Vulnerable under EPBC and TSC Acts).

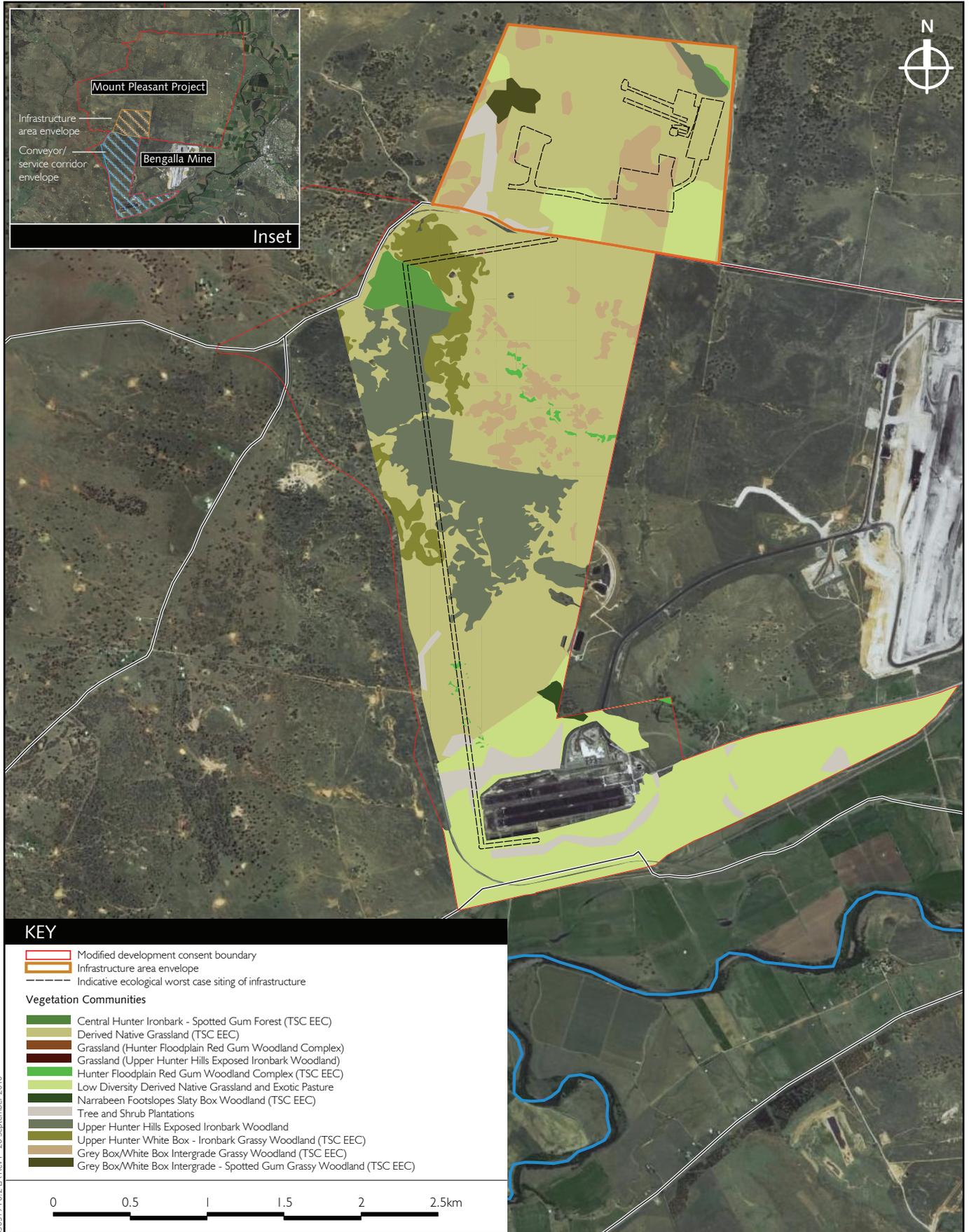
These threatened species, which are predicted as likely to occur within suitable habitats in the proposed modification areas, are typical for woodland and grassy open forest remnants in the upper Hunter Valley.

### 6.2.2 Impact assessment

The primary impact from the proposed modifications will be the clearing of vegetation. 'Clearing of Native Vegetation' is listed as a Key Threatening Process and has been identified as a direct cause of the decrease in biodiversity (NSW Scientific Committee, 2004). However, it should be noted that the proposed modifications relate to options of already approved infrastructure and may lead to reductions in clearing, as discussed further below.

A conservative worst case approach to the ecological impact assessment has been adopted in which it has been assumed that:

- the maximum areas of highest quality native vegetation will be cleared within the infrastructure and conveyor/service corridor envelopes; and



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- a 30m disturbance area has been included along the entire length of the conveyor/service corridor.

Table 6.5 shows the comparative areas and types of vegetation communities to be cleared by the approved rail facilities and specific locations of infrastructure within the infrastructure area (as detailed in the EIS), versus the proposed modification components assuming worst case alignment of the optional conveyor/service corridor and configuration of infrastructure within the infrastructure envelope (refer to Figure 6.6). These are termed ‘approved layout’ and ‘proposed layout’ respectively. Approved for the purposes of this report relates to Development Consent DA 92/97.

Under the proposed worst case scenario, the proposed layout would require approximately 47.5ha of vegetation clearing compared to approximately 54.8ha of clearing that would be required for the approved project, resulting in a reduction in the clearing requirements by approximately 7.3ha. The proposed worst case scenario (refer to Figure 6.6) results in a total layout footprint of approximately 35.5ha of vegetation communities currently listed under the TSC Act, compared with approximately 41.6ha under the approved layout footprint.

**Table 6.5 Vegetation communities potentially impacted by approved and proposed layout**

<b>Vegetation community</b>	<b>Approved layout (ha)</b>	<b>Proposed layout (ha)</b>
Upper Hunter White Box – Ironbark Grassy Woodland	-	1.3
Grey Box/White Box Intergrade Grassy Woodland	2.0	9.1
Central Hunter Ironbark - Spotted Gum Forest	-	0.9
Hunter Floodplain Red Gum Woodland Complex	0.2	0.2
Tree and Shrub Plantations	1.1	0.8
Upper Hunter Hills Exposed Ironbark Woodland	1.6	4.2
Derived Native Grassland	39.6	24.0
Grassland (Hunter Floodplain Red Gum Woodland Complex)	0.5	0.6
Grassland (Upper Hunter Hills Exposed Ironbark Woodland)	1.4	1.3
Low Diversity Derived Native Grassland and Exotic Pasture	8.4	5.1
<b>Total</b>	<b>54.8</b>	<b>47.5</b>

Note: The areas in the above table are based on the layout for infrastructure and the rail loop as shown in Figure 2 in the 1997 Mount Pleasant EIS. Construction disturbance in these areas is not included.

The removal of vegetation from within the modification areas is not considered to constitute a significant impact to the fauna listed in Section 6.2.1, due to highly mobile nature of these species allowing them to be able to continue to forage and breed in the area. The proposed layout footprint is not considered sufficiently extensive to cause population and/or genetic isolation as a result of fragmentation.

Indirect impacts are a result of secondary processes and often occur around the periphery of a development. They include such things as weed invasion, increases in feral animals, erosion, and changes in habitat connectivity. The potential for indirect impacts that would result from the conveyor/service corridor being preferred to the approved rail facilities and modified configuration of infrastructure within the infrastructure area envelope is considered minimal, allowing for already approved construction activities.

### 6.2.3 Management and monitoring

The DECCW has well established principles (DECC 2008) regarding the assessment of potential ecological impacts of proposed developments and how they should be managed. Essentially, these principles can be categorised into: avoid, mitigate, and compensate.

Should the conveyor/service corridor option be pursued, the approved layout footprint would reduce by approximately 7.3ha and this reduces the disturbance of vegetation communities currently listed under the TSC Act.

During the construction phase, pre-clearance surveys of relevant forest and woodland areas for threatened flora and fauna species will be undertaken. Details of the rehabilitation of the infrastructure area and conveyor/service corridor (should this option be pursued) upon decommissioning will be provided in the Rehabilitation and Environment Management Plan (REMP).

Overall, ecological management of the proposed modifications will be incorporated into the development of the Flora and Fauna Management Plan as required under Condition 3.4 of the development consent. Additionally, identified monitoring locations associated with the construction and operation of the proposed modifications, will be included in the AEMR as per Condition 8.6 of the development consent.

### 6.2.4 Conclusions

The landscape of the proposed modification areas has been used for grazing since European settlement and as a result has been heavily cleared and disturbed historically. Notwithstanding this, vegetation communities listed as EECs under the TSC Act are located within the modification areas, including; Derived Native Grassland, Grey Box/White Box Intergrade – Spotted Gum Grassy Woodland, Upper Hunter White Box – Ironbark Grassy Woodland, Grey Box/White Box Intergrade Grassy Woodland, Central Hunter Ironbark – Spotted Gum Forest, Hunter Floodplain Red Gum Woodland Complex and Narrabeen Foothills Slaty Box Woodland.

To provide for flexibility in the detailed design of the infrastructure area and optional conveyor/service corridor, a conservative worst case approach to ecological impact assessment was adopted. Under the worst case scenario, the total modification area footprint would comprise approximately 47.5ha of vegetation clearance, versus approximately 54.8ha of clearance for the approved rail facilities and infrastructure area. The proposed worst case scenario would result in a total layout footprint of 35.5ha of vegetation communities currently listed under the TSC Act compared with 41.6ha under the approved layout footprint.

The DECCW principles on management of potential ecological impacts have been considered with the proposed modifications resulting in an approximate 7.3ha reduction in disturbance of vegetation communities, should the conveyor/service corridor option be pursued.