

Table 4B.7
Identified Threatened Species

Species	NSW Wildlife Atlas	Ayers et al (1996)	BIO CLIM	TSC Act	EPBC Act	GCNRC (2007) Assessment	
						Habitat Suitability / Potential Occurrence	Conclusion
<i>Hakea pulvinifera</i>	✓	✓	✓		✓	Unknown away from Keepit Dam.	Not Present
<i>Dichanthium setosum</i>			✓		✓	Suitable habitat present but no previous records of its occurrence.	Not Present
<i>Philotheca ericifolia</i>			✓		✓	Suitable habitat NOT present.	Not Present
<i>Tylophora linearis</i>		✓			✓	Suitable habitat NOT present.	Not Present
<i>Diuris tricolor</i>				✓		Suitable habitat NOT present.	Not Present
<i>Euphrasia arguta</i>				✓		Suitable habitat NOT present.	Not Present
<i>Goodenia macbarronii</i>				✓	✓	Suitable habitat NOT present.	Not Present
<i>Homopholis belsonii</i>						Not known south of Warialda and no previous records of its occurrence.	Not Present
<i>Thesium australe</i>			✓	✓	✓	Suitable habitat NOT present.	Not Present
<i>Cadellia pentastylis</i>			✓		✓	Suitable habitat possibly present	Not Present
<i>Calotis glandulosa</i>			✓			Suitable habitat present but outside normal range.	Not Present
<i>Swainson murrayana</i>			✓		✓	Suitable habitat present but outside normal range.	Not Present
<i>Digitaria porrecta</i>					✓	Suitable habitat present but no previous records of its occurrence.	Not Present
<i>Pterostylis cobarensis</i>					✓	Suitable habitat NOT present.	Not Present
Note - = Not Recorded							
Source: Modified after GCNRC (2007a) – Section 7 and Section 8 respectively							

The following TSC Act listed Endangered Ecological Communities are recorded as occurring within the Gunnedah region.

- Native Vegetation on Cracking Clay Soils of the Liverpool Plains.
- White Box Yellow Box Blakely's Red Gum Woodland.
- Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions.

The EPBC Act listed the White Box Yellow Box Blakely's Red Gum Grassy Woodland and Derived Native Grassland community, which is equivalent to the TSC Act listed White Box Yellow Box Blakely's Red Gum Woodland.



Of the vegetation identified within the study area, GCNRC (2007a) concluded that only a highly modified remnant of the Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions EEC is present (Community 6).

4B.2.2.3.3 Endangered Ecological Communities and Populations

GCNRC (2007a) considered the structure and composition of the vegetation communities present within the study area, comparing these to the listed endangered ecological communities and populations under the TSC Act and the EPBC Act. Reference to NSW Scientific committee findings was also made where relevant.

The following TSC Act listed Endangered Ecological Communities are recorded as occurring within the Gunnedah region.

- Native Vegetation on Cracking Clay Soils of the Liverpool Plains.
- White Box Yellow Box Blakely's Red Gum Woodland.
- Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions.

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Of the vegetation identified within the study area, GCNRC (2007a) concluded that only a highly modified remnant of the Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions EEC is present (Community 6).

4B.2.2.3.4 Critical Habitat

There are no areas of critical habitat listed under either the TSC Act or EPBC Act within either study area.

4B.2.2.3.5 Koala Habitat

Bimble Box, *Eucalyptus populnea* ssp *Bimbil* and White Box, *Eucalyptus albens*, identified within the Project Site study area are listed in Schedule 2 of SEPP 44 as Koala feed trees. Bimble Box and White Box are relatively scattered and the proportion of Koala feed trees to be disturbed would be <15%. Therefore, the study area does not represent “potential Koala habitat”.



4B.2.2.4 Design Features, Operational Safeguards, Mitigation Measures and Offset Strategies

4B.2.2.4.1 Introduction

The total area of disturbance associated with the Project is approximately 243ha (237ha on the Project Site and 6ha on the transport route), the majority of which (200.7ha) would occur on previously disturbed land used for cropping and/or grazing.

Approximately 36.3ha of native vegetation on the Project Site would be disturbed by the Project in the following communities.

- Community 1 – 11.6ha.
- Community 2 – 23.4ha.
- Community 3 – 1.3ha.

There would also be minor disturbance to isolated trees within a 6.0ha area of Community 4 along the alignment of the transport route.

4B.2.2.4.2 Design Features

In order to minimise the impact on native vegetation communities, the following design features have or would be adopted.

- The out-of-pit overburden emplacements were designed to avoid, as far as practicable, remnant stands of native vegetation. In particular, Community 5, which represents a modified remnant of the Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions EEC, has been avoided.
- The section of the transport route which uses the Shannon Harbour Road reserve would be constructed with a meander to minimise the number of mature native trees that require removal. Based on an inspection of the transport route along Shannon Harbour Road, GCNRC (2007a) indicates that no more than 20 trees would require removal, including:
 - 1 Pepper Tree, *Schinus ariera* (introduced);
 - 2 White Box, *Eucalyptus albens* (one debilitated);
 - 14 Bull Oak, *Casuarina luehmannii* (most smaller trees and saplings);
 - 1 White Cypress Pine, *Callitris glaucophylla*;
 - 1 Narrow-leaved Ironbark, *Eucalyptus crebra* (mature); and
 - 1 Wild Orange, *Capparis mitchellii*.



4B.2.2.4.3 Operational Safeguards

The Proponent proposes to adopt the following operational safeguards in order to minimise any potential adverse impacts on the local flora within the Project Site. These safeguards are of a general nature and have been developed in consultation with GCNRC.

- (i) The extent of clearing undertaken would be minimised and consistent with operational requirements.
- (ii) All areas to be cleared would be clearly defined.
- (iii) All clearing and topsoil stripping would be undertaken in campaigns on an as-needs basis.
- (iv) Soil material and biomass removed beyond the first 18 to 24 months of mining would be directly transferred to an active rehabilitation area, where practicable.
- (v) Progressive rehabilitation of all disturbed surfaces would be undertaken in accordance with the procedures described in Section 2.14.
- (vi) Any additional internal roads required on the cleared lands would be constructed well away from stands of native vegetation.
- (vii) Noxious weeds would be controlled at all times.

4B.2.2.4.4 Mitigation Measures and Offset Strategies

In order to compensate for the removal of 36.3ha of native vegetation from Communities 1, 2 and 3, a strategy to rehabilitate specific areas of the Project Site to native vegetation, create and/or improve habitat corridors on and adjacent to the Project Site and transport route, and protect areas of native vegetation from agricultural activities on land external to the Project Site would be adopted. The competing consideration for a return of the post-mining landform to agricultural purposes consistent with that prior to disturbance, has influenced this strategy.

Rehabilitation

As illustrated on **Figure 2.15** and described in Section 2.14.5, an area of 84.4ha has been nominated for the re-establishment of native vegetation. Through the planting of native tree and shrub species tubestock, and sowing of native grasses and other groundcover, Narrow Leaf Ironbark – Pilliga Grey Box and Pilliga Grey Box - White Box - Yellow Box - White Cypress Pine type native vegetation would be re-established and designated for nature conservation. Recognising that the greatest habitat value is provided by vegetation linked to other similar habitats, the re-establishment of native vegetation over approximately 84ha would be concentrated on the western overburden emplacement and adjoin Vickery State Forest.



On-site Native Vegetation Protection

A 42.3ha area of remnant, but degraded Narrow Leaf Ironbark – Pilliga Grey Box Community vegetation exists in the northwest corner of the Project Site on the “Glenroc” property. Agricultural activity would be excluded from this area and the native vegetation allowed to revegetate (see **Figure 4B.9**).

Creation and Maintenance of Wildlife Corridors

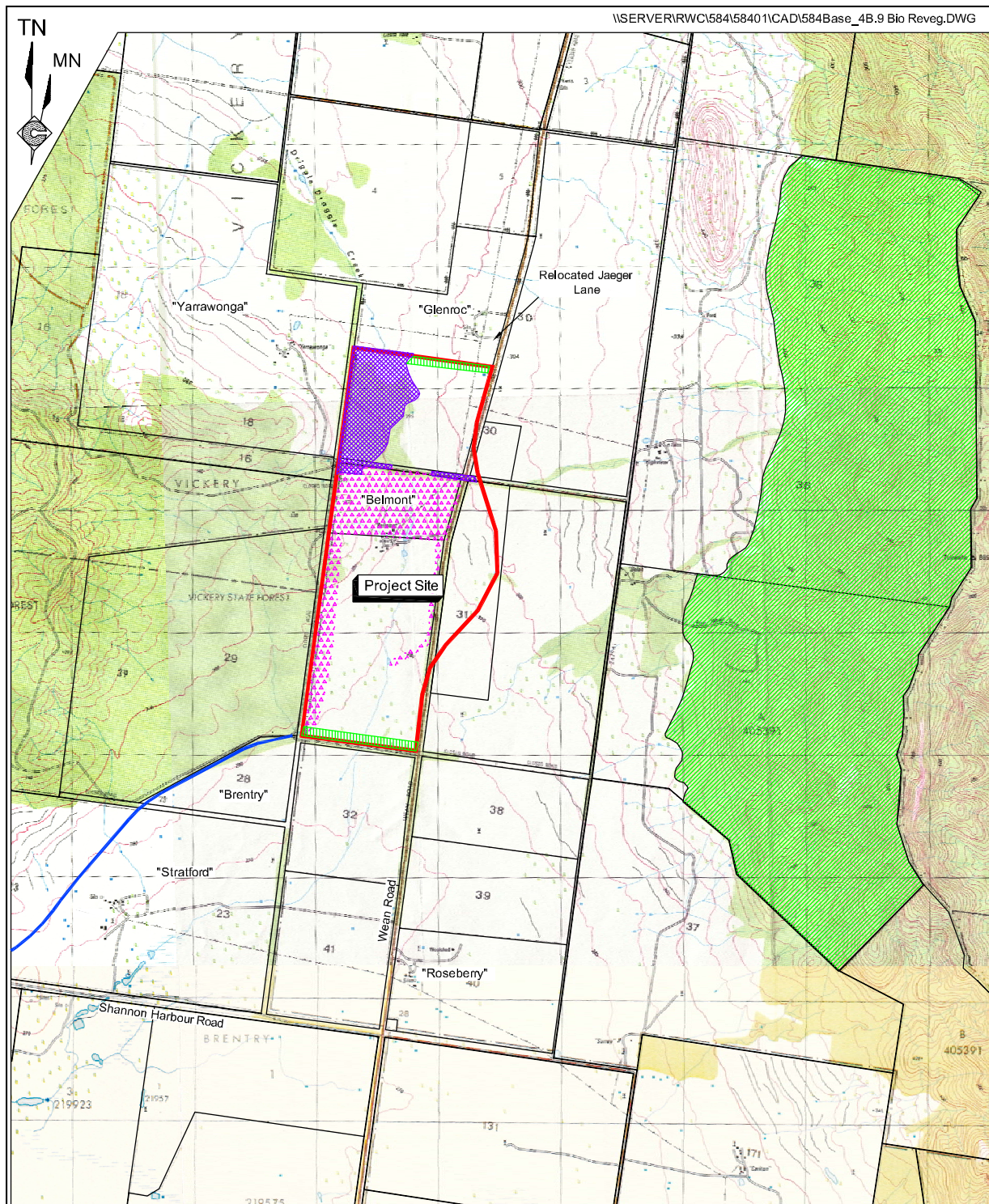
Several existing and one proposed habitat corridor would be maintained and/or created to promote the linkage of remnant areas of native vegetation in the local area (see **Figure 4B.9**). The proposed habitat corridors are as follows.

- Northern Project Site Boundary: A 2.6ha corridor would be created to link the offset area on the “Glenroc” property to the road easement of Wean Road. It is proposed to enhance the vegetation within this corridor with Narrow Leaf Ironbark – Pilliga Grey Box Community type trees and shrubs.
- Closed Jaeger lane: A 2.6ha corridor would link the conserved vegetation on the “Glenroc” property, the rehabilitated native vegetation on the “Belmont” property and the remnant vegetation of the Wean Road and Jaeger Lane (east) road reserves).
- Riordan Road – Southern Project Site Boundary: The remnant vegetation within this closed road easement along the southern boundary of the Project Site (3.8ha) would be fenced and the native vegetation already established protected from grazing. This corridor would be enhanced through planting tree and shrub species within an adjacent 50m corridor along the southern boundary of the Project Site. Species. The corridor provides a link between the vegetation of Vickery State Forest and the remnant vegetation which occurs within the Wean road easement.

Regional Biodiversity Offset Strategy

The Proponent is close to finalising a Regional Biodiversity Offset Strategy, in conjunction with the Department of Planning and the Department of Environment and Climate Change. The Whitehaven Regional Biodiversity Offset Strategy would provide for the long-term conservation of approximately 1000ha of remnant native vegetation which extends from CCA Zone 2 – Kelvin onto the “Yarrari” and “Belah” properties (see **Figure 4B.9**). The Whitehaven Regional Biodiversity Offset Strategy would include the fencing and sub-division of the 1000ha of vegetation, with this area wither allocated as an extension of CCA Zone 2 – Kelvin or entered into long-term conservation through creation of a covenant with succession of title over the sub-divided land. The sub-divided portions of the land would be progressively allocated as offsets to projects of the Proponent, including the Belmont Coal Project, which result in disturbance to native vegetation.





REFERENCE

- Project Site Boundary
- Transport Route
- Proposed Biodiversity Offset Area
- Rehabilitated Woodland
- Additional Habitat Enhancement through Replanting
- Whitehaven Regional Biodiversity Offset Area

Figure 4B.9

BIODIVERSITY OFFSETS AND NATIVE
VEGETATION REHABILITATION



4B.2.2.5 Assessment of Impacts

4B.2.2.5.1 Introduction

In order to assess the level of impact of the Project on the vegetation of the two study areas and their surrounding environs, the relative areas of each vegetation community type has been determined, the presence or potential presence of threatened species, communities or populations has been reviewed and a Seven-part Test has been conducted by GCNRC (2007a) in accordance with DECC Guidelines for Threatened Species Assessment (DEC, 2005) for both study areas. The results of the Seven-part Tests and impact assessment are presented in the following sub-sections.

4B.2.2.5.2 Project Site and Transport Route Study Area

Given the highly modified condition of much of the study area, suitable habitat exists for only a small number of the threatened species identified as potentially occurring in the region (see **Table 4B.7**). None of the threatened flora species recorded on or predicted to occur in the wider area around the Project Site was identified within the Project Site study area.

Notwithstanding that none of the listed flora species listed as threatened on the schedules of the TSC Act and EPBC Act were identified within the study area, and in accordance with the DECC's draft Guidelines for Threatened Species Assessment, GCNRC (2007a) undertook an assessment of the following seven factors to assess the significance of the proposed activities on threatened species, populations and communities ("seven part test of significance").

A. In the case of a Threatened species, whether the action proposed is likely to have an adverse effect on the life cycle of the species such that a viable local population of the species is likely to be placed at risk of extinction:

No Threatened flora species have been recorded within the study area in the past and none were recorded during field survey. Consequently it is concluded that there would be no adverse affect from the Project on the life cycle of any Threatened flora species such that a viable local population of the species is likely to be placed at risk of extinction.

B. In the case of an endangered population, whether the action proposed is likely to have an adverse effect on the life cycle of the species that constitutes the endangered population such that a viable local population of the species is likely to be placed at risk of extinction:

No endangered flora populations have been recorded from within the study area in the past and none were recorded during field survey. Consequently it is concluded that there would be no adverse affect from the Project on the life cycle of any flora species that constitutes an endangered population such that a viable local population of the species is likely to be placed at risk of extinction.



C. In the case of an endangered ecological community or critically endangered ecological community, whether the action proposed:

- [i] is likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction, or**
- [ii] is likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.**

The study area contains a remnant of the *Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions Endangered Ecological Community*. This community was recorded on the 'Glenroc' property in the northern section of the study area.

The design for the Project allows for the *Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions Endangered Ecological Community* to remain intact and so it would not be subjected to any significant impact.

Consequently it is considered that the Project:

- is not likely to have an adverse effect on the extent of the ecological community such that its local occurrence is likely to be placed at risk of extinction; nor
- is it likely to substantially and adversely modify the composition of the ecological community such that its local occurrence is likely to be placed at risk of extinction.

D. In relation to the habitat of a threatened species, population or ecological community:

- [i] the extent to which the habitat is likely to be removed or modified as a result of the action proposed, and**
- [ii] whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as a result of the proposed action, and**
- [iii] the importance of the habitat to be removed, modified fragmented or isolated to the long-term survival of the species, population or ecological community in the locality.**

The Project would not impact in any significant manner on the *Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions Endangered Ecological Community* as the area supporting this community would not be disturbed.

Consequently it is concluded that the Project would not have any significant impact on this endangered ecological community.



E. Whether the action proposed is likely to have an effect on critical habitat [either directly or indirectly].

No critical habitat is present within the study area. Consequently, it is concluded that the Project would not have any effect on any critical habitat.

F. Whether the action proposed is consistent with the objectives or actions of a species recovery plan or threat abatement plan.

There is no species recovery plan in existence for the *Brigalow within the Brigalow Belt South, Nandewar and Darling Riverine Plains Bioregions Endangered Ecological Community* and there are no threat abatement plans that have been finalised and that are relevant to the study area.

G. Whether the action proposed constitutes or is part of a key threatening process or is likely to result in the operation of, or increase the impact of, a key threatening process.

The Project would involve two activities listed as Key Threatening Processes in the Schedules of the *NSW Threatened Species Conservation Act 1995*, namely:

- Clearing of Native Vegetation; and
- Removal of Dead Wood and Dead Trees.

The number of native trees proposed for removal is not great and would be more than compensated for by the proposed offsets. Consequently the impact of the proposed clearing is not significant in the longer term. With regard to dead trees and dead wood on the ground, the impact of the Project would be no greater than that of a program aimed at removing rabbit and fox harbour to control these feral animals and therefore, the impact of this activity is not considered to be significant. Consequently, it's unlikely that the impact of the Project would significantly increase the impact of a key threatening process.

4B.2.2.5.3 Regional Biodiversity

Namoi River Catchment Targets (NCMB, 2003)

The Namoi Catchment Management Authority has established targets to be achieved within the Namoi River Catchment with reference to biodiversity. The Project has therefore been assessed against the three following targets.

- *Target B.1 - Existing native vegetation*
By 2010 a minimum of 15% (6 300km²) of the catchment would be managed for conservation. The 15% is to be made up from 3 150km² public lands (parks, reserves) and 3 150km² on private land.

As part of the Proponent's offset strategy, 42.3ha of existing native vegetation on the Project Site would be conserved during the life of the Project and in the final landform (see **Figure 4B.9**). A further 13ha of habitat corridors would be created and/or enhanced on the Project Site boundary and surrounds through de-stocking and/or tree



planting. In addition, part of the remnant vegetation located on the “Yarrari” and “Belah” properties, which would be incorporated into long-term conservation as part of the Whitehaven Regional Biodiversity Offset Strategy, would be allocated to offset disturbance associated with the Belmont Coal Project. This would contribute to the targeted 3 150km² of existing native vegetation to be managed on private land for conservation within the catchment.

- *Target B.2 - Distribution and quality of biodiversity*
By 2010 maintain and manage the extent of;
 - a) *existing (2001) native vegetation communities within each bioregion in the Namoi Catchment by the adoption of management principles that improve condition; and*
 - b) *high Conservation Value Vegetation as identified and defined by Regional Vegetation and Water Management Committees.*

Those areas of existing native vegetation to be managed for conservation include a number of native woodland community types. These vegetation communities are representative of the native vegetation of the bioregion as well as comprising areas of high conservation value in line with Target B.2.

- *Target B.3 - Additional native vegetation*
By 2010 support the maintenance of, or improve biodiversity with strategic native revegetation of an additional 10 000ha.

As part of the Proponent’s proposed rehabilitation and offset strategy, 84.4ha of the disturbed area of the Project would be rehabilitated to native woodland type vegetation. This is approximately 2.3 x the area of native vegetation disturbed by the Project. As noted above, the Proponent has committed to further offsetting the proposed disturbance through maintenance of approximately 42.3ha of remnant or regenerating woodland on the “Glenroc” property for conservation and the creation and enhancement of 13ha of habitat corridors. The Proponent is also currently finalising a Regional Biodiversity Offset Strategy, in conjunction with the Department of Planning and the Department of Environment and Climate Change, which would result in the long-term conservation of approximately 1 000ha of remnant native vegetation. This would assist in the attainment of the Namoi Catchment Management Authority’s target (Target B.3) for strategic native revegetation of an additional 10 000ha within the catchment.

Guidelines for Threatened Species Assessment – Key Thresholds (DEC, 2005)

GCNRC (2007) considers the impacts of the Project against the key thresholds identified in Step 5 of DECC (2005). Based on the proposed disturbance, and considering the proposed operational controls, mitigation measures and offset strategies, GCNRC (2007) concludes the project would:

- maintain biodiversity, and based on the proposed offset strategy, improve biodiversity values;



- not reduce the long-term viability of any species, population or community;
- not accelerate, or place at risk of extinction, any species, population or community; and
- not adversely affect critical habitat.

4B.2.3 Fauna

4B.2.3.1 Study Methodology

Similar to the flora study, the fauna study has been completed over two distinct periods. An initial assessment was completed in 2002 over the Project Site and a transport route which traversed the southern edge of the Vickery State Forest. This initial assessment has been supplemented by additional desktop and field surveys completed in November and December 2006 to incorporate the transport route between the Project Site and Hoad Lane (SR 95) and the updated requirements of the Department of Environment and Climate Change for threatened species assessment (as outlined in DEC (2005)). CES (2007) provides the detail on the fauna survey work completed on the Project Site and transport route.

2002 Survey and Assessment

Separate study areas were defined for the Project Site and the transport route and previous studies of vegetation incorporating these areas were reviewed to provide an indication of the likely habitat type and fauna assemblages for each study area. Prior to a field survey over the study areas, a search of the documented records held on the Department of Environment and Conservation, Atlas of NSW Wildlife Database for the Boggabri 1: 100 000 mapsheet was completed to identify Threatened plant species previously recorded within the local area. Other literature reviewed to compile a checklist of regional fauna included Strahan (1995), Swan (1990), Barker *et al* (1995), Parnaby (1992), Cogger (2000), Churchill (1998), Ayers *et al* (1996-99), NPWS (1999) and other published and unpublished sources.

The fauna checklist for the Gunnedah/Boggabri Region recorded 18 species of frogs, at least 107 birds, some 50 mammals and 36 reptiles in the region.

The subsequent field surveys, conducted between December 2001 and September 2002 targeted amphibians, birds, small mammals, larger and arboreal mammals, microbats, nocturnal fauna, reptiles invertebrates and fish. The survey methodology for each of these fauna types is provided by CES (2007) – Part 3 of the *Specialist Consultant Studies Compendium*.

2006 Survey and Assessment

A new search of the documented records held on the Department of Environment and Conservation, Atlas of NSW Wildlife Database for the Boggabri 1: 100 000 mapsheet was completed. Between 30 October and 2 November 2006, supplementary fauna sampling was undertaken over the Project Site and the transport route. This sampling included targeted



searches for reptiles and amphibians, bat call analyses, cage, Elliot and hair trapping, hair analyses and pedestrian and vehicle traverses of the Project Site and transport route.

Additional detail on the study methodology is provided by CES (2007) – Part 3 of the *Specialist Consultant Studies Compendium*.

4B.2.3.2 Existing Fauna Assemblage

4B.2.3.2.1 Habitat Types

Figure 4B.10 presents the five habitat types were identified by CES (2007) on the Project Site and transport route, namely:

- Open Woodland Habitat of Narrow-leaf Ironbark – Pilliga Grey Box (Vegetation Community 1).
- Open Woodland Corridor Habitat of Pilliga Grey Gum – White Cypress Pine (Vegetation Communities 2, 4 and parts of Community 3).
- Creek line Gallery Habitat of Box trees with scattered White Cypress Pine (Vegetation Community 3).
- Regenerating Remnant Habitat of White Cypress Pine (Vegetation Community 7).
- Cleared paddocks (cultivated, grazed and contoured - Vegetation Community 8).

4B.2.3.2.2 Regional Fauna

Based on a search of the DECC (NPWS) NSW Wildlife Atlas for the Boggabri 1:100 000 mapsheet area, the regional fauna assemblage is as follows.

- Amphibians – 18 species, of which one is listed as endangered.
- Birds – 107 species, of which six are listed as endangered and 29 listed as vulnerable.
- Mammals – 50 species (including 12 introduced species), of which seven species are listed as endangered (presumed extinct), one species is listed as endangered and nine species are listed as vulnerable.
- Reptiles – 6 species, of which three have been listed as vulnerable.

Various fish species occur within the regions but have not been considered given the lack of suitable habitat in the Project Site.

Table 4B.8 presents a compilation of the threatened species of the regional fauna assemblage (for the Boggabri 1:100 000 mapsheet) based on a search of the DECC (NPWS) NSW Wildlife Atlas.



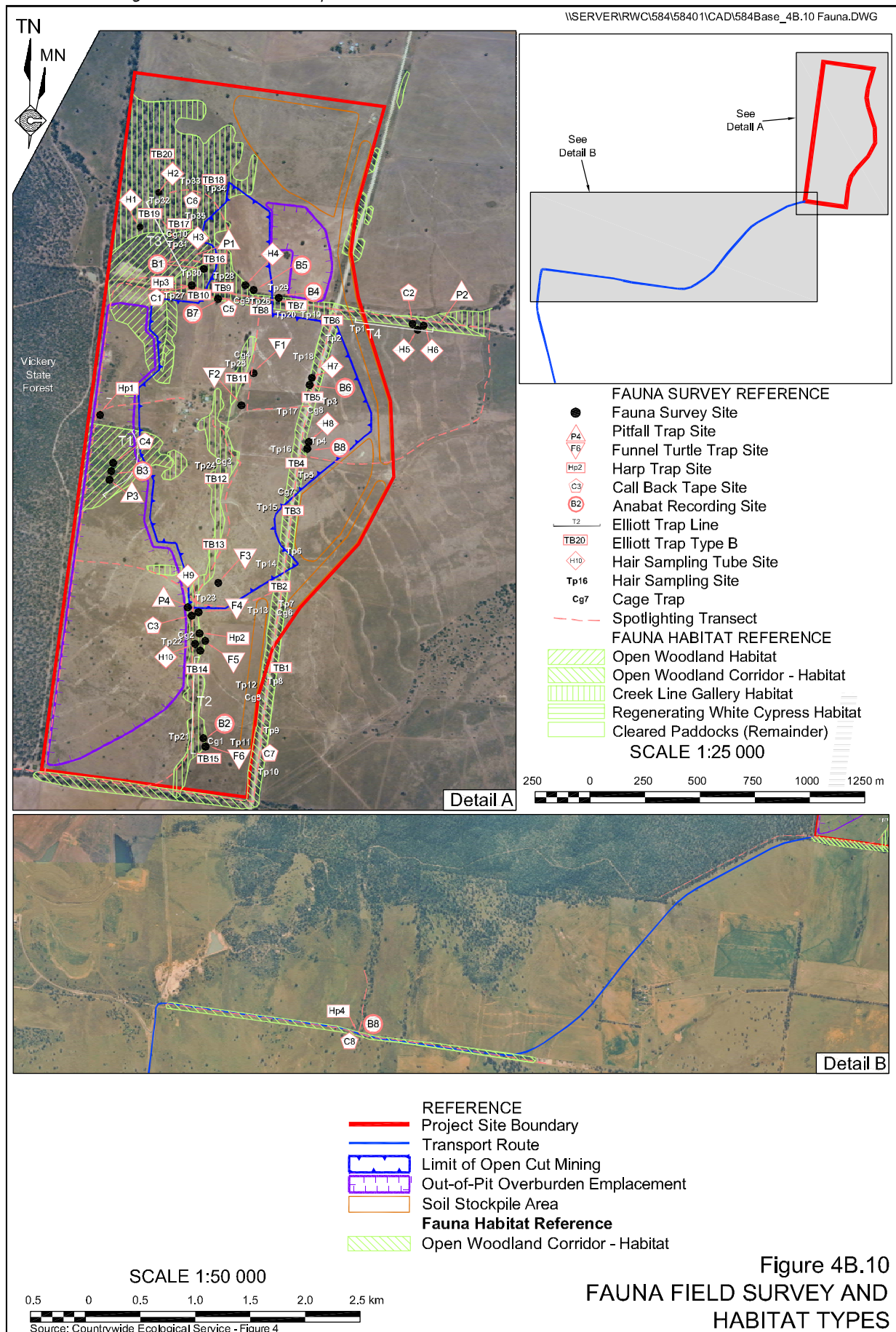


Table 4B.8
Regional Threatened Species Assemblage

Fauna Group	Endangered	Vulnerable
Amphibians	1. Booroolong Frog	
Birds	1. Bush Thick-knee (Curlew) 2. Black-necked Stork ^W 3. Malleefowl 4. Cotton-Pygmy Goose ^W 5. Swift Parrot 6. Australian Bustard WD 7. Squatter Pigeon	1. Australasian Bitten ^W 2. Black Bitten ^W 3. Magpie Goose ^W 4. Freckled Duck ^W 5. Blue-billed Duck ^W 6. Black-necked Stork ^W 7. Osprey ^{WD} 8. Black-breasted Buzzard 9. Square-tailed Kite 10. Red Goshawk 11. Grey Falcon 12. Brolga ^W 13. Plains-wanderer 14. Sanderling ^W 15. Painted Snipe ^{WD} 16. Mongolian Plover ^W 17. Black-tailed Godwit ^W 18. Superb Parrot 19. Glossy Black-Cockatoo 20. Red-tailed Black Cockatoo 21. Powerful Owl 22. Barking Owl 23. Eastern Grass Owl 24. Masked Owl 25. Turquoise Parrot 26. Diamond Firetail 27. Striated Fieldwren 28. Grey-crowned Babbler 29. Pied Honeyeater 30. Speckled Warbler 31. Painted Honey-eater 32. Regent Honeyeater 33. Pink (Major Mitchell's) Cockatoo 34. Hooded Robin 35. Brown Treecreeper
Mammals	1. White-footed Rabbit-rat ^P 2. Brush-tailed Bettong ^P 3. Plains Rat ^P 4. Gould's Mouse ^P 5. Bridled Nailtail Wallaby ^P 6. Bilby ^P 7. Western Barred Bandicoot ^P 8. Eastern Hare Wallaby ^P 9. Eastern Quoll ^P 10. Black-striped Wallaby 11. Brush-tailed Rock-wallaby	1. Koala 2. Squirrel Glider 3. Little Pied Bat 4. Large Pied Bat 5. Greater Long-eared Bat 6. Yellow-bellied Sheath-tail Bat 7. Long-haired Rat 8. Stripe-faced Dunnart 9. Rufous Bettong 10. Brush-tailed Phascogale 11. Little Bent-wing Bat 12. Common Bent-wing Bat 13. Tiger Quoll
Reptiles		1. Pale-headed Snake 2. Border Thick-tailed Gecko 3. Namoi River Elseya
Note ^P : Presumed Extinct Note ^W : Wetland species Note ^{WD} : Wetland dependent (species associated with river channels). Source: Modified after CES (2007) – Section 4.1		

4B.2.3.2.3 Fauna Species of the Survey Areas

The complete lists of fauna species identified during the survey are presented in CES (2007). A summary of the number of species recorded during the fauna surveys is presented in **Table 4B.9**. **Table 4B.9** also identifies the threatened fauna species identified during the 2001, 2002, 2006 and 2007 surveys conducted by CES (CES, 2007).

4B.2.3.2.4 Conservation Significance

Within the region (covered by the Boggabri 1:100 000 mapsheet), a total of 62 threatened species have been previously recorded in the region. This includes 41 bird species, 17 mammal species, one amphibian and three reptile species. Of these, seven species are considered to be extinct, eight species as Endangered on Schedule 1, Part 1 of the TSC Act 1995 and the



remainder as Vulnerable on Schedule 2 of the Act. With respect to the National listing, the Spotted-tailed Quoll is listed as Endangered, the Regent Honeyeater as Endangered and Migratory and an additional four species covered by migratory provisions of the Commonwealth *EPBC Act 1999*. The species listed as extinct in NSW have been excluded from further assessment.

Only four of the 62 threatened fauna species were recorded on the Project Site and transport route between the Project Site and Hoad Lane (see **Table 4B.9**).

Table 4B.9
Fauna Species Recorded

Fauna Group	Number of Species	Native	Exotic	Threatened species
Amphibians	6	6	0	0
Birds	59	58	1	3 • Grey Falcon • Grey-crowned Babbler • Gilberts Whistler
Mammals	28	21	7	1 • Yellow-bellied Sheathtail Bat
Reptiles	10	10	0	
Source: Modified after CES (2007) – Tables 6 to 11				

SEPP No. 44 - Koala Habitat Protection

State Environmental Planning Policy No. 44 - Koala Habitat Protection (SEPP 44), which applies in the Gunnedah Local Government Area, aims to identify potential Koala habitat in the form of native vegetation where the trees of the types listed in Schedule 2 of SEPP 44 constitute at least 15% of the trees in the area. Based on the SEPP 44 Scheduled feed tree species representing <15% of all trees (see Section 4B.2.2.3.5), the Project Site nor the transport route are regarded as “potential Koala habitat”.

Clearing of Native Vegetation and Cumulative Impact (NVC Act)

As designated development under the *Environmental Planning & Assessment Act 1979*, no further assessment is required under the *Native Vegetation Conservation Act 1997*.

4B.2.3.3 Operational Safeguards, Mitigation Measures and Offset Strategies

4B.2.3.3.1 Introduction

Whilst fauna diversity is relatively low on the Project Site and along transport route as a consequence of prior agricultural and farming activities, the Proponent would implement the following safeguards to minimise the impacts on local fauna, and in the medium to longer term, enhance fauna habitat.



4B.2.3.3.2 Project Site Safeguards

The Proponent has committed to the following safeguards designed to avoid / limit impacts on both existing fauna and fauna habitats.

- (i) Internal roads would be located on alignments through cleared paddocks to minimise removal of native vegetation.
- (ii) The relocated sections of Wean Road (SR 6) and Jaeger Lane would be aligned through cleared paddocks to minimise removal of native vegetation.
- (iii) Removal of native vegetation, including regenerating White Cypress Pine patches, would be kept to a minimum.
- (iv) Where possible, tree removal, especially the mature trees, would be carried out in late spring and early autumn to avoid spring nesting birds and over-wintering bats.
- (v) Inspections of mature trees for nesting birds and roosting bats would be undertaken prior to each clearing campaign where mature trees with hollows are to be removed.
- (vi) If located, nesting and roosting hollows, as well as nests, used by listed threatened species, would, if possible, be relocated to appropriate locations nearby.
- (vii) No felled or fallen timber within the Project Site would be burnt. Rather, all stumps would be buried within the overburden emplacements and all branches and tree trunks <300mm in diameter or containing hollows would be placed over the areas of the final landform designated for the re-establishment of native vegetation. Large diameter logs not containing hollows would be sold and/or used for farm-related activities.
- (viii) Post-mining rehabilitation would commence as soon as possible to re-establish the connectivity of the habitat corridor along Jaeger Lane. Similarly, post-mining rehabilitation of the habitat south of Jaeger Lane would commence as soon as practicable to re-establishment of the connectivity of a habitat corridor along Wean Road (SR 6).
- (ix) Both out-of-pit emplacements would be rehabilitated with native tree, shrub and grass species.
- (x) A vegetation management plan would be prepared for those areas of the Project Site not planned for ongoing grazing and/or cropping.
- (xi) A vertebrate pest control program would be included as part of the mining operation and management plan in order to minimise the impact of species that have been listed as key threatening processes.



4B.2.3.3.3 Transport Route Safeguards

- (i) The transport route has been located within cleared cultivated paddocks to minimise further removal of native vegetation.
- (ii) Causeway design would ensure that natural creek flows are not interfered with.
- (iii) Where the transport route is located within the Shannon Harbour Road Corridor, the clearing of native vegetation along the road shoulders would be avoided. Where practical, branches would be lopped to preserve trees with overhanging branches.
- (iv) Intersections have been located to avoid the necessity to remove native vegetation.
- (v) Any existing vermin-proof fence along the northern section of the transport route would be preserved and/or replaced to discourage native fauna from running onto the road from areas of habitat cover.

4B.2.3.3.4 Mitigation Measures and Offset Strategies

The Project would result in disturbance to 36.3ha of native vegetation, which provides various habitat types for native fauna. The strategy to mitigate and offset disturbance to native vegetation communities (see Section 4B.2.2.4.4) would also serve to mitigate and offset any impacts on the habitat value of the Project Site for native fauna. Of particular importance to native fauna would be the establishment and enhancement of habitat corridors (see **Figure 4B.9**), linking the vegetation of Vickery State Forest with remnant areas of vegetation on and surrounding the Project Site (largely within existing and proposed road easements).

4B.2.3.4 Assessment of Impacts

4B.2.3.4.1 Native Species, Populations and Communities

CES (2007) notes that 43 species of threatened fauna (1 frog species, 28 bird species, 11 mammal species and 3 reptile species) have been recorded or have the potential to occur on the Project Site, transport route and/or surrounding areas. **Table 4B.10** presents a brief summary of the potential impact the Project may have on each of the identified 43 species.

Of these, CES (2007) concludes the Project is unlikely to have a significant impact on 36 species given the location and habitat type present on the Project Site and transport route, or the range and/or distribution of the species. Of the remaining seven species, CES (2007) considers there is sufficient potential for impact on these species to warrant the preparation of seven-part tests, in accordance with the DECC's *draft Threatened Species Assessment Guidelines* (DEC, 2005), to assess if the Project would be likely to significantly impact on each species.



CES (2007) considers the operational safeguards and biodiversity offset strategy proposed by the Proponent and concludes that it is unlikely that any of these species would be significantly affected by the Project.

Table 4B.10
Potential Impact on Identified Threatened Species

Page 1 of 3

Species	Potential for Impact
Frogs	
Booroolong Frog	Confined to high mountain streams. This habitat type is not present on the Project Site and transport route. No further assessment is warranted.
Birds	
Freckled Duck	Requires permanent wetland area. This habitat type is not present on the Project Site and transport route. No further assessment is warranted.
Mallee Fowl	Due to the presence of foxes and the degraded understorey of native vegetation remnants, it is unlikely this species would occur on or around the Project Site or transport route. No further assessment is warranted.
Bush Thick-Knee	Due to the presence of foxes and the degraded understorey of native vegetation remnants, it is unlikely this species would occur on or around the Project Site or transport route. No further assessment is warranted.
Plains Wanderer	Due to the presence of foxes and the degraded understorey of native vegetation remnants, it is unlikely this species would occur on or around the Project Site or transport route. No further assessment is warranted.
Blue-Billed Duck	Only a single vagrant of this species has been recorded in the region which is outside its normal range. No further assessment is warranted.
Black-Necked Stork	Only a single vagrant of this species has been recorded in the region which is outside its normal range. No further assessment is warranted.
Cotton-Pygmy Goose	This species is generally associated with wetlands and as such no suitable habitat exists on the Project Site or along the transport route. No further assessment is warranted.
Australian Bustard	This species is wetland dependent and as such no further assessment is warranted.
Square-tailed Kite	These species has a very large home range and is dependent on habitat with large tree hollows to roost and high prey density. The Project Site does not represent optimal habitat and therefore no further assessment is warranted.
Red Goshawk	
Black-breasted Buzzard	
Grey Falcon	The Project Site and transport route are within the identified range of this species. Further assessment under the TSC Act (by seven-part test) is warranted and has been undertaken.
Powerful Owl	These species has a very large home range and is dependent on habitat with large tree hollows to roost and high prey density. The Project Site does not represent optimal habitat and therefore no further assessment is warranted.
Barking Owl	
Masked Owl	
Eastern Grass Owl	This species has a very large home range and is dependent on grassland with high prey density. The Project Site does not represent optimal habitat and therefore no further assessment is warranted.
Turquoise Parrot	Recorded on the Project Site and known to occur in the local area. Further assessment under the TSC Act (by seven-part test) is warranted and has been undertaken.



Table 4B.10 (Cont'd)
Potential Impact on Identified Threatened Species

Page 2 of 3

Species	Potential for Impact
Birds (Cont'd)	
Swift Parrot	This species is nomadic in the part of its range coinciding with the Project Site and transport route. Given the nomadic nature of the species the Project is unlikely to impact on it and no further assessment is warranted .
Regent Honeyeater	This species is only expected to occur in the local area as a transient as this is beyond the western limit of its normal range. No further assessment is warranted .
Pied Honeyeater	This species is dependent on reasonable native shrub density of flowering species (eg. <i>Eremophila</i> , <i>Brachysema</i> and <i>Grevillea</i> .) which is not a characteristic of existing habitats on the Project Site or transport route. No further assessment is warranted
Painted Honeyeater	This species is heavily dependent on Mistletoe which is not a characteristic of existing habitats on the Project Site or transport route. No further assessment is warranted
Diamond Firetail	This species is a seed eater that frequents woodland and forest with grassy understorey. Clearing of native vegetation has reduced this habitat type on the Project Site and transport route with the Project therefore unlikely to significantly impact on the species. No further assessment is warranted
Speckled Warbler	Generally confined to undisturbed open woodland. All woodland type habitat on the Project Site and transport route has been moderately to highly disturbed. No further assessment is warranted
Grey-Crowned Babbler	This species was recorded on the Project Site (CES, 2007) and is known to occupy open woodland dominated by mature Eucalypts, with tall shrubs and intact ground cover. This habitat type is present on the Project Site. Therefore further assessment under the TSC Act (by seven-part test) is warranted and has been undertaken .
Gilbert's Whistler	Although not previously recorded within the region, a single juvenile of the species was identified by CES (2007) within the Ironbark vegetation north of Jaeger Lane. Therefore further assessment under the TSC Act (by seven-part test) is warranted and has been undertaken .
Hooded Robin	Although the Hooded Robin has not been recorded on or within sight distance of the Project Site or the Transport Route it has, however, been recorded near the southwestern edge of the Project Site in the adjoining Vickery State Forest (NPWS 2007 - see Figure 5). Further assessment under the TSC Act (by seven-part test) is warranted and has been undertaken .
Black Cockatoo	This species was identified feeding within a Belah Community approximately 10km northwest of the Project Site. There is none of this habitat type on the Project Site. No further assessment is warranted
Mammals	
Black-Striped Wallaby	There has been no recent record of this species locally. Significant clearing in the local area makes it unlikely this species would occur on the Project Site or transport route. No further assessment is warranted .
Rufous Bettong	There has been no recent record of this species locally. Significant clearing in the local area makes it unlikely this species would occur on the Project Site or transport route. No further assessment is warranted .
Brush-Tailed Rock Wallaby	This species is confined to rocky outcrops and ledges or steep hill slopes. This habitat type is not present on the Project Site and transport route. No further assessment is warranted .



Table 4B.10 (Cont'd)
Potential Impact on Identified Threatened Species

Page 3 of 3

Species	Potential for Impact
Mammals (Cont'd)	
Long-Haired Rat	This species is confined to the semi-arid region further west of the Project Site and transport route and is not expected to occur here. No further assessment is warranted.
Koala	This species is subject to consideration under SEPP44. No further assessment is warranted.
Squirrel Glider	This species prefers more mesic habitat with dense shrub layers. This habitat type is not present on the Project Site and transport route. No further assessment is warranted.
Yellow-bellied Sheathtail Bat	This species was recorded by CES (2007) on the Project Site. It appears quite rare over its known range. Further assessment under the TSC Act (by seven-part test) is warranted and has been undertaken.
Little Pied Bat	It is very patchily distributed and quite rare, although its status is considered stable by Dickman (1994), and as it was not recorded during the survey, no further assessment is warranted.
Greater Long-eared Bat	This species was not recorded by CES (2007) on the Project Site or transport route although it is possible it may occur locally. It is known to be quite rare and detection and capture are quite rare. No further assessment is warranted.
Eastern Free-tail Bat	The Project Site and transport route would be at the western limit of the known range of this species which prefers more mesic habitat. This habitat type is not present on the Project Site and transport route. No further assessment is warranted.
Beccaris Mastiff Bat	The Project Site is within the known range of this species and as a precautionary measure, further assessment under the TSC Act (by seven-part test) is warranted and has been undertaken.
Spotted Quoll	This species requires a relatively dense ground cover and is therefore not expected to occur on the Project Site or transport route. No further assessment is warranted.
Reptiles	
Pale-headed Snake	This species generally occurs along watercourses with mature trees and thick understorey where it feeds on frogs. This habitat type is not present on the Project Site and transport route. No further assessment is warranted.
Border Thick-tailed Gecko	This species generally inhabits rocky, wooded areas with large boulders. This habitat type is not present on the Project Site and transport route. No further assessment is warranted.
Namoi River Elseya	This species inhabits the headwaters of the Namoi, Gwydir and MacDonald Rivers and is unlikely to frequent the Project Site or transport route. No further assessment is warranted.
Source: Modified after CES (2007) – Section 6.1	

Based on the results of the seven part tests, it is concluded that the Project would not result in any of the key thresholds identified in Step 5 of DECC (2005) being reached or exceeded, ie. considering the proposed operational controls, mitigation measures and offset strategies, the Project would:

- maintain biodiversity, and based on the proposed offset strategy, improve biodiversity values;
- not reduce the long-term viability of any species, population or community;
- not accelerate, or place at risk of extinction, any species, population or community; and
- not adversely affect critical habitat.



4B.2.3.4.2 EPBC Act Considerations

The impact of the Project on migratory, terrestrial and wetland bird species listed under the EPBC Act, was also assessed. CES (2007) concludes the Project Site would be unlikely to be used as habitat by any of these species. Hence, the Project would be highly unlikely to impact on any of these species.

4B.2.3.4.3 SEPP 44 Considerations

Neither the Project Site nor the transport route represent potential Koala habitat. A comprehensive survey of the Project Site and transport route has not identified any sign of Koala habitation (CES, 2007) and as such these areas are not considered core Koala habitat. CES (2007) concludes that given the Proponent's proposed rehabilitation and biodiversity offset strategy, no significant area of potential Koala habitat would be lost and therefore no Koala management plan is required.

4B.2.3.4.4 Key Threatening Processes

The following Key Threatening Processes as listed under the TSC Act and the EPBC Act are relevant to an assessment of impact on the native fauna of the Project Site, transport route and surrounding environs.

- Clearing of native vegetation.
- Removal of dead wood and dead trees.
- Predation by feral cats.
- Predation by the European Red Fox.
- Competition and grazing by the feral European Rabbit.

The Proponent's proposed rehabilitation and offset strategy would reduce the impact of the proposed clearing of up to 36.3ha of native vegetation by replacing the areas disturbed and enhancing the habitat value of the vegetation retained. By retaining and spreading cleared vegetation over areas designated for rehabilitation to native vegetation, the impact of dead wood and dead tree removal would be minimised. By reducing the area of cleared agricultural land in the final landform, the Project would also be likely to reduce the existing impact of the feral pest species listed as Key Threatening Processes by reducing their free foraging range over open pastures.

4B.2.3.5 Conclusion

On the basis of the investigations undertaken, CES (2007) concludes that the Project is:

- (i) unlikely to significantly affect any of the listed threatened species, fauna populations or communities;
- (ii) unlikely to augment or significantly contribute to any of the Commonwealth or State listed key threatening processes in the long term;



- (iii) unlikely to significantly affect any Ramsar wetland or any CAMBA or JAMBA internationally listed species;
- (iv) unlikely to significantly affect any core or potential Koala habitat; and
- (v) consistent with ESD principles with regards to fauna and would not adversely affect the local biodiversity irreversibly.

4B.3 ABORIGINAL HERITAGE

The Aboriginal heritage assessment was undertaken by Archaeological Surveys and Reports Pty Ltd (ASR, 2007). The full assessment is presented in Part 4 of the Specialist Consultant Studies Compendium, with the relevant information from the assessment summarised in the following subsections.

4B.3.1 Introduction

Based on the environmental risk analysis undertaken for the Belmont Coal Project (see Section 3.3 and **Table 3.5**), the potential environmental impacts related to Aboriginal heritage requiring assessment and their unmitigated risk rating are as follows.

- Disturbance or destruction of identified sites and/or artefacts of Aboriginal cultural heritage without the permission of LALC or DECC (extreme risk).
- Disturbance or destruction of currently unidentified sites and/or artefacts of Aboriginal cultural heritage without the permission of LALC or DECC (high risk).

In addition, the Director-General's requirements issued by Department of Planning require that the assessment of Aboriginal heritage refer to the draft *Guidelines of Aboriginal Cultural Heritage Assessment and Community Consultation* (Department of Environment and Conservation).

The following sub-sections present the method of assessment, review the results of an Aboriginal heritage survey undertaken, provide the proposed management of identified sites and assess the significance of any impact on these. The assessment was undertaken in consultation with the Red Chief Local Aboriginal Land Council (LALC) with other interested groups invited to comment following the lodgement of an advertisement in the local media relating to the Project and proposed area of disturbance.

4B.3.2 Method of Investigation

The Aboriginal heritage assessment comprised the following components.

1. A review of previous archaeological investigations on and surrounding the Project Site.
2. Consultation with the Red Chief Local Aboriginal Land Council (LALC), including on-site discussions with group representatives.



3. An assessment of the archaeological potential of the Project Site based on the presence or absence of resources such as vegetation, water and stone.
4. A review of the Aboriginal Sites Register (Aboriginal Heritage Information Management System – AHIMS) covering the Project Site and surrounding local area and recent archaeological investigations within the local area (see **Figure 4B.11**).
5. The development of a predictive model for archaeological material that might realistically be expected to be present.
6. The completion of comprehensive field surveys over the majority of the Project Site and an area sufficiently large to the east to account for the proposed relocation of Wean Road (February 2002) and the transport route and remainder of the Project Site (July 2002). ASR (2007) provides further information on the areas covered by the field surveys and the identified Aboriginal sites.
7. An assessment of the cultural significance of the identified sites of Aboriginal heritage.
8. Development of recommendations for the management of identified sites of Aboriginal significance.
9. An assessment of the impact on Aboriginal heritage as a result of the Project as it relates both to identified sites and artefacts and the cumulative impacts on the regional record.

4B.3.2.1 Summary of Results

4B.3.2.1.1 Aboriginal Sites Register Search

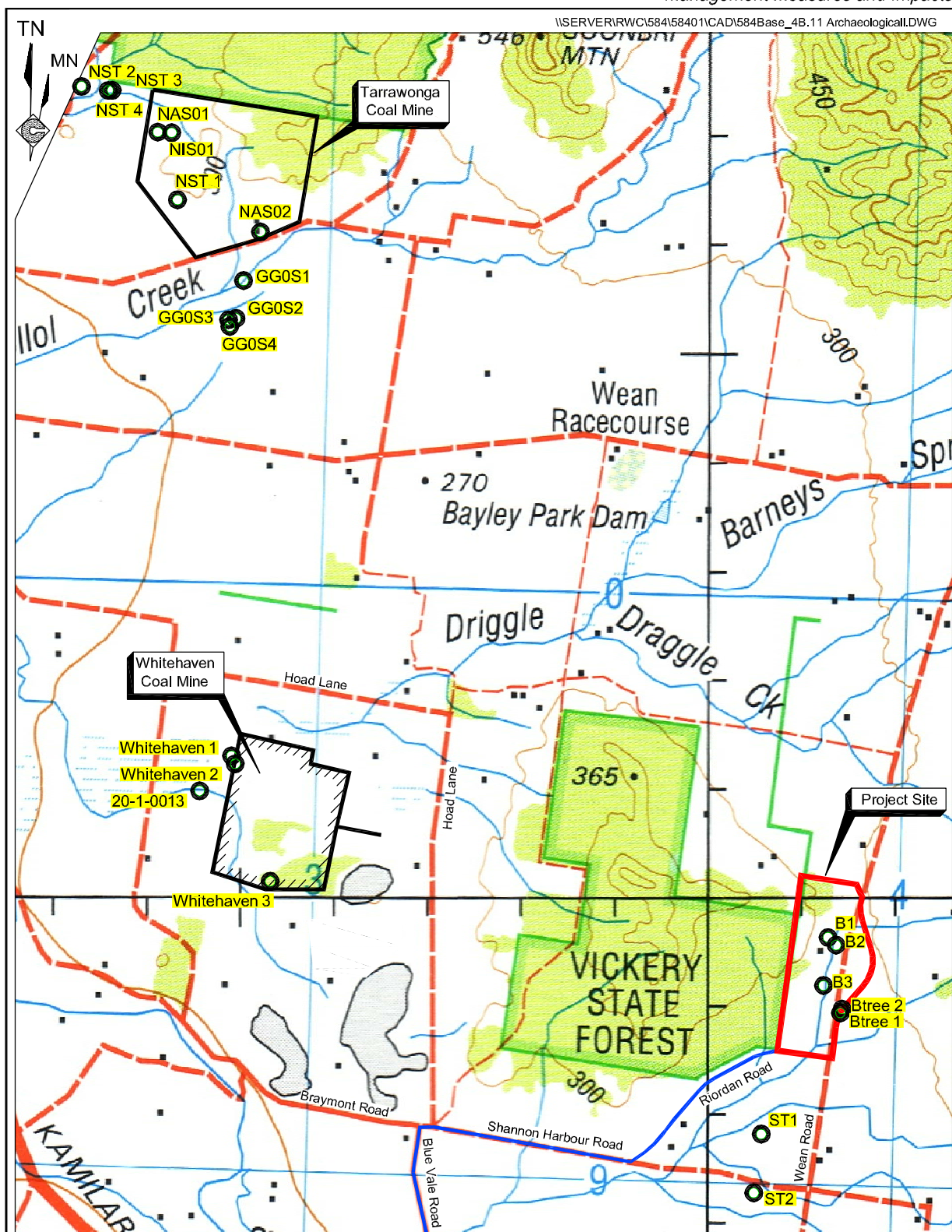
A search of the Aboriginal Sites Register within a 403km² area centred on the Project Site identified ten previously recorded sites. None of these sites, however, occur within the Project Site or along the alignment of the transport route.

4B.3.2.1.2 Previous Archaeological Investigations

Whitehaven Coal Mine

Two previous archaeological investigations undertaken for the Whitehaven Coal Mine, approximately 10km to the west of the Project Site and 4.6km northwest of the intersection of the Shannon Harbour Road – Hoad Lane intersection of the transport route, ASR (1999) and ASR (2004) identified a total of four sites, in addition to those identified on the Aboriginal Sites Register. Of those identified by ASR (1999), two of which were located external to the western boundary of ML 1471, and a third located in excess of 500m from the limit of mining of the Whitehaven Coal Mine. The fourth site identified by ASR (2004) was located to the southwest of the limit of mining within ML 1471. None of these sites would be impacted upon by the transport route for the Project.





REFERENCE

- Project Site Boundary
- Transport Route
- ST1 Archaeological Site

SCALE 1:100 000

1 0 1 2 3 4 5 km

Base Map Source: Australian Surveying & Land Information Group - Manilla SH56-09 1:250 000

Note: A Colour Version of this figure is available on the project CD

Figure 4B.11

REGIONAL ARCHAEOLOGICAL RECORD



Tarrawonga Coal Mine and Transport Route

An archaeological investigation was completed in 2005 for the Tarrawonga Coal Mine, approximately 14.6km northwest and 16.1km north-northwest of the Project Site and Shannon Harbour Road – Hoad Lane intersection respectively, and Tarrawonga Coal Mine transport route (ASR, 2005). This investigation identified four Aboriginal sites on the mine site area⁵, incorporating one scarred tree, two artefact scatters and one isolated artefact and four open scatters adjacent to the final alignment of the transport route.

Boggabri Coal Project

An archaeological investigation undertaken for the Boggabri Coal Project to the immediate north and northwest of the Tarrawonga Coal Mine identified a number of artefacts scatters and scarred trees (Archaeological Risk Assessment Services, 2005).

The identified Aboriginal sites, presented on **Figure 4B.11**, have all subsequently been submitted to the DECC for entry onto the Aboriginal Sites Register.

4B.3.2.1.3 Current Archaeological Investigation Results

Five Aboriginal sites were recorded within the Project Site and two adjacent to the alignment of the transport route (see **Figure 4B.12**). These are summarised in **Table 4B.11**.

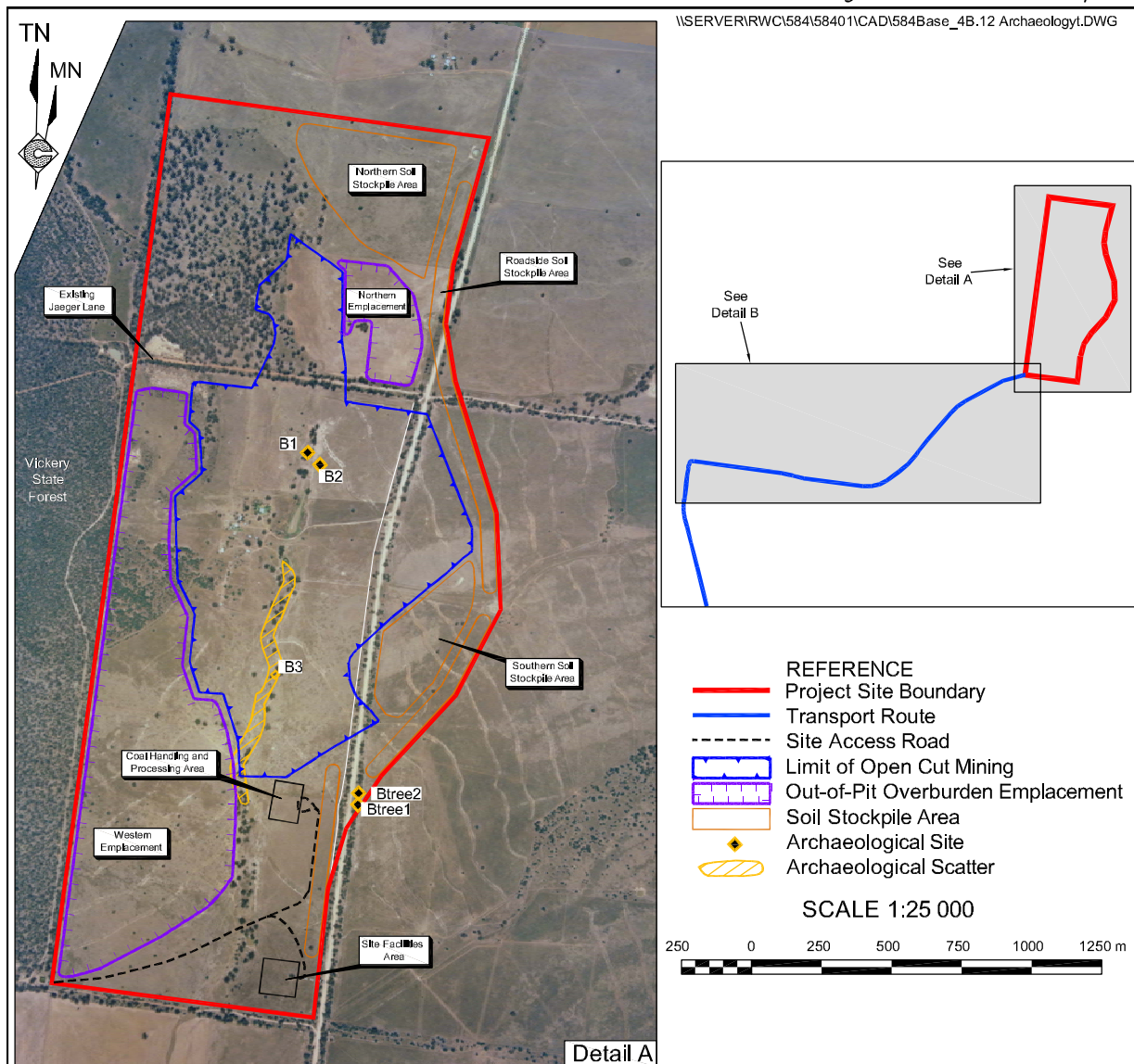
4B.3.3 Significance Assessment

4B.3.3.1 Introduction

An assessment of the significance of all sites, Aboriginal places, and archaeological material is required to firstly determine whether appropriate safeguards can be put in place to enable a Project to proceed. Secondly, it provides information to the Department of Environment and Climate Change (NPWS) on the future management of the area. The assessment addresses both the actual cultural significance of the feature or site as well as the potential it offers for research into the history of an area.

⁵ The isolated artefact and the artefacts within one of the scatters within the Project Site were salvaged and relocated to the Cumbo Gunerah Keeping Place.





SCALE 1:50 000

0.5 0 0.5 1.0 1.5 2.0 2.5 km

Source: Archaeological Surveys and Reports Pty Ltd - Figure 8
Base Photo Source: Geo-spectrum (Australia) Pty Ltd - Date of Photograph: 21 November 2001

Figure 4B.12
PROJECT SITE AND TRANSPORT
ROUTE ARCHAEOLOGICAL RECORD



Table 4B.11
Aboriginal Sites - Project Site and Transport Route

Reference*	Site Type	Comments
Project Site		
Btree 1	Scarred Tree	Large box gum on eastern side of Wean Road easement. - Lozenge shaped scar. 160cm x 40cm x 4cm (deep). 295cm above ground level. - Northerly aspect.
Btree 2	Scarred Tree	Large box gum on eastern side of Wean Road easement. - Lozenge shaped scar. 57cm x 15cm x 3cm (deep). 146cm above ground level. - Westerly aspect.
B1	Isolated Artefact	Core of highly silicified grey mudstone or very fine silcrete.
B2	Artefact Scatter	A scatter of micro-debitage or trimming flakes.
B3	Artefact Scatter (>40 artefacts)	An extended scatter of 3 cores and multiple flakes and flake pieces approximately 800m long along the western bank of a north-south oriented drainage line through the Project Site.
Transport route		
ST1	Scarred Tree	Large box gum within closed road reserve - Lozenge shaped scar. 223cm x 70cm x 11cm (deep). 18cm above ground level. - Westerly aspect.
ST2	Scarred Tree	Large box gum within closed road reserve - Lozenge shaped scar. 140cm x 42cm x 6cm (deep). 14cm above ground level. - Westerly aspect.
Source: Modified after ASR (2007) – Section 7		
* See Figure 4B.12		

4B.3.3.2 Cultural Significance

The Aboriginal or cultural significance of Aboriginal relics and sites can only be assessed by the Aboriginal Community, and in particular, the Elders. The potential disturbance to the sites B1, B2 and B3 was advertised in the “Namoi Valley Independent” on 20 February 2007 in accordance with the Department of Environment and Conservation’s *Interim Guidelines for Community Consultation* (DEC, 2004). ASR received correspondence from the coordinator of the Gunida Gunyah Aboriginal Corporation (Mrs Jane Bender).

The correspondence received from the three Aboriginal groups is summarised as follows.

Red Chief LALC recommended the following.

- There should be no disturbance to the scarred trees identified on the Project Site and adjacent to the transport route.
- Salvaged artefacts should be relocated to the Cumbo Gunerah Keeping Place.



- All sites should be registered on the Aboriginal Heritage Information Management System (DECC).
- Monitors should be on site for all turf (topsoil) stripping either side of the north-south oriented drainage line through the Project Site.

Bigundi Biame Gunnedar Traditional People when consulted in late 2006, concurred with the recommendations of Red Chief LALC and requested representatives be present on site for all topsoil stripping activities.

Gunida Gunyah Aboriginal Corporation requested they be consulted during the salvage of the identified Aboriginal artefacts.

A copy of the recommendations provided by the Red Chief LALC is provided in full as an Appendix to ASR (2007).

4B.3.3.3 Research Potential

Of the seven sites recorded (see **Table 4B.11**), only the extended artefact scatter of Site B3 was considered by ASR (2007a) to be of sufficient content to warrant consideration of its research potential. However, as the artefacts were likely redeposited by the flow of water through the drainage line and therefore the site has limited potential to produce additional artefacts following excavation and the artefacts themselves were not considered to be particularly unique, the research potential for the site is assessed by ASR (2007a) to be low.

Whilst significant culturally, the scarred trees do not provide significant research potential other than as components of any large-scale analysis of scarred trees generally.

4B.3.4 Design and Operational Safeguards

The Project would result in disturbance to three of the seven recorded sites, namely B1, B2 and B3. In line with the recommendations of the Aboriginal groups who were originally consulted and who responded to advertisement of the potential disturbance to these sites, the artefacts would be salvaged and relocated to the Cumbo Gunerah Keeping Place. It is noted that a S85A Care and Control Permit under the NPW Act would be obtained prior to relocation of the artefacts in this way.

Disturbance to all other sites would be avoided with the transport route aligned to avoid disturbance to the scarred trees ST1 and ST2. Btree 1 and Btree 2 lie outside the Project Site and the proposed light vehicle entrance would be located away from these scarred trees.



Additional operational safeguards and controls to be adopted by the Proponent include the following.

- (i) The scarred trees identified would be enclosed within a fenced area of at least 20m radius from the tree with the location and words “Culturally Sensitive Area – Aboriginal Scarred Tree” marked on all mine plans.
- (ii) Aboriginal monitors would be invited to site for all topsoil stripping activities along the north-south oriented tributary traversing the Project Site. Any sites detected during monitoring would be managed in accordance with the relevant Acts.
- (iii) If any further Aboriginal objects are uncovered at any time during the course of the Project, work at the area would cease and Proponent must contact the NSW DECC for advice.
- (iv) The Proponent would conduct a Cultural Heritage Awareness Induction Course for its staff, contractors and any heritage monitors working on the Project Site. This would help raise awareness and ameliorate any impact on heritage sites during site establishment and subsequent mining activities. This induction would include making all staff and contractors aware of their responsibilities with respect to Aboriginal heritage under the *National Parks and Wildlife Act 1974*.

4B.3.5 Assessment of Impacts

4B.3.5.1 Identified Aboriginal Sites

The design and operational safeguards proposed by the Proponent illustrate a commitment to ensuring the Aboriginal heritage sites are appropriately managed, with the salvage of those artefacts at those sites to be disturbed in line with the requests of the local Aboriginal groups. Fencing off the most sensitive of these further demonstrates the Proponent’s commitment to avoiding impacts upon these sites. It is noted that air and ground vibration associated with blasting can potentially damage some Aboriginal heritage sites. In the case of those sites to remain in situ during the operation of the Project (four scarred trees), these do not represent site types likely to be damaged by vibration. In light of this, and the proposed design and operational safeguards, the impact of the proposed Belmont Coal Project on Aboriginal heritage is assessed to be acceptable.

4B.3.5.2 Assessment of Cumulative Impact

Based on the results of this, and previous archaeological investigations for coal mining projects within the region, it is clear that there is a potential for many other sites to exist in the region, particularly adjacent to or in the vicinity of reliable water sources. Given there are likely to be other Aboriginal sites within the region, and in order to assess the potential cumulative impact of the proposed disturbance on the regional Aboriginal heritage record, it is important to establish the probability of identifying sites of similar cultural and scientific value.



Similar to the results of this and recent archaeological investigations for coal mining projects, artefact scatters are the site type most likely to be found regardless of land use. They are the site type that is least likely to be affected by land use, ie. vegetation clearing, agriculture, or land improvements and might be found in undisturbed woodland, in ploughed paddocks, on contour banks and in tracks, paths and erosion features. The cumulative impact of the proposed disturbance to sites B1, B2 and B3 is therefore likely to be minor.

In contrast, scarred trees can only exist where there are still old growth trees of at least 120 years old, ie. those trees that would have been sufficiently large in girth prior to ‘European’ settlement of the area, for the bark to be a useful size to Aboriginal people. Trees fitting this description are likely to represent less than 3% of the regional vegetation. The likelihood of identifying this type of site is therefore much reduced and the cumulative impact of disturbance to a site of this type would be far greater than for a relatively common artefact scatter or isolated artefact. Disturbance to the scarred tree sites would be avoided and therefore there would be no cumulative impact on the regional record of this site type.

4B.4 TRANSPORTATION ASPECTS

4B.4.1 Introduction

Based on the environmental risk analysis undertaken for the Project (see Section 3.3 and **Table 3.5**), the potential environmental impacts related to traffic and transport requiring assessment and their unmitigated risk rating are as follows.

- Increased traffic congestion (moderate risk).
- Road pavement deterioration (high risk).
- Elevated risk of accident/incident on local roads (moderate to high risk).
- Elevated risk of rail related accident/incident (low to high risk).

In addition, the Director-General’s requirements issued by the Department of Planning require that this assessment refer to the Guide to Traffic Generating Development and Road Design Guide (Roads & Traffic Authority), or relevant Austroads standards.

The following sub-sections assess the existing road, rail and traffic environments, the proposed changes generated by the Project, relevant design features, operational safeguards and ongoing management to mitigate the risks posed and an assessment of residual impacts.

4B.4.2 Existing Transport Network and Traffic Levels

4B.4.2.1 Introduction

The Project Site is serviced by a network of local roads, a State highway and railway line. **Figure 4B.13** displays these roads and railway line all of which are described in the following sub-sections.

