APPENDIX M

Fauna Assessment Report

CONTINUED OPERATIONS AT BAAL BONE COLLIERY – FAUNA ASSESSMENT REPORT

by BIODIVERSITY MONITORING SERVICES, May 2009

1.0 BACKGROUND

The Wallerawang Collieries Limited (TWCL) is currently seeking to gain Project Approval for the continuation of mining activities at Baal Bone Colliery within the current lease area. Baal Bone Colliery is an underground longwall coal mine located near the township of Cullen Bullen, approximately 25km north west of Lithgow in the state of New South Wales (NSW).

Project Approval under Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act) is sought for the continued operations at Baal Bone Colliery including operation of the CHPP and mining related facilities within the Surface Infrastructure Area, and mining of Longwalls 29 to 31 and Remnant Areas within the Underground Mining Area. The proposed continuation of mining operations does not seek to alter the approved extraction limit.

Following 1 August 2010, the project will be a project to which Part 3A of the EP&A Act applies pursuant to Clause 6 and Item 5 of Schedule 1 of the *State Environmental Planning Policy (Major Development) 2005* (Major Development SEPP).

An Environmental Assessment under Part 3A of the EP&A Act is to be undertaken as part of the approval process and this will guided by many constraints, including the requirements of the Director-General of the Department of Planning and Xstrata Coal NSW HSEC STD1.16.

Project Approval is being sought for the following project components at Baal Bone:

- Continuation of underground mining in Longwalls 29 to 31, which are the subject of a current approved Subsidence Management Plan (SMP);
- Continued operation of associated surface infrastructure and a prepared saleable coal production of 2.0 Million tonnes per annum (Mtpa) (equating to 2.8 Mtpa Run of Mine (ROM) coal);
- Continued haulage of prepared saleable coal to domestic markets in accordance with current approvals; and
- Mining of remnant areas within the existing workings.

This fauna assessment has been prepared as part of the environmental impact assessment of the proposed mining operations (the Project). The Project Area is shown in Figure 1.

The aim of this report is to identify fauna species and associated habitats across the area likely to be affected by the proposed mining operations, to assess the conservation significance of these species and habitats, and to assess impacts of the Project upon these species and habitats with particular reference to those species listed on the *NSW Threatened Species Conservation Act 1995* (TSC Act) and *Commonwealth Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Figure 1: Survey Areas within Baal Bone Colliery

2.0 METHODOLOGY

The fauna assessment was undertaken in three stages:

Stage One – Gap and Constraints Analysis

A gap/constraints analysis was required to assess what level of existing information about fauna is available to use in preparing the Environmental Assessment. This analysis was a desk-top study of literature available on fauna known to occur within the general area surrounding Baal Bone Colliery. This information was derived from data held in the DECC Atlas of NSW Wildlife and other relevant fauna databases (e.g. State Forests, Australian Museum), and from documents relating to previous environmental assessments undertaken at Baal Bone Colliery.

Stage Two – Baseline Data Acquisition

Fauna surveys have been undertaken in several of the lease areas where operations are currently occurring. Areas of land not currently approved to be mined were surveyed for fauna and habitat condition in March 2009. Detailed descriptions of these surveys are given in a separate report.

Stage Three – Production of an Assessment Report

The information obtained from the above two stages was used to develop an assessment report to be used in the overall Environment Assessment required under Part 3A of the NSW EP&A Act and under the Commonwealth EPBC Act, if required. This report provides information on the fauna, particularly threatened species, likely to be present in the areas to be assessed and includes the potential likely impacts from underground mining on critical habitats and threatened fauna within the development areas and identifies constraints and relevant management strategies.

3.0 GAP AND CONSTRAINTS ANALYSIS

Records of fauna species known to occur within the boundaries of Baal Bone Colliery, as well as within an area surrounding the mine having a radius of 20km (the "locality"), were obtained from a variety of sources. These included:

- Records from the wildlife database held by the Department of Environment and Conservation (formerly National Parks & Wildlife Service). Fauna records within the 1:100 000 Wallerawang, Bathurst and Katoomba map sheets were obtained under licence No. CON93005;
- Records from the Australian Museum, Forests NSW and National Parks and Wildlife Service obtained from www.bionet.nsw.gov.au;
- Records from internal and published impact assessment reports (**Table 1** lists reports covering Baal Bone Colliery); and
- Personal records.

Where possible geographic references were obtained for each record and overlaid onto a base topographic map that contained the boundaries of the Colliery. By using the Arc-View geographic information system, it was possible to draw a 20km buffer around the colliery boundary and accurately determine those records that were within the locality.

Records of threatened species were separated from the general listings and their locations were added to the map. This provided relatively accurate listings of threatened species that are known to have occurred within the boundaries and the locality of the colliery. Some of the records are more than 20 years old (e.g. surveys for the original Baal Bone Colliery EIS were undertaken in 1981), and the dates of the records were entered as part of their attributes. Although such records do not indicate the present-day presence of the species, they are helpful in determining whether such a species could occupy the area.

Thus, this exercise provided two major outputs:

1. A list of fauna species known to occur within the boundaries of the Colliery. This list provides baseline data to be in future monitoring of the area.

2. A list of threatened species known to occur within the boundaries of the Colliery as well as within 20km of the Colliery area. This list was used to determine those threatened species potentially to be affected by any mining activity (notably impacts from subsidence) could be targeted during any fauna surveys.

Table 1: Reports Reviewed for the Gap Analysis

Reference	Relevance
Denny, M.J.S. 1981 Report on the impact of coal mining upon fauna at the Baal Bone site, Cullen Bullen. Report to Coalex PL in Baal Bone Colliery EIS, Nexus Environmental Studies	Provides list of terrestrial and aquatic species located during fauna surveys in 1980
Brian Stone Environmental Services 1989 CLA192 EIS	Area now CL391. Uses fauna listings from Denny 1981
Lim, L. 1995 A Fauna Survey of Baal Bone Colliery. Report to RW Corkery and Co. PL for Wallerawang Collieries Ltd	Describes fauna located within an area approximating CCL749
Mjadwesch Environmental Service Support 2000 Flora and Fauna Survey and Impact Assessment for Proposed Baal Bone Colliery Mine Dewatering Facility (LW19) and Pipeline (LW1)	Provides list of terrestrial and aquatic fauna located within an area in Baal Bone Northern Area (near Baal Bone Creek and Gap)
Appendix to HSEC SSTD 5.12 Flora and Fauna Management 2005	Species list developed from earlier unreferenced survey and other reported sightings
Mount King Ecological Surveys October 2005 Terrestrial Fauna Assessment of Proposed Longwall and Exploratory Drilling Areas at Baal Bone Colliery Report to Baal Bone Colliery	Reports on the results from fauna surveys covering LW 25-28 and LW 29-31
Mount King Ecological Surveys December 2006 Terrestrial Fauna Assessment of Proposed Longwall 29-31 SMP Area at Baal Bone Colliery Baseline Data Spring 2005 and Summer 2006	Reports on the results from fauna surveys of LW29-31 in 2005 and 2006
Mount King Ecological Surveys December 2006 Terrestrial Fauna Assessment of Proposed SMP Application Area for Longwall Panels 29-31 at Baal Bone Colliery	Review of existing information about fauna known from Baal Bone Colliery
OzArk Environmental & Heritage Management P/L May 2007 Flora and Fauna Assessment: Proposed 1.7km, 11kV Powerline Corridor and Ventilation Compound Baal Bone Colliery	Uses previous survey results, but provides a short species list of fauna observed in an area within Baal Bone Northern Area
Umwelt 2007 Environmental Assessment Ventilation Shaft and Powerline Corridor for SE Mining Area Baal Bone Colliery	Uses results from OzArk report

Reference	Relevance
Mount King Ecological Surveys September 2007 Terrestrial Fauna Assessment of proposed Longwall 29-31 SMP Area at Baal Bone Colliery Baseline Data Winter 2007	Provides list of fauna located within SMP Area in late winter 2007
Mount King Ecological Surveys April 2008 Fauna Monitoring During 2007 within the LW29-31 Subsidence Management Plan Application Area at Baal Bone Colliery	Provides list of fauna located within SMP Area in winter, spring and summer 2007
Mount King Ecological Surveys July 2008 Fauna Monitoring within the Longwall 29-31 Subsidence Management Plan Application Area at Baal Bone Colliery Autumn 2008 Sample	Provides list of fauna located within SMP Area in autumn 2008
Biodiversity Monitoring Services January 2009 Fauna Monitoring within the Longwall 29-31 Subsidence Management Plan Application Area at Baal Bone Colliery Spring 2008 Sample	Provides list of fauna located within SMP Area in spring 2008
Biodiversity Monitoring Services March 2009 Fauna Monitoring During 2008 within the LW29-31 Subsidence Management Plan Application Area at Baal Bone Colliery	Provides list of fauna located within SMP Area in winter, spring and summer 2008
Biodiversity Monitoring Services May 2009 Baal Bone Colliery Fauna Survey Report	Provides data obtained from fauna surveys of the Northern Area and a small area within Baal Bone Colliery

Data on the distribution of fauna within Baal Bone Colliery was used in the assessment within the area and provides information on the known and potential threatened species that may occur within Baal Bone Colliery. This list of threatened species has been used in the Assessment of Significance in the present report.

4.0 Fauna Known from Baal Bone Colliery

It is now possible to amalgamate the results from the surveys reported above with existing information about fauna known from Baal Bone Colliery. Surveys for fauna in the Colliery were first undertaken in 1980 and there have been a total of 11 surveys of varying effort since that time (see **Table 1**). **Table 2** provides a list of fauna species known to occur within the boundaries of Baal Bone Colliery together with their conservation status

Table 2: Fauna Known from Baal Bone Colliery

A. MAMMALS

Scientific Name	Common Name	Status
Tachyglossidae		
Tachyglossus aculeatus	Short-beaked Echidna	P
Dasyuridae		
Antechinus stuartii	Brown Antechinus	P
Antechinus agilis	Agile Antechinus	P
Petauridae		
Petaurus norfolcensis	Squirrel Glider	V
Petaurus breviceps	Sugar Glider	P
Phalangeridae		
Trichosurus vulpecula	Common Brushtail Possum	P
Pseudocheiridae		
Petauroides volans	Greater Glider	P
Pseudocheirus peregrinus	Common Ringtail Possum	P
Vombatidae		
Vombatus ursinus	Common Wombat	P
Macropodidae		
Macropus giganteus	Eastern Grey Kangaroo	P
Macropus robustus	Common Wallaroo	P
Macropus rufogriseus	Red-necked Wallaby	P
Wallabia bicolor	Swamp Wallaby	P
Muridae		
Mus musculus	House Mouse	U
Rattus rattus	Black Rat	U
Rattus fuscipes	Southern Bush Rat	P
Hydromys chrysogaster	Water Rat	P
Vespertilionidae		
Nyctinomus australis	White-striped Freetail Bat	P
Vespadelus darlingtoni	Large Forest Bat	P
Chalinolobus dwyeri	Large-eared Pied Bat	V
Chalinolobus gouldii	Gould's Wattled Bat	P
Chalinolobus morio	Chocolate Wattled Bat	P
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	V
Vespadelus regulus	Southern Forest Bat	P
Vespadelus vulturnus	Little Forest Bat	P
Canidae		
Canis familiaris	Dog	U
Vulpes vulpes	Red Fox	U

Scientific Name	Common Name	Status
Felidae		
Felis catus	Cat	U
Bovidae		
Bos taurus	European Cattle	U
Suidae		
Sus scrofa	Feral Pig	U
Leporidae		
Oryctolagus cuniculus	Rabbit	U

Notes: P – Protected, U - Unprotected, V - Vulnerable

B. BIRDS

Scientific Name	Common Name	Status
Phasianidae		
Coturnix ypsilophora	Brown Quail	P
Anatidae		
Anas gracilis	Grey Teal	P
Anas superciliosa	Pacific Black Duck	P
Chenonetta jubata	Australian Wood Duck	P
Podicipedidae		
Poliocephalus poliocephalus	Hoary-headed Grebe	P
Tachybaptus novaehollandiae	Australasian Grebe	P
Phalacrocoracidae		
Phalacrocorax melanoleucos	Little Pied Cormorant	P
Phalacrocorax sulcirostris	Little Black Cormorant	P
Ardeidae		
Egretta novaehollandiae	White-faced Heron	P
Ardea pacifica	White-necked Heron	P
Accipitridae		
Accipiter fasciatus	Brown Goshawk	P
Aquila audax	Wedge-tailed Eagle	P
Hieraaetus morphnoides	Little Eagle	P
Falconidae		
Falco berigora	Brown Falcon	P
Charadriidae		
Elseyornis melanops	Black-fronted Dotterel	P
Vanellus miles	Masked Lapwing	P
Columbidae		
Ocyphaps lophotes	Crested Pigeon	P
Phaps chalcoptera	Common Bronzewing	P
Phaps elegans	Brush Bronzewing	P

Scientific Name	Common Name	Status
Cacatuidae		
Cacatua galerita	Sulphur-crested Cockatoo	P
Callocephalon fimbriatum	Gang-gang Cockatoo	V
Calyptorhynchus lathami	Glossy Black-Cockatoo	V
Calyptorhynchus funereus	Yellow-tailed Black-Cockatoo	P
Eolophus roseicapillus	Galah	P
Psittacidae		
Alisterus scapularis	Australian King-Parrot	P
Platycercus adscitus eximius	Eastern Rosella	P
Platycercus elegans	Crimson Rosella	P
Neophema pulchella	Turquoise Parrot	V
Cuculidae		
Cacomantis flabelliformis	Fan-tailed Cuckoo	P
Strigidae		
Ninox novaeseelandiae	Southern Boobook	P
Podargidae		
Podargus strigoides	Tawny Frogmouth	P
Caprimulgidae		
Eurostopodus mystacalis	White-throated Nightjar	P
Aegothelidae		
Aegotheles cristatus	Australian Owlet-nightjar	P
Halcyonidae		
Dacelo novaeguineae	Laughing Kookaburra	P
Todiramphus sanctus	Sacred Kingfisher	P
Menuridae		
Menura novaehollandiae	Superb Lyrebird	P
Climacteridae		
Climacteris erythrops	Red-browed Treecreeper	P
Climacteris picumnus	Brown Treecreeper	V
Cormobates leucophaeus	White-throated Treecreeper	P
Maluridae		
Malurus cyaneus	Superb Fairy-wren	P
Malurus lamberti	Variegated Fairy-wren	P
Pardalotidae		
Pardalotus punctatus	Spotted Pardalote	P
Pardalotus striatus	Striated Pardalote	P
Acanthizidae		
Acanthiza chrysorrhoa	Yellow-rumped Thornbill	P
Acanthiza lineata	Striated Thornbill	P
Acanthiza nana	Yellow Thornbill	P
Acanthiza pusilla	Brown Thornbill	P
Acanthiza reguloides	Buff-rumped Thornbill	P
Gerygone mouki	Brown Gerygone	P
Gerygone olivacea	White-throated Gerygone	P

Scientific Name	Common Name	Status
Origma solitaria	Rockwarbler	P
Sericornis frontalis	White-browed Scrubwren	P
Smicrornis brevirostris	Weebill	P
Meliphagidae		
Acanthorhynchus tenuirostris	Eastern Spinebill	P
Anthochaera carunculata	Red Wattlebird	P
Lichenostomus chrysops	Yellow-faced Honeyeater	P
Lichenostomus leucotis	White-eared Honeyeater	P
Lichenostomus virescens	Singing Honeyeater	P
Manorina melanocephala	Noisy Miner	P
Melithreptus brevirostris	Brown-headed Honeyeater	P
Melithreptus lunatus	White-naped Honeyeater	P
Philemon corniculatus	Noisy Friarbird	P
Phylidonyris nigra	White-cheeked Honeyeater	P
Phylidonyris novaehollandiae	New Holland Honeyeater	P
Petroicidae		
Eopsaltria australis	Eastern Yellow Robin	P
Microeca fascinans	Jacky Winter	P
Petroica boodang	Scarlet Robin	P
Eupetidae		
Cinclosoma punctatum	Spotted Quail-thrush	P
Psophodes olivaceus	Eastern Whipbird	P
Neosittidae		
Daphoenositta chrysoptera	Varied Sittella	P
Pachycephalidae		
Colluricincla harmonica	Grey Shrike-thrush	P
Falcunculus frontatus	Eastern Shrike-tit	P
Pachycephala pectoralis	Golden Whistler	P
Pachycephala rufiventris	Rufous Whistler	P
Dicruridae		
Myiagra rubecula	Leaden Flycatcher	P
Grallina cyanoleuca	Magpie-lark	P
Rhipidura albiscapa	Grey Fantail	P
Rhipidura leucophrys	Willie Wagtail	P
Artamidae		
Cracticus nigrogularis	Pied Butcherbird	P
Cracticus torquatus	Grey Butcherbird	P
Gymnorhina tibicen	Australian Magpie	P
Strepera graculina	Pied Currawong	P
Strepera versicolor	Grey Currawong	P
Campephagidae		
Coracina novaehollandiae	Black-faced Cuckoo-shrike	P
Coracina tenuirostris	Cicadabird	P
Oriolidae		
Oriolus sagittatus	Olive-backed Oriole	P

Scientific Name	Common Name	Status
Corvidae		
Corvus coronoides	Australian Raven	P
Corvus mellori	Little Raven	P
Corcoracidae		
Corcorax melanorhamphos	White-winged Chough	P
Sturnidae		
Sturnus vulgaris	Common Starling	U
Ptilonorhynchidae		
Ptilonorhynchus violaceus	Satin Bowerbird	P
Hirundinae		
Hirundo neoxena	Welcome Swallow	P
Petrochelidon nigricans	Tree Martin	P
Zosteropidae		
Zosterops lateralis	Silvereye	P
Dicaeidae		
Dicaeum hirundinaceum	Mistletoebird	P
Passeridae		
Passer domesticus	House Sparrow	U
Motacillidae		
Anthus australis	Australian Pipit	P
Estrilidae		
Neochmia temporalis	Red-browed Finch	P
Stagonopleura guttata	Diamond Firetail	V
Fringillidae		
Carduelis carduelis	European Goldfinch	U

Notes: P – Protected, U - Unprotected, V - Vulnerable

C. REPTILES

Scientific Name	Common Name	Status
Varanidae		
Varanus varius	Lace Monitor	P
Agamidae		
Amphibolurus muricatus	Jacky Lashtail	P
Pogona barbata	Eastern Bearded Dragon	P
Scincidae		
Acritoscincus platynota	Red-throated Cool-skink	P
Acritoscincus duperreyi	Eastern Three-lined Skink	P
Ctenotus taeniolatus	Copper-tailed Ctenotus	P
Hemiergis decresiensis	Three-toed Earless Skink	P
Lampropholis delicata	Dark-flecked Garden Sunskink	P
Lampropholis guichenoti	Grass Skink	P
Saproscincus mustelinus	Weasel Shadeskink	P
Tiliqua nigrolutea	Blotched Blue-tongued Lizard	P
Elapidae		
Pseudechis porphyriacus	Red-bellied Black Snake	P
Pseudonaja textilis	Eastern Brown Snake	P

Notes: P – Protected, U - Unprotected, V - Vulnerable

D. AMPHIBIANS

Scientific Name	Common Name	Status
Hylidae		
Litoria lesueuri	Lesueur's Frog	P
Litoria ewingii	Brown Tree Frog	P
Myobatrachidae		
Limnodynastes dumerilii	Eastern Banjo Frog	P
Limnodynastes tasmaniensis	Spotted Marsh Frog	P
Crinea signifera	Common Eastern Toadlet	P

Notes: P – Protected, U - Unprotected, V - Vulnerable

4.0 Known and Expected Threatened Species

Analysis of the records for threatened species derived from the DECC Wildlife Database (accessed 13th January 2009) shows that there are 36 Threatened species known to occur within 20km of Baal Bone Colliery. These are listed in **Table 3**.

Table 3: Threatened Species Identified on the DECCW Wildlife Database that are Known or Expected to occur within Baal Bone Colliery

A. Mammals

Scientific Name	Common Name	Status
Dasyuridae		
Dasyurus maculatus	Spotted-tailed Quoll	V
Burramyidae		
Cercartetus nanus	Eastern Pygmy Possum	V
Petauridae		
Petaurus norfolcensis	Squirrel Glider	V
Petaurus australis	Yellow-bellied Glider	V
Phascolarctidae		
Phascolarctos cinereus	Koala	V
Macropodidae		
Petrogale penicillata	Brush-tailed Rock-wallaby	V
Molossidae		
Mormopterus norfolkensis	Eastern Freetail Bat	V
Vespertilionidae		
Chalinolobus dwyeri	Large-eared Pied Bat	V
Falsistrellus tasmaniensis	Eastern False Pipistrelle	V
Miniopterus australis	Little Bentwing-bat	V
Miniopterus schreibersii oceanensis	Eastern Bent-wing Bat	V
Scoteanax rueppellii	Greater Broad-nosed Bat	V

Notes: V - Vulnerable

B. Reptiles

Scientific Name	Common Name	Status
Varanidae		
Varanus rosenbergi	Rosenberg's Goanna	V
Scincidae		
Eulamprus leuraensis	Blue Mountains Water skink	E1
Elapidae		
Hoplocephalus bungaroides	Broad-headed Snake	E1

Notes: V – Vulnerable, E1 – Endangered (TSC Act)

C. Amphibians

Scientific Name	Common Name	Status
Myobatrachidae		
Pseudophryne australis	Red-crowned Toadlet	V
Mixophyes balbus	Stuttering Frog	V

Notes: V - Vulnerable

D. Birds

Scientific Name	Common Name	Status
Accipitridae		
Lophoictinia isura	Square-tailed Kite	V
Cacatuidae		
Callocephalon fimbriatum	Gang-gang Cockatoo	V
Calyptorhynchus lathami	Glossy Black-Cockatoo	V
Psittacidae		
Lathamus discolor	Swift Parrot	E1
Neophema pulchella	Turquoise Parrot	V
Strigidae		
Ninox connivens	Barking Owl	V
Ninox strenua	Powerful Owl	V
Tytonidae		
Tyto novaehollandiae	Masked Owl	V
Tyto tenebricosa	Sooty Owl	V
Climacteridae		
Climacteris picumnus	Brown Treecreeper	V
Acanthizidae		
Pyrrholaemus sagittatus	Speckled Warbler	V
Meliphagidae		
Grantiella picta	Painted Honeyeater	V
Melithreptus gularis gularis	Black-chinned Honeyeater (eastern subsp.)	V
Xanthomyza phrygia	Regent Honeyeater	E1

Petroicidae		
Melanodryas cucullata	Hooded Robin	V
Pomatostomidae		
Pomatostomus temporalis temporalis	Grey-crowned Babbler (south-eastern sub-species)	V
Estrilidae		
Stagonopleura guttata	Diamond Firetail	V

Notes: V – Vulnerable, E1 – Endangered (TSC Act)

E. INVERTEBRATES

Scientific Name	Common Name	Status
Paralucia spinifera	Bathurst Copper Butterfly	E1
Petalura giganteua	Giant Dragonfly	V

Notes: V – Vulnerable, E1 – Endangered (TSC Act)

All of the 36 threatened species listed in **Table 3** have the potential to occur within Baal Bone Colliery, and seven of these species are known to occur within Baal Bone Colliery. Consequently, all 36 threatened species would require an Assessment of Significance test if any development goes ahead. This assessment is undertaken in **Section 5.0**.

5.0 APPLICATION OF AN ASSESSMENT OF SIGNIFICANCE ("7-Part Test") TO THREATENED SPECIES KNOWN OR EXPECTED TO OCCUR WITHIN BAAL BONE COLLIERY, PARTICULARLY WITHIN THE SOUTH-WESTERN AREA

5.1 LEGISLATIVE REQUIREMENTS

A development or activity undertaken under the EP&A Act requires an Assessment of Significance to be provided to the appropriate determining authority. Under the *Threatened Species Conservation Amendment Act 2002*, the factors to be considered when determining whether an action, development or activity is likely to significantly affect threatened species, populations or ecological communities, or their habitats (known previously as the "8-part test"), have been revised. This affects s5A EP&A Act, s94 *Threatened Species Conservation Act* 1995 (TSC Act) and s220ZZ *Fisheries Management Act* 1994 (FM Act).

The revised factors (now called "7-part test") maintain the same intent but focus consideration of likely impacts in the context of the local rather than the regional environment as the long-term loss of biodiversity at all levels arises primarily from the accumulation of losses and depletions of populations at a local level. A description of each factor follows, together with short notes on their application. These notes have been taken from "Guidelines for undertaking the Assessment of Significance (Section 5A EP&A Act)" (Department of Environment and Conservation, 2005).

The factors of assessment are:

(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,

This factor refers only to those species listed on Part 1 and Part 4 of Schedule 1 and Part 1 of Schedule 1A of the TSC Act, and Part 1 and Part 4 of Schedule 4 of the FM Act.

(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,

This factor is essentially identical to factor (a) except that it refers only to endangered populations listed on Part 2 of Schedule 1 of the TSC Act and Part 2 of Schedule 4 of the FM Act, whereas factor (a) refers to species.

(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,

This factor applies to endangered ecological communities listed under Part 3 of Schedule 1 of the TSC Act and Part 3 of Schedule 4 of the FM Act, and

critically endangered ecological communities listed under Part 2 of Schedule 1A of the TSC Act and Part 2 of Schedule 4A of the FM Act.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which 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,

When applying this factor, consideration must be given to all short-term and long-term impacts (direct and indirect) on habitat that is likely to support threatened biota regardless of whether the habitat occurs on the subject site. This is equally true for occupied and unoccupied habitat as the recovery of threatened species, populations and ecological communities relies on having access to suitable habitat to move into as numbers increase.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

This factor is aimed at assessing whether the proposal is likely to affect (directly or indirectly) areas of critical habitat present in the study area. Critical habitat refers only to those areas of land listed in the Register of Critical Habitat kept by the Director General of DECC and the Register of Critical Habitat kept by the Director General of Department of Primary Industries (DPI).

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

When deciding whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan, consideration must be given to relevant approved recovery plans and threat abatement plans.

(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.

This factor refers only to those key threatening processes (KTP) listed on Schedule 3 of the TSC Act and Schedule 6 of the FM Act. In addition to deciding whether the action/activity constitutes a KTP, consideration must also be given to whether the proposal is likely to exacerbate a KTP.

5.2 DETERMINATION OF THREATENED SPECIES LIKELY TO OCCUR

Analysis of the records for threatened species derived from the DECC Wildlife Database (accessed 13th January 2009) and from published and unpublished reports of fauna surveys at Baal Bone Colliery shows that there are 36 Threatened species known to occur within 20km of the Colliery. These are listed in **Table 3** above.

Although listed for the locality (i.e. within 20km of Baal Bone Colliery), not all of the threatened species are likely to occur within the area of woodland habitat in the Colliery, nor are all likely to be affected by subsidence effects from underground mining. The major impacts from underground mining are upon sensitive habitats such as wetlands, water courses, wet gullies (dells), clifflines and rocky outcrops. The area to be assessed for continued mining does not contain these sensitive habitats. There is an ephemeral water course within the area, but this was dry during the survey and it is unlikely to

be considered as permanently watered throughout the year. **Table 4** lists the threatened species known from the locality and determines the likelihood of any impact upon each species.

Table 4: Threatened Animal Species Known From the Locality and the Likelihood of any Impact from the Development

Common Name	Habitat Preferences	Likely to be Affected
Spotted-tailed Quoll	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows
Eastern Pygmy Possum	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows
Squirrel Glider	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows
Yellow-bellied Glider	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows
Koala	Forest and woodland	Preferred habitat in area, but no loss of feed trees
Brush-tailed Rock-wallaby	Rocky outcrops	No preferred habitat in area, unlikely to be affected
Eastern Freetail Bat	Forest and woodland for foraging and roosting	Preferred habitat in area, but minor loss of resources
Large-eared Pied Bat	Forest and woodland for foraging and caves for roosting	Preferred foraging habitat in area, but loss of resources minimal
Eastern False Pipistrelle	Forest and woodland for foraging and roosting	Preferred habitat in area, but loss of resources minimal
Little Bentwing-bat	Forest and woodland for foraging, caves for roosting	Preferred foraging habitat in area, but loss of resources minimal
Eastern Bent-wing Bat	Forest and woodland for foraging, caves for roosting	Preferred foraging habitat in area, but loss of resources minimal

Common Name	Habitat Preferences	Likely to be Affected
Greater Broad-nosed Bat	Forest and woodland for foraging and roosting	Preferred habitat in area, but loss of resources minimal
Rosenberg's Goanna	Heath and rocky outcrops	Preferred habitat not significantly affected
Blue Mountains Water Skink	Wetlands, water courses	No preferred habitat in area, unlikely to be affected
Broad-headed Snake	Exfoliated rocky surfaces, trees with hollows	Preferred habitat in area, but loss of resources minimal
Red-crowned Toadlet	Moist, narrow rock crevices	No preferred habitat in area, unlikely to be affected
Stuttering Frog	Water courses	No preferred habitat in area, unlikely to be affected
Bathurst Copper Butterfly	Requires blackthorn	Limited blackthorn in area, and loss of resources minimal
Giant Dragonfly	Edges of wetlands	No preferred habitat in area, unlikely to be affected
Square-tailed Kite	Forest and woodlands	Preferred habitat in area, but minor loss of resources
Gang-gang Cockatoo	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows
Glossy Black-Cockatoo	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows
Swift Parrot	Forest and woodlands	Preferred habitat in area, but minor loss of resources
Turquoise Parrot	Woodland and grassland	Preferred habitat in area, but minor loss of resources
Barking Owl	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows
Powerful Owl	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows

Common Name	Habitat Preferences	Likely to be Affected
Masked Owl	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows
Sooty Owl	Forest and woodland	Preferred habitat in area, but no loss of trees with hollows or rocky outcrops
Brown Treecreeper	Forest and woodlands	Preferred habitat in area, but minor loss of resources
Speckled Warbler	Forest and woodlands	Preferred habitat in area, but minor loss of resources
Painted Honeyeater	Mistletoe and woodland	Preferred habitat in area, but minor loss of resources
Black-chinned Honeyeater	Forest and woodlands	Preferred habitat in area, but minor loss of resources
Regent Honeyeater	Blossoming forest and woodlands	Preferred habitat in area, but minor loss of resources
Hooded Robin	Forest and woodlands	Preferred habitat in area, but minor loss of resources
Grey-crowned Babbler	Forest and woodlands	Preferred habitat in area, but minor loss of resources
Diamond Firetail	Forest and woodlands	Preferred habitat in area, but minor loss of resources

From the above analysis, it can be seen that the potential for any threatened species to be significantly affected is very low. The effects from underground mining on areas of woodland have been shown to be low or not measurable (see on-going monitoring reports for Baal Bone Colliery). Consequently, it is possible to conclude that there should be no significant impacts upon any population of threatened species found within the existing approved workings of Baal Bone Colliery. However, to ensure a complete assessment is undertaken the majority of the species listed above will be subjected to an Assessment of Significance (7-part test).

The following threatened species have not been addressed in this assessment because there is no preferred habitat within the currently mined area and remnant areas:

- Red-crowned Toadlet;
- Stuttering Frog;
- Giant Dragonfly;
- Blue Mountains Water Skink;
- Brush-tailed Rock-wallaby;
- Rosenberg's Goanna; and
- Broad-headed Snake.

The remaining 29 species are assessed in the following section.

5.3 NOTES ON THE 7-PART TEST

The application of the 7-part test of significance to each threatened species is based upon their known or expected presence within the existing approved workings at Baal Bone Colliery and the potential impacts due to mine disturbance (primarily subsidence) and any surface disturbance from infrastructure construction and operation. Subsidence due to longwall mining may result in destabilisation of cliff-lines and changes to hydrology of creek systems and swamps.

The on-going monitoring of a range of fauna (mammals including bats, avifauna, reptiles and amphibians), particularly threatened species, within sites sampling woodland habitat, creeks, swamps and valley forest within Baal Bone Colliery will ensure that any effects from subsidence can be recognised quickly.

From the results of the detailed assessment of potential impacts upon the threatened species listed under the NSW TSC Act likely to occur within Baal Bone Colliery (see Appendix 1 for this assessment) it is concluded that it is

unlikely that any threatened species would be significantly affected by the operation of the existing surface infrastructure area (including the coal handling and preparation plant, stockpiles and infrastructure), as well as coal haulage via road and rail from the site. There is no need for any Species Impact Statement to be developed for any of the species assessed.

6.0 APPLICATION OF ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 TO FAUNA KNOWN OR EXPECTED TO OCCUR WITHIN THE SOUTH-WESTERN AREA AT BAAL BONE COLLIERY

6.1 BACKGROUND

With the commencement of the Environment Protection and Biodiversity Conservation Act (EPBC Act) it is now necessary to assess whether an action[1] is likely to have a significant impact on a matter of national environmental significance. Consequently, all actions are subject to an assessment and approval process. Matters of National Environmental Significance (NES) identified in the EPBC Act are:

- World Heritage properties;
- Ramsar wetlands;
- Nationally threatened species and ecological communities;
- Migratory species;
- Commonwealth marine areas, and
- Nuclear actions.

Those matters relevant to any action at Baal Bone Colliery are nationally threatened species and ecological communities and migratory species.

Threatened species are listed under the EPBC Act as:

- Extinct in the wild; or
- Critically endangered; or
- Endangered; or

[1] An action includes a project, development, undertaking or an activity or series of activities.

- Vulnerable.

Ecological communities are listed as critically endangered and endangered.

There are criteria for assessing whether an impact upon a threatened species or ecological community is significant and would trigger an approval under the Act. The criteria are essentially the same for critically endangered, endangered or vulnerable species and are:

An impact is significant if:

- Decreases the size of a population ("important population of a species" for vulnerable), or
- Reduces the area of occupancy of the species ("an important population" for vulnerable), or
- Fragments an existing population into two or more populations (add "important" for vulnerable), or
- Adversely affects critical habitat, or
- Disrupts the breeding cycle of a population, or
- Modifies, destroys, removes, isolates or decreases the availability or quality of habitat to the extent that the species is likely to decline, or
- Introduces potentially harmful species into habitat, or
- Interferes with the recovery of the species (add "substantially" for vulnerable).

An impact on a critically endangered ecological community or an endangered community is significant if it:

- Adversely affects an ecological community, or
- Reduces the extent of a community, or
- Fragments an occurrence of the community, or
- Adversely affects critical habitat, or
- Modifies or destroys abiotic (non-living) factors necessary for the community's survival, or
- Introduces potentially harmful species into an ecological community, or
- Interferes with the recovery of an ecological community.

There is also a requirement for approval under the EPBC Act if an action has a significant impact upon a migratory species. An impact upon a migratory species is significant if it:

- Modifies (including fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroys or isolates an area of habitat important for the survival of the species in Australia, or
- Introduces invasive species into important habitat of the species, or
- Seriously disrupts the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically meaningful proportion of the population of the species.

These criteria must be applied to any listed species or community that may occur within the South-western Area at Baal Bone Colliery.

6.2 POTENTIAL LISTED SPECIES AND COMMUNITIES

An inquiry to the online database for the EPBC Act, on the Environment Australia web site (http://www.environment.gov.au/epbc), provided an EPBC Act Protected Matters Report. This showed that there are 12 migratory species, 20 threatened species and 12 Listed Marine Species (11 of these are species that overfly marine areas during migration) known from an area of 50km radius surrounding Baal Bone Colliery. These are listed in **Table 5**.

An assessment whether each of these species would occur within the South-western Area and whether any species could be affected by the development follows.

TABLE 5: POTENTIAL THREATENED AND MIGRATORY FAUNA SPECIES

Scientific Name	**Common Name**	**Status**
Haliaeetus leucogaster	White-bellied Sea-Eagle	Migratory, Listed Marine Species
Hirundapus caudacutus	White-throated Needletail	Migratory, Listed Marine Species (overfly)
Myiagra cyanoleuca	Satin Flycatcher	Migratory, Listed Marine Species (overfly)
Rhipidura rufifrons	Rufous Fantail	Migratory, Listed Marine Species (overfly)
Gallinago hardwickii	Latham's Snipe	Migratory, Listed Marine Species (overfly)
Rostratula benghalensis	Painted Snipe	Migratory, Listed Marine Species (overfly)
Merops ornatus	Rainbow Bee-eater	Migratory, Listed Marine Species (overfly)
Monarcha melanopsis	Black-faced Monarch	Migratory, Listed Marine Species (overfly)
Ardea alba	Great Egret	Migratory, Listed Marine Species (overfly)
Ardea ibis	Cattle Egret	Migratory, Listed Marine Species (overfly)
Apus pacificus	Fork-tailed Swift	Migratory, Listed Marine Species (overfly)
Xanthomyza phrygia	Regent Honeyeater	Endangered, Migratory
Rostratula australis	Australian Painted Snipe	Vulnerable
Polytelis swainsonii	Superb Parrot	Vulnerable
Lathamus discolor	Swift Parrot	Endangered, Listed Marine Species (overfly)
Dasyurus maculatus ssp. *maculatus*	Spotted-tailed Quoll	Endangered
Petrogale penicillata	Brush-tailed Rock-wallaby	Vulnerable
Chalinolobus dwyeri	Large-eared Pied Bat	Vulnerable
Nyctophilus timoriensis	Eastern Long-eared Bat	Vulnerable
Isoodon obesulus obesulus	Southern Brown Bandicoot	Endangered
Potorous tridactylus tridactylus	Long-nosed Potoroo	Vulnerable
Pteropus poliocephalus	Grey-headed Flying-fox	Vulnerable
Eulamprus leuraensis	Blue Mountains Water Skink	Endangered
Hoplocephalus bungaroides	Broad-headed Snake	Vulnerable
Heleioporus australiacus	Giant Burrowing Frog	Vulnerable
Litoria littlejohni	Heath Frog	Vulnerable
Mixophyes balbus	Stuttering Frog	Vulnerable
Paralucia spinifera	Purple Copper Butterfly	Vulnerable
Macquaria australasica	Macquarie Perch	Endangered
Prototroctes maraena	Australian Grayling	Vulnerable
Maccullochella peelii peelii	Murray Cod	Vulnerable

6.3 DESCRIPTION OF EXPECTED IMPACTS

There is little likelihood of any significant effects from the longwall mining. There are no swamps or other wetlands within the Area, although there are swamps associated with nearby Cox's River. Although rocky formations are considered to be sensitive to subsidence, these formations are not found within the south-western area of the Colliery (adjacent to LW18A).

On-going monitoring of fauna populations and wildlife habitats will occur within and close to the south western area should mining of the remnant coal resources (see Figure 1) occur. Changes in species diversities and habitat condition that could indicate some influence from subsidence will be responded to by Baal Bone Colliery.

6.4 WOULD ANY LISTED SPECIES BE AFFECTED?

Each listed species is assessed in terms of likelihood of occurrence in the remnant areas within the existing workings, and the likelihood of a significant impact from the development if the species could occur. This assessment is given in Appendix 2 of this report.

From the analysis provided in Appendix 2 of the threatened and migratory species listed under the Commonwealth EPBC Act that could potentially occur within the remnant areas within the existing workings at Baal Bone Colliery, it is concluded that it is unlikely that any such species would be significantly affected by the continued underground mining within the remnant areas within the existing workings at Baal Bone Colliery.

APPENDIX 1: ASSESSMENT OF SIGNIFICANCE FOR THREATENED SPECIES LIKELY TO OCCUR AT BAAL BONE COLLIERY

Bathurst Copper Butterfly *Paralucia spinifera*

A small butterfly with a thick body and wings coloured black or deep brown and displaying a bronze or green iridescence.

Distribution:

General The Bathurst Copper (or Purple) Butterfly occurs on the Central Tablelands in an area generally bounded by Oberon, Hartley and Bathurst (NPWS 1999).

Locality There is a cluster of records of this species in lower altitude land about 15km to the south of the Colliery.

Baal Bone Colliery There are no records of this species within the boundaries of the Colliery.

Preferred Habitat:

This butterfly occurs above 900m in altitude and is generally associated with exposure to full day sun. It is closely associated with the shrub Blackthorn, *Bursaria spinosa*, and the ant, *Ananychomyrma itinerans*, for breeding. Blackthorn is associated with the drier woodland communities such as the Tablelands Dry Woodland and Tablelands Grassy Woodland Complex.

Occurrence of Habitat within Baal Bone Colliery:

All preferred habitats are widely distributed throughout the Colliery, although there is little evidence for the presence of Blackthorn.

Sensitivity to Disturbance:

Woodland habitat has a low sensitivity to disturbance by subsidence. It is concluded that the Bathurst Copper Butterfly would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from State Forests in the region.

APPLICATION OF 7-PART TEST:

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,*

The Bathurst Copper Butterfly is closely associated with the shrub Blackthorn, *Bursaria spinosa*, and the ant, *Ananychomyrma itinerans*. These are mainly found at lower altitudes than that within the study area and it is unlikely that this species would be found in the Colliery. It is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

There is limited preferred habitat of the Bathurst Copper Butterfly within the Colliery and none of this habitat would be affected by subsidence.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The threat abatement objectives of the recovery plan for the Bathurst Copper Butterfly are to prevent the continuation of factors that are detrimentally affecting the butterfly and its habitat, and to prevent the occurrence of activities that may affect the butterfly and its habitat. As no preferred habitat should be affected by subsidence the action is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Bathurst Copper Butterfly would not be significantly affected by the development.

Square-tailed Kite *Lophoictinia isura*

This raptor is usually seen singly, soaring over woodland and forest canopy in search of bird nestlings for food.

Distribution:

General The Square-tailed Kite is found throughout much of Australia, and within all of NSW. Although widely distributed, it is considered rare over its range (Morcombe, 2000). There are scattered records of this species throughout NSW, with most records being along the coast and tablelands.

Locality There are two records for the Square-tailed Kite within 20km of the Colliery.

Colliery There are no records within the boundaries of the Colliery.

Preferred Habitat:

The Square-tailed Kite inhabits forest and woodland habitats and is often associated with ridge and gully forests (NPWS, 1999). All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland.

Occurrence of Habitat within the Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Square-tailed Kite would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from the following National Parks: Goulburn River, Wollemi, Morton, Mount Kaputar, Ingalba, Mootwingee and Ben Boyd. Also found in the following Nature Reserves: Nocoleche, Morrisons Lake and Macquarie Marshes (NPWS, 1999).

APPLICATION OF 7-PART TEST:

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,*

There are no records of the Square-tailed Kite within the Colliery and any preferred habitat (woodland) would not be affected by the proposed action. It is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Square-tailed Kite but the species profile lists the following priority actions:

- Protect known habitat from fires of a frequency greater than that recommended for the retention of biodiversity.
- Retain and protect nesting and foraging habitat, particularly along watercourses.
- Report suspected illegal bird shooting and egg-collecting to DEC.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Square-tailed Kite would not be significantly affected by the development.

Barking Owl *Ninox connivens*

A robust owl with piecing yellow eyes that roosts by day in leafy trees, often near watercourses. It nests in tree hollows.

Distribution:

General The Barking Owl occurs in northern, eastern and south-western Australia. This species is found throughout most of NSW, but is most abundant in the west of the State (NPWS, 2003b).

Locality There are six records of the Barking Owl within the locality of the Colliery.

Colliery There are no records for the Barking Owl within the boundaries of the Colliery.

Preferred Habitat:

It inhabits open forest and woodland in warm lowland areas on gentle terrain and roosts by day in dense streamside galleries and thickets (Ayres *et al*, 1996). It breeds in hollows of large eucalypts or paperbarks, usually near water courses or wetlands (NPWS, 2003b). All the woodland communities would represent the preferred habitats of this species.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery, although there are no sufficiently large watercourses in the Colliery.

Sensitivity to Disturbance:

The communities have a low sensitivity to disturbance by subsidence. It is concluded that the Barking Owl would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

According to the recovery plan for the Barking Owl (NPWS, 2003b), this bird is known from 53 conservation reserves in NSW, including Goulburn River, Kanangra-Boyd, Blue Mountains and Wollemi National Parks. It is also known from 25 State Forests.

APPLICATION OF 7-PART TEST:

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,*

There are no records of the Barking Owl within the Colliery despite several surveys for nocturnal fauna and any preferred habitat (woodland) would not be affected by the proposed action. It is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The objectives of the recovery plan for the Barking Owl include:

- Increase understanding of the biology, ecology and management of the Barking Owl
- Undertake threat abatement and mitigation (actions include Protect known Barking Owl nest sites and surrounding habitat; Assist with the protection of Barking Owl habitat from disturbance due to developments and activities)

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Barking Owl would not be significantly affected by the development.

Powerful Owl *Ninox strenua*

A very large owl with large golden eyes that roosts in on tree branches and nests in tree hollows.

Distribution:

General This species is mainly distributed along the coast and tablelands of NSW.

Location There are 17 records of the Powerful Owl distributed throughout the 20km area surrounding the Colliery, the closest being about 1.5km to the north-west.

Colliery The Powerful Owl has not been located within the Colliery.

Preferred Habitat:

This species is associated with moist and dry sclerophyll forests and woodlands, often with dense vegetation and old trees in sheltered valleys (Ayres *et al*, 1996). All the woodland communities would represent the preferred habitats of this species.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Powerful Owl would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from Blue Mountains, Wollemi, Royal, Kur-ring-gai Chase and Kanangra-Boyd National Parks.

APPLICATION OF 7-PART TEST:

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,*

There are no records of the Powerful Owl within the Colliery despite several surveys for nocturnal fauna and any preferred habitat (woodland) would not be affected by the proposed action. It is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:
i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The Recovery Plan for the Large Forest Owls (DEC 2005) includes the Powerful Owl. There are several objectives for this species including minimising further loss and fragmentation of habitat outside conservation reserves and the mitigation of development related threats. The DECC web site provides a list of priority actions for this species. These are:

- Apply low-intensity, mosaic pattern fuel reduction regimes.
- Searches for the species should be conducted in suitable habitat in proposed development areas and proposed forest harvesting compartments.

- Retain at least a 200 metre buffer of native vegetation around known nesting sites.
- Retain large stands of native vegetation, especially those containing hollow-bearing trees.
- Protect riparian vegetation to preserve roosting areas.
- Protect hollow-bearing trees for nest sites. Younger recruitment trees should also be retained to replace older trees in the long-term.
- Minimise visits to nests and other disturbances, including surveys using call playback, when owls are breeding.
- Assess the importance of the site to the species' survival. Include the linkages the site provides for the species between ecological resources across the broader landscape.

The action would be consistent with such priority actions.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Powerful Owl would not be significantly affected by the development.

Masked Owl *Tyto novaehollandiae*

This species lives in dry eucalypt forests and woodlands from sea level to 1100 m and roosts and breeds in moist eucalypt forested gullies, using large tree hollows or sometimes caves for nesting. This habitat is available, albeit limited, within the study area and there are few trees containing hollows within the study area and these could be utilised for shelter and breeding.

Distribution:

General This species is mainly distributed along the coast and tablelands of NSW.

Location There is only one record of the Masked Owl within the 20km area surrounding the Colliery.

Colliery The Masked Owl has not been located within the Colliery.

Preferred Habitat:

This species is associated with dry sclerophyll forests and woodlands in the west and wet forests on the coast, often with dense vegetation and old trees in sheltered valleys. All the woodland communities would represent the preferred habitats of this species. It roosts and nests in tree hollows.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Masked Owl would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from a number of conservation reserves and State Forests.

(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,*

As no trees with hollows will be affected, it is unlikely that the life cycle of the Masked Owl will be significantly affected.

(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 population occurs in the study area.

(c) *in the case of an 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,
(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,

Not relevant to this assessment.

d) In relation to the habitat of a threatened species, population or ecological community:
i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The Recovery Plan for the Large Forest Owls (DEC 2005) includes the Masked Owl. There are several objectives for this species including minimising further loss and fragmentation of habitat outside conservation reserves and the mitigation of development related threats. The DECC web site provides a list of priority actions for this species. These are:

- Drive carefully at night through forest areas.
- Retain and protect stands of native vegetation, especially those with hollow-bearing trees.
- Retain hollow-bearing trees as well as large, mature trees that will provide hollows in the future.
- Limit the use of pesticides used in suitable native habitat.

The action would be consistent with such priority actions.

(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.

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Masked Owl would not be significantly affected by the development.

Sooty Owl *Tyto tenebricosa*

Sooty Owls are limited mainly to the tall, moist eucalypt forests and rainforests of the escarpments and coastal areas. They are strongly associated with sheltered gullies with tall, dense understorey. This species roost in hollows in live or occasionally dead trees, caves or recesses in cliffs. Preferred habitat is available, albeit limited, within the study area and there are few trees containing hollows within the study area and these could be utilised for shelter and breeding.

Distribution:

General This species is mainly distributed along the coast and eastern tablelands of NSW.

Location There is only one record of the Sooty Owl within the 20km area surrounding the Colliery.

Colliery The Sooty Owl has not been located within the Colliery.

Preferred Habitat:

This species is associated with tall, moist eucalypt forests and rainforests of the escarpment and coastal areas. Some sheltered gullies within the Colliery, but not found in the South-western Area would represent the preferred habitats of this species. Roosts and nests in tree hollows.

Occurrence of Habitat within Colliery:

There is limited preferred habitat within the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Sooty Owl would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from a number of conservation reserves and State Forests.

APPLICATION OF 7-PART TEST:

(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,*

As no trees with hollows will be affected, it is unlikely that the life cycle of the Sooty Owl will be significantly affected.

(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 population occurs in the study area.

(c) *in the case of an 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,
(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,

Not relevant to this assessment.

d) In relation to the habitat of a threatened species, population or ecological community:
i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The Recovery Plan for the Large Forest Owls (DEC 2005) includes the Sooty Owl. There are several objectives for this species including minimising further loss and fragmentation of habitat outside conservation reserves and the mitigation of development related threats. The DECC web site provides a list of priority actions for this species. These are:

- Retain and protect stands of rainforest and moist forest, especially those with hollow-bearing trees.
- Retain hollow-bearing trees as well as large, mature trees that will provide hollows in the future.
- Limit the use of pesticides used in suitable native habitat.

The action would be consistent with such priority actions.

(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.

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Sooty Owl would not be significantly affected by the development.

Glossy Black-Cockatoo *Calyptorhynchus lathami*

Small blackish brown cockatoo with a broad, bulbous bill.

Distribution:

General The Glossy Black-Cockatoo is found throughout eastern NSW where it occurs in coastal or inland woodlands and forests or timbered watercourses.

Locality There are 30 records of the Glossy Black-cockatoo distributed throughout the 20km area surrounding the Colliery.

Colliery There one record for this species within the boundaries of the Colliery, near the LW29-31 in the south east of the Colliery's mining lease area.

Preferred Habitat:

This species is closely associated with she-oaks (*Casuarina* and *Allocasuarina* species) for food and hollows in mature or dead trees for nesting (Ayres *et al*, 1996). Woodland communities containing she-oak species would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Area.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Glossy Black-cockatoo would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from Blue Mountains, Wollemi, Goulburn River, Morton, Brisbane Waters and Kanangra-Boyd National Parks, as well as many conservation reserves along the NSW coast.

APPLICATION OF 7-PART TEST:

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,*

There is one record of the Glossy Black-cockatoo within the Colliery and it is likely that it would feed upon any she-oaks in the Colliery. However, any preferred habitat (woodland) would not be affected by the proposed action. It is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Glossy Black-cockatoo but the species profile lists the following priority actions:

- Reduce the impact of burning to retain diverse understorey species and in particular to permit the regeneration of she-oaks.
- Protect existing and future hollow-bearing trees for nest sites.
- Retain and protect areas of native forest and woodland containing she-oaks.
- Establish forested corridors linking remnant areas of habitat; include local she-oak species in bush revegetation works.
- Report suspected illegal bird trapping and egg-collecting to the DEC.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Glossy Black-cockatoo would not be significantly affected by the development.

Gang-gang Cockatoo *Callocephalon fimbriatum*

Small grey and pink parrot with a wispy scarlet crest.

Distribution:

General The Gang-gang Cockatoo is distributed from southern Victoria through south and central-eastern NSW. It is known from the south coast to the Hunter region and inland to the Central Tablelands.

Locality There are 56 records within the locality of the Colliery

Colliery There were several sightings of Gang-gang Cockatoos within the boundaries of the Baal Bone Colliery, particularly within the south-eastern area (near LW29-31).

Preferred Habitat:

In summer this species utilises tall montane forests and woodlands and, in winter, it occurs at lower altitudes in drier more open eucalypt forests and woodlands. It requires tree hollows for breeding, usually close to water. All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Gang-gang Cockatoo would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from Blue Mountains, Wollemi, Goulburn River National Parks, as well as many conservation reserves along the NSW coast.

APPLICATION OF 7-PART TEST:

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,*

There are records of the Gang-gang Cockatoo within the Colliery but it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Gang-gang Cockatoo but the species profile lists several priority actions including management of fire to protect tree hollows.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Gang-gang Cockatoo would not be significantly affected by the development.

Brown Treecreeper (eastern subspecies) *Climacteris picumnus victoriae*

A medium-sized insectivorous bird that nests in tree hollows within permanent territories. They forage on tree trunks and on the ground amongst leaf litter.

Distribution:

General The eastern subspecies of the Brown Treecreeper is distributed through south-eastern Queensland, eastern NSW and south-eastern Victoria (Schodde and Mason, 1999). In NSW, they are mainly found on the western slopes of the Great Dividing Range, and are sparsely scattered to the east of the Divide in drier areas, such as western parts of Cumberland Plain (NPWS, 2002c).

Locality There are 73 records of the Brown Treecreeper in the locality of the Colliery.

Colliery There are three records of the Brown Treecreeper within the Colliery. These sightings have been within the LW29-31 Colliery during the on-going monitoring surveys.

Preferred Habitat:

This medium-sized insectivorous bird occupies eucalypt woodlands, mainly with grassy understorey, but is also found in paddocks and grasslands where there are sufficient logs and dead trees nearby (Environment ACT, 1997). It is sedentary and nests in tree hollows within permanent territories. Studies have shown that Brown Treecreepers are unable to disperse to isolated woodland patches and that remnant connectivity influences dispersal success (Cooper, 2000; Cooper *et* al, 2002). All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Brown Treecreeper would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from New England, Blue Mountains, Wollemi and Kanangra-Boyd National Parks, and Longneck Lagoon and Munghorn Gap Nature Reserves.

APPLICATION OF 7-PART TEST:

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,*

The Brown Treecreeper is known to occur within the Colliery but it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,
No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Brown Treecreeper but the species profile includes the following priority actions:

- Modify grazing management practices that will maintain or improve habitat values and still allow some grazing to occur at strategic times of the year.
- Do not allow further loss of dead standing or fallen timber from firewood collection or on-farm practices such as 'tidying up'; do not allow removal of hollow-bearing dead or living trees and stumps on private and public lands.

Protection of the surface land is part of the actions proposed.

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.*
Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Brown Treecreeper would not be significantly affected by the development.

Regent Honeyeater *Xanthomyza phrygia*

A striking honeyeater with a black head and back and bold yellow edges to the wings and tail feathers. Forages and nests in the foliage of woodlands.

Distribution:

General Within NSW, the Regent Honeyeater is found from the coast to the western slopes and as far inland as Narrabri (NPWS, 1999). This species is semi-nomadic and will exploit areas when trees are in blossom.

Locality There is a cluster of records to the north of the Colliery. Most records are more than 10km from the Colliery, but there are two records (one in 1996 and another in 2004) at the western and southern edge of the Colliery.

Colliery There are no records of the Regent Honeyeater within the boundaries of the Colliery.

Preferred Habitat:

Mainly found in box-ironbark woodlands and wet lowland forests dominated by Swamp Mahogany, Spotted Gum and River Oak (NPWS, 1999). All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate potential for disturbance by subsidence. It is concluded that the Regent Honeyeater would have a low sensitivity to disturbance.

Occurrence within Conservation Reserves:

Known from the following National Parks: Yengo, Warrumbungle, Gardens of Stone, Wollemi, Scheyville, Goulburn River, Broadwater, Bundjalong, Yuraygir, Brisbane Waters, Ingalba, Hat Head, Royal and Seven Mile Beach. Also found the following Nature Reserves: Munghorn Gap, Pilliga, Cocklebay, and The Charcoal Tank (NPWS, 1999).

APPLICATION OF 7-PART TEST:

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,*

The Regent Honeyeater is not known to occur within the Colliery but there would be preferred habitat (e.g. flowering ironbark) during the year. However, it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is a National and NSW Recovery Plan for the Regent Honeyeater (NSW DEC 2004) that has the objective of ensuring that the species persists in the wild and maintains current status by stopping population decline and securing habitat extent and quality in currently regularly used areas, ensuring that the current significant habitat area remain viable and to undertake habitat improvement at strategic sites. There are several priority actions for this species are available from the DECC web site. These are:

- Maintain a captive population of Regent Honeyeaters.
- Provide landholders and other community members with information on the ecology and conservation requirements of the Regent Honeyeater. Use incentives on private land to encourage landholders to manage key areas.
- Encourage landholders/agistees to remove stock from sensitive riparian breeding sites.
- No loss of mature key nectar tree species. Minimise the removal of mistletoes at key sites.
- Protect and enhance key breeding and foraging habitats.
- Encourage natural regeneration and increase the remnant size of known and potential Regent Honeyeater habitats.
- Continue treeplanting programs at key breeding and foraging locations.
- No further loss of known woodland and forest habitat throughout the range of the Regent Honeyeater from developments.
- Conduct research into habitat selection in non-breeding season and long-distance movements.
- Investigate impacts of interspecific competition for resources and nest predation by native birds.

The action would be consistent with such priority actions.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Regent Honeyeater would not be significantly affected by the development.

Swift Parrot *Lathamus discolor*

A slender mid-green parrot related to rosellas, with nectar-eating habits of lorikeets.

Distribution:

General Swift Parrots migrate to mainland Australian from Tasmania during winter to feed on blossoms. Bred in Tasmania. They are found in the coast, tablelands and western slopes of NSW.

Locality There is a cluster of records to the north of the Colliery.

Colliery There are no records of the Swift Parrot within the boundaries of the Colliery.

Preferred Habitat:

Mainly found in dry sclerophyll forests and woodlands. All the woodland communities would represent the preferred habitats of this species e.g. Newnes Plateau Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Swift Parrot would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from Royal, Kur-ring-Gai Chase and Brisbane Waters National Parks, as well as many conservation reserves along the NSW coast.

APPLICATION OF 7-PART TEST:

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,*

The Swift Parrot is not known to occur within the Colliery but there would be preferred habitat. However, it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Swift Parrot but the species profile includes the following priority actions:

- Searches for the species should be conducted in suitable habitat in proposed development areas. Known feeding areas should be protected.
- Retain stands of winter-flowering feed-trees, particularly large mature individuals.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Swift Parrot would not be significantly affected by the development.

Turquoise Parrot *Neophema pulchella*

A small grass-green coloured parrot with a swift flight. Nests in dead stump or spout of eucalypt.

Distribution:

General The Turquoise Parrot is found throughout eastern Australia and its range in NSW extends from the coast to the western slopes and plains (its western limit is about the eastern edge of the Western Division).

Locality Known from ten sites in the locality of the Colliery, mainly to the north.

Colliery The Turquoise Parrot was located in open grassland near the old open cut during the 1980 surveys.

Preferred Habitat:

Edges of woodland adjoining clearings and on timbered ridges and creeks in farmland (Blakers *et al*, 1984). This parrot forages on the ground for seeds of grasses and forbs. "In my experience the birds have always been found in open forest and grassy glades in woodland close to a creek that contains permanent waterholes. The open forests of Yellow Box, White Box and Blakely's Redgum appear to be particularly favoured" (P.65, Morris, 1980). Nests are located in hollows of small trees, stags and fence posts[2]. All the woodland communities would represent the preferred habitats of this species.

Occurrence of Habitat within the Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Turquoise Parrot would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from a number of conservation reserves in eastern and central NSW, including the Blue Mountains National Park.

[2] Higgins, P.J. 1999 *Handbook of Australian, New Zealand and Antarctic Birds Volume 4.* Oxford University Press, Melbourne

APPLICATION OF 7-PART TEST:

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,*

The Turquoise Parrot is not known to occur within the Colliery in recent years, but there would be preferred habitat. However, it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Turquoise Parrot but the species profile includes the following priority actions:

- Undertake fox and feral cat control programs in key habitat areas.
- Retain areas of open woodland with grassy under-storey and adjoining grassland.
- Protect hollow-bearing trees for nest sites. Younger mature trees should also be retained to provide replacements for the older trees when they eventually die and fall over.
- Protect sites where Turquoise Parrots forage and nest from heavy, prolonged grazing.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Turquoise Parrot would not be significantly affected by the development.

Hooded Robin (south-eastern form) *Melanodryas cucullata cucullata*

The Hooded Robin is a small ground and aerial feeding insectivore that has experienced substantial declines in agricultural regions.

Distribution:

General The south-eastern form of the Hooded Robin occurs within the Central Tablelands and Blue Mountains.

Locality There are 31 scattered records for the Hooded Robin within the locality of the Colliery.

Colliery There have been no sightings of the Hooded Robin within the Colliery.

Preferred Habitat:

The Hooded Robin favours open areas adjoining large woodland blocks, with areas of dead timber and sparse shrub cover[3]. All the woodland communities would represent the preferred habitats of this species e.g. Newnes Plateau Woodland.

Occurrence of Habitat within the Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Hooded Robin would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Several conservation reserves in the Central Tablelands, including Blue Mountains National Park.

APPLICATION OF 7-PART TEST:

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,*

[3] Final Determination to list the Hooded Robin (south-eastern form), NSW Scientific Committee, NPWS, 26th October, 2001

The Hooded Robin is not known to occur within the Colliery but there would be preferred habitat. However, it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,
No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Hooded Robin but the species profile includes the following priority actions:

- Retain dead timber on the ground in open woodland areas.
- Enhance potential habitat through regeneration by reducing the intensity and duration of grazing.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Hooded Robin would not be significantly affected by the development.

Speckled Warbler *Pyrrholaemus sagittata*

The Speckled Warbler is a small perching bird that forages on the ground and in the understorey. It nests on the ground in grass tussocks, litter and fallen branches.

Distribution:

General The Speckled Warbler is distributed from south-eastern Queensland to Victoria. In NSW, they occupy eucalypt and cypress woodlands with grassy understorey, mainly on the western slopes. They are also found in drier coastal areas such as the Cumberland Plain, western Sydney and the Hunter River (Schodde and Mason 1999).

Locality There are nine scattered records to the north and south of the Colliery.

Colliery There are no records of the Speckled Warbler within the boundaries of the Colliery.

Preferred Habitat:

This species inhabits woodlands with a grassy understorey, often on ridges or gullies. All the woodland communities would represent the preferred habitats of this species e.g. Newnes Plateau Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Speckled Warbler would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from Scheyville, Goulburn River, Warrabah and Cocoparra National Parks, and Burning Mountain, Castlereagh and Windsor Downs Nature Reserves. It is also found at St Albans Common.

APPLICATION OF 7-PART TEST:

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,*

The Speckled Warbler is not known to occur within the Colliery but there would be preferred habitat. However, it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:
i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Speckled Warbler but the species profile includes the following priority actions:

- Retain dead timber on the ground in open woodland areas.
- Retain existing vegetation along roadsides, in paddocks and remnant stands of native trees.
- Encourage regeneration of habitat by fencing remnant stands.
- Assess the importance of the site to the species' survival. Include the linkages the site provides for the species between ecological resources across the broader landscape.
- Report any new sightings of the speckled warbler to the Department of Environment and Conservation.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Speckled Warbler would not be significantly affected by the development.

Black-chinned Honeyeater (eastern subspecies) *Melithreptus gularis gularis*

The Black-chinned Honeyeater is a medium-sized green and white passerine bird with a black head. They are branch and foliage gleaners and breed communally (Schodde and Mason, 1999).

Distribution:

General The eastern subspecies of the Black-chinned Honeyeater is distributed from south-eastern Queensland to Victoria. In NSW, they occupy eucalypt woodlands containing box-ironbark associations and River Red Gum, mainly on the western slopes. They are also found in drier coastal areas such as the Cumberland Plain, western Sydney and the Hunter River (NPWS 2001c).

Locality There are 14 scattered records of the Black-chinned Honeyeater within the locality of the Colliery.

Colliery No Black-chinned Honeyeater has been located within the Colliery.

Preferred Habitat:

This species is found in eucalypt woodlands, especially those containing box-ironbark associations and Red River Gum, within an approximate annual rainfall range of 400-700mm. All the woodland communities would represent the preferred habitats of this species e.g. Newnes Plateau Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Black-chinned Honeyeater would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from Blue Mountains, Wollemi, Goulburn River, Scheyville, Weddin, Warrumbungle and Comibla National Parks, and Longneck Lagoon, Ingalba, Castlereagh and Munghorn Gap Nature Reserves. Also known from St Albans Common, Weddin SF and Lake Burragorang catchment.

APPLICATION OF 7-PART TEST:

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,*

The Black-chinned Honeyeater is not known to occur within the Colliery but there would be preferred habitat. However, it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Black-chinned Honeyeater but the species profile includes the following priority actions:

- Retain suitable woodland habitats, particularly those with unimproved pasture and an intact native ground plant layer.
- Increase the size and connectivity of existing remnants, planting trees and establishing buffer zones of unimproved uncultivated pasture around woodland remnants.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Black-chinned Honeyeater would not be significantly affected by the development.

Diamond Firetail *Stagonopleura guttata*

The Diamond Firetail is a brightly coloured finch that occupies woodland where there is a grassy understorey. They nest in trees and bushes and forage on the ground for seeds and insects. Considered a 'decliner' species within the western slopes (Reid, 1999)

Distribution:

General The Diamond Firetail is distributed through central and eastern NSW as well as southern and central Queensland, Victoria and Eyre Peninsula, South Australia (NPWS 2001d). In NSW, it mainly occurs west of the Great Dividing Range, although there are populations known from the Cumberland Plain and the Hunter, Clarence, Richmond and Snowy River valleys.

Locality There are 37 scattered records within the locality of Colliery.

Colliery There are several records for this species within the boundaries of the Colliery. A small flock appears to be resident within the shrubbery at the Colliery headworks and another flock was sighted in cleared land in the north of the Colliery.

Preferred Habitat:

This bird is found in eucalypt woodlands, forests and mallee where there is grassy understorey. They nest in trees and bushes and forage on the ground. All the woodland communities would represent the preferred habitats of this species e.g. Newnes Plateau Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Diamond Firetail would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from Blue Mountains, Goulburn River, Yengo, and Gunderbooka National Parks.

APPLICATION OF 7-PART TEST:

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,*

The Diamond Firetail is known to occur within disturbed areas in the Colliery. It is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Diamond Firetail but the species profile includes the following priority actions:

- Search for the species in suitable habitat in areas that are proposed for development or management actions.
- Retain dead timber on the ground in open woodland areas.
- Reduce heavy grazing by domestic stock in areas of known or potential habitat, to enable flowering and subsequent seeding of grasses and forbs that this species requires.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Diamond Firetail would not be significantly affected by the development.

Grey-crowned Babbler (south-eastern sub-species) *Pomatostomus temporalis temporalis*

The Grey-crowned Babbler is the largest of the four Australian babblers that lives in large family groups.

Distribution:

General The Grey-crowned Babbler is found throughout large parts of northern Australia and in south-eastern Australia. In NSW, the eastern sub-species occurs on the western slopes of the Great Dividing Range, and on the western plains reaching as far as Louth and Hay.

Locality There is only one sighting of this bird within the locality, to the north-east of the Colliery.

Colliery No records of the Grey-crowned Babbler from within the Colliery boundaries.

Preferred Habitat:

Inhabits open Box-Gum Woodlands on the slopes, and Box-Cypress-pine and open Box Woodlands on alluvial plains.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Grey-crowned Babbler would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Found in a number of conservation reserves and State Forests.

APPLICATION OF 7-PART TEST:

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,*

The Grey-crowned Babbler is not known to occur within the Colliery but there would be preferred habitat. It is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Grey-crowned Babbler but the species profile includes the following priority actions:

- Retain existing woodland vegetation.
- Retain dead timber on the ground in open woodland areas.
- Encourage regeneration of habitat by fencing remnant stands.
- Increase the size of existing remnants, planting trees and establishing buffer zones of unimproved uncultivated pasture around woodland remnants.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Grey-crowned Babbler would not be significantly affected by the development.

Painted Honeyeater *Grantiella picta*

The Painted Honeyeater is small bird with a distinctive black head and back and white underparts with dark streaks on the flanks.

Distribution:

General The Painted Honeyeater is nomadic and occurs at low densities throughout its range. The greatest concentrations of the bird and almost all breeding occurs on the inland slopes of the Great Dividing Range in NSW, Victoria and southern Queensland. During the winter it is more likely to be found in the north of its distribution.

Locality There is a single record to the south of the Colliery.

Colliery There are no records of this bird within the Colliery boundaries.

Preferred Habitat:

Inhabits Boree, Brigalow and Box-Gum Woodlands and Box-Ironbark Forests and a specialist feeder on the fruits of mistletoes growing on woodland eucalypts and acacias.

Occurrence of Habitat within Colliery:

All preferred habitats are sparsely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Painted Honeyeater would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Found in a number of conservation reserves and State Forests.

APPLICATION OF 7-PART TEST:

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,*

The Painted Honeyeater is not known to occur within the Colliery but there would be limited preferred habitat. It is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Painted Honeyeater but the species profile includes the following priority actions:

- Manage grazing on sites where Painted Honeyeater habitat occurs.

- Encourage regeneration of habitat by fencing remnant stands and undertaking new plantings.
- Protect remnant woodland and open forest throughout the range of the species.
- Regenerate and replant local flora species to maintain breeding and foraging habitat.

Protection of the surface land is part of the actions proposed.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Painted Honeyeater would not be significantly affected by the development.

Koala *Phascolarctos cinereus*

A stocky arboreal marsupial that sends most of its time in trees.

Distribution:

General This species has a fragmented distribution throughout eastern Australia. It is known from both sides of the Great Dividing Range but mainly occurs on the central and northern coasts of NSW.

Locality There are 15 records for the Koala within the locality of the Colliery, all to the east of the Colliery.

Colliery There are no records from within the boundaries of the Colliery.

Preferred Habitat:

The Koala inhabits eucalypt forest and woodland feeding upon preferred tree species such as Ribbon Gum and Forest Red Gum (NPWS, 1999). All the

woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland.

Occurrence of Habitat within the Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Koala would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from the Blue Mountains National Park and 'have been recorded in numerous conservation reserves along the coast and the slopes and tablelands of the Great Dividing Range' (NPWS, 1999). There are listed endangered populations of this species at Hawkes Nest and Pittwater LGA.

APPLICATION OF 7-PART TEST:

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,*

The Koala is not known to occur within the Colliery despite several surveys. It is highly unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The draft recovery plan for the Koala has seven objectives and which the first is to 'Conserve the Koala in their existing habitat'

The action proposed is consistent with this objective.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Koala would not be significantly affected by the development.

Spotted-tailed Quoll *Dasyurus maculatus*

The Tiger or Spotted-tailed Quoll is a relatively large dasyurid (carnivorous) marsupial that is partly arboreal.

Distribution:

General Sparsely distributed along the Great Dividing Range from Queensland to Victoria.

Locality There are two Spotted-tailed Quoll records known from about two km to the south of the Colliery.

Colliery There are no records of the Spotted-tailed Quoll within the boundaries of the Colliery.

Preferred Habitat:

Tiger Quolls inhabit sclerophyll forests, woodlands and rainforest where they mainly hunt on the ground (Ayres *et al*, 1996). Nest sites are rock shelters, hollow logs or tree hollows. All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland.

Occurrence of Habitat within the Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Spotted-tailed Quoll would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from the Blue Mountains, Morton, Kanangra-Boyd and Wollemi National Parks. Occurs in numerous conservation throughout eastern NSW (NPWS, 1999).

APPLICATION OF 7-PART TEST:

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,*

The Spotted-tailed Quoll is not known to occur within the Colliery despite several surveys, but there is preferred habitat within the Colliery. It is highly unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Spotted-tailed Quoll but the species profile lists several priority actions including:

- Consult with DEC if Spotted-tailed Quolls are raiding poultry, rather than taking direct action.
- Retain and protect large, forested areas with hollow logs and rocky outcrops, particularly areas with thick understorey or dense vegetation along drainage lines.

The action proposed is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Spotted-tailed Quoll would not be significantly affected by the development.

Squirrel Glider *Petaurus norfolkensis*

A small arboreal marsupial that can glide between trees.

Distribution:

General The Squirrel Glider is found along the Great Dividing Range and the coastal plains in eastern Australia from Cape York to Victoria. Mainly found on inland slopes.

Locality There are scattered records within the locality of the Colliery.

Colliery A Squirrel Glider responded to a broadcast call and was observed emerging from a small hollow at the base of a dead tree limb in the Colliery during a 2005 survey in 2005 and a Squirrel Glider was trapped in the Northern Area of the Colliery during surveys in 2009.

Preferred habitat:

Generally dry sclerophyll forest and woodlands which have mature or mixed-age stands of more than one eucalypt species. The stands usually include smooth-barked gums and high-nectar-producing species, such as *Acacia,* as a source of carbohydrate during winter (Menkhorst *et al,* 1988). The Squirrel Glider requires hollows in trees as den sites and utilises a range of hollows at various heights in living and dead trees and are known to travel up to 1 km from their foraging area to a preferred hollow (Menkhorst, 1995). Dead trees with hollows and iron-barked eucalypts are preferred nesting sites for this species (Rowston, 1998). All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Squirrel Glider would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from the Blue Mountains, Brisbane Water, Goulburn River, Wollemi, Kanangra-Boyd, Tooloom, Border Ranges, Mount Warning, Warrumbungle National Parks and Binnaway Nature Reserve (NPWS, 1999). There are listed endangered populations of this species at Barrenjoey Peninsula and Wagga Wagga.

APPLICATION OF 7-PART TEST:

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,*

The Squirrel Glider is known to occur within the Colliery and there is preferred habitat. It is highly unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Squirrel Glider but the species profile lists several priority actions including:

- Retain den trees and recruitment trees (future hollow-bearing trees).
- Retain food resources, particularly sap-feeding trees and understorey feed species such as Acacias and banksias.
- Retain and protect areas of habitat, particularly mature or oldgrowth forest containing hollow-bearing trees and sap-feeding trees.

The action proposed is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Squirrel Glider would not be significantly affected by the development.

Yellow-bellied Glider *Petaurus australis*

An active, highly mobile large arboreal marsupial.

Distribution:

General Patchily distributed along the Great Dividing Range and coast from Mackay to Melbourne.

Locality There are ten records of the Yellow-bellied Glider to the north-east of the Colliery. There are reports of its presence in Wolgan Valley during the Australian Museum surveys for the Emirate's Resort development.

Colliery There are no records within the boundaries of the colliery, although there have been observations of characteristic 'sap cuts' within wet gullies in the Northern Area of the Colliery.

Preferred Habitat:

This species is found in sclerophyll forests (wet and dry) and woodlands, preferring tall mature forests (Ayres *et al*, 1996). It forages at night in the crowns of eucalypts and at distinctive sap sites on the trunks of trees. During the day it rests in leaf-lined dens in hollow tree limbs and trunks. Recent studies have shown that the probability of Yellow-bellied Glider occurrence was highest at sites located in large patches of old-growth forest (Incoll *et* al, 2001). All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery, but would be limited in the remnant areas within the existing workings.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Yellow-bellied Glider would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Known from the Blue Mountains, Kanangra-Boyd, Morton and Brisbane Water National Parks and from Muogamarra Nature Reserve. Occurs in various conservation reserves along the east coast and adjacent inland areas of NSW (NPWS, 1999).

APPLICATION OF 7-PART TEST:

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,*

The Yellow-bellied Glider is not known to occur within the Colliery but there is preferred habitat within the Colliery. It is highly unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

The recovery plan for the Yellow-bellied Glider has five objectives including:

- To encourage and assist in improving the protection and management of the Yellow-bellied Glider and its habitat
- To identify and monitor significant populations of the species

The action proposed is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Yellow-bellied Glider would not be significantly affected by the development.

Eastern Pygmy-possum *Cercartetus nanus*

A small arboreal marsupial that mainly feeds on pollen and nectar from banksias, eucalypts and understorey plants.

Distribution:

General This species is distributed in the south-eastern corner of Australia. It is mainly found in coastal areas and tablelands in NSW.

Locality The Eastern Pygmy-possum has recently been captured within stands of banksia shrub at Springvale and Clarence Collieries and is known from old records near Pipers Flat.

Colliery There are no records within the boundaries of the colliery.

Preferred Habitat:

Found in a variety of habitats including wet and dry sclerophyll forest, woodland, coastal banksia scrub and wet heath. All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex, Tablelands Dry Woodland and Cox River Swamps communities.

Occurrence of Habitat within the Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The communities have a low to moderate sensitivity to disturbance by subsidence. It is concluded that the Eastern Pygmy-possum would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Located in Barren Grounds Nature Reserve, and Budderoo, Royal and Heathcote National Parks and several state forests.

APPLICATION OF 7-PART TEST:

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,*

The Eastern Pygmy-possum is not known to occur within the Colliery but there is preferred habitat within the southwest portion of the Colliery, particularly within stands of banksia. It is highly unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Eastern Pygmy-possum but the species profile provides priority actions including:

- Avoid frequent burning of habitat.
- Protect habitat in proposed development areas and retain linkages across the broader landscape .
- Avoid overgrazing by stock and fire wood collection in areas of heathy understorey vegetation.

The action proposed is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

It is concluded that the Eastern Pygmy-possum would not be significantly affected by the development.

Eastern Bentwing Bat *Miniopterus schreibersii oceanensis*

A medium sized insectivorous bat that roosts in caves etc.

Distribution:

General The Eastern Bentwing Bat is a species that occurs along the coast and ranges from Cape York to Adelaide, and Northern Australia.

Locality There are scattered records of the Eastern Bentwing Bat within the locality of the Colliery.

Colliery This bat has been located, by call analysis, within the LW29-31 SMP Area and in the Northern Area of the Colliery.

Preferred Habitat:

It is cave roosting, congregating at a few select maternity roosts to give birth, with congregations at such roosts often numbering in the many thousands. It spends much of the year in small scattered roosts on caves, mines, tunnels, culverts and suitable buildings emerging at night to forage for insects. In spring, females congregate at a small number of suitable nursery caves where a single young is born in December. These maternity sites are normally situated in limestone cave systems which provide the correct temperature and humidity range to raise the young (Dwyer, 1995). This bat is typically found in well timbered areas where it forages above the tree canopy on small insects. It may travel relatively large distances between roost sites according to seasonal and local needs.

All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland. The roosting habitat (e.g. caves) would be associated with rocky formations and clifflines.

Occurrence of Habitat within the Colliery:

Foraging and roosting habitats are distributed throughout the Colliery, and there is the potential for maternity roosts within the clifflines and rocky outcrops. However, there would not be any maternity roosts within the remnant areas within the existing workings.

Sensitivity to Disturbance:

The woodland communities have a low to moderate sensitivity to disturbance by subsidence. However, the rocky formations are considered to be sensitive to subsidence. This could result in loss of roosting habitat due to cliff collapse. However, there is a likelihood of the creation of preferred habitat (cliff cracks) and it is concluded that the Eastern Bentwing Bat would have a moderate sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

This species is represented in Newington Nature Reserve and Sydney Harbour, Wollemi, Blue Mountains and Kur-ring-gai National Parks.

APPLICATION OF 7-PART TEST:

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,*

The Eastern Bentwing Bat is known to occur within the Colliery and there is preferred foraging habitat within the remnant areas to the south west of Colliery. Rocky formations are considered to be sensitive to subsidence, but these formations are limited within the Colliery and will possibly be avoided during underground mining. Also, there is a likelihood of the creation of preferred habitat (cliff cracks) and it is concluded that it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:
i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Eastern Bentwing Bat but the species profile provides priority actions including:

- Retain native vegetation around roost sites, particularly within 300 m of maternity caves.
- Minimise the use of pesticides in foraging areas.
- Protect roosting sites from damage or disturbance.

The action proposed is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Eastern Bent-wing Bat would not be significantly affected by the development.

Eastern False Pipistrelle *Falsestrelis tasmaniensis*

A large and robust insectivorous bat that flies within or just below the tree canopy.

Distribution:

GeneralThe Eastern False Pipistrelle is known from south eastern Queensland, eastern NSW, Victoria and Tasmania.

Locality There are 15 scattered records of the Eastern False Pipistrelle in the locality of the Colliery.

Colliery There are no records within the boundaries of the Colliery.

Preferred Habitat:

This species prefers forests and woodlands, particularly wet habitats where trees are more than 20m high (Churchill, 1998). It roosts in tree hollows and occasionally caves and buildings (Ayres *et al*, 1996). All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland. The occasional roosting habitat of caves would be associated with rocky formations.

Occurrence of Habitat within the Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The woodland communities have a low to moderate sensitivity to disturbance by subsidence and rocky formations are considered to be highly sensitive to subsidence (loss of roosting habitat due to cliff collapse). However, this species mainly roosts in tree hollows and it is concluded that the Eastern False Pipistrelle would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

There are records for this bat from Blue Mountains, Goulburn River and Wollemi National Parks, and it likely to use other reserves for forage and roost habitat.

APPLICATION OF 7-PART TEST:

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,*

The Eastern False Pipistrelle is not known to occur within the Colliery but there is preferred habitat within the south western portion of the Colliery. Rocky formations are considered to be sensitive to subsidence, but these formations are limited within the Colliery and will possibly be avoided during underground mining. Also, there is a likelihood of the creation of preferred habitat (cliff cracks) and it is concluded that it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Eastern False Pipistrelle but the species profile provides priority actions including:

- Retain native vegetation that is floristically and structurally diverse.
- Minimise the use of pesticides within or adjacent to areas where insectivorous bats occur.
- Protect roost sites from disturbance.

The action proposed is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Eastern False Pipistrelle would not be significantly affected by the development.

Eastern Freetail-bat *Mormopterus norfolkensis*

An insectivorous bat that prefers open areas and waterways.

Distribution:

General East coast of NSW, mainly on the coastal side of the Great Dividing Range.

Locality There is one record of the Eastern Freetail-bat in the locality of the Colliery.

Colliery There are no records within the boundaries of the Colliery.

Preferred Habitat:

This species prefers dry sclerophyll forests and woodlands with a preference for open spaces and are more active in the upper slopes of forest areas rather than in riparian areas (Churchill, 2008). It roosts in tree hollows and occasionally buildings.

Occurrence of Habitat within the Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The woodland communities have a low to moderate sensitivity to disturbance by subsidence and rocky formations are considered to be highly sensitive to subsidence (loss of roosting habitat due to cliff collapse). However, this species mainly roosts in tree hollows and it is concluded that the Eastern Freetail-bat would have a low sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

There are records for this bat from Blue Mountains, Goulburn River and Wollemi National Parks, and it likely to use other reserves for forage and roost habitat.

APPLICATION OF 7-PART TEST:

(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,*

The Eastern Freetail-bat is not known to occur within the Colliery but there is preferred habitat within the south western portion of the Colliery. It is concluded that it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

(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 such population is known to exist.

(c) in the case of an 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,

(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,

No endangered ecological community is present in the study area.

(d) in relation to the habitat of a threatened species, population or ecological community:

(i) the extent to which habitat is likely to be removed or modified as result of the result of the action proposed, and

The extent of removal or modification of habitat will be slight.

(ii) whether an area of habitat is likely to become fragmented or isolated from other areas of habitat as result of the proposed action, and

No area of habitat will become fragmented or isolated as result of the action proposed.

(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 amount of habitat to be removed, modified, fragmented or isolated will be small compared to that available in the area.

(e) whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),

Critical habitat for the species is yet to be defined.

(f) whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for this species, but the priority actions for this species include:

Retain hollow-bearing trees and provide for hollow tree recruitment.

Retain foraging habitat.

Minimise the use of pesticides in foraging areas.

Hollow-bearing trees and foraging habitat will be retained during the construction and maintenance of the power lines.

(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 proposed development is not recognised as a key threatening process.

From the above test, it is concluded that the Eastern Freetail-bat would not be significantly affected by the development.

Large-eared Pied Bat *Chalinolobus dwyeri*

An insectivorous bat with large ears and curly wattles.

Distribution:

General The Large-eared Pied Bat is distributed in south eastern Queensland and from the coast to the western slopes in NSW.

Locality There are 22 records to the east and south of the Colliery.

Colliery This species has been located by call analysis in the Northern Area of the Colliery.

Preferred Habitat:

The Large-eared Pied Bat is found in dry forest and woodland habitats and mainly roost in caves and mines (Churchill, 1998). All the woodland communities would represent the preferred habitats of this species. These include Tablelands Grassy Woodland Complex and Tablelands Dry Woodland. The roosting habitat of caves could be associated with rocky formations.

Occurrence of Habitat within Colliery:

All preferred habitats are widely distributed throughout the Colliery.

Sensitivity to Disturbance:

The woodland communities have a low to moderate sensitivity to disturbance by subsidence and rocky formations are considered to be highly sensitive to subsidence (loss of roosting habitat due to cliff collapse). However, the loss of roosting habitat due to subsidence would be balanced by the creation of new roosting habitat (from cracking) and it is concluded that the Large-eared Pied Bat would have a moderate sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

This bat is found in the Warragamba Dam catchment area, as well as Wollemi, Kanangra-Boyd and Blue Mountains National Parks.

APPLICATION OF 7-PART TEST:

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,*

The Large-eared Pied Bat is known to occur within the Colliery and there is preferred habitat within the south western portion of the Colliery. Rocky formations are considered to be sensitive to subsidence, but these formations are limited within the Colliery and will possibly be avoided during underground mining. Also, there is a likelihood of the creation of preferred habitat (cliff cracks) and it is concluded that it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Large-eared Pied Bat but the species profile provides priority actions including:

- Protect known and potential habitat from burning at too-frequent intervals.
- Reduce the use of pesticides and consider alternatives where available.
- Protect known and potential forest and woodland habitat around cliffs, rock overhangs and old mine workings from clearing and isolation.

The action proposed is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Large-eared Pied Bat would not be significantly affected by the development.

Little Bentwing-bat *Miniopterus australis*

Little Bentwing-bats are small chocolate brown insectivorous bats with a body length of about 45 mm.

Distribution:

General Coastal north-eastern NSW and eastern Queensland.

Locality There is one record about 11km north-east of the Colliery.

Colliery This species has not been located in the Colliery.

Preferred Habitat:

Moist eucalypt forest, rainforest or dense coastal banksia scrub. Little Bentwing-bats roost in caves, tunnels and sometimes tree hollows during the day, and at night forage for small insects beneath the canopy of densely vegetated habitats.

Occurrence of Habitat within Colliery:

Preferred foraging habitats are widely distributed throughout the Colliery and roosting habitat could be found in the rocky outcrops.

Sensitivity to Disturbance:

The woodland communities have a low to moderate sensitivity to disturbance by subsidence and rocky formations are considered to be highly sensitive to subsidence (loss of roosting habitat due to cliff collapse). However, the loss of roosting habitat due to subsidence would be balanced by the creation of new roosting habitat (from cracking) and it is concluded that the Little Bentwing-bat would have a moderate sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Found in a number of conservation reserves and State Forests.

APPLICATION OF 7-PART TEST:

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,*

The Little Bentwing-bat is not known to occur within the Colliery but there is preferred habitat within the south western portion of the Colliery. Rocky formations are considered to be sensitive to subsidence, but these formations are limited within the Colliery and will possibly be avoided during underground mining. Also, there is a likelihood of the creation of preferred habitat (cliff cracks) and it is concluded that it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Little Bentwing-bat but the species profile provides priority actions including:

- Retain stands of native vegetation.
- Reduce use of pesticides.
- Protect known roosting and nursery sites and surrounding forest.
- Check with DECC before undertaking recreational caving activities.

The action proposed is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Little Bentwing-bat would not be significantly affected by the development.

Greater Broad-nosed Bat *Scoteanax rueppellii*

A large powerful bat with a broad head and a short square muzzle.

Distribution:

General The Greater Broad-nosed Bat is found mainly in the gullies and river systems that drain the Great Dividing Range, from north-eastern Victoria

to the Atherton Tableland. It extends to the coast over much of its range. In NSW it is widespread on the New England Tablelands, however does not occur at altitudes above 500 m.

Locality There are three records to the south of the Colliery.

Colliery This species has not been located in the Colliery.

Preferred Habitat:

This species utilises a variety of habitats from woodland through to moist and dry eucalypt forest and rainforest, though it is most commonly found in tall wet forest. Although this species usually roosts in tree hollows, it has also been found in buildings.

Occurrence of Habitat within Colliery:

Preferred foraging and roosting habitats are widely distributed throughout the Colliery. However, this bat is unlikely to occur in much of the Colliery as it does not occur at altitudes above 500m.

Sensitivity to Disturbance:

The woodland communities have a low to moderate sensitivity to disturbance by subsidence and it is concluded that the Greater Broad-nosed Bat would have a moderate sensitivity to disturbance from subsidence.

Occurrence within Conservation Reserves:

Found in a number of conservation reserves and State Forests.

APPLICATION OF 7-PART TEST:

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,*

The Greater Broad-nosed Bat is not known to occur within the Colliery but there is preferred habitat within the south western portion of the Colliery. It is concluded that it is unlikely that the life cycle of this species would be disrupted by subsidence due to underground mining in the Colliery.

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 population occurs in the Colliery.

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,

No endangered ecological community occurs within the Colliery.

d) In relation to the habitat of a threatened species, population or ecological community:

i) the extent to which habitat is likely to be removed or modified as a result of the action proposed,

No preferred habitat would be removed or modified within the Colliery.

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,

No area of preferred habitat is likely to become fragmented or isolated as a result of the proposed action.

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,

No preferred habitat will be removed, modified, fragmented or isolated within the Colliery.

e) *Whether the action proposed is likely to have an adverse effect on critical habitat (either directly or indirectly),*

No critical habitat is listed for the Colliery.

f) Whether the action proposed is consistent with the objectives or actions of a recovery plan or threat abatement plan,

There is no recovery plan for the Greater Broad-nosed Bat but the species profile provides priority actions including:

- Raise landowners' awareness of the presence of this species, and provide information on how their management actions will affect the species' survival.
- Actively encourage the conservation of the riparian vegetation and water quality of streams and rivers.
- DECC should be consulted when planning development/s to minimise impact/s on populations.
- Conduct searches for the species in suitable habitat in proposed development areas.
- Protect hollow-bearing trees for breeding sites, including those on farmland; younger mature trees should also be retained to provide replacements for the older trees as they die and fall over.
- Retain stands of native vegetation, especially those with hollow-bearing trees (including dead trees), and retain other structures containing bats.
- Retain a buffer of vegetation around roost sites in vegetated areas.
- Reduce the use of pesticides in the environment and enter known sites of this species and its potential habitat onto maps used for planned poison spraying activities.
- Encourage regeneration and replanting of local flora species to maintain bat foraging habitat.
- Assess the site's importance to the species' survival, including linkages provided between ecological resources across the broader landscape.

The action proposed is consistent with these objectives.

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.*

Alteration of habitat following subsidence due to longwall mining is listed as a Key Threatening Process.

From the above test, it is concluded that the Greater Broad-nosed Bat would not be significantly affected by the development.

APPENDIX 2: ASSESSMENT UNDER THE ENVIRONMENT PROTECTION AND BIODIVERSITY CONSERVATION ACT 1999 OF FAUNA KNOWN OR EXPECTED TO OCCUR WITHIN THE SOUTH-WESTERN AREA AT BAAL BONE COLLIERY

Migratory Species

1. *Haliaeetus leucogaster* White-bellied Sea-Eagle

Distribution: Within range
Broad Habitat Preferences: Usually coastal and seasonally flooded inland swamps.
Likelihood of Occurrence: Unlikely within the remnant areas within the existing workings, no preferred habitat
Expected Impacts from Development: Low, as no preferred habitat will be affected

2. *Hirundapus caudacutus* White-throated Needletail

Distribution: Within main part of range
Broad Habitat Preferences: Aerial over most habitats
Likelihood of Occurrence: Known to occur on the Newnes Plateau on one occasion (M. Denny *pers. comm.*).
Expected Impacts from Development: Low, as capable of using cleared areas, as well as timbered land

3. Myiagra cyanoleuca Satin Flycatcher

Distribution: Within range, recorded in Newnes Plateau area.
Broad Habitat Preferences: Forests and woodlands, heath, prefers wet gullies during breeding
Likelihood of Occurrence: Not known from the South-western Area and unlikely to occur, as no preferred habitat
Expected Impacts from Development: Low, as no preferred habitat will be affected

4. Rhipidura rufifrons Rufous Fantail

Distribution: Within range, known from Newnes State Forest
Broad Habitat Preferences: Rainforest, dense wet forest, riverside vegetation
Likelihood of Occurrence: Not known from the remnant areas within the existing workings and unlikely to occur, as no preferred habitat
Expected Impacts from Development: Low, as no preferred habitat to be affected

5. Gallinago hardwickii Latham's Snipe

Distribution: Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Low vegetation around wetlands, irrigated crops
Likelihood of Occurrence: Not known from the remnant areas within the existing workings, as no preferred habitat
Expected Impacts from Development: Low, as preferred habitat would not be affected

6. Rostratula benghalensis Painted Snipe

Distribution: Within range, but no records from region
Broad Habitat Preferences: Surrounds and shallows of wetlands that are well vegetated with dense low cover
Likelihood of Occurrence: Low at site, as no preferred vegetation within remnant areas within the existing workings
Expected Impacts from Development: Low, as no preferred habitat

7. *Merops ornatus* Rainbow Bee-eater

Distribution: Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Surrounds and shallows of wetlands that are well vegetated with dense low cover
Likelihood of Occurrence: Not known from the remnant areas within the existing workingsbut could occur during the summer months foraging in the area
Expected Impacts from Development: Low, as preferred habitat would not be affected.

8. *Monarcha melanopsis* Black-faced Monarch

Distribution: Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Rainforests, mangroves, eucalypt forests and woodlands
Likelihood of Occurrence: Not known from remnant areas within the existing workingsbut could occur
Expected Impacts from Development: Low, as preferred habitat in the remnant areas within the existing workings (woodland) would not be affected.

9. *Ardea alba* Great Egret

Distribution: Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Wetlands, flooded pastures, dams, estuarine mudflats, mangroves and reefs
Likelihood of Occurrence: Not known from the remnant areas within the existing workingsand unlikely to occur as no preferred habitat

Expected Impacts from Development: Low, as no preferred habitat in the remnant areas within the existing workings

10. *Ardea ibis* Cattle Egret

Distribution: Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Moist pastures with tall grass, shallow open wetlands and margins, mudflats
Likelihood of Occurrence: Not known from the remnant areas within the existing workingsand unlikely to occur as no preferred habitat
Expected Impacts from Development: Low, as no preferred habitat in the remnant areas within the existing workings

11. *Apus pacificus* Fork-tailed Swift

Distribution: Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Aerial over a range of habitats
Likelihood of Occurrence: Not known from the remnant areas within the existing workingsbut likely to occur as a summer migrant
Expected Impacts from Development: Low, as no preferred habitat in the remnant areas within the existing workingswould be affected

Threatened Species

1. Lathamus discolor Swift Parrot

Distribution: : Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Forests and woodlands with flowering trees
Likelihood of Occurrence: Likely when sufficient trees are flowering
Expected Impacts from Development: Low, as no preferred habitat would be affected

2. *Xanthomyza phrygia* Regent Honeyeater (also listed as Migratory species)

Distribution: Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Ironbark forest and box woodlands
Likelihood of Occurrence: Could occur, but only occasionally recorded from Newnes State Forest
Expected Impacts from Development: Low, as expected impacts on box woodland and ironbark forest are very low.

3. *Polytelis swainsonii* Superb Parrot

Distribution: Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Open woodland and riverine habitats
Likelihood of Occurrence: Possible, but at it's eastern edge of distribution
Expected Impacts from Development: Low, as no preferred habitat would be affected

4. *Rostratula australis* Australian Painted Snipe

Distribution: Within its range, but not known from the region.
Broad Habitat Preferences: Muddy, shallow freshwater swamps
Likelihood of Occurrence: Possible (within range, but no suitable habitat)
Expected Impacts from Development: Very low, as no preferred habitat would be affected

5. *Dasyurus maculatus* ssp. *maculatus* Spotted-tailed Quoll

Distribution: Within its range, and known from Newnes State Forest
Broad Habitat Preferences: Forest, woodland, rocky outcrops
Likelihood of Occurrence: Possible, but not recorded from region in recent years or found in the remnant areas within the existing workings
Expected Impacts from Development: Very low, as only a very small amount of habitat would be affected

6. *Petrogale penicillata* Brush-tailed Rock-wallaby

Distribution: Known from surrounding national parks (e.g. Wollemi, Yengo and Blue Mountains)
Broad Habitat Preferences: North-facing cliff ledges
Likelihood of Occurrence: Low within the site, as no preferred habitat.
Expected Impacts from Development: Very low, as no preferred habitat at site

7. *Chalinolobus dwyeri* Large-eared Pied Bat

Distribution: Known from Newnes State Forest
Broad Habitat Preferences: Roosts in caves and rocky overhangs, forages in woodland
Likelihood of Occurrence: Found at adjoining coal mines, but not known from remnant areas within the existing workings
Expected Impacts from Development: Low, as preferred habitat only slightly affected

8. *Nyctophilus timoriensis* Eastern Long-eared Bat (south-eastern form)
Distribution: Within its range, but there are no records for Newnes Plateau area
Broad Habitat Preferences: A variety of vegetation types, including box/ironbark/cypress pine along the western slopes. Roosts in tree hollows, crevices and loose bark.
Likelihood of Occurrence: Could occur
Expected Impacts from Development: Very low, as preferred habitat at site not affected

9. *Pteropus poliocephalus* Grey-headed Flying-fox

Distribution: Within range, but not known from the Newnes Plateau area
Broad Habitat Preferences: Roost at camps and feeds on nectar, pollen and fruits of various trees
Likelihood of Occurrence: Low
Expected Impacts from Development: Very low, as not expected in area and preferred habitat not affected

10. *Isoodon obesulus obesulus* Southern Brown Bandicoot

Distribution: Not recorded from the region
Broad Habitat Preferences: Sandy soil with low vegetation
Likelihood of Occurrence: Low, as not known from the area and outside recorded range
Expected Impacts from Development: Very low, as not expected in area and preferred habitat not affected

11. *Potorous tridactylus tridactylus* Long-nosed Potoroo

Distribution: Not recorded from the region
Broad Habitat Preferences: Woodland with dense understorey
Likelihood of Occurrence: Low, as not known from the area and outside recorded range
Expected Impacts from Development: Very low, as not expected in area and preferred habitat not affected

12. *Eulamprus leuraensis* Blue Mountains Water Skink

Distribution: Known from Newnes Plateau State Forest
Broad Habitat Preferences: High elevation sedge and shrub swamps with boggy soil
Likelihood of Occurrence: Low, as there is no preferred habitat within the remnant areas within the existing workings
Expected Impacts from Development: Low, as preferred habitat not affected

13. *Hoplocephalus bungaroides* Broad-headed Snake

Distribution: Within range, and recorded in the Newnes Plateau area
Broad Habitat Preferences: Loose rock and tree hollows
Likelihood of Occurrence: Could occur within the remnant areas within the existing workings, as there is preferred habitat available
Expected Impacts from Development: Low, as preferred habitat not affected

14. *Heleioporus australiacus* Giant Burrowing Frog

Distribution: Sydney Basin, but not recorded in the Newnes Plateau area
Broad Habitat Preferences: Upland swamps and rocky pools
Likelihood of Occurrence: Low, as there is no preferred habitat within the remnant areas within the existing workings
Expected Impacts from Development: Low, as preferred habitat not affected

15. *Mixophyes balbus* Stuttering Frog

Distribution: Within range and recorded from Newnes State Forest
Broad Habitat Preferences: Flowing streams in wet forests
Likelihood of Occurrence: Low, as there is no preferred habitat within the remnant areas within the existing workings
Expected Impacts from Development: Low, as preferred habitat not affected

16. *Litoria littlejohni* Heath Frog

Distribution: Not recorded from the region**,** but known from Mount Wilson, Blue Mountains
Broad Habitat Preferences: Sedgelands, wet and dry sclerophyll forests and woodlands
Likelihood of Occurrence: Low, as possibly outside range
Expected Impacts from Development: Low, as preferred habitat not affected and possible outside range

17. *Paralucia spinifera* Purple Copper Butterfly

Distribution: Within range and known from the Newnes Plateau region
Broad Habitat Preferences: Associated with Blackthorn at altitudes above 900m
Likelihood of Occurrence: Possible, but limited preferred habitat
Expected Impacts from Development: Low, as preferred habitat not affected

18. *Maccullochella peelii* Murray Cod

Distribution: No records for region
Broad Habitat Preferences: Deep water, rivers
Likelihood of Occurrence: Extremely low, as no preferred habitat
Expected Impacts from Development: Very low, as preferred habitat not available

19. *Macquaria australasica* Macquarie Perch

Distribution: Within range but there are no records for the Newnes Plateau region
Broad Habitat Preferences: Cool, clear water in the upper reaches of rivers

Likelihood of Occurrence: Extremely low, as no preferred habitat
Expected Impacts from Development: Very low, as preferred habitat not available

20. *Prototroctes maraena* Australian Grayling

Distribution: No records for region, only known from eastern fall of Dividing Range
Broad Habitat Preferences: Clear gravely streams
Likelihood of Occurrence: Extremely low, as no preferred habitat
Expected Impacts from Development: Very low, as preferred habitat not available and outside range