



# **Broad Headed Snake and Southern Brown Bandicoot Management Plan**

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Name	Position	Company/Site	Exp (yrs)	Revision
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**Document Revisions**

Revision	Description of Changes	Date
1.0	Replaces ICHMP0250 Southern Brown Bandicoot Management Plan (SBBMP) and ICHMP0256 Broad Headed Snake Management Plan (BHSMP). Previous Revision History provided in Appendix 4. Updated to new format. Incorporates regulatory agency comments.	16/12/2020
1.1	Inclusion of Broad-headed Snake and Southern Brown Bandicoot Offset Strategy Proposal Version 3 as Appendix 5. <u>Approved:</u> <ul style="list-style-type: none"> <li>• Department – 18/12/2020</li> <li>• DAWE – 28/01/2021</li> </ul>	23/12/2020
2.0	Scheduled review. General update. Inclusion of additional Broad-headed Snake sighting. Inclusion of feedback from consultation with BCD and DCCEEW. Removal of references to South32. <ul style="list-style-type: none"> <li>• Department – 9 April 2025</li> <li>• DCCEEW – 10 June 2025</li> </ul>	30/01/2025

**Declaration**

EPBC No.	2010/5350 and 2001/214
Project Name:	Bulli Seam Operations Expansion (2010/5350) and Dendrobium Coal Mine (2001/214)
Proponent:	Illawarra Coal Holdings Pty Ltd
ABN:	69 093 857 286
Approved action:	<p><u>Bulli Seam Operations Expansion</u></p> <p>To expand underground mining operations at the existing Appin coal mine and West Cliff Colliery. The proposal is to develop several new underground longwall mining areas, and upgrade the existing West Cliff Washery, including the creation of a new coal wash emplacement (as described in the request to vary proposal to take an action received on 22 December 2011</p> <p><u>Dendrobium Coal Mine</u></p> <p>To extract Wongawilli Seam Coal from an area of reserve located to the north of the current Eloura Mine, Woronora Plateau, NSW and associated works.</p>
Location of the Action:	Appin, NSW (Bulli Seam Operations Expansion) and Mt Kembla, NSW (Dendrobium Coal Mine)
Date of preparation of management plan:	January 2025

**Declaration of accuracy**

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act)* makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the *EPBC Act* or the *Environment Protection and Biodiversity Conservation Regulations 2000 (Cth)*. The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed:



Full name (please print): Chris Schultz

Organisation (please print): Illawarra Coal Holdings Pty Ltd

Date: 30 January 2025

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# 1 Introduction

Appin Mine incorporates the underground mining operations, which extract coal from the Bulli Seam, and associated surface activities, including the West Cliff Coal Preparation Plant (WCCPP) and Coal Wash Emplacement Area (CWEA). Appin Mine is located approximately 25 kilometres (km) north-west of Wollongong in New South Wales. Appin Mine is owned and operated by Endeavour Coal Pty Ltd, a subsidiary of Illawarra Coal Holdings Pty Ltd (ICHPL) which is a wholly owned subsidiary of Gear M Illawarra Met Coal Pty Ltd (GM<sup>3</sup>).

Appin Mine, Cordeaux Colliery and Dendrobium Mine (and associated facilities) are collectively operated by GM<sup>3</sup>.

ICHPL received Project Approval 08\_0150 (the Project Approval) from the Planning Assessment Commission of NSW under delegation of the Minister for Planning and Infrastructure on 22 December 2011<sup>1</sup> for current and proposed mining of the Bulli Seam Operations (BSO) for the next 30 years, and production of up to 10.5 million tonnes per annum of run of mine (RoM) coal. This approval incorporates underground mining, transport and coal wash emplacement activities undertaken 24 hours a day, seven days per week.

Condition 17 of Schedule 4 of the Project Approval requires the preparation of a CWEA Management Plan (CWEAMP), with Condition 17 d) requiring the inclusion of management strategies for the protection and conservation of the Broad-headed Snake and Southern Brown Bandicoot.

EPBC Approval 2001/214 (the DEN EPBC Approval) was issued by the Australian Government on 20/12/2001 under the Environment Protection and Biodiversity Conservation (EPBC) Act 1999. Condition 5 of the DEN EPBC Approval required the submission of a plan for the management of Broad-headed Snake at Stage 3 of the CWEA. This included the provision of compensatory habitat.

EPBC Approval 2010/5350 (the EPBC Approval) was issued by the Australian Government on 15 May 2012 under the EPBC Act. Condition 7 of the EPBC Approval requires the preparation of a Southern Brown Bandicoot and Broad-headed Snake Management Plan.

The Broad-headed Snake and Southern Brown Bandicoot Management Plan (SBMP)<sup>2</sup> has been prepared to detail the measures to avoid, mitigate and manage impacts on the Broad-headed Snake, Southern Brown Bandicoot and their habitats as a result of Appin Mine operations. The SBMP has been prepared to satisfy Condition 17 d) of Schedule 4 of the Project Approval, Condition 5 of the DEN EPBC Approval and Condition 7 of the EPBC Approval. The SBMP should be read in conjunction with the CWEAMP.

Coal wash emplacement is currently occurring in Stage 3. Future coal wash emplacement will occur in Stage 4. The Stage 4 CWEA is scheduled to commence in approximately four (4) years<sup>3</sup>, however this timeframe is dependent on how much coal wash is diverted to beneficial reuse.

## 1.1 Objectives

The objectives of the SBMP are to:

- detail measures to avoid, mitigate and manage impacts on the Broad-headed Snake, Southern Brown Bandicoot and their habitats;

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<sup>1</sup> As modified by MOD 1 (April 2015), MOD 2 (October 2016) and MOD 3 (April 2022)

<sup>2</sup> Replaced ICHMP0250 Southern Brown Bandicoot Management Plan (SBBMP) and ICHMP0256 Broad Headed Snake Management Plan (BHSMP)

<sup>3</sup> Currently expected to be 2029.

- outline provisions for funding of research programs to inform or enhance the conservation of these species; and
- meet the requirements of approval conditions as listed in Appendices 1, 2 and 3.

**1.2 Scope**

The SBMP applies to potential impacts on the Broad-headed Snake and Southern Brown Bandicoot from Stages 3 and 4 of the CWEA construction and operations.

**1.3 Environmental Management System**

ICHPL has a comprehensive Environmental Management System (EMS) in place to minimise the impact of its operations on the local environment and community. The SBMP is a component of the EMS which is certified to ISO 14001.

**1.4 Consultation**

As required, the components relating to the Broad-headed Snake and Southern Brown Bandicoot from the CWEAMP) were prepared in consultation with the then Department of the Environment (DoTE - now Department of Climate Change, Energy, the Environment and Water (DCCEEW - Commonwealth)) and the NSW Office of Environment and Heritage (OEH – now Biodiversity and Conservation Division (BCD) of DCCEEW - NSW).

DoTE and OEH were provided with drafts of the BHSMP and SBBMP for comment with responses addressed within Rev 3 of the BHSMP and Rev 2 of the SBBMP where appropriate (refer to Appendix 6 for version history).

Consultation has been undertaken as part of this review of the SBMP with BCD, the Department and DCCEEW. The comments from the consultation process have been incorporated into Version 2.0 of the SBMP.

Appendix 10 outlines comments from the relevant government agencies following consultation and the ICHPL response.

Consultation with relevant agencies will only be undertaken where there is a material change to the CWEAMP or SBMP or if specifically requested by the Department or DCCEEW. Administrative changes do not constitute a material change.

**2 Roles and Responsibilities**

Table 1 outlines the roles and responsibilities associated with the SBMP.

**Table 1: Summary of roles and responsibilities**

Role	Responsibilities
Superintendent Environment	<ul style="list-style-type: none"> <li>• Implement and periodically review the SBMP.</li> <li>• Liaise with government regulators and ICHPL senior leadership team in relation to any non-compliances with the SBMP.</li> </ul>
Specialist Environment	<ul style="list-style-type: none"> <li>• Advise, coach and mentor ICHPL operations with respect to meeting the standards and requirements of the SBMP.</li> <li>• Monitor and review compliance against these requirements.</li> </ul>

	<ul style="list-style-type: none"> <li>• Undertake monitoring as required within their level of qualifications and experience.</li> <li>• Coordinate monitoring with external consultants.</li> <li>• Review monitoring data and implement corrective/preventative actions as required.</li> </ul>
Production Personnel	<ul style="list-style-type: none"> <li>• Provision of suitable resources to manage the CWEA in accordance with the SBMP.</li> <li>• Day to day operation and maintenance of CWEA in accordance with the SBMP and CWEAMP.</li> </ul>
Ecologist or wildlife specialist (with experience in relation to the Broad-headed Snake or Southern Brown Bandicoot)	<ul style="list-style-type: none"> <li>• Relocation (if required) of the Broad-headed Snake or Southern Brown Bandicoot.</li> <li>• Undertake monitoring as required.</li> </ul>

Site personnel will undertake the following training in environmental management and responsibilities:

- All site personnel will undertake the general induction.
- Personnel working at Appin Mine will undertake a site familiarisation, including emergency response procedures.
- Surface personnel will undertake the on-line Environmental Awareness Training.
- CWEA supervisors and operators will be provided specific awareness training for working within the footprint of the approved emplacement area.

### 3 Legislation and Planning

#### 3.1 Project Approval

Potential impacts from the BSO Project are assessed in the BSO Project EA 2009 and BSO Project EIS 2011. The results were assessed under the *Environmental Planning and Assessment Act 1979 (EP&A Act)* and *EPBC Act*. All activities carried out as part of the BSO Project will be in accordance with the conditions of the Project Approval, in accordance with any written directions of the Planning Secretary and generally in accordance with the Environmental Assessment (EA), Statement of Commitments and Preferred Project Report, and in accordance with the EPBC Approval and DEN EPBC Approval.

Appendix 1 outlines the Broad-headed Snake and Southern Brown Bandicoot management requirements of the Project Approval and cross references where the requirements have been addressed within the SBMP.

Appendix 2 outlines the Broad-headed Snake and Southern Brown Bandicoot management requirements of the EPBC Approval and cross references where the requirements have been addressed within the SBMP.

Appendix 3 outlines the Broad-headed Snake and Southern Brown Bandicoot management requirements of the DEN EPBC Approval and cross references where the requirements have been addressed within the SBMP.

### 3.2 Relevant Legislation

Key regulatory and SBMP obligations are managed via an obligations management database. The obligations are allocated to responsible personnel. This process is detailed in the Environmental Compliance/Conformance Assessment and Reporting Procedure (IMCP0186).

Legislation applicable to the SBMP includes but is not limited to:

- *Biodiversity Conservation Act 2016*<sup>4</sup> (*BC Act*);
- *EPBC Act*;
- *Environment Protection and Biodiversity Conservation Regulations 2000*;
- *Environmental Planning and Assessment Act 1979*
- *National Parks and Wildlife Act, 1974*; and
- *Protection of the Environment Operations Act, 1997*.

### 3.3 Guidelines

This SBMP has been developed to be consistent with the principles of the following guidelines:

- ISO 14001:2015 Environmental Management Systems.
- Conservation Advice for *Hoplocephalus bungaroides* (Broad-headed Snake).
- Conservation Advice for *Isoodon obesulus obesulus* (Southern Brown Bandicoot).

## 4 Broad-Headed Snake Information

The Broad-headed Snake *Hoplocephalus bungaroides* (see Plate 1) is a species of national conservation significance. It is listed as Endangered<sup>5</sup> under provisions of the *EPBC Act* and as Endangered under the *BC Act*.



**Plate 1: Broad-headed Snake**

Records of Broad-headed Snake are restricted to the Sydney Basin Bioregion of NSW (Cogger 2000). The species occurs in association with Triassic sandstones within the Sydney Basin, and

<sup>4</sup> Previously the *Threatened Species Conservation Act 1995 (TSC Act)*

<sup>5</sup> Conservation significance designation changed from vulnerable to endangered in 2023.

is typically found among exposed sandstone outcrops within vegetation types ranging from woodland to heath. Within these habitats, they generally seek shelter in rock crevices and exfoliating rock with males and non-gravid females also using tree hollows during the warmest periods of summer (Webb and Shine 1998b). Research has found that the rock outcrops used by Broad-headed Snake have relatively specific characteristics, being generally western facing and with a relatively open canopy (Webb and Shine 1998a, b).

Furthermore, the rock crevices within these outcrops are quite specific, with rocks having to be exposed to direct sunlight (no overgrowth; Pringle et al 2003), be a rock-on-rock substrate and have relatively specific crevice structures and rock thicknesses that provide specific microclimates (Croak et al 2008).

These highly specific rock characteristics lead to a paucity of suitable rocks being available in any given outcrop area and so there may be significant competition for suitable rocks between resident snakes and hence, the loss of suitable crevices may be a significant problem for local populations. Individual snakes have been found sheltering in hollows in tree species including *Eucalyptus gummifera*, *E. punctata*, *E. piperita* and *E. agglomerata* and prefer larger trees, trees with multiple hollows or dead trees. These hollows are typically located in positions where they are relatively unshaded by surrounding vegetation. Individual snakes use between one and nine trees and may spend long periods within a single hollow, up to 48 days (Webb & Shine 1997a).

The Broad-headed Snake is an ambush predator, spending up to four weeks in the same retreat site (Webb & Shine 1997a) and preying on small reptiles and mammals that enter the retreat (Webb & Shine 1997a; Wells 1981). Snakes feed very infrequently, with less than 20% of captured adults showing signs of having fed recently (Webb & Shine 1994). Juveniles feed more frequently than adults (Webb & Shine 1994; Webb & Shine 1998c). Juvenile snakes feed primarily on Velvet Geckos (*Oedura lesuerii*) (up to 70% of prey items) and occasionally on small skinks (Downes 1999; Webb & Shine 1998c). Adult snakes also consume Velvet Geckos, although they only comprise 27% of prey items (Webb & Shine 1998c). Other prey items include lizards, snakes and small mammals (Downes 1999; Shine 1983b; Webb & Shine 1998c). Broad-headed Snakes show a greater specialisation or specificity of prey than is typical of Australian snakes (Webb and Shine 1998c), which may be related to limited prey types occurring within their preferred habitats.

The Broad-headed Snake has been recorded to have a sedentary life cycle. Individuals in southern areas of its range have been found to occupy home ranges that are only 3.43 ( $\pm 2.86$  SD) ha ( $n = 18$ ) with all snakes avoiding sharing space (Webb & Shine 1997b). Despite this low home range size and habitat specificity, recent research has indicated that there is a relatively high exchange of genes amongst populations, although this appears to occur only along lines of outcropping (Dubey et al 2011). The Broad-headed Snake also has a notably long reproductive cycle, with adults reaching maturity only at six years for female snakes and five years for males (Webb et al. 2003). Females are able to produce offspring only every second year (Webb et al 2002) and with litter sizes of 4-12 (Webb & Shine 1998c). This relatively low reproductive rate, relative to other Australian elapid snakes, appears to be related to low prey availability or low prey capture rates (Webb et al. 2003).

Stages 3 and 4 of the CWEA contain areas of suitable habitat for the species in the Sandstone Scribbly Gum Woodland, Sandstone Gully Apple Peppermint Forest and Sandstone Gully Peppermint Forest. These vegetation units contain areas of suitably exposed sandstone that also have adjacent forests containing large hollow bearing trees that can be used during summer.

Common prey species, such as the Velvet Gecko and the Southern Leaf-tailed Gecko (*Phyllurus platurus*), have also been recorded within Stages 3 and 4 of the CWEA, indicating that prey species are available.

To date, the Broad-headed Snake has been definitively recorded only twice within the Stage 3 CWEA (Figure 2). Another record near to the Stage 4 CWEA is still the subject of some conjecture. Several records of the species exist within 10 km of the Appin North/WCCPP operations (OEH

Atlas of NSW Wildlife – See Figure 2). Most of these records occur to the north and east of the site, including within Dharawal National Park. Locally, the species has a patchy distribution, almost certainly reflecting its specific habitat requirements.

#### 4.1 Significance of Broad-headed Snake Population within the Study Area

The local Broad-headed Snake population within the Appin North Surface Lease and surrounds is considered to be of national conservation significance and, as such, Stages 3 and 4 of the CWEA may be considered to support an ‘important population’ of the species, as defined by the *EPBC Act*.

An important population is one that is necessary for a species' long-term survival and recovery and may include populations that are:

- key source populations either for breeding or dispersal;
- populations that are necessary for maintaining genetic diversity; and/or
- populations that are near the limit of the species range.

Under provisions of the *EPBC Act*, an action has, will have, or is likely to have a ‘significant impact’ on a ‘Vulnerable Species’ if it does, will, or is likely to:

- decrease the size of an important population of a species; or
- reduce the area of occupancy of an important population; or
- fragment an existing important population into two or more populations; or
- adversely affect critical habitat; or
- disrupt the breeding cycle of an important population; or
- modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline; or
- directly or indirectly result in invasive species that are harmful to a vulnerable species becoming established in the ‘vulnerable species’ habitat; or
- interferes substantially with the recovery of the species.

#### 4.2 Habitats of the Broad-headed Snake within the Study Area

Known and potential habitat for the Broad-headed Snake occurs within Stages 3 and 4 of the CWEA and the remainder of the surface lease. This habitat includes:

- rocky outcrops, crevices, caves and overhangs;
- open forest and woodland with hollow-bearing trees (particularly dead trees); and
- fallen hollow timber and bark.

The individual recorded by Biosis Research (2001) was observed in March 2001 during a spotlighting survey and was crossing a dirt track between open woodland habitat on a ridge, within the site (refer to Figure 2). A second individual was recorded in April 2016 by ICHPL personnel during a pre-clearing survey in the Stage 3 CWEA. The snake was captured and relocated in accordance with the BHSMP to a location shown on Figure 2 and Figure 3.

The snake, detected during the pre-clearance survey, was approximately 40 cm long and showed no signs of injury, parasites or other ill-health. Its colouration was bright suggesting it had recently sloughed and its body condition was good based on the rounded overall body shape. More importantly, the snake was clearly a female that was

carrying at least two or possibly large full term young based on the bulges in her lower abdomen. This species produces live young between December and April (Cogger 2014), which fits in with the condition of this individual.

The Broad-headed Snake spends a significant amount of time inactive in retreat-sites and moves only short distances between winter sites (i.e. rocky outcrops). The species' movement is more frequent and extensive within woodland (summer) habitat, with males and non-gravid females moving up to 780 m from winter sites into woodland during summer (Webb and Shine 1997a). Potential habitat is shown in Plate 2.



**Plate 2: Potential Broad-headed Snake habitat**

Two juvenile Broad-headed Snakes were observed in the Appin North switch room in January 2024 (refer to Figure 2). One (1) of the snakes was alive and the other was deceased. The cause of death was unable to be identified.<sup>6</sup> The snake that was alive exited the switch room on its own accord however was observed to have returned on subsequent inspections. The alive snake was not relocated.

#### 4.3 Potential Impacts on Broad-headed Snake

Key Threatening Processes (KTP), as listed under Schedule 4 of the *BC Act*, are actions that have the ability to significantly impact threatened species and/or their habitats. KTPs relevant to the proposal that would impact on actual and potential habitat for the Broad-headed Snake include:

- bushrock removal - the emplacement operations involve the removal of bushrock, including large rock platforms and outcrops that provide potential habitat for the species;
- clearing of native vegetation; and
- loss of hollow-bearing trees.

The CWEA operations have the potential to negatively impact on the local population of Broad-headed Snake either directly through mortality and habitat removal, or indirectly by changes to habitat conditions, fragmentation of suitable habitats and loss of prey items.

A risk assessment has been undertaken and is provided in Appendix 4.

A summary of potential impacts associated with the Project are outlined in Sections 4.3.1.1 and 4.3.1.2.

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<sup>6</sup> The remains were provided to the Australian Museum.

#### 4.3.1.1 Direct Impacts

Direct impacts that may result from the active emplacement within Stages 3 and 4 of the CWEA include:

- death and/or injury of Broad-headed Snakes due to the disturbance and removal of known and potential habitat for this species;
- direct loss of habitat such as hollow-bearing trees, hollow logs and exposed sandstone rocky outcrops;
- increased predation due to loss of sheltering habitat;
- relocation of individuals during habitat translocation;
- direct road-kill mortality by construction vehicles (although less likely due to reduced vehicle movements at night); and
- creation of artificial barriers to movement (e.g. isolation of rock outcrops from adjacent hollow-bearing trees to the extent that snakes can no longer move between these two critical resources).

#### 4.3.1.2 Indirect Impacts

Potential indirect impacts that may result from the active emplacement within Stages 3 and 4 of the CWEA include:

- loss of prey habitat and hence prey availability leading to starvation and reduced recruitment;
- reduction in genetic diversity within the regional population due to a reduction or loss of the Appin North population, or to disrupted capacity for the species to move within and through Stages 3 and 4 of the CWEA; and
- reduction in quality of surrounding habitat due to noise, vibration and dust from Appin Mine operational activities.

## 5 Southern Brown Bandicoot Information

The Southern Brown Bandicoot, *Isoodon obesulus obesulus* (Shaw and Nodder 1797), is a medium-sized (400 - 1600 g) ground-dwelling marsupial (see Plate 3). Like other members of the bandicoot family (Peramelidae) the species has a long tapering snout with a naked nose, a compact body and short tail with a pointed end. The head has small, rounded ears and small eyes. The coarsely furred dorsal surface of the body is usually dark grey with golden-brown flecks, and the softer underbelly is creamy-white. While the forelegs are short with curved claws on the digits, the hind limbs are much longer resembling those of macropods. The hind feet are characterised by the presence of syndactylus toes, formed by fusion of the second and third digits. These are used for grooming (DEC 2006).

The Southern Brown Bandicoot is a species of national conservation significance. It is listed as Endangered in Schedule 1, Part 2 of the BC Act and Endangered in the *EPBC Act*. In NSW, the species has a patchy distribution along the eastern coastline and adjacent lower foothills in the southern part of the state, from the Hawkesbury River to the Victorian border. Records of the species are generally confined to heathlands or woodlands and forests with heath understorey, typically on friable sandy soil.

Bandicoots usually nest in a shallow depression in the ground covered by leaf litter, grass or other plant material (Rayment 1954; Ride 1970; Gordon 1974, in DEC 2006). The upper surface of this covering may be mixed with earth to waterproof the inside of the nest (Stodart 1983; Gordon 1983

in DEC 2006). Internally, the nest comprises a hollow chamber, often lined with grass and leaves with no distinct entrance or exit.



**Plate 3: Southern Brown Bandicoot (DSEWPaC, 2011)**

### 5.1 Significance of Southern Brown Bandicoot population within the Study Area

The Stage 3 CWEA Species Impact Statement (SIS) prepared by Biosis (2007) found no records of Southern Brown Bandicoot during targeted surveys of the species in the CWEA. The SIS concluded that whilst habitat for the species existed within the CWEA, it was unlikely that the species would be affected by the proposed Stage 3 CWEA as the species had not been sighted since a recorded sighting in Dharawal National Park several decades prior. Previous records of Southern Brown Bandicoot in the study area are shown in Figure 1.

During the fauna survey for the Terrestrial Fauna Assessment prepared for the BSO Project EA, Biosphere Consultants (2009) trapped one adult male Southern Brown Bandicoot in the proposed Stage 4 CWEA. Further targeted trapping, use of hair tubes and use of infrared motion sensing cameras was conducted, however no further animals were captured, photographed or hair traces found.

However, numerous Southern Brown Bandicoot diggings were located outside of the Stage 4 CWEA (including within land to the north, in the Dharawal National Park to the east and in the Metropolitan Special Area to the south). In addition, some other bandicoot diggings were recorded; however, these could not be distinguished between the Long-nosed Bandicoot and the Southern Brown Bandicoot. A bandicoot skull was found within the Metropolitan Special Area and was subsequently identified as belonging to a Southern Brown Bandicoot by palaeontologist Henk Godthelp from the University of NSW (Biosphere 2009).

The Southern Brown Bandicoot is probably best described as present but rare. The proposed Stage 4 CWEA and surrounds provide habitat for the Southern Brown Bandicoot, resulting in part from the 2001 bushfires creating habitat mosaics in early to mid-succession phase at the time of the BSO Project surveys. Conversely, the greater the time lapse since the last landscape-scale bushfire, the greater the possibility that some early successional habitats may become sub-optimal for the species. It is likely that well managed cool mosaic burnings between well-spaced landscape-wide bushfires may be required as part of a management mix to maintain optimal habitat outcomes for the Southern Brown Bandicoot. (Biosphere 2009).

## 5.2 Potential Impacts on Southern Brown Bandicoot

The Southern Brown Bandicoot Recovery Action Plan (DEC 2006) lists five KTPs from Schedule 4 of the BC Act that are of direct relevance to the Southern Brown Bandicoot:

- predation by the European Red Fox *Vulpes vulpes*;
- predation by the Feral Cat *Felis catus*;
- high frequency fire resulting in disruption of life cycle processes in plants and animals and loss of vegetation structure and composition;
- clearing of native vegetation; and
- infection of native plants by *Phytophthora cinnamomi*.

The KTP of most direct relevance to the proposal is clearing of vegetation which would impact on actual and potential habitat for the Southern Brown Bandicoot.

The CWEA operations have the potential to negatively impact on the local population of Southern Brown Bandicoot either directly through mortality, habitat removal and increased susceptibility to predation by introduced carnivores, or indirectly by changes to habitat conditions, fragmentation of suitable habitats and loss or degradation of food resources.

A risk assessment has been undertaken and is provided in Appendix 5.

A summary of potential impacts associated with the proposal is outlined in Sections 5.2.1.1 and 5.2.1.2.

### 5.2.1.1 Direct impacts

Direct impacts that may result from the Stage 4 CWEA operations include:

- death and/or injury of Southern Brown Bandicoots due to the removal of known and potential habitat for this species;
- direct loss of habitat;
- increased susceptibility to predation by introduced carnivores due to loss or degradation of habitat;
- loss or injury to individuals during capture and translocation; and
- creation of artificial barriers to movement.

### 5.2.1.2 Indirect impacts

Potential indirect impacts that may result from the active emplacement within the Stage 4 CWEA include:

- loss of habitat for prey items and hence loss of food resources leading to starvation;
- reduction in genetic diversity within the regional population due to a reduction or loss of the Appin North population, or to disrupted capacity for the species to move within and through the Stage 4 CWEA; and
- reduction in quality of the existing surrounding habitat due to noise and dust from the proposal.

## 6 Management and Mitigation

This section addresses Condition 17(d) of Schedule 4 of the Project Approval and Condition 7(a) of the EPBC Approval in relation to the Broad-headed Snake and Southern Brown Bandicoot as follows:

*17 (d) management strategies for the protection and conservation of the Broad-headed Snake and the Southern Brown Bandicoot;*

*7(a) measures to avoid, mitigate and manage impacts on the Southern Brown Bandicoot, Broad-headed Snake and their habitats occurring as result of the action*

### 6.1 Management Strategies

Clearing practices will incorporate appropriate controls to minimise mortality and injury to Broad-headed Snakes and Southern Brown Bandicoots occupying the site. These are summarised in the following sections.

#### 6.1.1 Pre-clearance surveys

Prior to the first stage of clearing, the area to be cleared will be marked using flagging and surveyed by an ecologist or suitably trained and experienced fauna catcher/spotter to locate, record and mark specific habitat features that are proposed for preservation and redistribution to the emplacement (e.g. rocks and boulders, stags and large hollows). The pre-clearing surveys (relating to Stage 3 CWEA operations) that have been undertaken to date are summarised in Table 2.

**Table 2: Summary of pre-clearing surveys undertaken in Stage 3**

Area in Ha	Purpose of Clearing <sup>7</sup>	Report Reference
6.5	Coal wash emplacement	Niche, 2011
0.4	Coal wash emplacement	Niche 2012
0.25	Slurry pond	Illawarra Coal, 2013
2	Coal wash emplacement	Illawarra Coal, 2015
2	Coal wash emplacement	Illawarra Coal, 2016
0.3	Coal wash emplacement	Illawarra Coal, 2018
2.4	Coal wash emplacement	Illawarra Coal, 2019
1	Coal wash emplacement	Illawarra Coal, 2020
2.5	Coal wash emplacement	Illawarra Coal, 2021
0.14	Coal wash emplacement / Slurry Pond drainage channel	Illawarra Coal, 2022
2.63	Coal wash emplacement	Illawarra Coal, 2023

<sup>7</sup> Table includes areas cleared for Stage 3 under the BHSMP that was developed in 2007 for the DEN EPBC Approval Condition 5. Future clearing activities in Stage 3 and Stage 4 will be undertaken in accordance with the current version of the SBMP.

In April 2016, one individual Broad-headed Snake was found in the Stage 3 CWEA during a pre-clearing survey. The individual was captured and released to another location in accordance with the BHSMP (See Figure 2 and Figure 3).

### 6.1.2 Two-stage Clearing

The primary mitigating measure for protection of Broad-headed Snakes and Southern Brown Bandicoots within the CWEA is two-stage clearing.

Where possible, (i.e. where access to trees by the excavator is safe and practical), clearing of hollow bearing trees will be performed in a two-stage process where surrounding vegetation is cleared separately, before the removal of habitat trees to allow fauna an opportunity to move.

The process is detailed in the approved CWEAMP.

### 6.1.3 Management of Captured Animals

#### 6.1.3.1 Broad-headed Snake

If a Broad-headed Snake is found during the two-stage clearing process, the animal will be relocated to pre-determined suitable habitat within the Appin North surface mining lease area (Figure 3).

Pre-determined sites for relocation will take into account the species home ranges and be evenly spaced to avoid social conflict.

Pre-determined relocation sites will necessarily consist of the following:

- occur on Hawkesbury Sandstone within the current known range of the species and provide rocky (rock on rock) outcrops with a westerly or north-westerly aspect, and horizontal crevices (Webb and Shine 1998c); and/or
- have large adjacent areas of woodland that support large stags or trees bearing numerous hollows (Webb and Shine 1997b). The adjacent woodland will ideally be larger than the area supporting rocky outcrops (Webb and Shine 1997a) and contain preferred species of 'habitat trees' (trees most often selected by Broad-headed Snakes) such as *Eucalyptus gummifera*, *E. punctata*, *E. agglomerata* and *E. piperita* (Webb and Shine 1997b).

Information collected for relocated individuals will include:

- a) Health/condition of the individual.
- b) Size.
- c) Sex.
- d) Approximate age cohort.
- e) Photos of the snake (including head shot).
- f) Location detected (including GPS coordinates) and notes on habitat type (including rock availability and vegetation), photos etc.
- g) Location of relocated site (including GPS coordinates) and notes on habitat.

Any other fauna located within the CWEA during the pre-clearing survey will also be relocated. In particular, any Velvet Geckos (and other lizards) encountered will be relocated to the same pre-determined sites for Broad-headed Snakes to provide prey for the relocated snakes.

Where possible, snakes will be translocated from the initial capture point to the nearest site considered suitable for the long-term habitation by the species, but not more than 1 km from that point (where possible) to reduce the possibility for unfavourable genetic mixing.

Snakes will be released at sites as soon as practicable after capture.

BCD will be notified within one month of any Broad-headed Snakes identified during pre-clearing surveys and relocated.

### 6.1.3.2 Southern Brown Bandicoot

In the event that an individual is found during the two-stage clearing process, the animal will be relocated to pre-determined suitable habitat within the Appin North surface mining lease area.

Sites for relocation will take into account the species home ranges and be evenly spaced to avoid social conflict. Where possible, captured bandicoots will be translocated from the initial capture point to the nearest site considered suitable for the long-term habitation by the species, but not more than 1 km from that point (where possible) to reduce the possibility for unfavourable genetic mixing.

Bandicoots will be released at sites as soon as practicable after capture.

### 6.1.4 Habitat Salvage, Translocation and Augmentation – Broad-headed Snake

Rocky outcrops, crevices, caves and overhangs provide winter habitat for the Broad-headed Snake (Goldingay and Newell 2000). Suitable winter habitat occurring within the Stages 3 and 4 of the CWEA will be identified during the pre-clearance survey.

Rehabilitation of the CWEA for the Broad-headed Snake, in terms of winter habitat, will include the following:

- Salvaged rocky outcrops and boulders will ideally be positioned with a westerly or north-westerly aspect and crevices should remain horizontal (Webb and Shine 1998c; Goldingay and Newell 2017).
- The Velvet Gecko should also be translocated (Webb and Shine 2000). Suitable habitat for this prey species is the same as for the Broad-headed Snake's winter habitat and includes loose rock on rock substrate (Shine et al. 1998, Webb and Shine 1998c, Croak et al. 2013).
- Translocated rocky features/shelter sites will ideally be evenly spaced and not clumped together to encourage a greater number of Broad-headed Snakes to the area (Webb and Shine 1997a). If shelter sites are too close together, they are likely to remain uninhabited due to home range overlap. Shelter sites will ideally be placed at least 300 m apart and close/adjacent to suitable summer habitat (translocated hollow-bearing trees/stags or limbs within rehabilitating sections of the old CWEAs (Webb and Shine 1997a)).
- Artificial rocks/concrete pavers will be added to the CWEA behind the line of clearing to increase habitat opportunities for prey items and the Broad-headed Snake if insufficient natural rock cannot be sourced from the CWEA for this purpose. Webb and Shine (2000) recommend the use of large pavers (30 – 45 cm wide and 5 – 10 cm thick), as well as a range of smaller pavers (e.g. 19 cm wide) and thicker pavers (e.g. > 30 cm thick) placed with a variety of crevice sizes (up to 10 mm). The artificial rocks will be placed in both shaded and exposed areas to

provide a range of suitable micro-climates for the snake and its prey depending on the time of year (Croak et al. 2013, Croak et al. 2008, Croak, et al. 2010).

- Hollow logs and hollow-bearing stags will also be translocated to provide additional retreat-sites for the Broad-headed Snake and its prey (Webb and Shine 1997b).

An example of artificial habitat installed in 2022 in Stage 3 of the CWEA is shown in Plate 4.



**Plate 4: Artificial Broad-headed Snake habitat installed in Stage 3 of the CWEA**

#### **6.1.5 Habitat Protection during Construction – Southern Brown Bandicoot**

In addition to the actions provided in the above sections, the following practices will be adopted during construction:

- Sediment control measures will be adopted during clearing, as outlined in the CWEAMP.
- Areas approved for clearing will be clearly demarcated using flagging tape and regularly inspected to prevent unnecessary clearing or access by construction vehicles and plant to surrounding potential habitat.
- Construction materials and spoil must not be stored, dumped or stockpiled within surrounding habitat.
- Induction of the CWEA Supervisory personnel will include information about the Southern Brown Bandicoot and its habitat within Stage 4 of the CWEA, along with protection measures that will be in place and enforced during the construction period.
- General information on threatened species (including key site contacts for threatened species) will be provided to all CWEA personnel and included in the pre-clearance survey and Permit to Disturb.

## **6.2 Summary of Impact Minimisation Strategies**

Measures to minimise impacts of the Project (Stage 3 and 4 CWEAs) on the local population of the Broad-headed Snake and Southern Brown Bandicoot are outlined in Table 3.

**Table 3: Impact minimisation measures for the protection of the Broad-headed Snake and Southern Brown Bandicoot**

Performance Objective	Performance Target	Management/Mitigation Measures	Monitoring and Reporting Methods
Protection of Broad-headed Snake and Southern Brown Bandicoot habitat outside the approved CWEA and development footprints	<ul style="list-style-type: none"> <li>No loss of Broad-headed Snake or Southern Brown Bandicoot individuals or its habitat outside the approved CWEA and development footprints</li> </ul>	<ul style="list-style-type: none"> <li>Vegetation clearing to be within approved boundaries as defined in the Project Approval and shown in Figure 1 of the CWEAMP.</li> </ul>	<ul style="list-style-type: none"> <li>Works as executed survey plans of any vegetation clearing.</li> <li>Reporting of non-conformance with the pre-clearance survey report as detailed in Section 8.</li> </ul>
Protection of Broad-headed Snake and Southern Brown Bandicoot within the approved CWEA and development footprints	<ul style="list-style-type: none"> <li>Minimise loss of Broad-headed Snake and Southern Brown Bandicoot individuals within the approved CWEA footprints due to construction and operations.</li> </ul>	<ul style="list-style-type: none"> <li>Conduct pre-clearance surveys in the Stage 3 and 4 CWEAs and subsequent two-stage clearing, to give animals the opportunity to move away.</li> <li>Individuals found will be relocated to pre-determined suitable habitat within the Appin North surface mining lease area.</li> </ul>	<ul style="list-style-type: none"> <li>Document by preparation of pre-clearing survey reports for every CWEA phase cleared including use of GIS coordinates for survey results.</li> <li>Document numbers of individuals observed, trapped and released.</li> <li>Document the number of injuries and deaths and report in Annual Review.</li> <li>Observation of animal condition.</li> <li>Record release location.</li> <li>Complete post-clearance survey report.</li> </ul>
Re-establishment of suitable SBB and BHS habitat on completed and rehabilitating CWEAs	<ul style="list-style-type: none"> <li>Establishment of suitable rocky and woodland habitat components to support Broad-headed Snake individuals within five years of commencement of rehabilitation.</li> <li>Establishment of suitable vegetation cover, habitat</li> </ul>	<ul style="list-style-type: none"> <li>Placement of hollow logs, stags with hollows and rock outcrop elements of habitat for the Broad-headed Snake in rehabilitated areas.</li> <li>Installation of artificial habitat for Broad-headed Snakes (e.g. concrete paving slabs) if</li> </ul>	<ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> <li>Reports from the annual rehabilitation monitoring program to be attached to the Appin Mine Annual Review.</li> </ul>

Performance Objective	Performance Target	Management/Mitigation Measures	Monitoring and Reporting Methods
	components and soil profiles <sup>8</sup> to support Southern Brown Bandicoot individuals within five (5) years of commencement of rehabilitation.	necessary as per Webb and Shine (2000) when suitable rocky habitat from salvage is not available or cannot be positioned acceptably. <ul style="list-style-type: none"> <li>Placement of topsoil, hollow logs and other structural elements of habitat for the Southern Brown Bandicoot in rehabilitated areas.</li> </ul>	
Reduce dust impacts on Broad-headed Snake and Southern Brown Bandicoot habitat from operations.	<ul style="list-style-type: none"> <li>Dust controls as per CWEAMP and Air Quality and Greenhouse Gas Management Plan.</li> </ul>	<ul style="list-style-type: none"> <li>Dust impacts from CWEA operations will be mitigated by the coal wash material being wet from coal washing processes, use of water carts and being compacted once emplaced.</li> <li>Active CWEA will be capped and vegetated as soon as practicable.</li> </ul>	<ul style="list-style-type: none"> <li>Annual environmental reporting of air quality results and performance of mitigation measures in the Appin Mine Annual Review.</li> </ul>
Predator control to enhance population viability of the Broad-headed Snake and Southern Brown Bandicoot.	<ul style="list-style-type: none"> <li>Maintain low numbers of vertebrate pests at Appin North.</li> </ul>	<ul style="list-style-type: none"> <li>Participation in regional vertebrate pest programs with National Parks and Wildlife Service and WaterNSW through liaison with program managers and funding (if applicable).</li> </ul>	<ul style="list-style-type: none"> <li>Reporting on success of pest control programs as applicable.</li> <li>Monitoring of vertebrate pest abundance through annual emplacement monitoring.</li> </ul>

<sup>8</sup> Soil profiles are established through the placement of topsoil over capping material that has been translocated. Within five years of rehabilitation being undertaken (pending favourable weather conditions), there will be good vegetation growth and leaf litter drop that will provide foraging habitat.

Performance Objective	Performance Target	Management/Mitigation Measures	Monitoring and Reporting Methods
		<p><i>Note: The regional research program established under the EPBC Approval (Condition 7b) will focus on population monitoring. A regional pest program will be designed once a population of Southern Brown Bandicoots has been confirmed and defined.</i></p>	
<p>Monitoring and reporting undertaken and submitted as scheduled</p>	<ul style="list-style-type: none"> <li>• Annual monitoring report submitted as required.</li> <li>• Management plan review as required.</li> </ul>	<ul style="list-style-type: none"> <li>• Reporting of project to DCCEEW and other stakeholders.</li> <li>• Adjustments made to systems and methods as a result of monitoring results or a review of procedures as required.</li> </ul>	<ul style="list-style-type: none"> <li>• Monitoring including pre-clearing surveys, capture and transfer of animals, implementation of two-stage clearing, success of habitat translocation efforts and progress in rehabilitation of emplacement sites.</li> <li>• Annual compliance report to DCCEEW.</li> </ul>

### 6.3 Monitoring

Broad-headed Snake and Southern Brown Bandicoot monitoring requirements are provided in Table 3.

Monitoring requirements will include:

- pre-clearing surveys, which includes monitoring of habitat and species presence;
- records of capture and transfer of animals (if required);
- implementation of two-stage clearing;
- success of habitat translocation efforts; and
- progress of rehabilitation in emplacement sites through the Annual Emplacement Monitoring Program.

Further detail is provided in the CWEAMP.

## 7 Provision of Regional Funding

### 7.1 Provision of Funding

This section addresses Condition 7(b) of the EPBC Approval as follows:

*(b) provisions for the contribution of no less than \$250,000 (GST exclusive) in funding towards regional Southern Brown Bandicoot and Broad-headed Snake programs. This funding must not be expended on the measures referred to in condition 7a;*

ICHPL has funded \$250,000 towards the regional management of the Southern Brown Bandicoot and Broad-headed Snake programs as outlined in this Plan and as detailed in the Offset Strategy (Appendix 7).

The project took place over three (3) years commencing July 2014 and finishing June 2017 with payments issued as follows:

- Year 1 \$85,000 July 2014.
- Year 2 \$85,000 July 2015.
- Year 3 \$80,000 July 2016.

### 7.2 Actions to be Funded

ICHPL consulted with OEH (local and threatened species unit) regarding EPBC Approval Conditions 7(b) to (e). Condition 7 (c) requires:

*(c) a description of actions to be funded and undertaken to inform and/or enhance the conservation of these species, including through survey or research, threat abatement with specific reference to predator controls and habitat restoration or rehabilitation, including public reporting or publication of information gained by these actions;*

OEH developed a Project Proposal to be funded by ICHPL, which addressed points (c) to (f) of the EPBC Approval Condition 7.

The Project Proposal, OEH Letter of endorsement and BHPBilliton letter of endorsement are provided in Appendix 7, Appendix 8 and Appendix 9 respectively.

### 7.3 Impacts on other EPBC Act Listed Species

This section addresses Condition 7(d) of the EPBC Approval for works conducted by OEH as follows:

*(d) a demonstration that management actions to be undertaken will not adversely impact EPBC Act listed species;*

The OEH Proposal addressed the above requirement (see section titled Consideration of Impacts of the Project).

### 7.4 Funding Arrangements

This section addresses Condition 7(e) of the EPBC Approval as follows:

*(e) a description of funding arrangements or agreements including work programs and responsible entities.*

OEH provided a Project Proposal for the Broad-headed Snake and Southern Brown Bandicoot recovery actions (see Appendix 7).

ICHPL provided the funding through a Non-order Invoice (NOI). OEH issued three separate invoices, prior to the start of each financial year i.e. Year 1, Year 2 and Year 3.

### 7.5 Documentary Evidence of Funding

This section addresses Condition 7(f) of the EPBC Approval as follows:

*(f) measures for the provision of documentary evidence within 30 days of the funding having been expended and/or that funding commitments have been met.*

ICHPL provided documentary evidence to the Department of the Environment and Energy (DoTE&E) in September 2016 to satisfy this condition.

The relevant results were included in the FY17 BSO Annual Review.

## 8 Reporting and Review

### 8.1 Events, Non-Compliance, Corrective Action and Preventative Action

Events, non-compliances, corrective actions and preventative actions are managed in accordance with the Reporting and Investigation Standard and Environmental Compliance/Conformance Assessment and Reporting Procedure. These procedures, which relate to all ICHPL operations, detail the processes to be utilised with respect to event and hazard reporting, investigation and corrective action identification. The key elements of the process include:

- identification of events, non-conformances and/or non-compliances;
- recording of the event, non-conformance and/or non-compliance in the event management system (G360);
- investigation/evaluation of the event, non-conformance and/or non-compliance to determine specific corrective and preventative actions;
- assigning corrective and preventative actions to responsible persons in G360; and
- review of corrective actions to ensure the status and effectiveness of the actions.

Incidents and non-compliances will be reported to all relevant agencies via the Annual Review or notified in accordance with Section 8.2.

The Emergency Response Control Plan (APNMP0005) will be activated in an emergency. The plan includes contact details and duty cards for site personnel.

The Pollution Incident Response Management Plan (PIRMP) will be activated where a pollution incident occurs that causes or threatens material harm to the environment. The PIRMP includes internal and external contact details.

Any environmental incidents are required to be notified to the site Specialist Environment.

## 8.2 Incident and Non-compliance Notifications

### 8.2.1 Notification of incidents – Government Agencies

In accordance with Condition 7 of Schedule 6 of the Project Approval, the Planning Secretary is to be notified in writing via the Major Projects website immediately after becoming aware of an incident<sup>9</sup>. In accordance with Condition 7AA, reports are to be provided in accordance with the requirements set out in Appendix 7 of the Project Approval.

### 8.2.2 Notification of Non-compliances – Government Agencies

In accordance with Condition 7A of Schedule 6 of the Project Approval, the Planning Secretary must be notified in writing via the Major Projects website within seven (7) days after becoming aware of a non-compliance<sup>10</sup>.

## 8.3 Reporting

Operational and environmental performance of Appin Mine is reported through the:

- Compliance Report; and
- Annual Review.

Reports are available on the GM<sup>3</sup> website at [link](#). The Annual Review and Compliance Report will be provided to DCCEEW.

### 8.3.1 Compliance Report

Annual reporting is undertaken as per Condition 14 of the EPBC Approval.

The Compliance Report is required to be submitted to DCCEEW by 15 August of each year via [EPBCMonitoring@dcceew.gov.au](mailto:EPBCMonitoring@dcceew.gov.au), is attached as an appendix in the Annual Review, and is published on the GM<sup>3</sup> website.

The Compliance Report is also submitted to the Resources Regulator in accordance with Schedule A of Consolidated Coal Lease 724.

### 8.3.2 Annual Review

ICHPL will report on the performance of the SBMP in the Annual Review.

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<sup>9</sup> The definition of an incident in the Project Approval is “A set of circumstances that causes or threatens to cause material harm to the environment; and/or breaches or exceeds the limits or performance measures/criteria in this approval”

<sup>10</sup> A non-compliance that has been notified as an incident does not need to also be notified as a non-compliance.

The Annual Review is prepared in accordance with Condition 4 of Schedule 6 of the Project Approval and is submitted to relevant agencies in September each year. Annual Reviews are made available to the general public via the GM<sup>3</sup> website.

#### **8.4 Review of SBMP**

In accordance with Condition 5 of Schedule 6 of the Project Approval, the SBMP will be reviewed, and if necessary revised, within three (3) months, of:

- the submission of an Annual Review;
- the submission of an incident report;
- the submission of an Independent Environmental Audit (IEA) report; and
- any modification to the conditions of the Project Approval (unless the conditions require otherwise); or
- a direction of the Planning Secretary under Condition 4 of Schedule 2.

Review of the SBMP will also be undertaken:

- following significant environment incidents;
- when there is a need to improve performance in an area of environmental impact; and
- periodically to maintain SBMP currency.

Outcomes from each review will be documented in the Management Plan Review Log (unless the SBMP is being updated as part of the review). The SBMP will only be revised where a material change to site operations or environmental management has occurred, or in accordance with the review period on the SBMP. Administrative or descriptive changes do not constitute a material change.

Where a review triggers a revision of the SBMP, the SBMP will be revised and submitted to the Secretary and/or Minister for approval. Once approved, the SBMP will be uploaded to the GM<sup>3</sup> website.

The approved SBMP will be implemented.

The Superintendent Environment is responsible for coordinating reviews of the SBMP.

#### **8.5 Publication of Documents**

Condition 13 of the EPBC Approval requires the proponent to publish all management plans, reports, strategies or agreements required by these conditions of approval on their website.

Approved versions of the SBMP will be displayed on the GM<sup>3</sup> website at [link](#).

#### **8.6 Audits**

##### **8.6.1 IEA**

In accordance with Condition 9 of Schedule 6 of the Project Approval and Condition 18 of the EPBC Approval, an IEA shall be commissioned every three (3) years, that will include a review of the SBMP. The report is required to be submitted to the Secretary within six weeks of completion of the audit, in accordance with Condition 10 of Schedule 6 of the Project Approval and Condition 18 of the EPBC Approval.

This audit must:

- a) be conducted by a suitably qualified and independent team of experts whose appointment has been endorsed by the Minister;
- b) include consultation with relevant state agencies;
- c) assess the environmental performance of the project and assess whether it is complying with the requirements in this approval (including any assessment, plan or program (however described) required under this approval);
- d) review the adequacy of strategies, plans or programs required under the abovementioned approvals; and
- e) recommend appropriate measures or actions to improve the environmental performance of the action, and/or any assessment, plan or program required under the above mentioned approvals; and
- f) audit criteria must be agreed to be the Minister;
- g) within 6 weeks of the completion of this audit, or as otherwise agreed by the Minister, the person taking the action must submit a copy of the audit report to the Minister. The audit report must address the criteria to the satisfaction of the Minister.

Note: The audit team must be led by a suitably qualified auditor and include experts in any field specified by the Minister.

IEAs have been conducted in 2013, 2016/17, 2019 and 2022, with the next IEA to be conducted in 2025. Recommendations from the IEA will be incorporated into the SBMP where appropriate.

### 8.6.2 ISO 14001

As part of the ISO 14001 certification, ICHPL maintains an environmental auditing and governance program across all of its operational sites. The program, which includes the use of competent internal and accredited external auditors, is an integral part of maintaining certification under the ISO 14001 standard.

External surveillance audits are undertaken on an annual basis, with recertification audits undertaken every three years.

Internal audits (Governance Reviews) of the SBMP are nominally undertaken on a three yearly basis.

## 9 Acronyms

Term	Definition
BCD	Biodiversity and Conservation Division of DCCEEW
BHSMP	Broad-headed Snake Management Plan
BSO	Bulli Seam Operations
CWEA	Coal Wash Emplacement Area
CWEAMP	Coal Wash Emplacement Area Management Plan
DAWE	Department of Agriculture, Water and Environment

Term	Definition
DCCEEW	Department of Climate Change, Energy, the Environment and Water
DEC	Department of Environment and Conservation
DEN	Dendrobium
Department	Department of Planning, Housing and Infrastructure, previously: <ul style="list-style-type: none"> <li>- Department of Planning and Environment (DPE)</li> <li>- Department of Planning, Industry and Environment (DPIE)</li> </ul>
DoTE(E)	Department of the Environment (and Energy)
DPIE	Department of Planning, Industry and Environment
DSEWPaC	Department of Sustainability, Environment, Water, Population and Communities
EA	Environmental Assessment
EMS	Environmental Management System
<i>EP&amp;A Act</i>	<i>Environmental Planning and Assessment Act</i>
<i>EPBC Act</i>	<i>Environment Protection and Biodiversity Conservation Act</i>
G360	Event reporting system
ICHPL	Illawarra Coal Holdings Pty Ltd
IEA	Independent Environmental Audit
KTP	Key Threatening Process
NOI	Non Order Invoice
OEH	Office of Environment and Heritage (now BCD)
PIRMP	Pollution Incident Response Management Plan
SBMP	Broad-headed Snake and Southern Brown Bandicoot Management Plan
SBBMP	Southern Brown Bandicoot Management Plan
WCCPP	West Cliff Coal Preparation Plant

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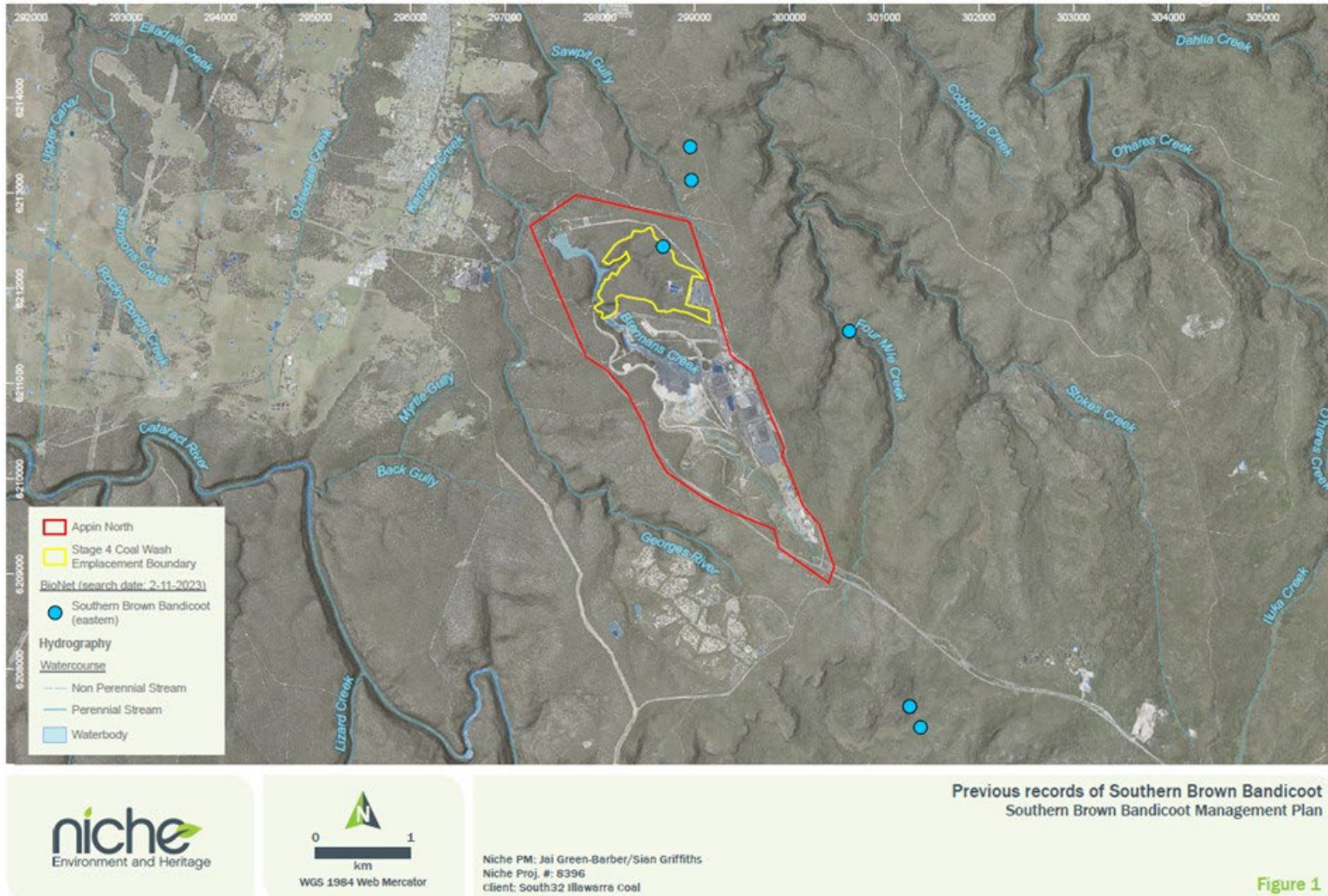
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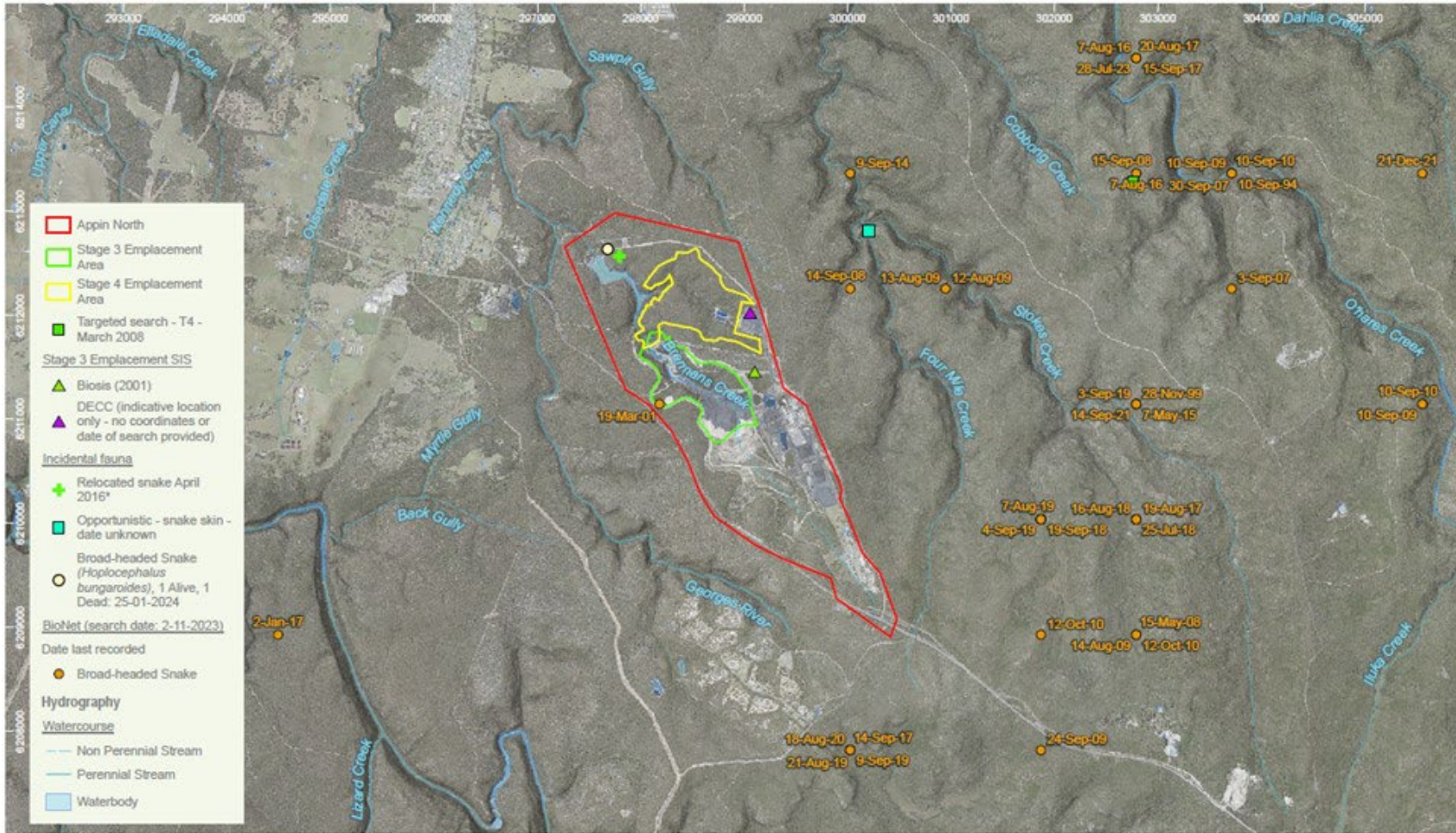
# 11 Figures

**Figure 1: Previous Records of Southern Brown Bandicoot**



Terrain: Multi-Directional Hillshade; Atlas,USGS,NGA,NASA,CGIAR,NCEAS,NLS,QS,NMA,Geodatabyresen,GGA,OS2 and the GIS User Community | Watercourses, Waterbodies, Road and Rail alignments, Protected areas of NSW © Spatial Services 2021. | Niche uses GDA2020 as standard for all project-related data. In order to ensure that data from numerous sources and coordinate systems is aligned, on-the-fly transformation to WGS 1984 Web Mercator Auxiliary Sphere is used in the map above. For ease of reference, the grid tick marks and labels shown around the border of the map are presented in GDA2020, using the relevant MGA zone.

**Figure 2: Previous Records of Broad-headed Snake**



WGS 1984 Web Mercator

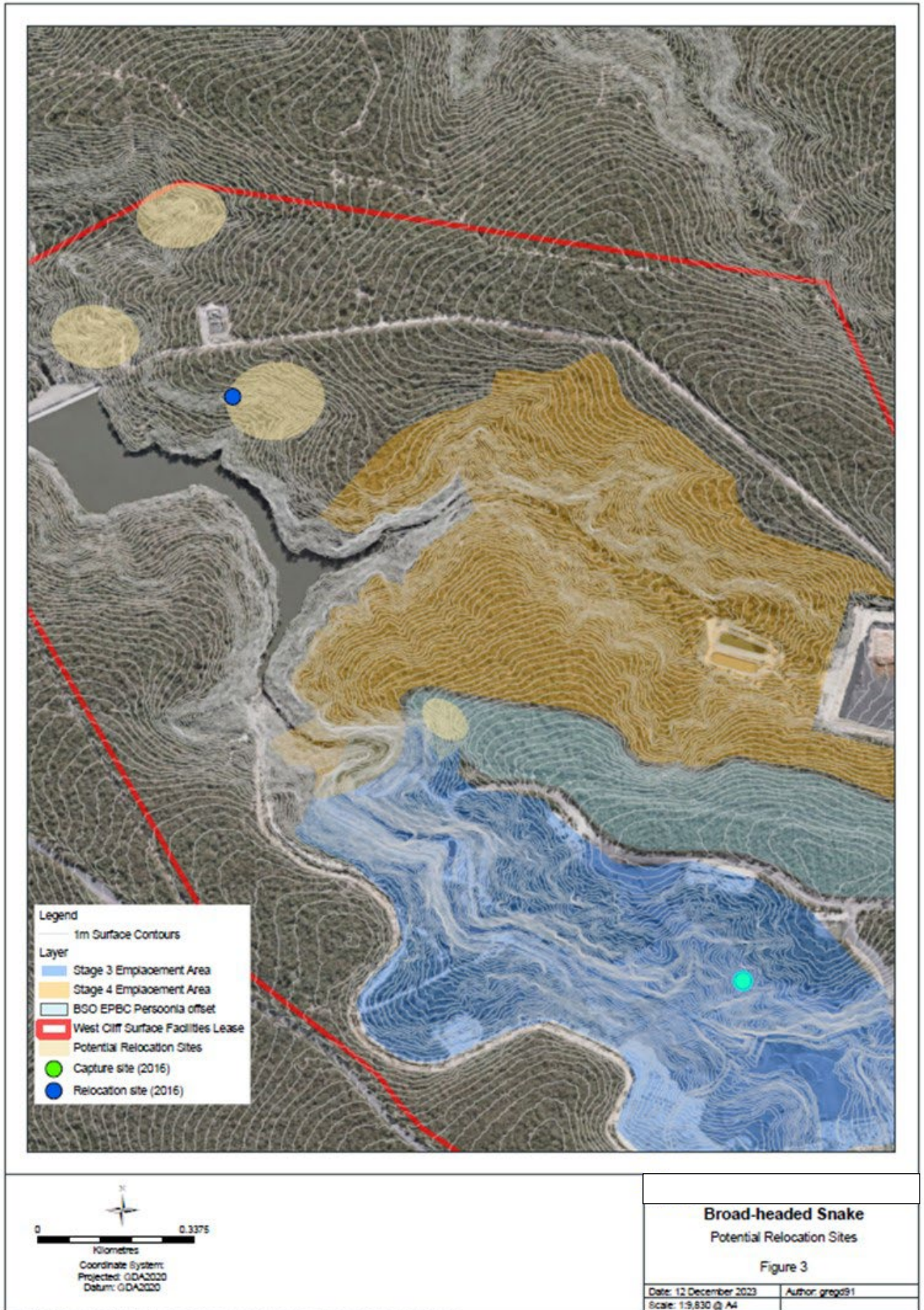
**Previous records of Broad-headed Snake**  
Broad-headed Snake Management Plan

Niche PM: Jai Green-Barber/Sian Griffiths  
Niche Proj. #: 8396  
Client: South32 Illawarra coal

Figure 2

Terrain: MUS-Directional Hillshade; Airbus, USGS, NGA, NASA, CGIA, FNCEAS, NLS, OS, NMA, Geodatabases, GSA, GSI and the GIS User Community; Watercourses, Waterbodies, Road and Rail alignments, Protected areas of NSW © Spatial Services 2021. | Niche uses GDA2020 as standard for all project-related data. In order to ensure that data from numerous sources and coordinate systems is aligned, on-the-fly transformation to WGS1984 Web Mercator Auxiliary Sphere is used in the map above. For ease of reference, the grid tick marks and labels shown around the border of the map are presented in GDA2020, using the relevant MGA zone.

**Figure 3: Broad-headed Snake Potential Relocation Sites**



## 12 Appendices

### Appendix 1: Project Approval Conditions: SBMP

Condition	Requirement	Section
Condition 17 of Schedule 4	<p>The Proponent shall prepare and implement a West Cliff Emplacement Area Management Plan for the project to the satisfaction of the Secretary. This plan must be prepared in consultation with BCD and be submitted to the Planning Secretary for approval by the end of June 2013. This plan must include:</p> <p>(d) management strategies for the protection and conservation of the Broad-headed Snake and the Southern Brown Bandicoot.</p>	See Coal Wash Emplacement Area Management Plan

### Appendix 2: EPBC Approval 2010/5350 Conditions: SBMP

Condition	Requirement	Section
Condition 7	Within 1 year of the date of this approval the person taking the action must provide for the Minister's approval a Southern Brown Bandicoot and Broad-headed Snake management plan or plans. The plan or plans must include:	This document and previous versions
	(a) measures to avoid, mitigate and manage impacts on the Southern Brown Bandicoot, Broad-headed Snake and their habitats occurring as result of the action;	Section 6
	(b) provisions for the contribution of no less than \$250,000 (GST exclusive) in funding towards regional Southern Brown Bandicoot and Broad-headed Snake programs. This funding must not be expended on the measures referred to in condition 6a;	Section 7.1
	(c) a description of actions to be funded and undertaken to inform and/or enhance the conservation of these species, including through survey or research, threat abatement with specific reference to predator controls and habitat restoration or rehabilitation, including public reporting or publication of information gained by these actions;	Section 7.2
	(d) a demonstration that management actions to be undertaken will not adversely impact EPBC Act listed species;	Section 7.3
	(e) a description of funding arrangements or agreements including work programs and responsible entities; and	Section 7.4
	(f) measures for the provision of documentary evidence within 30 days of the funding having been expended and/or that funding commitments have been met.	Section 7.5
Condition 13	Unless otherwise agreed to or instructed in writing by the Minister, the person taking the action must publish all management plans, reports, strategies or agreements required by these conditions of approval on	Section 8.3

	their website. Each management plan, report strategy or agreement must be published on the website within 30 days of being approved.	
Condition 14	Within three months of every 12 month anniversary of the commencement of the action, the person taking the action must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of any management plans as specified in the conditions. Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the department at the same time as the compliance report is published.	Section 8.1
Condition 18	<p>By the end of 31 December 2013 and every three years thereafter, unless the Minister directs otherwise, the person taking the action must commission and pay the full cost of an independent environmental audit of project. This audit must:</p> <ul style="list-style-type: none"> <li>be conducted by a suitably qualified and independent team of experts whose appointment has been endorsed by the Minister;</li> <li>include consultation with relevant state agencies;</li> <li>assess the environmental performance of the project and assess whether it is complying with the requirements in this approval (including any assessment, plan or program (however described) required under this approval);</li> <li>review the adequacy of strategies, plans or programs required under the abovementioned approvals; and</li> <li>recommend appropriate measures or actions to improve the environmental performance of the action, and/or any assessment, plan or program required under the above mentioned approvals; and</li> </ul> <p>audit criteria must be agreed to be the Minister;</p> <p>within 6 weeks of the completion of this audit, or as otherwise agreed by the Minister, the person taking the action must submit a copy of the audit report to the Minister. The audit report must address the criteria to the satisfaction of the Minister.</p> <p>Note: The audit team must be led by a suitably qualified auditor and include experts in any field specified by the Minister.</p>	Section 8.4.1

### Appendix 3: EPBC Approval (2001/214) Conditions: SBMP

Condition	Requirement	Section
Condition 5	S32 Illawarra Coal must submit for the Minister's approval a plan for managing the impacts of the action on the Broad-headed Snake <i>Hoplocephalus bungaroides</i> . The plan must be implemented. No vegetation may be cleared as part of West Cliff Coal Emplacement Stage 3 until the plan has been approved by the Minister.	Previously submitted BHSMP

### Appendix 4: Risk Assessment - Broad-headed Snake

Risk Description	Likelihood	Consequence	Risk	Measures and commitments to minimise risk	Performance objectives and monitoring programs	Trigger values for additional action, review and reporting
Death and/or injury of Broad-headed Snakes due to the disturbance and removal of known and potential habitat for this species	Unlikely	Moderate	Low	<ul style="list-style-type: none"> <li>Vegetation clearing to be within approved boundaries as defined in the Project Approval.</li> <li>Conduct pre-clearance surveys in the Stage 3 and 4 CWEAs and subsequent two-stage clearing, to give animals the opportunity to move away.</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>No deaths and/or injury to Broad-headed snakes due to disturbance and removal of known and potential habitat.</li> </ul> <p><b>Monitoring Program</b></p> <ul style="list-style-type: none"> <li>Post clearance survey report.</li> </ul>	Deaths and/or injury to Broad-headed snakes due to disturbance and removal of known and potential habitat.
Direct loss of habitat such as hollow-bearing trees, hollow logs and exposed sandstone rocky outcrops	Likely	Moderate	Medium	<ul style="list-style-type: none"> <li>Habitat translocated from areas cleared to rehabilitation areas.</li> <li>Placement of hollow logs, stags with hollows and rock outcrop elements of habitat for the Broad-headed Snake in rehabilitated areas.</li> <li>Installation of artificial habitat for Broad-headed Snakes (e.g. concrete paving slabs) if necessary when suitable rocky habitat from salvage is not available or cannot be positioned acceptably.</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>Establishment of suitable rocky and woodland habitat components to support Broad-headed Snake individuals within five years of commencement of rehabilitation.</li> </ul> <p><b>Monitoring Program</b></p> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> <li>Post clearance survey report.</li> </ul>	Suitable rocky and woodland habitat components have not been established to support Broad-headed Snake individuals within five years of commencement of rehabilitation.

Risk Description	Likelihood	Consequence	Risk	Measures and commitments to minimise risk	Performance objectives and monitoring programs	Trigger values for additional action, review and reporting
Increased predation due to loss of sheltering habitat	Possible	Moderate	Medium	<ul style="list-style-type: none"> <li>Vegetation clearing to be within approved boundaries as defined in the Project Approval.</li> <li>Conduct pre-clearance surveys in the Stage 3 and 4 CWEAs and subsequent two-stage clearing, to give animals the opportunity to move away.</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>Establishment of suitable rocky and woodland habitat components to support Broad-headed Snake individuals within five years of commencement of rehabilitation.</li> <li>Maintain low numbers of vertebrate pests at Appin North.</li> </ul> <p><b>Monitoring Program</b></p> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> <li>Post clearance survey report.</li> <li>Reporting on success of pest control programs as applicable.</li> <li>Monitoring of vertebrate pest abundance through annual emplacement monitoring.</li> </ul>	<p>Suitable rocky and woodland habitat components have not been established to support Broad-headed Snake individuals within five years of commencement of rehabilitation.</p> <p>Statistically significant Increase in vertebrate pest abundance.</p>
Relocation of individuals during habitat translocation	Possible	Minor	Low	<ul style="list-style-type: none"> <li>Checks of habitat prior to translocation.</li> <li>Individuals found will be relocated to pre-determined suitable habitat within the Appin</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>No deaths and/or injury to Broad-headed Snakes during habitat translocation.</li> </ul>	<p>Deaths and/or injury to Broad-headed Snakes during habitat translocation.</p>

Risk Description	Likelihood	Consequence	Risk	Measures and commitments to minimise risk	Performance objectives and monitoring programs	Trigger values for additional action, review and reporting
				North surface mining lease area.	<b>Monitoring Program</b> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> <li>Post clearance survey report.</li> </ul>	
Direct road-kill mortality by construction vehicles	Possible	Moderate	Medium	<ul style="list-style-type: none"> <li>Reduced vehicle movements at night</li> </ul>	<b>Performance Objective</b> <ul style="list-style-type: none"> <li>No deaths and/or injury to Broad-headed Snakes due to vehicles.</li> </ul> <b>Monitoring Program</b> <ul style="list-style-type: none"> <li>Incident reporting</li> </ul>	Deaths and/or injury to Broad-headed Snakes recorded as a result of vehicle movements.
Creation of artificial barriers to movement	Possible	Moderate	Medium	<ul style="list-style-type: none"> <li>Corridors to be maintained between vegetated areas to enable movement of snakes between habitat areas.</li> </ul>	<b>Performance Objective</b> <ul style="list-style-type: none"> <li>Establishment of suitable rocky and woodland habitat components to support Broad-headed Snake individuals within five years of commencement of rehabilitation.</li> </ul> <b>Monitoring Program</b> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> </ul>	Suitable rocky and woodland habitat components have not been established to support Broad-headed Snake individuals within five years of commencement of rehabilitation.
Loss of prey habitat and hence prey availability leading to starvation and reduced recruitment	Rare	High	Low	<ul style="list-style-type: none"> <li>Habitat translocated from areas cleared to rehabilitation areas.</li> <li>Placement of hollow logs, stags with hollows and</li> </ul>	<b>Performance Objective</b> <ul style="list-style-type: none"> <li>Establishment of suitable rocky and woodland habitat components to support Broad-headed</li> </ul>	Suitable rocky and woodland habitat components have not been established to support Broad-headed

Risk Description	Likelihood	Consequence	Risk	Measures and commitments to minimise risk	Performance objectives and monitoring programs	Trigger values for additional action, review and reporting
				rock outcrop elements of habitat for the Broad-headed Snake prey in rehabilitated areas. <ul style="list-style-type: none"> <li>Installation of artificial habitat for Broad-headed Snake prey (e.g. concrete paving slabs) if necessary when suitable rocky habitat from salvage is not available or cannot be positioned acceptably.</li> </ul>	Snake individuals within five years of commencement of rehabilitation.  <b>Monitoring Program</b> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> </ul>	Snake individuals within five years of commencement of rehabilitation.
Reduction in genetic diversity within the regional population due to a reduction or loss of the Appin North population, or to disrupted capacity for the species to move within and through Stages 3 and 4 of the CWEA	Rare	Moderate	Low	<ul style="list-style-type: none"> <li>Corridors to be maintained between vegetated areas to enable movement of snakes between habitat areas.</li> </ul>	<b>Performance Objective</b> <ul style="list-style-type: none"> <li>Establishment of suitable rocky and woodland habitat components to support Broad-headed Snake individuals within five years of commencement of rehabilitation.</li> </ul> <b>Monitoring Program</b> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> </ul>	Suitable rocky and woodland habitat components have not been established to support Broad-headed Snake individuals within five years of commencement of rehabilitation.
Reduction in quality of surrounding habitat due to noise, vibration and dust from Appin Mine operational activities	Likely	Moderate	Medium	<ul style="list-style-type: none"> <li>Corridors to be maintained between vegetated areas to enable movement of snakes between habitat areas.</li> <li>Dust impacts from CWEA operations will be</li> </ul>	<b>Performance Objective</b> <ul style="list-style-type: none"> <li>Operational activities to be undertaken in approved areas.</li> <li>Dust mitigation measures to be implemented.</li> </ul>	Operational impacts observed in habitat surrounding the CWEA.

Risk Description	Likelihood	Consequence	Risk	Measures and commitments to minimise risk	Performance objectives and monitoring programs	Trigger values for additional action, review and reporting
				mitigated by the coal wash material being wet from coal washing processes, use of water carts and being compacted once emplaced. <ul style="list-style-type: none"> <li>• Active CWEA will be capped and vegetated as soon as practicable.</li> </ul>	<b>Monitoring Program</b> <ul style="list-style-type: none"> <li>• Site inspections.</li> </ul>	

### Appendix 5: Risk Assessment - Southern Brown Bandicoot

Risk Description	Likelihood	Consequence	Risk	Measures and commitments to minimise risk	Performance objectives and monitoring programs	Trigger values for additional action, review and reporting
Death and/or injury of Southern Brown Bandicoots due to the removal of known and potential habitat for this species	Unlikely	Moderate	Low	<ul style="list-style-type: none"> <li>Vegetation clearing to be within approved boundaries as defined in the Project Approval.</li> <li>Conduct pre-clearance surveys in the Stage 3 and 4 CWEAs and subsequent two-stage clearing, to give animals the opportunity to move away.</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>No deaths and/or injury to Southern Brown Bandicoots due to disturbance and removal of known and potential habitat.</li> </ul> <p><b>Monitoring Program</b></p> <ul style="list-style-type: none"> <li>Post clearance survey report.</li> </ul>	Deaths and/or injury to Southern Brown Bandicoots due to disturbance and removal of known and potential habitat.
Direct loss of habitat	Likely	Minor	Low	<ul style="list-style-type: none"> <li>Placement of topsoil, hollow logs and other structural elements of habitat for the Southern Brown Bandicoot in rehabilitated areas.</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>Establishment of suitable vegetation cover, habitat components and soil profiles to support Southern Brown Bandicoot individuals within five years of commencement of rehabilitation.</li> </ul> <p><b>Monitoring Program</b></p> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> <li>Post clearance survey report.</li> </ul>	Suitable vegetation cover, habitat components and soil profiles to support Southern Brown Bandicoot individuals have not been established within five years of commencement of rehabilitation.
Increased susceptibility to predation by introduced carnivores	Rare	Minor	Low	<ul style="list-style-type: none"> <li>Placement of topsoil, hollow logs and other structural elements of habitat for the Southern</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>Establishment of suitable vegetation cover, habitat components and soil</li> </ul>	Suitable vegetation cover, habitat components and soil profiles to support Southern Brown Bandicoot

due to loss or degradation of habitat				Brown Bandicoot in rehabilitated areas.	<p>profiles to support Southern Brown Bandicoot individuals within five years of commencement of rehabilitation.</p> <ul style="list-style-type: none"> <li>Maintain low numbers of vertebrate pests at Appin North.</li> </ul> <p><b>Monitoring Program</b></p> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> <li>Post clearance survey report.</li> <li>Reporting on success of pest control programs as applicable.</li> <li>Monitoring of vertebrate pest abundance through annual emplacement monitoring.</li> </ul>	<p>individuals have not been established within five years of commencement of rehabilitation.</p> <p>Statistically significant Increase in vertebrate pest abundance.</p>
Loss or injury to individuals during clearing, capture and/or translocation	Possible	Moderate	Medium	<ul style="list-style-type: none"> <li>Translocation to be undertaken by trained personnel.</li> <li>Individuals found will be relocated to pre-determined suitable habitat within the Appin North surface mining lease area.</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>No deaths and/or injury to Southern Brown Bandicoot during translocation.</li> </ul> <p><b>Monitoring Program</b></p> <ul style="list-style-type: none"> <li>Post clearance survey report.</li> </ul>	Deaths and/or injury to Southern Brown Bandicoots during translocation.
Creation of artificial barriers to movement	Possible	Moderate	Medium	<ul style="list-style-type: none"> <li>Corridors to be maintained between vegetated areas to enable movement of Southern Brown Bandicoot between habitat areas.</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>Establishment of suitable rocky and woodland habitat components to support Broad-headed Snake individuals within five years</li> </ul>	Suitable rocky and woodland habitat components have not been established to support Broad-headed Snake individuals within

					of commencement of rehabilitation.  <b>Monitoring Program</b> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> </ul>	five years of commencement of rehabilitation.
Loss of habitat for prey items and hence loss of food resources leading to starvation	Rare	High	Low	<ul style="list-style-type: none"> <li>Placement of topsoil, hollow logs and other structural elements of habitat for the Southern Brown Bandicoot in rehabilitated areas.</li> </ul>	<b>Performance Objective</b> <ul style="list-style-type: none"> <li>Establishment of suitable vegetation cover, habitat components and soil profiles to support Southern Brown Bandicoot individuals within five years of commencement of rehabilitation.</li> </ul> <b>Monitoring Program</b> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> <li>Post clearance survey report.</li> </ul>	Suitable vegetation cover, habitat components and soil profiles to support Southern Brown Bandicoot individuals have not been established within five years of commencement of rehabilitation.
Reduction in genetic diversity within the regional population due to a reduction or loss of the Appin North population, or to disrupted capacity for the species to move within and through the Stage 4 CWEA	Rare	Moderate	Low	<ul style="list-style-type: none"> <li>Corridors to be maintained between vegetated areas to enable movement of Southern Brown Bandicoot between habitat areas.</li> </ul>	<b>Performance Objective</b> <ul style="list-style-type: none"> <li>Establishment of suitable rocky and woodland habitat components to support Broad-headed Snake individuals within five years of commencement of rehabilitation.</li> </ul> <b>Monitoring Program</b> <ul style="list-style-type: none"> <li>Annual CWEA Rehabilitation Inspection program undertaken.</li> </ul>	Suitable rocky and woodland habitat components have not been established to support Broad-headed Snake individuals within five years of commencement of rehabilitation.

<p>Reduction in quality of the existing surrounding habitat due to noise and dust from the proposal</p>	<p>Likely</p>	<p>Moderate</p>	<p>Medium</p>	<ul style="list-style-type: none"> <li>• Corridors to be maintained between vegetated areas to enable movement of snakes between habitat areas.</li> <li>• Dust impacts from CWEA operations will be mitigated by the coal wash material being wet from coal washing processes, use of water carts and being compacted once emplaced.</li> <li>• Active CWEA will be capped and vegetated as soon as practicable.</li> </ul>	<p><b>Performance Objective</b></p> <ul style="list-style-type: none"> <li>• Operational activities to be undertaken in approved areas.</li> <li>• Dust mitigation measures to be implemented.</li> </ul> <p><b>Monitoring Program</b></p> <ul style="list-style-type: none"> <li>• Site inspections.</li> </ul>	<p>Operational impacts observed in habitat surrounding the CWEA.</p>
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## Appendix 6: Version History – SBBMP and BHSMP

This Appendix has been included to provide the history of the Broad-headed Snake and Southern Brown Bandicoot Management Plans prior to amalgamation in 2020.

### SBBMP

Version	Description of changes	Date
1.0	New plan developed for EPBC Act and EP&A Act approvals (developed by Niche Environment and Heritage)	2013
2.0	Incorporate comments from OEH and DSEWPaC (developed by David Gregory (ICHPL) and Niche Environment and Heritage) Approved: DotE - 28 May 2014	2014
3.0	Updated to reflect South32 name and branding. Updates to management & mitigation measures to remove duplication with the Coal Wash Emplacement Area Management Plan. Updated section on Management of Captured bandicoots to preference being relocation. Updated section on Provision of Regional Funding - funding has been expended. (Developed by David Gregory (ICHPL)) Approved: DotEE - 29 November 2017	2017

### BHSMP

Version	Description of changes	Date
1.0	Original Plan for Dendrobium EPBC Approval (2001/214), Condition 5 (developed by Biosis Pty Ltd)	2007
2.0 and 3.0	Plan updated to reflect Bulli Seam Operations EPBC 2010/5350 requirements (developed by David Gregory (ICHPL) and Niche Environment & Heritage) Approved: DotE – 28 May 2014	2013 and 2014
4.0	Updated to reflect South32 name and branding. Updates to management & mitigation measures to remove duplication with the Coal Wash Emplacement Area Management Plan. Updated section on Management of Captured Broad-headed Snakes to preference being relocation. Updated section on Provision of Regional Funding - funding has been expended.  (Developed by David Gregory (ICHPL)) Approved: DotEE – 17 January 2019	2017

## Appendix 7: Broad-headed Snake and Southern Brown Bandicoot Offset Strategy

### Broad-headed snake and southern brown bandicoot Offset Strategy Office of Environment and Heritage Project Summary Version 3 – April 2014

Project Initiation and Planning	
Project Name	Bulli Seam Operations broad-headed snake and southern brown bandicoot Offset Strategy, Woronora Plateau.
Project Context	<p>BHP Billiton Illawarra Coal (BHPB) was granted approval for their Bulli Seam Operations Project by the Federal Government (EPBC 2010/5350) on 15 May 2012. The EPBC Approval, in accordance with condition 7, requires that Illawarra Coal provide a Southern Brown Bandicoot &amp; Broad Headed Snake Management Plan for approval by the Federal Minister for the Environment.</p> <p>The Office of Environment and Heritage (OEH) has been approached by BHPB to develop and implement a project proposal to be funded by BHPB, that addresses points (c ) to (f) of this condition as outlined below. This project proposal aims to address this request.</p> <p><i>7. Within 1 year of the date of this approval the person taking the action must provide for the Minister's approval a Southern Brown Bandicoot and Broad Headed Snake conservation management plan or plans. The plan or plans must include:</i></p> <ul style="list-style-type: none"> <li><i>a) measures to avoid, mitigate and manage impacts on the Southern Brown Bandicoot, Broad Headed Snake and their habitats occurring as a result of the action</i></li> <li><i>b) provisions for the contribution of no less than \$250 000 (GST exclusive) in funding towards regional Southern Brown Bandicoot and Broad Headed Snake programs. This funding must not be expended on the measures referred to in Condition 7a</i></li> <li><i>c) a description of actions to be funded and undertaken to inform and/or enhance the conservation of these species, including through survey or research, threat abatement with specific reference to predator controls and habitat restoration or rehabilitation, including public reporting or publication of information gained by these actions</i></li> <li><i>d) a demonstration that management actions to be undertaken will not adversely impact EPBC ACT listed species</i></li> <li><i>e) a description of funding arrangements or agreements including work programs and responsible entities, and</i></li> <li><i>f) measures for the provision of documentary evidence within 30 days of the funding having been expended and/or that funding commitments have been met.</i></li> </ul> <p><i>The approved plan or plans must be implemented within 2 years of the date of this approval. The clearing of native vegetation for the stage 4 coal wash emplacement cannot occur until the approved plan or plans have been implemented.</i></p>
Project Manager	Meagan Hinds, Senior Threatened Species Officer Ecosystems and Threatened Species, Greater Sydney Office of Environment and Heritage P: (02) 9585 6842 E: <a href="mailto:meagan.hinds@environment.nsw.gov.au">meagan.hinds@environment.nsw.gov.au</a>
Project Sponsor	Lou Ewins, Manager Ecosystems and Threatened Species, Greater Sydney Office of Environment and Heritage P: (02) 9585 6802 E: <a href="mailto:lou.ewins@environment.nsw.gov.au">lou.ewins@environment.nsw.gov.au</a>

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<p><b>Stakeholders</b></p>	<p><b>BHP Billiton Illawarra Coal (BHPB)</b>                  Joanna Page, Manager Environment                  P: (02) 4286 3322 E: <a href="mailto:joanne.page@bhpbilliton.com">joanne.page@bhpbilliton.com</a>                  David Gregory, Specialist Land and Biodiversity                  P: (02) 4286 3323 E: <a href="mailto:David.Gregory@bhpbilliton.com">David.Gregory@bhpbilliton.com</a>    <b>Commonwealth Department of Environment (DoE)</b>                  Manel Samarakoon, Approvals Monitoring, Compliance and Enforcement Branch                  P: (02) 6274-1080 E: <a href="mailto:manel.samarakoon@environment.gov.au">manel.samarakoon@environment.gov.au</a></p>
<p><b>Project Team</b></p>	<p><b>Ecosystems and Threatened Species, Metro</b>                  Meagan Hinds, Senior Threatened Species Officer                  Debbie Andrew, Natural Heritage Officer    <b>Ecosystems Management Science</b>                  Ben Hope, Project Officer, Conservation Implementation</p>
<p><b>Project partners / Expert input</b></p>	<p><b>OEH</b>                  James Dawson/Kylie Madden/Lachlan Wilmott/Elizabeth Magarey, Ecosystems &amp; Threatened Species, Illawarra Parks and Wildlife Division                  Tony Horwood, Area Manager, Illawarra                  Phil Craven, Project Officer, South Coast Region                  Andrew Claridge, Research Scientist, Planning &amp; Assessment (SBB expert)    <b>Sydney Catchment Authority</b>                  Kelvin Lambkin, Senior Catchment Officer    <b>BHS habitat restoration experts</b>                  Ben Croak, University of Sydney                  Ross Goldingay, Southern Cross University    <b>Contractors</b>                  To be determined via formal contractor tender selection process.</p>
<p><b>Project Objectives</b></p>	<ol style="list-style-type: none"> <li>1. Improve our understanding of the distribution and habitat usage of the southern brown bandicoot across the Woronora Plateau via the implementation of a systematic survey program.</li> <li>2. Asses the risk of fox predation on any identified southern brown bandicoot population.</li> <li>3. Improve our understanding of the distribution and threats acting on the broad-headed snake across the Woronora Plateau to address existing knowledge gaps via the implementation of a targeted survey and threat assessment program.</li> <li>4. Reduce the impact of threats operating on the broad-headed snake and its habitat at priority locations across the Woronora Plateau via the implementation of site protection and habitat restoration program.</li> </ol> <p>Note it is beyond the scope of this project to incorporate threat management actions, particularly predator control, for the southern brown bandicoot. See project scope for further explanation.</p>
<p><b>Project Tasks</b></p>	<ol style="list-style-type: none"> <li>1. Undertake a formal tender selection process to select contractor(s) to undertake identified tasks requiring expert skills and knowledge (eg. BHS survey &amp; habitat assessment, image review, camera deployment)</li> <li>2. Develop and implement a systematic survey program for the SBB across the Woronora plateau using IR remote cameras and predator scat collection while also incorporating an assessment of habitat and fox predation across the study area.</li> <li>3. If SBB population is confirmed, develop recommendations for priority site management and threat abatement actions including</li> </ol>

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	<p>population monitoring and predator control.</p> <ol style="list-style-type: none"> <li>4. Develop and implement a targeted BHS survey program across the Woronora Plateau addressing distribution knowledge gaps.</li> <li>5. Conduct an assessment of threats operating at known BHS sites and identify priority locations for site protection and habitat restoration.</li> <li>6. Develop and implement a targeted BHS threat management program that addresses habitat protection, management and restoration actions at identified priority locations.</li> <li>7. Prepare and distribute annual and final project implementation reports to project stakeholders.</li> </ol> <p>A brief description of the methods to undertake these tasks is outlined in Attachment 1.</p>																												
<b>Cost/budget</b>	<p>As outlined in the context above this project will be implemented using external funds provided by BHP Billiton as part of condition 7 of the EPBC Act Approval for no less than \$250,000.</p> <p>It is anticipated that funds will be split across the three tasks as outlined in the indicative budget below.</p> <table style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2"><b>Southern Brown Bandicoot (survey)</b></td> </tr> <tr> <td>Contract expertise</td> <td style="text-align: right;">\$ 90,000</td> </tr> <tr> <td>Cameras</td> <td style="text-align: right;">\$ 18,000</td> </tr> <tr> <td>Field consumables/running costs</td> <td style="text-align: right;">\$ 12,000</td> </tr> <tr> <td><b>Sub Total</b></td> <td style="text-align: right;"><b>\$120,000</b></td> </tr> <tr> <td colspan="2"><b>Broad-headed Snake (survey &amp; monitoring)</b></td> </tr> <tr> <td>Contract expertise</td> <td style="text-align: right;">\$ 60,000</td> </tr> <tr> <td>Consumables/running costs</td> <td style="text-align: right;">\$ 5,000</td> </tr> <tr> <td><b>Sub total</b></td> <td style="text-align: right;"><b>\$ 65,000</b></td> </tr> <tr> <td colspan="2"><b>Broad-headed Snake (site protection &amp; restoration)</b></td> </tr> <tr> <td>Materials</td> <td style="text-align: right;">\$ 44,000</td> </tr> <tr> <td>Contract labour/expertise</td> <td style="text-align: right;">\$ 21,000</td> </tr> <tr> <td><b>Sub total</b></td> <td style="text-align: right;"><b>\$ 65,000</b></td> </tr> <tr> <td><b>Grand total</b></td> <td style="text-align: right;"><b>\$250,000</b></td> </tr> </table> <p>The project will also include considerable in-kind contributions from the OEH project team and partners who are responsible for the project development and implementation.</p>	<b>Southern Brown Bandicoot (survey)</b>		Contract expertise	\$ 90,000	Cameras	\$ 18,000	Field consumables/running costs	\$ 12,000	<b>Sub Total</b>	<b>\$120,000</b>	<b>Broad-headed Snake (survey &amp; monitoring)</b>		Contract expertise	\$ 60,000	Consumables/running costs	\$ 5,000	<b>Sub total</b>	<b>\$ 65,000</b>	<b>Broad-headed Snake (site protection &amp; restoration)</b>		Materials	\$ 44,000	Contract labour/expertise	\$ 21,000	<b>Sub total</b>	<b>\$ 65,000</b>	<b>Grand total</b>	<b>\$250,000</b>
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<b>Grand total</b>	<b>\$250,000</b>																												
	<p>It is proposed that the project be scheduled over three years commencing July 2014 and finishing June 2017 with payments scheduled as follows:</p> <p>Year 1 \$85,000 July 2014                  Year 2 \$85,000 July 2015                  Year 3 \$80,000 July 2016</p> <p>All figures above are exclusive of GST.</p>																												
<b>Scope</b>	<p>The study area is generally referred to as the Woronora Plateau, which covers approximately 134,000ha and comprises the following areas:</p> <ul style="list-style-type: none"> <li>• Dharawal National Park, (6674ha)</li> <li>• Upper Nepean State Conservation Area, (25,086ha)</li> <li>• Woronora Plateau Special Area, (2768ha)</li> <li>• Metropolitan Special Area, (87, 087ha) and</li> <li>• O'Hares Special Area (7400ha)</li> </ul> <p>See Figure 1 in Attachment 1</p> <p>The project has been developed to address approval condition 7 (as noted above). It is consistent with priority actions identified by the OEH Saving our Species Program as it improves our understanding and management of two state and commonwealth listed threatened species the southern brown bandicoot and the broad-headed snake across the</p>																												

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	<p>Woronora Plateau.</p> <p>The project does not include predator control actions for the BHS as this is not an identified threat to this species.</p> <p>The project does not include predator control actions for the SBB as until a population for this species can be identified within the study area it is not appropriate to commit to the implementation of such actions. However, should a population be found, recommendations will be developed in accordance with the OEH SBB recovery program and the Fox Threat Abatement Plan. It is anticipated that the entire funds committed to the SBB will be required to address the primary objective for this species (Objective 1).</p> <p>The project is not intended to fund the implementation of priority actions for these species outside of the study area. However, it is possible that options for BHS site protection and habitat restoration within the study area may be exhausted prior to expenditure of funds allocated to this task. If this occurs OEH will consult with the Commonwealth Department of Environment and BHPB to reallocate this money to other BHS priority sites identified within Morton and/or Royal National Parks.</p>
<b>Outcomes</b>	
<b>Project inputs</b>	<ol style="list-style-type: none"> <li>1. Existing knowledge and data on species distribution, habitat requirements, survey and habitat restoration techniques.</li> <li>2. Existing project priorities for survey, threat assessment, site protection and habitat restoration in accordance with established BHS and SBB recovery programs.</li> <li>3. Expertise from project team, partners, experts and contractors as required.</li> </ol>
<b>Project outputs/reporting</b>	<ol style="list-style-type: none"> <li>1. Annual works schedule outlining proposed works for the year ahead prepared on: project commencement July 2014; year 2 commencement July 2015 and year 3 commencement July 2016.</li> <li>2. Expert Contractor(s) selected via formal contractor selection process.</li> <li>3. Annual 2014/15 and 2015/16 progress reports outlining project progress and implementation, delivered by July 2015 and July 2016.</li> <li>4. Updated distribution map of the SBB and BHS across the study area.</li> <li>5. Improved understanding of habitat requirements and threats acting across the study area on the BHS and SBB.</li> <li>6. Identification of priority areas across the study area for threat management action for the BHS.</li> <li>7. Description and map of BHS site protection and habitat restoration works implemented at priority areas across the study area.</li> <li>8. Final report outlining project objectives, methods, outcomes and recommendations for future work.</li> </ol>
<b>Project risks</b>	<ol style="list-style-type: none"> <li>1. Feasibility of project implementation given extensive study and limited funding for project implementation                      Response: Additional consultation has been undertaken with project team and experts to discuss project scope and feasibility in January and February 2014 and methods have been revised as per Attachment 1 and the study area has remain unchanged.</li> <li>2. Delays due to weather &amp; fire which can limit access to study area, especially water catchment lands                      Response: The project has been scheduled over three years to allow flexibility in scheduling fieldwork and incorporate allowances for delays. In addition a detailed yearly works schedule will be developed and updated regularly to ensure timeframes, performance measures and</li> </ol>

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	<p>outputs are met.</p> <p>3. Scope creep, and expectations of BHP, Commonwealth &amp; other interested parties                  Response: This risk will be managed by the development of a project plan and yearly works schedule that has clear identification objectives and scope to be agreed by all interested parties including the Federal Government and BHPB. The project will also incorporate regular communication and reporting strategy to ensure interested parties are kept up-to-date.</p> <p>4. Ability of systematic survey methods to detect SBB across the large study area.                  Response: The draft survey method was developed in consultation with species experts in NSW and the review of similar studies conducted elsewhere in Australia and will continue to be refined during the implementation of the project. It is important to note that the lack of detection of the target species (or a nil result) is not necessarily a reflection of an inadequate survey. Outcomes from the review of the draft have been incorporated into the project methodology.</p> <p>5. Long-term security of BHS site protection and restoration measures (eg vandalism ) and illegal collection of BHS                  Response: An assessment will be made to maximise the distance of habitat restoration areas from access routes while also still allowing easy access to bring in artificial bushrock. Natural rocks will be used where possible and restoration sites will not be made public. The study area was chosen given its already restricted access arrangements, particularly to the catchment lands which covers over 75% of the study area. The project will also investigate opportunities to incorporate targeted education awareness campaign within the community stakeholders with the aim of reducing impacts from habitat disturbance and illegal collection.</p>
<b>Timeframe</b>	The project will be implemented over three years commencing July 2014 and completed by June 2017.
<b>Roles and Responsibilities</b>	<p>Office of Environment and Heritage:</p> <ul style="list-style-type: none"> <li>• Development of draft and final project proposal to BHPB with cc copy to DoE for endorsement</li> <li>• Project development, co-ordination and implementation including formal contractor selection process, yearly works schedule and progress reporting to project team</li> <li>• Provision of project reports, including progress reports for 2015 and 2016 and final report in 2017, to BHPB with cc copies to DoE.</li> </ul> <p>BHP Billiton, Illawarra Coal:</p> <ul style="list-style-type: none"> <li>• Funding of project for at least \$250,000 with payment schedule outlined above, including provision of contract of agreement for funds</li> <li>• Provide comment and endorsement of draft and final project proposal to OEH</li> <li>• Submission of final project plan to DoE</li> <li>• Reporting to Commonwealth for this project (against condition of consent 7 ii-vi) including progress and final reporting.</li> </ul> <p>Commonwealth Department of Environment:</p> <ul style="list-style-type: none"> <li>• Approval authority for condition 7 ii-vi implementation</li> <li>• Provide comment and endorsement of draft and final project proposal to BHPB and OEH.</li> </ul>

Project Performance Measures/Timeline		
	1. Draft project proposal to BHPB & DoE	1. 11/12/13
	2. Final project proposal submitted for endorsement	2. 4/04/14
	3. Final project proposal endorsed	3. 30/04/14
	4. Formal contractor selection process	4. 30/7/14
	5. Project commences & 2014/15 works schedule	5. July 14
	6. 2014/15 progress report & 15/16 works schedule	6. 30/07/15
	7. 2015/16 progress report & 16/17 works schedule	7. 30/7/16
	8. Final project report outlining outcomes	8. 30/8/17
	a. Revised distribution description and maps for BHS & SBB	
	b. If population located, a description of habitat preferences for SBB	
	c. Description of threats and management recommendations for BHS and SBB	
	d. Priority areas for BHS across study area	
	e. Description and map of site protection works	
	f. Recommendations for future management and research for the BHS and SBB across the study area	

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## Attachment 1

**BHS and SBB Offset Project****Methods****Introduction**

Both the broad-headed snake and the southern brown bandicoot are threatened species with extremely limited distributions. Records of both these species on the West Cliff emplacement site are a significant finding.

In December 2011 consideration by OEH experts was given to the long-term recovery objective for these species in NSW which for each species is:

*"to secure the species in the wild for 100 years and to maintain its conservation status under the TSC Act"*

In order to meet these objectives a set of actions for each species was developed, which are outlined separately below.

*Broad-headed snake*

The broad-headed snake (BHS) is endemic to NSW and its current distribution extends from Wollemi NP in the North; the edge of the Clyde River catchment in the ranges SW of Nowra in the south; to the upper Blue Mountains at Blackheath and Newnes in the west and to near Little Marley within Royal NP in the east. Within this area it occupies very distinctive seasonally specific micro-habitats (exfoliating sandstone bushrock on outcrops, crevices and tree hollows) along sandstone cliffs, ridges and outcrops.

In the 2011 OEH prioritisation process it was determined that in addition to current active management of the two priority populations (Morton NP and surrounds, Royal & Heathcote NPs), a third priority site was required to secure the species. As part of this process the most recent records of the species were assessed, in conjunction with likely large areas of secure habitat. This assessment identified the record at West Cliff Colliery and the surrounding catchment lands and National Park estate as the highest priority for further targeted priority action implementation for the species in the State. Therefore this site has been identified as critical for the long-term conservation of this species and a suite of priority threat mitigation and habitat management actions have been developed for implementation.

Furthermore, options for offsetting this species outside the existing conservation reserve system are limited as there are no confirmed locations other than those noted above. Instead, targeted survey, site protection and habitat restoration is required and is the focus of this project proposal.

*Southern Brown Bandicoot*

In NSW the southern brown bandicoot is only known from two confirmed and disjunct populations, one in northern Sydney and the other in the far south-eastern corner of the State. Both populations are primarily on public land, in either National Park estate or a combination of National Park estate and State Forest.

In order to meet the above objective it was determined that in addition to active management of the two identified populations, further work was required to identify a third population to secure the species. As part of this process the most recent records of the species were assessed, in conjunction with likely large areas of secure potential habitat. This assessment identified the record at West Cliff Colliery and the surrounding catchment lands and National Parks estate as the highest priority for further targeted survey for the species in the State. Therefore, this site has been identified as potentially critical for the long-term conservation of this species and a

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## Attachment 1

suite of priority threat mitigation and habitat management actions have been developed for implementation.

Furthermore, options for offsetting this species outside the existing conservation reserve system are limited as there are no confirmed locations other than those noted above. Instead, targeted survey and active management of the major threat to this species (predation by foxes) is required and is the focus of this project proposal. Fox control is beyond the scope of the current work, however, the results will be used to assess the need for fox control in the area and develop a plan for a predator control program if required.

## Methods

### Study Area

The study area for both species comprises of approximately 134,000 ha across the following areas:

- Dharawal National Park, (6674ha)
- Upper Nepean State Conservation Area, (25,086ha)
- Woronora Plateau Special Area, (2768ha)
- Metropolitan Special Area, (87, 087ha) and
- O'Hares Special Area (7400ha)

Figure 1 shows the proposed study area and current records for the southern brown bandicoot and broad-headed snake. As the habitat requirements of both species differ, work will be targeted to appropriate habitat for each species. A limited amount of survey effort has occurred in these areas and the current project will aim to address these knowledge gaps rather than duplicate existing knowledge.

### Survey

As the biology of the southern brown bandicoot and the broad-headed snake differ each program employs separate methods within the same general area. A survey design for each species is outlined below.

#### Southern Brown Bandicoot

##### Survey design

Recent research and management programs for the species are now recommending the use of infra-red (IR) cameras over more traditional survey methods using cage traps and/or hair tubes as cameras are proving more efficient and effective at detecting this species and other small to medium sized mammals. Cage trapping is labour intensive, costly and time consuming, while hair tubes are less effective for detection.

While the upfront cost of cameras may be more costly, ongoing relative costs are lower as they can be installed for long periods in the field with much higher detection rates than cage trapping and hair tubes. Existing survey and monitoring programs for the species in NSW are based heavily on infrared cameras deployments. Furthermore elsewhere in Australia the use of IR cameras for survey small-medium sized mammals is general practice and is the preferred method outlined in the Commonwealth survey and assessment guidelines for this species.

As indicated in figure 1, little is currently known about the species distribution and habitat preference across the study area. Therefore the study area will be systematically surveyed to representatively sample the range of habitat types and burn histories. Camera deployment will occur year round over the life of the project as detection is not affected by seasonality. Sites will consist of a single IR camera deployed with a baited lure (eg. peanut butter, honey and oats) and retrieved after at least three weeks (or at least 21 trap nights). Sites will be independent with spacing at least 1-2kms from other sites and will be generally located adjacent (20-50m) to

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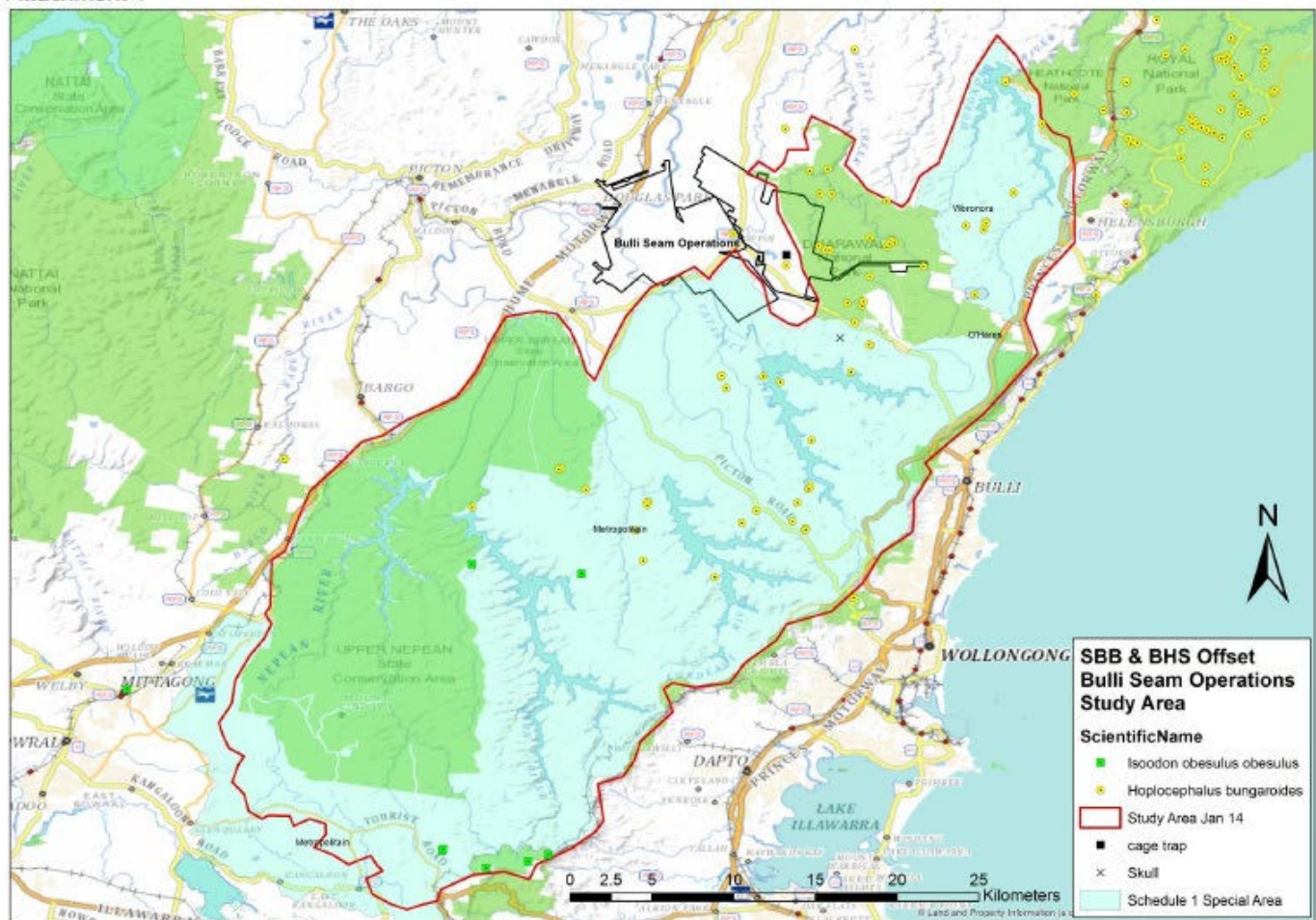


Figure 1: Survey area and southern brown bandicoot and broad-headed snake records.

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trails and tracks which provide relatively good access across the study area. Basic site data will be collected using a site characteristic data sheet similar to that used by WildCount. Where possible, sites will be located where there is evidence of bandicoot diggings and this information will be collected and used in the analysis. All images of individuals captured, including targets (southern brown bandicoots) and non-targets (foxes and other animals) will be tagged and processed in accordance with WildCount image processing methods.

Should the target species be confirmed early on in the survey period (ie. within the first 1-2 years), this information will be used to inform and refine the survey strategy. This could lead to more targeted survey where effort could concentrate on specific habitat types or locations and possibly increase the density of sites in identified area(s) of interest therefore enable the delimitation of discrete populations of the species and/or the extent of suitable habitat. The annual implementation project reports will outline in detail the specific bandicoot survey methods employed to date, highlighting any necessary refinements to the above strategy.

It is anticipated that project planning including survey design and reporting will be generally supported by the project co-ordinator, team and partners providing expert advice. Fieldwork, image processing and scat analysis will be undertaken by contractors with specific survey and analysis expertise. It is estimated that with at least 30 cameras, between 250 and 350 sites will be surveyed across the study area which equates to approximately 12 weeks/60 days of fieldwork spread over the three year project period.

It is recognised that this proposed survey strategy differs from the standard guidelines established by the Commonwealth Department of Sustainability, Environment, Water, Population and Communities (2011) "Draft Referral Guidelines for the endangered southern brown bandicoot (eastern) (*Isodon obesulus obesulus*)" in camera trap density (1 camera / 5ha for affected areas over 30ha) repetition and duration (minimum of two surveys, each of 14 days duration). However, given the extremely large scale and non-development related purpose of the survey it is considered that the proposed survey strategy balances limited resources (ie cameras, staff/contractor time) against study area coverage while trying to maximise detection of the target species. As such this unique situation requires an individually tailored approach rather than the standard approach as outlined in the guidelines.

To supplement this program, incidental collection of predator scats, primarily foxes, will also be collected and analysed on an opportunistic basis. This will add to our knowledge of foxes across the study area and their common prey/diet which may include the southern brown bandicoot. All site, image and scat data collected will be entered into the NSW Wildlife Atlas survey database.

### Threat assessment

Should the survey program confirm the presence of the southern brown bandicoot within the study area, a more detailed threat assessment and management program will need to be developed. Incidental records of predators collected via scat and images will provide an indicative assessment of this threat although it will need to be supplemented by a systematic assessment of fox activity which can then be used to determine the suitability of a fox control program at this location. If fox control is likely to benefit this species and funding for such a program can be secured, a site plan consistent with the NSW Fox Threat Abatement Program will be developed for implementation in the future.

### **Broad-headed snake**

#### Survey design

In contrast to the southern brown bandicoot, the specific habitat requirements and existing knowledge of the species across the study area means that a more targeted survey strategy can be used for the broad-headed snake. Surveys can be timed to occur during the cooler months of the year when the species is known to reside under exfoliating sandstone bushrock on sandstone outcrops between a westerly and northerly aspect. Digital aerial photography and topographical maps will be used to identify sites on the basis of abundant surface rock, close

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proximity of cliff edges, with northern and western aspects, and the proximity of woodland with tree hollows to rocky cliff edges. These sites will then be prioritised with regards to access with preference given to sites within easy access from tracks across the study area (up to 1-2 km walk). Surveys will not be limited to accessible sites and will aim to survey all identified potential habitat. If necessary, remote potential habitat will be surveyed by foot and potentially assisted by helicopter transport.

Survey methods are based on standard guidelines for saxicolous reptiles whereby a 1-person hour (or 2 person 30 mins) survey over a minimum area of 0.5 ha is undertaken in a linear manner with a dimension of 250 m x 20 m (0.5 ha) searching exposed rock in preference to heath or woodland habitats. Where possible 25 % of the search time (15 mins) will be devoted to habitats that are vegetated (not exposed rock). Observations shall be recorded for all reptiles and rock invertebrates identified as well as a count of all rocks or crevices inspected. Environmental variables measured include cloud cover, wind speed, wind direction, rain, ambient temperature and relative humidity. Search effort will be recorded for each broad habitat of the site (ie. exposed rock, woodland, heath, forest). A field survey data sheet used in the Morton wilderness surveys will be customised for data collection.

Additional information on habitat suitability and disturbance will be recorded to enable an assessment of threats across the study area. This information will guide threat management and habitat restoration objectives and will include the collection of the following:

- number and area of suitable rocks as well as lack of suitable rocks
- evidence of past & present disturbance (rock scars, caching, damage etc)
- access issues
- time since fire and evidence of overshadowing

It is anticipated that project planning including survey design and reporting will be generally supported by the OEH project team and partners with additional partners and experts providing advice. The estimated survey and threat assessment effort is likely to cover approximately 100 new sites and 20 existing sites (4 sites /day) within initial part of the program followed by the establishment of monitoring program for a subset of identified sites (approximately 20-40). This will equate to approximately 60 days of fieldwork during the prime winter survey period (approximately June-September) over the project timeframe and will be undertaken by contract expertise and supported by staff and/or volunteers where desired and available.

### Threat assessment

This component will incorporate information collected during surveys and the compilation of knowledge from previous survey efforts and land managers. The aim is to identify priority habitat across the study area and the need for threat mitigation (access, disturbance) and habitat restoration. It will also identify opportunities for habitat restoration and protection.

### ***BHS Habitat protection and restoration***

Based on information collected during the site survey and assessment noted above the project will implement site protection and restoration actions at identified priority sites. This will utilise techniques established by researchers at Southern Cross University and the University of Sydney and focus habitat restoration using:

- natural bushrock replacement where bushrock is available and can easily be replaced and
- artificial bushrock in areas that are denuded of natural bushrock and are within areas that access can be restricted and easily accessed by management trails.

Methods for these techniques are outlined in the following references:

- Croak, B.M., D.A. Pike, J.K. Webb, and R. Shine. (2010). Using artificial rocks to restore non-renewable shelter sites in human-degraded systems: colonization by fauna. *Restoration ecology* 18(4): 428-438.
- Goldingay, R. (1998) Between a rock and a hard place: conserving the Broad-headed Snake in Australia's oldest National Park. *Proceedings Linnæan Society N.S.W.* 120: 1-10.

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Goldingay, R. and Newell, D. (2000) Experimental rock outcrops reveal continuing habitat disturbance for an endangered Australian Snake. *Conservation Biology* 14(6): 1908-1912

In addition, site protection measures also to be considered will include:

- rationalisation of access (gating, fencing, closure of tracks, limiting foot/vehicle access)
- signage
- surveillance

It is anticipated that the habitat restoration and site restoration implementation will be generally co-ordinated and supported by the project co-ordinator, team and partners providing expert advice. The habitat restoration and protection budget has provided for indicative costings for the following measures:

- gating & fencing at 8 sites
- installation of 10 signs
- 500 artificial bushrocks
- 2 weeks of natural bushrock replacement
- 2 weeks of monitoring of works.

This will be re-assessed once the outcomes of the initial survey and assessment have been undertaken. As the majority of the study area is within Sydney's drinking water catchments and is generally restricted to the public, the actual need for such restoration and site protection works maybe over estimated. Should this be the case, opportunities for funding for similar site protection and habitat restoration works at Morton and/or Royal NP priority sites will be investigated and implemented, in consultation with the project stakeholders.

## Consideration of impacts of project

Condition 7d of the consent conditions requires the demonstration that the proposed management actions to be undertaken will not adversely impact EPBC Act species. This project has been developed with the conservation of both the BHS and SBB in mind and as such all actions are designed to either improve our understanding of the species or to manage threats acting on the species. As such these actions are intended to have a positive impact on the target species. Where actions have potential to have a negative impact, measures have been put in place to ensure that this risk and impact is minimised.

### Broad-headed snake

Specifically, when surveying for the broad-headed snake during the cooler months of the year it is necessary to lift the exfoliating sandstone bushrocks to inspect the cavity underneath. This action can cause damage to this habitat via changing the crevice dimensions or by breaking or damaging the rock which may reduce or destroy this habitat. Therefore it is standard practice that surveys are only conducted by suitably qualified experts who are aware of these risks and take the necessary care when undertaking these surveys to minimise the disturbance to this habitat. Similarly, these surveys have the potential to harm individuals or their prey when lifting bushrock. Once again this risk is minimised by the use of only qualified experts to undertake these tasks. Bushrock habitat is also fragile and when moving around sites either during survey, threat assessment or habitat restoration actions, care will also be taken to ensure minimal damage to bushrock habitat is achieved. All staff, contractors and/or volunteers working in this habitat will be briefed to ensure that the necessary care is taken. Should damage to habitat occur during these works, this damage will be recorded and every effort will be made to rectify the damage where possible by either of the habitat restoration techniques outlined above.

### Southern brown bandicoot

This project aims to use the least invasive technique for survey and detection of the target species, ie infra-red remote cameras. As noted above the move to their use has been because of both the greatly reduced impact on the target species compared to other survey techniques particularly cage trapping or hair tubes and their comparative success rate and cost of

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implementation. Cameras do not involve the physical entrapment or direct interaction with any individuals and only requires the temporary removal of a very minor area of likely habitat to obtain a clear image of the individual at the lure. This habitat will quickly grow back and is a minimal temporary loss.

It is also noted that these practices are recognised as standard within the industry and the project will require a scientific license and animal ethics approval prior to commencement which will discuss these risks and proposed mitigation measures in detail. Once these approvals have been received they will be provided to both BHPB and DoE.

## Appendix 8: OEH Broad-headed Snake and Southern Brown Bandicoot Proposal Endorsement



Our reference: DOC14/46528, SF14/2223  
Contact: Meagan Hinds 02 9585 6825

Joanne Page  
Manager Environment  
BHP Billiton Illawarra Coal  
PO Box 514  
Unanderra NSW 2526

Dear Ms Page

I am writing with regards to BHP Billiton Illawarra Coal (BHPBIC) request that the Office of Environment and Heritage (OEH) develop and implement a project proposal to fulfil the requirements of Condition 7 of the Federal Government Bulli Seam Operations Project Approval EPBC 2010/5350. This condition requires BHPBIC to contribute no less than \$250,000 to regional Broad-headed Snake and Southern Brown Bandicoot recovery programs in order to offset predicted impacts of the proposal.

I am pleased to advise you that this project proposal has now been finalised and a copy is attached for your endorsement. This project proposal has been prepared in consultation with the Commonwealth Department of Environment, species experts, relevant land managers and BHPBIC. It is proposed that the project be scheduled over three years, commencing 1 July 2014 and finishing 30 June 2017 with payments scheduled as follows:

Year 1	\$85,000 - July 2014
Year 2	\$85,000 - July 2015
Year 3	\$80,000 - July 2016

OEH now seeks your written endorsement of the project proposal to ensure that the necessary arrangements within OEH and BHPBIC are completed in time to allow for the commencement of the project and the first project payment in July 2014.

A copy of the final project proposal has also been provided to the Commonwealth Department of Environment. Should you require further information regarding this matter please contact Meagan Hinds, Senior Threatened Species Officer on 0295856825 or [meagan.hinds@environment.nsw.gov.au](mailto:meagan.hinds@environment.nsw.gov.au).

Yours sincerely

David Trewin  
Regional Manager  
Greater Sydney Region

17/4/14

PO Box 1967 Hurstville NSW 1481  
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Tel: (02) 9995 5000 Fax: (02) 9585 6555  
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[www.environment.nsw.gov.au](http://www.environment.nsw.gov.au)

## Appendix 9: BHPBilliton Broad-headed Snake and Southern Brown Bandicoot Proposal Endorsement

Illawarra Coal

28 April 2014

David Trewin  
Regional Manager  
Greater Sydney Region  
Office of Environment and Heritage  
PO Box 1967  
Hurstville, NSW, 1481



Illawarra Coal Holdings Pty Ltd  
BHP Billiton Illawarra Coal Regional Operations Centre  
Level 3, Enterprise 1, Innovation Campus, Squires Way  
North Wollongong NSW 2500 Australia  
PO Box 514  
Unanderra NSW 2528 Australia  
Tel +61 2 4286 3000 Fax +61 2 4286 3600  
bhpbilliton.com

Attention: Meagan Hinds

### Re: Endorsement of the Southern Brown Bandicoot and Broad-headed Snake Project Proposal

I am writing in response to your letter dated 17 April 2014 (your ref DOC14/46528, SF14/2223) requesting our written endorsement of the Broad-headed Snake (BHS) and Southern Brown Bandicoot (SBB) Project Proposal, Version 3.

Illawarra Coal endorses Version 3 of the Project Proposal and is committed to providing OEH with total funding of \$250,000 paid over 3 years to contribute toward the regional BHS and SBB recovery programs as outlined in the Proposal.

We request that OEH provide Illawarra Coal with an invoice for the first payment of \$85,000 by 15 June 2014 to allow payment to be processed during July.

Should you have any questions, please contact David Gregory, Specialist Land and Biodiversity on (02) 42863323 or via [david.gregory@bhpbilliton.com](mailto:david.gregory@bhpbilliton.com).

Yours Faithfully

  
**Joanne Page**  
Head of Health, Safety and Environment  
Phone: (02) 42863322  
Email: [joanne.page@bhpbilliton.com](mailto:joanne.page@bhpbilliton.com)

Illawarra Coal Holdings Pty Ltd  
ABN 69 093 857 286

A member of the BHP Billiton Group, which is headquartered in Australia  
Registered Office: 180 Lonsdale Street, Melbourne, Victoria 3000, Australia  
ABN 49 004 026 077

### Appendix 10: Agency Consultation

Agency Comments	ICHPL Response
<b>DAWE</b>	
<p><u>Response received 23 December 2020</u></p> <p>Could you please append the OEH Project Proposal to this plan and resend? Appendix 5 appears to only contain the OEH letter seeking endorsement of the proposal, not the proposal itself.</p> <p>The Project Proposal is heavily referenced within the plan and the majority of relevant condition items are deferred to this document, with Appendix 5 being the in-text reference. Please ensure it is Appended and complete.</p>	<p>Document has been included as Appendix 7. The letter of endorsement is now Appendix 8. The BHPBilliton letter of endorsement has been included as Appendix 9.</p>
<b>Biodiversity and Conservation Division</b>	
<p><u>Response received 23 November 2020</u></p> <p>My team has reviewed the BHS &amp; SSB Management Plan and has made comments on the plan attached for consideration. The comments regarding the monitoring of relocated snakes reflects comments made on the 2016 version of the BHS management plan in email dated 5th October 2017 with David Gregory. It also includes some notes on additional BHS habitat restoration and reconstruction methods for consideration.</p>	<p>Noted</p>
<p>Section 4.2 - What details were collected on this snake and has there been any follow-up monitoring post relocation.</p>	<p>Details of the snake captured were provided to OEH on 11 October 2017 in a report. Details of the snake have now been included in the SBMP.</p> <p>There was no post relocation monitoring of the snake. Radio telemetry is very intrusive for a species of this size.</p>
<p>Section 6.1.3.1 - What details are collected? And what post relocation monitoring is undertaken? As per previous advice include:</p> <p>Collection of data on any located individuals, (location, habitat found in, approximate age cohort, microchip or headshot for re-identification purposes)</p>	<p>These details were covered in an email to OEH on 11 October 2017.</p> <p>Additional detail on data capture has been provided in Section 6.1.3.1.</p> <p>It was identified that monitoring of individuals post relocation using</p>

<p>Collection of data on relocation site (GPS location, habitat characteristics inc. rock availability, vegetation)</p> <p>Post relocation monitoring of any relocated individuals, preferably during winter on two occasions for the life of the plan</p> <p>Reporting to DPIE - BCD on the location of any BHS during pre-clearing surveys (within 1 month) and annual reporting of outcomes from monitoring of relocated individuals</p>	<p>radio telemetry is very intrusive given the small size of the snakes. It was also noted that the snakes are venomous. Non-intrusive monitoring will be considered if a suitable methodology is identified.</p>
<p>Section 6.1.4 - dot point 1 - New article on natural rock replacement as a habitat restoration technique from Ross Goldingay.</p> <p>Goldingay, R.L. &amp; Newell, D.A. (2017). Small-scale field experiments provide important insights to restore the rock habitat of Australia’s most endangered snake. Restor. Ecol. 25, 243–252.</p>	<p>This reference has been included.</p>
<p>Section 6.1.4 - dot point 2 - Another reference:</p> <p>Croak BM, Webb JK, Shine R (2013b) The benefits of habitat restoration for rock-dwelling velvet geckos Oedura lesueurii. Journal of Applied Ecology 50:432–439</p>	<p>This reference has been included.</p>
<p>Section 6.1.4 - dot point 2 - a couple more recent references re habitat restoration using artificial bushrock</p> <p>Croak BM, Pike DA, Webb JK, Shine R (2012) Habitat selection in a rocky landscape: experimentally decoupling the influence of retreat-site attributes from that of landscape features. PLoS One 7:e37982</p> <p>Croak, B. M., D. A. Pike, J. K. Webb, and R. Shine. 2008. Three dimensional crevice structure affects retreat site selection by reptiles. Animal Behaviour (in press). DOI: 10.1016/j.anbehav2008.08.011.</p> <p>Croak, B.M., Pike, D.A., Webb, J.K. and Shine, R. (2010). Using artificial rocks to restore nonrenewable shelter sites in human-degraded systems: colonization by fauna. Restoration Ecology 18, 428-438.</p>	<p>These references have been included.</p>
<p>Table 3 - Include post relocation BHS monitoring at relocation site and surrounds</p>	<p>It was identified that monitoring of individuals post relocation using radio telemetry is very intrusive given the small size of the snakes. It was also noted that the snakes are venomous. Non-intrusive monitoring will be considered if a suitable methodology is identified.</p>

<p>Table 3 - must include:                  Collection of data on any located individuals, (location, habitat found in, approximate age cohort, microchip or headshot for re-identification purposes)                  Collection of data on relocation site (GPS location, habitat characteristics inc. rock availability, vegetation)                  documentation of post relocation monitoring events and outcomes</p>	<p>Additional detail on data capture has been provided in Section 6.1.3.1.</p>
<p><u>Response received 4 June 2024</u></p>	
<p>Document Revisions Table: How does this table relate to the ones in Appendix 4?</p>	<p>This document revision table relates to the document revisions since the two management plans were combined. The revision tables in Appendix 4 relate to the revisions of the original Broad-headed Snake Management Plan and Southern Brown Bandicoot Management Plan.</p>
<p>Table 1: [Specialist Environment] Within their level of qualifications and experience. [Undertake monitoring as required].</p>	<p>Text amended to reflect this revision.</p>
<p>Section 3.1: List which approvals apply eg EPBC referral # date etc</p>	<p>The Project Approval and EPBC Approvals are defined in Section 1.</p>
<p>Section 3.2: South32 internal procedures [Environmental Compliance/Conformance Assessment and Reporting Procedure]</p>	<p>Noted. Document number included.</p>
<p>Section 4: Reference, is this specific to the locality? Or is this where sightings have occurred? [Individual snakes have been found sheltering in hollows in tree species including <i>Eucalyptus gummifera</i>, <i>E. punctata</i>, <i>E. piperita</i> and <i>E. agglomerata</i>]</p>	<p>The reference is included at the end of the paragraph. It does not relate to where sightings have occurred on site.</p>
<p>Section 4.2: Have these habitats been mapped in Stage 3 and Stage 4?</p>	<p>These habitats have not been mapped. They are identified during the pre-clearance survey.</p>
<p>Section 4.2: [The snake was captured and relocated in accordance with the BHSMP] To a location shown on Figure 2.</p>	<p>Text 'to a location shown on Figure 2 and Figure 3' added.</p>
<p>Section 4.2: Detected during pre clearance actions [The snake was approximately 40 cm long and showed no signs of injury, parasites or other ill-health].</p>	<p>Text 'detected during pre-clearance survey' added.</p>
<p>Section 4.2: Moved by staff? It relocated itself? [The snake that was alive exited the switch room however was observed to have returned on subsequent inspections. The alive snake was not relocated].</p>	<p>The snake relocated itself. Text added.</p>
<p>Section 4.3.1.1: Aren't operations 24 hours? [although unlikely due to the nocturnal nature of Broad-headed Snakes].</p>	<p>Text amended to 'less likely due to reduced vehicle movements at night'.</p>

<p>Section 5.1: Figure 1 shows bandicoots in Stage 4 area detected in 2023 - a population in the impact area. Document should refer to the map/s that show Stage 3 and Stage 4 so the reader is aware of where these areas are.</p>	<p>The 2023 date indicates the date of the Bionet search, which contains historical records. The second paragraph in Section 5.1 states that a Southern Brown Bandicoot was recorded in Stage 4 of the CWEA in 2009. Stage 4 of the CWEA is shown on Figure 1.</p>
<p>Section 5.1: The CWEAMP should propose some appropriate burning regimes to support SBB.</p>	<p>There are vast areas of Southern Brown Bandicoot habitat surrounding the CWEA. In addition, the rehabilitation on the CWEA is at various stages of succession, representing the habitat mosaics in early to mid-succession.</p>
<p>Section 6.1.1: Suitably trained and experienced fauna spotter catcher or ecologist. [suitably trained site environmental representative]</p>	<p>Text amended to include 'experienced fauna spotter/catcher'. Ecologist is already included in text.</p>
<p>Section 6.1.2: If all except trees, rocks and logs are cleared without checking the habitat and the 1st stage of clearing using machinery is unsupervised by a fauna spotter catcher or ecologist, how are SBB protected from machinery as their habitat is not necessarily the type of habitat that is being salvaged in Stage 2 clearing? It might be ok for BHS but not for SBB.</p>	<p>The removal of vegetation is progressive. The first stage is the removal of shrubs and groundcovers, the next stage is tree removal, the next stage is soil removal and finally habitat removal.</p> <p>The process is undertaken using an excavator and small areas are cleared at a time. The progressive nature of the clearing allows time for any animals to relocate.</p>
<p>Section 6.1.3.1: How will this be confirmed? What method/s are proposed? [Pre-determined sites for relocation will take into account the species home ranges and be evenly spaced to avoid social conflict. Ideally, predetermined relocation sites should not be inhabited by another Broad-headed Snake at the time of relocation]</p>	<p>Four potential relocation sites have been identified on Figure 3. Text amended to reflect tense.</p> <p>The text '<i>Ideally, predetermined relocation sites should not be inhabited by another Broad-headed Snake at the time of relocation</i>' has been removed.</p>
<p>Section 6.1.3.1: Rock on rock outcrops [rocky outcrops]</p>	<p>Text amended to reflect rock on rock.</p>
<p>Section 6.1.3.2: This species may not be found in the first stage of clearing if only machinery is used and habitat is not checked. They do not live in hollows and areas of suitable nesting and foraging habitat would need to be inspected. Especially areas observed to have diggings. This could only be detected by an experienced ecologist/fauna spotter catcher</p>	<p>The removal of vegetation is progressive. The first stage is the removal of shrubs and groundcovers, the next stage is tree removal, the next stage is soil removal and finally habitat removal.</p>

<p>inspecting the area before or as part of stage 1. Machinery used as the only method in stage 1 could result in the loss of an animal that isn't associated with logs, hollows, rock or stags.</p>	<p>The process is undertaken using an excavator and small areas are cleared at a time. The progressive nature of the clearing allows time for any animals to relocate.</p>
<p>Section 6.1.4: A better term is salvage [translocation].</p>	<p>'Salvage' has been added.</p>
<p>Section 6.1.4: During? Or prior to the 1st stage of the pre clearance survey. How will it be marked prior to machinery removing other habitat? Who will do this work and what characteristics are they looking for? [identified during the pre-clearing survey].</p>	<p>The pre-clearance survey is undertaken prior to any disturbance by the site Specialist Environment or suitably trained consultant.</p> <p>Habitat is marked either using spray paint or a brightly coloured tape. These areas are identified in the pre-clearance survey report and/or Permit to Disturb.</p>
<p>Section 6.1.4: Can we use terms that are on a plan? Eg corridor? Used in plan in the CWEAMP showing Stage 4 area being cleared in corridors? [behind the line of clearing].</p>	<p>Text '<i>behind the line of clearing</i>' removed.</p>
<p>Section 6.1.4: Translocated rocky features.[the above].</p>	<p>Text 'Translocated rocky features' has been added.</p>
<p>Section 6.1.4: Stags. The are no longer trees if they've been moved. [trees]</p>	<p>Text '<i>stags</i>' added.</p>
<p>Section 6.1.4: How many areas of augmented habitat will be created? Is there a number per hectare that can be quantified?</p>	<p>As noted, research has suggested that habitat should be placed 300 metres apart. The number of augmented habitat areas to be established will be dependent on the availability of habitat salvaged and able to be translocated from the areas being cleared.</p>
<p>Section 6.1.5: There isn't much information on the detail of sediment and erosion control within the CWEAMP - it is assumed detail is provided in the Water Management Plan.</p>	<p>Detail is provided in the CWEAMP.</p>
<p>Section 6.1.5: How? What is to prevent access to protected areas. Most development would have labelled fencing to protect adjacent vegetation [CWEA will be clearly demarcated].</p>	<p>Flagging tape is used to demarcate the areas approved for clearing during the pre-clearance survey. The text '<i>flagging tape</i>' has been added.</p> <p>It is noted that clearing of vegetation is approved within the approved footprint for the CWEA.</p> <p>Areas in the vicinity of the CWEA where vegetation clearing is prohibited e.g. the Offset Area, are fenced.</p>

<p>Section 6.1.5: This document could have a current list of people to contact. As would be included in a pre clearance protocol/checklist.</p>	<p>The contact details for responsible personnel are included in the pre-clearance survey report and the Permit to Disturb. Text has been included to reflect this. These are the operational documents associated with each area to be cleared and most appropriate to have these contact details.</p>
<p>Table 3: Shown on FIGURE XX [approved boundaries]</p>	<p>Details of approved boundaries are provided in the CWEAMP (Plan 1).</p>
<p>Table 3: Annual reporting detailing measures used to protect adjacent habitat and any breaches or accidental impacts to those areas. Including any outcomes of accidental clearing or dumped stockpiles. Report of any loss of BHS or SBB as a result of impacts to protected area.</p>	<p>Areas in which progressive clearing is undertaken are demarcated using flagging tape.</p> <p>Sections 8.1 and 8.2 have been added to detail the reporting process for incidents and non-compliances.</p> <p>The text <i>'Reporting of non-conformance with the pre-clearance survey report as detailed in Section 8'</i> has been added.</p>
<p>Table 3: Future development is not relevant - this would be addressed in future approval? Suggest removal or change of wording to discuss the currently approved activities.</p>	<p>Wording has been removed.</p>
<p>Table 3: Pre clearance survey? Shouldn't this be a report post clearing to document loss of any fauna including BHS, SBB and any translocations of fauna, BHS, SBB etc. Update wording to be clear what is being delivered. Would this also be included in the annual report.</p>	<p>A post-clearance survey report will be developed. This is detailed in the CWEA Management Plan (Section 7.2.6).</p>
<p>Table 3: Report these [injuries and deaths] in the post clearing and/or annual report.</p>	<p>Inclusion of text as recommended by BCS and inclusion of reference to Annual Review.</p>
<p>Table 3: There should be some quantifiable and qualifiable components listed eg X number of rock on rock substitute habitat elements placed per hectare (taking into account the home range); X number of hollow bearing stags placed per hectare area of rehabilitated CWEA.</p>	<p>This will be dependent on the habitat features able to be salvaged from the area being cleared. Habitat salvage will be maximised.</p> <p>Habitat translocation on to rehabilitated areas will occur as soon as practical after removal from areas being cleared.</p>
<p>Table 3: Dead stags with hollows [Placement of hollow logs and rock outcrop elements]</p>	<p>Text <i>'stags with hollows'</i> included.</p>

<p>Table 3: State when this action [installation if artificial habitat] is required ie when suitable rocky habitat from salvage is not available or cannot be positioned acceptably then X number of rock on rock substitute habitat components will be installed per hectare.</p>	<p>Text <i>'when suitable rocky habitat from salvage is not available or cannot be positioned acceptably'</i> has been added.</p> <p>Artificial habitat will be placed as detailed in Section 6.1.4.</p>
<p>Table 3: Where are the details of this [habitat components and soil profiles] discussed? Salvaging hollows, rocks etc has been mentioned but not details of how revegetation will improve soil and ensure suitable vegetation and habitat elements for SBB.</p>	<p>The subsoil is separated from the topsoil and is spread in different layers on the area being rehabilitated, providing a soil profile. The process for respreading soil horizons is detailed in Section 7.3.3.1 of the CWEA Management Plan.</p> <p>Within five years there will be good vegetation growth and leaf litter drop, that will provide foraging habitat. Footnote 7 has been included to clarify this.</p>
<p>Table 3: If this is the objective [support Southern Brown Bandicoot individuals within five years of commencement of rehabilitation] there should be more detailed goals and monitoring to measure this. In its current state it's not measurable.</p>	<p>Reporting is required to the Resources Regulator on rehabilitation progress. The various stages of rehabilitation are listed in Table 4 of the CWEA Management Plan.</p> <p>This performance target is linked to the Ecosystem and land use development phase.</p>
<p>Table 3: Reduce impacts of feral animals predating on SBB. Reduce impacts of grazing feral animals on competition and land degradation eg goats, deer, pigs etc. This wording is flawed, especially with no feral animal control.</p>	<p>There are very limited numbers of vertebrate pests in or in the vicinity of the CWEA. The only grazing pests observed are very low numbers of rabbits and deer. Potential predators (foxes) have also been observed. No feral cats have been observed. The location of the CWEA, surrounded by National Park/State Conservation Area does not make it practical for feral pest control programs to only be undertaken on the Appin North surface lease area. Any vertebrate pest control needs to be undertaken on a landscape basis, and would need to include, as stated, the NPWS, LLS or WaterNSW.</p>

Table 3: If feral animals are not being controlled this is not a suitable performance target. Or if it is being stated there are no SBB then this is also not a suitable performance target. This should be redesigned to an appropriate performance target. Ideally feral animal control should be conducted.	Performance target changed to <i>'Maintain low numbers of vertebrate pests at Appin North'</i> .
Table 3: Participation in these programs should be defined eg is it funding? active employment of contractors? liaison with the program managers?	Text <i>'through liaison with program managers and funding'</i> added.
Table 3: No clear what this means [Reporting on research outcomes as required]. Criteria needs reviewing as per other comments about feral animal control.	Text <i>'Reporting on success of pest control programs as applicable'</i> has been added.
Table 3: Predator control would help BHS too which are subject to feral cat and fox predation.	Broad-headed Snake has now been referenced.
Table 3: Additional performance target should be twice a year feral animal control actions to reduce predations and competition.	Any vertebrate pest control needs to be undertaken on a landscape basis, and would need to include, as stated, the NPWS, LLS or WaterNSW.
Table 3: This project [regional research program] was funded by Appin Mine years ago. Not aware that SoS SBB and BHS projects are feeding back into this management plan. So this management measure is not current and should be revised.	Reference to the regional research program has been removed.
Table 3: Feral animal control should be a management action regardless of a confirmed SBB population presence. There are diggings, indicating there is a SBB population. In addition, the scale of disturbance in this locality can increase impacts of feral animals on the environment and species. Also the Figure in section 11 shows a SBB observed in 2023, which appears to be in the Stage 4 area so there is likely a confirmed population.	<p>The 2023 date indicates the date of the Bionet search, which contains historical records. The second paragraph in Section 5.1 states that a Southern Brown Bandicoot was recorded in Stage 4 of the CWEA in 2009.</p> <p>The lack of further sightings in the area indicates that there is no confirmed population.</p> <p>Diggings are not specific to Southern Brown Bandicoots and may be sign of another insect foraging species.</p>
Table 3: Regulators? [stakeholders]	Regulators are a subset of stakeholders.
Table 3: Is this the CWEA MP or WMP? Or other plan? [management plan review as required].	All management plans are periodically reviewed, however in this instance it refers to this management plan.

Table 3: It is unlikely the success of translocation can be measured.	The word ' <i>habitat</i> ' has been included before translocation to make it clearer what will be monitored.
Table 3: Where do these adjustments [made to systems and methods] come from? Make it clearer what would trigger adjustments.	Text ' <i>as a result of monitoring results or a review of procedures</i> ' included.
Table 3: BCS is not aware is not aware of a captive breeding that relates to this project. Delete if not relevant.	Text deleted.
Section 7.3: Cannot find [Consideration of Impacts of the Project].	This section is in Attachment 1 of the Broad-headed Snake and Southern Brown Bandicoot Offset Strategy, provided in Appendix 7.
Section 8.2: Should put this in front of document.	Noted. This section is consistently included at this location in all ICHPL management plans.
Section 8.4.2: First and only use of this term [governance reviews]. Further information required.	The text ' <i>audits</i> ' has also been included. These are internal reviews of conformance against the requirements of the management plan.
Appendix 4: Since these now the same plan, how do these versions work? Could these tables be updated now that it's one document?	Appendix 4 (now Appendix 6) has been included to provide the history of the Broad-headed Snake and Southern Brown Bandicoot Management Plans prior to amalgamation in 2020. The history of the management plan post amalgamation is included in the Document Review table at the beginning of the document.
<b>Department</b>	
<p><u>Response received 12 December 2020</u></p> <p>Update Section 8.2 to clarify that the management plan will only be revised then submitted and approved by the secretary in accordance with the conditions of approval.</p> <p>Please include consultation of other regulatory agencies on previous versions. This will allow the reader to see the proponent has consulted with the other agencies such as Department of Agriculture, Water and the Environment.</p>	<p>Section 8.2 has been updated as requested.</p> <p>Consultation with DAWE has not yet been undertaken. The SBMP will be submitted to DAWE following approval of the Coal Wash Emplacement Area Management Plan by DPIE (of which the SBMP meets Condition 17d of Schedule 4). Any comments from DAWE will be incorporated into the final document. A final version of the</p>

	SBMP will be provided to DPIE for DPIE's records.
<p><u>Comment received 17 July 2024</u></p> <p>A - Please add reference to the <i>Environment Protection and Biodiversity Conservation Regulations</i> to section 3.2 - relevant legislation, as these are referred to in the inserted declaration made in the revised Plan.</p>	Reference added.
<p>B - In Section 4, the conservation listing has been updated. Please add reference to the BC Act number (63) under which the conservation designation was made: <a href="https://legislation.nsw.gov.au/view/whole/html/inforce/current/act-2016-063#statusinformation">https://legislation.nsw.gov.au/view/whole/html/inforce/current/act-2016-063#statusinformation</a></p>	Footnote added to show change in conservation designation from vulnerable to endangered.
<p>C - The Scope of the Plan is noted to apply to <i>potential impacts on the Broad-headed Snake and Southern Brown Bandicoot from Stages 3 and 4 of the CWEA construction and operations</i>. Please comment on the progress or timings associated with Stages 3 and 4 of the CWEA construction and operations, as these don't currently have a relative reference point in the Plan. If scope progress is available in the EMS, please reference timelines/programme stages as available in the EMS. Has all clearing been completed for the project stages?</p>	<p>Additional context has been provided in Section 1 around the linkage between the CWEAMP and the SBMP and timing for Stage 3 and 4 of the CWEA.</p> <p>Clearing is undertaken progressively. No clearing has been undertaken in Stage 4 of the CWEA at this time.</p>
<p>D - The Commonwealth Species Profile and Threats Database (SPRAT) (<a href="https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1182">https://www.environment.gov.au/cgi-bin/sprat/public/publicspecies.pl?taxon_id=1182</a>) lists <i>Approved Conservation Advice</i> available for the broad-headed snake, in effect under the EPBC Act from 15-Nov-2023. <a href="https://www.environment.gov.au/biodiversity/threatened/species/pubs/1182-conservation-advice-15112023.pdf">https://www.environment.gov.au/biodiversity/threatened/species/pubs/1182-conservation-advice-15112023.pdf</a></p> <p>Please consider the Approved Conservation Advice and it's application to the Plan. The Advice notes that radio-tracking and long-term mark-recapture programs have demonstrated that broad-headed snakes have high site fidelity. I note that radio-tracking has not been adopted subsequent to previous advice on the plan (for various reasons) (Appendix 10), however, have long-term mark-recapture programs been considered? Please add commentary regards long term rehabilitation monitoring to the plan, or a plan for relocation of individuals</p>	<p>Long-term mark/recapture programs have not been considered as there have been very few individuals located. Since the plan was first developed in 2007, there has been one individual that was required to be relocated (2016) and two individuals (one alive and one deceased) found in an electrical switch room (2024). The alive snake was not required to be relocated.</p> <p>As noted in Appendix 10 of the SBMP, monitoring of individuals post relocation using radio telemetry is very intrusive given the small size of the snakes. It was also noted that the snakes are venomous, and therefore handling of the snakes will be minimised. These snakes' fangs are small, venom quantity equally small, but recent clinical experience</p>

	<p>suggests these snakes could cause lethal bite if not cause many other health problems later (Source: Husbandry Guidelines Broad-headed Snake (Western Sydney Institute of TAFE, 2009)).</p> <p>In reviewing the Standard Operating Procedure - Permanent Marking of Reptiles by Scale Marking (Department of Biodiversity, Conservation and Attractions, 2017), the following are considerations that need to be addressed:</p> <ul style="list-style-type: none"> <li>- ICHPL is not equipped to undertake this work, and any wildlife carers/snake catchers brought in to relocate the snake would also not necessarily be equipped to do this work. In catching a snake, they maintain a safe distance and use appropriate snake catching equipment, as opposed to attempting to hold the snake to mark it.</li> <li>- Animal ethics need to be considered. Mark and capture is usually undertaken by researchers as opposed to for snake relocation. There is limited benefit to ICHPL in tracking a relocated snake, as if it had been relocated the habitat is likely to have been removed and it is not likely to be located again.</li> <li>- Projects involving wildlife may require a licence.</li> <li>- The goal if a snake is found is for it to be relocated safely as quickly as possible to reduce stress on the snake and reduce the risk to personnel. On this basis, and as BHS have been found so infrequently at Appin North, it would not be practical to have a specialist available on call with an ethics permit to mark the snake.</li> <li>- Permanent marking of snakes may result in infection and death.</li> </ul>
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	<p>A plan for relocation of individuals has already been included in Section 6.1.3.1 of the SBMP.</p> <p>Additional information of relocation and management of captured animals is provided in the Coal Wash Emplacement Area Management Plan (Section 7).</p>
<p>E - Please comment on monitoring programmes for the species under the plan, including frequency. It appears that the monitoring of broad-headed snakes occurs (or occurred):</p> <ol style="list-style-type: none"> <li>1. after a post clearance survey report,</li> <li>2. as part of the Annual CWEA Rehabilitation Inspection, or</li> <li>3. after an incident (vehicle strike) report.</li> </ol> <p>Do points 1-3 capture all the monitoring opportunities for the broad-headed snake in Table 3? If so, leave as-is. If not, please update the monitoring opportunities in Table 3 and in the Plan generally.</p>	<p>It is not considered that monitoring would occur after a vehicle incident, unless the snake was not injured badly and recovered after care and was able to be released back into the wild.</p> <p>Monitoring of habitat is undertaken as part of the pre-clearing survey. This is when it would be identified if there are snakes that need to be relocated. If a snake is identified, then it would be relocated and reporting undertaken, however as noted as above there are significant constraints around marking snakes.</p> <p>Monitoring requirements are noted in Section 6.3 and Table 3.</p>
<p><b>Department of Climate Change, Energy, the Environment and Water</b></p>	
<p><u>Response received 27/06/2024</u></p> <p>Our initial assessment notes that further information may be required if it has not been already provided:</p> <p>- As this is a revised plan, please mention the revisions, approval dates and approving authorities in the revision table, leading up to the current revision. Also the expertise of the team revising it needs to be mentioned on a separate page</p>	<p>The revisions are provided in the table on Page 4 of the plan. It is noted that the Broad-headed Snake Management Plan and Southern Brown Bandicoot Management Plan were merged into the one document in 2020. Previous revisions of the separate plans are listed in Appendix 4.</p> <p>The dates of approval have been included. The years of experience with the personnel who have developed and reviewed the plan are provided in the review table on Page 4.</p>
<p>It appears to be a revision with material changes and therefore it has not been submitted under the revised</p>	<p>This is not the case – the plan is being submitted under Condition 16A. The changes to this plan are not</p>

<p>management plan condition. Please confirm that is the case.</p>	<p>material and do not indicate any new or increased impact associated with the approved action. A description of the changes was provided by separate email.</p>
<p>Since the original plan was written, there has been an update in the requirements of the departmental guidelines for management plans. The plans submitted currently, are expected to meet the requirements of the environmental management plan guidelines available at: <a href="http://dcceew.gov.au">Environmental Management Plan Guidelines (dcceew.gov.au)</a> Please provide a table as an appendix to this revised plan demonstrating how this revised plan meets the requirements of these guidelines.</p>	<p>Table provided in MP as Appendix 11.</p>
<p>A compliance table on the requirements of the conditions including which section and with some narrative on why the plan is revised and how the revised plan meets the requirements would be helpful.</p>	<p>Appendix 2 of the plan provides a cross reference between the requirements of Conditions 7, 13, 14 and 18 of EPBC Approval 2010/5350 and Condition 5 of EPBC Approval 2001/214 and where these requirements have been addressed in the plan.</p>
<p>If this revised plan has been also submitted to NSW regulatory authority, please provide details about that.</p>	<p>The plan has also been submitted to the Department of Planning, Housing and Infrastructure in accordance with Condition 17d) of Schedule 4 of Project Approval 08_0150. The plan has been submitted concurrently due to the current anticipated timeframes for document approval.</p>
<p><u>Response received 28/01/2025</u> Minor corrections made in document.</p>	

## Appendix 11: Assessment - Requirements of Environmental Management Plan Guidelines

Requirement	Section
Cover page and declaration of accuracy	Page 5
Document version control	Page 4 and Appendix 6
Table of Contents	Page 2
Executive summary or introduction	Section 1
Conditions of approval reference table	Appendix 2 and Appendix 3
Project description	Section 1
Objectives	Section 1.1
Environmental management roles and responsibilities	Section 2
Reporting	Section 8.3
Environmental training	Section 2
Emergency contacts and procedures	Section 8.1
Potential environmental impacts and risks	-
<ul style="list-style-type: none"> <li>• Threats to matters protected under the EPBC Act</li> </ul>	Section 4.3 and Section 5.2
<ul style="list-style-type: none"> <li>• Potential Impacts</li> </ul>	Section 4.3 and Section 5.2
<ul style="list-style-type: none"> <li>• Risk assessment</li> </ul>	Appendix 4 and 5
Environmental management measures	-
<ul style="list-style-type: none"> <li>• Environmental management activities, controls and performance targets</li> </ul>	Section 6 and Table 3
<ul style="list-style-type: none"> <li>• Environmental management maps and diagrams</li> </ul>	Section 11
<ul style="list-style-type: none"> <li>• Environmental monitoring</li> </ul>	Section 6.2 and Table 3
<ul style="list-style-type: none"> <li>• Corrective actions</li> </ul>	Section 8.1
Audit and review	-
<ul style="list-style-type: none"> <li>• Environmental auditing</li> </ul>	Section 8.6
<ul style="list-style-type: none"> <li>• Environmental management plan review</li> </ul>	Section 8.4
Glossary	Section 9

## Appendix 12: Management Plan Approval – Department

Department of Planning, Housing and Infrastructure



Our ref: MP08\_0150 PA-134 & PA-135

Chris Schultz  
Superintendent Environment  
Illawarra Coal Holdings Pty. Ltd.  
PO Box 514  
Unanderra, NSW 2526

09/04/2025

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**Subject: Appin Mine Coal Wash Emplacement Management Plan and Broad-headed Snake and Southern Brown Bandicoot Management Strategy**

Dear Chris,

I refer to the Appin Mine Coal Wash Emplacement Management Plan (MP08\_0150-PA-134) and management strategy for the Broad-headed Snake and Southern Brown Bandicoot (MP08\_0150-PA-135), submitted in accordance with Condition 17, Schedule 4 of the consent for the Bulli Seam Operations Project (MP08\_0150).

The Department has carefully reviewed the documents and is satisfied that they meet the requirements of the conditions of consent. The Department also note that due to internal document management system updates at Illawarra Coal Holdings Pty. Ltd., that there are inconsistencies in the document version numbers.

Accordingly, the Department approves the Appin Mine Coal Wash Emplacement Area Management Plan (Version 6, January 2025) and the Broad Headed Snake and Southern Brown Bandicoot management strategy (Version 2, January 2025).

Please ensure you make the documents publicly available on the project website at the earliest convenience. You are reminded that if there are any inconsistencies between the Plan or Strategy and the conditions of approval, the conditions prevail.

If you wish to discuss the matter further, please contact [REDACTED] on [REDACTED].

Yours sincerely

Jessie Evans  
Director, Resource Assessments  
Resource Assessments

**Appendix 13: Management Plan Approval – Commonwealth DCCEEW**

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**Australian Government**  
**Department of Climate Change, Energy,  
 the Environment and Water**

EPBC 2010/5350

Chris Schultz  
 Superintendent Environment  
 Illawarra Coal Holdings Pty Ltd  
 PO Box 514  
 Unanderra NSW 2526

**Approval of Revised Environmental Management Plans for Bulli Seam Operations Expansion, Bulli, NSW**

Dear Mr Schultz

Thank you for your email dated 26 June 2024 to the Department of Climate Change, Energy, the Environment and Water (the department), seeking approval of the revised Environmental Management Plans, in accordance with condition 16 of the above project under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Officers of the department have advised me on the revised Environmental Management Plans and the requirements of the conditions of the approval for this project. On this basis, and as a delegate of the Minister for the Environment and Water (the Minister), I have decided to approve:

- Appin Mine Coal Wash Emplacement Area Management Plan, version 6.0, January 2025; and
- Broad Headed Snake and Southern Brown Bandicoot Management Plan, version 2.0, January 2025.

Now these revised approved plans must be implemented. The approved plan must also be published in accordance with your conditions of approval.

Approval condition 16 A to 16 E for this project allows you (under certain circumstances) to implement revised plans without seeking approval from the Minister. If you require any advice on whether to submit a revised plan for approval, please contact the officer below. When submitting any revised plan to the Minister, please provide a 'tracked changes' version of the plan. I also attach a fact sheet providing guidance on new or increased impact relating to changes to approved management plans under the EPBC Act.

DCCEEW.gov.au  
 John Gorton Building - King Edward Terrace, Parkes ACT 2600 Australia  
 GPO Box 3090 Canberra ACT 2601 ABN: 63 573 932 849  
 LET 510 v3.5

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As you are aware, the department has an active monitoring program which includes monitoring inspections, desk top document reviews and audits. Please ensure that you maintain accurate records of all activities associated with, or relevant to, the conditions of approval so that they can be made available to the department on request. Should you require any further information please contact [REDACTED] on [REDACTED] or by email to [PostApproval@dcceew.gov.au](mailto:PostApproval@dcceew.gov.au).

Yours sincerely



Rachael Short  
Branch Head  
Environment Assessment (Vic, Tas) and Post Approvals

10 June 2025

Attachment:

- New or Increased Impact factsheet at: [Guidance on 'new or increased impact' relating to changes to approved management plans under EPBC Act environmental approvals - DCCEEW](#)