

**BULGA
COAL**

GLENCORE



Biodiversity Management Plan

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1. Introduction

The Bulga Coal Complex (BCC) mining lease is located approximately 12 kilometres southwest of Singleton, 1 kilometre north of Broke and 1.5 kilometres east of Bulga, in the Upper Hunter Valley of NSW (refer to Figure 1). The Bulga Coal Complex is managed by Bulga Coal Management Pty Limited (BCM) and comprises Bulga Open Cut (BOC) and Bulga Underground Operations (BUO).

The Bulga Open Cut and Bulga Underground Operations have separate development consents but common ownership and both are serviced by a common coal handling and preparation plant (CHPP) and rail loading facility located in the north eastern corner of the BCC (Figure 2).

1.1 Purpose and Scope

The purpose of this Biodiversity Management Plan (BMP) is to outline the strategies to be employed for the management of remnant vegetation and fauna species within the BCC, in accordance with Schedule 3, Conditions 29 to 35 of the BOC development consent (SSD-4960) and Schedule 4, Conditions 43, 43A and 44 of the BUO development consent (DA 376-8-2003 Mod 8. The mine overburden rehabilitation component of this management plan relates to Conditions 53 to 55 of the BOC development consent and Conditions 60 and 61 of the BUO development consent.

This BMP has also been prepared to satisfy the requirements of Conditions 2 and 3 of the Commonwealth EPBC Act approval (2012/6637) for the Bulga Coal Optimisation Project and conditions 4 and 5 of EPBC Act approval 2018/8300 for development consent SSD 4960 Modification 4.

This BMP applies to all land within the BCC mining leases (refer to Figure 2) and the BOAs listed in **Section 8**.

1.2 Related Documents

This BMP provides a brief overview of mine rehabilitation activities and monitoring at BCC, however, detailed rehabilitation information is provided in the Bulga Complex Rehabilitation Management Plan.

1.3 Roles and Responsibilities

Relevant roles and responsibilities have been developed for the implementation of this BMP. These are outlined in Table 1.1.

Figure 1 - Locality Plan

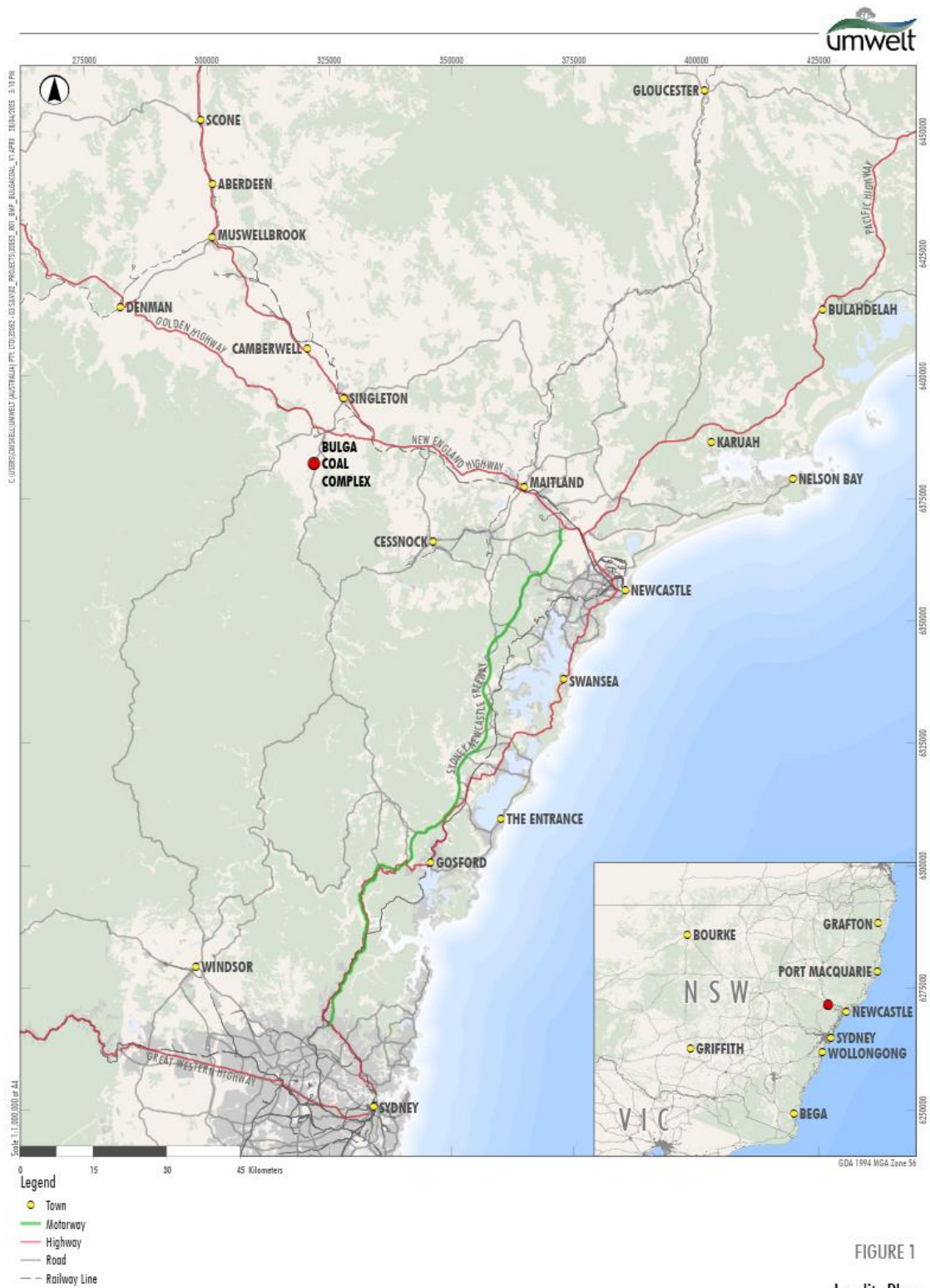


Image Source: ESRI Basemap Data source: Bulga (2020)

Table 1.1 – Roles and Responsibilities

Roles	Responsibilities
Operations Manager	<ul style="list-style-type: none"> • approve sufficient resources for the implementation of this BMP;
Environment and Community Manager	<ul style="list-style-type: none"> • ensure sufficient time and resources are allocated to implement the management and monitoring strategies of the BMP;
Environment and Community Coordinator	<ul style="list-style-type: none"> • facilitate the external reporting requirements outlined in this plan; • undertake training as required to communicate the requirements of this plan to all relevant personnel and contractors; • co-ordinate the day to day implementation of the management and monitoring strategies of the BMP; • undertake biannual inspections as required; • authorise clearing activities in accordance with the GDP process and other controls outlined in this BMP; • analyse and collate documentation for inclusion in the Annual Review; • assess the effectiveness of the management and monitoring strategies and instigate the adaptive management process as required; • ensure all internal and external reporting requirements are met; • ensure that all relevant records are effectively maintained on site; • periodically review progress against targets and performance indicators; • ensure that personnel involved in the carrying out and monitoring of the BMP activities and values are appropriately qualified, licensed and experienced to undertake the task; and • manage/control access to areas covered by the BMP.
BOC Technical Services Manager	<ul style="list-style-type: none"> • Allow sufficient time and resources in the mine planning process to salvage ecological resources from areas to be disturbed;
Other BCM Staff and Contractors	<ul style="list-style-type: none"> • ensure staff and contractors are informed and trained where relevant in relation to controls on activities within the area subject to this BMP; • receive training regarding controls on activities within the area subject to this BMP; • observe boundaries of the area subject to this BMP when undertaking work on site; and • undertake activities in line with directions from the Operations Manager and Environment and Community Manager.

1.4 Consultation

Consultation with the relevant authorities including the NSW Department of Planning, Housing and Infrastructure (DPHI) and Commonwealth Department of Climate Change, Energy, the Environment and Water (DCCEE) occurred throughout the process of developing this BMP and will continue throughout the ongoing management of the site and its BOAs as required.

2. Regulatory Requirements

2.1 Development Consent

The conditions of the relevant consents and where they are addressed in this BMP are outlined in Table 2.1, Table 2.2 and Table 2.3 below.

Table 2.1 – Bulga Open Cut Development Consent Conditions (SSD-4960)

Condition			Related Section in BMP																		
<p>Biodiversity Offset Strategy</p> <p>29. The Applicant shall implement the biodiversity offset strategy described in the EIS and SEE (MOD 4), summarised in Table 9 and shown conceptually in Appendix 9.</p> <p><i>Table 9: Summary of the Biodiversity Offset Strategy</i></p> <table border="1"> <thead> <tr> <th>Area</th> <th>Offset Type</th> <th>Minimum Size (ha)</th> </tr> </thead> <tbody> <tr> <td>Reedy Valley Offset Area</td> <td>Existing vegetation to be enhanced and additional vegetation to be established, with the restoration of at least 42 ha of White Box – Yellow Box – Blakely’s Red Gum Woodland and Derived Native Grassland CEEC and 44 ha of the Central Hunter Grey Box-Ironbark Woodland EEC</td> <td>1,486</td> </tr> <tr> <td>Broke Road Offset Area</td> <td>Existing vegetation to be enhanced and additional vegetation to be established, with the restoration of at least 189 ha of the Central Hunter Grey Box-Ironbark Woodland EEC</td> <td>241</td> </tr> <tr> <td>Wollombi Brook Conservation Area</td> <td>Existing vegetation to be enhanced and additional vegetation to be established, with the restoration of at least 10 ha of the Warkworth Sands Woodland EEC and 16 ha of the Central Hunter Grey Box-Ironbark Woodland EEC</td> <td>65</td> </tr> <tr> <td>Condran Property Biodiversity Offset Area</td> <td>Existing vegetation to be enhanced and additional vegetation to be established, with the restoration of at least 6.9 ha of Central Hunter Ironbark-Spotted Gum-Grey Box Forest EEC</td> <td>50</td> </tr> <tr> <td>Vere Offset Area</td> <td>Existing vegetation to be enhanced and additional vegetation to be established, including at least 81.1 ha of existing Central Hunter Valley Eucalypt Forest and Woodland CEEC and restoration of at least 33.8 ha of additional Central Hunter Valley Eucalypt Forest and Woodland CEEC</td> <td>153.7</td> </tr> </tbody> </table>			Area	Offset Type	Minimum Size (ha)	Reedy Valley Offset Area	Existing vegetation to be enhanced and additional vegetation to be established, with the restoration of at least 42 ha of White Box – Yellow Box – Blakely’s Red Gum Woodland and Derived Native Grassland CEEC and 44 ha of the Central Hunter Grey Box-Ironbark Woodland EEC	1,486	Broke Road Offset Area	Existing vegetation to be enhanced and additional vegetation to be established, with the restoration of at least 189 ha of the Central Hunter Grey Box-Ironbark Woodland EEC	241	Wollombi Brook Conservation Area	Existing vegetation to be enhanced and additional vegetation to be established, with the restoration of at least 10 ha of the Warkworth Sands Woodland EEC and 16 ha of the Central Hunter Grey Box-Ironbark Woodland EEC	65	Condran Property Biodiversity Offset Area	Existing vegetation to be enhanced and additional vegetation to be established, with the restoration of at least 6.9 ha of Central Hunter Ironbark-Spotted Gum-Grey Box Forest EEC	50	Vere Offset Area	Existing vegetation to be enhanced and additional vegetation to be established, including at least 81.1 ha of existing Central Hunter Valley Eucalypt Forest and Woodland CEEC and restoration of at least 33.8 ha of additional Central Hunter Valley Eucalypt Forest and Woodland CEEC	153.7	Section 7 and Section 8 and related Appendices.
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Condition			Related Section in BMP
Rehabilitation Area	Vegetation to be established, with the restoration of at least 2,200 ha of Central Hunter Grey Box–Ironbark Woodland EEC, 250 ha of Central Hunter Ironbark-Spotted Gum-Grey Box Forest EEC and 50 ha of Central Hunter Swamp Oak Forest	2,500	
TOTAL		4,495.7	
Habitat for Threatened Fauna Species 30. The Proponent must ensure that the biodiversity strategy provides potentially suitable habitat for the following threatened fauna species, to the satisfaction of the Planning Secretary: Little Eagle, Little Lorikeet, Brown Treecreeper, Diamond Firetail, Speckled Warbler, Swift Parrot, Regent Honeyeater, Grey-crowned Babbler, Varied Sitella, Scarlet Robin, Hooded Robin, Grey-headed Flying-fox, Yellow-bellied Sheath-tail-bat, Eastern Freetail-bat, Large-eared Pied Bat, Eastern False Pipistrelle, Little Bentwing-bat, Eastern Bentwing-bat, Large-footed Myotis, Greater Broad-nosed Bat and Eastern Cave Bat.			Section 5, Section 6, Section 7 and Section 8
Hunter Ironbark Research Program 31. The Applicant must implement any relevant findings of the Hunter Ironbark Research Program for the Ravensworth complex during the establishment of the vegetation in the Rehabilitation Area (see Table 9 above) to the satisfaction of the Secretary.			Section 7.2
Regent Honeyeater Recovery Plan Contribution 32. The Applicant must contribute at least \$200,000 over 2 years towards the implementation of actions under the National Regent Honeyeater Recovery Plan. The initial payment of at least \$100,000 must be made within 6 months of the date of this consent.			Addressed under separate documentation.
Long Term Security of Offsets 33. By the end of December 2015, unless the Planning Secretary agrees otherwise, the Applicant must make suitable arrangements to provide appropriate long-term security for the land within the Biodiversity Offset Strategy identified in Table 9 (excluding the Rehabilitation Area and Vere Offset Area), to the satisfaction of the Planning Secretary.			Section 8.1 and relevant Appendices.
33A. Within 2 years of commencing development approved under Modification 3, or other timeframe as agreed by the Planning Secretary, the Applicant must make suitable arrangements for the long-term protection of the Vere Offset Area identified in Table 9, to the satisfaction of the Biodiversity Conservation Trust.			Section 8.1 and relevant Appendix.
Rehabilitation Offsets 33B. Within 10 years of the cessation of mining operations, or other timeframe agreed by the Planning Secretary, the Applicant must make suitable arrangements for the long term protection of the 2,500 ha Rehabilitation Area identified in Table 9, to the satisfaction of the Biodiversity Conservation Trust. If the rehabilitation area does not meet the listing criteria of the targeted EEC or the completion criteria, then the Applicant must retire the relevant deficient biodiversity credits in accordance with the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the BCT.			To be addressed at relevant time.

Condition	Related Section in BMP
Biodiversity Management Plan	
34. The Applicant must prepare a Biodiversity Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:	This document
(a) be prepared by a suitably qualified and experienced person/s;	Section 13.0
(b) be prepared in consultation with BCD, and submitted to the Planning Secretary for approval within 3 months of the approval of Modification 3;	Section 1.4
(c) describe how the implementation of the biodiversity offset strategy would be integrated with the overall rehabilitation of the site;	Sections 6 and 7
(d) establish baseline data for the existing habitat in the offsite biodiversity offset area and on the site;	Section 3.0 and relevant Appendices
(e) describe the short, medium, and long-term measures that would be implemented to: <ul style="list-style-type: none"> • manage the impacts of clearing vegetation, including pre-clearance surveys; 	Section 4 and Appendix A
<ul style="list-style-type: none"> • manage the remnant vegetation and habitat on the site; and 	Sections 4 and 5
<ul style="list-style-type: none"> • implement the biodiversity offset strategy; 	Section 7
(f) include detailed performance and completion criteria for evaluating the performance of the biodiversity offset strategy, and include triggers for remedial action, where these performance or completion criteria are not met;	Section 7.8 and relevant Appendices
(g) include a strategy that describes how the biodiversity offset areas in Table 9 will be secured;	Section 7.1 and relevant Appendices.
(h) include a detailed description of the measures that would be implemented for: <ul style="list-style-type: none"> • enhancing the quality of existing vegetation and fauna habitat in the biodiversity offset areas; 	Section 7.0 and relevant Appendices.
<ul style="list-style-type: none"> • restoring native vegetation and fauna habitat on the biodiversity areas and rehabilitation area through focusing on assisted natural regeneration, targeted vegetation establishment and the introduction of naturally scarce fauna habitat features (where necessary); 	Section 5.6, 6, 7 and relevant Appendices.
<ul style="list-style-type: none"> • maximising the salvage of resources within the approved disturbance area – including vegetative and soil resources – for beneficial reuse in the enhancement of the biodiversity areas or rehabilitation area; 	Section 4.2.2
<ul style="list-style-type: none"> • collecting and propagating seed; 	See relevant Appendices
<ul style="list-style-type: none"> • protecting vegetation and fauna habitat outside the approved disturbance area on site; 	Section 5
<ul style="list-style-type: none"> • minimising the impacts on fauna on site, including undertaking pre-clearance surveys; 	Section 4 and 5
<ul style="list-style-type: none"> • managing any potential conflicts between the proposed restoration works in the biodiversity areas and any Aboriginal heritage values (both cultural and archaeological); 	Section 5.9 and relevant Appendices.
<ul style="list-style-type: none"> • managing salinity; 	Section 5.3 and relevant Appendices.

Condition	Related Section in BMP
<ul style="list-style-type: none"> controlling weeds, including measures to avoid and mitigate the spread of noxious weeds; 	Section 5.4 and relevant Appendices.
<ul style="list-style-type: none"> controlling feral pests, with consideration of actions identified in relevant threat abatement plans; 	Section 5.5 and relevant Appendices.
<ul style="list-style-type: none"> controlling erosion; 	Section 5.2 and relevant Appendices
<ul style="list-style-type: none"> managing grazing and agriculture on site; 	Section 5.1 and relevant Appendices.
<ul style="list-style-type: none"> controlling access; and 	Section 5.8 and relevant appendices.
<ul style="list-style-type: none"> managing bushfire hazards; 	Section 5.7 and relevant Appendices.
(i) include a seasonally based program to monitor and report on the effectiveness of these measures, and progress against the detailed performance indicators and completion criteria, and identify improvements that could be implemented to improve biodiversity outcomes;	Section 8 and relevant Appendices.
(j) identify the potential risks to the successful implementation of the biodiversity offset strategy, and include a description of the contingency measures that would be implemented to mitigate these risks, including provisions for alternative direct and/or supplementary offset measures where regeneration of EECs and/or the propagation/translocation of threatened flora do not meet performance and completion criteria; and	Section 7 and relevant Appendices.
(k) include details of who would be responsible for monitoring, reviewing, and implementing the plan.	Section 1.3
<p>34A. The Applicant must not commence any vegetation clearing within the additional disturbance areas approved under Modification 3 until the Biodiversity Management Plan is approved by the Planning Secretary.</p> <p>The Applicant must implement the Biodiversity Management Plan as approved by the Planning Secretary.</p>	This document and Appendices
<p>Conservation Bond</p> <p>35. Within 6 months of the approval of the Biodiversity Management Plan, the Applicant must lodge a conservation bond with the Department to ensure that the biodiversity offset strategy is implemented in accordance with the performance and completion criteria described in the Biodiversity Management Plan.</p>	Section 10 and relevant Appendices
<p>Adaptive Management</p> <p>2. The Applicant must assess and manage development-related risks to ensure that there are no exceedances of the criteria and/or performance measures in Schedule 4. Any exceedance of these criteria and/or performance measures constitutes a breach of this consent and may be subject to penalty or offence provisions under the EP&A Act or EP&A Regulation.</p> <p>Where any exceedance of these criteria and/or performance measures has occurred, the Applicant must, at the earliest opportunity:</p> <p>(a) take all reasonable and feasible steps to ensure that the exceedance ceases and does not recur;</p> <p>(b) consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and</p>	Section 12

Condition	Related Section in BMP
(c) implement remediation measures as directed by the Planning Secretary, to the satisfaction of the Planning Secretary.	
<p>Condition 3 – Schedule 5 - Management Plan Requirements</p> <p>3. The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:</p> <p>(a) detailed baseline data;</p> <p>(b) a description of:</p> <ul style="list-style-type: none"> • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; • the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures; <p>(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;</p> <p>(d) a program to monitor and report on the: impacts and environmental performance of the development;</p> <ul style="list-style-type: none"> • effectiveness of any management measures (see c above); <p>(e) a contingency plan to manage any unpredicted impacts and their consequences;</p> <p>(f) a program to investigate and implement ways to improve the environmental performance of the development over time;</p> <p>(g) a protocol for managing and reporting any:</p> <ul style="list-style-type: none"> • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and <p>(h) a protocol for periodic review of the plan.</p>	<p>Section 3 Section 2 Section 7.8 and relevant Appendices Sections 4, 5 and 6 Section 8 Section 7.8 and relevant Appendices Section 8.4 Section 12 Section 11 Section 9</p>

Table 2.2 lists the BUO consent conditions relevant to the BMP.

Table 2.2 – Relevant Consent Conditions from the BUO Development Consent

Condition	Related Section in BOMP
<p>Habitat Creation and Conservation</p> <p>43. The Applicant must:</p> <p>(a) take all practicable measures to minimise vegetation clearing during the development, and wherever practicable, avoid clearing the existing woodland vegetation on site;</p> <p>(b) establish and maintain the proposed ecological corridors on site (see Appendix 6);</p> <p>(c) ensure the corridors shown in Appendix 6 link to the Wollombi Brook Conservation Area;</p> <p>(d) conserve, maintain and enhance the existing Warkworth Sands Woodland ecological community (see Appendix 7);</p> <p>(e) investigate the potential distribution of the Warkworth Sands Woodland ecological community on company owned land on and adjacent to the site, and consider options for providing long-term protection to the existing and potential areas of the Warkworth Sands Woodland ecological community;</p> <p>(f) deleted;</p> <p>(g) deleted;</p> <p>(h) Conduct regular flora and fauna monitoring on site during the development, to the satisfaction of the Planning Secretary.</p>	<p>Section 4</p> <p>Section 6</p> <p>Section 6</p> <p>Section 7.4 and Appendix E</p> <p>Section 8</p>
<p>Additional Vegetation Offsets</p> <p>43A. By the end of December 2014, the Applicant must:</p> <p>(a) provide an area that is, in the opinion of the Planning Secretary, suitable in its quantity, quality and vegetation community to offset the clearing of 5.34 ha of Central Hunter Grey Box – Ironbark Woodland under Modification 5;</p> <p>(b) provide an area that is, in the opinion of the Planning Secretary, suitable in its quantity, quality and vegetation community to offset the disturbance of 23.71 ha of Central Hunter Grey Box – Ironbark Derived Native Grassland under Modification 5; and</p> <p>(c) make suitable arrangements to manage, protect and provide long-term security for these areas,</p> <p>to the satisfaction of the Planning Secretary.</p>	<p>Section 7.1 and Appendix C.</p>
<p>Biodiversity Management Plan</p> <p>44. The Applicant must prepare a Biodiversity Management Plan for the Bulga Mining Complex to the satisfaction of the Planning Secretary. This plan must:</p> <p>(a) be prepared in consultation with BCD, and submitted to the Planning Secretary for approval by 31 March 2017;</p> <p>(b) include a detailed description of what measures would be implemented to satisfy the requirements in condition 43 and 43A of Schedule 4;</p> <p>(c) describe the short, medium, and long term measures that would be implemented to:</p> <ul style="list-style-type: none"> • manage the impacts of clearing vegetation, including pre-clearance surveys; and • manage the remnant vegetation and habitat on the site; 	<p>Section 1.4</p> <p>Section 7.1 and Appendix C.</p> <p>Section 4 and Appendix A</p> <p>Section 5</p> <p>Section 7 and relevant Appendices</p> <p>Section 5.6, 6, 7 and relevant Appendices</p> <p>Section 4.2.2</p>

Condition	Related Section in BOMP				
<p>(d) include a detailed description of the measures that would be implemented over the next 3 years, including the procedures to be implemented for:</p> <ul style="list-style-type: none"> • enhancing the quality of existing vegetation and fauna habitat in the conservation and offset areas; • restoring native vegetation and fauna habitat on the biodiversity areas and rehabilitation area through focusing on assisted natural regeneration, targeted vegetation establishment and the introduction of naturally scarce fauna habitat features (where necessary); • maximising the salvage of resources within the approved disturbance area – including vegetative and soil resources – for beneficial reuse in the enhancement of the biodiversity areas or rehabilitation area; • collecting and propagating seed from the local area; • protecting vegetation and fauna habitat outside the approved disturbance area on site; • minimising the impacts on fauna on site, including undertaking pre-clearance surveys; • managing any potential conflicts between the proposed restoration works in the biodiversity areas and any Aboriginal heritage values (both cultural and archaeological); • managing salinity; • controlling weeds and feral pests; • controlling erosion; • managing grazing and agriculture on site; • controlling access; and • bushfire management; <p>(e) include a seasonally-based program to monitor and report on the effectiveness of these measures, and progress against the detailed performance and completion criteria;</p> <p>(f) identify the potential risks to the successful implementation of the plan, and include a description of the contingency measures that would be implemented to mitigate these risks; and</p> <p>(g) include details of who would be responsible for monitoring, reviewing, and implementing the plan.</p> <p>The Applicant must implement the Biodiversity Management Plan as approved by the Planning Secretary.</p>	<p>See relevant Appendices</p> <p>Section 5</p> <p>Section 4 and 5</p> <p>Section 5.9 and relevant Appendices.</p> <p>Section 5.3 and relevant Appendices.</p> <p>Section 5.4 and relevant Appendices.</p> <p>Section 5.5 and relevant Appendices.</p> <p>Section 5.2 and relevant Appendices</p> <p>Section 5.1 and relevant Appendices.</p> <p>Section 5.7 and relevant Appendices.</p> <p>Section 8 and relevant Appendices.</p> <p>Section 7 and relevant Appendices.</p> <p>Section 1.3</p>				
<p>Rehabilitation Objectives</p> <p>60 The Applicant must rehabilitate the site in accordance with the conditions imposed on the mining leases(s) associated with the development under the <i>Mining Act 1992</i>. This rehabilitation must comply with the objectives in Table 17.</p> <p>Table 17: Rehabilitation Objectives (relevant to this Biodiversity MP)</p> <table border="1" data-bbox="245 1771 1106 1973"> <thead> <tr> <th data-bbox="245 1771 442 1832">Feature</th> <th data-bbox="442 1771 1106 1832">Objective</th> </tr> </thead> <tbody> <tr> <td data-bbox="245 1832 442 1973">Watercourses subject to subsidence impacts</td> <td data-bbox="442 1832 1106 1973">Hydraulically and geomorphologically stable with riparian vegetation that is the same of better than prior to mining.</td> </tr> </tbody> </table>	Feature	Objective	Watercourses subject to subsidence impacts	Hydraulically and geomorphologically stable with riparian vegetation that is the same of better than prior to mining.	<p>Section 6, Rehabilitation management plan/Rehabilitation Strategy.</p>
Feature	Objective				
Watercourses subject to subsidence impacts	Hydraulically and geomorphologically stable with riparian vegetation that is the same of better than prior to mining.				

Condition		Related Section in BOMP
Land to be restored or maintained for agricultural purposes	Restored and maintained to: <ul style="list-style-type: none"> the same or higher land capability and agricultural suitability than prior to mining; and a landform consistent with the surrounding environment, including no greater than minor changes to flooding characteristics or ponding. 	
Other land	Restore ecosystem function including maintaining or establishing self-sustaining ecosystems comprised of: <ul style="list-style-type: none"> local native plant species (unless the RR agrees otherwise); and a landform consistent with the surrounding environment, including no greater than minor changes to flooding characteristics or ponding. 	
Progressive Rehabilitation 61. The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance		Section 6, Rehabilitation management plan/Rehabilitation Strategy.

Table 2.3 lists the consent conditions relevant to the BMP as required under the EPBC Act approvals 2012/6637 and 2018/8300.

Table 2.3 – Commonwealth Project Approval Conditions for the BOP

Condition	Related Section in BMP
<p>2. To compensate for the loss of approximately 557 ha of regent honeyeater, swift parrot and grey headed flying fox habitat, 611ha of large-eared pied bat habitat and approximately 65 slaty red gum trees, the approval holder must provide for the protection of offset lands identified in the maps at Schedule 1 of this notice as:</p> <ul style="list-style-type: none"> Reedy Valley Offset Site; Wollombi Brook Conservation Area; and Broke Road Offset Site. <p>These offset lands must meet the requirements of the EPBC Offsets Policy and provide for the protection of threatened species habitat on these sites for the duration of the action's impact through a legally binding conservation covenant which must be in force within 3 years of the commencement of the action.</p> <p>Written evidence of compliance against this condition must be provided to the Department prior to the commencement of the action including evidence that action is being taken to put in place a suitable legally binding conservation covenant.</p>	Appendix C, D and E

Condition	Related Section in BMP
<p>3. The approval holder must submit for the Minister's approval a Biodiversity Management Plan (BMP) which provides for the offsetting of residual impacts to matters of national environmental significance including but not limited to:</p> <ul style="list-style-type: none"> • Regent honeyeater; • Swift parrot; • Large-eared pied bat; and • Slaty red gum. <p>The BMP must include:</p> <p>(a) management actions designed to improve the ecological quality of habitat for the above species on offset lands identified in condition 2 and protect these sites from ecological degradation for the duration of the action's impact on matters of national environmental significance;</p> <p>(b) an ecological monitoring program to monitor the success of management actions in the BMP and define measurable targets of management actions, performance indicators, and an adaptive management framework for the duration of the action's impact on habitat for matters of national environmental significance. Management actions prescribed by the BMP must be clear, measurable, auditable and time bound;</p> <p>(c) clear objectives and performance indicators as well as corrective actions for circumstances where a management action fails to meet its prescribed objective or performance indicator.</p>	<p>This document, Section 7.1 and Appendix C, D and E</p> <p>Sections 5.1 – 5.8 Section 6.3</p> <p>Section 8 Section 7.8 & Appendices B-G</p> <p>Section 7.8 & Appendices B-G Section 8.4</p>
Listed threatened species and ecological community	
<p>The objective of conditions 5 and 6 is to minimise the impacts of the action on listed threatened species and an ecological community.</p> <p>5. The approval holder must comply with the State development consent conditions 29, 30, 33, 33A, 33B, 34 and 34A of Schedule 3.</p> <p>(a) To compensate for the loss of the listed threatened species and ecological community habitat identified at condition 4, the approval holder must submit the Biodiversity Offset Strategy (specified at condition 29 of the State development consent) to the Minister for approval.</p> <p style="margin-left: 40px;">i. The approval holder must not commence vegetation clearing within the modification additional disturbance area (delineated by a red boundary at Annexure 1) until the Biodiversity Offset Strategy has been approved by the Minister.</p> <p style="margin-left: 40px;">ii. The approval holder must implement the Biodiversity Offset Strategy as approved by the Minister.</p> <p>6. The approval holder must comply with the State development consent conditions 53, 54, 55 and 56.</p>	<p>Condition 5 addressed in this BMP.</p> <p>Section 4</p> <p>Condition 6 addressed in Rehabilitation management plan/Rehabilitation Strategy.</p>

3. Existing Environment

The existing environment of the BCC has been assessed in detail in a number of environmental assessments, the most recent of these being Modification 3 of the Bulga Optimisation Project consent (SSD 4960). This modification aimed to maximise resource recovery in the current BOP Project Area by extending the open cut operations to the southeast into a former open cut mining area occupied by the current tailings storage facilities. This project also required modification (7) to the Bulga Underground Operations consent (DA 376-8-2003) for the relocation of underground infrastructure required to facilitate the Proposed Modification.

This project application was supported by a Biodiversity Assessment Report prepared by Umwelt (Australia) Pty Limited (2019). A summary of the information presented in that and previous assessments is provided in the sections below.

3.1 Land Use History

BCC is situated in a rural area, primarily surrounded by rural landholdings, agriculture, mining and defence training activities (refer to Figure 3). Adjoining the eastern boundary of the BCC is land owned by the Commonwealth of Australia which forms part of the Singleton Military Training Area (SMTA). Portions of this land have been leased to BCC for open cut mining purposes since 1998.

There are several mines located around the BCC. The closest is the Mount Thorley Operations which adjoins the northern boundary of the BOC; the associated Warkworth Mine is located to the immediate north of the Mount Thorley Operations (refer to Figure 3). Several other mines such as Wambo are located further north west and northeast of the BCC.

Figure 3 - Land Use

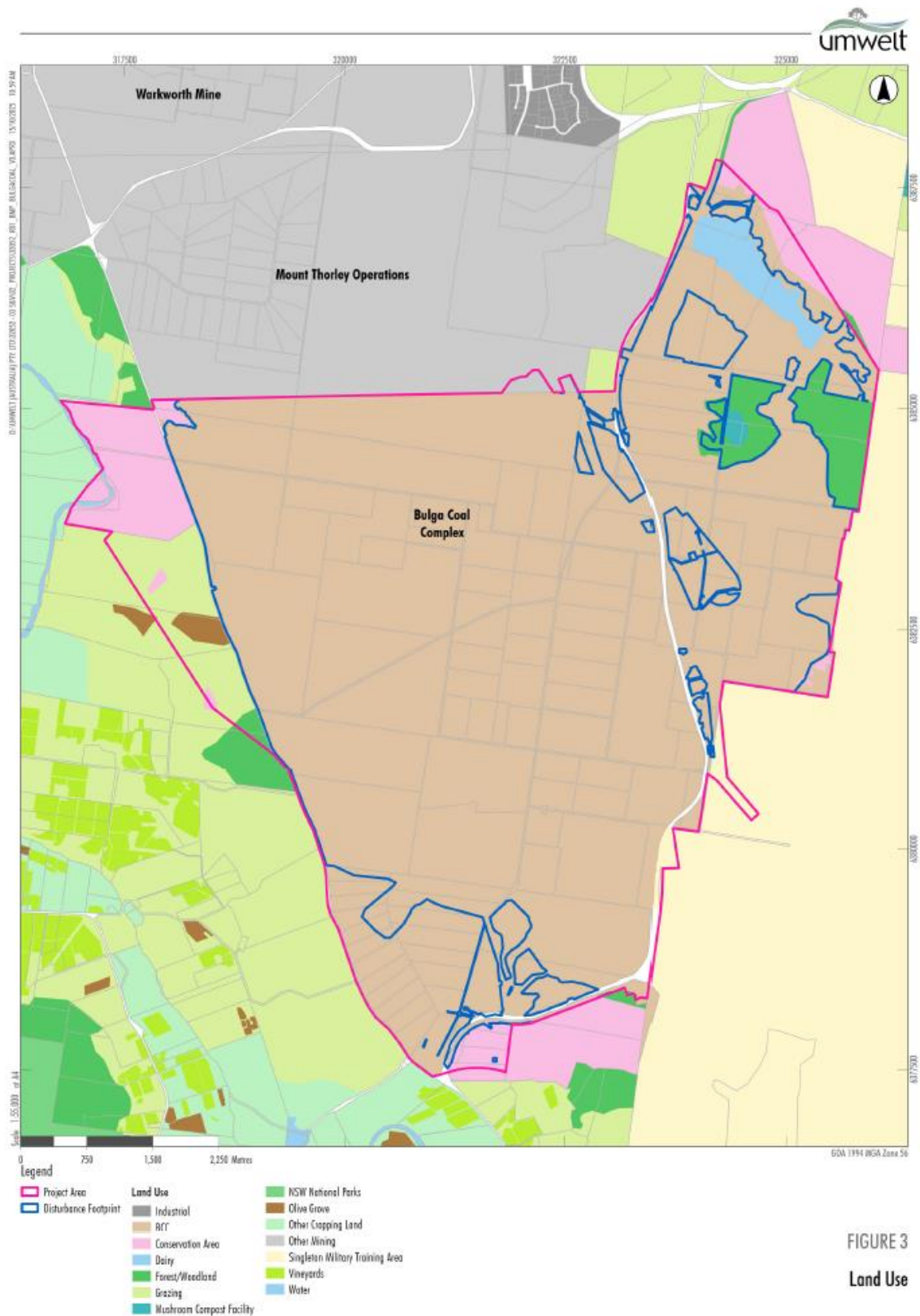


FIGURE 3
Land Use

Image Source: Neemap (Aug 2020) Data source: DFSI (2018), Bulga (2020)

Land immediately to the northeast, west and south of the BCC is predominantly utilised for agricultural purposes. The Wollombi Brook alluvial flats are located approximately 2.5 kilometres to the west of the BCC. Due to their fertility, these alluvial flats and adjoining lower slopes support much of the agricultural activities of the area, including:

- fodder and lucerne crops;
- viticulture;
- dairying; and
- horse breeding.

The fertile footslopes of the Fordwich Sill are used for similar activities to those carried out on the Wollombi Brook alluvial flats, with cropping less prevalent on the higher slopes.

Beef cattle grazing is the dominant agricultural enterprise on the less fertile soils away from the Fordwich Sill and Wollombi Brook alluvials. A Mushroom Composting facility, Viticulture and horticulture, predominately olive growing, also occurs on the slopes away from the Wollombi alluvials.

Outside of mining, defence and agriculture, the area surrounding the BCC supports the following land uses (refer to Figure 3) including:

- small rural towns (Broke, Milbrodale and Bulga); and
- hospitality and tourist operations including short stay accommodation, winery cellar doors, restaurants/cafes and specialist retail outlets.

The Mount Thorley industrial area, located to the immediate north of the Mount Thorley Operations, is located within three kilometres of the BCC.

Mining, cattle grazing activities and past land clearance associated with previous agricultural activity has disturbed much of the BCC and surrounding areas, resulting in the vegetation being dominated by pastoral grassland with pockets of remnant and re-growth woodland. The vegetation within and surrounding the BCC is discussed further in **Section 3.4.1**.

3.2 Climatic Information

A meteorological station at the BCC continuously records rainfall, wind speed, wind direction, temperature and solar radiation. Analysis of historical wind data indicates the most common winds on an annual basis were from the south and northwest with few winds originating from the northeast. During summer, winds from the east-southeast dominate with a lesser portion of winds from the south. In autumn, winds from the south are most common. During the winter months, winds predominantly occur from the northwest with a spread of winds from the southwest quadrant. The spring windrose had a wind distribution similar to the annual windrose with winds originating from the south, northwest and southeast.

Long term temperature and rainfall data (125 years) has also been collected from the Bureau of Meteorology weather station at Jerrys Plains. This data indicates that January is the hottest month with a mean maximum temperature of 30.6°C and July is the coldest month with a mean minimum temperature of 5.4°C. Rainfall data showed January is the wettest month with an average rainfall of 94.3 mm over eight days and August is the driest month with an average rainfall of 19.9 mm over 5.1 days.

3.3 Landform, Geology and Soils

The BCC area is typical of the central lowlands of the Hunter Valley, which are characterised by undulating to low rolling hills formed on weak sedimentary rocks with low local relief (Kovac and Lawrie 1991). Elevations within the BCC lease area range between 169 mAHD in the south-eastern corner of the complex and 50 mAHD along Loders Creek. The overall in-pit overburden emplacement area elevation is approximately 150 mAHD with some areas up to approximately 165m AHD to provide topographical relief.

Elevation in the surrounding area ranges from around 40 mAHD on the Hunter River at the junction with Wollombi Brook to around 300 mAHD at the Vere (within the Vere BOA) and over 500 mAHD along Broken Back Range. The Yengo and Wollemi escarpments to the south and west of the Wollombi Brook valley are between 250 mAHD and 400 mAHD in elevation, intersected by deeply incised valleys. The Broken Back Range, the Vere, and Yengo and Wollemi escarpments remain heavily vegetated due to their rugged terrain and poor agricultural value. The flat alluvial plans and gently undulating terrain around the Project area has been largely cleared in the past for agricultural or mining purposes, although, as noted earlier, the lower quality agricultural land is regenerating to woodland in a number of areas.

Since the 1980's mining in the BCC area has created mining voids, overburden emplacements areas and surface facilities which are now key topographical features within the area.

The soil types occurring within the BCC are mapped on the Singleton 1:250,000 Soil Landscapes Map Sheet and described in Kovac and Lawrie (1991). Soils landscapes present include Branxton, Rothbury, Saxonvale, Warkworth and Wollombi (Kovac and Lawrie, 1991); the location of these soil landscapes is shown on Figure 4. The Branxton soil landscape dominates the site, with a smaller area of the Rothbury soil landscape in the north-east of the BCC. These soils generally have low fertility and are moderately to highly erodible. The remaining soil landscapes are located in the west of the site and only occupy a very small area (refer to Figure 4).

3.4 Flora and Fauna

3.4.1 Vegetation Communities

The vegetation within the BCC has been heavily modified due to a history of clearing and disturbance for agricultural purposes and more recently for mining. Previous surveys have identified numerous vegetation communities (or variants thereof) (Figure 5) and disturbed or non-vegetated areas (not including mine rehabilitation). Four vegetation communities recorded in the BCC conform to endangered ecological communities (EECs) listed under the *Biodiversity Conservation Act 2016* (BC Act) (refer to Table 3.1). The vegetation communities recorded in the area covered by the BMP include:

- Central Hunter Grey Box - Ironbark Open Woodland;
- Central Hunter Grey Box - Ironbark Woodland (EEC);
- Central Hunter Grey Box - Ironbark Derived Native Grassland (DNG);
- Central Hunter Bullock Forest Regeneration;
- Central Hunter Ironbark - Spotted Gum - Grey Box Forest (EEC);
- Central Hunter Paperbark Soaks Woodland;
- Central Hunter Swamp Oak Forest;

- Hunter Valley Weeping Myall Woodland (EEC);
- Mixed Shrubland on Alluvial Soil;
- Riparian Derived Grassland;
- Warkworth Sands Woodland (EEC), with the following variants:
 - WSW Angophora Woodland;
 - WSW Angophora and Bulloak Open Woodland;
 - WSW Angophora and Bulloak Woodland;
 - WSW Bulloak Forest;
 - WSW Derived Native Grassland;
 - WSW Disturbed Grassland;
 - WSW Ironbark Woodland;
 - WSW Red Gum – Melaleuca Woodland
 - WSW Red Gum Woodland and
 - WSW Regenerating;
- Hunter Valley River Oak Forest.

Disturbed, planted or non-vegetated areas include:

- Disturbed;
- Exotic Grassland;
- Grassland on Alluvial Soil;
- Olive Grove;
- Planted Areas;
- Rehabilitation Grassland;
- Rehabilitation Woodland;
- Waterbody.

The Central Hunter Valley Eucalypt Forest and Woodland ecological community was listed as a critically endangered ecological community (CEEC) in 2015 under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The CEEC includes a range of vegetation communities where they occur on soils derived from the Permian sedimentary bedrock found on the valley floors and on lower hillslopes and low ridges. The vegetation communities that occur in the BCC and may conform to the CEEC Final Determination include:

- Central Hunter Grey Box - Ironbark Woodland EEC;
- Central Hunter Grey Box - Ironbark Derived Native Grassland (DNG) (where it occurs within 30 metres of the CEEC);
- Central Hunter Bulloak Forest Regeneration (in part); and
- Central Hunter Ironbark - Spotted Gum - Grey Box Forest EEC.

Table 3.1 BC Act and EPBC Act Equivalent Communities

BC Act Vegetation Community	Equivalent EPBC Act Community
<ul style="list-style-type: none"> Central Hunter Grey Box - Ironbark Woodland EEC; Central Hunter Grey Box - Ironbark Derived Native Grassland (DNG) (where it occurs within 30 metres of the CEEC); Central Hunter Bulloak Forest Regeneration (in part); and Central Hunter Ironbark - Spotted Gum - Grey Box Forest EEC 	Central Hunter Valley Eucalypt Forest and Woodland CEEC

Detailed survey and analysis would be required to determine whether these communities meet the key diagnostic characteristics and conditions thresholds described in the Final Determination (DoE 2015).

3.4.2 Threatened Flora Species

The following threatened flora species have been recorded within the BCC, and include (as per Figure 5):

- Slaty Red Gum (*Eucalyptus glaucina*); and
- White-flowered Wax plant (*Cynanchum elegans*).

Slaty red gum is listed as vulnerable under both the NSW Biodiversity Conservation Act 2016 (BC Act) and Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act). Approximately 15 individuals were recorded in the Broke Road BOA to the north-east of the project area during the field surveys for the BOP EIS (refer to Figure 5). Subsequent ecological monitoring has identified *Eucalyptus glaucina* individuals and stands across an area of approximately 30 ha within the Broke Road offset, with an observed increase in juvenile Slaty Red Gum hybrids. A large population of slaty red gum is known to occur on the adjoining SMTA, which is estimated to be in the order of 1,000,000 individuals (ERM, 2004).

White-flowered wax plant was identified in one location (refer to Figure 6) during the ecological assessment for the Blakefield South Subsidence Management Plan (SMP). It is located in a remote area of the SMTA and is not predicted to be impacted by mine subsidence.

Two endangered flora populations (EPs) have also been recorded within the BCC (Figure 6). These are:

- the Weeping Myall (*Acacia pendula*); and
- the Tiger Orchid (*Cymbidium canaliculatum*).

3.4.3 Threatened Fauna Species

A total of 26 threatened fauna species (as listed under the BC Act and/or the EPBC Act) have been recorded within or immediately adjacent to the BCC; either as part of surveys, database searches or literature reviews. The location of each of the threatened species' records is shown on Figure 6, with the species recorded being:

- brown treecreeper (*Climacteris picumnus victoriae*) – Vulnerable under BC Act;
- diamond firetail (*Stagonopleura guttata*) - Vulnerable under BC Act;
- Eastern freetail bat (*Mormopterus norfolkensis*) - Vulnerable under BC Act;

- Eastern bentwing bat (*Miniopterus schreibersii oceanensis*) - Vulnerable under BC Act;
- Eastern cave bat (*Vespadelus troughtoni*) - Vulnerable under BC Act;
- Eastern false pipistrelle (*Falsistrellus tasmaniensis*) - Vulnerable under BC Act;
- flame robin (*Petroica phoenicea*) Vulnerable under BC Act;
- greater broad-nosed bat (*Scoteanax rueppellii*) - Vulnerable under BC Act;
- grey-crowned babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*) - Vulnerable under BC Act;
- grey-headed flying fox (*Pteropus poliocephalus*) – Vulnerable under BC Act and EPBC Act
- hooded robin (south-eastern form) (*Melanodryas cucullata cucullata*) - Vulnerable under BC Act;
- large-eared pied bat (*Chalinolobus dwyeri*) - Endangered under BC Act and EPBC Act;
- large footed myotis (*Myotis adversus*) - Vulnerable under BC Act;
- little bentwing-bat (*Miniopterus australis*) - Vulnerable under BC Act;
- little eagle (*Hieraaetus morphnoides*) - Vulnerable under BC Act;
- little lorikeet (*Glossopsitta pusilla*) - Vulnerable under BC Act;
- masked owl (*Tyto novaehollandiae*) - Vulnerable under BC Act;
- regent honeyeater (*Anthochaera Phrygia*) – Critically Endangered under BC Act and EPBC Act;
- scarlet robin (*Petroica boodang*) - Vulnerable under BC Act;
- speckled warbler (*Chthonicola sagittata*) - Vulnerable under BC Act;
- spotted-tail quoll (*Dasyurus maculatus*) - Vulnerable under BC Act and Endangered under EPBC Act;
- spotted harrier (*Circus assimilis*) - Vulnerable under BC Act;
- squirrel glider (*Petaurus norfolcensis*) - Vulnerable under BC Act;
- swift parrot (*Lathamus discolor*) Critically Endangered under the BC Act and EPBC Act
- varied sitella (*Daphoenositta chrysoptera*) - - Vulnerable under BC Act;
- yellow-bellied sheath-tail bat (*Saccolaimus flaviventris*) - Vulnerable under BC Act.

3.4.4 Introduced Species

Previous surveys and inspections have identified a total of 75 introduced flora species within the BCC. This includes six species of particular importance as all are Weeds of National Significance and Priority Weeds in the Upper Hunter:

- tiger pear (*Opuntia aurantiaca*);
- creeping pear (*Opuntia humifusa*);
- common prickly pear (*Opuntia stricta* var. *stricta*);
- green cestrum (*Cestrum parqui*);
- African boxthorn (*Lycium ferocissimum*); and
- lantana (*Lantana camara*).

Other common introduced flora species include fireweed (*Senecio madagascariensis*), Africa olive (*Olea europaea subsp. Cuspidate*), Paddy's lucerne (*Sida rhombifolia*) and galenia (*Galenia pubescens*).

Similarly, a number of introduced fauna species have been recorded at the BCC, including:

- common myna (*Acridotheres tristis*);
- common starling (*Sturnus vulgaris*);
- wild dog (*Canis lupis*);
- feral cat (*Felis catus*);
- black rat (*Rattus rattus*);
- fox (*Vulpes vulpes*);
- feral pig (*Sus scrofa*);
- brown hare (*Lepus europaeus*);
- European hare (*Lepus europaeus occidentalis*);
- European rabbit (*Oryctolagus cuniculus*);
- feral goat (*Capra hircus*);
- European carp (*Cyprinus carpio*);
- rusa deer (*Cervus timorensis*).

The management of these introduced species is outlined in **Section 5.4** and **5.5** below.

Figure 4 - Soils

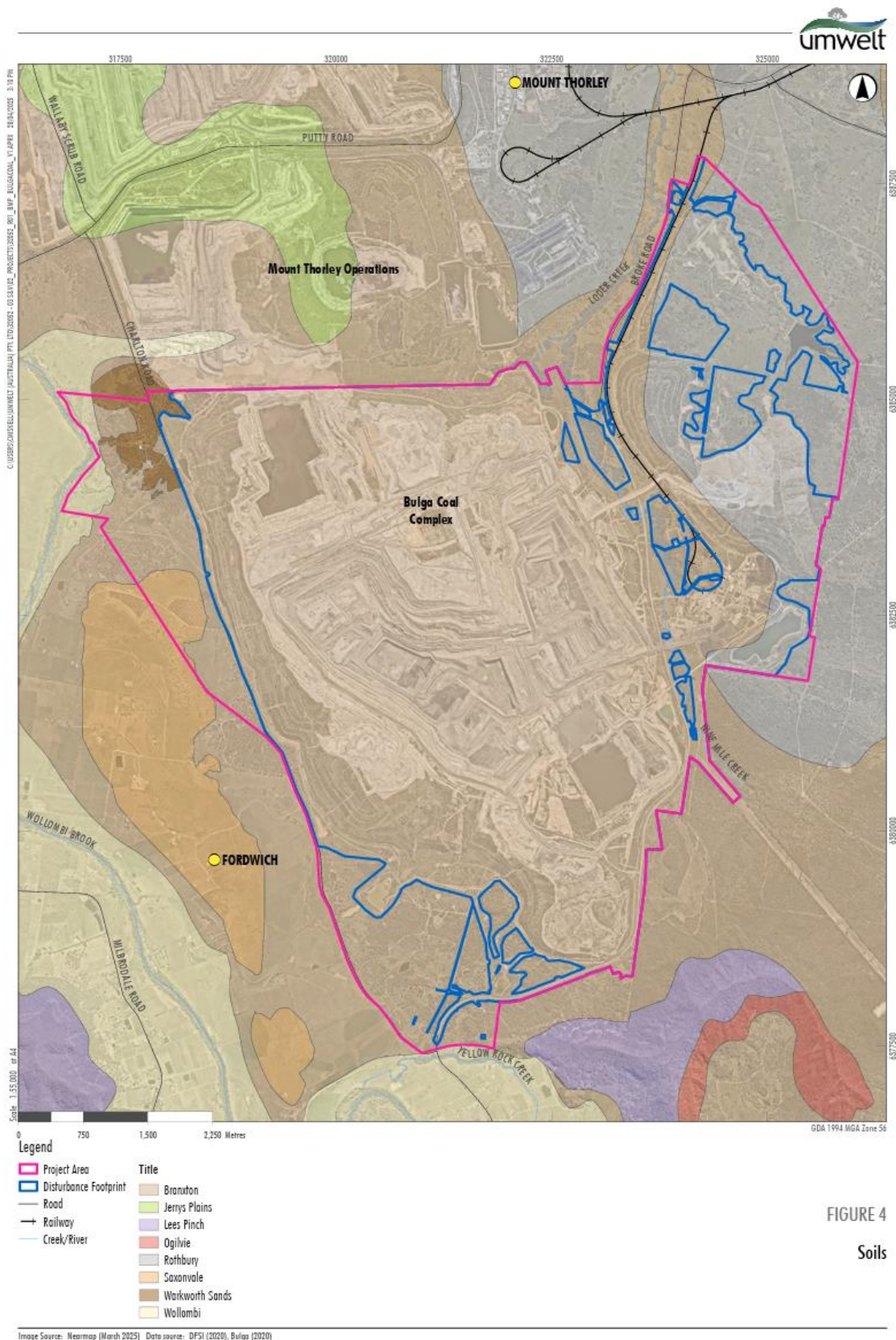


FIGURE 4
Soils

Figure 5 - Vegetation Communities

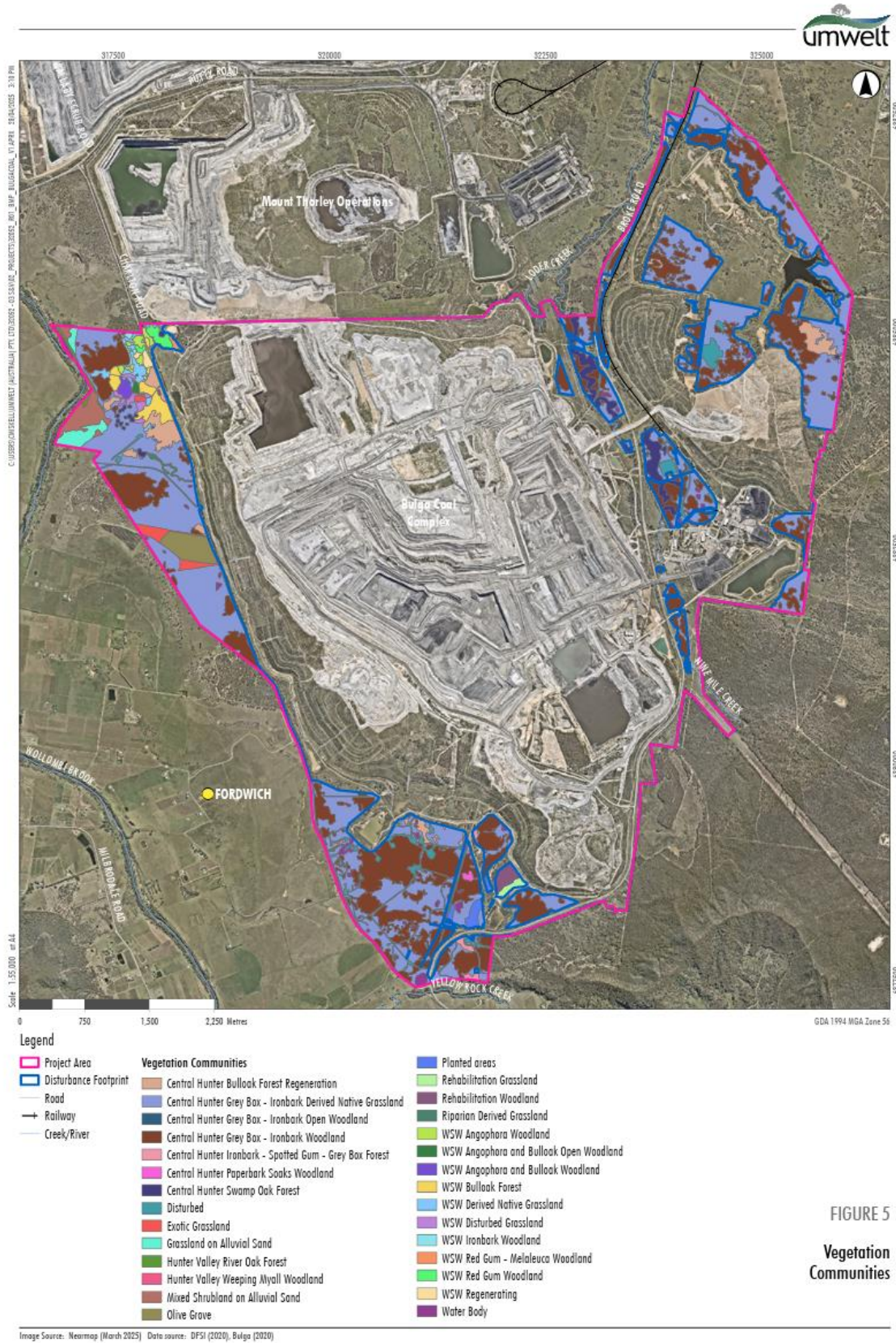


FIGURE 5
Vegetation Communities

Figure 6 - Threatened Fauna and Flora

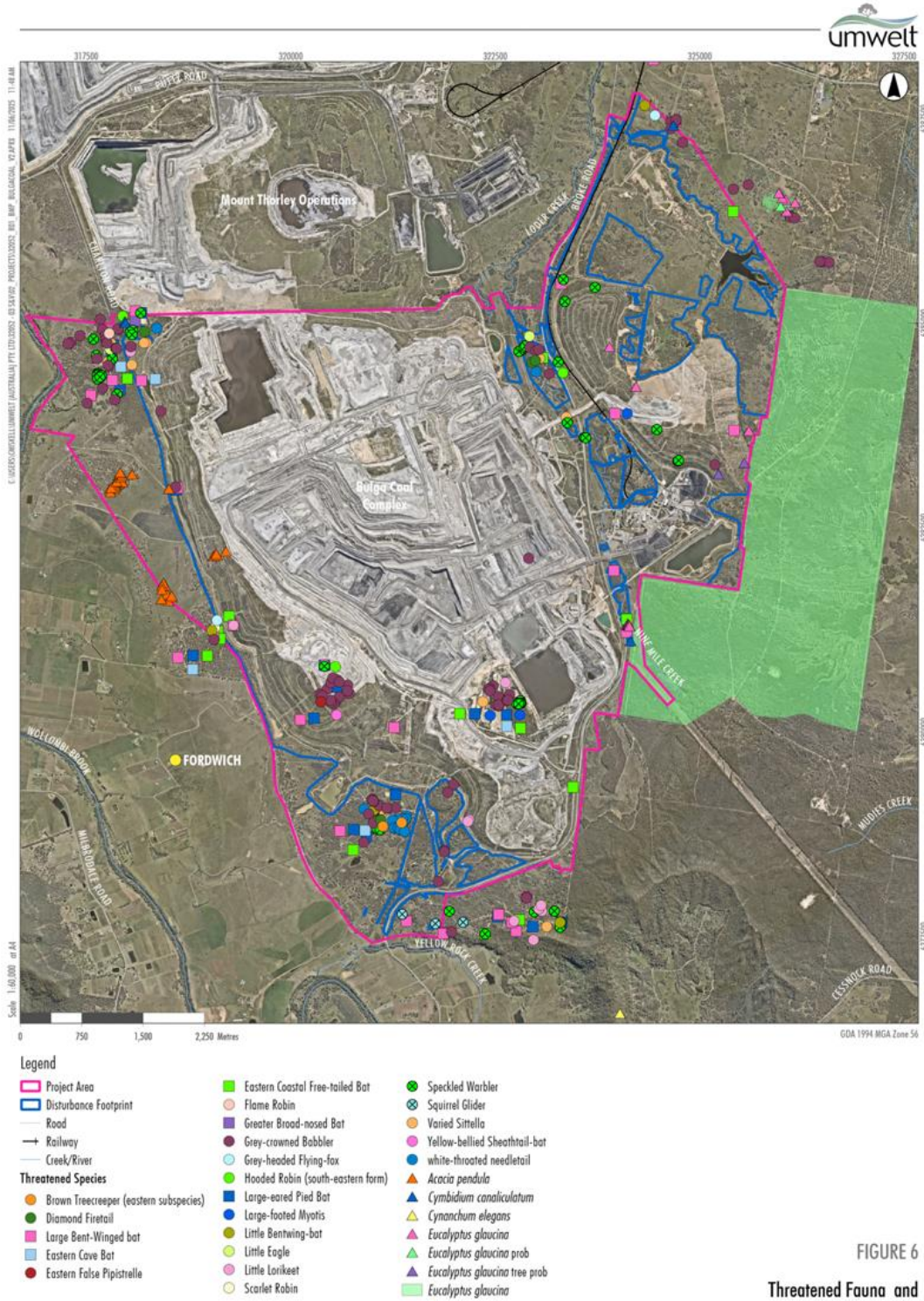


FIGURE 6
Threatened Fauna and Flora Monitoring

Image Source: Nearmap (March 2025) Data source: DFSI (2020), Bulga (2020)

4. Land Clearing

The BCC approach to land clearing is to minimise impacts to flora and fauna species as much as possible. This includes particular focus on threatened species known or with the potential to occur in the habitats of the BCC.

Any ground disturbance activities (including vegetation removal) undertaken at BCC are required to be completed in accordance with a Glencore Ground Disturbance Permit (GDP). The purpose of the GDP is to identify potential environmental or community hazards associated with the proposed scope of works, and list controls to be implemented to control and minimise the hazards. Flora and fauna considerations within the GDP include:

- presence of threatened species;
- presence of endangered ecological communities;
- restriction on felling of habitat trees; and
- re-use or stockpiling of cleared vegetation.

If hazards are identified that cannot be controlled and/or the impact is not approved, the works are not allowed to proceed. If controls can be implemented to remove or control the hazard, these are listed on the GDP and communicated to personnel involved in the works.

4.1 Clearing Procedure

Clearing of remnant native vegetation will be required for the ongoing operation of the BCC. The controls that are implemented to minimise the potential impact on surrounding flora and fauna include:

- use of the Ground Disturbance Permit for all clearing activities;
- delineation of areas to be cleared in the field;
- installation of erosion and sediment controls as required;
- pre-clearance surveys prior to clearing any native vegetation (including grasslands);
- tree-felling procedure for remnant native woodland;
- training and communication with personnel undertaking the clearing; and
- regular inspections.

The controls are utilised for all remnant native vegetation (including grasslands). Where disturbance of previous mine rehabilitation is required, pre-clearance surveys and the tree-felling procedure will not be utilised if vegetation is not of sufficient age to provide habitat to native fauna. However, resources such as topsoil and vegetation will be salvaged where appropriate.

4.2 Pre-Clearance Surveys

A detailed pre-clearance survey form (BULOC-1104430715-6038) has been developed to minimise the impact of clearing on native species (both threatened and non-threatened), as well as significant habitat features. The pre-clearance survey aims to identify significant ecological features within areas to be cleared and provide recommendations to minimise the impact of the clearing on them.

Pre-clearance surveys are required to be undertaken before areas of remnant native vegetation (including grasslands, shrublands and open woodlands) are to be cleared. The surveys are to be undertaken by suitably qualified and experienced personnel.

The purpose of the pre-clearance survey is to:

- identify and mark habitat trees;
- identify habitat resources for salvage (hollow-bearing logs etc.);
- identify presence of any threatened fauna;
- identify potential seed collection resources;
- identify any requirements for weed control to be undertaken prior to clearing;
- recommend protocols to manage any known archaeological sites; and
- identify and mark out suitable areas for topsoil and vegetation stockpiles.

4.2.1 Tree-Felling Procedure

The tree felling procedure is designed to minimise potential impacts resulting from clearing on native fauna species, particularly threatened species. The procedure is required when the clearing of remnant native vegetation is required. The procedure is documented in detail in **Appendix A** - A habitat tree-felling form (BULXC-2103827161-7647) has been developed to record the steps taken during the felling of habitat trees.

4.2.2 Resource Salvage

Resources that will be salvaged (where practical) from clearing activities include topsoil, vegetation and hollow-bearing trees/logs and native seed. These resources will be re-used in rehabilitation areas to improve revegetation outcomes and to augment habitat features.

Topsoil will be stripped from cleared areas in accordance with the procedures outlined in the Bulga Complex Rehabilitation Management Plan. Vegetation may either be mulched and incorporated into the topsoil or stockpiled separately and spread over rehabilitation areas to provide additional habitat.

Where habitat trees are felled, or significant hollow-bearing logs are identified in pre-clearance surveys, these are stockpiled separately to other vegetation stockpiles. Where appropriate habitat trees may be re-erected on rehabilitation areas, or alternatively they will be placed on the ground along with hollow-bearing logs to provide habitat for ground dwelling species.

Seed resources within areas to be cleared are identified during pre-clearance surveys. Where practical, this seed will be collected from trees after they have been felled, but prior to them being stockpiled or mulched. Collected seed will be stored and either propagated to create tubestock for rehabilitation activities or incorporated into the seed mix used on rehabilitation areas (refer to **Section 7**).

5. Land and Biodiversity Management

The following sections describe the management methods that will be implemented to manage the remnant vegetation and habitat on site at BCC. This includes vegetation within operational areas, as well as the buffer lands owned by BCC surrounding its operations. The management of the BOAs is discussed in **Section 8** and Appendix B -. All of these actions, in combination with the Bulga Complex Rehabilitation Management Plan for the post-mining areas aim to protect and enhance existing habitat on site, and to provide additional habitat as required under the approval conditions.

5.1 Grazing Management

The majority of the land owned by BCC has been destocked to facilitate the regrowth of woodland vegetation and to enhance biodiversity values. However, some buffer land owned by BCC is leased to external parties for cattle agistment.

Where cattle will continue to be grazed on BCC buffer land, formal lease agreements will be maintained with entities undertaking the grazing activities. These agreements will have strict guidelines relating to overgrazing and care will be taken to avoid overstocking which may lead to land degradation and erosion, as well as weed control. Regular inspections will be undertaken on all grazed properties.

Further details regarding the management of cattle on and surrounding the BOAs is provided in Appendix B -. Briefly, the controls to be implemented include:

- cattle will be removed from all BOA areas where regeneration of native ecosystems is the primary objective;
- where practical, cattle will be removed from Glencore owned properties surrounding the BOA's to reduce the potential for cattle to access these areas;
- regular inspections will be undertaken of all fences and gates to reduce the potential for unintended cattle access onto BOAs; and
- where grazing is a secondary objective of the BOA (e.g. Reedy Valley), strict controls will be implemented to limit cattle to a permitted area.

5.2 Erosion and Sediment Control

Erosion and sedimentation issues may arise as the result of ground disturbance, vegetation removal, overstocking of cattle and from mine subsidence impacts. Erosion and sediment impacts will be managed in accordance with the strategies outlined in the BCC Erosion and Sediment Control Plan and the BCC Erosion and Sediment Control Procedure. The main controls outlined in this plan include:

- completion of a Ground Disturbance Permit prior to any land disturbance;
- temporary erosion and sediment controls to be in place prior to any construction activity outside of an existing dirty water management system;
- use of diversion structures to separate 'clean' water runoff from disturbed areas runoff, to minimise volumes of sediment-laden and mine water for management;
- using designated sediment control devices to control sediment-laden runoff;
- revegetation of disturbed areas as soon as possible following the completion of construction activities; and

- timely rehabilitation of subsided ground as required.

There are currently no major erosion issues on BCC buffer lands that require remediation or management. In the event that issues are identified, they will be managed in accordance with the plans described above.

Additionally, regular inspections are undertaken of all non-mining land to identify potential erosion issues, particularly along drainage lines.

Permanent photo monitoring points will be established at each area where there is significant erosion. In such areas, additional monitoring methods will be considered and may include drone surveys, use of LIDAR or other similar methods.

5.3 Salinity Management

The BCC has established both dirty and mine water systems to prevent environmental harm from sediment laden or saline water runoff. All areas that are exposed to runoff from coaly or other saline material are managed as part of the mine water system. This is a closed system which prevents the release of saline water to the surrounding environment unless through a licensed discharge in accordance with the Hunter River Salinity Trading Scheme (HRSTS). Water from this system is not used for any purposes outside of the system (e.g. saline water is not used for dust suppression on roads outside of the mine water system).

There are currently no salinity issues identified on BCC buffer lands.

5.4 Weed Management

As outlined in **Section 3.4.4**, several Weeds of National Significance have been recorded at BCC. These include tiger pear (*Opuntia aurantiaca*), creeping pear (*Opuntia humifusa*), common prickly pear (*Opuntia stricta* var. *stricta*), green cestrum (*Cestrum parqui*), African boxthorn (*Lycium ferocissimum*), African olive (*Olea europaea* subsp. *cuspidate*) and lantana (*Lantana camara*) (**Figure 8**).

The Operational Weed Management Action Plan 2024-2028 for each offset identifies the key weed areas that require treatment, and the recommended timeframes and methods for control, based on the type of weeds present. Weed control is performed in accordance with this, along with any weeds identified in the biannual offset inspections and annual ecological monitoring reports.

Figure 7 - Existing Weed Locations

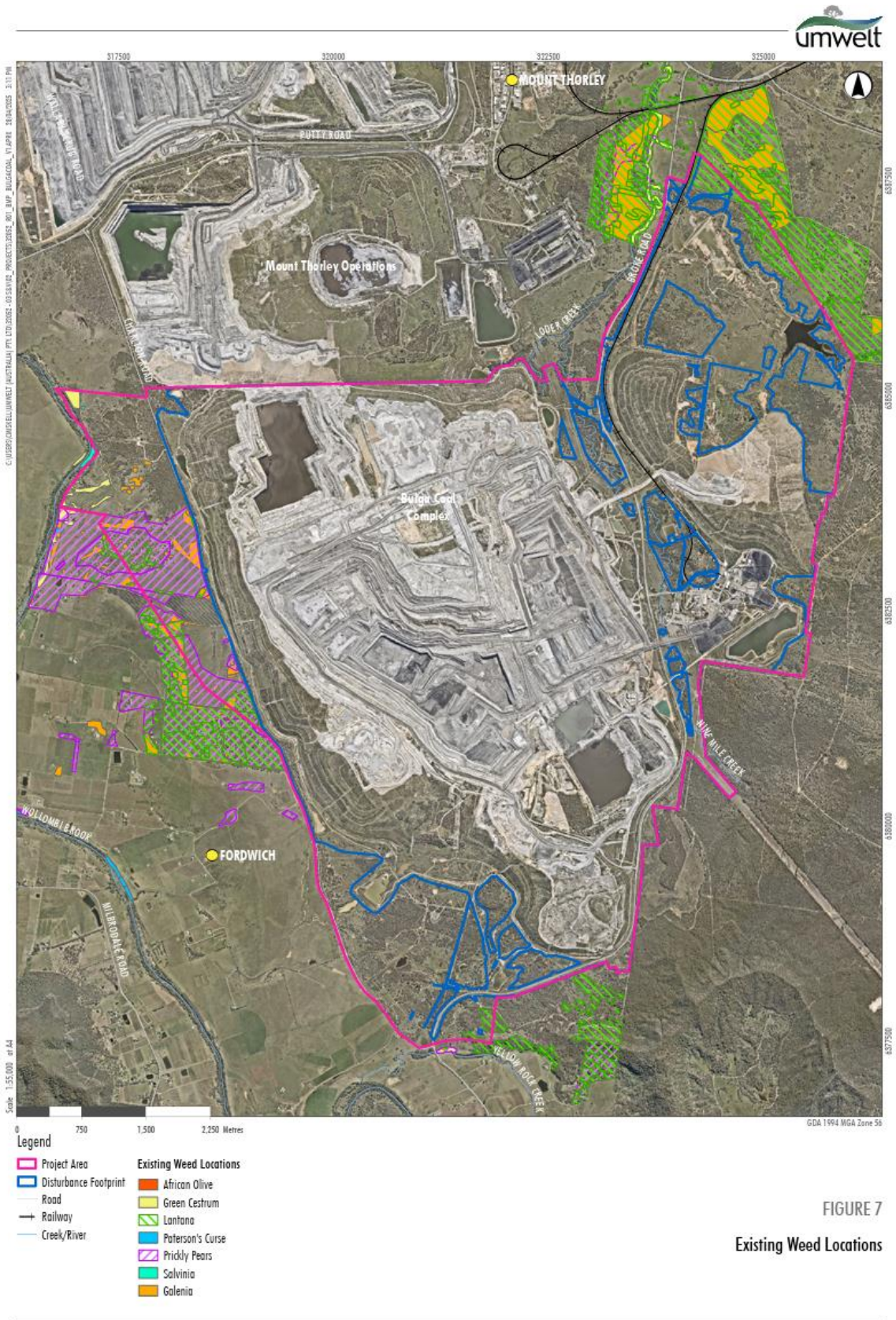


FIGURE 7
Existing Weed Locations

5.5 Feral Animal Control

Section 2.5.45.5 identifies the feral animals which have been observed at BCC, including:

- common myna (*Acridotheres tristis*);
- common starling (*Sturnus vulgaris*);
- wild dog (*Canis lupis*);
- feral cat (*Felis catus*);
- black rat (*Rattus rattus*);
- fox (*Vulpes vulpes*);
- feral pig (*Sus scrofa*);
- brown hare (*Lepus europaeus*);
- European hare (*Lepus europaeus occidentalis*);
- European rabbit (*Oryctolagus cuniculus*);
- feral goat (*Capra hircus*);
- European carp (*Cyprinus carpio*);
- rusa deer (*Cervus timorensis*).

Wild dogs, feral cats, foxes and pigs are of key concern as they can predate on native fauna, and also out-compete native fauna for resources.

The presence of feral animals is identified through ecological monitoring programs and regular inspections of non-mining land. Opportunistic sightings of feral animals within operational areas are also reported to the Environment and Community Department.

Licensed contractors are engaged to conduct a biannual wild dog and fox baiting program in autumn and spring. The baiting program is designed to target areas where wild dogs and foxes have been observed. Additional culling and trapping exercises for other pest animals (e.g. pigs, kangaroos etc.) are conducted as recommend by monitoring. Where possible these exercises will be coordinated with adjoining landowners (Mt Thorley Warkworth and the Department of Defence) to maximise the benefits of the programs. Feral animal control is undertaken in accordance with the relevant NSW and Federal legislative requirements with feral animal control designed to have the least impact on native wildlife. The scope and effectiveness of these programs will be reported annually in the Annual Review.

5.6 Habitat Enhancement

The protection and enhancement of the habitat within the non-impacted remnant areas of the BCC will contribute greatly to increasing the quality and quantity of fauna habitat with the site. BCC has subsequently developed a habitat enhancement program to focus on increasing the habitat available

for threatened species within non-impacted remnant vegetation. The long-term aim of this program is to restore the level of fauna habitat present prior to mining operations.

This program involves the installation of nest boxes as well as the relocation of hollow bearing logs/trees and other habitat features such as fallen timber and boulders. Due to the ability of nest boxes to provide habitat for specific species, nest boxes are the most favoured approach for habitat enhancement. To date, BCC has installed 721 nest boxes throughout the target habitat enhancement areas.

Further installation may be undertaken in response to ecological monitoring report recommendations. Nest boxes installed will be targeted towards hollow-dependent (or potentially hollow-using) threatened fauna species, such as the following (which have been recorded in the BCC):

- brown treecreeper (*Climacteris picumnus victoriae*);
- Eastern freetail-bat (*Mormopterus norfolkensis*);
- Eastern bentwing-bat (*Miniopterus schreibersii oceanensis*);
- Eastern false pipistrelle (*Falsistrellus tasmaniensis*);
- greater broad-nosed bat (*Scoteanax rueppellii*);
- large-footed myotis (*Myotis adversus*);
- little lorikeet (*Glossopsitta pusilla*);
- masked owl (*Tyto novaehollandiae*);
- squirrel glider (*Petaurus norfolcensis*);
- yellow-bellied sheath-tail-bat (*Saccolaimus flaviventris*).

Appropriately designed and maintained nest boxes will also benefit a number of other non-threatened species.

The areas that will be targeted for habitat enhancement are shown on Figure 8. This program will complement the habitat enhancement being undertaken on rehabilitation areas (refer to **Section 7**).

Additionally, the 2003 Bulga Underground Continued Operations EIS (Umwelt, 2003) committed to the progressive establishment of habitat corridors throughout the life of the operation. The aim of these corridors was to link the areas of remnant vegetation in the Singleton Military Training Area (SMTA) to riparian vegetation along Wollombi Brook. As a result of the BOP, the majority of the BOC area will be rehabilitated to woodland vegetation (refer to **Section 7**), creating a significantly larger corridor between the SMTA and Wollombi Brook. Additionally, a large portion of this rehabilitation will have commenced within the first four years of the project (i.e. the noise and visual bund). Therefore these habitat corridors will no longer be established as originally designed, but will be integrated into the larger BOC rehabilitation and habitat enhancement programs.

Figure 8 - Potential Habitat Enhancement Area

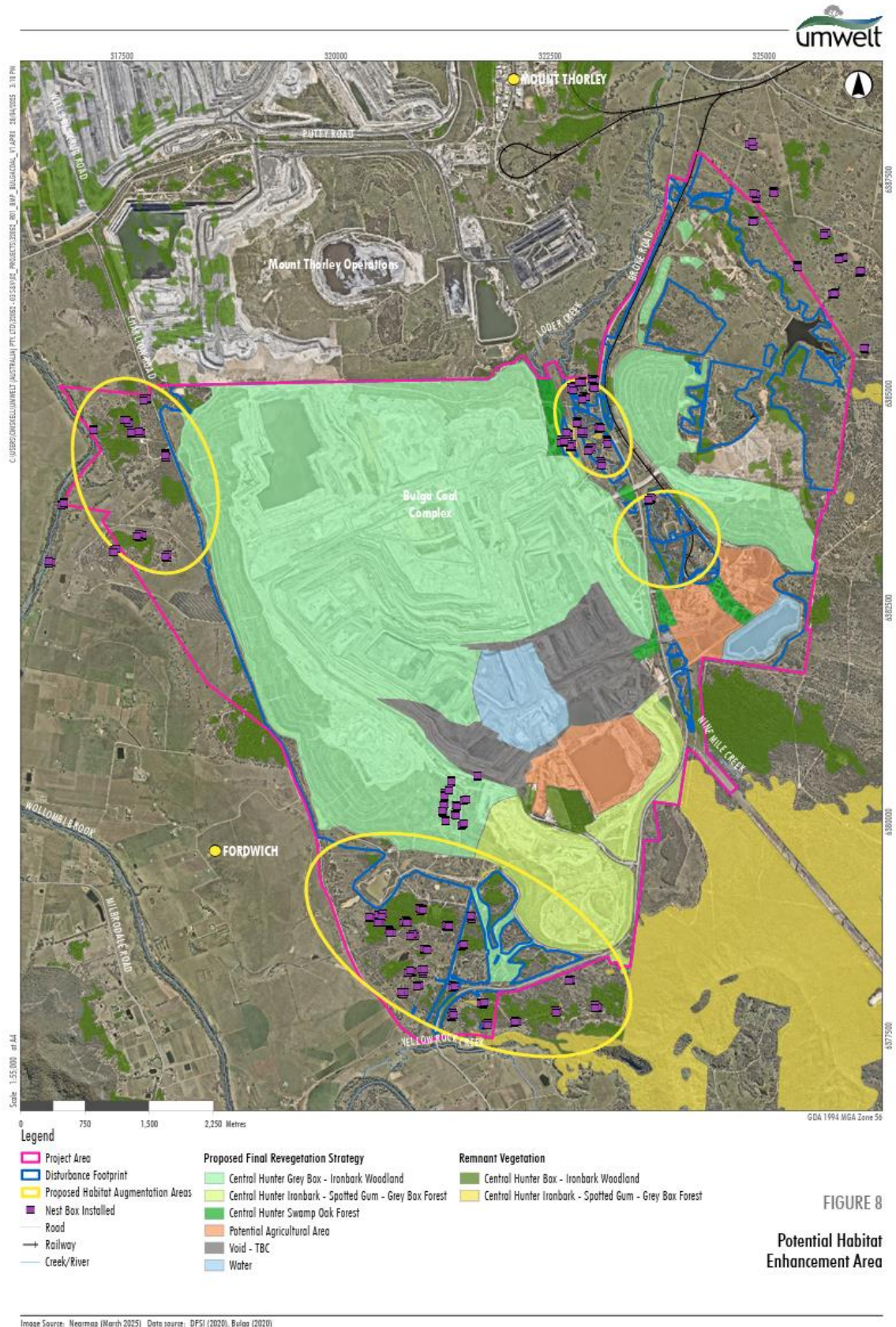


FIGURE 8
Potential Habitat Enhancement Area

5.7 Bushfire Management

Appropriate bushfire management is required to protect life and property, while providing necessary protection to the ecological features of the area. BCC has developed a Bushfire Management Plan in consultation with the NSW Rural Fire Service (RFS). The RFS also conduct inspections of the BCC when required and provide advice regarding the ongoing bushfire management of the site.

Bushfire management controls undertaken on an annual basis include slashing of boundary fences to provide fire-breaks and access points, maintenance of fire trails and fuel load assessments. These are completed in August-September prior to the start of the bushfire season.

If controlled burning is requested/initiated by the RFS on surrounding land, BCC will assist where possible in maintaining similar fire regimes within the BCC site. However, any controlled burning will take into account the following factors:

- exclusion of bushfire from rehabilitation, revegetation and regeneration areas to allow replanted and regenerating communities to mature to a stage where they are able to withstand bushfire and regenerate naturally following such an event;
- consideration of known records of threatened species, endangered populations and EEC's; and
- asset and livestock protection.

The bushfire management of the BOAs is outlined in Appendix B -.

5.8 Fencing/Prevention of Unauthorised Access

The external boundaries of the BCC have been fenced to exclude stock and to protect from unauthorised access and disturbance. Annual inspections of the BCC will include an inspection of all external fences and gates, and any damaged areas will be repaired as soon as feasible.

Unauthorised access into buffer lands and remnant vegetation has the potential to impact on the biodiversity values of these areas through:

- unauthorised clearing;
- illegal waste dumping;
- weed invasion;
- erosion and sedimentation; and
- native fauna injury.

Areas of remnant vegetation surrounding the mining operations are fenced and all external gates are locked to prevent unauthorised access. Signage has been installed on all access points as needed and is inspected biannually. Regular inspections are undertaken of fence lines and gates to identify any unauthorised access and repairs are undertaken as needed.

5.9 Conflict between Biodiversity Areas and Areas of Significant Aboriginal Heritage Values

The BOAs detailed in this document contain, or have the potential to contain, areas of significant Aboriginal heritage. In particular, the Wollombi Brook Conservation Area was initially established as an offset for Aboriginal heritage purposes. The objectives of biodiversity conservation and cultural heritage protection may present conflicts where ground disturbance works are required for active regeneration works, or access is required into culturally sensitive areas. The strategies that will be implemented to manage these conflicts for each individual BOA are outlined in Appendix B -.

Conflicts may also be presented in remnant vegetation areas where maintenance or enhancement works are proposed within Aboriginal heritage areas. For these areas, potential conflicts will be managed through the Ground Disturbance Permit process which will identify Aboriginal heritage sites/areas within proposed work areas. Where Aboriginal heritage sites occur, the first preference will be to relocate the proposed maintenance or enhancement works. Where this cannot be achieved, impacts on the heritage sites will be managed in accordance with the BCC Aboriginal Cultural Heritage Management Plan (ACHMP).

5.10 Riparian Vegetation

Previous underground mining at BUO caused minor impacts along the Northern and Southern Drainage Lines, and other minor unnamed drainages. Stream health and channel stability monitoring will be undertaken annually at the Northern and Southern Drainage Lines to assess any impacts associated with mining activity. Should any mining related impacts be identified, assessments will be undertaken to determine if remedial works and/or enhancement of these areas with native vegetation are required to maintain surface flow, prevent flooding, maintain existing vegetation types and maintain a landform consistent with the surrounding environment. Where remediation has the potential to create more disturbance than the ponding, these aquatic habitats will continue to be monitored for change.

6. Rehabilitation

Rehabilitation of disturbed land is described in detail in the Bulga Complex Rehabilitation Management Plan (RMP). This document outlines the detailed objectives for each mine closure domain, mine rehabilitation methodology and detailed monitoring program. This information has been summarised in the sections below, with further information relating to interactions with this document provided (e.g. re-use of natural resources on rehabilitation areas).

6.1 Rehabilitation Objectives and Criteria

In accordance with SSD-4960 and DA 376-8-2003 Bulga Coal will:

- a) Rehabilitate the site in accordance with the conditions imposed on the mining lease(s) associated with the development under the *Mining Act 1992*;
 - b) Rehabilitate the site generally consistent with and the Rehabilitation Management Plan; and
- Rehabilitate all parts of the site to comply with the rehabilitation objectives in **Table 6.1**.

Table 6.1 Development Consent Rehabilitation Objectives for Bulga Coal

Feature	Objective
SSD-4960	
Mine site (as a whole)	<ul style="list-style-type: none"> • Safe, stable and non-polluting • Final landform to: <ul style="list-style-type: none"> - Be designed to minimise the visual impacts of the development; - Be in keeping with the natural terrain features of the area; - Be integrated with the rehabilitated landforms of surrounding mines; - Incorporate macro-relief and micro-relief and drainage features that mimic natural topography and mitigate erosion, to the greatest extent practicable; - Avoid straight run drainage drop structures; - Minimise long term ground water seepage; - Minimise exposure of tailings material and prevent the occurrence of spontaneous combustion; and - Be sustainable and compatible with surrounding land uses.
Final void	<ul style="list-style-type: none"> • Designed as long term groundwater sinks and to maximise groundwater flows across back-filled pits to the final void; • Minimise: <ul style="list-style-type: none"> - The size and depth of final voids; - The drainage catchment of final voids; - Any high wall instability risk; - Risk of flood interaction for all flood events up to and including the Probable Maximum Flood.
Revegetation	<ul style="list-style-type: none"> • Restore self-sustaining ecosystems that meet the requirements of the Rehabilitation Area in the Biodiversity Offset Strategy in condition 29 of Schedule 3, plus re-instate at least an additional 121 hectares (ha) of Central Hunter Grey Box-Ironbark Woodland EEC; • Establish native vegetation areas that complement and improve local and regional biodiversity.
Agricultural land	<ul style="list-style-type: none"> • Return at least 260 ha of land within the project disturbance area to be suitable for agricultural use.
Surface Infrastructure	<ul style="list-style-type: none"> • To be decommissioned and removed, unless RR agrees otherwise.
Community	<ul style="list-style-type: none"> • Ensure public safety; • Minimise the adverse socio-economic effects associated with mine closure.
DA 376-8-2003	
Mine site (as a whole)	<ul style="list-style-type: none"> • Mine site is to be safe, stable and non-polluting • Final land use compatible with surrounding land uses
Surface Infrastructure	<ul style="list-style-type: none"> • To be decommissioned and removed, unless the Executive Director Mineral Resources agrees otherwise.

Feature	Objective
Portals and vent shafts	<ul style="list-style-type: none"> To be decommissioned and made safe and stable. Consider opportunities to retain habitat for threatened species (e.g. bats), where practicable
Watercourses subject to subsidence impacts	<ul style="list-style-type: none"> Hydraulically and geomorphologically stable, with riparian vegetation that is the same or better than prior to mining
Land to be restored or maintained for agricultural purposes	<ul style="list-style-type: none"> Restored and maintained to: <ul style="list-style-type: none"> the same or higher land capability and agricultural suitability than prior to mining; and a landform consistent with the surrounding environment, including no greater than minor changes to flooding characteristics or ponding.
Other land	<ul style="list-style-type: none"> Restore ecosystem function, including maintaining or establishing self-sustaining eco-systems comprised of: <ul style="list-style-type: none"> local native plant species (unless the RR agrees otherwise); and a landform consistent with the surrounding environment, including no greater than minor changes to flooding characteristics or ponding.
Built features damaged by mining operations	<ul style="list-style-type: none"> Repair to pre-mining condition or equivalent unless: <ul style="list-style-type: none"> the owner agrees otherwise; or the damage is fully restored, repaired or compensated for under the <i>Coal Mine Compensation Act 2017</i>.
Community	<ul style="list-style-type: none"> Ensure public safety; minimise the adverse socio-economic effects associated with mine closure.

Domain specific rehabilitation objectives as approved by the Resources Regulator are included in the RMP. Proposed completion criteria, pending approval by the Resources Regulator are also included in detail in the RMP.

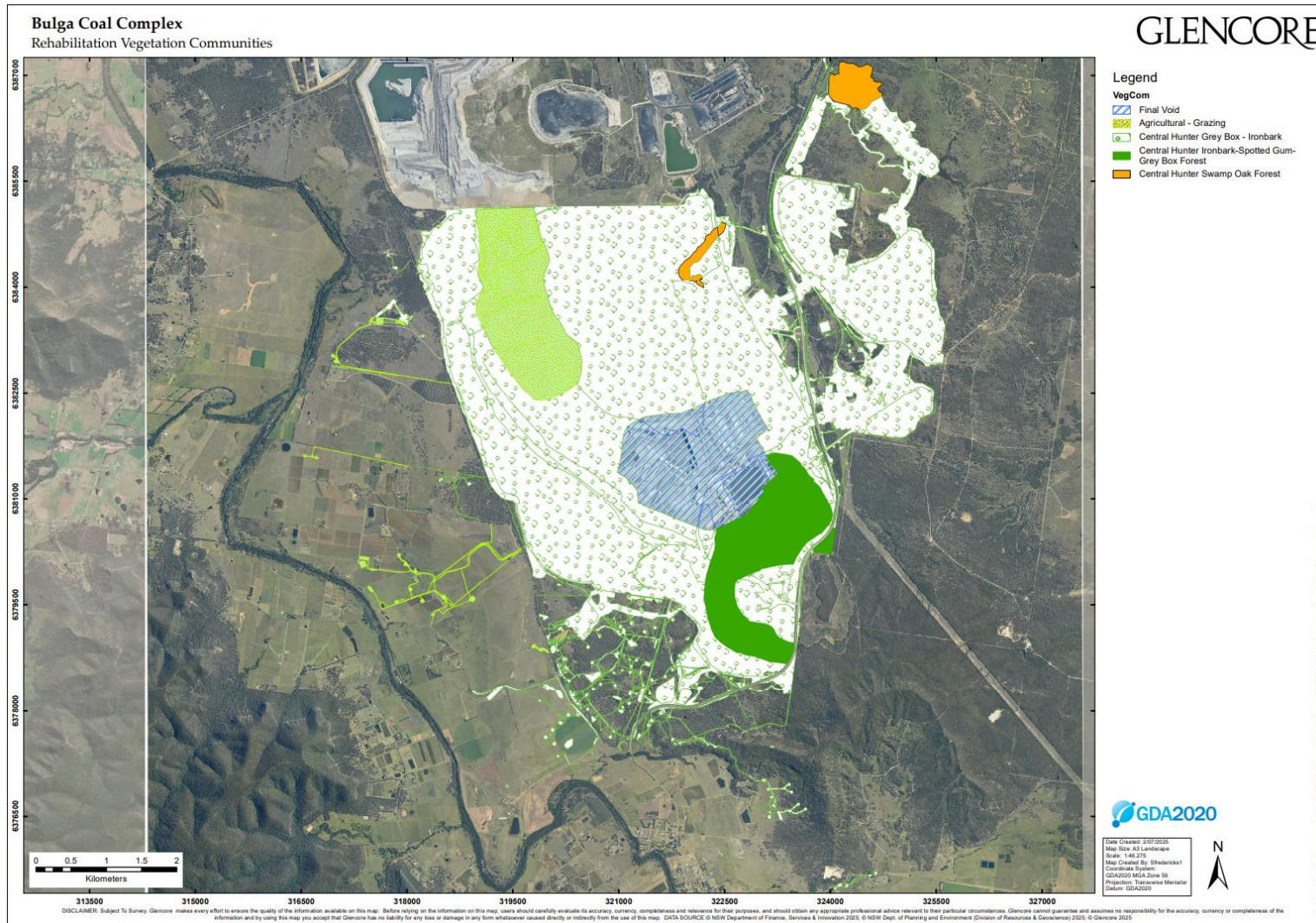


Figure 9 – Indicative Rehabilitation Vegetation Communities

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Effective:

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Owner Coordinator - Environment & Community

Version:

Review:

Uncontrolled unless viewed on the intranet

The criteria themselves have been developed using analogue sites from remnant vegetation which form part of the rehabilitation monitoring program. An assessment of each rehabilitation area against the criteria is made on an annual basis as part of the monitoring program. This assessment is reported annually in the BCC Annual Review.

6.2 Rehabilitation Methodology

The rehabilitation methodology for both BOC and BUO are outlined in detail in the Bulga Complex Rehabilitation Management Plan. Generally, rehabilitation involves the following processes:

- shaping of disturbed areas to meet approved landform;
- backfilling and repair to subsidence cracking;
- installation of drainage structures;
- deep ripping;
- rock raking;
- installation of habitat features (e.g. stag trees, woody debris);
- spreading of topsoil and/or organic matter;
- application of ameliorants;
- re-ripping of prepared surface; and
- revegetation.

As outlined in **Section 5.2**, topsoil and vegetation that has been cleared ahead of mining activities will be re-spread over rehabilitation areas to provide a more beneficial growth medium for revegetation, as well as habitat for native fauna. Habitat trees and hollow-bearing logs will also be salvaged and re-used on rehabilitation areas for habitat augmentation.

Revegetation activities will generally involve direct seeding of native woodland ecosystems using a combination of seed collected from on site, as well as that purchased from external sources. Tubestock may also be utilised in some circumstances to augment the revegetation process. The native vegetation communities that will be re-established (and the total area of each over the life of the BCC) include:

- Central Hunter Grey Box – Ironbark Woodland (minimum of 2,200 ha);
- Central Hunter Ironbark – Spotted Gum – Grey Box Forest (minimum of 250 ha); and
- Central Hunter Swamp Oak Forest (minimum of 50 ha).

The arrangement of these communities within rehabilitation areas will aim to replicate the surrounding remnant vegetation. For example, Central Hunter Swamp Oak Forest will be targeted along the rehabilitated drainage lines and the Central Hunter Ironbark – Spotted Gum – Grey Box Forest will be targeted located along the southern and eastern perimeters of the site where that community is more prevalent. The indicative locations of these communities in the rehabilitated landscape are shown on Figure 9.

Relevant findings from the completed Hunter Ironbark Research Program have been incorporated into BCC processes, particularly the rehabilitation methodology. These will be reported in the Annual Review, or subsequent revisions to this BMP or the Rehabilitation Management Plan.

6.3 Active Regeneration in BOAs

The Biodiversity Offset Strategy outlined in **Section 8** requires the regeneration of derived native grasslands in most BOAs. In all cases, it is proposed to use regular monitoring to evaluate the effectiveness and appropriateness of natural regeneration processes rather than assisted regeneration. This method is preferred as active regeneration has the potential to introduce weed species through ground disturbance, and cause erosion. Further information regarding the proposed regeneration programs for each BOA is provided in Appendix B -. and the results of the monitoring programs will be reported in the Annual Review.

7. Biodiversity Offset Strategy

7.1 Overview

A detailed Biodiversity Offset Strategy was developed as part of the BOP EIS (Umwelt 2013) and subsequent approvals to compensate for impacts on the species, vegetation communities and ecological features that will be impacted by the ongoing operations at BCC. The objectives of the biodiversity offset strategy are to:

- provide offsets that contain as many as possible of the threatened vegetation communities, endangered flora populations, threatened flora species and threatened fauna species impacted by the BCC, particularly;
 - regent honeyeater
 - swift parrot;
 - large-eared pied bat; and
 - slaty red gum
- provide offsets that are strategically located, either close to the area of impact or in a regionally significant position;
- provide offsets in which an environmental gain can be made via appropriate management strategies;
- secure offsets in perpetuity;
- to develop a management strategy for the positive environmental management of the proposed offset sites, but with appropriate consideration of the existing rural nature of the area;
- as a minimum provide offsets that have the same ecological value as the residual impacts of the ongoing operations on threatened vegetation communities, endangered flora populations, threatened flora species and threatened fauna species; and
- where possible provide offsets that exceed the ecological value of the residual impacts of the BCC on threatened vegetation communities, endangered flora populations, threatened flora species and threatened fauna species.

The biodiversity offset strategy required as part of the current approvals comprises the following offsets:

- Reedy Valley Offset Area – 1,486 ha;
- Broke Road Offset Area – 241 ha;

- Wollombi Brook Conservation Area – 65 ha;
- Condran Biodiversity Offset Area – 50 ha;
- The Vere Offset Area – 153.7 ha: and
- Rehabilitation Areas – 2,500 ha (refer to **Section 7**).

Conservation Agreements (under the *National Parks and Wildlife Act (1974)*) have been finalised to secure Reedy Valley, Broke Road, Wollombi Brook and Condran BOAs in perpetuity. These were finalised in 2019, thus making that year 1 of their operation. A Stewardship Agreement (under the BC Act) was approved for The Vere BOA in 2023. The first payment was received in July 2024 triggering year 1 of operation.

The Weeping Myall Management Areas do not form part of the biodiversity offset strategy, however have been established to conserve and manage two stands of weeping myall (*Acacia pendula*) located on the western side of the BCC.

In addition to the offsets required by the BOC development consent (SSD-4960), Condition 43A of the BUO development consent (DA 376-8-2003 Mod 5) requires the establishment of offset areas for 5.34 ha of Central Hunter Grey Box – Ironbark Woodland and 23.71 ha of Central Hunter Grey Box – Ironbark Derived Native Grassland. These offsets have been incorporated into the Broke Road Offset area, as discussed in **Section 8.3**.

The locations of these offset areas are shown on Figure 10 and discussed in further detail in the sections below.

7.1.1 Risks to the Biodiversity Offset Strategy

A list of the risks and issues that may impact on the ability of BCC to successfully implement the Biodiversity Offset Strategy includes:

- Failure to meet government and community guidelines and expectations;
- Failure to meet performance criteria for BOAs;
- Insufficient resourcing to implement the biodiversity offset strategy;
- Unauthorised clearing within BOAs;
- Lack of availability of locally occurring species to be either seeded or planted in rehabilitation or regeneration areas;
- Loss of biological resources (topsoil, hollows, seed) for use in rehabilitation;
- Poor spoils/substrate material inhibiting plant establishment and growth;
- Inadequate landform design leading to unstable landform;
- Weed infestation within BOAs and rehabilitation areas;
- Feral animal species within BOAs and rehabilitation areas;
- Grazing of cattle within prohibited areas;
- Erosion and sedimentation of BOAs; and
- Unauthorised access into BOAs and rehabilitation areas.

The mitigation measures that will be implemented to address these risks are outlined in the sections below and the individual management strategies for each BOA (Appendix B -).

Figure 10 - Offset Areas

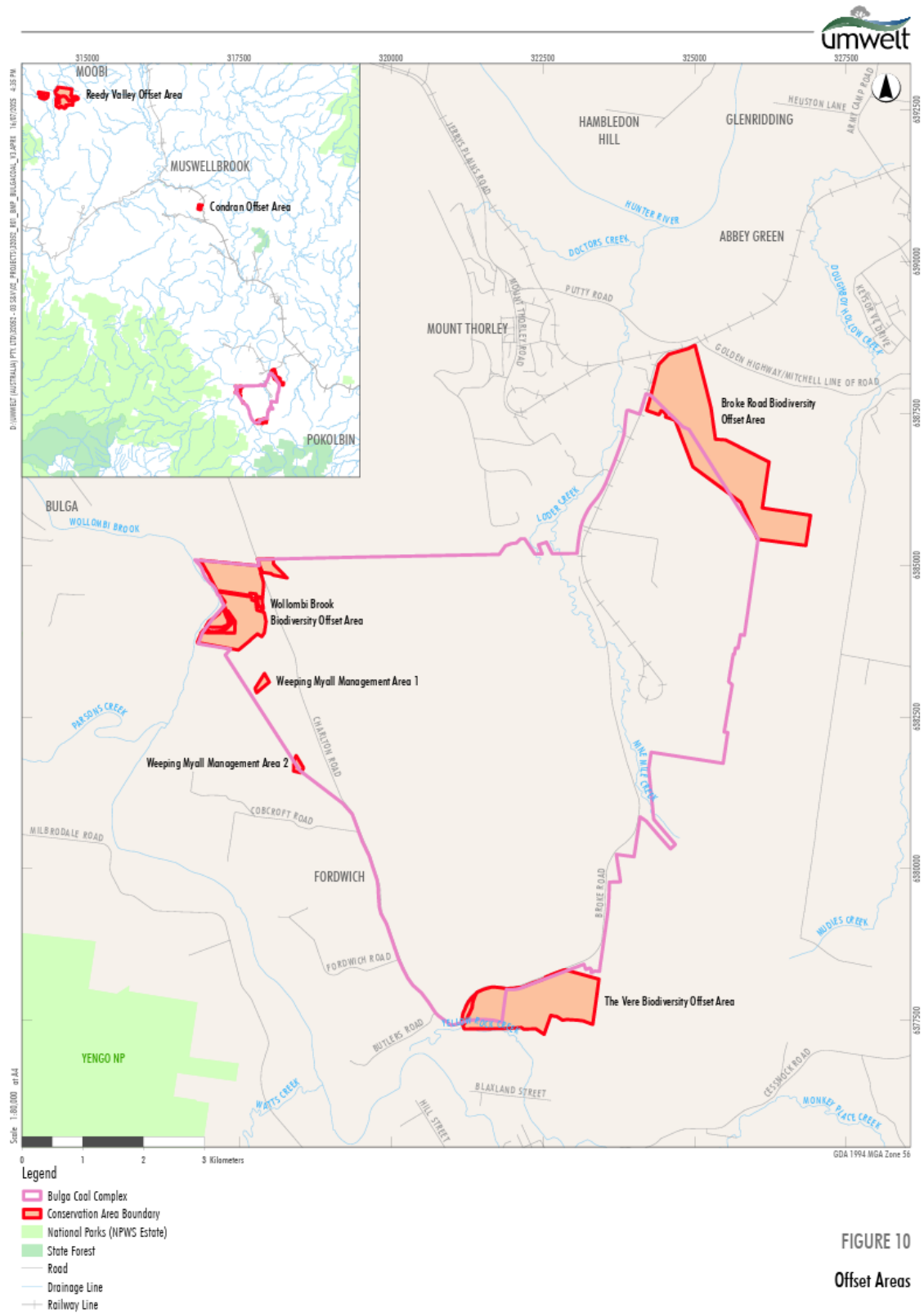


Image Source: Data source: Geoscience Australia, Forestry Corporation of NSW (2019), DSFI (2017), NPWS Estate (2019)

7.2 Condran BOA

During November 2009, BOC received a modification to DA 41-03-99 which permitted the construction of a 3GL water storage dam adjacent to the BCC CHPP. Construction of the dam involved the clearing of approximately 20 ha of Central Hunter Grey Box – Ironbark Woodland community and one hectare of Forest Red Gum Woodland. Subsequently, the modified development consent required the establishment of at least 20 ha of ‘Hunter Box – Ironbark Woodland.

Following discussions with OEH the Condran Property at Antiene, just north of Lake Liddell and 10 km south-east of Muswellbrook (refer to Figure 10), was purchased to offset the 20ha of Central Hunter Grey Box – Ironbark Woodland. The Condran BOA consists of the following vegetation communities outlined in Table 7.1.

Table 7.1 – Condran BOA Vegetation Communities

Vegetation Community	Legal Status	Area (ha)
Central Hunter Ironbark – Spotted Gum – Grey Box Forest	EEC (BC) CEEC (EPBC)	19.5
Central Hunter Ironbark – Spotted Gum – Grey Box Forest (Red Gum variant)	EEC (BC)	5.5
River-flat Eucalypt Forest	EEC (BC)	4.5
Derived Native Grassland	-	20.5
TOTAL		50

One threatened flora species, the pine donkey orchid (*Diuris tricolor*) has been recorded in the BOA. This species is listed as vulnerable under the BC Act, and forms part of the Muswellbrook LGA endangered population of the species. Thirteen threatened fauna species have also been recorded and comprise five micro-bats and five bird species including;

- Eastern bentwing-bat (*Miniopterus orianae oceanensis*);
- Eastern cave bat (*Vespadelus troughtoni*);
- greater broad-nosed bat (*Scoteanax rueppellii*);
- grey-crowned babbler (*Pomatostomus temporalis temporalis*);
- large-eared pied bat (*Chalinolobus dwyeri*);
- little lorikeet (*Glossopsitta pusilla*);
- scarlet robin (*Petroica boodang*);
- Southern myotis (*Myotis macropus*);
- speckled warbler (*Pyrrholaemus sagittatus*);
- square-tailed kite (*Lophoictinia isura*);
- spotted-tail quoll (*Dasyurus maculatus*);
- squirrel glider (*Petaurus norfolcensis*); and
- varied sittella (*Daphoenositta chrysoptera*).

The long-term targets for the Condran BOA include the restoration of at least 6.9 ha of Central Hunter Ironbark – Spotted Gum - Grey Box Forest.

The Condran Biodiversity Offset Management Plan (**Appendix B -**) has been developed to document the management strategies, monitoring programs and initial performance criteria for the BOA. The results of the monitoring program, as well as a detailed description of works undertaken for this BOA will be reported annually in the BCC Annual Review.

7.3 Broke Road BOA

The Broke Road BOA is located at the northern end of Broke Road and adjoins the northern and north-eastern boundary of the BOP Project Area (refer to Figure 10). The Broke Road BOA is approximately 251 ha in area and is dominated by derived native grasslands with smaller areas of woodland and open woodland. Of the total 251 ha, 241 ha is required under the BOP and 10 ha is designated as an offset to satisfy the approval conditions for the Blakefield North Project.

The Broke Road BOA includes the following key ecological elements:

- threatened ecological community (TEC);
- habitat for threatened flora species; and
- habitat for threatened fauna species.

A summary of the vegetation communities that have been recorded on the Broke Road BOA are outlined in Table 7.2 below.

Table 7.2 – Broke Road BOA Vegetation Communities

Vegetation Community	Legal Status		Broke Road Offset Property (ha)
	BC	EPBC	
Central Hunter Grey Box - Ironbark Woodland	EEC	CEEC	24
Central Hunter Grey Box - Ironbark Open Woodland	EEC	-	22
Central Hunter Grey Box - Ironbark Derived Native Grassland	-	-	196
Central Hunter Swamp Oak Forest	-	-	2
Disturbed Land	-	-	3.6
Water bodies	-	-	3.4
Total			251

Two threatened flora species, slaty red gum (*Eucalyptus glaucina*) and tiger orchid (*Cymbidium canaliculatum*) have been recorded in the Broke Road BOA. The slaty red gum is listed as Vulnerable under the TSC Act and EPBC Act, and an estimated 30 ha of potential habitat occurs on the Broke Road BOA for the species. The Broke Road BOA also provides habitat for the EPBC listed Regent Honeyeater, Swift Parrot and Large-eared Pied Bat. Thirteen threatened fauna species have been identified at the Broke Road BOA including;

- Eastern freetail bat (*Micronomus norfolkensis*);
- Eastern bentwing bat (*Miniopterus schreibersii oceanensis*);
- Eastern cave bat (*Vespadelus troughtoni*).
- greater broad-nosed bat (*Scoteanax rueppellii*)
- grey-crowned babbler (*Pomatostomus temporalis temporalis*);

- grey-headed flying-fox (*Pteropus poliocephalus*);
- large-eared pied bat (*Chalinolobus dwyeri*);
- little bentwing bat (*Miniopterus australis*);
- little lorikeet (*Glossopsitta pusilla*);
- masked owl (*Tyto novaehollandiae*);
- speckled warbler (*Chthonicola sagittata*);
- squirrel glider (*Petaurus norfolcensis*); and
- swift parrot (*Lathamus discolor*).

A record of the threatened blue-billed duck (*Oxyura australis*) was recorded in 2020 from a dam close to this BOA. Additional effort to survey for this species has been added to the monitoring program for this BOA.

The long-term targets for the Broke Road BOA are to enhance the biodiversity values of the existing vegetation, to restore at least 189 ha of Central Hunter Grey Box – Ironbark Woodland and to improve the habitat quality for the key EPBC listed species listed previously. These longer-term objectives will be achieved through the establishment of shorter-term objectives and targets which have been outlined in the Broke Road Biodiversity Offset Management Plan (**Appendix C** -). This document outlines the management strategies, monitoring programs and initial performance criteria for the BOA for the next three years.

The results of the monitoring program, as well as a detailed description of works undertaken at the Broke Road BOA will be reported annually in the BCC Annual Review.

7.4 Reedy Valley BOA

The Reedy Valley BOA is located on the 2,569 hectare Reedy Valley property located in the Manobalai locality of the Hunter Valley (refer to Figure 10). The Reedy Valley BOA comprises 1,486 ha of the Reedy Valley property, with the remaining 1083 ha retained and managed for agricultural purposes and not subject to this plan. This BOA is required under the BOP approval.

The Reedy Valley BOA provides the following key ecological elements:

- threatened ecological community (TEC) and endangered flora population habitat areas;
- habitat for threatened fauna species;
- is located in the Great Eastern Ranges Initiative; and
- is positioned strategically within the landscape.

A summary of the vegetation communities that have been recorded in the Reedy Valley BOA are outlined in Table 7.3 below.

Table 7.3 – Reedy Valley BOA Vegetation Communities

PCT code	Plant community type (PCT)	BC Act	EPBC Act	Area (ha)
116	Weeping Myall - Coobah - Scrub Wilga shrubland of the Hunter Valley	EEC		<0.1

PCT code	Plant community type (PCT)	BC Act	EPBC Act	Area (ha)
1598	Forest Red Gum grassy open forest on floodplains of the lower Hunter			19.5
1612	Narrow-leaved Ironbark - Grey Gum - Native Olive woodland of Central Hunter			456.9
623	Narrow-leaved Ironbark +/- Grey Box grassy woodland of the upper Hunter Valley, mainly Sydney Basin Bioregion (updated from PCT 1691)	EEC	CEEC	125.0
201	Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion			0.8
480	Black Cypress Pine - ironbark +/- Narrow-leaved Wattle low open forest mainly on Narrabeen Sandstone in the Upper Hunter region of the Sydney Basin Bioregion			359.9
485	River Oak riparian grassy tall woodland of the western Hunter Valley (Brigalow Belt South Bioregion and Sydney Basin Bioregion)			7.6
483	Grey Box x White Box grassy open woodland on basalt hills in the Merriwa region, upper Hunter Valley (updated from PCT 618)	CEEC	CEEC	492
624	Large-fruited Grey Gum - Narrow-leaved Stringybark open forest on sheltered sandstone hillslopes in the Scone region of the upper Hunter Valley			18.9
TOTAL				1480.6

No threatened flora species have been recorded in the Reedy Valley BOA to date. A total of 22 threatened fauna species have been identified in the BOA including:

- brown treecreeper (*Climacteris picumnus picumnus*);
- Eastern Freetailed-bat (*Micronomus norfolkensis*);
- diamond firetail (*Stagonopleura guttata*);
- dusky woodswallow (*Artamus cyanopterus*);
- Eastern bentwing-bat (*Miniopterus orianae oceanensis*);
- Eastern cave bat (*Vespadelus troughtoni*);
- glossy black cockatoo (*Calyptorhynchus lathami*);
- greater broad-nosed bat (*Scoteanax rueppellii*);
- grey-crowned babbler (*Pomatostomus temporalis temporalis*);
- grey-headed flying-fox (*Pteropus poliocephalus*);
- large-eared pied bat (*Chalinolobus dwyeri*);
- little bent-wing bat (*Miniopterus australis*);
- little lorikeet (*Glossopsitta pusilla*);
- masked owl (*Tyto novaehollandiae*);

- regent honeyeater (*Anthochaera phrygia*);
- Southern myotis (*Myotis macropus*);
- speckled warbler (*Pyrrholaemus sagittatus*);
- spotted harrier (*Circus assimilis*);
- squirrel glider (*Petaurus norfolcensis*);
- varied sitella (*Daphoenositta chrysoptera*);
- white-bellied sea eagle (*Haliaeetus leucogaster*); and
- yellow-bellied sheath-tail bat (*Saccolaimus flaviventris*).

The long term targets for the Reedy Valley BOA include the restoration of at least 42 ha of White Box – Yellow Box – Blakely’s Red Gum Woodland and Derived Native Grassland CEEC and 44 ha of Central Hunter Grey Box – Ironbark Woodland, as well as improving the habitat quality for the EPBC listed species. These longer-term objectives will be achieved through the establishment of shorter-term objectives and targets which have been outlined in the Reedy Valley Biodiversity Offset Management Plan (**Appendix D** -). This document outlines the management strategies, monitoring programs and initial performance criteria for the BOA for the next three years.

The results of the monitoring program, as well as a detailed description of works undertaken at the Reedy Valley BOA will be reported annually in the BCC Annual Review.

7.5 Wollombi Brook Biodiversity Offset Area

The Wollombi Brook BOA Area relates to 114 ha of offset lands required under the BOP, located in the north western corner of the BOC, as shown on Figure 10. The BOA includes areas conserved for biodiversity purposes, for cultural heritage purposes and areas designated for the conservation of both. Despite these technical distinctions, the entire BOA is being managed to ensure both values are maintained and enhanced, where appropriate. The Wollombi Brook BOA provides the following key ecological values:

- Central Hunter Grey Box - Ironbark Woodland in the New South Wales North Coast and Sydney Basin Bioregions (EEC – BC Act)
- Central Hunter Valley Eucalypt Forest and Woodland (Critically Endangered Ecological Community (CEEC) – EPBC Act)
- Warkworth Sands Woodland in the Sydney Basin Bioregion (EEC – BC Act)
- habitat for threatened fauna species.

A summary of the vegetation communities, EEC/CEECs and threatened species recorded in the BOA is provided in the sections below.

Table 7.4 – Wollombi Brook BOA Vegetation Communities

PCT code	Plant community type (PCT)	Condition	Area (ha)
1658	Rough-barked Apple - Narrow-leaved Ironbark - Blakely's Red Gum - Bull Oak - Coast Banksia woodland on sands of the Warkworth area	Intact	21.94
		DNG	3.52
1660	Narrow-leaved Ironbark Heathy Woodland on sandstone ranges of the Sydney Basin Bioregion	Intact	0.12
		DNG	7.52

PCT code	Plant community type (PCT)	Condition	Area (ha)
1692	Bull Oak grassy woodland of the central Hunter Valley	Intact	2.42
1691	Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter	Intact	18.58
		DNG	33.36
1731	Swamp Oak - Weeping Grass Grassy Riparian Forest of the Hunter Valley	Intact	2.67
485	River Oak riparian grassy tall woodland of the western Hunter Valley (Brigalow Belt South Bioregion and Sydney Basin Bioregion)	Intact	1.57
No comparable PCT	Exotic Grassland	-	0.7
No comparable PCT	Grassland on Alluvial Sand	-	10.63
No comparable PCT	Mixed Shrubland on Alluvial Sand	-	11.05
No comparable PCT	Water Body	-	0.13
TOTAL			114.21

No threatened flora species or endangered populations have been recorded in the Wollombi Brook BOA to date. A total of 17 threatened fauna species have been identified in the BOA including:

- brown tree creeper (*Climacteris picumnus*)
- diamond firetail (*Stagonopleura guttata*);
- Eastern bentwing-bat (*Miniopterus orianae oceanensis*);
- Eastern cave bat (*Vespadelus troughtoni*);
- Eastern freetail-bat (*Mormopterus norfolkensis*);
- flame robin (*Petroica phoenicea*);
- grey-crowned babbler (*Pomatostomus temporalis temporalis*);
- hooded robin (south-east form) (*Melanodryas cucullata cucullata*);
- large-eared pied bat (*Chalinolobus dwyeri*);
- little eagle (*Hieraetus morphnoides*);
- little lorikeet (*Glossopsitta pusilla*);
- masked owl (*Tyto novaehollandiae*)

- scarlet robin (*Petroica boodang*);
- speckled warbler (*Pyrrholaemus sagittatus*);
- squirrel glider (*Petaurus norfolcensis*);
- varied sitella (*Daphoenositta chrysoptera*); and
- white-bellied sea-eagle (*Haliaeetus leucogaster*)

The long term targets for the BOA are to restore at least 10 ha of the Warkworth Sands Woodland EEC and 16 ha of the Central Hunter Grey Box – Ironbark Woodland from DNG and to improve the habitat quality for the EPBC listed species previously described. These longer-term objectives will be achieved through the establishment of shorter-term objectives and targets which have been outlined in the Wollombi Brook Biodiversity Offset Management Plan (**Appendix E -**). This document outlines the management strategies, monitoring programs and initial performance criteria for the BOA for the next three years.

The results of the monitoring program, as well as a detailed description of works undertaken at the BOA will be reported annually in the BCC Annual Review.

7.6 Weeping Myall Management Area

The Weeping Myall Management Area consists of two stands of weeping myall (*Acacia pendula*) which are located on the western side of the BCC, west of Charlton Road (refer to Figure 10). The Weeping Myall Management Areas, which occur outside of the disturbance footprint for the BOP, will be protected and managed by BCC however do not form part of a formal biodiversity offset. Management Area 1 contains relatively young trees while Management Area 2 contains very mature weeping myall trees.

A number of management measures will be implemented to preserve these stands, including stock exclusion, fencing and signage, weed management and insect and pest management. Further details are provided in the Weeping Myall Management Plan included as **Appendix F -**.

7.7 The Vere Biodiversity Offset Area

The Vere BOA relates to 153.7 ha of offset lands located to the east of the intersection between Broke and Charlton Roads in Bulga, NSW (Figure 10).

A large proportion of the Vere BOA currently comprises native vegetation and derived native grasslands (DNG) of moderate to good condition, therefore the BOMP focusses on regeneration and revegetation strategies to enhance existing communities and establish further native vegetation in degraded areas. These works will focus specifically on the critically endangered ecological community (CEEC) Central Hunter Valley Eucalypt Forest and Woodland CEEC.

The Vere BOA provides the following key ecological values:

- threatened ecological communities (TECs) and endangered flora population habitat areas;
- habitat for threatened flora species;
- habitat for threatened fauna species; and
- strategic location near to Yengo National Park and Pokolbin State Forest.

Seven vegetation communities (PCTs) have been mapped within the Vere BOA, with a number of condition classes mapped within the dominant spotted gum – ironbark community. The mapping of this BOA identified 81.1 ha of existing Central Hunter Valley Eucalypt Forest and Woodland CEEC as listed under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Table 7.5 – Vegetation Communities Identified Within the Vere BOA

Plant Community Type Condition Class	Area (ha)
HU815/PCT1601 Spotted Gum - Narrow-leaved Ironbark – Red Ironbark shrub - grass open forest of the central and lower Hunter <i>Moderate to Good</i>	91.6
HU815/PCT1601 Spotted Gum - Narrow-leaved Ironbark – Red Ironbark shrub - grass open forest of the central and lower Hunter <i>Moderate to Good Shrubland</i>	6.3
HU815/PCT1601 Spotted Gum - Narrow-leaved Ironbark – Red Ironbark shrub - grass open forest of the central and lower Hunter <i>Moderate to Good Derived Native Grassland</i>	28.2
HU815/PCT1601 Spotted Gum - Narrow-leaved Ironbark – Red Ironbark shrub - grass open forest of the central and lower Hunter <i>Moderate to Good - Previous Ground Disturbance</i>	8.4
HU906/PCT1692 Bull Oak grassy woodland of the central Hunter Valley <i>Moderate to Good</i>	7.0
HU812/PCT1598 Forest Red Gum grassy open forest on floodplains of the lower Hunter <i>Moderate to Good</i>	0.8
HU564/PCT922 Melaleuca decora Low Forest of the Central Hunter Valley, Sydney Basin Bioregion <i>Moderate to Good</i>	1.5
HU945/PCT1731 Swamp Oak – Weeping Grass grassy riparian forest of the Hunter Valley <i>Moderate to Good</i>	1.3
HU815/PCT1601 Spotted Gum - Narrow-leaved Ironbark – Red Ironbark shrub - grass open forest of the central and lower Hunter <i>Low Condition Exotic Grassland</i>	0.2
Cleared Land (including water bodies)	8.4
Total	153.7

Ten threatened fauna have been recorded in the Vere BOA (as per the Bionet Atlas) however no threatened flora or endangered populations have been recorded in this BOA to date. 14 threatened fauna species recorded in the BOA including;

- brown tree creeper (eastern subspecies) (*Climacteris picumnus victoriae*);
- Eastern bentwing-bat (*Miniopterus schreibersii oceanensis*);
- Eastern cave bat (*Vespadelus troughtoni*);
- Eastern coastal freetail-bat (*Micronomus norfolkensis*);
- dusky woodswallow (*Artamus cyanopterus*);
- grey-crowned babbler (eastern subspecies) (*Pomatostomus temporalis temporalis*);
- grey-headed flying-fox (*Pteropus poliocephalus*);

- large-eared pied bat (*Chalinolobus dwyeri*);
- little bentwing-bat (*Miniopterus australis*);
- little lorikeet (*Glossopsitta pusilla*);
- speckled warbler (*Chthonicola sagittata*);
- squirrel glider (*Petaurus norfolcensis*);
- varied sittella (*Daphoenositta chrysoptera*); and
- yellow-bellied sheath-tail-bat (*Saccolaimus flaviventris*).

The long-term targets for the BOA are to restore at least 81.1 ha of existing Central Hunter Valley Forest and Woodland and restoration of at least 33.8 ha of additional Central Hunter Valley Forest and Woodland. These longer-term objectives will be achieved through the establishment of shorter-term objectives and targets which have been outlined in the Vere Biodiversity Offset Management Plan (**Appendix G** -). This document outlines the management strategies, monitoring programs and initial performance criteria for the BOA for the next three years.

The results of the monitoring program, as well as a detailed description of works undertaken at the BOA will be reported annually in the BCC Annual Review.

7.8 BOA Performance Indicators and Completion Criteria

A set of performance indicators and completion criteria have been established for each BOA (see **Appendices B-G**). The performance indicators have been derived to demonstrate progress towards achieving the biodiversity management objectives and the future improvement of habitat quality. Monitoring results identifying whether the performance criteria are being met and whether the BOAs are tracking towards the anticipated improvement in habitat quality will be reported annually in the Annual Review.

Preliminary completion criteria have also been developed to provide a target for the biodiversity management works in each BOA. These long-term completion criteria will be refined as further data is collected from the analogue monitoring sites within the BOA, similar to the ongoing refinement of the rehabilitation criteria described in **Section 7.5**.

8. Monitoring & Research

BCC has developed a detailed ecological monitoring program which covers remnant vegetation areas and buffer zones of the BCC, biodiversity offset sites and mine rehabilitation areas. The scope and objectives of these monitoring programs are outlined in the sections below. Further detail on these monitoring programs can be found in the relevant BOMPs (Appendix B -) and in the Bulga Complex Rehabilitation Management Plan.

8.1 Ecological Monitoring

The condition of the remnant vegetation surrounding the BCC will be monitored to identify potential deterioration in vegetation health or habitat quality as a result of mining operations. This monitoring will be undertaken annually, however if the results show negligible change over a reasonable timeframe, the frequency of monitoring may be reduced (through consultation and modification to this BMP). Refer to Figure 11.

The BCC ecological monitoring comprises the following methods:

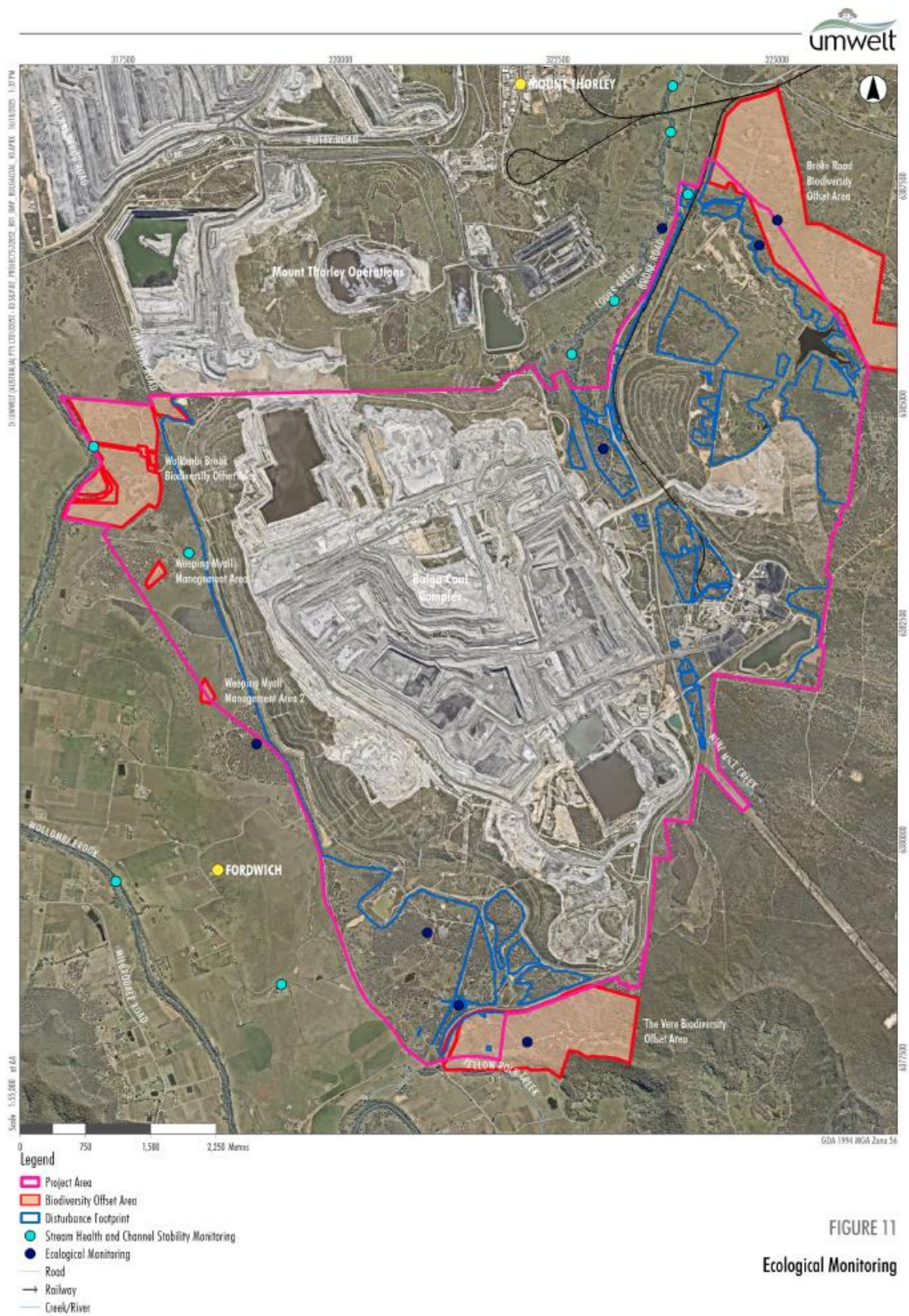
- Flora monitoring – in 2018 this monitoring was upgraded to use the BAM (OEH 2018). Seven sites are monitored within the buffer lands surrounding the operations. This allows collection of consistent and comparable data and facilitates comparison of site data to the benchmark values defined in the BioNet Vegetation Information System (VIS)
- Fauna monitoring – this monitoring is consistent with BOA fauna monitoring methodology, targeting broad range of fauna species, including birds (diurnal and nocturnal), mammals (including bats), reptiles and amphibians. To broaden the amount and type of information collected, habitat assessments and remote cameras have been used as well. A mixture of these methods are employed across 9 sites and across various seasons
- Photo monitoring – this is included in the BAM and occurs at each end of the 50 m transect. Photo monitoring at consistent points allows visual comparison of site features and condition over time.

Should any of the sites monitoring programs identify observable changes in the presence or habitat of other species (e.g. mammals, herpetofauna), or additional threatened species are identified, the monitoring program will be expanded to include these species.

In addition, nest box monitoring is completed on an annual basis. The objective of the nest box monitoring program will be to identify usage and provide recommendations to improve future installations.

Results and recommendations from the ecological monitoring program will be reported annually in the Annual Review which is placed on the BCM website on 30 March each year.

Figure 11 - Ecological Monitoring



8.2 Rehabilitation Monitoring

BCC has an extensive rehabilitation monitoring program to track the establishment and progress of rehabilitated areas towards the completion criteria. The objectives of the rehabilitation monitoring program are to:

- Assess the long-term stability and functioning of re-established ecosystems on mine affected land;
- Assess rehabilitation performance against the completion criteria; and
- Facilitate continuous improvement in rehabilitation practices.

The monitoring program will continue within rehabilitated and non-mined areas (reference sites) until it can be demonstrated that rehabilitation has satisfied the closure criteria. The rehabilitation monitoring criteria for each domain have been developed to demonstrate that selected indicators (or criteria) have reached their established completion criteria or that a satisfactory successional trajectory has been established that will result in a self-sustainable ecosystem.

An annual rehabilitation monitoring program has been developed to confirm the rehabilitation objectives, performance criteria and closure criteria are being met, and to identify opportunities for improvement. The monitoring programs have been designed to effectively monitor onsite revegetation, surrounding vegetation, species diversity and native fauna habitats. The monitoring program consists of the following surveys:

- Annual rehabilitation walkover inspection;
- Fauna and nest box monitoring;
- Initial establishment monitoring (rehabilitation \leq 3 years old); and
- Long term rehabilitation monitoring program (rehabilitation $>$ 3 years old).

Based on the outcomes of the rehabilitation monitoring program, a care and maintenance program is implemented. The scope of the care and maintenance program may include weed and feral animal control, fertilising, re-seeding or planting (where required), and erosion and sediment control works.

8.2.1 Measuring Performance against Rehabilitation Objectives and Rehabilitation Completion Criteria

Annual Rehabilitation Walk Over Inspections

The annual rehabilitation walkover inspection provides a general assessment on rehabilitation health and potential emerging issues that require maintenance (e.g. weeds, erosion, poor growth rates). The walkover inspection does not review rehabilitation areas against the closure criteria but provides management recommendations to assist the rehabilitation in moving towards the criteria.

Initial Establishment Rehabilitation Monitoring

The initial establishment monitoring is a rapid style assessment of young (\leq 3 years old) rehabilitated areas, principally to determine germination success, presence of weeds and landform stability. The GCAA Rehabilitation Monitoring Procedure describes the monitoring methodology and the data collection method used for the key final land uses.

Long Term Rehabilitation Monitoring

The long-term rehabilitation monitoring program utilises the Biodiversity Assessment Methodology, to compare rehabilitation areas with biometric scores from the targeted vegetation communities. The objective of the long-term monitoring program (areas >3 years old) is to evaluate progress of rehabilitation towards fulfilling completion criteria, additional statutory requirements that may apply to the operation and ultimately the targeted post-mining land use. The methods described for long term rehabilitation monitoring apply to both rehabilitation and reference monitoring sites. For further details on methodology and timing refer to the GCAA Rehabilitation Monitoring Procedure.

8.3 Biodiversity Offset Monitoring

8.3.1 Seasonal Monitoring Program

The Biodiversity Offset Areas will be subject to a seasonal monitoring program, which are outlined in further detail in the individual BOMP's for each area (Appendix B -). These monitoring programs are similar to the rehabilitation monitoring program, where reference sites have been chosen within the BOA's to establish criteria for the regeneration areas to meet. The objectives of the monitoring programs will be generally to:

- identify any potential loss of biodiversity values over whole of BOA;
- document the ecological characteristics of remnant woodland vegetation to establish a baseline for developing accurate closure criteria for the regeneration of DNG (where relevant);
- assess the recovery of DNG areas (where relevant);
- to assess and map the presence of threats such as significant populations of pest fauna species or weed infestations; and
- identify the need for additional or corrective management measures to achieve the performance indicators and completion criteria.

The location and number of monitoring sites for each BOA and the results of the annual monitoring will be reported in the Annual Review each year.

8.3.2 Inspection Program

In addition to the seasonal ecological monitoring program, biannual inspections will be undertaken of each BOA, focussing on the following key issues:

- weed management;
- pest management;
- fence and gate condition;
- access track condition;
- erosion or sedimentation; and
- progress of regeneration areas.

The inspections will be documented on a formal inspection sheet and any actions arising from the inspections will be tracked for completion. The inspections will be undertaken in spring and autumn each year. Additionally, any corrective actions taken will be reported in the Annual Review.

8.4 Trigger Action Response Plan

The following trigger action response plan (TARP) has been developed to identify required management actions in the event of impacts to surrounding remnant vegetation areas. This TARP does not cover rehabilitation areas (addressed in the Bulga Complex Rehabilitation Management Plan) or BOAs (addressed in individual BOMPs). Where necessary, management measures in this BMP will be amended accordingly with the aim of continually improving biodiversity management standards. Any actions required to be implemented as a result of the annual review of the below triggers to be undertaken by the BCC Environment and Community Manager will be reported in the BCC Annual Review, refer to **Section 10**.

The triggers specified within the TARP have been based upon key parameters which are monitored and have the potential to have a material impact on the community. The timeframe associated with the triggers has been set at three years to allow for natural fluctuations.

Table 8.1 – Biodiversity TARP

Aspect/Category	Key Element	Trigger	Response
Biodiversity Values	Species diversity	Total live native flora species diversity decreases by more than 10 per cent over a period of three years or more	Undertake a review to determine the causal factors in the decline and develop an action plan to return native species diversity to previous levels.
		Exotic species diversity (weed species) is greater than 40 per cent, or increases by more than 15 per cent over a period of three years or more	Develop and implement a targeted weed action plan for the monitoring site and surrounding vegetation
	Ground Cover	Endemic ground cover decreases by 15 per cent or more over a period of three years or more	Undertake a review to determine the causal factors in the decline, and develop an action plan to return endemic ground cover to previous levels
	Habitat Value	Habitat values are trending negatively.	Undertake a review to determine the causal factors in the decline, and develop an action plan to improve habitat resources

8.4.1 Identification of Previously Unrecorded Threatened Species

In the event that a threatened species is identified at the BCC which has not previously been identified, a suitably qualified ecologist will be engaged and the following protocol implemented:

- Implement appropriate measures to ensure that ongoing work will not significantly impact on the species while appropriate ameliorative measures are investigated by the ecologist;
- A suitably qualified ecologist will undertake an investigation into the distribution and habitat utilisation of the species, and to identify appropriate amelioration measures as necessary; and
- Review and update this Biodiversity Management Plan to include the outcomes of the investigation and any additional mitigation measures that are required to be implemented to protect the species.

Additionally, all newly identified threatened species will be reported annually in the Annual Review.

8.5 Hunter Ironbark Research Program

In 2013 Ravensworth Operations commenced a research project in conjunction with the University of Newcastle which aimed to improve the establishment of Central Hunter Grey Box – Ironbark and Central Hunter Ironbark – Spotted Gum – Grey Box communities in rehabilitation areas. The key focus of the study was to identify the niche and amelioration requirements of key herbs, forbs and native grasses which have proven to be difficult to establish in constructed rehabilitation landforms.

The final report published in 2016 outlined the results of the project and provided the following main recommendations:

- Design landscapes that minimise gully erosion. This is a common practice at BCM where detailed drainage designs are completed for each rehabilitation area. Given the lack of erosion identified in monitoring events, it is not considered any further work is required in this area.
- Use topsoil or subsoil enhanced with coarse wood mulch wherever possible. This strategy is already implemented at BCM, where topsoil is used preferentially over other substrates. In addition, the vast majority of topsoil at Bulga has a significant amount of woody debris mixed throughout due to the practice of incorporating mulch into the topsoil during clearing.
- Ensure substrates are not contaminated by weeds. This is also a common practice at BCM. Significant weed patches in clearing areas are either controlled prior to stripping, or avoided. All topsoil stockpiles are scalped prior to re-use in rehabilitation areas.
- Increase numbers of ground cover native species in seed mixes. BCM includes approximately 25 different native grass and groundcover species totalling 2kg/ha in its rehabilitation seed mix.

The final Hunter Ironbark Research Program report can be found on the Bulga Coal public website.

9. Reporting and Review

9.1 Reporting

All ecological, BOA and rehabilitation monitoring results will be reported in the Annual Review. The Annual Review will include a comparison of data against previous year's results as well as a list of management recommendations derived from the monitoring reports, and a statement of compliance with EPBC approval conditions. The full monitoring reports will be made available on the BCC public website by 30 March each year.

9.2 BMP Review

In accordance with Schedule 5, Condition 5 of the BOC Project Approval, this BMP will be reviewed within three months of any of the following:

- The submission of an annual review (Annual Review);
- The submission of an incident report (relating to biodiversity, rehabilitation or BOA);
- The submission of an audit report; or
- Any modification to the conditions of the Project Approval.

If this review determines that modifications are required to this BMP, a revised BMP will be submitted to DPHI for within four weeks for approval. The revised BMP will also be submitted to the Department of Environment for approval.

10. Conservation Bond and Implementation Costs

A Conservation Bond is required for management works to be completed in the BOAs in accordance with Condition 35 and this has been established. The purpose of this bond is to cover the cost of the management of land required to be set aside as an offset area, should the mine consent holder be unable or unwilling to continue management of the land. The Conservation Bond value is based on all the activities identified in the relevant BOMPs and this BMP, for a period of three years, being the life of the plan.

11. Complaints Management

Bulga Coal implements a complaints hotline for handling the conflict resolution process. The conflict resolution process includes:

- a) acknowledging all complaints, responding to the complainant within 24 hours, where practicable;
- b) registering all complaints in CMO;
- c) investigating complaints impartially giving proper consideration to the facts and the circumstances prevailing at the time;
- d) implementing corrective actions if required;
- e) reporting to relevant stakeholders of investigation outcomes and corrective actions taken; and

Complaints are managed in accordance with GCAA-625378177-10296 – 10.05 Complaints Management. This protocol provides a process to ensure that complaints received by GCAA and its operations are properly documented and handled in accordance with licence requirements and company policy.

Details of complaints received by Bulga Coal are reported to stakeholders at Community Consultative Committee meetings and in the Annual Review.

12. Adaptive Management

12.1 Adaptive Management Process

Adaptive management of the BMP will be responsive to any new and relevant data that may arise through the monitoring program, legislative change or any other studies completed at the site. This will enable a flexible approach to management commitments, allowing ongoing feedback and refinement of the BMP. Adaptive management will be a key mechanism to address the risks to the successful implementation of the BMP. Adaptive management steps include regular review of the BMP, including adaptation of performance indicators and completion criteria, recognising potential risks to the successful implementation of the BMP and having a framework in place for corrective actions.

12.2 Re-Assessment of Targets and Performance Indicators

The performance indicators and completion criteria are preliminary and will need to adapt and change as targets are met and new challenges arise. Each three years they will be assessed and redeveloped as appropriate in response to monitoring outcomes and the success or otherwise of the management and improvement strategies. Modifications to the targets and performance indicators will be recorded in a revised BMP.

13. Revision History

Full details of the document history are recorded in the document control register, by version. A summary of the current change is provided in **Table 11.1** below.

Table 13.1 – Revision History

Version	Date	Review team (consultation)	Change Summary
1.0	February 2015	Bulga Open Cut	Original document
2.0	March 2017	Umwelt and Bulga Open Cut	Updated to include recommendations by DoEE
3.0	April 2017	Bulga Open Cut	Formatting changes
4.0	December 2017	Bulga Open Cut	Updated to include recommendations by DPE.
5.0	November 2020	Umwelt and Bulga Open Cut	Update for three-year review and new consents.
6.0	July 2021	Umwelt and Bulga Open Cut	Updated to include comments from Internal Review and address the comments received from DPPI on 30 June 2021. DPPI approval received on 14 October 2021. Inserted letter from DPPI into Appendix I and also inserted appointment of experts letter from DPPI into Appendix H.
Draft 1 7.0	May 2022	Bulga Open Cut	Updated to address comments received from DCCEEW on 12 January 2022 and 6 May 2022
7.0	May 2022	Bulga Open Cut	Published version 7.0 for DCCEEW approval, as requested by DCCEEW.
Draft 1 8.0	July 2025	Umwelt and Bulga Open Cut	Three-year revision. Updated to include 2022 development consent changes.
Draft 2 8.0	March 2026	Bulga Open Cut	Updated to include Section 5.10 to address comments from DPPI.

Appendix A - Tree Felling Procedure

Appendix B - Condran Biodiversity Offset Management Plan

Appendix C - Broke Road Biodiversity Offset Management Plan

Appendix D - Reedy Valley Biodiversity Offset Management Plan

Appendix E - Wollombi Brook Biodiversity Offset Management Plan

Appendix F - Weeping Myall Biodiversity Offset Management Plan

Appendix G - The Vere Biodiversity Offset Management Plan

Appendix H - Appointment of Experts Letter from DPHI



Ralph Northey
 Environment and Community Manager
 Bulga Coal Management Pty Ltd
 Via email: Ralph.Northey@glencore.com.au

16/09/2020

Dear Mr Northey

Bulga Optimisation Project (SSD 4960) & Bulga Underground Operations (DA 376-8-2003) Appointment of Experts & Mining in the Whybrow Wedge Section of SSD 4960

I refer to the your letter and supporting curriculum vitae's requesting the Planning Secretary's approval of suitably qualified and experienced persons to assist in revising the Rehabilitation Strategy and a number of management plans for the Bulga Optimisation Project (SSD 4960 – Modification 3) and the Bulga Underground Operations (DA 376-8-2003 – Modification 7), in accordance with Conditions 15(a), 22(a), 28(a), 34(a), 42(a) and 56(c) of Schedule 3 of SSD 4960 and Conditions 24A(a), 7G(a) and 32C(a) of Schedule 4 of DA 376-8-2003.

The Department has reviewed the nominations and information provided by Bulga Coal and is satisfied that the experts listed below are suitably qualified and experienced to assist in preparing the revised Rehabilitation Strategy and various management plans.

Accordingly, the Planning Secretary approves the appointment of the following persons to prepare the revised Rehabilitation Strategy and the following revised management plans in accordance with the relevant conditions of SSD 4960 and DA 376-8-2003.

Name	Company	Relevant Plan/ Strategy
Thomas Lewandowski	Enviro Strata Consulting Pty Ltd	Blast Management Plan
Shane Lakmaker	Jacobs	Air Quality and Greenhouse Gas Management Plan
Anthony Marszalek	Hydro Engineering & Consulting Pty Ltd	Water Management Plan
Rebecca Vere	Umwelt	Biodiversity Management Plan
Ben Churcher	Ozark	Heritage Management Plan
Adam Williams	SLR Consulting	Rehabilitation Strategy
Dorian Walsh	Hansen Bailey	Exploration Activities and Minor Surface Infrastructure Management Plan
Tony Welbourne	Global Acoustics	Noise Management Plan

I also refer to your letter and supporting figure requesting the written agreement of the Planning Secretary to commence mining within the Whybrow Wedge section of the recently approved SSD 4960 – Modification 3, prior to the revision and approval of the Noise, Blasting, Water, Air Quality and Greenhouse Gas Management Plans in accordance with Condition 5C of Schedule 5 of SSD 4960.

The Department has reviewed the existing approved Environmental Management Strategy (EMS) for the site and considers that the operational and environmental controls currently being implemented by Bulga Coal as part of the existing approved consent conditions, EMS and associated

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management plans would continue to be fit for purpose for undertaking activities within the Whybrow Wedge.

As such, in accordance with Condition 5C of Schedule 5 of SSD 4960, the Planning Secretary agrees that Bulga Coal may undertake approved mining activities within the Whybrow Wedge area prior to revision of the Noise, Blasting, Water, Air Quality and Greenhouse Gas Management Plans required following the approval of Modification 3 to SSD 4960.

For the sake of clarity, I wish to confirm that this approval is limited to the approved surface disturbance area known as the Whybrow Wedge and does not extend to other activities approved under Modification 3. I also note that Bulga Coal must continue to apply and complying with the approved consent conditions, the existing management plans and EMS for the site.

Finally, I would like to take this opportunity to remind you that Bulga Coal is required to submit any revisions of the strategies, plans, and programs required under SSD 4960 – Modification 3 and DA 376-8-2003 – Modification 7 to the Planning Secretary for approval by October 2020 in accordance with Conditions 15 (b) and 22 (b) of Schedule 3, 5 (d) of Schedule 5 of SSD 4960 and Condition 5 (d) of Schedule 6 of DA 376-8-2003.

If you have any questions, please contact Tegan Cole via email at Tegan.Cole@planning.nsw.gov.au.

Yours sincerely



Matthew Sprott
Director
Resource Assessments (Coal & Quarries)
as nominee of the Planning Secretary

Appendix I - DPHI Approval



Ralph Northey
Environment and Community Manager
Bulga Coal Management Pty Limited
567 Broke Rd
Singleton, NSW, 2330

14/10/2021

Dear Mr. Northey

**Bulga Optimisation Project (SSD-4960)/ Bulga Underground Mine (DA376-8-2003
Bulga Coal Complex - Biodiversity Management Plan**

I refer to the Bulga Biodiversity Management Plan, which was submitted in accordance with Condition 34 of Schedule 3 of the consent for the Bulga Optimisation Project (SSD-4960) and Condition 44 of Schedule 4 of the consent for the Bulga Underground Mine (DA 376-8-2003).

The Department has carefully reviewed the document and is satisfied that it is consistent with the relevant conditions of consent.

Accordingly, the Planning Secretary has approved the Bulga Biodiversity Management Plan (Revision 6.0, Dated July 2021). Please ensure that the approved plan is placed on the project website at the earliest convenience.

If you wish to discuss the matter further, please contact Wayne Jones on (02) 6575 3406.

Yours sincerely

A handwritten signature in black ink, appearing to be 'S O'Donoghue', written over a light blue horizontal line.

Stephen O'Donoghue
Director
Resource Assessments (Coal & Quarries)
As nominee of the Secretary