



# Regional Biodiversity Strategy

## Neubeck Project, Springvale Mine Extension Project and Angus Place Colliery Extension Project

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## Contents

1.0	INTRODUCTION .....	1
2.0	GOVERNMENT POLICY ON BIODIVERSITY OFFSETTING .....	2
3.0	THE OFFSET REQUIREMENTS .....	5
3.2	The Conservation Values of the Newnes Plateau and Ben Bullen State Forest .....	14
4.0	THE REGIONAL BIODIVERSITY STRATEGY .....	17
5.0	VEGETATION IMPACTED BY CENTENNIAL PROJECTS .....	19
6.0	THE OFFSET AREA .....	23
6.1	Overview .....	23
6.2	The Springvale and Angus Place Offset Land .....	23
6.3	The Neubeck Offset Land .....	28
7.0	THE METRIC USED TO ESTABLISH THE OFFSET .....	30
8.0	SECURING THE OFFSET LAND .....	34
9.0	OBJECTIVES FOR OFFSET LAND MANAGEMENT .....	36
10.0	SUPPLEMENTARY MEASURES TO SUPPORT CONSERVATION OUTCOMES .....	37
10.0	MONITORING PROGRAM .....	39
11.0	THE COST OF THE OFFSET PACKAGE .....	40
11.1	Economic and Social Costs and Benefits of the Biodiversity Strategy .....	40
12.0	CONCLUSION .....	41
13.0	REFERENCES .....	42

## Tables

Table 1 Action Summary Table .....	2
Table 2 Summary of 7 Part Tests of Significance for Angus Place .....	6
Table 3 Summary of EPBC Assessment of Significance for Angus Place .....	8
Table 4 Summary of 7 Part Tests of Significance for Springvale Mine .....	9
Table 5 Summary of EPBC Assessment of Significance for Springvale Mine .....	11
Table 6 Summary of 7 Part Tests of Significance for Neubeck Coal Project .....	12
Table 7 Summary of EPBC Assessment of Significance for Neubeck Coal Project .....	13
Table 8 Causal Factors Leading to Impacts to East Wolgan Swamp .....	14
Table 9 Office of Environment and Heritage Requirements .....	17
Table 10 Department of the Environment Requirements .....	17
Table 11 Springvale Native Vegetation Communities to be Directly Impacted .....	20
Table 12 Springvale Native Vegetation Communities to be Indirectly Impacted .....	20
Table 13 Angus Place Native Vegetation Communities to be Directly Impacted .....	21
Table 14 Angus Place Native Vegetation Communities to be Indirectly Impacted .....	21
Table 15 Neubeck Native Vegetation Communities to be Directly Impacted .....	22
Table 16 Neubeck Threatened Species to be Directly Impacted .....	22
Table 17 Vegetation Unit Areas and BioBank Credit Values for Lot 135 .....	26
Table 18 TSC Act and EPBC Act Listed Species Recorded in the Site and Locality .....	26
Table 19 Vegetation Unit Areas and BioBank Credit Values for Lot 163 .....	28
Table 20 TSC Act and EPBC Act Listed Species Recorded in the Site and Locality .....	29
Table 21 Ecosystem Credit Balance .....	31
Table 22 Species Credit Balance .....	31
Table 23 TSC Act and EPBC Act Listed Species Recorded in the Site and Locality .....	32

## Figures

Figure 1 Springvale and Angus Place Offset Location .....	25
Figure 2 Springvale and Angus Place Offset Vegetation .....	27
Figure 3 Current Tenure Arrangements .....	35

## Appendices

Appendix 1	Springvale Vegetation Removal Figures
Appendix 2	Angus Place Vegetation Removal Figures
Appendix 3	Neubeck Coal Project Vegetation Removal Figure
Appendix 4	Additional Project Vegetation Removal Figures



## I.0 Introduction

### Angus Place Extension Project (SSD\_5602), Springvale Extension Project (SSD\_5594), and Neubeck Coal Project (SSD\_5598)

RPS has been engaged to provide Centennial Coal with a response to the Director-General's requirements issued for the Angus Place and Springvale projects on 6<sup>th</sup> November 2012 and the Neubeck Coal Project on 30<sup>th</sup> August 2013 which included:

*An offset strategy, which is clearly quantified, to ensure that the development maintains or improves the terrestrial and aquatic biodiversity values of the region in the medium to long term.*

An offset package is also required, where impacts cannot be avoided or mitigated to compensate for any predicted or potential residual significant impacts on Matters of National Environmental Significance, as part of the supplementary Director-General's requirements issued by DoPI for both projects on 30<sup>th</sup> August 2013.

This document quantifies the direct and indirect impacts of the three State Significant Developments (SSD), it provides details of how the direct and indirect residual impacts will be offset, what additional supplementary offsets that are proposed, how those offsets will be secured and managed, and how the offset measures proposed by Centennial Coal will satisfy both the state and federal offset principles.

## 2.0 Government Policy on Biodiversity Offsetting

Offsets are used to compensate for the residual adverse impacts of a Project on the environment. Offsets are used to balance the residual impacts after avoidance and mitigation measures have been implemented. For assessments under the EPBC Act, offsets are required if these residual impacts are significant. Significance of the residual impact is tested against the Department of the Environment's Significant Impact Guidelines for Matters of National Environmental Significance (MNES) and offsets should be related to the conservation priority of the impacted species/community.

Offsets are typically packaged into 'direct offset' which provides a measurable conservation gain to compensate for the residual impacts, and 'indirect or supplementary offset' which add value to the existing knowledge base of an impacted species/community.

Offsets that deliver social, economic and/or environmental co-benefits are encouraged by both the State and Federal governments. These include offsets that increase land connectivity or offsets that protect and manage privately owned land for conservation purposes.

Centennial has taken these principles into consideration, as detailed in the **Table 1** below, when designing this biodiversity strategy.

**Table 1 Action Summary Table**

NSW Offset Principles for Major Projects (State Significant Development and Infrastructure)	
Before offsets are considered, impacts must first be avoided and unavoidable impacts minimised through mitigation measures. Only then should offsets be considered for the remaining impacts	Chapter 8 of the respective EISs discusses the constraints to the mine design that have been identified and included in mine planning considerations.  These constraints have resulted in there being no significant impacts on biodiversity values as a result of the Projects.  The offset package proposed includes provision of land to compensate for the direct impacts to <i>E. cannonni</i> , <i>E. aggregata</i> and <i>Thesium australe</i> and 8 vegetation communities comprising 86.06ha (two of which are EEC).
Offset requirements should be based on a reliable and transparent assessment of losses and gains	Further detail on the assessment method to establish the offset is included in this report
Offsets must be targeted to the biodiversity values being lost or to higher conservation priorities	Further detail on the biodiversity values lost and gained is included in this section of the relevant EISs.
Offsets must be additional to other legal requirements	There is no current requirement for an offset to be provided by this Project, although the package includes provision to offset previous requirements within the current Springvale and Angus Place development consent as well as the Clarence Colliery Reject Emplacement Area (MOD 2) and the Western Coal Services Upgrade Project.
Offsets must be enduring, enforceable and auditable	Centennial will enter into covenant arrangements to protect the biodiversity values .
Supplementary measures can be used in lieu of offsets	Supplementary measures, as identified in this report, have been included to complement the offset package and to reduce the monitoring effort required to establish impacts.
Offsets can be discounted where significant social and economic benefits accrue to NSW as a consequence of the proposal	The offsets required for the projects have been quantified in the context of the biodiversity values, for which the offset land holds high conservation priorities. With the social and economic contributions proposed by the projects (discussed in Chapter 6 of the respective EISs), the offset package itself provides significant social and

NSW Offset Principles for Major Projects (State Significant Development and Infrastructure)	
	<p>economic benefits to the NSW community through:</p> <ul style="list-style-type: none"> <li>conservation in perpetuity of high priority biodiversity values</li> <li>proximity of offset land to existing reservations</li> <li>provision of ongoing financial support to achieve agreed criteria for conservation</li> <li>provision of access to conserved land for tourism and recreational purposes</li> <li>investment in research, recovery and maintenance plans to understand potential threats to conservation outcomes and integrate this understanding with values of adjacent National Parks, World Heritage Areas and National Heritage Places</li> </ul> <p>The biodiversity strategy presented in the respective EISs presents an opportunity cost to Centennial, however, it also provides a long term benefit to the community.</p>
Environment Protection and Biodiversity Conservation Act 1999 Environmental Offsets Policy	
Suitable offsets must deliver an overall conservation outcomes that improves or maintains the viability of the protected matter	<p>As there are no direct impacts to protected matters, and the residual impacts following avoidance and mitigation measures are not significant, direct offsets are not required. Regardless, the offset package proposed includes provision of land to compensate for the potential impacts to Temperate Highland Peat Swamps on Sandstone (THPSS).</p> <p>The offset package proposed includes provision of land to compensate for the direct impacts to <i>Thesium australe</i> and 86.06ha of native vegetation (none of which are EEC).</p>
Suitable offsets must be built around direct offsets but may include other compensatory measures	<p>As there are no direct impacts to protected matters, and the residual impacts following avoidance and mitigation measures are not significant, direct offsets are not required. Regardless, the offset package proposed includes provision of land to compensate for the potential impacts to Temperate Highland Peat Swamps on Sandstone (THPSS).</p> <p>The offset package proposed includes provision of land to compensate for the direct impacts to <i>Thesium australe</i> (listed as vulnerable under the EPBC Act) and 86.06ha of native vegetation (none of which are EEC).</p> <p>Further compensatory measures will be implemented, supporting clear conservation objectives and reducing the monitoring related impacts to the Newnes Plateau.</p>
Suitable offsets must be of a size and scale proportionate to the residual impacts of the protected matter	The offset proposed provides for the conservation of 342.2 hectares of critically endangered ecological community and habitat for over 160 fauna species.
Suitable offsets must effectively account for and manage the risks of the offset not succeeding	<p>To ensure success of the strategy, Centennial is providing land already owned by the company with high conservation value. Centennial will also develop completion criteria for the offset land as outlined in this strategy, taking into consideration the <i>Guide to Managing Box Gum Grassy Woodlands (2010)</i>.</p> <p>In the unlikely event that the offset does not succeed, Centennial will include provision for offset management in the security held by the Division of Resources and Energy under the <i>Mining Act 1992</i>.</p>

NSW Offset Principles for Major Projects (State Significant Development and Infrastructure)	
Suitable offsets must be additional to what is already required, determined by law or planning regulations, or agreed to under other schemes or programs	There is no current requirement for an offset to be provided by this Project, although the package includes provision to offset previous requirements within the current Springvale and Angus Place development consent.
Suitable offsets must be efficient, effective, timely, transparent, scientifically robust and reasonable	As the land is owned by Centennial Coal, the offset can be secured for the life of the Projects immediately upon grant of consent. The offset land is effective as, outlined in this strategy, the land provides connectivity to the Airly State Forest, the Capertee National Park and the Mugii Murum-ban State Conservation Area. Management actions and completion criteria identified in this strategy will result in effective and timely offset security.
Suitable offsets must have transparent governance arrangements including being able to be readily measured, monitored, audited and enforced	<p>The offset land is land owned by Centennial Airly Pty Ltd, a subsidiary of Centennial Coal Company, and as such a baseline condition against which the success of completion criteria can be measured, has been undertaken. This, along with a restrictive covenant arrangement for the land, will ensure the offset can be measured, monitored and audited in accordance with the completion criteria described in this EIS.</p> <p>There are no future development proposals for the land. There are no mineral titles on the land. Centennial holds a coal lease over part of the offset area; however there are no recoverable coal reserves. There is an existing petroleum extraction licence (PEL) over part of the offset land, and a PEL application over the remaining land.</p>

### 3.0 The Offset Requirements

In order to establish the need for an offset, particularly a direct offset, the extent of residual impacts to threatened species/communities and MNES needs to be ascertained. **Tables 2 - 7** summarise the likely residual impacts, with details provided in Springvale Mine Extension Project – Flora and Fauna Assessment Report (RPS 2014a), Angus Place Extension Project – Flora and Fauna Assessment Report (RPS 2014b), Neubeck Coal Project – Flora and Fauna Assessment Report (RPS 2014c) concluding that the residual impacts, once avoidance and mitigation measures are implemented, are not significant. The attributes that are likely to be impacted by the proposed project are described in detail within the respective reports and is summarised in **Section 5** below.

For the Springvale and Angus Place Mine Extension Projects, this conclusion has been formed through the adoption of avoidance measures, including where possible, minimising surface disturbance footprints, placing surface infrastructure outside habitat for threatened species, shortening longwall blocks (where it is economically feasible to do so) and narrowing void widths. The Projects have specifically reviewed the circumstances that could lead to an impact to sensitive surface features (Refer to Table 2.6 of the EIS, reproduced below in **Table 8**).

This review, combined with a review of the extensometer and piezometer data collected across the existing mining operations, demonstrate a high level of confidence that a managed height of fracturing will result in no significant impact to groundwater and surface water systems or the ecological communities that rely upon them. Despite this, activities undertaken as part of these Projects may indirectly impact the endangered ecological communities that comprise Temperate Highland Peat Swamps on Sandstone (Newnes Plateau Shrub Swamps and Newnes Plateau Hanging Swamps), both of which are listed as Endangered Ecological Communities under the *Threatened Species Conservation Act 1995* and the *Environment Protection and Biodiversity Conservation Act 1999*.

Table 2 Summary of 7 Part Tests of Significance for Angus Place

Group and species	(a) Risk of extinction of local population	(b) Risk of extinction of endangered population	(c) adverse impact on the extent of, or modification to EECs or CECs leading to local extinction	(d) habitats of threatened species, EECs or CECs			(e) adverse impact on critical habitat	(f) consistence with recovery or threat abatement plan
				(i) extent of habitat removed modified	(ii) will habitat become isolated	(iii) importance of habitat removed, modified or isolated		
Flora								
Acacia bynoeana	Unlikely	na	na	Not significant	No	Not important	na	na
Boronia deanei	Nil	na	na	Low	No	No impact	na	na
Caesia parviflora var. minor	Nil	na	na	Unlikely	No	Not important	na	na
Eucalyptus pulverulenta	Unlikely	na	na	Unlikely	No	No impact	na	na
Eucalyptus aggregata	Unlikely	na	na	Unlikely	No	No impact	na	na
Genoplesium superbum	Nil	na	na	Unlikely	No	Not important	na	na
Lastreopsis hispida	Unlikely	na	na	Unlikely	No	Not important	na	na
Persoonia acerosa	Nil	na	na	Not significant	No	Not important	na	na
Persoonia hindii	Nil	na	na	Not significant	No	Not important	na	na
Prasophyllum fuscum	Nil	na	na	Low	No	Not important	na	na
Thesium austral (Austral toadflax)	Unlikely	na	na	Not significant	No	Not important	na	na
Veronica blakelyi syn.	Unlikely	na	na	Not significant	No	Not important	na	na
Invertebrates								
Giant Dragonfly	Unlikely	na	na	Unlikely	No	No effect	na	na
Adam’s Emerald Dragonfly FM Act	Unlikely	na	na	Unlikely	Unlikely	Not important	na	na
Herpetofauna								
Stuttering Frog	Unlikely	na	na	Unlikely	No	No effect	na	Consistent
Giant Burrowing Frog	Unlikely	na	na	Unlikely	No	No effect	na	na
Littlejohn’s Tree Frog	Unlikely	na	na	Unlikely	No	No effect	na	na
Red-crowned Toadlet	Unlikely	na	na	Not significant	No	No effect	na	na
Blue Mountains Water Skink	Nil	na	na	Unlikely	No	No effect	na	Consistent
Broad-headed Snake	Unlikely	na	na	Unlikely	No	No effect	na	na
Rosenberg’s Goanna	Unlikely	na	na	11.4 ha	No	Not important	na	na
Birds								
Regent Honeyeater	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Gang-gang Cockatoo	Unlikely	na	na	Nil	No	Not important	na	na
Glossy Black-Cockatoo	Unlikely	na	na	Nil	No	Not important	na	na
Speckled Warbler	Unlikely	na	na	Nil	No	Not important	na	na
Brown Treecreeper	Unlikely	na	na	Nil	No	Not important	na	na
Varied Sittella	Unlikely	na	na	Nil	No	Not important	na	na
Little Lorikeet	Unlikely	na	na	Nil	No	Not important	na	na
Painted Honeyeater	Unlikely	na	na	Nil	No	Not important	na	na
Hooded Robin	Unlikely	na	na	Nil	No	Not important	na	na
Scarlet Robin	Unlikely	na	na	Nil	No	Not important	na	na
Flame Robin	Unlikely	na	na	Nil	No	Not important	na	na

Group and species	(a) Risk of extinction of local population	(b) Risk of extinction of endangered population	(c) adverse impact on the extent of, or modification to EECs or CECs leading to local extinction	(d) habitats of threatened species, EECs or CECs			(e) adverse impact on critical habitat	(f) consistence with recovery or threat abatement plan
				(i) extent of habitat removed modified	(ii) will habitat become isolated	(iii) importance of habitat removed, modified or isolated		
Black-chinned Honeyeater	Unlikely	na	na	Nil	No	Not important	na	na
Masked Owl	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Sooty Owl	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Barking Owl	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Powerful Owl	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Grey-crowned Babbler	Unlikely	na	na	Not significant	No	Not important	na	na
<b>Mammals</b>								
Eastern Bentwing-bat	Unlikely	na	na	Unlikely	No	Not important	na	na
Large-eared Pied Bat	Unlikely	na	na	Unlikely	No	Not important	na	na
Little Pied Bat	Unlikely	na	na	Unlikely	No	Not important	na	na
Eastern Cave Bat	Unlikely	na	na	Unlikely	No	Not important	na	na
Eastern Freetail-bat	Unlikely	na	na	Nil	No	Not important	na	na
Eastern False Pipistrelle	Unlikely	na	na	Nil	No	Not important	na	na
Greater Broad-nosed Bat	Unlikely	na	na	Nil	No	Not important	na	na
Yellow-bellied Sheath-tail Bat	Unlikely	na	na	Nil	No	Not important	na	na
Southern Brown Bandicoot	Unlikely	na	na	Nil	No	Not important	na	na
Eastern Pygmy Possum	Unlikely	na	na	Nil	No	Not important	na	na
Koala	Unlikely	na	na	Nil	No	Not important	na	na
Brush-tailed Rock-wallaby	Unlikely	na	na	Nil	No	Not important	na	na
Squirrel Glider	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Yellow-bellied Glider	Unlikely	na	na	Nil	No	Not important	na	na
Spotted-tailed Quoll	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
<b>EECs and TECs</b>								
Newnes Plateau Shrub Swamp	na	na	Unlikely	Unlikely	No	No effect	na	na
Montane Peatlands and Swamps	na	na	Unlikely	Nil	No	No effect	na	na
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland	na	na	Unlikely	Unlikely	No	Not important	na	na

Table 3 Summary of EPBC Assessment of Significance for Angus Place

Group and Species	(a) Lead to a long-term decrease in the size of an important population	(b) Reduce the area of occupancy of the species	(c) Fragment an existing important population	(d) Adversely affect habitat critical to the survival of a species	(e ) Disrupt the breeding cycle of a population	(f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	(g) Result in invasive species becoming established	(h) Introduce disease that may cause the species to decline	(i) Interfere substantially with the recovery of the species
<b>Plants</b>									
<i>Acacia bynoeana</i>	Unlikely	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely
<i>Boronia deanei</i>	No	No	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely
<i>Eucalyptus pulverulenta</i>	Unlikely	No	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely
<i>Prasophyllum fuscum</i>	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
<i>Persoonia acerosa</i>	Unlikely	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely
<i>Prostanthera cryptandroides</i> subsp. <i>cryptandroides</i> (Wollemi Mintbush)	Unlikely	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely
<i>Thesium australe</i>	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
<b>Herpetofauna</b>									
Giant Burrowing Frog	Unlikely	No	No	No	No	No	Unlikely	Unlikely	Unlikely
Stuttering Frog	Unlikely	by 0.03 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
Littlejohn's Tree Frog	Unlikely	by 0.33 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
Blue Mountains Water Skink	No	No	No	No	No	No	Unlikely	Unlikely	Unlikely
Broad-headed Snake	No	by 0.63 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
<b>Birds</b>									
Regent Honeyeater	Unlikely	Unlikely	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely
<b>Mammals</b>									
Koala	Unlikely	by 23.08 ha	No	0.16 ha to be removed	Unlikely	No	Unlikely	Unlikely	Unlikely
Spotted-tailed Quoll	Unlikely	by 23.24 ha	No	Unlikely	No	No	Unlikely	Unlikely	Unlikely
Southern Brown Bandicoot	Unlikely	by 23.24 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
New Holland Mouse	No	by 23.24 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
Large-eared Pied Bat	No	No	No	No	No	No	Unlikely	Unlikely	Unlikely
Brush-tailed Rock-wallaby	Unlikely	by 0.63 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
<b>EECs and TECs</b>									
Temperate Highland Peat Swamps on Sandstone	Unlikely	No	No	No	No	No	na	na	na



Table 4 Summary of 7 Part Tests of Significance for Springvale Mine

Group and species	(a) Risk of extinction of local population	(b) Risk of extinction of endangered population	(c) adverse impact on the extent of, or modification to EECs or CECs leading to local extinction	(d) habitats of threatened species, EECs or CECs			(e) adverse impact on critical habitat	(f) consistence with recovery or threat abatement plan
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Boronia deanei	Nil	na	na	Low	No	No impact	na	na
Caesia parviflora var. minor	Nil	na	na	Unlikely	No	Not important	na	na
Eucalyptus pulverulenta	Unlikely	na	na	Not significant	No	No impact	na	na
Eucalyptus aggregata	Unlikely	na	na	Not significant	No	No impact	na	na
Genoplesium superbum	Nil	na	na	Unlikely	No	Not important	na	na
Lastreopsis hispida	Unlikely	na	na	Not significant	No	Low	na	na
Persoonia acerosa	Nil	na	na	Not significant	No	Not important	na	na
Persoonia hindii	Nil	na	na	Not significant	No	Not important	na	na
Prasophyllum fuscum	Nil	na	na	Low	No	No impact	na	na
Thesium austral (Austral toadflax)	Unlikely	na	na	Not significant	No	No impact	na	na
Veronica blakelyi syn.	Unlikely	na	na	Not significant	No	Not important	na	na
Invertebrates								
Giant Dragonfly	Unlikely	na	na	Unlikely	No	No effect	na	na
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Herpetofauna								
Stuttering Frog	Unlikely	na	na	Unlikely	No	No effect	na	na
Giant Burrowing Frog	Unlikely	na	na	Unlikely	No	No effect	na	na
Littlejohn’s Tree Frog	Unlikely	na	na	Unlikely	No	No effect	na	na
Red-crowned Toadlet	Unlikely	na	na	Not significant	No	No effect	na	na
Blue Mountains Water Skink	Nil	na	na	Unlikely	No	No effect	na	na
Broad-headed Snake	Unlikely	na	na	Unlikely	No	No effect	na	na
Rosenberg’s Goanna	Unlikely	na	na	11.4 ha	No	Not important	na	na
Birds								
Regent Honeyeater	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Gang-gang Cockatoo	Unlikely	na	na	Nil	No	Not important	na	na
Glossy Black-Cockatoo	Unlikely	na	na	Nil	No	Not important	na	na
Speckled Warbler	Unlikely	na	na	Nil	No	Not important	na	na
Brown Treecreeper	Unlikely	na	na	Nil	No	Not important	na	na
Varied Sittella	Unlikely	na	na	Nil	No	Not important	na	na
Little Lorikeet	Unlikely	na	na	Nil	No	Not important	na	na
Painted Honeyeater	Unlikely	na	na	Nil	No	Not important	na	na
Hooded Robin	Unlikely	na	na	Nil	No	Not important	na	na
Scarlet Robin	Unlikely	na	na	Nil	No	Not important	na	na
Flame Robin	Unlikely	na	na	Nil	No	Not important	na	na

Group and species	(a) Risk of extinction of local population	(b) Risk of extinction of endangered population	(c) adverse impact on the extent of, or modification to EECs or CECs leading to local extinction	(d) habitats of threatened species, EECs or CECs			(e) adverse impact on critical habitat	(f) consistence with recovery or threat abatement plan
				(i) extent of habitat removed modified	(ii) will habitat become isolated	(iii) importance of habitat removed, modified or isolated		
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Masked Owl	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Sooty Owl	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Barking Owl	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Powerful Owl	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Grey-crowned Babbler	Unlikely	na	na	Not significant	No	Not important	na	na
<b>Mammals</b>								
Eastern Bentwing-bat	Unlikely	na	na	Unlikely	No	Not important	na	na
Large-eared Pied Bat	Unlikely	na	na	Unlikely	No	Not important	na	na
Little Pied Bat	Unlikely	na	na	Unlikely	No	Not important	na	na
Eastern Cave Bat	Unlikely	na	na	Unlikely	No	Not important	na	na
Eastern Freetail-bat	Unlikely	na	na	Nil	No	Not important	na	na
Eastern False Pipistrelle	Unlikely	na	na	Nil	No	Not important	na	na
Greater Broad-nosed Bat	Unlikely	na	na	Nil	No	Not important	na	na
Yellow-bellied Sheath-tail Bat	Unlikely	na	na	Nil	No	Not important	na	na
Southern Brown Bandicoot	Unlikely	na	na	Nil	No	Not important	na	na
Eastern Pygmy Possum	Unlikely	na	na	Nil	No	Not important	na	na
Koala	Unlikely	na	na	Nil	No	Not important	na	na
Brush-tailed Rock-wallaby	Unlikely	na	na	Nil	No	Not important	na	na
Squirrel Glider	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
Yellow-bellied Glider	Unlikely	na	na	Nil	No	Not important	na	na
Spotted-tailed Quoll	Unlikely	na	na	Nil	No	Not important	na	Inconsistent
<b>EECs and TECs</b>								
Newnes Plateau Shrub Swamp	na	na	Unlikely	Unlikely	No	No effect	na	na
Montane Peatlands and Swamps	na	na	Unlikely	Unlikely	No	No effect	na	na
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland	na	na	Unlikely	0.22 ha	No	Not important	na	na

Table 5 Summary of EPBC Assessment of Significance for Springvale Mine

Group and Species	(a) Lead to a long-term decrease in the size of an important population.	(b) Reduce the area of occupancy of the species.	(c) Fragment an existing important population.	(d) Adversely affect habitat critical to the survival of a species	(e ) Disrupt the breeding cycle of a population	(f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline.	(g) Result in invasive species becoming established	(h) Introduce disease that may cause the species to decline.	(i) Interfere substantially with the recovery of the species.
<b>Plants</b>									
<i>Acacia bynoeana</i>	No	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely
<i>Boronia deanei</i>	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
<i>Eucalyptus pulverulenta</i>	Unlikely	No	No	No	No	Unlikely	Unlikely	Unlikely	No
<i>Prasophyllum fuscum</i>	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
<i>Persoonia acerosa</i>	Unlikely	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely
<i>Prostanthera cryptandroides</i> subsp. <i>cryptandroides</i> (Wollemi Mintbush)	Unlikely	No	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely
<i>Thesium australe</i>	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
<b>Herpetofauna</b>									
Giant Burrowing Frog	Unlikely	No	No	No	No	No	Unlikely	Unlikely	Unlikely
Stuttering Frog	Unlikely	by 0.17 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
Littlejohn's Tree Frog	Unlikely	by 0.18 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
Blue Mountains Water Skink	No	No	No	No	No	No	Unlikely	Unlikely	Unlikely
Broad-headed Snake	No	by 2.52 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
Birds									
Regent Honeyeater	Unlikely	Unlikely	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely
Mammals									
Koala	Unlikely	reduce by 11.38 ha	No	0.22 ha of critical habitat to be removed	Unlikely	No	Unlikely	Unlikely	Unlikely
Spotted-tailed Quoll	Unlikely	reduce by 11.44 ha	No	Unlikely	No	No	Unlikely	Unlikely	Unlikely
Southern Brown Bandicoot	Unlikely	reduce by 11.37 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
New Holland Mouse	No	reduce by 11.44 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
Large-eared Pied Bat	No	No	No	No	No	No	Unlikely	Unlikely	Unlikely
Brush-tailed Rock-wallaby	Unlikely	reduced by 2.45 ha	No	No	No	No	Unlikely	Unlikely	Unlikely
<b>EEC</b>									
Temperate Highland Peat Swamps on Sandstone	Unlikely	No	No	No	No	No	na	na	na

Table 6 Summary of 7 Part Tests of Significance for Neubeck Coal Project

Group and species	(a) Risk of extinction of local population	(b) Risk of extinction of endangered population	(c) adverse impact on the extent of, or modification to EECs or CECs leading to local extinction	(d) habitats of threatened species, EECs or CECs			(e) adverse impact on critical habitat	(f) consistence with recovery or threat abatement plan
				(i) extent of habitat removed modified	(ii) will habitat become isolated	(iii) importance of habitat removed, modified or isolated		
Flora								
<i>Eucalyptus aggregata</i>	Unlikely	N/A	N/A	300 individuals	No	Not important	N/A	N/A
<i>Eucalyptus cannonii</i>	Nil	N/A	N/A	39 individuals and up to 61.62ha of potential habitat	No	Not important	N/A	N/A
<i>Genoplesium superbum</i>	Unlikely	N/A	N/A	68.36 ha of potential habitat	No	Not important	N/A	N/A
<i>Persoonia marginata</i>	Nil	N/A	N/A	Up to 79.13 ha of potential habitat	No	Not important	N/A	N/A
<i>Thesium australe</i>	Unlikely	N/A	N/A	61 individuals and up to 102.35 ha of potential habitat	No	Not important	N/A	N/A
Invertebrates								
Bathurst Copper Butterfly	Potentially	N/A	N/A	0.91 hectares of potential habitat	Yes	Potential importance	N/A	Consistent
Birds								
Glossy Black-Cockatoo	Unlikely	N/A	N/A	3.97 ha of potential habitat	No	Not important	N/A	N/A
Gang-gang Cockatoo	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	N/A
Little Lorikeet	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	N/A
Speckled Warbler	Unlikely	N/A	N/A	63.27 ha of potential habitat	No	Not important	N/A	N/A
Painted Honeyeater	Unlikely	N/A	N/A	50.02 ha of potential habitat	No	Not important	N/A	N/A
Regent Honeyeater	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	Inconsistent
Powerful Owl	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	Inconsistent
Barking Owl	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	Inconsistent
Brown Treecreeper	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	N/A
Varied Sittella	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	N/A
Scarlet Robin	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	N/A
Flame Robin	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	N/A
Hooded Robin	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	N/A
Diamond Firetail	Unlikely	N/A	N/A	110.44 ha of potential habitat	No	Not important	N/A	N/A
Mammals								
Spotted-tailed Quoll	Unlikely	N/A	N/A	65.85 ha of potential habitat	No	Not important	N/A	Inconsistent
Koala	Unlikely	N/A	N/A	86.09 ha of potential habitat	No	Not important	N/A	Consistent
Squirrel Glider	Unlikely	N/A	N/A	54.35 ha of potential habitat	No	Not important	N/A	N/A
Eastern Bentwing-bat	Unlikely	N/A	N/A	90.05 ha of potential habitat	No	Not important	N/A	N/A
Large-eared Pied Bat	Unlikely	N/A	N/A	90.05 ha of potential habitat	No	Not important	N/A	Consistent
Eastern False Pipistrelle	Unlikely	N/A	N/A	90.05 ha of potential habitat	No	Not important	N/A	N/A
EECs and TECs								
Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland	N/A	N/A	Unlikely	Removal of 17.73 ha	No	Not important	N/A	N/A

Table 7 Summary of EPBC Assessment of Significance for Neubeck Coal Project

Group and Species	(a) Lead to a long-term decrease in the size of an important population	(b) Reduce the area of occupancy of the species	(c) Fragment an existing important population	(d) Adversely affect habitat critical to the survival of a species	(e ) Disrupt the breeding cycle of a population	(f) Modify, destroy, remove or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline	(g) Result in invasive species becoming established	(h) Introduce disease that may cause the species to decline	(i) Interfere substantially with the recovery of the species
<b>Flora</b>									
<i>Persoonia marginata</i>	No	Unlikely	No	No	No	No	Potentially	Unlikely	Unlikely
<i>Thesium australe</i>	Unlikely	Potential occupancy area will be reduced by 102.31 ha.	Potentially	Unable to identify or quantify critical habitat	No	Unlikely	Potentially	Unlikely	Unlikely
<b>Fauna</b>									
Copperwing Butterfly	Potentially	Potential occupancy area will be reduced by 0.91 ha.	Potentially	Unable to identify or quantify critical habitat	Potentially	Potentially	Unlikely	Unlikely	Potentially
Regent Honeyeater	Unlikely	Unlikely	Unlikely	No	No	No	Unlikely	Unlikely	Unlikely
Spotted-tailed Quoll	Unlikely	Potential occupancy area will be reduced by 65.85 ha.	No	No	No	No	Minor	Unlikely	Unlikely
Koala	Unlikely	Potential occupancy area will be reduced by 86.08 ha.	No	Yes, approx. 79.01 ha of critical habitat occur within the PAA.	Unlikely	Unlikely	Unlikely	Unlikely	Unlikely
Large-eared Pied Bat	No	Potential occupancy area will be reduced by 90.5 ha.	No	No	No	No	Unlikely	Unlikely	Unlikely

**Table 8 Causal Factors Leading to Impacts to East Wolgan Swamp**

Causal Factors	Springvale Coal Management Response
Mine water discharge	Cease mine water discharge to Newnes Plateau (including proposed underground water storage for future emergency mine water discharges). (There have been no Newnes Plateau discharges since April 2010)
Intersection of major geological fault structures	Major geological structure zones identified through detailed topographic, geological and geophysical analysis. The relationship between mine subsidence, geological faulting and groundwater response is well understood from historical monitoring data (based on piezometers, extensometers, subsidence monitoring (terrestrial and LiDAR), exploration borehole data). This understanding is used in the mine planning and design process to ensure that combinations of risk factors do not occur in future mining areas in the Project Application Area.
Orientation of longwall panels sub-parallel to major structures	Angle of orientation increased for future swamps e.g increase to 24° for Carne West and 51° for Sunnyside East.
Steepness and depth valley containing swamps	Surface topography is well understood from Digital Terrain Model. Analysis of topographic and subsidence data identified no measured impacts at slope angles <18 degrees (see Section 8.2.1 of this EIS).
In situ stress direction and magnitude	Horizontal stress orientation mapped through exploration borehole geophysical testing / analysis. Horizontal stress magnitude measured through installation of instrumentation in surface to seam boreholes and in the roof at seam level.
Critical width longwall panel design	Future longwalls in the vicinity of swamps are based on Subcritical panel design
Location and orientation of geological structure adjacent to the permanent barrier pillar	Future Mine workings designed to avoid alignment of major geological structure zones sub-parallel with edge of permanent barrier pillar subject to multiple panel subsidence effects
Subsidence interaction of adjacent Angus Place and Springvale workings	Springvale Mine and Angus Place Colliery future mining areas are not adjacent to each other (separated by over 500 m) thus interaction will be avoided.

For the Neubeck Project, this conclusion has been formed through the adoption of avoidance measures, including minimising the footprint of the mine. Regardless, there are residual impacts as a result of the Neubeck Project that require direct offsetting.

### 3.2 The Conservation Values of the Newnes Plateau and Ben Bullen State Forest

Angus Place Colliery and Springvale Mine have recognised, through the final land use proposed for the Projects, the conservation values that the Newnes Plateau and Ben Bullen State Forest currently holds and will hold in the future following cessation of forestry and mining activities. These conservation values have been identified through consultation with a number of stakeholders and a literature review of stakeholder documentation, including:

- The Greater Blue Mountains World Heritage Area Strategic Plan (2009 to 2019),
- 'Save our Swamps' documentation (2010)
- Review of Piezometer Monitoring Data in Newnes Plateau Shrub Swamps and their Relationship with Underground Mining in the Western Coalfield, DECCW (2010)
- Coalpac Consolidation Project Planning Assessment Commission Report, 2013
- The Geoheritage and Geomorphology of the Sandstone Pagodas of the North-western Blue Mountains region (NSW), Washington et al, 2011

- The Gardens of Stone Park Proposal: Stage 2, the Western Escarpment, Airly-Genowlan Mesa, Newnes Plateau and related Crown lands, 2005<sup>1</sup>
- The Impact of Coal Mining on the Gardens of Stone, Colong Foundation for Wilderness, 2010
- Alteration of Habitat Following Subsidence due to Longwall Mining – Key Threatening Process Listing, Office of Environment and Heritage, 2005

This review identified the common theme and desire to protect, conserve, present and rehabilitate the environmental values of the Newnes Plateau for recreation and tourism purposes. This includes consideration of:

- Threats to conservation values that include (but are not limited to) fire, pests and weeds
- Methods to establish the health status of swamp communities to guide management decisions, as discussed in Chapter 10.3 of the EIS
- Impacts of mine water discharge on swamp communities, as discussed in Chapter 2 and Chapter 8 of the EIS
- Value of pagoda systems that occur within the Banks Wall and Burra Moko Head Sandstones, as discussed in Chapter 2 and Chapter 10.1 of the EIS<sup>2</sup>
- Impacts of mining related activities to areas with potential conservation value, including construction of access roads and utility corridors, historical cliff collapses, potential changes to hydrology; as discussed in Chapter 2 and Chapter 10.1, 10.2 and 10.3 of the EIS
- Support by Centennial Coal Company Ltd for the reservation of Mugii Murum-ban State Conservation Area in a State Conservation Area in 2011
- A heritage assessment for the Mount Airly Oil Shale Ruins, completed by Centennial Airly Pty Ltd in 2013
- Discharge of water away from the World Heritage Area and reuse of water for industrial purposes, as discussed in Chapter 10.2 of the EIS
- Subsidence protection zones whilst maintaining economically viable operations, as discussed in Chapter 8 of the EIS
- Collection of real time and relevant data to inform understanding of the biodiversity and geo-diversity values, as discussed in Chapter 2 and Chapter 10 and 10 of the EIS
- Management and monitoring of underground mining operations to achieve predicted height of fracturing, thereby minimising to the greatest extent possible surface related impacts, as discussed in Chapter 2 and Chapter 8 of the Springvale Mine Extension Project EIS and the Angus Place Mine Extension Project EIS
- Recognition of the geo-diversity of pagoda systems and avoidance of impacts to these systems within the Neubeck Coal Project EIS (Chapter 8)
- A minimum 300m set back of the mine footprint to pagoda systems, as discussed in Chapter 8 of the Neubeck Project EIS

<sup>1</sup> Including *The Gardens of Stone Park Proposal Stage Two Illustrated: A proposal to extend the Gardens of Stone and Blue Mountains National Parks and create a Gardens of Stone Conservation Area and a Western Escarpment State Conservation Area*, Blue Mountains Conservation Society and the Colong Foundation for Wilderness, 2005.

*Seeing the Gardens...the other Blue Mountains: Nature based tourism and recreation in the Gardens of Stone Stage Two Park Proposal*, Blue Mountains Conservation Society and the Colong Foundation for Wilderness, 2009

<sup>2</sup> The EIS refers to the Environmental Impact Statement of the Neubeck Coal Project, the Springvale Mine Extension Project and the Angus Place Colliery Extension Project, unless specified otherwise.



severely disturbed

- Avoidance of *Bursaria spinosa*, the known host plant for the Copperwing Butterfly, as discussed in Chapter 10 of the Neubeck Project EIS.

By taking into consideration the measures identified above, the conservation values of the Newnes Plateau, and to a lesser extent the Ben Bullen State Forest, and the management strategies to avoid and mitigate impacts, the mining operations at Angus Place and Springvale can be managed to achieve a future conservation outcome. Whilst the direct impacts of the Neubeck Project will result in a loss of threatened species and their habitats, by restricting the mine footprint as far as practicable these impacts have been minimised such that the offsets and supporting supplementary measures can compensate for this loss.

Centennial Coal has developed this biodiversity strategy to meet this broader conservation outcome.



## 4.0 The Regional Biodiversity Strategy

A regional biodiversity offset strategy is to be developed that takes into account the cumulative (direct and indirect) impact of these proposals. The land proposed to be used for offsetting will be included in the EISs, with full quantification of the vegetation communities contained therein. A comparison with the vegetation communities at the impact sites that are being offset will also be included.

This report addresses the requirements of the OEH and Department of the Environment Director General's Requirements and is summarised in **Table 9** and **10**.

**Table 9 Office of Environment and Heritage Requirements**

Office of Environment and Heritage Requirements	Where Addressed in this Report
clear quantification of each vegetation community that will be directly and indirectly impacted,	Table 11, 12, 13, 14, 15 and 16
clear maps showing the vegetation communities to be impacted,	Appendix 1, 2, 3 and 4
clear quantification of each vegetation community on the proposed offset sites	Table 17 and 19
a clear map showing the location of the proposed offset site and the vegetation communities on the site, including the size of the offset site, the landscape context and the cadastre boundaries,	Figures 1 and 2
demonstration of the metric used to show that the impacts are fully offset,	Table 21 and 22, and Section 7
details of the proposed mechanism for securing the offset site in perpetuity,	Section 8 of this Report
objectives for management of the proposed offset site, and	Section 9 of this Report
demonstration that the proposed offset proposal is consistent with relevant Government policies and principles	Section 2 of this Report and Table 1

**Table 10 Department of the Environment Requirements**

Department of the Environment Requirements	Where Addressed in this Report
Location and size of the offset land	Figure 1 and Table 14
Maps showing the relevant ecological features, the landscape context and the cadastre boundary	Figure 1 and 2
The current tenure arrangements (including zoning and land ownership) of the offset land	Figure 3
Confirmed records of presence (or otherwise) of relevant protected matters on the offset land	Figure 2, and Table 18 and 20
Detailed information of the presence and quality of habitat for relevant protected matters on the offset land. The quality of habitat should be assessed in a manner consistent with <i>How to use the offset assessment guide</i>	Figure 2, Table 18 and 20, and Sections 6.2 and 6.3
Management actions that will be undertaken that improve or maintain the quality of the proposed offset land	Section 9 of this Report
Time over which management actions will deliver proposed improvements or maintenance of habitat quality	Section 8 and 9 of this Report
Risk of damage, degradation or destruction to any offset land in the absence of formal protection and/or management over a foreseeable period of time (20 years)	Section 8 of this Report
Presence of pending development applications, mining leases or other activities on or near the offset land that indicate development intent	Figure 3
Average risk of loss for similar sites	Austin et al. (2000) found that the Box – Gum Grassy Woodland and Derived Grassland ecological community had been reduced to less than 1% of its pre-

Department of the Environment Requirements	Where Addressed in this Report
	1750 extent in the Central Lachlan region. Thomas et al. (2000) estimated <4% remaining in the NSW South Western Slopes and Southern Tablelands. Gibbons and Boak (2002) estimated 7.4% of Yellow Box/Blakely's Red Gum woodland remaining in 30,000 hectares on the NSW South West Slopes, which is reduced to 3.4% when isolated trees, remnants of less than one hectare and small, modified patches were excluded (TSSC 2006).
Presence and strength of formal protection mechanisms currently in place	The offset land is owned by Centennial Airly Pty Ltd. This ownership affords a level of existing protection for the land (for example through existing land management practices including restrictions on grazing, and pest control) that a restrictive covenant will strengthen.
The proposed strategy is additional to any existing requirement, determined by law or planning regulations, agreed to under other schemes or programs or required under an existing duty of care	Section 2 of this Report
Overall cost of the strategy, including acquisition/land transfer costs; implementation of related management actions; and monitoring, reporting and auditing of the strategy	Section 11 of this Report

The Biodiversity Strategy will be included in the Statement of Commitments for each EIS.

## 5.0 Vegetation Impacted By Centennial Projects

Vegetation within the Angus Place and Springvale Project Application Areas is dominated by three distinct vegetation types; dense low swamp shrubby vegetation along the drainage lines, eucalypt forest vegetation on the slopes and ridges and dry rocky heath along cliffs and ridge tops.

Within the Springvale Survey Area and the PAA the report *Vegetation of the Western Blue Mountains- including the Capertee, Coxs, Jenolan and Gurmang Areas* (DEC 2006a) has mapped 32 vegetation communities. Ground-truthing of the site identified 26 vegetation communities. The impact of the proposal to these vegetation communities is summarised in **Table 11** and **12** and displayed in **Appendix 1**.

For Angus Place the report *Vegetation of the Western Blue Mountains- including the Capertee, Coxs, Jenolan and Gurmang Areas* (DEC 2006) has mapped 32 vegetation communities within the Survey Area and the Project Application Area (PAA). Ground-truthing of the site identified 16 vegetation communities. The impact of the proposal to these vegetation communities is summarised in **Table 13** and **14** and displayed in **Appendix 2**.

Within the Neubeck Site a total of nine native vegetation communities were identified, two of which are commensurate with Tablelands Snow Gum, Black Sallee, Candlebark and Ribbon Gum Grassy Woodland in the South Eastern Highlands, Sydney Basin, South East Corner and NSW South Western Slopes Bioregions, an Endangered Ecological Community (EEC) listed under the TSC Act. In addition three TSC Act and EPBC Act listed flora species will be directly impacted as a result of the proposal. The impact of the proposal to these vegetation communities and flora species is summarised in **Table 15** and **Table 16** and is displayed in **Appendix 3**.

**Table 11 Springvale Native Vegetation Communities to be Directly Impacted**

WBM Unit	Vegetation Community Description	BioBank Unit	Vegetation Community Description	Area (ha)
MU7	Newnes Plateau Narrow-leaved Peppermint - Mountain Gum - Brown Stringybark Layered Forest	HN558	Narrow-leaved Peppermint - Mountain Gum - Brown Barrel moist open forest on high altitude ranges, northern South Eastern Highlands	1.50
MU8	Newnes Sheltered Peppermint- Brown Barrel Shrubby Forest	HN599	Sydney Peppermint - Narrow-leaved Peppermint shrubby open forest on sheltered slopes of the Newnes Plateau, Sydney Basin	0.73
MU11	Tableland Gully Snow Gum- Ribbon Gum Montane Grassy Forest (EEC)	HN599	Sydney Peppermint - Narrow-leaved Peppermint shrubby open forest on sheltered slopes of the Newnes Plateau, Sydney Basin	0.22
MU26	Newnes Plateau Narrow-leaved Peppermint - Silver-top Ash Layered Open Forest	HN600	Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin	5.44
MU26a	Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest	HN600	Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin	1.09
MU28	Sandstone Plateau And Ridge Scribbly Gum - Silver-top Ash Shrubby Woodland	HN600	Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin	2.29
MU29	Sandstone Slopes Sydney Peppermint Shrubby Forest	HN600	Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin	0.10
MU44	Sandstone Plateaux Tea Tree- Dwarf Sheoak- Banksia Rocky Heath	HN508	Blue Mountains Mallee Ash - Dwarf Casuarina heath of the upper Blue Mountains, Sydney Basin	0.07
<b>Total</b>				<b>11.44</b>

**Table 12 Springvale Native Vegetation Communities to be Indirectly Impacted**

WBM Unit	Vegetation Community Description	BioBank Unit	Vegetation Community Description	Area (ha)
MU50	Newnes Plateau Shrub Swamp	HN563	Prickly Tea-tree - sedge wet heath on sandstone plateaux, central and southern Sydney Basin	62.68
MU51	Newnes Plateau Hanging Swamp	HN563	Prickly Tea-tree - sedge wet heath on sandstone plateaux, central and southern Sydney Basin	13.31
MU52	Newnes Plateau Rush - Sedge - Snow Gum Hollow Wooded Heath	HN592	Swamp Gum - Ribbon Gum woodland on poorly-drained flats, South Eastern Highlands	0.58
<b>Total</b>				<b>76.57</b>

**Table 13 Angus Place Native Vegetation Communities to be Directly Impacted**

WBM Unit	Vegetation Community Description	BioBank Unit	Vegetation Community Description	Area (ha)
MU7	Newnes Plateau Narrow-leaved Peppermint - Mountain Gum - Brown Stringybark Layered Forest	HN558	Narrow-leaved Peppermint - Mountain Gum - Brown Barrel moist open forest on high altitude ranges, northern South Eastern Highlands	1.06
MU14	Tableland Mountain Gum- Snow Gum- Daviesia Montane Open Forest	HN590	Snow Gum - Mountain Gum tussock grass-herb forest of the South Eastern Highlands	0.16
MU26	Newnes Plateau Narrow-leaved Peppermint - Silver-top Ash Layered Open Forest	HN600	Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin	8.25
MU26a	Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest	HN600	Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin	0.11
MU28	Sandstone Plateau And Ridge Scribbly Gum - Silver-top Ash Shrubby Woodland	HN600	Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin	5.45
MU29	Sandstone Slopes Sydney Peppermint Shrubby Forest	HN600	Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin	1.84
MU30	Exposed Blue Mountains Sydney Peppermint- Silvertop Ash Shrubby Woodland	HN600	Sydney Peppermint - Silvertop Ash heathy open forest on sandstone ridges of the upper Blue Mountains, Sydney Basin	6.38
<b>Total</b>				<b>23.25</b>

**Table 14 Angus Place Native Vegetation Communities to be Indirectly Impacted**

WBM Unit	Vegetation Community Description	BioBank Unit	Vegetation Community Description	Area (ha)
MU50	Newnes Plateau Shrub Swamp	HN563	Prickly Tea-tree - sedge wet heath on sandstone plateaux, central and southern Sydney Basin	10.33
MU51	Newnes Plateau Hanging Swamp	HN563	Prickly Tea-tree - sedge wet heath on sandstone plateaux, central and southern Sydney Basin	9.71
<b>Total</b>				<b>20.04</b>

**Table 15 Neubeck Native Vegetation Communities to be Directly Impacted**

WBM Unit	Vegetation Community Description	BioBank Unit	Vegetation Community Description	Area (ha)
MU11	Tableland Gully Snow Gum - Ribbon Gum Grassy Forest (EEC)	HN572	Ribbon Gum – Snow grassy forest on damp flats, eastern South Eastern Highlands	13.25
MU15	Tableland Hollows Black Gum - Black Sally Grassy Open Forest (EEC)	HN504	Black Gum grassy woodland of damp flats and drainage lines of the eastern Southern Tablelands, South Eastern Highlands	4.48
MU32	Tableland Hills Scribbly Gum - Narrow-leaved Stringybark Shrubby Open Forest	HN570	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands	2.59
MU33	Tableland Broad leaved Peppermint – Brittle Gum – Red Stringybark Grassy Open Forest	HN514	Broad-leaved Peppermint - Red Stringybark grassy open forest on undulating hills, South Eastern Highlands	15.75
MU35	Tableland Gully Mountain Gum – Broad- leaved Peppermint Grassy Forest	HN590	Snow Gum - Mountain Gum tussock grass-herb forest of the South Eastern Highlands	8.92
MU37	Cox's Permian Red Stringybark - Brittle Gum Woodland and MU 32: Tableland Scribbly Gum - Narrow-leaved Stringybark Shrubby Open Forest	HN570	Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands	41.10
MU60	Non-native Vegetation - Other exotics (willow etc)	HN622	Highly disturbed areas - road verges, table drains, road embankments, ploughed paddocks etc	3.97
MU62	Cleared and Severely Disturbed Lands	HN626	Derived grasslands of the South Eastern Highlands and South East Corner – lower slopes and flats of upper Cox's and Tuglow River catchments	110.44
<b>Total</b>				<b>200.50</b>

**Table 16 Neubeck Threatened Species to be Directly Impacted**

Scientific Name	Common Name	Number of Individuals to be Directly Impacted
<i>Eucalyptus aggregata</i>	Black Gum	300
<i>Eucalyptus cannonii</i>	Capertee Stringybark	39
<i>Thesium australe</i>	Austral Toadflax	61

## 6.0 The Offset Area

### 6.1 Overview

The proposed offset land is located at Capertee, on land owned by Centennial Airly Pty Ltd. This land was acquired in 1997 following the acquisition of the then Novacoal operated Airly Mine. The offset area provides compensation for the residual impacts associated with the following projects:

- Springvale Mine Extension Project
- Angus Place Extension Project
- Angus Place MOD 2 - Ventilation Facility
- Springvale Colliery MOD 3 - Bore 8
- Western Coal Services Upgrade Project (currently under assessment by NSW Planning and Infrastructure)
- Clarence Colliery Reject Emplacement Area VI (currently under assessment by NSW Planning and Infrastructure)
- Neubeck Coal Project

The proposed offset site is located between the Airly State Forest, Capertee National Park and Mugii Murum-ban State Conservation Area and will make a significant contribution to the conservation of the connectivity between these estates. **Figure 1** depicts the regional context of the proposed offsets and demonstrates the connectivity value of these offsets.

### 6.2 The Springvale and Angus Place Offset Land

The proposed offset site for Springvale and Angus Place is Lot 135/DP755757 owned by Centennial Airly Pty Ltd. The properties are North of Lithgow NSW within the Hawkesbury/Nepean Catchment Management region which is within the Sydney Basin Bioregion and the Capertee Sub-region. This offset includes the previous impacts resulting from the Angus Place Ventilation Facility and the Springvale Colliery Bore 8, as well as the impacts proposed by the Western Coal Services Upgrade Project and the Clarence Reject Emplacement Area VI (**Appendix 4**).

Lot 135 DP 755757 lies within the Capertee Valley in The City of Lithgow Shire of Central Western NSW. The lot is comprised of a variety of vegetation communities. The site provides habitat for a number of threatened flora and fauna species and endangered ecological communities listed under both the state TSC Act and Federal EPBC Act.

The contiguous remnant vegetation within the offset site is in good condition and can be assumed to be in the same condition as the neighbouring Airly State Forest, Mugii Murum-ban State Conservation Area and Capertee National Park. The patches of remnant vegetation in the eastern portion of the offset area would be affected to a degree by edge effects due to surrounding derived grassland vegetation but most is still in good condition and retains connectivity with the more extensive areas of vegetation within and surrounding the site. The vegetation is comprised of predominantly grassy woodlands on the hills and slopes with small amounts of riparian vegetation along the drainage lines within the lot, a list of communities and their areas within the offset area is provided in **Table 17** and on **Figure 2**.

This vegetation is very likely to provide habitat in the form of foraging resource and breeding sites for many of the species recorded during fieldwork conducted in the site and locality. This included a total of 167 fauna species, comprising 29 mammal, 108 bird, 20 reptile and 10 amphibian species. Of the 167 fauna species

detected, 15 were listed as Vulnerable under the TSC Act (1995). In addition, the Large-eared Pied Bat is listed as Vulnerable under the EPBC Act 1999. MU20 is habitat for Capertee Stringybark with multiple records for this species collected from within these vegetation communities in the locality, a list of threatened species potentially occur within the offset area is provided in **Table 18**.

The Vegetation of the Western Blue Mountains (DEC 2006) indicates that within Lot 135 there is 9.99 ha of Capertee Rough-Barked Apple – Redgum – Yellow Box Grassy Woodland (MU20) which is commensurate with White Box – Yellow Box – Blakely's Red Gum Woodland Endangered Ecological Community (EEC) (TSC Act) and White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act) is present.

The offset value of this lot is in the threatened species that it provides habitat for, the endangered Ecological community that occurs within the site and the considerable connectivity between Airly State Forest, Capertee National Park and Muggi Murum-ban State Conservation Area that the conservation of this lot will ensure. In addition through management of the cleared areas there will potentially be a considerable gain in the area of the majority of the vegetation communities, and associated flora and fauna habitat, that occurs within the lot including the Capertee Rough-Barked Apple – Redgum – Yellow Box Grassy Woodland EEC.



No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.

Note that this Vegetation Community Map depicts clearly defined boundaries between vegetation communities that are the product of individual interpretation and are not distinguished by clearly defined boundaries 'on the ground'. Therefore, this map should only be treated as an indication of approximate peripheries between delineated vegetation communities.

Caution should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore, no account for intergrading areas between delineated vegetation communities has been made.

 National Park

AIRLY SF

## Mugii Murum-ban State Conservation Area

TITLE: FIGURE 1: AIRLY OFFSET SITE  
REGIONAL CONTEXT

LOCATION: AIRLY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 5/02/2014  
PURPOSE: OFFSET STRATEGY FIGURE

LAYOUT REF: #Workspace:M80#  
VERSION (PLAN BY): A-A3ZA

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JOB REF: 121085

RPS AUSTRALIA EAST PTY LTD (ABN 44 140 292 762)  
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Table 17 Vegetation Unit Areas and BioBank Credit Values for Lot 135

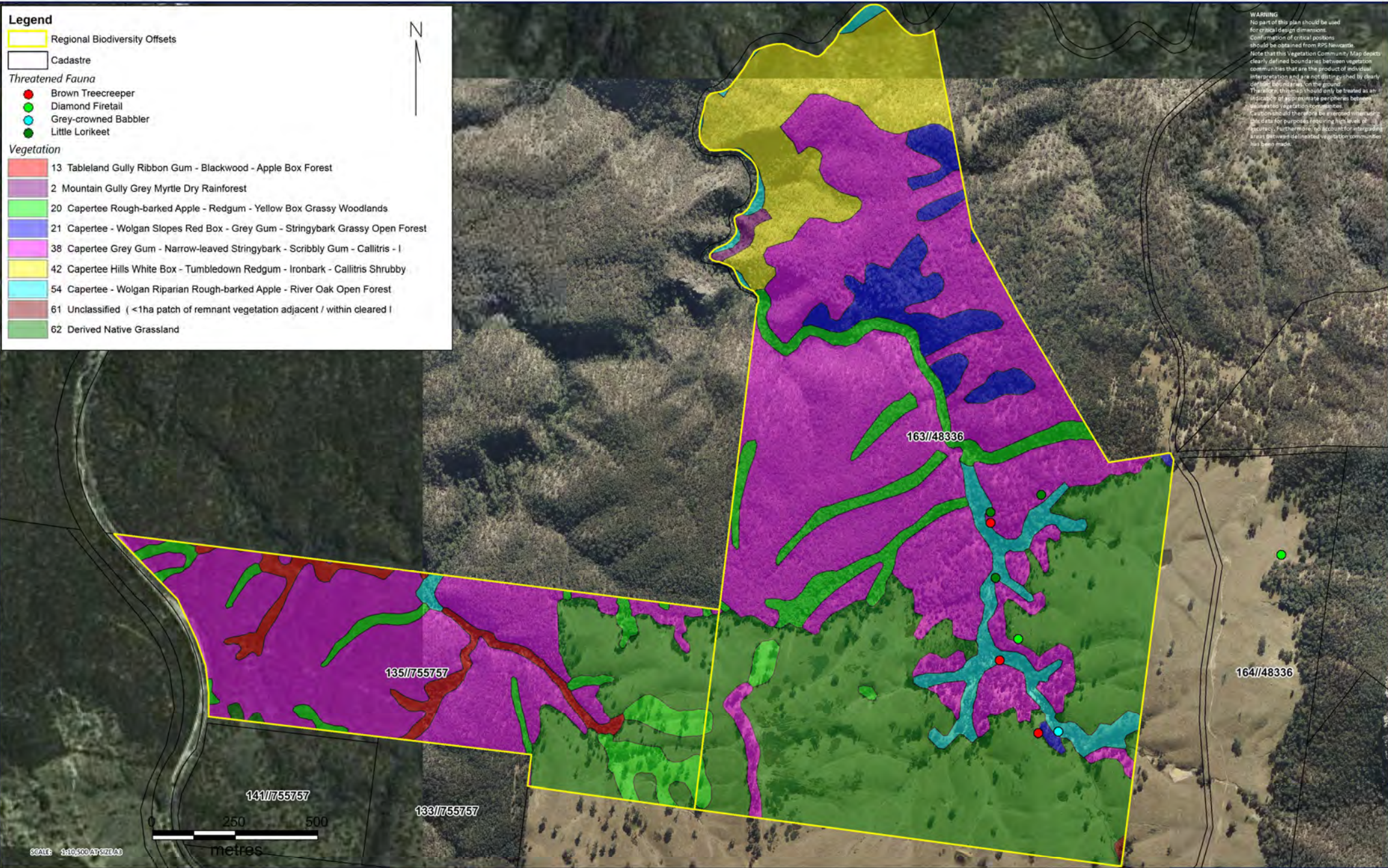
Lot	BioBank Veg Units	WBM Veg Units	Area (Ha)	Eco Credits	Species Credits	Veg Mapping Source
135	HN534	MU38	50.91	280	Nil	WBM (DEC 2006)
	HN501	MU13	6.21	34		WBM (DEC 2006)
	HN614	MU20	9.98	55		WBM (DEC 2006)
	HN626	MU62	19.06	105		WBM (DEC 2006)
	HN574	MU54	0.54	3		WBM (DEC 2006)
Total			86.70	477	0	

Table 18 TSC Act and EPBC Act Listed Species Recorded in the Site and Locality

Scientific name	Common name	TSC Act	EPBC Act	No. of Records Within Site
<b>Flora</b>				
<i>Eucalyptus Cannonii</i>	Cannon's Stringybark	V	-	Nil
<b>Reptiles</b>				
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V	-	Nil
<b>Avifauna</b>				
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	-	Nil
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	-	Nil
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V	-	Nil
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	Nil
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	Nil
<i>Ninox strenua</i>	Powerful Owl	V	-	Nil
<i>Pachycephala inornata</i>	Gilbert's Whistler	V	-	Nil
<i>Petroica boodang</i>	Scarlet Robin	V	-	Nil
<i>Petroica phoenicea</i>	Flame Robin	V	-	Nil
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V	-	Nil
<i>Stagonopleura guttata</i>	Diamond Firetail	V	-	Nil
<i>Tyto tenebricosa</i>	Sooty Owl	V	-	Nil
<b>Mammals</b>				
<i>Chalinolobus dwyeri</i> *	Large-eared Pied Bat	V	V	Nil
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll	V	E	Nil
<i>Miniopterus schreibersii oceanensis</i> *	Eastern Bentwing-bat	V	-	Nil
<b>Ecological Communities</b>				
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		E	CE	9.99ha

\*These species are cave dwelling species and the habitat value of the lot for these species would be dependent on the presence of these habitat features.





TITLE: FIGURE 2: OFFSET VEGETATION MAPPING

LOCATION: AIRLY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 12/03/2014  
PURPOSE: REPORT FIGURE

LAYOUT REF: J:\085\Centennial\All Jobs\121085 Passform  
VERSION (PLAN BY): A - A3 (ZA)

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### 6.3 The Neubeck Offset Land

The proposed offset site for the Neubeck Project is Lot 163 DP 48336 lies within the Capertee Valley in The City of Lithgow Shire of Central Western NSW. The lot is comprised of a variety of vegetation communities. The site provides habitat for a number of threatened flora and fauna species and endangered ecological communities listed under both the state TSC Act and the Federal EPBC Act.

Ecological investigations have confirmed the presence of 4 threatened fauna species listed as Vulnerable under the TSC Act 1995 including Brown Treecreeper (*Climacteris picumnus victoriae*), Grey-crowned Babbler (*Pomatostomus temporalis temporalis*), Diamond Firetail (*Stagonopleura guttata*), and Little Lorikeet (*Glossopsitta pusilla*). The Vegetation of the Western Blue Mountains (DEC 2006) indicates that the site also contains 14.99 ha of Capertee Rough-Barked Apple – Redgum – Yellow Box Grassy Woodland (MU20) which is commensurate with White Box – Yellow Box – Blakely's Red Gum Woodland Endangered Ecological Community (EEC) (TSC Act) and White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act).

The contiguous remnant vegetation within the northern portion of Lot 163 is in good condition and can be assumed to be in the same condition as the neighbouring Airly State Forest, Mugii Murum-ban State Conservation Area and Capertee National Park. The patches of remnant vegetation in the eastern portion of the offset area would be affected to a degree by edge effects due to surrounding derived grassland vegetation but most is still in good condition and retains connectivity with the more extensive areas of vegetation within and surrounding the site.

This vegetation is very likely to provide habitat in the form of foraging resource and breeding sites for many of the species recorded during fieldwork conducted in the site and locality. This included a total of 167 fauna species, comprising 29 mammal, 108 bird, 20 reptile and 10 amphibian species. Of the 167 fauna species detected, 15 were listed as Vulnerable under the TSC Act 1995, In addition, the Large-eared Pied Bat is listed as Vulnerable under the EPBC Act 1999. MU20 and MU21 is habitat for Capertee Stringybark with multiple records for this species collected from within these vegetation communities in the locality.

The offset value of this lot is in the threatened species that it provides habitat for, the endangered Ecological community that occurs within the site and the considerable connectivity between Airly State Forest, Capertee National Park and Mugii Murum-ban State Conservation Area that the conservation of this and other proposed lots will ensure. In addition through management of the cleared areas there will potentially be a considerable gain in the area of the majority of the vegetation communities, and associated flora and fauna habitat, that occurs within the lot including the Capertee Rough-Barked Apple – Redgum – Yellow Box Grassy Woodland EEC.

A summary of the areas of vegetation and their offset value in BioBank Credits is summarised in **Table 19**. A full list of Threatened species recorded within the lot and in the locality is detailed in **Table 20**.

**Table 19 Vegetation Unit Areas and BioBank Credit Values for Lot 163**

Lot	BioBank Veg Units	WBM Veg Units	Area (Ha)	Eco Credits	Species Credits	Veg Mapping Source
163	HN626	MU62	86.04	473	Nil	WBM (DEC 2006)
	HN534	MU38	113.3	576		WBM (DEC 2006)
	HN614	MU20	14.99	82		WBM (DEC 2006)
	HN538	MU 2	0.87	5		WBM (DEC 2006)
	HN574	MU54	11.05	61		WBM (DEC 2006)
	HN544	MU42	24.85	136		WBM (DEC 2006)
<b>Total</b>			<b>260.10</b>	<b>1,333</b>	<b>0</b>	

Table 20 TSC Act and EPBC Act Listed Species Recorded in the Site and Locality

Scientific name	Common name	TSC Act	EPBC Act	No. of Records Within Site
<b>Flora</b>				
<i>Eucalyptus Cannonii</i>	Cannon's Stringybark	V	-	Nil
<b>Reptiles</b>				
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V	-	Nil
<b>Avifauna</b>				
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	-	Nil
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	-	Nil
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V	-	4
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	Nil
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	28+
<i>Ninox strenua</i>	Powerful Owl	V	-	Nil
<i>Pachycephala inornata</i>	Gilbert's Whistler	V	-	Nil
<i>Petroica boodang</i>	Scarlet Robin	V	-	Nil
<i>Petroica phoenicea</i>	Flame Robin	V	-	Nil
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V	-	1
<i>Stagonopleura guttata</i>	Diamond Firetail	V	-	1
<i>Tyto tenebricosa</i>	Sooty Owl	V	-	Nil
<b>Mammals</b>				
<i>Chalinolobus dwyeri</i> *	Large-eared Pied Bat	V	V	Nil
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll	V	E	Nil
<i>Miniopterus schreibersii oceanensis</i> *	Eastern Bentwing-bat	V	-	Nil
<b>Ecological Communities</b>				
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		E	CE	14.99ha

\*These species are cave dwelling species and the habitat value of the lot for these species would be dependent on the presence of these habitat features.

## 7.0 The Metric Used to Establish the Offset

The BioBank Assessment Methodology (BBAM) was applied to assess the offset requirements resulting from the proposal and the offset value of the proposed offset site. The online BioBank Credit Calculator (BBCC) was run for the Springvale and Angus Place direct and indirect impact areas using data from the Springvale Mine Extension Project – Flora and Fauna Assessment Report (RPS 2014a) and Angus Place Extension Project – Flora and Fauna Assessment Report (RPS 2014b). A desktop assessment was utilised with the lowest baseline values used for the vegetation communities mapped within the development areas to estimate the likely Ecosystem and Species Credits that would be sought by the Office of Environment and Heritage. This same methodology was applied to the offset areas to determine the Ecosystem and Species Credits generated by the Offset for the Neubeck Coal Project the assessment complied with the BBAM. Fieldwork and calculations were conducted by a certified BioBank Accredited Assessor with all field data used for the BBCC calculations.

For vegetation figures within the conservation area there were some areas of field validated vegetation mapping, where this was not available the extents of the communities relied on mapping by DEC (2006). For species credits only known records were used in the calculator and where reliable field data was not available the precautionary approach for presence of habitat and likelihood of species occurrence was applied. A summary of the results and what the balance of the credits from the development versus offset scenarios is provided in **Table 21**. Both the Springvale Mine Project and the Angus Place Project will not impact upon species credit species and therefore only ecosystem credits are required. For the Neubeck Coal Project three species credit species will be impacted upon by the proposal, as such there is a species credit requirement for this site in addition to the ecosystem credit requirements (**Table 22**).

Three different vegetation types, which correspond to two different BioBank vegetation units, have been identified as potential Groundwater Dependent Ecosystems (GDE's) within the predicted subsidence extents for both sites. For quantification of the potential impacts to these communities all Temperate Highland Peat Swamps on Sandstone within the predicted subsidence extents were included. To account for the potential for indirect impacts to the swamp communities, the Future Site Value score was reduced by the minimum of one unit of condition resulting in a 42.03% Decrease in Site Value Score conservatively reflecting the unquantified potential negative impact to these communities.

Table 21 Ecosystem Credit Balance

Scenario	Site	HN501	HN504	HN514	HN534	HN538	HN544	HN558	HN563	HN570	HN572	HN574	HN590	HN592	HN599	HN600	HN614	HN626	Total
Development	Angus Place	-	-	-	-			65	-	-	-	-	-	-	-	1,359	-	-	-1,424
	Springvale	-	-	-	-			93	-	-	-	-	-	-	63	555	-	-	-711
	THPSS	-	-	-	-			-	10	-	-	-	-	1,296	-	-	-	-	-1,306
	Neubeck	-	156	645	-			-	-	1,999	478	-	372	-	-	-	-	3,533	-7,183
	Subtotal	-	-156	-645	-			-158	-10	-1,999	-478	-	-372	-1,296	-63	-1,914	-	-3,533	-10,624
Offset	Lot 135	34	-	-	280			-	-	-	-	3	-	-	-	-	55	105	+477
	Lot 163	-	-	-	1,071	5	136	-	-	-	-	61	-	-	-	-	213	1,240	+2,767
<b>Balance</b>	<b>Total</b>	<b>+34</b>	<b>-156</b>	<b>-645</b>	<b>+1,350</b>	<b>+5</b>	<b>+136</b>	<b>-158</b>	<b>-10</b>	<b>-1,999</b>	<b>-478</b>	<b>64</b>	<b>-372</b>	<b>-1,296</b>	<b>-63</b>	<b>-1,914</b>	<b>+268</b>	<b>-3,428</b>	<b>-7,380</b>

Table 22 Species Credit Balance

Species Credit Species	Common Name	Species Credits Generated
<b>Neubeck</b>		
<i>Thesium australe</i>	Austral Toadflax	-1,052
<i>Eucalyptus cannonii</i>	Cannon's Stringybark	-520
<i>Callocephalon fimbriatum</i>	Gang Gang Cockatoo	-1,737
<b>Total</b>		<b>-3,309</b>

Even though there is a deficit in the Credits generated by the proposed Offset Site the offset value of the proposed lots is in the threatened species that they provide habitat for, the Critically Endangered Ecological Community that occurs within the site and the considerable connectivity between Airly State Forest, Capertee National Park and Mugii Murum-ban State Conservation Area. The Biobanking Assessment Methodology does allow for the connectivity value of the offset site, but does not allow for linking the connectivity value between these National Parks, despite the Office of Environment and Heritage Principles suggesting otherwise.

Through management of the cleared areas on the offset land there will be a gain in the area of the majority of the vegetation communities, and associated flora and fauna habitat, that occurs within the lot including Capertee Rough-Barked Apple – Redgum – Yellow Box Grassy Woodland which is commensurate with White Box – Yellow Box – Blakely's Red Gum Woodland Endangered Ecological Community (EEC) (TSC Act) and White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act).

This vegetation within the offset area is very likely to provide habitat in the form of foraging resource and breeding sites for many of the species recorded during fieldwork conducted in the site and locality. This included a total of 167 fauna species, comprising 29 mammal, 108 bird, 20 reptile and 10 amphibian species. Of the 167 fauna species detected, 15 were listed as Vulnerable under the TSC Act (1995). In addition, the Large-eared Pied Bat is listed as Vulnerable under the EPBC Act 1999. MU20 and MU21 is habitat for *Eucalyptus cannonii* (Cannon's Stringybark) with multiple records for this species collected from within these vegetation communities in the locality (RPS 2014) refer to **Table 23** for a full list of these species.

The Vegetation of the Western Blue Mountains (DEC 2006) indicates that the offset area also contains a total of approximately 24.98 ha of Capertee Rough-Barked Apple – Redgum – Yellow Box Grassy Woodland (MU20) which is commensurate with White Box – Yellow Box – Blakely's Red Gum Woodland Endangered Ecological Community (EEC) (TSC Act) and White Box – Yellow Box – Blakely's Red Gum Grassy Woodland and Derived Native Grassland (EPBC Act) (RPS 2014).

**Table 23 TSC Act and EPBC Act Listed Species Recorded in the Site and Locality**

Scientific name	Common name	TSC Act	EPBC Act	No. of Records Within Site
<b>Flora</b>				
<i>Eucalyptus Cannonii</i>	Cannon's Stringybark	V	-	Nil
<b>Reptiles</b>				
<i>Varanus rosenbergi</i>	Rosenberg's Goanna	V	-	Nil
<b>Avifauna</b>				
<i>Callocephalon fimbriatum</i>	Gang-gang Cockatoo	V	-	Nil
<i>Calyptorhynchus lathami</i>	Glossy Black-Cockatoo	V	-	Nil
<i>Climacteris picumnus victoriae</i>	Brown Treecreeper (eastern subspecies)	V	-	4
<i>Daphoenositta chrysoptera</i>	Varied Sittella	V	-	Nil
<i>Glossopsitta pusilla</i>	Little Lorikeet	V	-	28+
<i>Ninox strenua</i>	Powerful Owl	V	-	Nil
<i>Pachycephala inornata</i>	Gilbert's Whistler	V	-	Nil
<i>Petroica boodang</i>	Scarlet Robin	V	-	Nil
<i>Petroica phoenicea</i>	Flame Robin	V	-	Nil
<i>Pomatostomus temporalis temporalis</i>	Grey-crowned Babbler (eastern subspecies)	V	-	1



Scientific name	Common name	TSC Act	EPBC Act	No. of Records Within Site
<i>Stagonopleura guttata</i>	Diamond Firetail	V	-	1
<i>Tyto tenebricosa</i>	Sooty Owl	V	-	Nil
<b>Mammals</b>				
<i>Chalinolobus dwyeri</i> *	Large-eared Pied Bat	V	V	Nil
<i>Dasyurus maculatus maculatus</i>	Spotted-tailed Quoll	V	E	Nil
<i>Miniopterus schreibersii oceanensis</i> *	Eastern Bentwing-bat	V	-	Nil
<b>Ecological Communities</b>				
White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived Native Grassland		E	CE	24.98 ha

\*These species are cave dwelling species and the habitat value of the lot for these species would be dependent on the presence of these habitat features.

## 8.0 Securing the Offset Land

The offset land will be placed under a restrictive covenant (or similar) to provide for in perpetuity conservation. For the purposes of clarity, in perpetuity is defined as the life of the Project, or achievement of completion criteria (whichever comes first). The restrictive covenant will place restrictions on future land use commensurate with conservation outcomes.

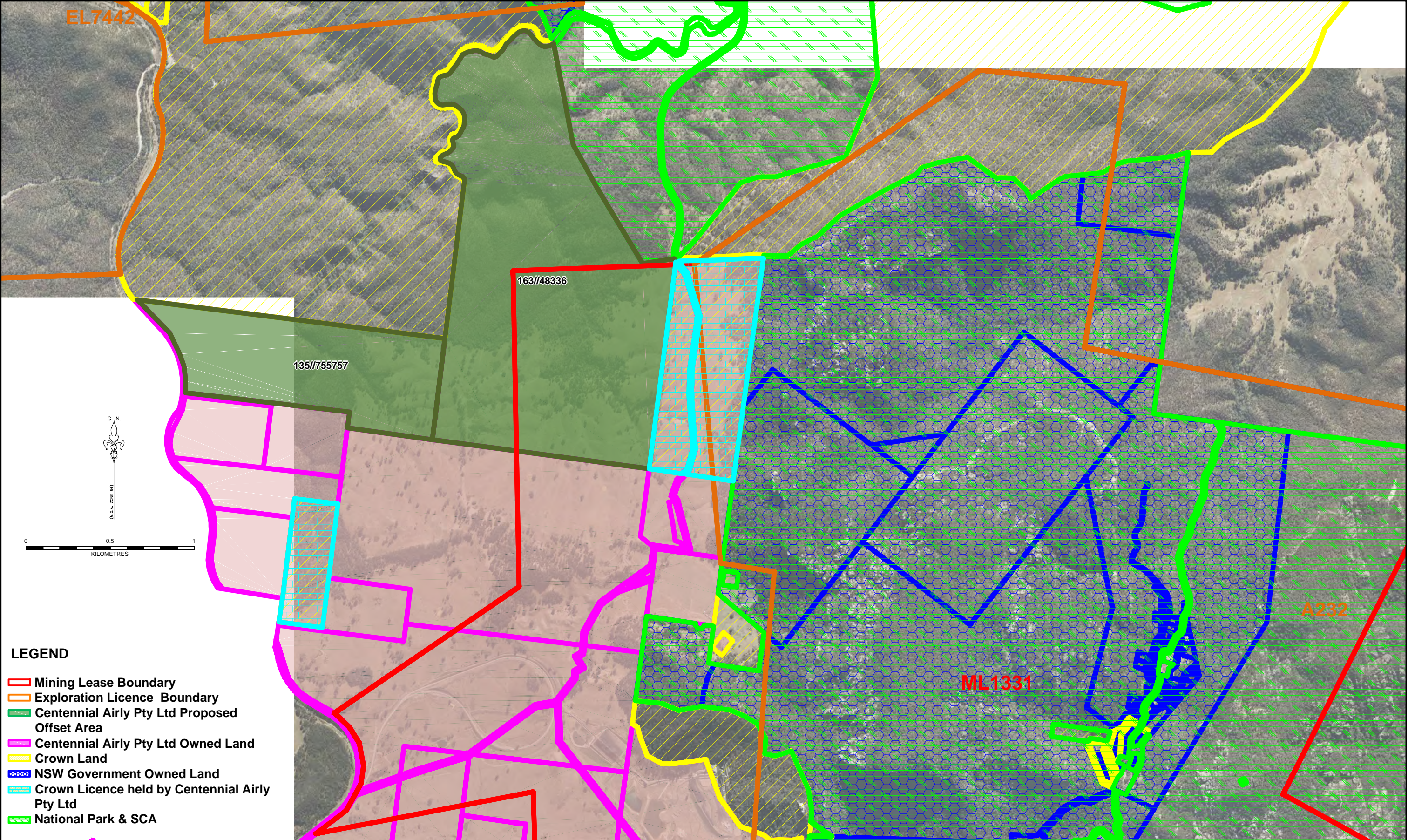
The covenant will be supported by a Land Management Plan that will include established completion criteria required to achieve an improved biodiversity outcome on the land such that once criteria are met, Centennial's conservation obligation will have been realised. The completion criteria have been derived from the priority recovery actions described in *Caring for our Country: A Guide to Managing Box Gum Grassy Woodlands (2010)*. Completion criteria will be focussed on achieving a conservation outcome and will include measures to:

- Repair and restore riparian habitat and values
- Timetable and methods for feral animal control and weed management
- Establishment and implementation of fire management practices, including fire breaks
- Exclusion of cattle grazing
- Implementation of erosion control measures

It is anticipated that these measures will result in an initial start-up investment by Angus Place Colliery and Springvale Mine together of \$100,000 over three years with ongoing maintenance costs in the order of \$15,000 per year until completion criteria are met. For the Neubeck Coal project it is anticipated that these measures will result in an initial start-up investment by Centennial Angus Place of \$100,000 over three years with ongoing maintenance costs in the order of \$15,000 per year until completion criteria are met. Long term management activities will be incorporated into the restrictive covenant for the land ensuring that the conservation values achieved will be maintained in perpetuity. The current land tenure arrangements that currently apply to the proposed offset site and locality is depicted in **Figure 3**.

Centennial will continue to consult with Office of Environment and Heritage and the Federal Department of the Environment to continue to refine this package.





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	SEAM	
	DRAWN	C.P.T.
	CHECKED	P.C.D.
	APPROVED	
	SCALE	Refer to scalebar

Airly Mine  
Offset Strategy Land Ownership  
& Mining Lease Details

Centennial Coal

Fassifem

DATE 11-03-2014

PC5419



## 9.0 Objectives for Offset Land Management

As identified in **Section 7**, completion criteria have been derived from the priority recovery actions described in *Caring for our Country: A Guide to Managing Box Gum Grassy Woodlands* (Rawlings et al 2010). Box-gum grassy woodlands have been nationally listed as an endangered ecological community that supports over 400 plant species and animals. Less than 5% of the original extent of box gum grassy woodlands remains in good condition, and what does remain exists in isolated patches across a fragmented landscape (Rawlings et al, 2010). The effects of grazing, weeds, nutrient inputs, fire, salinity and soil erosion threaten the health of these communities.

Conservation, management and land improvement activities that include targeting the threats to the communities, maximising species diversity and increasing connectivity will result in long term persistence of these communities over time. Rawlings et al 2010 identified eleven management strategies that, alone or in combination, will likely result in this longer term objective. These management strategies are:

- (1) Improve woodland condition
- (2) Use of fire
- (3) Weed management
- (4) Nutrient management
- (5) Strategic management of livestock and other herbivores
- (6) Regeneration and revegetation
- (7) Improving natural regeneration
- (8) Tubestock planting and direct seeding
- (9) Creating and improving buffers
- (10) Retaining or adding habitat
- (11) Looking after endangered plants and animals

Completion criteria will take into consideration these strategies and will be focussed on achieving a conservation outcome and will include measures to:

- Repair and restore riparian habitat and values
- Timetable and methods for feral animal control and weed management
- Establishment and implementation of fire management practices, including fire breaks
- Exclusion of cattle grazing
- Implementation of erosion control measures
- Habitat establishment for endangered species, including regent honeyeater, Gang Gang Cockatoo and other bird species

## 10.0 Supplementary Measures to Support Conservation Outcomes

Throughout the development of the Biodiversity Strategy, Centennial has undertaken a review of the Priority Actions for species and communities of concern to the Office of Environment and Heritage and the Department of the Environment. This review has identified a number of threatened species where actions for recovery can be supported by additional investment in research. These species include (but are not limited to):

- *Eucalyptus cannonii*
- *Bursaria spinosa*
- *Persoonia hindii*
- *Veronica blakelyi*
- Bathurst Copperwing Butterfly
- Blue Mountains Water Skink
- Giant Dragonfly
- *Thesium australe*
- Temperate Highland Peat Swamps on Sandstone (incorporating NPSS and NPHS)

With a focus on those recovery actions towards which Centennial can contribute, the following list has been compiled to provide a suggested research program encompassing these species.

- Contributing research funding towards furthering recovery plans for the threatened species listed above. This research may include mapping the extent of species distribution in a regional context, include trials for the establishment of species habitat, studies of the nature, form and function of species within the landscape, ecology of fire and its impact on species and communities, seed collection and propagation techniques, habitat requirements, methods to communicate research findings, and short and long term goals to measure the effectiveness of the research.
- Working with government and community groups to provide remediation advice and in kind support, for the active rehabilitation of shrub swamp communities impacted by other anthropogenic activities (for example, four wheel drive tracks) on the Newnes Plateau.

The mechanisms for establishing these research programs will be investigated and may include:

- Direct funding of existing research programs to either enhance or redirect research efforts
- Adding funds to the existing agreement between Springvale Coal, Centennial Angus Place and the Australian National University. This agreement was established as the outcome of an enforceable undertaking (described in Chapter 2 of the Springvale and Angus Place EISs). The agreement, Temperate Highland Peat Swamps on Sandstone Research Program Agreement, establishes a research program with academic freedom (that is, funding is distributed through a steering committee with expert representation) to pursue research proposals specific to achieving recovery outcomes for the THPSS. This agreement could be amended and extended to include additional research components. To date, the Enforceable Undertaking has invested funding into the following research topics:
  - » Mapping, location, distribution and extent of THPSS;
  - » Functionality of swamp systems;
  - » Ecology and biology of major structural species;

- » Environmental history of swamp communities, including resilience over time to fire;
- » Condition status and trends; and
- » Thresholds for recovery, including fire.

Centennial acknowledges that the existing approval condition requiring both the Angus Place and Springvale operations to develop and implement a *Persoonia hindii* Research and Management Plan is ongoing; the outcomes of this research and monitoring program will provide information to inform future management decisions regarding potential impacts to *Persoonia hindii*. To mitigate the unlikely event that this research program does not achieve the expected outcomes, the biodiversity package within this report includes consideration of *Persoonia hindii* and satisfies the requirement to provide additional offsets. The Management Plan is in the early stages of implementation and to date, the following actions have been undertaken:

- Initial survey and mapping of *Persoonia hindii* across parts of the Newnes Plateau
- Translocation of 62 plants, propagation trials via cuttings and seed collection
- Ongoing monitoring of translocated plants
- Consultation with Office of Environment and Heritage on the progress of the Plan

## 10.0 Monitoring Program

Centennial has invested considerable research and monitoring effort on the Newnes Plateau over the last 15 years of mining operations. In particular, Centennial's investment has focussed on monitoring the THPSS. Centennial's monitoring effort on the Newnes Plateau is extensive (refer to Figure 3.9 of the EIS) and contributes to an increase in other anthropogenic impacts, such as recreational 4WDs, through the establishment of access tracks for monitoring. Should the current suite of monitoring persist, these incidental (but not insignificant) impacts will continue across the Newnes Plateau, placing greater pressure on areas where conservation values are currently retained.

The biodiversity strategy will enable Centennial to redirect this monitoring investment towards those conservation outcomes described above. The monitoring program will be regionalised with greater effort on remote sensing data collection across a wider distribution of the Newnes Plateau and will focus on supporting research into rapid mapping techniques and defining vegetation community boundaries.

This current monitoring effort is approximately \$2 million per year. The implementation of this Biodiversity Strategy will see the costs of this monitoring effort reduced.

The redefined monitoring program, including the management actions identified above, will be incorporated into an agreed, combined Biodiversity Management Plan for the Projects, thereby reducing the current suite of management plans required for compliance to one. This Biodiversity Management Plan will be developed in consultation with OEH (including NPWS), DotE and the Forestry Corporation of NSW and will:

- Identify and incorporate the direct offset package identified in this report;
- Establish the Land Management Plan for the offset land, including management actions and completion criteria;
- Describe the research and monitoring program that will be implemented to focus on mapping the extent of species distribution in a regional context, include trials for the establishment of species habitat, studies of the nature, form and function of species within the landscape, ecology of fire and its impact on species and communities, seed collection and propagation techniques, habitat requirements; and
- Describe the measures that will be taken to rehabilitate shrub swamp communities impacted by other anthropogenic activities, using the Save Our Swamps Guideline.

The existing and future monitoring programs will focus on establishing these conservation outcomes.

## 11.0 The Cost of the Offset Package

The land proposed for the offset is Centennial owned land; regardless, there is an opportunity cost to the Company of \$140,000 per hectare (as per the BioBanking Calculator) that will be lost once this land is offset for these projects. Ancillary costs, including taxes, conveyancing and current land management expenses are incidental.

It is anticipated that the management actions identified above will result in an initial start-up investment by Angus Place Colliery and Springvale Mine together of \$100,000 over three years with ongoing maintenance costs in the order of \$15,000 per year until completion criteria are met. Long term management activities will be incorporated into the restrictive covenant for the land ensuring that the conservation values achieved will be maintained in perpetuity.

Centennial's current monitoring investment on the Newnes Plateau will be reduced and redirected following the implementation of the above monitoring program. The ongoing monitoring investment for both Projects will be in the order of \$250,000 per year across ecology (terrestrial and aquatic), water (surface and groundwater) and subsidence.

### 11.1 Economic and Social Costs and Benefits of the Biodiversity Strategy

The offsets required for the project have been quantified in the context of the biodiversity values lost or gained as a result of the predicted impacts of the Projects. The costs borne by Centennial through avoidance and mitigation measures, including reduced mine footprint, reduced longwall widths and, where economically practical, complete avoidance of sensitive surface features, are significant (see Chapter 6 of the EISs). This significance needs to be considered in the context of the ongoing benefits afforded to the community through the management and research actions taken to date for activities on the Newnes Plateau. These actions have contributed to a greater understanding of this environment, such that the results of these studies can be incorporated into broader recovery and conservation outcomes.

Balanced with this, are the benefits generated through this Biodiversity Strategy that may otherwise not be realised, by providing for:

- conservation in perpetuity of high priority biodiversity values;
- ongoing financial support to achieve agreed criteria for conservation;
- access to conserved land adjacent to the Mugii Murum-Ban State Conservation Area for tourism and recreational purposes; and
- investment in research, recovery and maintenance plans to understand potential threats to conservation outcomes and integrate this understanding with values of adjacent National Parks, World Heritage Areas and National Heritage Places.



## 12.0 Conclusion

Centennial will continue to consult with Office of Environment and Heritage and the Federal Department of the Environment to continue to refine this Biodiversity Strategy. This Strategy, combined with the current measures taken to avoid and minimise impacts, will compensate for the residual impacts, enhance biodiversity outcomes, conserve high conservation communities, and the associated flora and fauna, and will enable focussed effort on improving understanding of the biodiversity values of Box Gum Grassy Woodlands and the Newnes Plateau.

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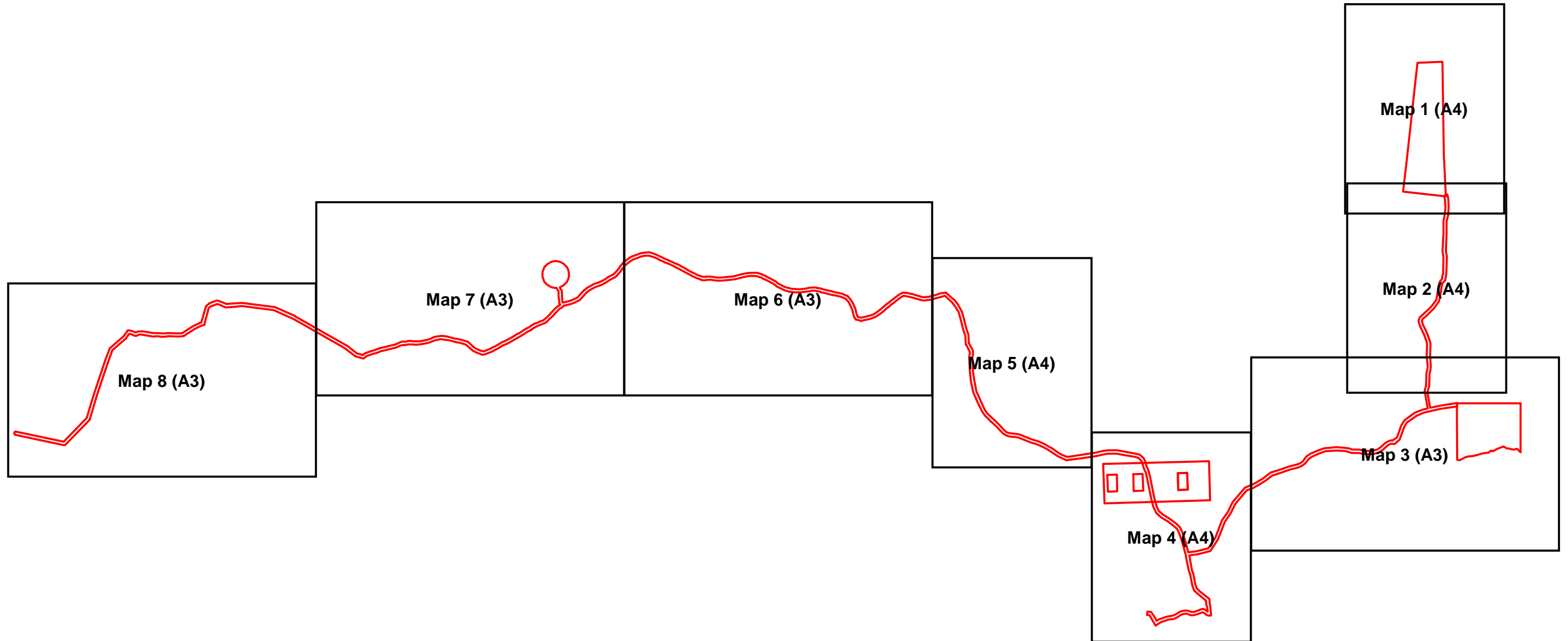
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## Appendix I

### Springvale Vegetation Removal Figures

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TITLE: SPRINGVALE REFERENCE MAP

LOCATION: SPRINGVALE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: 110326 Springvale - Major Extension\10. Drafting\Workspaces\Avoidance mapping  
VERSION (PLAN BY): PH-JS (A-A4)

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# Legend

- Indicative Surface
- Infrastructure Boundary Limits
- Proposed Clearing Areas

## Vegetation Communities

- 26a Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest
- 28 Sandstone Plateau And Ridge Scribbly Gum - Silver-top Ash Shrubby Woodland
- 44 Sandstone Plateaux Tea Tree - Dwarf Sheoak - Banksia Rocky Heath



Map 1 (A4)

0 100 200  
metres

SCALE: 1:5,000 AT SIZE A4

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TITLE: MAP 1: SPRINGVALE -  
VEGETATION COMMUNITIES  
TO BE IMPACTED

LOCATION: SPRINGVALE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

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# Legend

- Indicative Surface
- Infrastructure
- Boundary Limits
- Proposed Clearing Areas

## Vegetation Communities

- 26a Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest
- 28 Sandstone Plateau And Ridge Scribbly Gum - Silver-top Ash Shrubby Woodland



Map 2 (A4)

0 100 200  
metres

SCALE: 1:5,000 AT SIZE A4

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TITLE: MAP 2: SPRINGVALE -  
 VEGETATION COMMUNITIES  
 TO BE IMPACTED

LOCATION: SPRINGVALE COLLIERY

DATUM: GDA 94  
 PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
 PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: J:\OBS\Centennial\All Jobs\110326  
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This map should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore, no account for intergrid areas between delineated vegetation communities has been made.

 Indicative Surface  
 Infrastructure  
 Boundary Limits  
 Proposed Clearing Areas

26 Newnes Plateau Narrow-leaved  
Peppermint - Silver-top Ash Layered Open  
Forest

28 Sandstone Plateau And Ridge Scribbly  
Gum - Silver-top Ash Shrubby Woodland

59 Non-native Vegetation - Pine plantation /  
woodlot / shelter

N

A scale bar with markings at 0, 100, and 200 metres. The bar is black with white markings and the word 'metres' is written below it.

SCALE: 1:5,000 AT SIZE/A3

LOCATION: SPRINGVALE COLLIERY

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: J:\JOBS\Centennial\All Jobs\110326 Springvale - Major Extension\10. Drafting\Mapinfo\Workspaces\Avoidance Mapping\Biobanking Maps\*  
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#### Legend

-  Indicative Surface
-  Infrastructure
-  Boundary Limits
-  Proposed Clearing Areas

#### Vegetation Communities

-  26 Newnes Plateau Narrow-leaved Peppermint - Silver-top Ash Layered Open Forest
-  26a Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest

N



Map 4 (A4)

0 100 200  
metres

SCALE: 1:5,000 AT SIZE A4

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TITLE: MAP 4: SPRINGVALE -  
VEGETATION COMMUNITIES  
TO BE IMPACTED

LOCATION: SPRINGVALE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: J:\OBS\Centennial\All Jobs\110326  
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### Legend

- Indicative Surface
- Infrastructure
- Boundary Limits
- Proposed Clearing Areas

### Vegetation Communities

- 26 Newnes Plateau Narrow-leaved Peppermint - Silver-top Ash Layered Open Forest
- 26a Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest



Map 5 (A4)

0 100 200  
metres

SCALE: 1:5,000 AT SIZE A4

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TITLE: MAP 5: SPRINGVALE -  
VEGETATION COMMUNITIES  
TO BE IMPACTED

LOCATION: SPRINGVALE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

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**Legend**

- Indicative Surface
- Infrastructure
- Boundary Limits
- Proposed Clearing Areas

**Vegetation Communities**

- 7 Newnes Plateau Narrow-leaved Peppermint - Mountain Gum - Brown Stringybark Layered Forest
- 26 Newnes Plateau Narrow-leaved Peppermint - Silver-top Ash Layered Open Forest
- 26a Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest

**Map 6 (A3)**

0 100 200  
metres

**SCALE: 1:5,000 AT SIZE A3**

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Caution should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore, no account for intergrading areas between delineated vegetation communities has been made.

 Indicative Surface  
 Infrastructure  
 Boundary Limits  
 Proposed Clearing Areas

7 Newnes Plateau Narrow-leaved  
Peppermint - Mountain Gum - Brown  
Stringybark Layered Forest

26 Newnes Plateau Narrow-leaved  
Peppermint - Silver-top Ash Layered Open  
Forest

N

SCALE: 1:5,000 AT SIZE A3

LOCATION: SPRINGVALE COLLIERY

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: "I:\JOBS\Centennial\All Jobs\110326 Springvale - Major Extension\10. Drafting\Mapinfo\Workspaces\Avoidance Mapping\Biolbanking Maps"  
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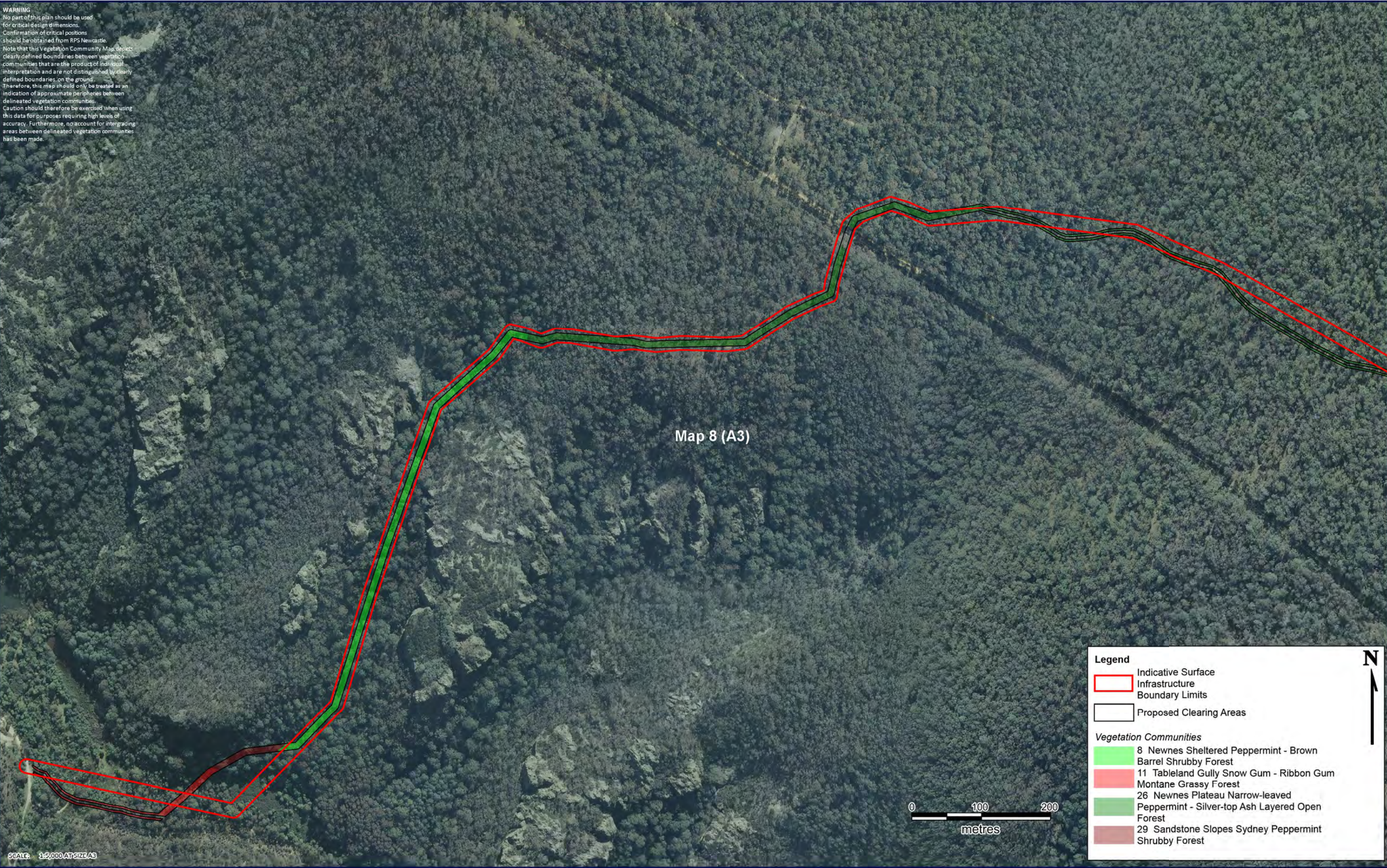
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SCALE: 1:5,000 (AT SIZE A3)

**Legend**

- Indicative Surface
- Infrastructure
- Boundary Limits
- Proposed Clearing Areas

**Vegetation Communities**

- 8 Newnes Sheltered Peppermint - Brown Barrel Shrubby Forest
- 11 Tableland Gully Snow Gum - Ribbon Gum Montane Grassy Forest
- 26 Newnes Plateau Narrow-leaved Peppermint - Silver-top Ash Layered Open Forest
- 29 Sandstone Slopes Sydney Peppermint Shrubby Forest

TITLE: MAP 8: SPRINGVALE - VEGETATION COMMUNITIES TO BE IMPACTED

LOCATION: SPRINGVALE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: J:\JOBS\Centennial\All Jobs\110326 Springvale - Major Extension\10. Drafting\MapInfo\Workspaces\Avoidance Mapping\Bicobanking Maps  
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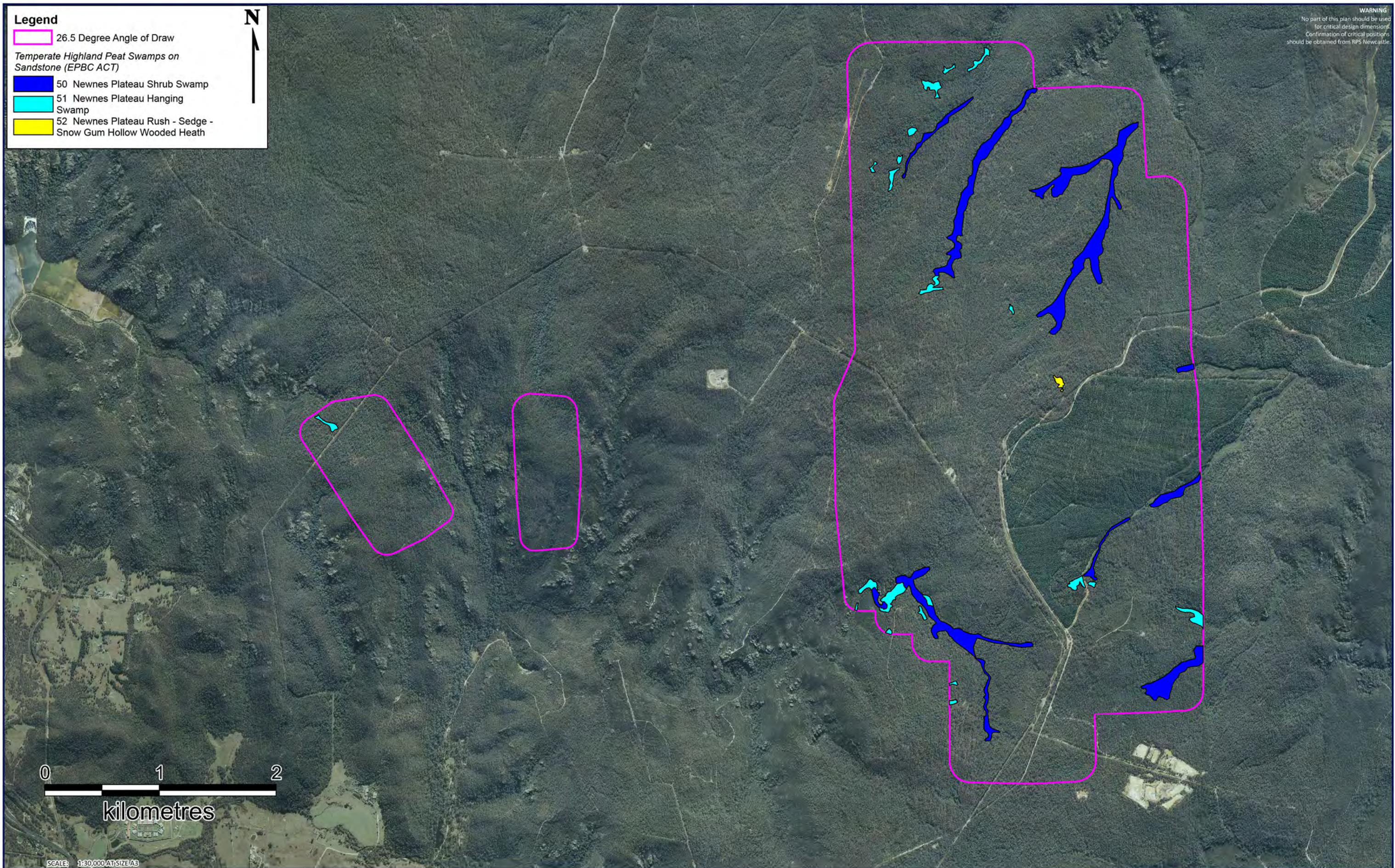
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TITLE: FIGURE 1: SPRINGVALE - THPSS WITHIN  
SUBSIDENCE EXTENTS

LOCATION: SPRINGVALE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 14/02/2014  
PURPOSE: BIOBANKING

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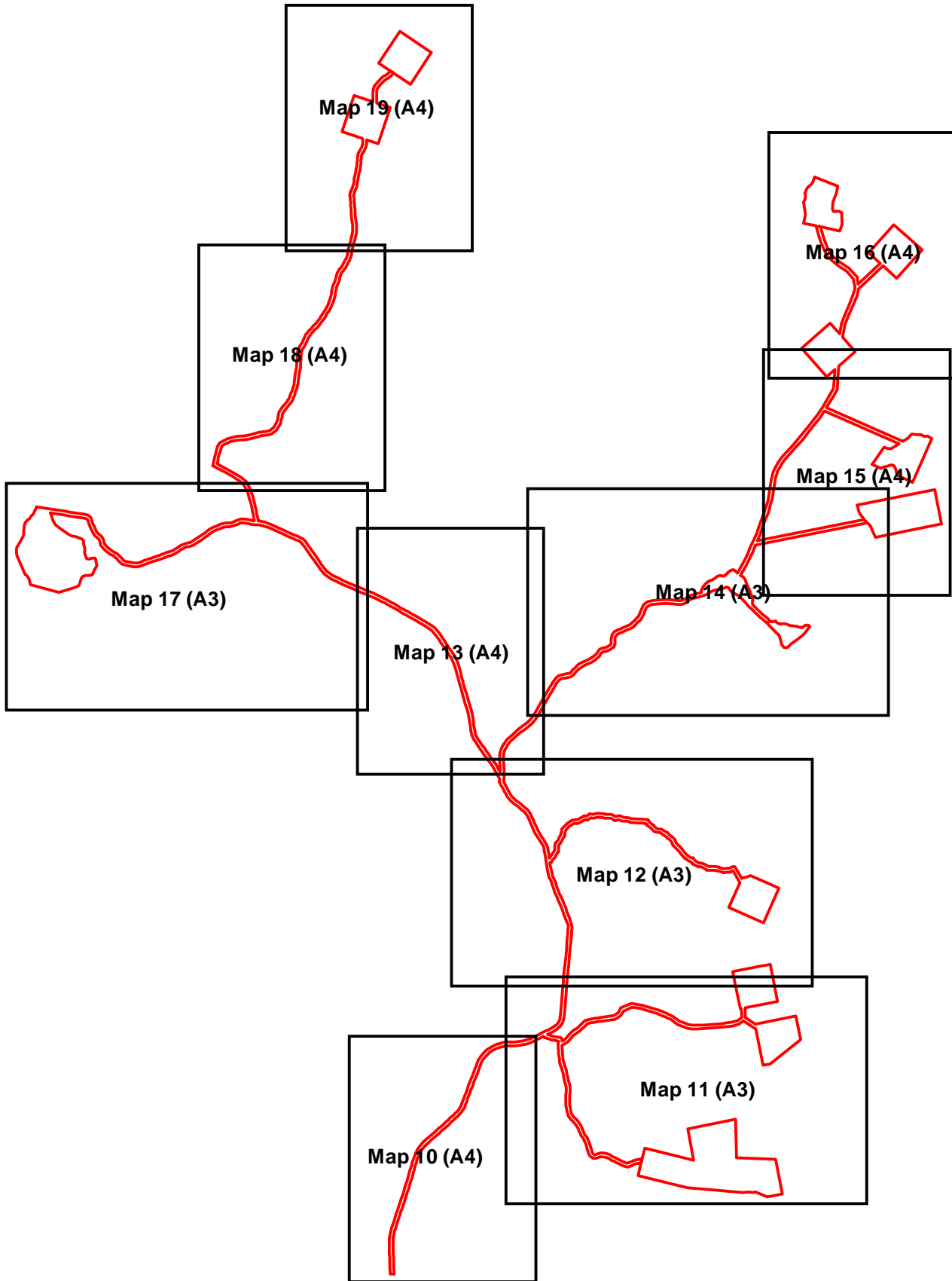
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## Appendix 2

### Angus Place Vegetation Removal Figures



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TITLE: ANGUS PLACE REFERENCE MAP	LOCATION: ANGUS PLACE COLLIERY	DATUM: GDA 94 PROJECTION: MGA ZONE 56	DATE: 13/02/2014 PURPOSE: CONSTRAINTS ANALYSIS	LAYOUT REF: Extension\10. Drafting\Workspaces\Avoidance Mapping VERSION (PLAN BY): JS (A A4)
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Map 10 (A4)

**Legend**

- Indicative Surface
- Infrastructure
- Boundary Limits
- Proposed Clearing Areas

**Vegetation Communities**

- 14 Tableland Mountain Gum - Snow Gum - Daviesia Montane Open Forest
- 26 Newnes Plateau Narrow-leaved Peppermint - Silvertop Ash Layered Open Forest
- 28 Sandstone Plateau and Ridge Scribbly Gum - Silvertop Ash Shrubby Woodland

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SCALE: 1:5,000 AT A4

TITLE: MAP 10: ANGUS PLACE - VEGETATION TO BE IMPACTED	LOCATION: ANGUS PLACE COLLIERY	DATUM: GDA 94 PROJECTION: MGA ZONE 56	DATE: 13/03/2014 PURPOSE: CONSTRAINTS ANALYSIS	LAYOUT REF: Extension\10. Drafting\ Workspaces\Avoidance Mapping VERSION (PLAN BY): JS (A A4)
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**Legend**

Indicative Surface Infrastructure Boundary Limits

Proposed Clearing Areas

**Vegetation Communities**

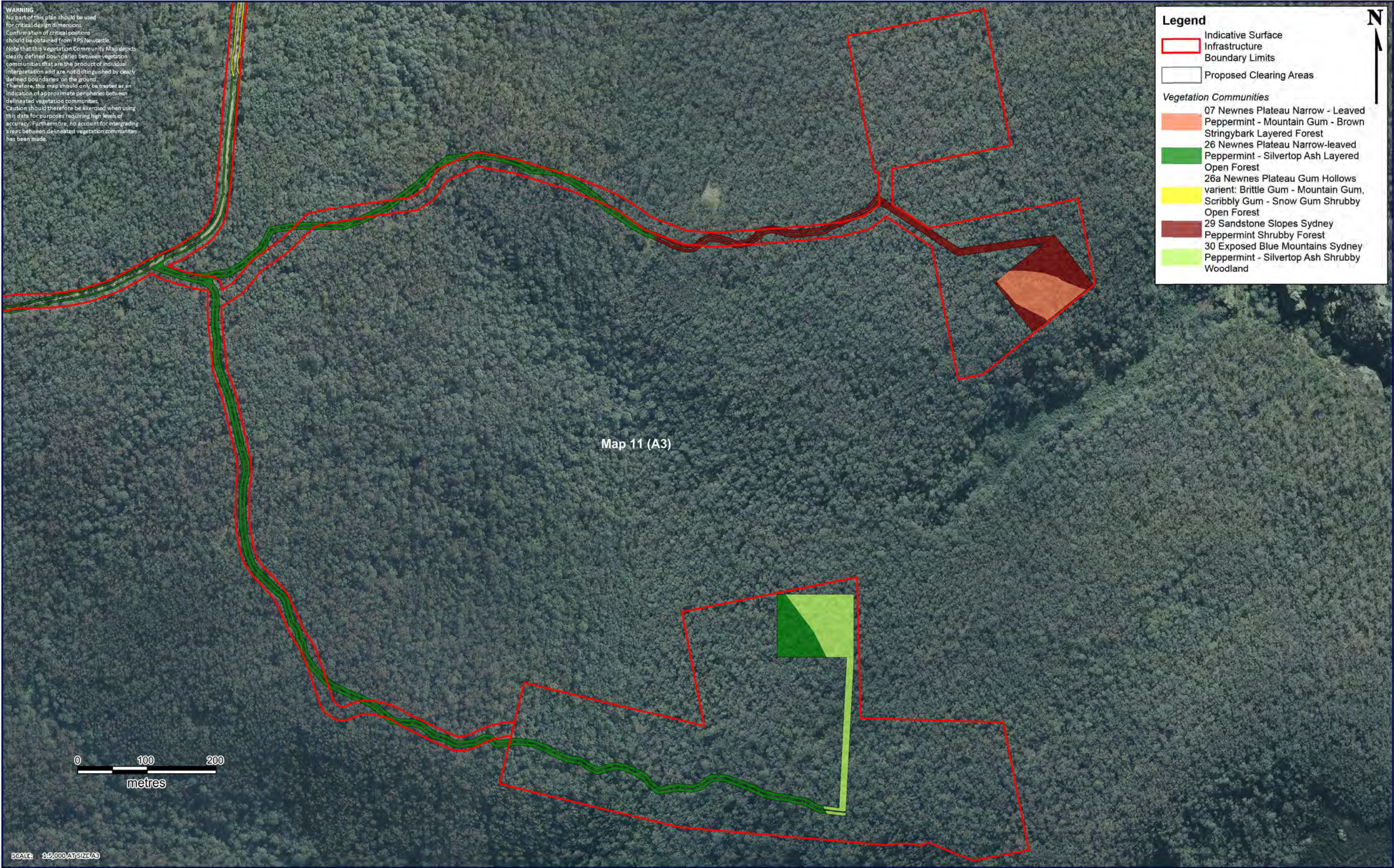
07 Newnes Plateau Narrow - Leaved Peppermint - Mountain Gum - Brown Stringybark Layered Forest

26 Newnes Plateau Narrow-leaved Peppermint - Silvertop Ash Layered Open Forest

26a Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest

29 Sandstone Slopes Sydney Peppermint Shrubby Forest

30 Exposed Blue Mountains Sydney Peppermint - Silvertop Ash Shrubby Woodland



SCALE: 1:5,000 (AT SIZE A3)

TITLE: MAP 11: ANGUS PLACE - VEGETATION COMMUNITIES TO BE IMPACTED

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
 PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
 PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: "J:\085\Centennial\All Jobs\121085 Fassifern Spot Work\10 - Drafting  
 \MapInfo Workspaces\Biolanking Maps"  
 VERSION (PLAN BY): JS (A A3)

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**Legend**

- Indicative Surface Infrastructure Boundary Limits
- Proposed Clearing Areas

**Vegetation Communities**

- 07 Newnes Plateau Narrow - Leaved Peppermint - Mountain Gum - Brown Stringybark Layered Forest
- 26 Newnes Plateau Narrow-leaved Peppermint - Silvertop Ash Layered Open Forest
- 26a Newnes Plateau Gum Hollows variant: Brittle Gum - Mountain Gum, Scribbly Gum - Snow Gum Shrubby Open Forest



Map 12 (A3)



SCALE: 1:5,000 (A3 SIZE)

TITLE: MAP 12: ANGUS PLACE - VEGETATION COMMUNITIES TO BE IMPACTED

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF:  
VERSION (PLAN BY): JS (A A3)

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## Legend

- Indicative Surface
- Infrastructure
- Boundary Limits
- Proposed Clearing Areas

## Vegetation Communities

- 07 Newnes Plateau Narrow - Leaved Peppermint - Mountain Gum - Brown Stringybark Layered Forest
- 26 Newnes Plateau Narrow-leaved Peppermint - Silvertop Ash Layered Open Forest
- 28 Sandstone Plateau and Ridge Scribbly Gum - Silvertop Ash Shrubby Woodland
- 29 Sandstone Slopes Sydney Peppermint Shrubby Forest



Map 13 (A4)

0 100 200  
metres

SCALE: 1:5,000 AT A4

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TITLE: MAP 13: ANGUS PLACE -  
VEGETATION TO BE IMPACTED

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/03/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: J:\JOBS\Centennial\All Jobs  
121085 Fassifern Spot Work\10 - Drafting\MapInfo Workspaces\Biobanking Maps"  
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Map 15 (A4)

Map 14 (A3)



SCALE: 1:5,000 AT SIZE A3

**Legend**

- Indicative Surface Infrastructure Boundary Limits
- Proposed Clearing Areas

**Vegetation Communities**

- 26 Newnes Plateau Narrow-leaved Peppermint - Silvertop Ash Layered Open Forest
- 28 Sandstone Plateau and Ridge Scribbly Gum - Silvertop Ash Shrubby Woodland
- 29 Sandstone Slopes Sydney Peppermint Shrubby Forest
- 30 Exposed Blue Mountains Sydney Peppermint - Silvertop Ash Shrubby Woodland



TITLE: MAP 14: ANGUS PLACE - VEGETATION COMMUNITIES TO BE IMPACTED

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

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VERSION (PLAN BY): JS (A A3)

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# Legend

- Indicative Surface Infrastructure Boundary Limits
- Proposed Clearing Areas

## Vegetation Communities

- 28 Sandstone Plateau and Ridge Scribbly Gum - Silvertop Ash Shrubby Woodland
- 29 Sandstone Slopes Sydney Peppermint Shrubby Forest
- 30 Exposed Blue Mountains Sydney Peppermint - Silvertop Ash Shrubby Woodland

Map 15 (A4)

0 100 200  
 metres

SCALE: 1:5,000/ATA4

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TITLE: MAP 15: ANGUS PLACE -  
 VEGETATION TO BE IMPACTED

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
 PROJECTION: MGA ZONE 56

DATE: 13/03/2014  
 PURPOSE: CONSTRAINTS ANALYSIS

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## Legend

- Indicative Surface Infrastructure Boundary Limits
- Proposed Clearing Areas

## Vegetation Communities

- 28 Sandstone Plateau and Ridge
- Scribbly Gum - Silvertop Ash
- Shrubby Woodland



Map 16 (A4)

0 100 200  
metres

SCALE: 1:5,000 (A4)

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TITLE: MAP 16: ANGUS PLACE -  
VEGETATION TO BE IMPACTED

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/03/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: \121085 Fassifern Spot Work\  
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**Legend**

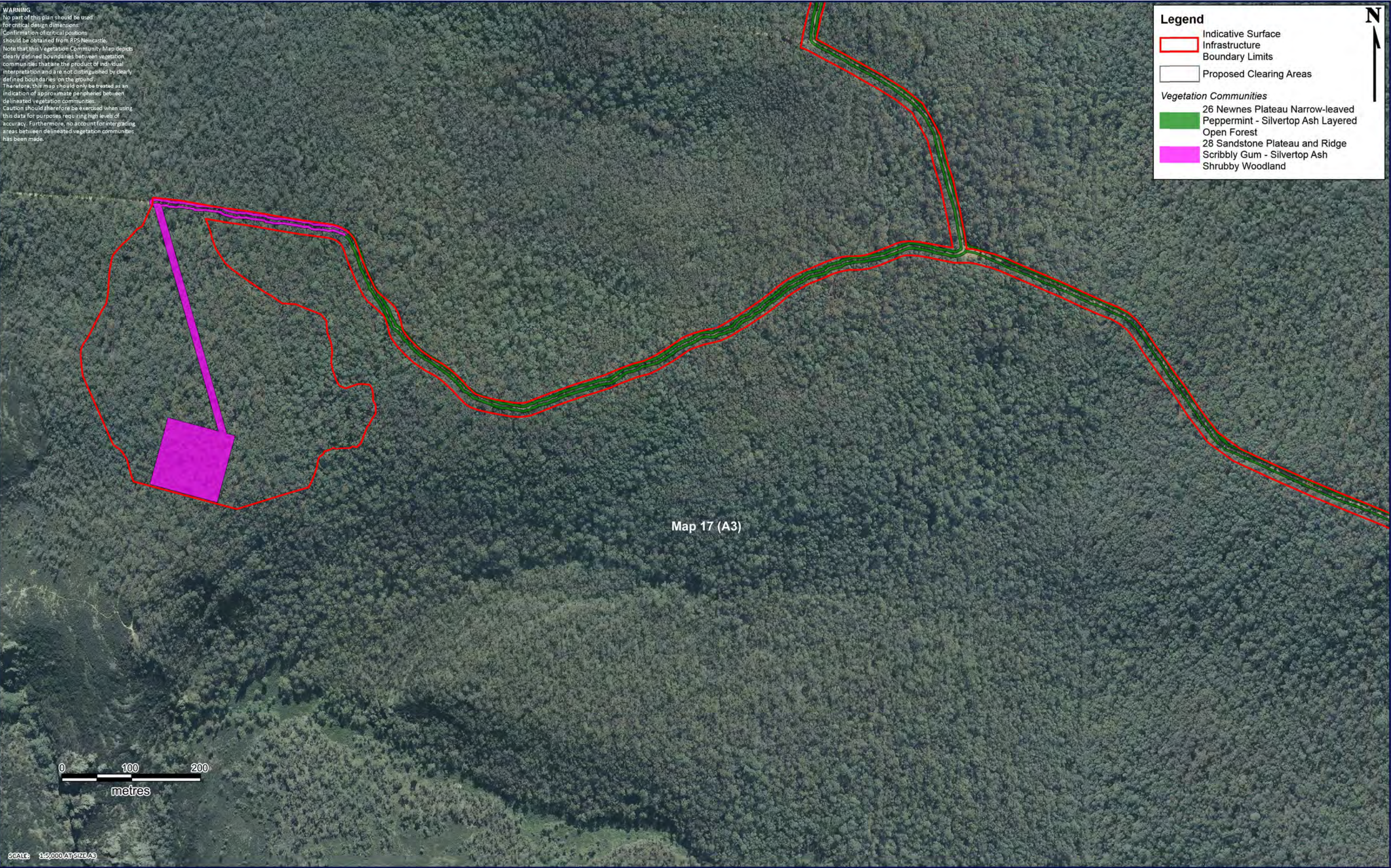
Indicative Surface Infrastructure Boundary Limits

Proposed Clearing Areas

**Vegetation Communities**

26 Newnes Plateau Narrow-leaved Peppermint - Silvertop Ash Layered Open Forest

28 Sandstone Plateau and Ridge Scribbly Gum - Silvertop Ash Shrubby Woodland



TITLE: MAP 17: ANGUS PLACE - VEGETATION COMMUNITIES TO BE IMPACTED

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/02/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: "J:\085\Centennial\All Jobs\121085 Fassifern Spot Work\10 - Drafting  
VERSION (PLAN BY): JS (A A3)

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Map 18 (A4)

**Legend**

- Indicative Surface Infrastructure Boundary Limits
- Proposed Clearing Areas

**Vegetation Communities**

- 26 Newnes Plateau Narrow-leaved Peppermint - Silvertop Ash Layered Open Forest
- 28 Sandstone Plateau and Ridge Scribbly Gum - Silvertop Ash Shrubby Woodland

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SCALE: 1:5,000/ATA4

TITLE: MAP 18: ANGUS PLACE -  
VEGETATION TO BE IMPACTED

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/03/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: \\121085 Fassifern Spot Work\10 - Drafting\MapInfo Workspaces\Biobanking Maps\VERSION (PLAN BY): JS (A A4)

CLIENT: CENTENNIAL  
JOB REF: 121085

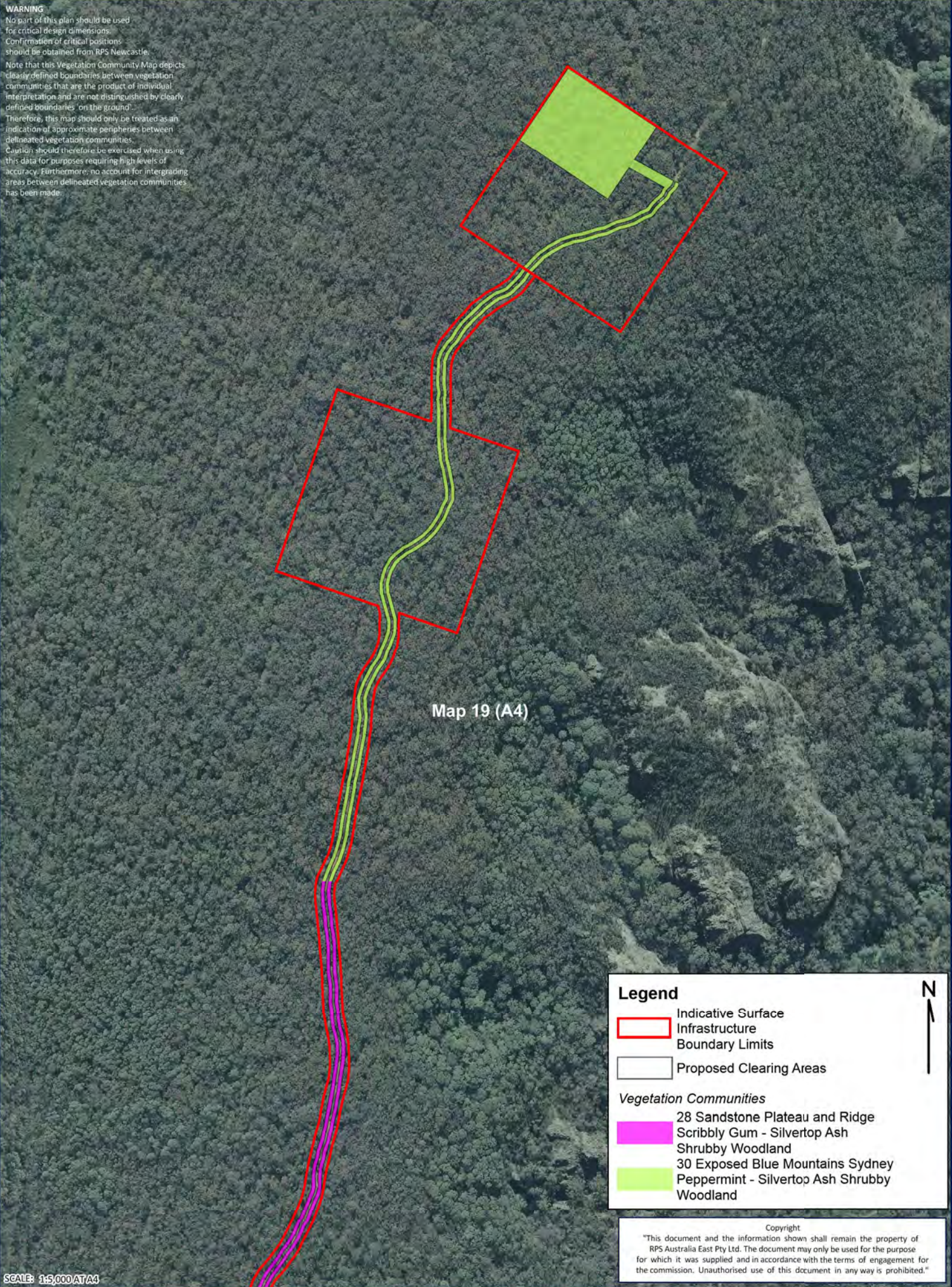
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TITLE: MAP 19: ANGUS PLACE -  
VEGETATION TO BE IMPACTED

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/03/2014  
PURPOSE: CONSTRAINTS ANALYSIS

LAYOUT REF: \121085 Fassifern Spot Work\  
10 - Drafting\MapInfo Workspaces  
Biobanking Maps"  
VERSION (PLAN BY): JS (A A4)

CLIENT: CENTENNIAL  
JOB REF: 121085

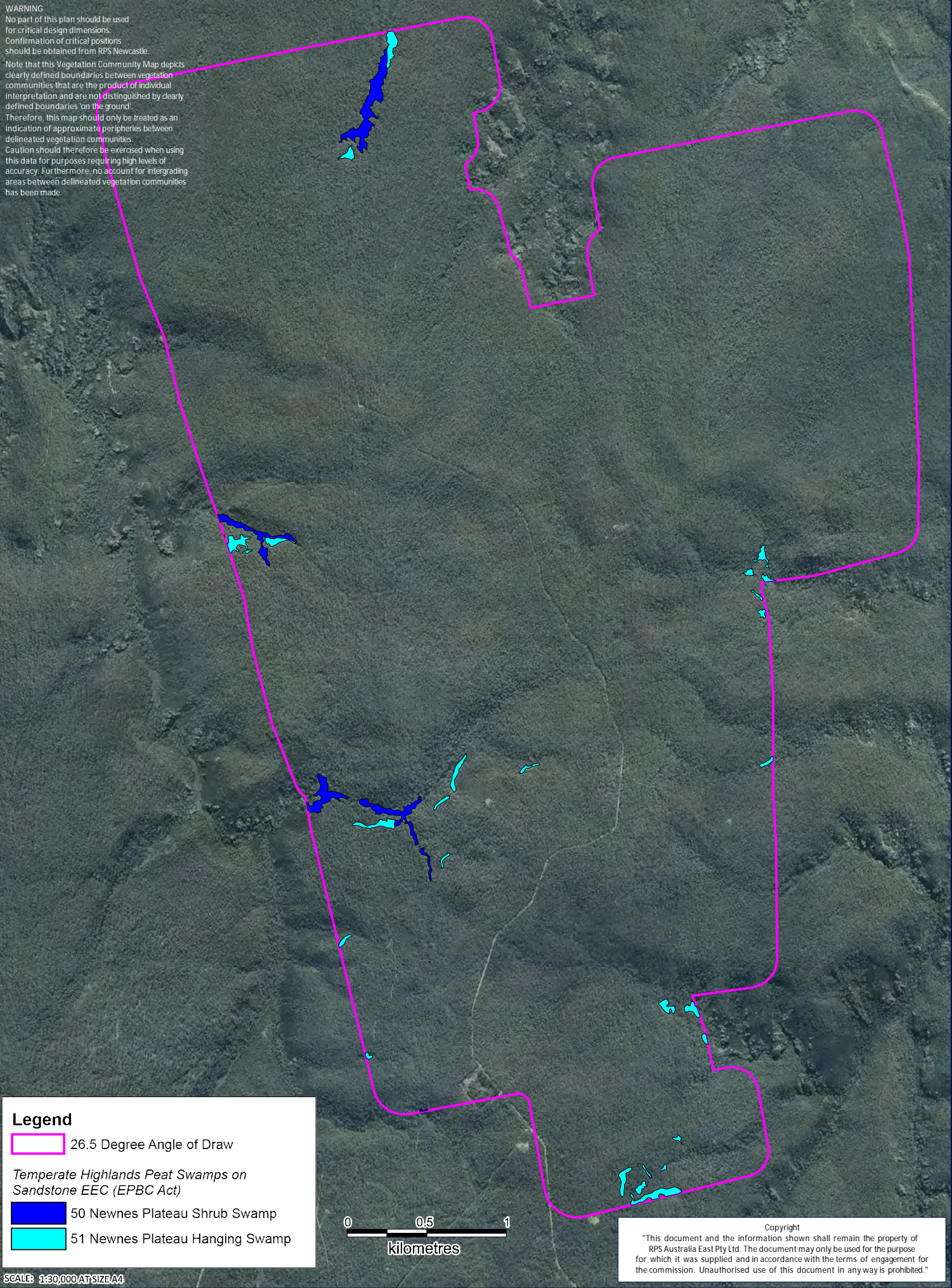
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**Legend**

 26.5 Degree Angle of Draw

*Temperate Highlands Peat Swamps on Sandstone EEC (EPBC Act)*

 50 Newnes Plateau Shrub Swamp

 51 Newnes Plateau Hanging Swamp

SCALE: 1:30,000 AT SIZE A4

0 0.5 1  
kilometres

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TITLE: FIGURE 2: ANGUS PLACE -  
THPSS WITHIN SUBSIDENCE  
EXTENTS

LOCATION: ANGUS PLACE COLLIERY

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 14/02/2014  
PURPOSE: BIOBANKING

LAYOUT REF: J:\JOBS\Centennial\All Jobs\121085 -  
Fassifern Spot Work\10 - Drafting  
VERSION (PLAN BY): JS (A A4)

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## Appendix 3

### Neubeck Coal Project Vegetation Removal Figure



## Legend




 Project Application Area

 Study Area

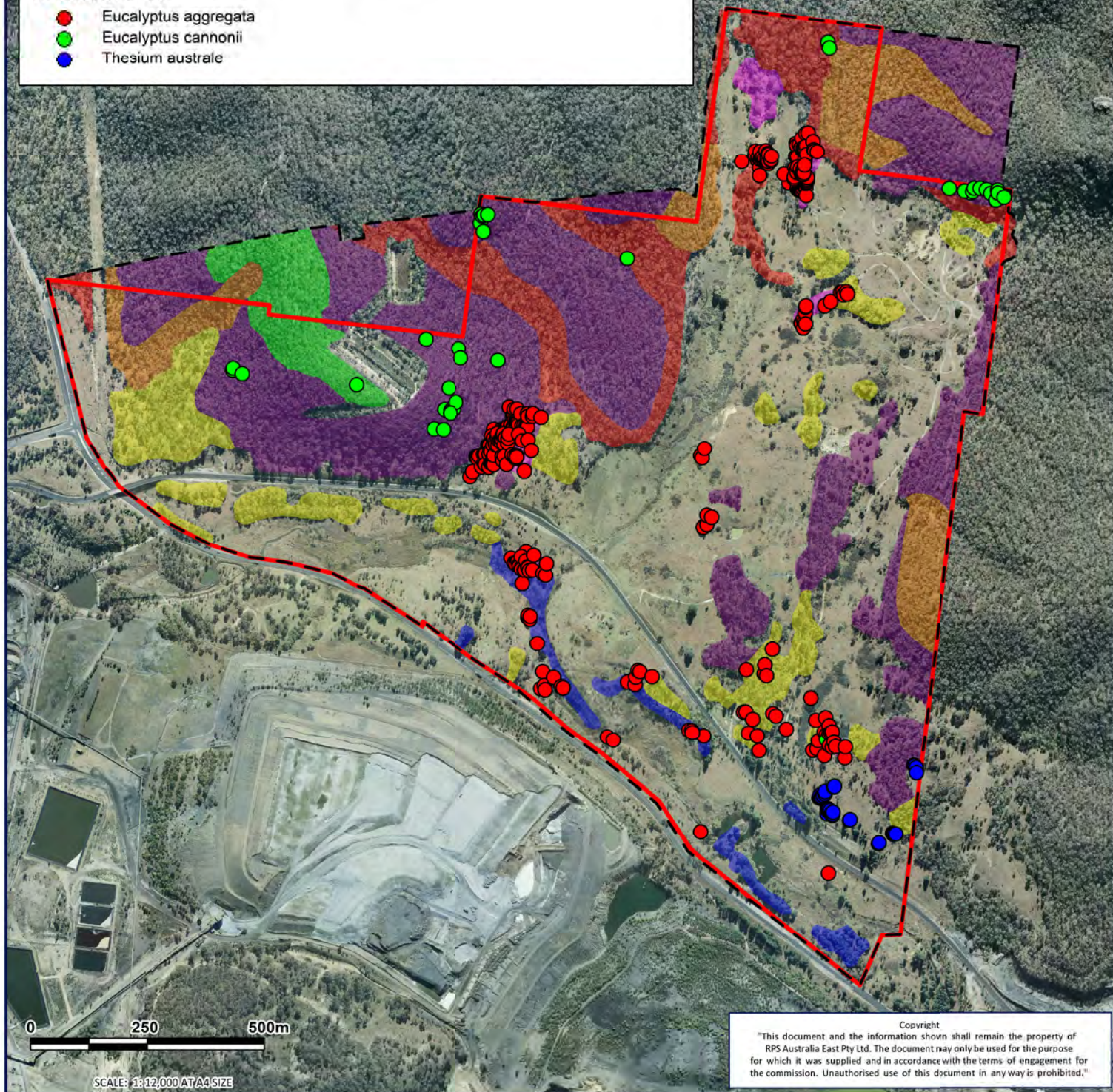
### Vegetation Communities (DEC 2006)

-  11 Tableland Gully Snow Gum - Ribbon Gum Montane Grassy Forest
-  15 Tableland Hollows Black Gum - Black Sally Open Forest
-  32 Tableland Hills Scribbly Gum - Narrow-leaved Stringybark Shrubby Open Forest
-  33 Tableland B-I Peppermint - Brittle Gum - Red Stringybark Grassy Open Forest
-  35 Tableland Gully Mountain Gum - Broad-leaved Peppermint Grassy Forest
-  37 Coxs Permian Red Stringybark - Brittle Gum Woodland
-  60 Non-native Vegetation - Other exotics (willow etc)
-  62 Cleared and Severely Disturbed Lands

### Threatened Flora

-  Eucalyptus aggregata
-  Eucalyptus cannonii
-  Thesium australe

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TITLE: NEUBECK VEGETATION COMMUNITIES

LOCATION: BLACKMANS FLAT

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 14/03/2014  
PURPOSE: REPORT FIGURE

LAYOUT REF: [\\V085\Centennial\All Jobs\105705 Neubeck  
Eco Baseline - Blackmans Flat\10- Drafting\Mapinfo\Workspaces\Report Figures  
VERSION (PLAN BY): A A4 (ZA)

CLIENT: CENTENNIAL  
JOB REF: 121085

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## Appendix 4

### Additional Project Vegetation Removal Figures



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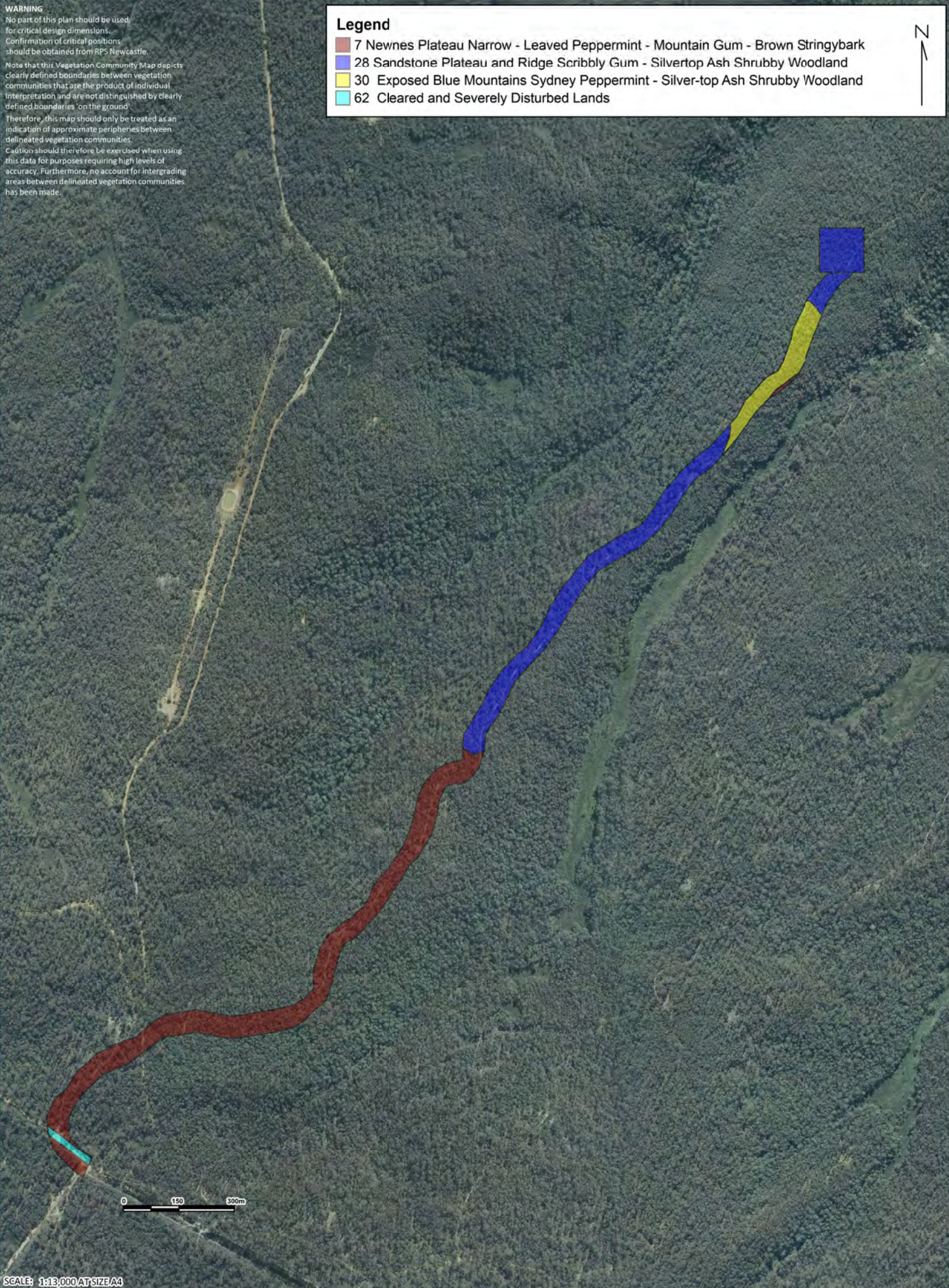
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**Legend**

- 7 Newnes Plateau Narrow - Leaved Peppermint - Mountain Gum - Brown Stringybark
- 28 Sandstone Plateau and Ridge Scribbly Gum - Silvertop Ash Shrubby Woodland
- 30 Exposed Blue Mountains Sydney Peppermint - Silver-top Ash Shrubby Woodland
- 62 Cleared and Severely Disturbed Lands



TITLE: BORE 8 VEGETATION  
REMOVAL

LOCATION: SPRINGVALE MINE

DATUM: GDA 94  
PROJECTION: MGA ZONE 56

DATE: 13/03/2014  
PURPOSE: REPORT FIGURE

LAYOUT REF: I:\085\Centennial\A4 job\121085  
Eastern Spot Work\121085 - Drafting\Mapfile Work\Work\Bores\Bore 8 Map  
VERSION (PLAN BY): A A4 (ZA)

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### Vegetation Communities

- 

kilometres

SCALE: 1:22,500 AT A4 SIZE

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J:\JOBS\Centennial\All Jobs\108478 Angus Place  
LAYOUT REF: Was 109034\Drafting\Workspaces\Eco  
VERSION (PLAN BY): A A4 (ZA)

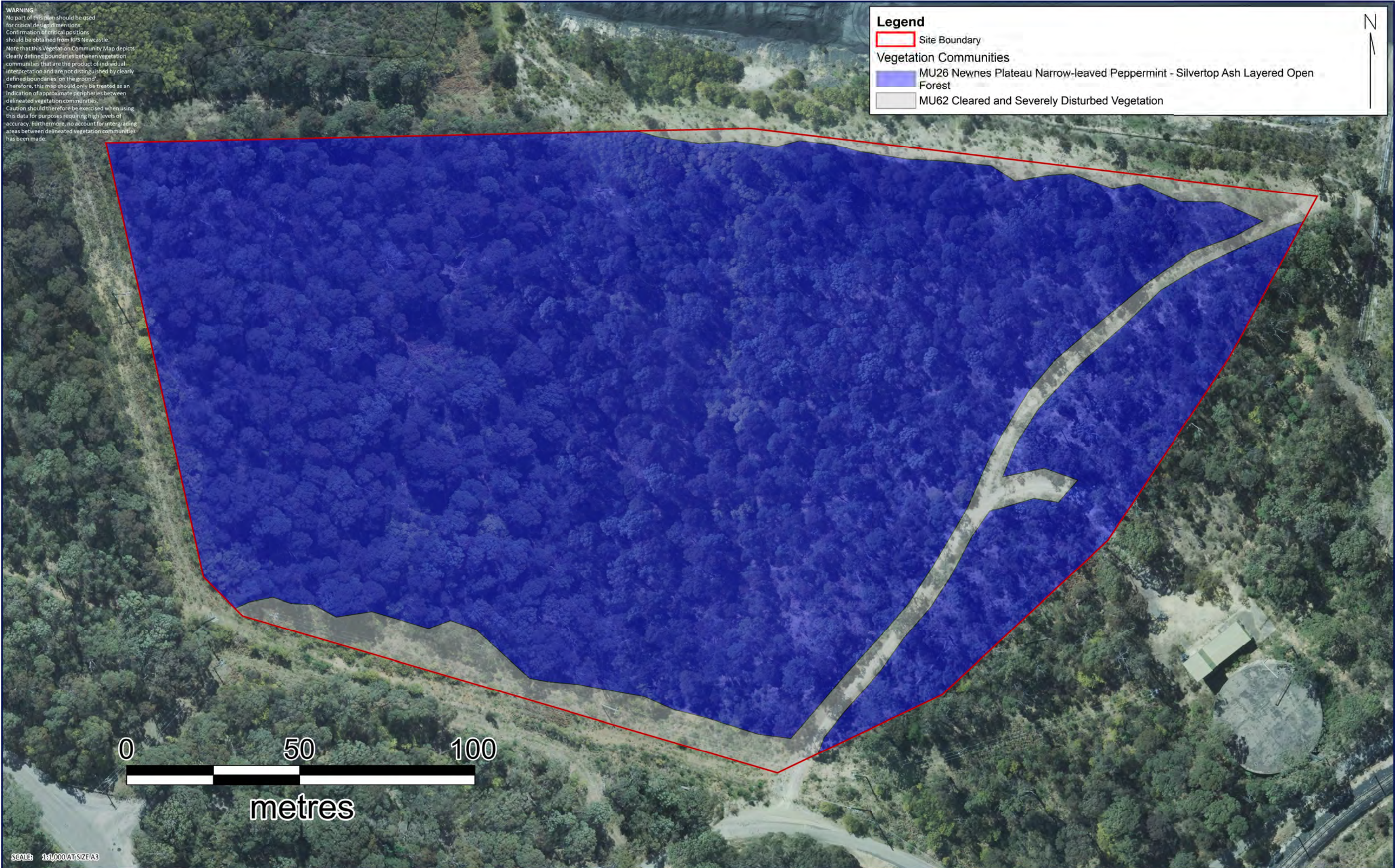

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**Legend**

- Site Boundary
- Vegetation Communities**
  - MU26 Newnes Plateau Narrow-leaved Peppermint - Silvertop Ash Layered Open Forest
  - MU62 Cleared and Severely Disturbed Vegetation



SCALE: 1:1,000 AT SIZE A3

FIGURE: CLARENCE REAVI VEGETATION MAP

LOCATION: CLARENCE COLLIERY

DATUM: GDA 94  
 PROJECTION: MGA ZONE 56

DATE: 12/03/2014  
 PURPOSE: REPORT FIGURE

LAYOUT REF: 110-Draft 1g1\MapInfo Workspaces\150\Report Figures\115372\_2\_gure2\_Vegetation\Map\_10122012  
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## Legend

### Vegetation Communities

- 11 Tableland Gully Snow Gum - Ribbon Gum Montane Grassy Forest (EEC)
- 15 Tableland Hollows Black Gum - Black Sally Open Forest (EEC)
- 37 Cocks Permian Red Stringybark - Brittle Gum Woodland
- 59 Non-native Vegetation - Pine plantation / woodlot / shelter
- Phragmites Wetland
- Planted / Regenerating Vegetation
- Cleared / Modified Land



**WARNING**  
No part of this plan should be used for critical design dimensions. Confirmation of critical positions should be obtained from RPS Newcastle.  
Note that this Vegetation Community Map depicts clearly defined boundaries between vegetation communities that are the product of individual interpretation and are not distinguished by clearly defined boundaries on the ground. Therefore, this map should only be treated as an indication of approximate peripheries between delineated vegetation communities. Caution should therefore be exercised when using this data for purposes requiring high levels of accuracy. Furthermore, no account for intergrading areas between delineated vegetation communities has been made.



TITLE: FIGURE : WESTERN COAL  
SERVICES VEGETATION  
MAPPING

LOCATION: BLACKMANS FLAT

DATUM: (GDA 94)  
PROJECTION: MGA ZONE 56

DATE: 12/03/2014  
PURPOSE: REPORT FIGURE

LAYOUT REF: J:\JOBS\Centennial\All  
Jobs\105704 Neubecks - Blackmans  
Flat\10- Drafting\Coal Services\  
Report Figures  
VERSION (PLAN BY): ZA (A A4)

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