

Part 9b

Biodiversity Offset Strategy

State Significant Development No. 5765

Prepared by:

Niche Environment and Heritage Pty Ltd

May 2020

This page has intentionally been left blank



ABN: 37 009 250 051

Biodiversity Offset Strategy

Prepared for: R.W. Corkery & Co. Pty Limited
1st Floor, 12 Dangar Road
PO Box 239
BROOKLYN NSW 2083

Tel: (02) 9985 8511
Email: brooklyn@rwcorkery.com

On behalf of: Bowdens Silver Pty Limited
ABN: 37 009 250 051

Sydney Office
Level 11, 52 Phillip Street
SYDNEY NSW 2000

Tel: (02) 8316 3997
Fax: (02) 8316 3999

Operations Office
68 Maloneys Road
LUE NSW 2850
P.O. Box 1115
MUDGEES NSW 2850

Tel: (02) 6373 6420

Email: information@bowdenssilver.com.au

A Silver Mines Limited company

Prepared by: Niche Environment and Heritage Pty Ltd
PO Box 2443
NORTH PARRAMATTA NSW 1750

Tel: (02) 9630 5658
Email: info@niche-eh.com

Ref No: 4879

May 2020

This Copyright is included for the protection of this document

COPYRIGHT

**© Niche Environment and Heritage Pty Ltd 2020
and**

© Bowdens Silver Pty Limited 2020

All intellectual property and copyright reserved.

Apart from any fair dealing for the purpose of private study, research, criticism or review, as permitted under the Copyright Act, 1968, no part of this report may be reproduced, transmitted, stored in a retrieval system or adapted in any form or by any means (electronic, mechanical, photocopying, recording or otherwise) without written permission. Enquiries should be addressed to Niche Environment and Heritage Pty Ltd.

CONTENTS

	Page
COMMONLY USED ACRONYMS AND UNITS	9b-5
EXECUTIVE SUMMARY.....	9b-7
1. INTRODUCTION.....	9b-11
1.1 BACKGROUND AND LEGISLATIVE FRAMEWORK	9b-11
1.2 OFFSETS REQUIRED FOR THE PROJECT.....	9b-11
1.3 COMMONWEALTH OFFSET REQUIREMENTS.....	9b-11
2. OFFSET STRATEGY	9b-14
2.1 AVAILABLE OFFSETTING OPTIONS	9b-14
2.2 OVERVIEW OF OFFSET STRATEGY.....	9b-15
2.3 CREDIT CONVERSIONS.....	9b-15
2.4 STAGED OFFSET APPROACH AND TIMING	9b-16
3. ON-SITE OFFSET SITES	9b-17
3.1 OFFSET SITE DESCRIPTION AND LOCATION	9b-17
3.2 ON-SITE OFFSET SITES TITLE DETAILS.....	9b-17
3.3 ON-SITE OFFSET SITE ECOSYSTEM CREDIT ASSESSMENT	9b-18
3.4 VEGETATION TYPES AND IMPROVEMENT IN BIODIVERSITY VALUES AT ON-SITE OFFSET SITES.....	9b-18
3.4.1 Management actions proposed at the offset sites	9b-18
3.4.2 Existing management obligations	9b-18
3.5 COMPARISON OF PROJECT OFFSET REQUIREMENT WITH CREDITS CREATED AT ON-SITE OFFSET SITES	9b-18
4. OFF-SITE OFFSET SITES	9b-22
4.1 APPROACH TO OFF-SITE OFFSETS.....	9b-22
4.2 METHODS TARGETING LANDHOLDINGS FOR OFF-SITE OFFSETS.....	9b-22
4.3 PURCHASE OF BIOBANKING CREDITS.....	9b-23
5. SPECIES CREDITS.....	9b-24
5.1 SPECIES CREDITS.....	9b-24
5.2 CREDIT CONVERSIONS AND APPROACH TO OFFSETTING	9b-24
5.2.1 Regent Honeyeater	9b-24
5.2.2 Koala and Squirrel Glider credits	9b-24
5.2.3 Acacia ausfeldii (Ausfeld's Wattle).....	9b-25
6. FURTHER OFFSETTING CONSIDERATIONS	9b-26
6.1 REHABILITATION SITE IDENTIFICATION.....	9b-26
6.2 SUPPLEMENTARY MEASURES	9b-26
6.3 SUMMARY OF FURTHER WORK	9b-26
7. REFERENCES.....	9b-27

CONTENTS

Page

APPENDICES

Annexure 1	Staged Credit Requirements	9b-33
Annexure 2	Biobanking Credit Calculator Output (Development Site)	9b-37
Annexure 3	Credit Profiles (Development Site)	9b-43
Annexure 4	Biodiversity Credit Report from the Biobanking Credit Calculator (Offset Sites)	9b-73

FIGURES

Figure 1	Regional location of offset sites	9b-28
Figure 2	Proposed stages of clearing	9b-29
Figure 3	Details of on-site offset sites	9b-30

TABLES

Table 1	Ecosystem credit offset requirement for the Project	9b-12
Table 2	Species credit offset requirement for the Project	9b-13
Table 3	Staged offset requirement	9b-16
Table 4	On-site offset site summary	9b-17
Table 5	Lots and DPs of offset areas	9b-17
Table 6	On-site offset site biodiversity values and condition improvement scores	9b-19
Table 7	Additional Management Actions	9b-20
Table 8	Comparison of the Project offset credit requirement and offsets created at the on-site offset sites	9b-21
Table 9	Off-site Offset Summary	9b-23

COMMONLY USED ACRONYMS AND UNITS

BAR	Biodiversity Assessment Report
BBAM	BioBanking Assessment Methodology
BBCC	BioBanking Credit Calculator
BC Act	NSW <i>Biodiversity Conservation Act 2016</i>
BCD	Biodiversity Conservation Division
BCT	Biodiversity Conservation Trust
BOS	Biodiversity Offset Strategy
BVT	BioMetric Vegetation Type
CEEC	Critically Endangered Ecological Community
CMA	Catchment Management Authority
DPIE	Department of Planning, Industry and Environment
EEC	Endangered Ecological Community
EP&A Act	NSW <i>Environmental Planning and Assessment Act 1979</i>
EPBC Act	Commonwealth <i>Environment Protection and Biodiversity Conservation Act 1999</i>
FBA	Framework for Biodiversity Assessment – NSW Biodiversity Offsets Policy for Major Projects
ha	Hectare/s
IBRA	Interim Biodiversity Region of Australian
LEP	Local Environmental Plan
MNES	Matters of National Environmental Significance listed under the EPBC Act
OEH	Office of Environment and Heritage
PCT	Plant Community Type
SEARS	Secretary's Environmental Assessment Requirements
SEPP	State Environmental Planning Policy
TEC	Threatened Ecological Community as listed under schedules of the BC Act and or EPBC Act. Collective term to describe vulnerable, endangered and critically endangered ecological communities

This page has intentionally been left blank

EXECUTIVE SUMMARY

Introduction

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by Bowdens Silver Pty Ltd (Bowdens Silver) to prepare a Biodiversity Offset Strategy (BOS) for the Bowdens Silver Project (the Project). The BOS should be read alongside the Biodiversity Assessment Report (BAR) for the Project prepared by EnviroKey (2020). Both documents have been prepared for the purpose of the Environmental Impact Statement for the Project prepared by R.W. Corkery & Co Pty Limited (RWC).

The Project is classified as State Significant Development (SSD). The Department of Planning, Industry & Environment (DPIE) has confirmed that the Project can be considered as a “pending or interim planning application” under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* and the environmental assessment may be undertaken under former legislation including the NSW *Threatened Species Conservation Act 1995* and former Section 5A of the NSW *Environmental Planning and Assessment Act 1979*. Accordingly, the BOS uses the Framework for Biodiversity Assessment (FBA) in accordance with the NSW Biodiversity Offsets Policy for Major Projects, consistent with the Secretary’s Environmental Assessment Requirements (SEARS) for the Project.

The BOS relies upon assessment completed for the BAR (EnviroKey, 2020) to outline the Project’s offset requirements, provides a brief review of options to satisfy the requirements and presents a strategy to demonstrate how the offset requirements will be met.

As clearing of vegetation would occur over approximately 12 years, a staged approach is proposed for offsetting whereby a tranche of offsetting would occur directly prior to each discrete stage of clearing. As a result, the offsetting obligations of the Project would be satisfied in three stages.

Credit requirement

EnviroKey (2020) identifies that a total of 381.71 ha of native vegetation would be removed for the Project. The vegetation to be removed is a residual impact of the Project after measures to avoid or mitigate vegetation clearing have been considered and implemented. The vegetation clearing comprises 11 Plant Community Types (PCTs), resulting in a total credit requirement of 23,019 ecosystem credits, as presented in **Table ES1**.

EnviroKey (2020) also identified that species credits would be required for the Regent Honeyeater (29,035), Squirrel Glider (4,042), Koala (3,629) and *Acacia ausfeldii* (9,240). More information on the assessed credit requirements are provided in EnviroKey (2020).

Table ES1
Summary of BBAM Credit Requirements

Vegetation Type	BBAM Credits required
PCT 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	38
PCT 273: White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	1,340
PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	1,168
PCT 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	9,989
PCT 323: Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	6,115
PCT 324: Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes	4,010
PCT325: Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes	40
PCT 358: Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion	46
PCT 401: Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region	33
PCT 468 Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo)	38
796: Derived grassland of the NSW South Western Slopes	202
Total	23,019

Offsetting options and strategy

The NSW FBA and Biodiversity Offsets Policy for Major Projects allows for a number of options in regard to satisfying the offset requirements for the Project.

- Credit purchase and retirement from offset sites secured by biobanking (now Stewardship) agreements. Purchase of credits provides funding for in-perpetuity management and protection for conservation purposes.
- Rehabilitation of mine sites.
- Contributing money to supplementary measures.
- Payments into a fund.

To satisfy the majority of the Project's offset requirements Bowdens Silver propose to establish or facilitate the establishment of Biodiversity Offset Sites using Biodiversity Stewardship Agreements within permissible IBRA subregions and where like-for-like offsets can be obtained under the rules of the NSW FBA. It is noted that this is the preferred/optimum option for offsetting by NSW DPIE.

The Biodiversity Offset Sites would be established under a Biodiversity Stewardship Agreement either on land within or adjacent to the Mine Site (on-site offsets) or on other freehold land within the region where offsets can be sourced under the FBA rules (off-site offsets).

On-site offsets

The proposed on-site offset consists of 36 Lots with a combined area of 795 ha (currently comprising 721 ha of native vegetation). These lands are located within and adjacent to the proposed Mine Site and are either owned by Bowdens Silver or are subject to purchase agreements which are already in place.

Overall the 9,939 credits created at the on-site offset sites meet 43% of the Project's overall ecosystem credit offset requirement and 71% of the Stage 1 requirements. An additional 13,080 ecosystem credits are required from off-site offsets to meet the Project's overall offset requirement while an additional 4,091 credits are required to meet the Stage 1 offset credit requirement.

Off-site offsets

To date the off-site offset sites have not been finalised, however, significant work has been completed in order to inform the offset strategy.

A desktop assessment was carried out to identify candidate properties for the establishment of offset sites. The desktop assessment involved the following.

- Analysis of vegetation mapping (DPIE, 2018) throughout the permissible offset areas comprising the IBRA subregions of Capertee Valley, Capertee Uplands, Wollemi and Inland Slopes.
- Identification of land holdings with large areas of mapped native vegetation (c.1000 ha) including large areas of Box Gum Woodland PCTs.
- After consideration of the above, properties that were in close proximity to Regent Honeyeater, Koala and Squirrel Glider records according to the NSW Wildlife Atlas were prioritised.

The process described above resulted in a short-list of ten properties for which relevant landholders were contacted with an expression of interest. Of the ten properties identified, 7 landholders have so far expressed interest in the creation of a stewardship site which would be facilitated by the Applicant.

Given the extent of native vegetation within the identified properties it is likely that the residual offset obligation would be met through establishment of one or two of the ten candidate properties. Upon confirmation of the available off-site offset areas, further fieldwork would be undertaken to determine the ecosystem and species credits that would be generated at these sites.

If necessary, any residual offset requirements would be satisfied by purchasing available credits from the market, through payment into the NSW Biodiversity Conservation Trust Fund or through supplementary measures, subject to agreement.

Credit conversions

The credit requirement for the Project has been determined in Biobanking credits in accordance with the FBA requirements. Establishment of in-perpetuity offset sites (formally Biobanking sites but now Biodiversity Stewardship Sites) in NSW can now only be done using the Biodiversity Assessment Method (BAM) and therefore, a conversion from Biobanking credits to BAM credits would be required and would be conducted by DPIE.

1. INTRODUCTION

1.1 BACKGROUND AND LEGISLATIVE FRAMEWORK

Niche Environment and Heritage Pty Ltd (Niche) was commissioned by Bowdens Silver Pty Ltd (Bowdens Silver) to prepare a Biodiversity Offset Strategy (BOS) for the Bowdens Silver Project (the Project). The BOS should be read alongside the Biodiversity Assessment Report (BAR) for the Project prepared by EnviroKey (2020). Both documents have been prepared for the purpose of the Environmental Impact Statement for the Project prepared by R.W. Corkery & Co Pty Limited (RWC).

The Project is classified as State Significant Development (SSD). The Department of Planning, Industry & Environment (DPIE) has confirmed that the Project can be considered as a “pending or interim planning application” under the *Biodiversity Conservation (Savings and Transitional) Regulation 2017* and the environmental assessment may be undertaken under former legislation including the *NSW Threatened Species Conservation Act 1995* and former Section 5A of the *NSW Environmental Planning and Assessment Act 1979*. Accordingly, the BOS uses the Framework for Biodiversity Assessment (FBA) in accordance with the NSW Biodiversity Offsets Policy for Major Projects, consistent with the Secretary’s Environmental Assessment Requirements (SEARS) for the Project.

1.2 OFFSETS REQUIRED FOR THE PROJECT

The FBA sets out a methodology to assess the residual impacts of Major Projects on biodiversity after avoiding or mitigating potential impacts, resulting in a specific offsetting requirement for each impacted Plant Community Type (PCT), which includes provision for associated ecosystem credit threatened fauna species, and species credit threatened species (generally species which cannot be linked to specific PCTs). Note that some species have both ecosystem and species credit requirements (e.g. where breeding habitat may be of particular importance and is not easily linked to PCTs).

The Project BAR (EnviroKey, 2020) outlines the methods used for determination of the offset requirement for the Project after consideration of the proposed footprint which would disturb a total of 381.71 ha of native vegetation comprising 11 PCTs. The required Biobanking (BBAM) offset credits are presented in **Table 1** and **Table 2** below and **Annexure 2** representing PCTs and species credit threatened species habitat to be cleared.

1.3 COMMONWEALTH OFFSET REQUIREMENTS

Offsets are required under the EPBC Act for threatened biodiversity that are significantly impacted by a project. The following EPBC Act listed threatened biodiversity has been considered to be potentially significantly impacted by the Project (EnviroKey, 2020 and see **Table 1** and **Table 2**). It is noted that assessments of significance generally do not consider all mitigation measures or any offsetting in determining the outcome.

- White Box Yellow Box Blakely’s Red Gum Woodland (Box Gum Woodland); and
- Regent Honeyeater.

Table 1
Ecosystem credit offset requirement for the Project

Plant Community Type (PCT)	Threatened Ecological Community Status and relevant Act	BBAM Credits required
PCT 266: White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion.	Endangered (BC Act) Critically Endangered (EPBC Act) White Box Yellow Box Blakely's Red Gum Woodland and considered significantly impacted (EnviroKey, 2020)	38
PCT 273: White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW.	N/A	1,340
PCT 277: Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion.	Endangered (BC Act) Critically Endangered (EPBC Act) White Box Yellow Box Blakely's Red Gum Woodland and considered significantly impacted (EnviroKey, 2020)	1,168
PCT 281: Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion.	Endangered (BC Act) Critically Endangered (EPBC Act) White Box Yellow Box Blakely's Red Gum Woodland and considered significantly impacted (EnviroKey, 2020)	9,989
PCT 323: Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion.	N/A	6,115
PCT 324: Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes.	N/A	4,010
PCT325: Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes.	N/A	40
PCT 358: Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion.	N/A	46
PCT 401: Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region.	N/A	33
PCT 468 Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo).	N/A	38
796: Derived grassland of the NSW South Western Slopes.	N/A	202
		23,019

Table 2
Species credit offset requirement for the Project

Species	Act required under	BBAM Credits required
Regent Honeyeater	NSW EP&A Act and Commonwealth EPBC Act (significantly impacted)	29,035
Squirrel Glider	NSW EP&A Act	4,042
Koala	NSW EP&A Act	3,629
<i>Acacia ausfeldii</i>	NSW EP&A Act	9,240

An approval bilateral agreement is in place between the NSW and the Commonwealth which allows for significantly impacted threatened species listed under the EPBC Act to be offset via the NSW FBA and Biodiversity Offsets Policy for Major Projects. Therefore, the strategy presented herein which addresses the State offset requirements also applies to the significantly impacted threatened biodiversity under the EPBC Act.

2. OFFSET STRATEGY

2.1 AVAILABLE OFFSETTING OPTIONS

The NSW FBA and Biodiversity Offsets Policy for Major Projects allow for a number of options in regard to satisfying the offset requirement for the Project (see a to d below). These are hierarchical in terms of preference and include:

- a) Offsetting through a site secured by a biobanking (now Stewardship¹) agreement. Biobanking (now Stewardship) agreements specify the number and type of biodiversity credits generated through the landowner's management actions to conserve and improve biodiversity values in-perpetuity. The Applicant purchases the number and type of biodiversity credits required to compensate for the loss of biodiversity on the development site and then 'retires' those credits. Retiring credits involves removing them from the market so they cannot be traded against another impact on biodiversity.

Applicants also have the option of establishing a biobank (now Stewardship) site on their own land to fulfil their offset requirement consistent with the above.

Where feasible offsets must be 'like for like' with the following rules applied to credit trading under the FBA:

- Ecosystem credits: like-for-like offsets must be the same plant community type or a plant community type in the same vegetation class that has undergone a similar or greater amount of clearing since European inhabitation and must be sourced from the same or adjacent IBRA sub-region (see **Figure 1** and **Annexure 3** Credit profile for a list of applicable vegetation types).
 - Species credit threatened species: like-for-like offsets must be the same threatened species (anywhere in NSW).
 - Variations to the above rules: where a proponent is unable to locate a suitable like-for-like offset site they may apply the FBA variation rules which allow for some level of departure away from like-for-like offsets.
- b) Rehabilitation of mine sites: Rehabilitation involves restoring biodiversity values on mine sites after mining activities have ceased (note – this does not change any typical consent condition or requirement to rehabilitate areas under relevant planning controls).
 - c) Contributing money to supplementary measures: If appropriate offsets are not feasible, Applicants can provide funds for supplementary measures for conservation activities targeted to impacted PCTs or threatened species.
 - d) Payments into a fund: The fund was only recently established under the recent BC Act – payments into the fund are now considered an option for offsetting.

¹ The Biobanking scheme under the TSC Act has been repealed and replaced with the BC Act which allows for creation of Stewardship offset sites as opposed to Biobanking offset sites. See Section 2.3. References to Biobanking sites have been replaced (or are followed by reference to) Stewardship sites within this report.

2.2 OVERVIEW OF OFFSET STRATEGY

To satisfy the majority of the Project's offset requirements Bowdens Silver propose to establish or facilitate the establishment of Biodiversity Offset Sites (see option a in Section 2.1 above) using Biodiversity Stewardship Agreements within permissible IBRA subregions and where like-for-like offsets can be obtained under the rules of the NSW FBA. It is noted that this is the preferred/optimum option for offsetting by NSW DPIE. At this stage, no departure from the like-for-like rules to take advantage of the variation rules is anticipated to be required.

The following IBRA subregions can be used for sourcing offset credits for ecosystem credits under the FBA (**Figure 1**):

- Capertee Valley (impacted IBRA subregion)
- Capertee Uplands
- Wollemi
- Inland Slopes

Biodiversity Offsets Sites will be established in two areas:

- On land already owned or secured by the Applicant within or adjacent to the Mine Site (referred to hereafter as on-site offsets)
- on land further from the mine on freehold land owned by private landholders (referred to hereafter as off-site offsets).

This BOS demonstrates how the identified offset sites collectively would satisfy the offset requirements for the Project. The strategy to satisfy any residual offset requirement (**Table 6**) would be to purchase available credits from the market or payment into the NSW Biodiversity Conservation Trust Fund noting that payment into the fund may not be possible for significantly impacted threatened species or communities that are listed under the EPBC Act (see EnviroKey, 2020). If required, supplementary measures would be investigated in consultation with the NSW Biodiversity & Conservation Division (BCD).

Due to recent legislation changes the Biobanking (BBAM) credit obligations outlined within this report will need to be converted into BAM credits (see Section 2.3).

2.3 CREDIT CONVERSIONS

As outlined in Section 1.2, the credit requirement for the Project has been determined in Biobanking credits as per the FBA requirements. However, in-perpetuity offset sites (formally Biobanking sites but now Biodiversity Stewardship Sites) in NSW can now only be established using the present BAM system which creates BAM credits. As BBAM and BAM currencies are generated from different scoring and measurement systems a conversion from BBAM credits into BAM credits will be required during Project approval. The conversion will be undertaken by the NSW BCD. Presently, the offset scoring has been completed using the FBA and associated Biobanking methodology in order to satisfy the FBA.

2.4 STAGED OFFSET APPROACH AND TIMING

Impacts from the Project via clearing of vegetation would occur over approximately 12 years. Therefore, a staged offsetting approach for the Project was discussed and agreed to on 28 May 2019 with the former NSW OEH whereby a tranche of offsetting would occur directly prior to each discrete stage of clearing. The stages summarised in **Table 3** and illustrated in **Figure 2** have been identified for impacts and offsetting.

Table 3
Staged offset requirement

Stage	Year from commencement	Deadline for credit retirement	Clearing area (native vegetation only)	Proportion of overall clearing/ offset requirement (approx.)
Stage 1	0-1	Within 12 months of project commencement	222.77 ha	58.36 %
Stage 2	3-4	Before any clearing in year 3	82.36 ha	21.58 %
Stage 3	6-12	Before and clearing in year 6	76.61 ha	20.07 %

The overall credit requirement for the project as presented in **Table 1** and **Table 2**, have been split into the three stages outlined in **Table 3** above (see **Annexure 1**).

The majority of the proposed offset sites referred to within this report will require further assessment and the processing of a Stewardship site application to allow for the purchase and/or retirement of biodiversity credits. For this reason, an interim period of 12 months between Project commencement and credit retirement is sought for Stage 1, consistent with other approvals of this nature.

3. ON-SITE OFFSET SITES

3.1 OFFSET SITE DESCRIPTION AND LOCATION

A series of offset sites would be used to generate credits to satisfy the offset requirements for the Project. A summary of details for the on-site offset sites is provided below (**Table 4**). Details of the on-site offset sites are illustrated in **Figure 3**.

Table 4
On-site offset site summary

Offset site name/number	Property features	Location	Land Ownership
On-site offset sites	36 lots surrounding the proposed mine site. Majority of the site is within the Capertee Valley IBRA subregion.	20-30 km south-east of Mudgee, NSW.	Majority of on-site offset areas are already owned by the Applicant. Property purchase agreements are in place for any additional privately-owned land. Some lots are Crown land or land owned by Mid-Western Regional Council (paper roads).

3.2 ON-SITE OFFSET SITES TITLE DETAILS

The on-site offset consists of 36 Lots (**Table 5**) with a combined area of 795 ha (currently comprising 721 ha of native vegetation). The majority of these Lots are located within and adjacent to the proposed Mine Site and are either owned by Bowdens Silver Mine or are subject to purchase agreements which are already in place. Crown land or lots owned by Mid-Western Regional Council have been included, however, it is noted that securing the land for the purpose of offsetting would require landowner consent or purchase of these lots. These lands constitute a very small portion of the identified offset lands.

Table 5
Lots and DPs of offset areas

Lot number(s)	DP number
On-site offset site	
1	572701
107, 61, 71, 76, 178, 3	755412
115, 127, 161, 119, 140, 29, 116, 118, 73, 70, 25, 120, 26, 143, 122, 168, 71	755435
2, 3, 4	776858
11	810747
2, 1	814633
1	835810
310, 311	850923
7008	1029652
132	1050074
102	1124638

3.3 ON-SITE OFFSET SITE ECOSYSTEM CREDIT ASSESSMENT

On-site offset sites were surveyed using the FBA methodology which has allowed for vegetation community determination, mapping of vegetation zones (**Figure 3**) and determination of credit yields (see **Annexure 4**). Sixty-two BBAM plots conducted within the on-site offset areas (primarily by Eco Logical Australia in 2014) were utilised to inform the credit assessment. The biodiversity offset areas and associated credit calculations will continue to be updated as the BOS is refined and finalised.

3.4 VEGETATION TYPES AND IMPROVEMENT IN BIODIVERSITY VALUES AT ON-SITE OFFSET SITES

Table 6 outlines ground-truthed PCTs across the on-site offset sites and demonstrates expected improvement of vegetation condition within the sites as calculated within the BBAM calculator.

3.4.1 Management actions proposed at the offset sites

The minimum required management actions as per the FBA and BAM for Stewardship sites would be implemented at all offset sites. Additional management actions proposed are detailed in **Table 7**.

3.4.2 Existing management obligations

There are no known management obligations for conservation within the proposed on-site offsets.

3.5 COMPARISON OF PROJECT OFFSET REQUIREMENT WITH CREDITS CREATED AT ON-SITE OFFSET SITES

Overall the 9,939 credits created at the on-site offset sites (see **Table 8**) meet 43% of the Project's overall ecosystem credit offset requirement and 71% of the Stage 1 requirements. An additional 13,080 ecosystem credits are required from off-site offsets to meet the Project's overall offset requirement while an additional 4,091 credits are required to meet the Stage 1 offset credit requirement.

Table 6
On-site offset site biodiversity values and condition improvement scores

Veg zone No	PCT no.	BVT code	Plant community type name	Condition	Area (ha)	Landscape Value Score	Current Site Value	Future Site Value	Gain in Site Value	Averted Loss in Site Value	Number of Ecosystem Credits Created
1	273	CW217	White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	Moderate/ Good - Medium	12	21.2	79.17	100	20.83	12.5	164
2	277	CW112	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Moderate/ Good - Poor	158	21.2	65.33	91	25.67	10	2246
3	281	CW111	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/ Good - Medium	114	21.2	87.33	97.33	10	15	1317
4	281	CW111	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/ Good - Poor	91	21.2	59.33	95	35.67	7	1453
5	323	CW291	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/ Good - High	224	21.2	93.23	100	6.77	17.97	2573
6	323	CW291	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/ Good - Medium	18	21.2	71.35	88.54	17.19	15.1	241
7	323	CW291	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/ Good - Poor	47	21.2	35.24	63.02	27.78	5.55	641
8	324	CW263	Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes	Moderate/ Good - High	26	21.2	82.81	96.88	14.07	16.49	336
9	325	CW325	Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes	Moderate/ Good - High	70	21.2	82.81	100	17.19	16.92	968

Table 7
Additional Management Actions

Veg zone No	PCT no.	Condition	Area (ha)	Additional management actions	Additional increase in gain score
1	273	Moderate/Good - Medium	12	None	-
2	277	Moderate/Good - Poor	158	Importation of logs from clearing activities Seeding for shrubs with native endemics Additional weed management for exotic species	0.5 0.5 0.5
3	281	Moderate/Good - Medium	114	Importation of logs from clearing activities	0.5
4	281	Moderate/Good - Poor	91	Importation of logs from clearing activities Seeding for shrubs with native endemics	0.5 0.5
5	323	Moderate/Good - High	224	None	-
6	323	Moderate/Good - Medium	18	Seeding for shrubs and/or native grasses	0.5
7	323	Moderate/Good - Poor	47	Seeding for shrubs and/or native grasses Import logs from clearing activities	0.5 0.5
8	324	Moderate/Good - High	26	None	-
9	325	Moderate/Good - High	70	None	-

Table 8

Comparison of the Project offset credit requirement and offsets created at the on-site offset sites

Name	PCT no.	TEC		Total BBAM Credits required	BBAM Credits required - Stage 1	BBAM Credits generated (on-site offset sites)	Other PCTs used to satisfy requirement – Stage 1	BBAM residual requirement – Stage 1
		BC Act	EPBC Act					
Rough-Barked Apple - red gum - Yellow Box woodland	281	Box Gum Woodland		9,989	6,730	2,770	PCT 277 (2,018)	1,942
Blakely's Red Gum - Yellow Box grassy tall woodland	277	Box Gum Woodland		1,168	228	2,246	0	0
White Box grassy woodland in the upper slopes sub-region	266	Box Gum Woodland	Box Gum Woodland	38	38	0	0	38
White Box shrubby open forest on fine grained sediments on steep slopes	273	-	-	1,340	1,288	164	0	1,124
Blue-leaved Stringybark open forest of the Mudgee region	325	-	-	40	0	968	0	0
Derived grassland of the NSW South Western Slopes	796	Box Gum Woodland	Box Gum Woodland	202	202	0	0	202
Inland Scribbly Gum grassy open forest on hills in the Mudgee Region	324	-	-	4,010	2,770	336	PCT 323 (796) PCT 325 (928)	710
Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills	358	-	-	46	4	0	0	4
Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills	468			38	38	0	0	38
Red Stringybark - Inland Scribbly Gum open forest on steep hills	323	-		6,115	2,659	3,455	0	0
Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats	401/1860			33	33	0	0	33
Totals				23,019	13,990	9,939	-	4,091

4. OFF-SITE OFFSET SITES

As stated within Section 2.1, the objective of this offset strategy corresponds with the preferred approach listed within the FBA for offsetting (credit retirement from offset sites with like-for-like values secured and managed for conservation in-perpetuity). The process described below to identify suitable off-site offset areas demonstrates how the offset strategy will achieve its objectives.

4.1 APPROACH TO OFF-SITE OFFSETS

To date the off-site offset sites have not been finalised, however significant work has been completed in order to inform the offset strategy. Various landholdings have been targeted based on the residual credits required after the contribution of on-site offset sites towards the overall offset package.

It is expected that a similar or slightly lower credit yield would be achieved within the off-site offset areas as compared with on-site offsets and an approximated yield of 10 BBAM credits per hectare (as opposed to an average of 13 credits per hectare at on-site offset sites) has been assumed for the purposes of providing an estimate of the land area required to meet the outstanding offset requirement.

Given the residual ecosystem credit requirement, it is predicted that between 850 and 1,000 hectares of off-site offset areas would be required.

The specific improvement of vegetation condition at the off-site offsets and consequent credit yield will be provided upon confirmation of the selected areas for offsetting and completion of required field survey.

4.2 METHODS TARGETING LANDHOLDINGS FOR OFF-SITE OFFSETS

A desktop assessment was carried out to identify candidate properties for the establishment of offset sites. The desktop assessment involved the following:

- Analysis of vegetation mapping (DPIE, 2018) throughout the permissible offset areas comprising the IBRA subregions of Capertee Valley, Capertee Uplands, Wollemi and Inland Slopes
- Identification of land holdings with large areas of mapped native vegetation (c.1000 ha) including large areas of Box Gum Woodland PCTs.
- After consideration of the above, properties that were in close proximity to Regent Honeyeater, Koala and Squirrel Glider records according to the NSW Wildlife Atlas were prioritised.

The process described above resulted in a short-list of ten properties for which relevant landholders were contacted with an expression of interest. Of the ten properties identified, 7 landholders have so far expressed interest in the creation of a stewardship site which would be facilitated by the Applicant.

Given the extent of native vegetation within the identified properties it is likely that the residual offset obligation would be met through establishment of one or two of the ten candidate properties.

General locational information for candidate off-site offset sites are provided in **Table 9**.

Table 9
Off-site Offset Summary

Potential offset site(s)	Property location	Location/values
Off-site offsets x 4	IBRA Region: South Western Slopes IBRA Subregion: Inland Slopes	South-west of the development site. Large areas of Box Gum Woodland. Squirrel Glider and Koala records in locality.
Off-site offsets x 2	IBRA Region: South Western Slopes IBRA Subregion: Capertee Valley	South-east of the development site. Areas of important habitat for Regent Honeyeater and other target species credit species.
Off-site offsets x 4	IBRA Region: South Western Slopes IBRA Subregion: Inland Slopes	South-west of the development site. Large areas of Box Gum Woodland. Squirrel Glider and Koala records in locality.

4.3 PURCHASE OF BIOBANKING CREDITS

During the course of investigating the offset strategy, credits required for the Project were added to the Biobanking credit register. Several parties expressed interest in supplying ecosystem and species credits. This indicates that suitable credits are available. These expressions of interest will be further pursued as required to address any possible shortfall regarding credits created via land purchase and stewardship site creation.

5. SPECIES CREDITS

5.1 SPECIES CREDITS

The presence of species credit species at the on-site and off-site offset sites, and the number of species credits generated, will be confirmed via targeted field survey in accordance with the BAM and relevant survey guidelines once the credit requirement is confirmed and after the necessary process for credit conversion takes place. Species credit surveys will be targeted to the most likely locations for each species based on the presence of NSW Wildlife records adjacent or upon on-site and off-site offset properties and after consideration of available habitat.

5.2 CREDIT CONVERSIONS AND APPROACH TO OFFSETTING

5.2.1 Regent Honeyeater

The EnviroKey (2020) BAR for the Project has considered the majority of the development site as Regent Honeyeater habitat and the species has been considered significantly impacted under the EPBC Act. No Regent Honeyeater biobanking credits were found to be available after searches of relevant registers. Therefore, in order to satisfy the offset requirement for this species BAM credits must be created (since Biobanking credits can no longer be created) and retired. Conversion of the current Biobanking credit requirement for the Project will be necessary to calculate how many BAM credits are required.

Both the NSW BCD and (then) Commonwealth DoEE were consulted in regard to the process for credit conversion for the Regent Honeyeater. Under the new BAM the Regent Honeyeater only requires credits where important habitat is impacted by development. Within the disturbance footprint only limited areas, constituting 7.3 ha of the proposed water supply pipeline, coincide with mapped important habitat. Given the required conversion process the eventual BAM credit requirement is forecast to be approximately 350-450 BAM credits which is anticipated to require an offset of approximately 100 hectares.

The strategy for meeting the credit requirement for Regent Honeyeater for the Project is to rely on the establishment of stewardship sites within off-site offset sites which have been identified as high priority due their location within known areas of important habitat for Regent Honeyeater. The area of habitat required to meet the converted BAM credit obligation would be satisfied by this process given the area available within proposed stewardship sites. Given that the off-site offset properties identified to date are large, it is likely that a single offset property would satisfy the BAM credit requirement for this species.

5.2.2 Koala and Squirrel Glider credits

Koala credits will be created after survey of on-site and off-site offset areas. Any shortfall in the number of credits required will be addressed through purchase of credits from the market (biobanking or BAM credits). These are readily available and Niche has received a number of EOIs from credit holders for these species.

5.2.3 *Acacia ausfeldii* (Ausfeld's Wattle)

A credit conversion to BAM credits will need to occur for the species to be offset as no biobanking credits are available for the species. All locations impacted for this species constitute relatively narrow areas for the proposed water pipeline. The area of impact has been calculated as 0.6 hectares based on mapping by EnviroKey (2020). Therefore, the offset requirement is likely to constitute a relatively small area/number of BAM credits estimated at 20 credits. Credits for *A. ausfeldii* will be created via identification of the species within either on-site or off-site offset areas. Should this not be possible due to the species absence, payments into the Biodiversity Conservation Fund are the likely preferred alternative. Based on current pricing this would amount to less than \$5,000 for the estimated number of credits required.

6. FURTHER OFFSETTING CONSIDERATIONS

6.1 REHABILITATION SITE IDENTIFICATION

Rehabilitation is not proposed for offsetting at this stage, however, may be determined appropriate at the off-site offset areas when the available areas are confirmed and surveyed. Notwithstanding, it is important to note that mine disturbance would be rehabilitated in accordance with the development approval with a rehabilitation bond also required to be provided to the Resources Regulator in accordance with the mining lease(s) required for the Project.

6.2 SUPPLEMENTARY MEASURES

Supplementary measures are not proposed at this stage, however, may be determined appropriate at both the on-site and off-site offset areas upon completion of targeted survey.

6.3 SUMMARY OF FURTHER WORK

Upon confirmation of the available off-site offset areas, further field survey will be undertaken to determine the ecosystem and species credits that would be generated at these sites. Targeted field survey will also be undertaken at the on-site offset to determine whether species credits can be generated. This information will be included in a final BOS, with an accompanying management plan for the on-site and off-site offset areas.

7. REFERENCES

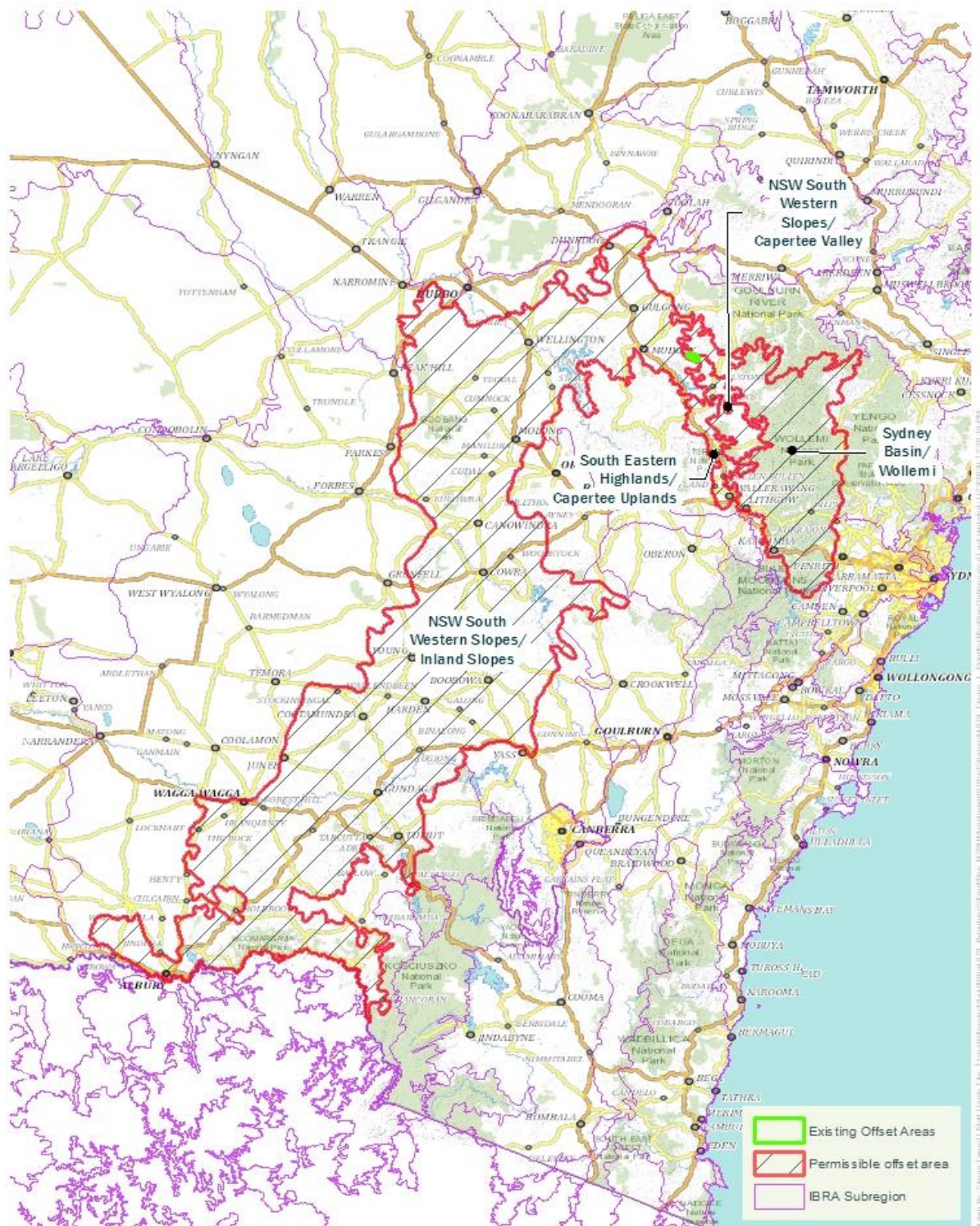
DPIE (2018) *State Vegetation Type Map: Central Tablelands Region* Version 1.0. VIS_ID 4778.

NSW Department of Planning Industry and Environment. Available online:
https://data.nsw.gov.au/data/dataset/state-vegetation-type-map-central-tablelands-region-version-0-1-vis_id-4778

EnviroKey (2020) *Biodiversity Assessment Report*, Specialist Consultant Studies Compendium Part 9a. Prepared for Bowdens Silver Pty Limited.

FIGURES

Figure 1 Regional location of offset sites



Niche PM: Simon Tweed
Niche Proj. #: 4879
Client: Bowdens Silver Pty Ltd

Permissible Offset Area (ecosystem credits) under
Framework for Biodiversity Assessment
Bowdens Silver Mine Offset Strategy

Figure 1

Figure 2 Proposed stages of clearing

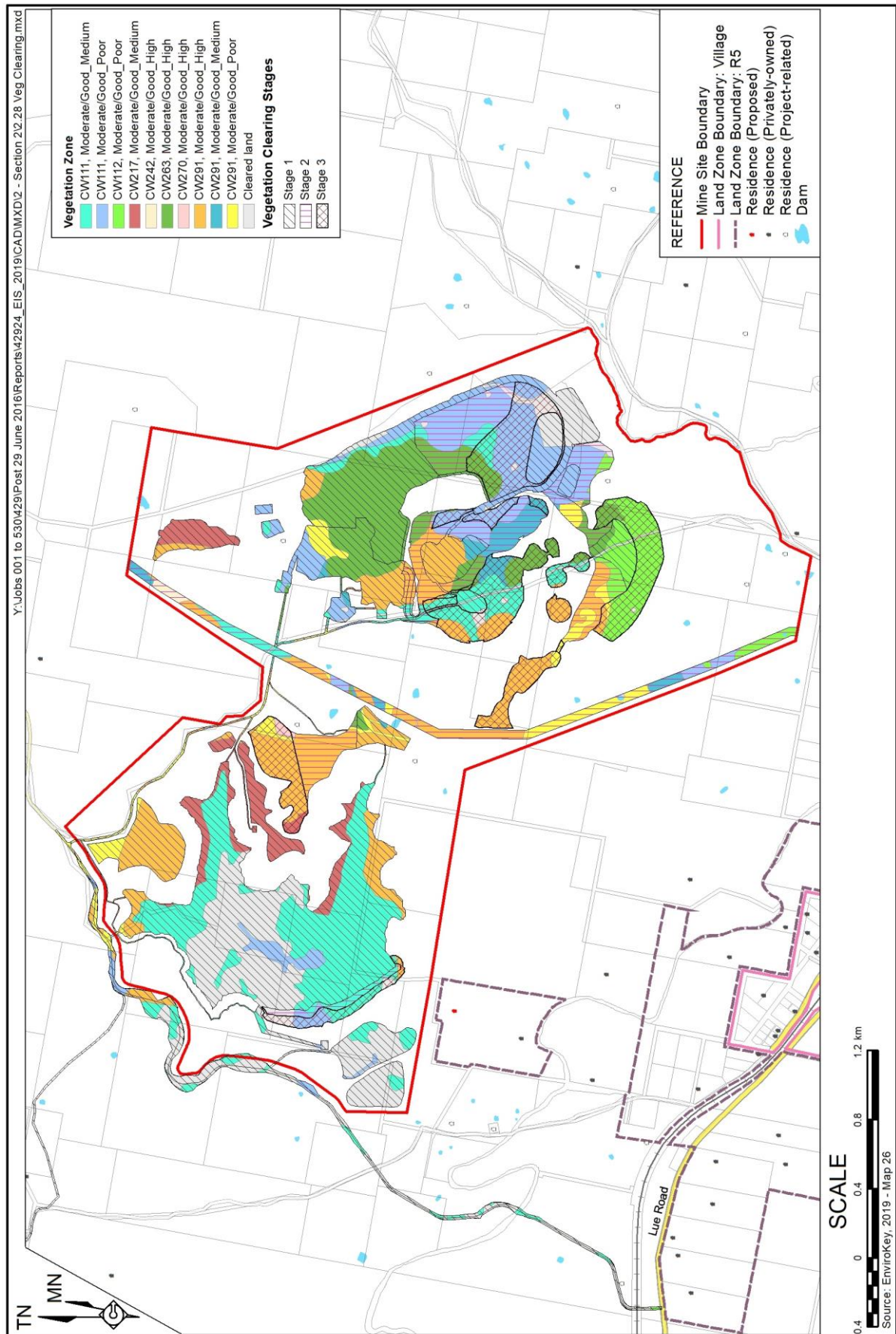
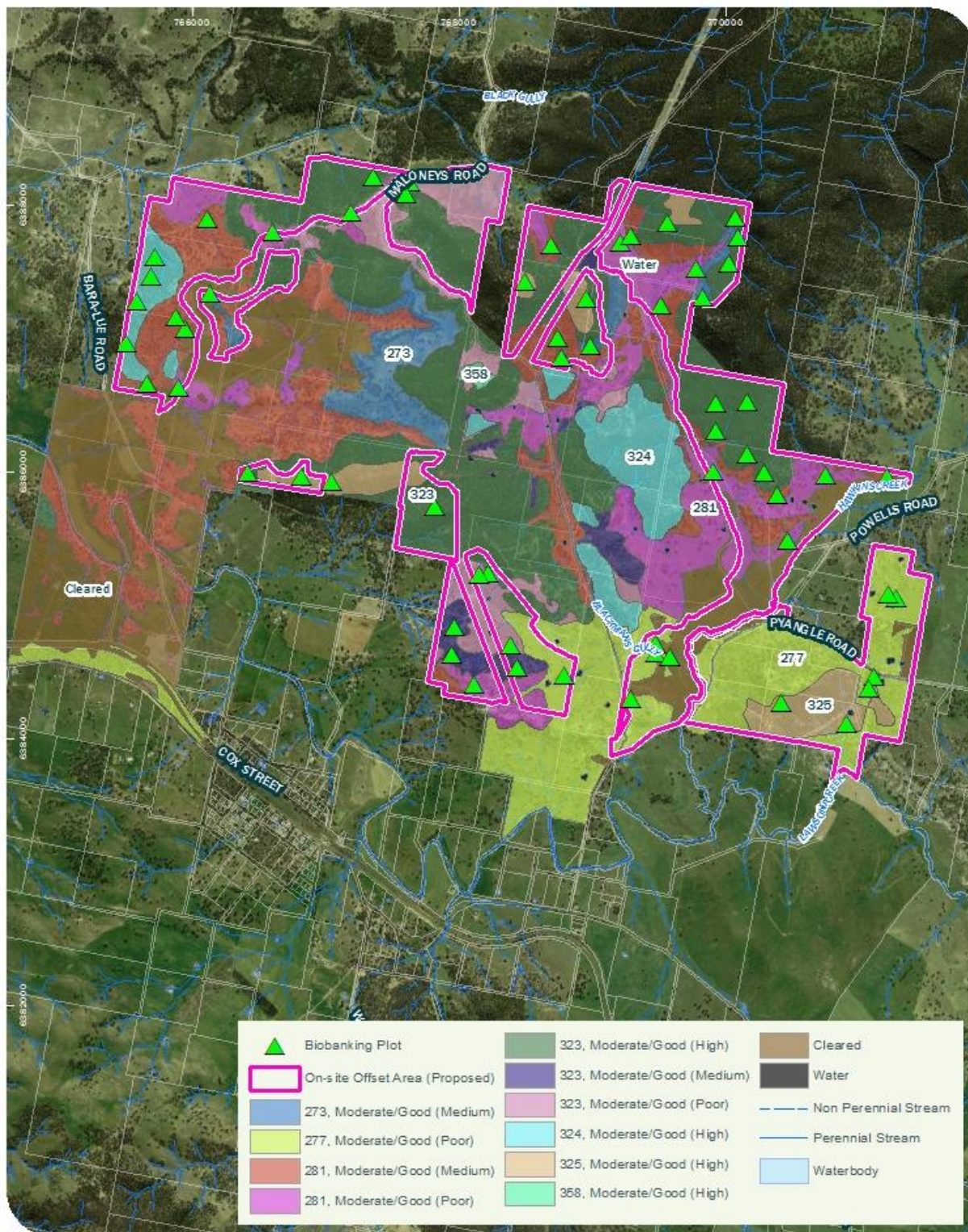


Figure 3 Details of on-site offset sites



Annexures

(Total No. of pages including blank pages = 48)

- Annexure 1 Staged Credit Requirement (4 pages)
- Annexure 2 Biobanking Credit Calculator Output
(Development Site) (6 pages)
- Annexure 3* Credit Profiles (Development Site) (30 pages)
- Annexure 4 Biodiversity Credit Report from the
Biobanking Credit Calculator (Offset Sites)
(6 pages)

* This Annexure is only available on the digital version of this document

This page has intentionally been left blank

Annexure 1

Staged Credit Requirements

(Total No. of pages including blank pages = 4)

This page has intentionally been left blank

Table A1-1 Staged Ecosystem Credit Requirement

PCT Code	BVT Code	Management zone	Clearing area – total disturbance	Clearing area – Stage 1 (hectares)	Clearing area – Stage 2 (hectares)	Clearing area – Stage 3 (hectares)	Total BBAM Credits required	BBAM Credits required – Stage 1	BBAM Credits required – Stage 2	BBAM Credits required – Stage 3
266	CW216	Med_11	1.24	1.24	0.00	0.00	38	38	0	0
273	CW217	Medium_1	21.68	20.84	0.00	0.84	1,340	1,288	0	52
277	CW112	Poor_2	19.73	4.19	2.49	13.05	1,075	228	136	711
277	CW112	Poor_2easement	2.07	0	2.07	0	93	0	93	0
281	CW111	Med_3	85.97	68.87	4.44	12.67	6,319	5,062	326	931
281	CW111	Med_3easement	2.35	0	2.35	0	136	0	136	0
281	CW111	Med_3b pipeline	4.53	4.53	0	0	251	251	0	0
281	CW111	Poor_4	61.92	26.33	20.21	15.37	3,096	1,316	1,011	769
281	CW111	Poor_4easement	2.10	0	2.10	0	86	0	86	0
281	CW111	Poor_4b pipeline	2.36	2.36	0	0	101	101	0	0
323	CW291	High_5	79.18	37.29	21.13	20.78	4,832	2,275	1,289	1,268
323	CW291	High_5_easement	2.50	0	2.50	0	132	0	132	0
323	CW291	High_5b_pipeline	0.21	0.21	0	0	0	0	0	0
323	CW291	Med_6	10.37	1.89	6.03	2.46	487	88	283	116
323	CW291	Med_6a_easement	1.44	0	1.44	0	52	0	52	0
323	CW291	Med_6b_pipeline	0.19	0.19	0	0	0	0	0	0
323	CW291	Poor_7	16.81	9.03	5.81	1.97	551	296	190	65
323	CW291	Poor_7easement	2.00	0	2.00	0	61	0	61	0
324	CW263	High_8	56.65	39.13	8.67	8.85	4,010	2,770	614	626
325	CW242	High_9	1.04	0.00	1.04	0.00	40	0	40	0
358	CW270	High_10	0.78	0.08	0.08	0.62	46	4	5	37
468	CW272	Med_13	0.65	0.65	0.00	0.00	38	38	0	0
796	CW249	DNG_12	5.18	5.18	0.00	0.00	202	202	0	0
1860/ 401	CW299	Med_14	0.76	0.76	0.00	0.00	33	33	0	0
		Totals	381.71	222.77	82.36	76.61	23,019	13,990	4,454	4,575

Table A1-2 Staged Species Credit Retirement

Species	BBAM Credits required	Stage 1 Credits required	Stage 2 Credits required	Stage 3 Credits required
Regent Honeyeater	29,035	16,778	6,350	5,907
Squirrel Glider	4,042	2,384	747	911
Koala	3,629	1,992	867	770
<i>Acacia ausfeldii</i>	9,240	9,240	0	0

Annexure 2

Biobanking Credit Calculator Output (Development Site)

(Total No. of pages including blank pages = 6)

This page has intentionally been left blank

BioBanking Credit Calculator

Ecosystem credits



Proposal ID : 0143/2019/4954MP

Proposal name : Bowdens Devel Incl Pipe April2020 MajPr

Assessor name : Steve Sass

Assessor accreditation number : 0143

Tool version : v4.0

Report created : 11/05/2020 07:32

Assessment circle name	Landsc ape score	Vegetation zone name	Vegetation type name	Condition	Red flag status	Management zone name	Management area	Current site value	Future site value	Loss in site value	Credit required for bio diversity	Credit required for TS	TS with highest credit requirement	Average species loss	Species TG Value	Final credit requirement for management zone
MineAndPipe MajPr	30.00	CW217, Moderate/Cool d_Medium	White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	Moderate/Cool d_Medium	Yes	mz1	21.68	72.40	0.00	72.40	0	1,340	Masked Owl	94.44	3.00	1,340
MineAndPipe MajPr	30.00	CW112, Moderate/Cool d_Poor	Blackely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Boregon	Moderate/Cool d_Poor	Yes	mz2	19.73	62.67	0.00	62.67	1,075	1,075	Masked Owl	66.67	3.00	1,075
MineAndPipe MajPr	30.00	CW112, Moderate/Cool d_Poor	Blackely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Boregon	Moderate/Cool d_Poor	Yes	mz2aEasemnt	2.07	62.67	12.67	50.00	93	93	Masked Owl	38.89	3.00	93
MineAndPipe MajPr	30.00	CW111, Moderate/Cool d_Medium	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Boregon and Bingaloo Belt South Boregon	Moderate/Cool d_Medium	Yes	mz3	85.70	88.00	0.00	88.00	6,299	6,299	Powerful Owl	100.00	3.00	6,299
MineAndPipe MajPr	30.00	CW111, Moderate/Cool d_Medium	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Boregon and Bingaloo Belt South Boregon	Moderate/Cool d_Medium	Yes	mz3aEasemnt	2.35	88.00	20.67	67.33	136	136	Powerful Owl	100.00	3.00	136
MineAndPipe MajPr	30.00	CW111, Moderate/Cool d_Medium	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Boregon and Bingaloo Belt South Boregon	Moderate/Cool d_Medium	Yes	mz3bPipe	4.53	88.00	24.00	64.00	251	251	Powerful Owl	100.00	3.00	251
MineAndPipe MajPr	30.00	CW111, Moderate/Cool d_Poor	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Boregon and Bingaloo Belt South Boregon	Moderate/Cool d_Poor	Yes	mz4	61.92	56.67	0.00	56.67	3,096	3,096	Powerful Owl	33.33	3.00	3,096

As on 11/05/2020

Page 1 of 4

Assessment circle name	Landsc	Vegetation zone name	Vegetation type name	Condition	Red flag status	Management zone name	Manage ment zone area	Current site value	Future site value	Loss in site value	Credits required for TS	TS with highest credit requirement	Average species loss	Species TG Value	Final credit requirement for management zone
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_Poor	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	ModerateGoo d_Poor	Yes	mz4aEasernmt	2.10	56.67	12.00	44.67	86	86 Powerful Owl	33.33	3.00	86
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_Poor	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	ModerateGoo d_Poor	Yes	mz4bPipe	2.36	56.67	9.33	47.34	101	101 Powerful Owl	33.33	3.00	101
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_High	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_High	Yes	mz5	78.25	78.65	7.29	71.36	0	4,775 Powerful Owl	46.67	3.00	4,775
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_High	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_High	Yes	mz5aEasernmt	2.50	78.65	18.23	60.42	0	132 Powerful Owl	33.33	3.00	132
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_High	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_High	Yes	mz5bPipe	0.21	0.00	0.00	0.00	0	2 Powerful Owl	0.00	3.00	0
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_High	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_High	Yes	mz5	78.25	78.65	7.29	71.36	0	4,775 Powerful Owl	46.67	3.00	4,775
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_High	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_High	Yes	mz5aEasernmt	2.50	78.65	18.23	60.42	0	132 Powerful Owl	33.33	3.00	132
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_High	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_High	Yes	mz5bPipe	0.21	0.00	0.00	0.00	0	2 Powerful Owl	0.00	3.00	0
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_Medium	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_Medium	Yes	mz6	10.37	52.60	0.00	52.60	0	487 Powerful Owl	53.33	3.00	487
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_Medium	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_Medium	Yes	mz6aEasernmt	1.44	52.60	14.59	38.02	0	52 Powerful Owl	6.66	3.00	52
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_Medium	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_Medium	Yes	mz6bPipe	0.19	0.00	0.00	0.00	0	1 Powerful Owl	0.00	3.00	0
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_Medium	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_Medium	Yes	mz6	10.37	52.60	0.00	52.60	0	487 Powerful Owl	53.33	3.00	487
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_Medium	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_Medium	Yes	mz6aEasernmt	1.44	52.60	14.59	38.02	0	52 Powerful Owl	6.66	3.00	52
MineAndPipe MajPr	30.00	CW291_Mo derateGoo d_Medium	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	ModerateGoo d_Medium	Yes	mz6bPipe	0.19	0.00	0.00	0.00	0	1 Powerful Owl	0.00	3.00	0

Assessment circle name	Landsc ape score	Vegetation zone name	Vegetation type name	Condition	Red flag status	Management zone name	Management zone area	Current site value	Future site value	Loss in site value	Credit required for bio diversity	Credit required for TS	TS with highest credit requirement	Average species loss	Species TG Value	Final credit requirement for management zone
MineAndPipe MajPr	30.00	CW291_Moderate/Good_Poor	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Good_Poor	Yes	mz7	16.81	34.20	0.52	33.88	0	551	Powerful Owl	46.66	3.00	551
MineAndPipe MajPr	30.00	CW291_Moderate/Good_Poor	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Good_Poor	Yes	mz7Easemnt	2.00	34.20	3.65	30.55	0	61	Powerful Owl	6.66	3.00	61
MineAndPipe MajPr	30.00	CW293_Moderate/Good_High	Inland Scribbly Gum grassy open forest on hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Good_High	Yes	mz8	56.65	84.38	0.00	84.38	0	4,010	Powerful Owl	93.33	3.00	4,010
MineAndPipe MajPr	30.00	CW242_Moderate/Good_High	Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes	Moderate/Good_High	Yes	mz9Easemnt	1.04	51.04	9.90	41.14	0	40	Powerful Owl	60.00	3.00	40
MineAndPipe MajPr	30.00	CW270_Moderate/Good_High	Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion	Moderate/Good_High	Yes	mz10	0.77	69.27	0.00	69.27	0	46	Powerful Owl	93.33	3.00	46
MineAndPipe MajPr	30.00	CW216_Moderate/Good_Medium	White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	Moderate/Good_Medium	Yes	MZ11	1.24	36.00	5.33	30.67	38	38	Masked Owl	27.78	3.00	38
MineAndPipe MajPr	30.00	CW249_Moderate/Good_Derived grassland	Derived grassland of the NSW South Western Slopes	Moderate/Good_Derived grassland	Yes	MZ12_DGL	5.18	66.67	9.52	57.15	0	202	Yellowbellied Shearwater	0.00	2.20	202
MineAndPipe MajPr	30.00	CW272_Moderate/Good_Medium	Narrow-leaved Ironbark - Black Cypress Pine + Black Cypress Pine shrubby open forest on sandstone low hills in the southern English Belt South Bioregion (Including Coonoo)	Moderate/Good_Medium	Yes	MZ13	0.65	76.56	9.38	67.18	0	38	Powerful Owl	33.34	3.00	38
MineAndPipe MajPr	30.00	CW289_Moderate/Good_Medium	Rough-barked Apple - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region	Moderate/Good_Medium	Yes	MZ14	0.76	48.44	1.04	47.40	0	33	Powerful Owl	46.67	3.00	33

BioBanking Credit Calculator

Species credits



Proposal ID : 0143/2019/4954MP
 Proposal name : Bowdens Devel Incl Pipe April2020 MajPr
 Assessor name : Steve Sass
 Assessor accreditation number : 0143
 Tool version : v4.0
 Report created : 11/05/2020 07:32

Scientific name	Common name	Species TG value	Identified population?	Can Id. popn. be offset?	Area / number of loss	Negligible loss	Red flag status	Number of credits
Anthochaera phrygia	Regent Honeyeater	7.70	No		375.33	0.00	No	28,900
Petaurus norfolcensis	Squirrel Glider	2.20	No		181.99	0.00	No	4,004
Phascogale carolinensis	Koala	2.60	No		138.66	0.00	No	3,605
Acacia ausfeldii	Ausfeld's Wattle	7.70	No		120.00	0.00	Yes	9,240

Annexure 3

Credit Profiles (Development Site)

(Total No. of pages including blank pages = 30)

Note: This Annexure is only available on the digital version of this document

This page has intentionally been left blank

Biodiversity credit report



This report identifies the number and type of biodiversity credits required for a major project.

Date of report: 11/05/2020

Time: 7:30:46AM

Calculator version: v4.0

Major Project details

Proposal ID:	0143/2019/4954MP
Proposal name:	Bowdens Devel Incl Pipe April2020 MajPr
Proposal address:	Bowdens Silver Limited 68 Maloneys Road Lue NSW 2850
Proponent name:	Bowdens Silver Limited
Proponent address:	68 Maloneys Road LUE NSW 2850
Proponent phone:	(02) 6373 6420
Assessor name:	Steve Sass
Assessor address:	PO Box 7231 Tathra NSW 2550
Assessor phone:	02 6494 5422
Assessor accreditation:	0143

Summary of ecosystem credits required

Plant Community type	Area (ha)	Credits created
Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	21.80	1,168.48
Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes	1.04	40.00
Derived grassland of the NSW South Western Slopes	5.18	202.00
Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes	56.65	4,010.00
Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion	0.77	46.00
Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo)	0.65	38.00
Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	111.77	6,058.00
Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region	0.76	33.00
Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	158.96	9,970.46
White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion	1.24	38.00
White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	21.68	1,340.00
Total	380.50	22,944

Credit profiles

1. Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, (CW111)

Number of ecosystem credits created 9,970
 IBRA sub-region Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion, (CW111)</p> <p>Apple Box - Blakely's Red Gum moist valley and footslopes grass-forb open forest of the NSW South Western Slopes Bioregion, (CW103)</p> <p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)</p> <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)</p> <p>Fuzzy Box woodland on colluvium and alluvial flats in the Brigalow Belt South Bioregion (including Pilliga) and Nandewar Bioregion, (CW139)</p> <p>Blakely's Red Gum - White Box - Yellow Box - Black Cypress Pine box grass/shrub woodland on clay loam soils on undulating hills of central NSW South Western Slopes Bioregion, (CW209)</p> <p>White Box - Rough-barked Apple alluvial woodland of the NSW central western slopes including in the Mudgee region, (CW211)</p> <p>White Box - White Cypress Pine - Western Grey Box shrub/grass/forb woodland in the NSW South Western Slopes Bioregion, (CW213)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW215)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)</p> <p>Yellow Box - Blakely's Red Gum grassy woodland of the Nandewar Bioregion, (CW225)</p> <p>Yellow Box grassy tall woodland on alluvium or parna loams and clays on flats in NSW South Western Slopes Bioregion, (CW226)</p> <p>Apple Box - Rough-barked Apple terrace flats woodland of the southern Brigalow Belt South Bioregion, (CW231)</p> <p>White Box - Blakely's Red Gum - Long-leaved Box - Nortons Box - Red Stringybark grass-shrub woodland on shallow soils on hills in the NSW South Western Slopes Bioregion, (CW320)</p> <p>Riparian Blakely's Red Gum - box - shrub - sedge - grass tall open forest of the central NSW South Western Slopes Bioregion, (CW295)</p> <p>Red Stringybark - Blakely's Red Gum +/- Long-leaved Box shrub/grass hill woodland of the NSW South Western Slopes Bioregion, (CW285)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (CW280)</p> <p>Yellow Box grassy woodland on lower hillslopes and valley flats in the southern NSW Brigalow Belt South Bioregion, (CW330)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

2. Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)

Number of ecosystem credits created	1,168
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)</p> <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW215)</p> <p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (CW280)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

3. White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)

Number of ecosystem credits created	38
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>White Box grassy woodland in the upper slopes sub-region of the NSW South Western Slopes Bioregion, (CW216)</p> <p>Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion, (CW112)</p> <p>Fuzzy Box Woodland on alluvial brown loam soils mainly in the NSW South Western Slopes Bioregion, (CW138)</p> <p>White Box grassy woodland of the Nandewar Bioregion and Brigalow Belt South Bioregion, (CW215)</p> <p>Red Box - White Box +/- Red Stringybark hill woodland in the NSW South Western Slopes Bioregion, (CW280)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

4. White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)

Number of ecosystem credits created	1,340
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)</p> <p>Blue-leaved Ironbark heathy woodland of the southern part of the Brigalow Belt South Bioregion, (CW114)</p> <p>Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)</p> <p>Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, (CW149)</p> <p>Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion, (CW155)</p> <p>Mugga Ironbark - Buloke - Pillga Box - White Cypress Pine shrubby woodland on sandstone in the Dubbo region, south-western Brigalow Belt South Bioregion, (CW157)</p> <p>Tumbledown Red Gum - Black Cypress Pine - Red Box low woodland of hills of the NSW South Western Slopes Bioregion, (CW202)</p> <p>Mugga Ironbark - Black Cypress Pine - Red Stringybark - Blakely's Red Gum - Red Ironbark woodland on hillslopes and in valleys on ranges in the NSW central western slopes, (CW268)</p> <p>Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW243)</p> <p>Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)</p> <p>Thyme Honey-myrtle - red gum - Mugga Ironbark shrubland / woodland in impeded drainage flats or depressions in the southern Brigalow Belt South Bioregion, (CW308)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

5. Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region, (CW299)

Number of ecosystem credits created

33

IBRA sub-region

Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
--	-----------------------------------

Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region, (CW299)

Black Cypress Pine - Narrow-leaved Stringybark heathy woodland of the southern Brigalow Belt South Bioregion, (CW107)

Black Cypress Pine shrubby woodland of the Brigalow Belt South Bioregion, (CW108)

Blue-leaved Ironbark heathy woodland of the southern part of the Brigalow Belt South Bioregion, (CW114)

Blue-leaved Ironbark woodland on sandy uplands and slopes of the Darling Riverine Plains Bioregion, (CW115)

Brown Bloodwood - cypress - ironbark heathy woodland in the Pilliga region of the Brigalow Belt South Bioregion, (CW120)

Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)

Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, (CW149)

Motherumbah (*Acacia cheelii*) woodlands on sandstones of the Brigalow Belt South Bioregion, (CW153)

Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion, (CW155)

Mugga Ironbark - Inland Grey Box shrubby woodland of the Brigalow Belt South Bioregion, (CW156)

Mugga Ironbark - Buloke - Pilliga Box - White Cypress Pine shrubby woodland on sandstone in the Dubbo region, south-western Brigalow Belt South Bioregion, (CW157)

Narrow-leaved Ironbark shrubby woodland of the Brigalow Belt South bioregion, (CW160)

Scribbly Gum - Brown Bloodwood woodland on volcanic slopes of the southern Brigalow Belt South Bioregion, (CW186)

Tumbledown Red Gum - Black Cypress Pine - Currawang woodland of ridges and rocky hills mainly of the Cobar Peneplain Bioregion, (CW201)

Tumbledown Red Gum - Black Cypress Pine - Red Box low woodland of hills of the NSW South Western Slopes Bioregion, (CW202)

White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes, (CW212)

White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)

Red Stringybark - Long-leaved Box - Black Cypress Pine shrub/grass woodland on siliceous sedimentary ranges in the upper NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion, (CW288)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest on mainly sandstone ranges in the NSW central western slopes, (CW261)

Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion, (CW291)

Capertee

and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Mugga Ironbark - Black Cypress Pine - Red Stringybark - Blakely's Red Gum - Red Ironbark woodland on hillslopes and in valleys on ranges in the NSW central western slopes, (CW268)

Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW243)

Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)

Narrow-leaved Ironbark - White Cypress Pine - Buloke tall open forest on lower slopes and flats in the Pilliga Scrub and surrounding forests in the central north Brigalow Belt South Bioregion, (CW273)

Dapper Mugga Ironbark - Western Grey Box - Blakely's Red Gum - Black Cypress Pine grass shrub hill woodland (southern Brigalow Belt South Bioregion), (CW271)

White Mallee - Dwyer's Red Gum mallee heath on sands in the Goonoo - Pilliga region, Brigalow Belt South Bioregion, (CW327)

Red Stringybark - Rough-barked Apple +/- Nortons Box open forest on hillslopes in the Warrumbungle NP - Coolah regions, (CW290)

Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion, (CW289)

Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo), (CW272)

White Cypress Pine - Narrow-leaved Ironbark - Buloke grassy open forest of the Dubbo region, southern Brigalow Belt South Bioregion, (CW326)

Mugga Ironbark - Narrow-leaved Ironbark - Buloke - Black Cypress Pine shrub grass open forest in the Goonoo forests and surrounding region, southern Brigalow Belt South Bioregion, (CW269)

Thyme Honey-myrtle - red gum - Mugga Ironbark shrubland / woodland in impeded drainage flats or depressions in the southern Brigalow Belt South Bioregion, (CW308)

Red gum - Rough-barked Apple - Narrow-leaved Ironbark - cypress pine grassy open forest on flats and drainage lines in the Goonoo and surrounding forests, southern Brigalow Belt South Bioregion, (CW281)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, (CW260)

Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion, (CW282)

Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bio, (CW275)

6. Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo), (CW272)

Number of ecosystem credits created	38
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions

Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo), (CW272)

Black Cypress Pine - Narrow-leaved Stringybark heathy woodland of the southern Brigalow Belt South Bioregion, (CW107)

Black Cypress Pine shrubby woodland of the Brigalow Belt South Bioregion, (CW108)

Blue-leaved Ironbark heathy woodland of the southern part of the Brigalow Belt South Bioregion, (CW114)

Blue-leaved Ironbark woodland on sandy uplands and slopes of the Darling Riverine Plains Bioregion, (CW115)

Brown Bloodwood - cypress - ironbark heathy woodland in the Pilliga region of the Brigalow Belt South Bioregion, (CW120)

Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)

Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, (CW149)

Motherumbah (*Acacia cheelii*) woodlands on sandstones of the Brigalow Belt South Bioregion, (CW153)

Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion, (CW155)

Mugga Ironbark - Inland Grey Box shrubby woodland of the Brigalow Belt South Bioregion, (CW156)

Mugga Ironbark - Buloke - Pilliga Box - White Cypress Pine shrubby woodland on sandstone in the Dubbo region, south-western Brigalow Belt South Bioregion, (CW157)

Narrow-leaved Ironbark shrubby woodland of the Brigalow Belt South bioregion, (CW160)

Scribbly Gum - Brown Bloodwood woodland on volcanic slopes of the southern Brigalow Belt South Bioregion, (CW186)

Tumbledown Red Gum - Black Cypress Pine - Currawang woodland of ridges and rocky hills mainly of the Cobar Penepplain Bioregion, (CW201)

Tumbledown Red Gum - Black Cypress Pine - Red Box low woodland of hills of the NSW South Western Slopes Bioregion, (CW202)

White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes, (CW212)

White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)

Red Stringybark - Long-leaved Box - Black Cypress Pine shrub/grass woodland on siliceous sedimentary ranges in the upper NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion, (CW288)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest on mainly sandstone ranges in the NSW central western slopes, (CW261)

Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion, (CW291)

Capertee

and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Mugga Ironbark - Black Cypress Pine - Red Stringybark - Blakely's Red Gum - Red Ironbark woodland on hillslopes and in valleys on ranges in the NSW central western slopes, (CW268)

Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW243)

Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)

Narrow-leaved Ironbark - White Cypress Pine - Buloke tall open forest on lower slopes and flats in the Pilliga Scrub and surrounding forests in the central north Brigalow Belt South Bioregion, (CW273)

Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region, (CW299)

Dapper Mugga Ironbark - Western Grey Box - Blakely's Red Gum - Black Cypress Pine grass shrub hill woodland (southern Brigalow Belt South Bioregion), (CW271)

White Mallee - Dwyer's Red Gum mallee heath on sands in the Goonoo - Pilliga region, Brigalow Belt South Bioregion, (CW327)

Red Stringybark - Rough-barked Apple +/- Nortons Box open forest on hillslopes in the Warrumbungle NP - Coolah regions, (CW290)

Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion, (CW289)

White Cypress Pine - Narrow-leaved Ironbark - Buloke grassy open forest of the Dubbo region, southern Brigalow Belt South Bioregion, (CW326)

Mugga Ironbark - Narrow-leaved Ironbark - Buloke - Black Cypress Pine shrub grass open forest in the Goonoo forests and surrounding region, southern Brigalow Belt South Bioregion, (CW269)

Thyme Honey-myrtle - red gum - Mugga Ironbark shrubland / woodland in impeded drainage flats or depressions in the southern Brigalow Belt South Bioregion, (CW308)

Red gum - Rough-barked Apple - Narrow-leaved Ironbark - cypress pine grassy open forest on flats and drainage lines in the Goonoo and surrounding forests, southern Brigalow Belt South Bioregion, (CW281)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, (CW260)

Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion, (CW282)

Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bio, (CW275)

7. Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion, (CW291)

Number of ecosystem credits created	6,058
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions

Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion, (CW291)

Black Cypress Pine - Narrow-leaved Stringybark heathy woodland of the southern Brigalow Belt South Bioregion, (CW107)

Black Cypress Pine shrubby woodland of the Brigalow Belt South Bioregion, (CW108)

Blue-leaved Ironbark heathy woodland of the southern part of the Brigalow Belt South Bioregion, (CW114)

Blue-leaved Ironbark woodland on sandy uplands and slopes of the Darling Riverine Plains Bioregion, (CW115)

Brown Bloodwood - cypress - ironbark heathy woodland in the Pilliga region of the Brigalow Belt South Bioregion, (CW120)

Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)

Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, (CW149)

Motherumbah (*Acacia cheelii*) woodlands on sandstones of the Brigalow Belt South Bioregion, (CW153)

Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion, (CW155)

Mugga Ironbark - Inland Grey Box shrubby woodland of the Brigalow Belt South Bioregion, (CW156)

Mugga Ironbark - Buloke - Pilliga Box - White Cypress Pine shrubby woodland on sandstone in the Dubbo region, south-western Brigalow Belt South Bioregion, (CW157)

Narrow-leaved Ironbark shrubby woodland of the Brigalow Belt South bioregion, (CW160)

Scribbly Gum - Brown Bloodwood woodland on volcanic slopes of the southern Brigalow Belt South Bioregion, (CW186)

Tumbledown Red Gum - Black Cypress Pine - Currawang woodland of ridges and rocky hills mainly of the Cobar Peneplain Bioregion, (CW201)

Tumbledown Red Gum - Black Cypress Pine - Red Box low woodland of hills of the NSW South Western Slopes Bioregion, (CW202)

White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes, (CW212)

White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)

Red Stringybark - Long-leaved Box - Black Cypress Pine shrub/grass woodland on siliceous sedimentary ranges in the upper NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion, (CW288)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest on mainly sandstone ranges in the NSW central western slopes, (CW261)

Inland Scribbly Gum - Black Cypress Pine - Red Ironbark open forest of the NSW central western slopes, (CW259)

Capertee

and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Mugga Ironbark - Black Cypress Pine - Red Stringybark - Blakely's Red Gum - Red Ironbark woodland on hillslopes and in valleys on ranges in the NSW central western slopes, (CW268)

Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion, (CW292)

Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW243)

Red Stringybark - Long-leaved Box - Black Cypress Pine - grassy/shrubby low woodland on ranges, central NSW South Western Slopes Bioregion, (CW287)

Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)

Narrow-leaved Ironbark - White Cypress Pine - Buloke tall open forest on lower slopes and flats in the Pilliga Scrub and surrounding forests in the central north Brigalow Belt South Bioregion, (CW273)

Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region, (CW299)

Dapper Mugga Ironbark - Western Grey Box - Blakely's Red Gum - Black Cypress Pine grass shrub hill woodland (southern Brigalow Belt South Bioregion), (CW271)

White Mallee - Dwyer's Red Gum mallee heath on sands in the Goonoo - Pilliga region, Brigalow Belt South Bioregion, (CW327)

Red Stringybark - Rough-barked Apple +/- Nortons Box open forest on hillslopes in the Warrumbungle NP - Coolah regions, (CW290)

Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion, (CW289)

Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo), (CW272)

White Cypress Pine - Narrow-leaved Ironbark - Buloke grassy open forest of the Dubbo region, southern Brigalow Belt South Bioregion, (CW326)

Mugga Ironbark - Narrow-leaved Ironbark - Buloke - Black Cypress Pine shrub grass open forest in the Goonoo forests and surrounding region, southern Brigalow Belt South Bioregion, (CW269)

Dwyer's Red Gum - Black Cypress Pine - ironbark low woodland on sandstone hillcrests in the Dubbo - Gilgandra region, south-western Brigalow Belt South Bioregion, (CW255)

Thyme Honey-myrtle - red gum - Mugga Ironbark shrubland / woodland in impeded drainage flats or depressions in the southern Brigalow Belt South Bioregion, (CW308)

Red gum - Rough-barked Apple - Narrow-leaved Ironbark - cypress pine grassy open forest on flats and drainage lines in the Goonoo and surrounding forests, southern Brigalow Belt South Bioregion, (CW281)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, (CW260)

Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region,

southern Brigalow Belt South Bioregion, (CW282)	
Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- - Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bio, (CW275)	

8. Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes, (CW263)

Number of ecosystem credits created	4,010
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions

Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes, (CW263)

Black Cypress Pine - Narrow-leaved Stringybark heathy woodland of the southern Brigalow Belt South Bioregion, (CW107)

Black Cypress Pine shrubby woodland of the Brigalow Belt South Bioregion, (CW108)

Blue-leaved Ironbark heathy woodland of the southern part of the Brigalow Belt South Bioregion, (CW114)

Blue-leaved Ironbark woodland on sandy uplands and slopes of the Darling Riverine Plains Bioregion, (CW115)

Brown Bloodwood - cypress - ironbark heathy woodland in the Pilliga region of the Brigalow Belt South Bioregion, (CW120)

Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)

Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, (CW149)

Motherumbah (*Acacia cheelii*) woodlands on sandstones of the Brigalow Belt South Bioregion, (CW153)

Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion, (CW155)

Mugga Ironbark - Inland Grey Box shrubby woodland of the Brigalow Belt South Bioregion, (CW156)

Mugga Ironbark - Buloke - Pilliga Box - White Cypress Pine shrubby woodland on sandstone in the Dubbo region, south-western Brigalow Belt South Bioregion, (CW157)

Narrow-leaved Ironbark shrubby woodland of the Brigalow Belt South bioregion, (CW160)

Scribbly Gum - Brown Bloodwood woodland on volcanic slopes of the southern Brigalow Belt South Bioregion, (CW186)

Tumbledown Red Gum - Black Cypress Pine - Currawang woodland of ridges and rocky hills mainly of the Cobar Peneplain Bioregion, (CW201)

Tumbledown Red Gum - Black Cypress Pine - Red Box low woodland of hills of the NSW South Western Slopes Bioregion, (CW202)

White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes, (CW212)

White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)

Red Stringybark - Long-leaved Box - Black Cypress Pine shrub/grass woodland on siliceous sedimentary ranges in the upper NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion, (CW288)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest on mainly sandstone ranges in the NSW central western slopes, (CW261)

Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion, (CW291)

Capertee

and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes, (CW242)

Inland Scribbly Gum - Black Cypress Pine - Red Ironbark open forest of the NSW central western slopes, (CW259)

Mugga Ironbark - Black Cypress Pine - Red Stringybark - Blakely's Red Gum - Red Ironbark woodland on hillslopes and in valleys on ranges in the NSW central western slopes, (CW268)

Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion, (CW292)

Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW243)

Red Stringybark - Long-leaved Box - Black Cypress Pine - grassy/shrubby low woodland on ranges, central NSW South Western Slopes Bioregion, (CW287)

Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)

Inland Scribbly Gum - White Bloodwood - Red Stringybark - Black Cypress Pine shrubby sandstone woodland mainly of the Warrumbungle NP - Pilliga region in the Brigalow Belt South Bioregion, (CW262)

Narrow-leaved Ironbark - White Cypress Pine - Buloke tall open forest on lower slopes and flats in the Pilliga Scrub and surrounding forests in the central north Brigalow Belt South Bioregion, (CW273)

Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion, (CW238)

Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region, (CW299)

Dapper Mugga Ironbark - Western Grey Box - Blakely's Red Gum - Black Cypress Pine grass shrub hill woodland (southern Brigalow Belt South Bioregion), (CW271)

White Bloodwood - Red Ironbark - Black Cypress Pine shrubby sandstone woodland of the Pilliga Scrub and surrounding regions, (CW318)

White Mallee - Dwyer's Red Gum mallee heath on sands in the Goonoo - Pilliga region, Brigalow Belt South Bioregion, (CW327)

Black Cypress Pine - Narrow-leaved Ironbark - red gum +/- White Bloodwood shrubby open forest on hills of the southern Pilliga, Coonabarabran and Garawilla regions, Brigalow Belt South Bioregion, (CW235)

Red Stringybark - Rough-barked Apple +/- Nortons Box open forest on hillslopes in the Warrumbungle NP - Coolah regions, (CW290)

Spur-wing Wattle heath on sandstone substrates in the Goonoo - Pilliga forests, Brigalow Belt South Bioregion, (CW307)

Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion, (CW289)

Blue-leaved Ironbark - Black Cypress Pine shrubby sandstone open forest in the southern Brigalow Belt South Bioregion (including Goonoo), (CW241)

Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum

shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo), (CW272)

White Cypress Pine - Narrow-leaved Ironbark - Buloke grassy open forest of the Dubbo region, southern Brigalow Belt South Bioregion, (CW326)

Mugga Ironbark - Narrow-leaved Ironbark - Buloke - Black Cypress Pine shrub grass open forest in the Goonoo forests and surrounding region, southern Brigalow Belt South Bioregion, (CW269)

Dwyer's Red Gum - Black Cypress Pine - ironbark low woodland on sandstone hillcrests in the Dubbo - Gilgandra region, south-western Brigalow Belt South Bioregion, (CW255)

Thyme Honey-myrtle - red gum - Mugga Ironbark shrubland / woodland in impeded drainage flats or depressions in the southern Brigalow Belt South Bioregion, (CW308)

Red gum - Rough-barked Apple - Narrow-leaved Ironbark - cypress pine grassy open forest on flats and drainage lines in the Goonoo and surrounding forests, southern Brigalow Belt South Bioregion, (CW281)

Narrow-leaved Wattle low open forest / very tall shrubland on ridges in northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW276)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, (CW260)

Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion, (CW282)

Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bio, (CW275)

9. Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes, (CW242)

Number of ecosystem credits created	40
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions

Black Cypress Pine - Narrow-leaved Stringybark heathy woodland of the southern Brigalow Belt South Bioregion, (CW107)

Black Cypress Pine shrubby woodland of the Brigalow Belt South Bioregion, (CW108)

Blue-leaved Ironbark heathy woodland of the southern part of the Brigalow Belt South Bioregion, (CW114)

Blue-leaved Ironbark woodland on sandy uplands and slopes of the Darling Riverine Plains Bioregion, (CW115)

Brown Bloodwood - cypress - ironbark heathy woodland in the Pilliga region of the Brigalow Belt South Bioregion, (CW120)

Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)

Long-leaved Box - Red Box - Red Stringybark mixed open forest on hills and hillslopes in the NSW South Western Slopes Bioregion, (CW149)

Motherumbah (*Acacia cheelii*) woodlands on sandstones of the Brigalow Belt South Bioregion, (CW153)

Mugga Ironbark - Western Grey Box - cypress pine tall woodland on footslopes of low hills in the NSW South Western Slopes Bioregion, (CW155)

Mugga Ironbark - Inland Grey Box shrubby woodland of the Brigalow Belt South Bioregion, (CW156)

Mugga Ironbark - Buloke - Pillga Box - White Cypress Pine shrubby woodland on sandstone in the Dubbo region, south-western Brigalow Belt South Bioregion, (CW157)

Narrow-leaved Ironbark shrubby woodland of the Brigalow Belt South bioregion, (CW160)

Scribbly Gum - Brown Bloodwood woodland on volcanic slopes of the southern Brigalow Belt South Bioregion, (CW186)

Tumbledown Red Gum - Black Cypress Pine - Currawang woodland of ridges and rocky hills mainly of the Cobar Peneplain Bioregion, (CW201)

Tumbledown Red Gum - Black Cypress Pine - Red Box low woodland of hills of the NSW South Western Slopes Bioregion, (CW202)

White Box - Tumbledown Red Gum - Long-leaved Box shrub/grass woodland on fine-grained sediments of the upper Macquarie River gorge, NSW central western slopes, (CW212)

White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW, (CW217)

Red Stringybark - Long-leaved Box - Black Cypress Pine shrub/grass woodland on siliceous sedimentary ranges in the upper NSW South Western Slopes Bioregion and South Eastern Highlands Bioregion, (CW288)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine hillslope shrub-tussock grass open forest on mainly sandstone ranges in the NSW central western slopes, (CW261)

Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion, (CW291)

Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes, (CW263)

Capertee

and any IBRA subregion that adjoins the IBRA subregion in which the development occurs

Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes, (CW242)

Inland Scribbly Gum - Black Cypress Pine - Red Ironbark open forest of the NSW central western slopes, (CW259)

Mugga Ironbark - Black Cypress Pine - Red Stringybark - Blakely's Red Gum - Red Ironbark woodland on hillslopes and in valleys on ranges in the NSW central western slopes, (CW268)

Red Stringybark woodland on hillslopes, northern NSW South Western Slopes Bioregion, (CW292)

Bottlebrush riparian shrubland wetland of the northern NSW South Western Slopes Bioregion and southern Brigalow Belt South Bioregion, (CW243)

Red Stringybark - Long-leaved Box - Black Cypress Pine - grassy/shrubby low woodland on ranges, central NSW South Western Slopes Bioregion, (CW287)

Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)

Inland Scribbly Gum - White Bloodwood - Red Stringybark - Black Cypress Pine shrubby sandstone woodland mainly of the Warrumbungle NP - Pilliga region in the Brigalow Belt South Bioregion, (CW262)

Narrow-leaved Ironbark - White Cypress Pine - Buloke tall open forest on lower slopes and flats in the Pilliga Scrub and surrounding forests in the central north Brigalow Belt South Bioregion, (CW273)

Red gum - Rough-barked Apple +/- tea tree sandy creek woodland (wetland) in the Pilliga - Goonoo sandstone forests, Brigalow Belt South Bioregion, (CW238)

Rough-barked Apple - Blakely's Red Gum - Black Cypress Pine woodland on sandy flats, mainly in the Pilliga Scrub region, (CW299)

Dapper Mugga Ironbark - Western Grey Box - Blakely's Red Gum - Black Cypress Pine grass shrub hill woodland (southern Brigalow Belt South Bioregion), (CW271)

White Bloodwood - Red Ironbark - Black Cypress Pine shrubby sandstone woodland of the Pilliga Scrub and surrounding regions, (CW318)

White Mallee - Dwyer's Red Gum mallee heath on sands in the Goonoo - Pilliga region, Brigalow Belt South Bioregion, (CW327)

Black Cypress Pine - Narrow-leaved Ironbark - red gum +/- White Bloodwood shrubby open forest on hills of the southern Pilliga, Coonabarabran and Garawilla regions, Brigalow Belt South Bioregion, (CW235)

Red Stringybark - Rough-barked Apple +/- Nortons Box open forest on hillslopes in the Warrumbungle NP - Coolah regions, (CW290)

Spur-wing Wattle heath on sandstone substrates in the Goonoo - Pilliga forests, Brigalow Belt South Bioregion, (CW307)

Red Stringybark - Narrow-leaved Ironbark - Black Cypress Pine - hill red gum sandstone woodland of southern NSW Brigalow Belt South Bioregion, (CW289)

Blue-leaved Ironbark - Black Cypress Pine shrubby sandstone open forest in the southern Brigalow Belt South Bioregion (including Goonoo), (CW241)

Narrow-leaved Ironbark - Black Cypress Pine +/- Blakely's Red Gum

shrubby open forest on sandstone low hills in the southern Brigalow Belt South Bioregion (including Goonoo), (CW272)

White Cypress Pine - Narrow-leaved Ironbark - Buloke grassy open forest of the Dubbo region, southern Brigalow Belt South Bioregion, (CW326)

Mugga Ironbark - Narrow-leaved Ironbark - Buloke - Black Cypress Pine shrub grass open forest in the Goonoo forests and surrounding region, southern Brigalow Belt South Bioregion, (CW269)

Dwyer's Red Gum - Black Cypress Pine - ironbark low woodland on sandstone hillcrests in the Dubbo - Gilgandra region, south-western Brigalow Belt South Bioregion, (CW255)

Thyme Honey-myrtle - red gum - Mugga Ironbark shrubland / woodland in impeded drainage flats or depressions in the southern Brigalow Belt South Bioregion, (CW308)

Red gum - Rough-barked Apple - Narrow-leaved Ironbark - cypress pine grassy open forest on flats and drainage lines in the Goonoo and surrounding forests, southern Brigalow Belt South Bioregion, (CW281)

Inland Scribbly Gum - Red Stringybark - Black Cypress Pine - Red Ironbark open forest on sandstone hills in the southern Brigalow Belt South Bioregion and northern NSW South Western Slopes Bioregion, (CW260)

Red Ironbark - Black Cypress Pine - stringybark +/- Narrow-leaved Wattle shrubby open forest on sandstone in the Gulgong - Mendooran region, southern Brigalow Belt South Bioregion, (CW282)

Narrow-leaved Ironbark- Black Cypress Pine - stringybark +/- Grey Gum +/- Narrow-leaved Wattle shrubby open forest on sandstone hills in the southern Brigalow Belt South Bioregion and Sydney Basin Bio, (CW275)

10. Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)

Number of ecosystem credits created	46
IBRA sub-region	Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Mugga Ironbark - Red Box - White Box - Black Cypress Pine tall woodland on rises and hills in the northern NSW South Western Slopes Bioregion, (CW270)</p> <p>Buloke - White Cypress Pine woodland in the NSW South Western Slopes Bioregion, (CW121)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

11. Derived grassland of the NSW South Western Slopes, (CW249)

Number of ecosystem credits created

202

IBRA sub-region

Capertee

Offset options - Plant Community types	Offset options - IBRA sub-regions
<p>Derived grassland of the NSW South Western Slopes, (CW249)</p> <p>Bluegrass - Redleg Grass - Common Woodruff clay plain grassland of northern Brigalow Belt South Bioregion, (CW113)</p> <p>Derived tussock grassland of the central western plains and lower slopes of NSW, (CW130)</p> <p>Derived tall spear grass grassland on mainly basalt hills of the Liverpool Plains, Liverpool Range and in the upper Hunter Valley (Merriwa district), south-eastern Brigalow Belt South Bioregion, (CW253)</p> <p>Derived Wire Grass grassland of the NSW Brigalow Belt South Bioregion and Nandewar Bioregion, (CW254)</p>	<p>Capertee</p> <p>and any IBRA subregion that adjoins the IBRA subregion in which the development occurs</p>

Summary of species credits required

Common name	Scientific name	Extent of impact Ha or individuals	Number of species credits created
Squirrel Glider	Petaurus norfolcensis	181.99	4,004
Regent Honeyeater	Anthochaera phrygia	375.33	28,900
Koala	Phascolarctos cinereus	138.66	3,605
Ausfeld's Wattle	Acacia ausfeldii	120.00	9,240

This page has intentionally been left blank

Annexure 4

Biodiversity Credit Report from the Biobanking Credit Calculator (Offset Sites)

(Total No. of pages including blank pages = 6)

This page has intentionally been left blank

BioBanking Credit Calculator

Ecosystem credits



Proposal ID : 171/2019/4990B
Proposal name : Bowdens Silver Project
Assessor name : Simon Tweed
Assessor accreditation number : 171
Tool version : v4.0
Report created : 04/02/2020 14:29

Assessment circle name	Landsc. age score	T/S subzone number	Vegetation zone name	Vegetation type name	Condition	Management zone name	Management zone area	Current site value	Future site value	Gain in site value	Total credit created for management zone
XXX	21.20	CW217_Mo derate/Goo d_Medium_1	CW217_Mo derate/Goo d_Medium	White Box shrubby open forest on fine grained sediments on steep slopes in the Mudgee region of the of central western slopes of NSW	Moderate/Goo d_Medium	mz2off	12.00	79.17	100.00	20.83	164
XXX	21.20	CW112_Mo derate/Goo d_Poor_1	CW112_Mo derate/Goo d_Poor	Blakely's Red Gum - Yellow Box grassy tall woodland of the NSW South Western Slopes Bioregion	Moderate/Goo d_Poor	mz2off	158.00	65.33	91.00	25.67	2,246
XXX	21.20	CW111_Mo derate/Goo d_Medium_1	CW111_Mo derate/Goo d_Medium	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/Goo d_Medium	mz2off	114.00	87.33	97.33	10.00	1,317
XXX	21.20	CW111_Mo derate/Goo d_Poor_1	CW111_Mo derate/Goo d_Poor	Rough-Barked Apple - red gum - Yellow Box woodland on alluvial clay to loam soils on valley flats in the northern NSW South Western Slopes Bioregion and Brigalow Belt South Bioregion	Moderate/Goo d_Poor	mz2off	91.00	59.33	91.00	31.67	1,362
XXX	21.20	CW291_Mo derate/Goo d_High_1	CW291_Mo derate/Goo d_High	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Goo d_High	mz5off	224.00	93.23	100.00	6.77	2,573
XXX	21.20	CW291_Mo derate/Goo d_Medium_1	CW291_Mo derate/Goo d_Medium	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Goo d_Medium	mz6off	18.00	71.35	88.54	17.19	241
XXX	21.20	CW291_Mo derate/Goo d_Poor_1	CW291_Mo derate/Goo d_Poor	Red Stringybark - Inland Scribbly Gum open forest on steep hills in the Mudgee - northern section of the NSW South Western Slopes Bioregion	Moderate/Goo d_Poor	mz7off	47.00	35.24	63.02	27.78	641
XXX	21.20	CW263_Mo derate/Goo d_High_1	CW263_Mo derate/Goo d_High	Inland Scribbly Gum grassy open forest on hills in the Mudgee Region, NSW central western slopes	Moderate/Goo d_High	mz8off	26.00	82.81	96.88	14.07	336

As on 4/02/2020

Page 1 of 3

Assessment circle name	Landsc ape score	TS subzone number	Vegetation zone name	Vegetation type name	Condition	Management zone name	Manage ment zone area	Current site value	Future site value	Gain in site value	Total credit created for management zone
XXX	21.20	CV242_Mo derate/Goo d_High_1	CV242_Mo derate/Goo d_High	Blue-leaved Stringybark open forest of the Mudgee region NSW central western slopes	Moderate/Goo d_High	msdoff	70.00	82.81	100.00	17.19	968

BioBanking Credit Calculator

Species credits



Proposal ID : 171/2019/4990B
Proposal name : Bowdens Silver Project
Assessor name : Simon Tweed
Assessor accreditation number : 171
Tool version : v4.0
Report created : 04/02/2020 14:29

Scientific name	Common name	Species TG value	Biobank on identified population?	Number Units found?	Number of credits
Petaurus norfolcensis	Squirrel Glider	2.20	No	363.00 ha	2,577
Phascogale cinerea	Koala	2.60	No	363.00 ha	2,577
Anthochaera phrygia	Regent Honeyeater	7.70	No	760.00 ha	5,396
Acacia ausfeldii	Ausfeld's Wattle	7.70	No	363.00 indiv	2,577

This page has intentionally been left blank