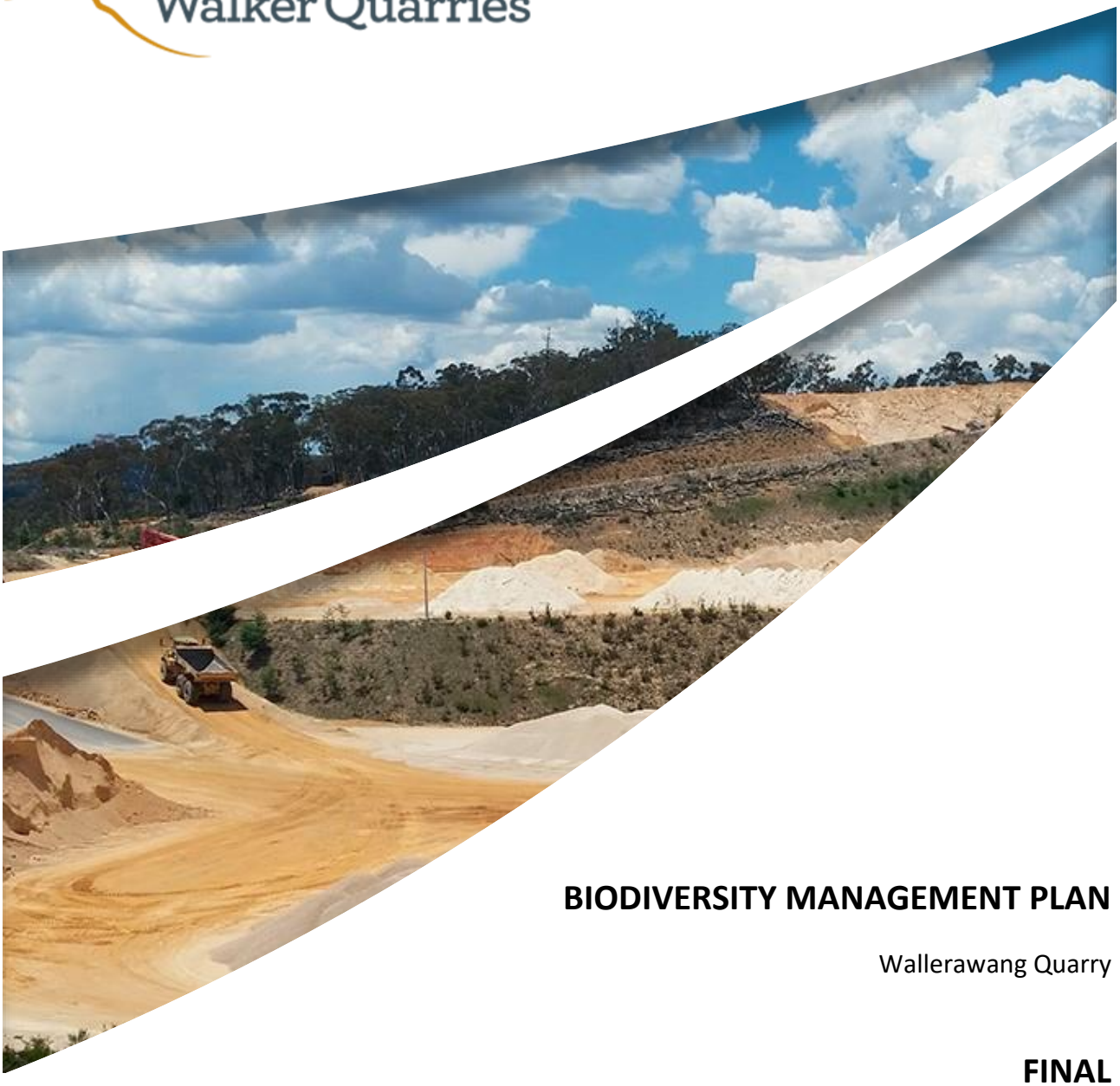
Walker Quarries



BIODIVERSITY MANAGEMENT PLAN

Wallerawang Quarry

FINAL

September 2020

umwelt
Environmental & Social Consultants

BIODIVERSITY MANAGEMENT PLAN

Wallerawang Quarry

FINAL

Prepared by
Umwelt (Australia) Pty Limited
on behalf of
Walker Quarries Pty Ltd

Project Director:	Alex Irwin
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Document Status

Rev No.	Reviewer		Approved for Issue	
	Name	Date	Name	Date
V0	Alex Irwin	22 February 2019	Alex Irwin	26 February 2019
V1	Alex Irwin	1 April 2019	Alex Irwin	3 April 2019
V1.1	Alex Irwin	4 April 2019	Alex Irwin	8 April 2019
V2.1	Alex Irwin	2 April 2020	Johann van der Merwe (Walker Quarries)	7 April 2020
V2.2	Alex Irwin	28 July 2020	David Murray (Walker Quarries)	29 July 2020
V2.3	Alex Irwin	23 September 2020	Johann van der Merwe (Walker Quarries)	24 September 2020

Note * V0 represents the first version of this plan prepared by Umwelt Pty Ltd. This follows from Rev 4 produced by RW Corkery & Co. Pty Limited.

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1.0 Scope

1.1 Purpose

This Biodiversity Management Plan (BDMP) for the Wallerawang Quarry (the Quarry) has been reviewed and updated by Umwelt (Australia) Pty Limited (Umwelt) on behalf of Walker Quarries Pty Ltd (Walker Quarries) in accordance with *Condition 26* of *Schedule 3* (hereafter conditions are identified as *Condition Schedule No. (Condition No.)*, e.g. *Condition 3(26)*) of Development Consent DA 344-11-2001 (DA 344-11-2001). The BDMP synthesises the recommendations made during the preparation of the various environmental assessments of the Quarry including:

- an *Environmental Impact Statement* (EIS) for development of the Quarry (Pacrim, 2001),
- an *Environmental Assessment* prepared to support an application for the first modification to DA 344-11-2001 (RWC, 2017),
- a Biodiversity Development Assessment Report (BDAR) prepared by Ecoplanning Pty Ltd (Ecoplanning, 2019b) and Statement of Environmental Effects (SoEE) prepared by Umwelt (Umwelt, 2019) to support an application for a third modification to DA 344-11-2001.

It has been prepared to guide the management of biodiversity values on the Quarry Site. Additional information concerning rehabilitation is provided in a Rehabilitation Management Plan prepared in accordance with *Condition 3(31)* of DA 344-11-2001.

The BDMP also provides for an updated Biodiversity Offset Strategy (BOS), as required by *Condition 3(24)* of DA 344-11-2001.

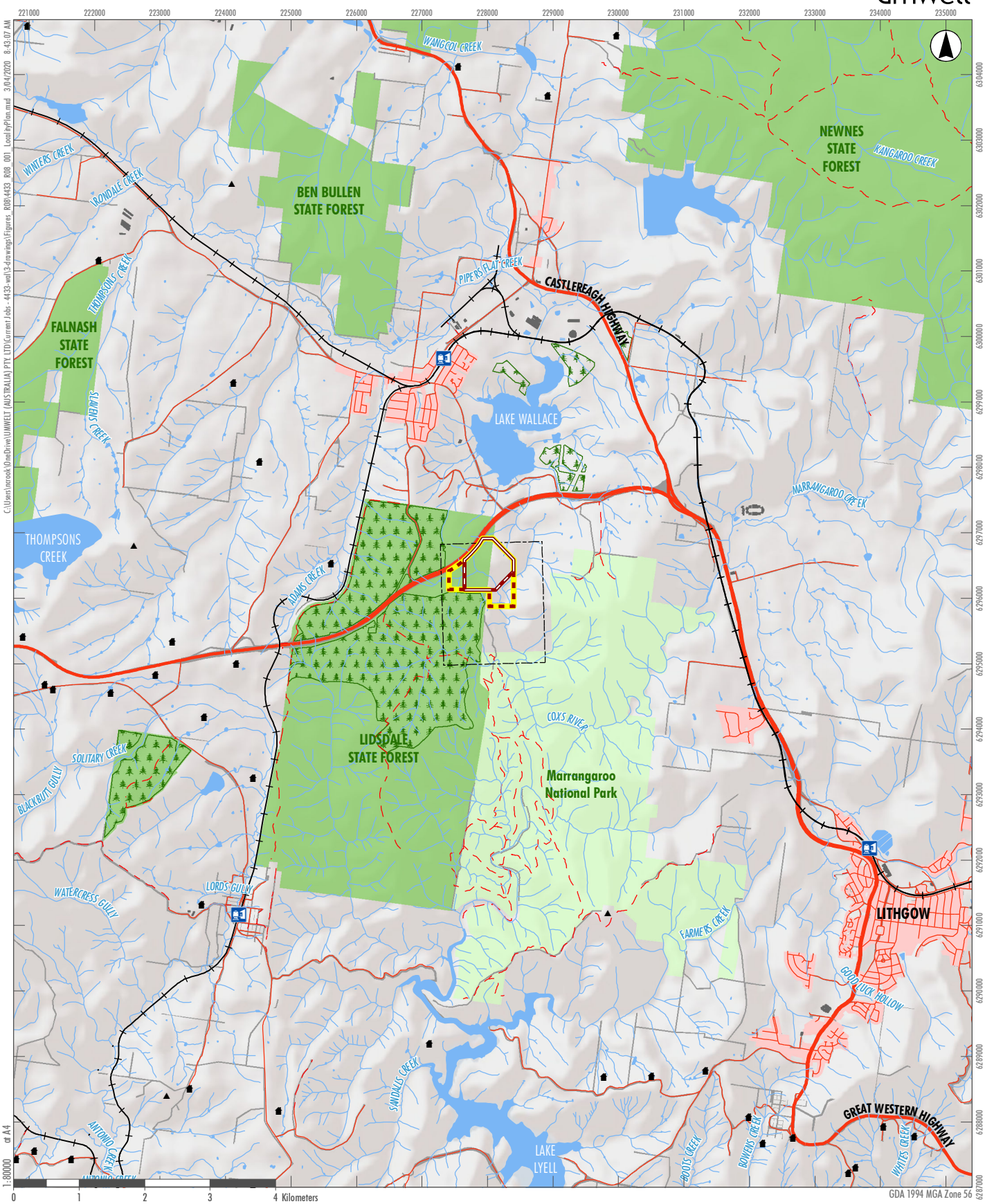
1.2 Quarry Operations

The Quarry is located approximately 8 kilometres (km) north-west of Lithgow (refer to **Figure 1.1**) and is operated in accordance with development consent DA 344-11-2001. DA 344-11-2001 was initially issued by the Minister for Infrastructure and Planning on 14 October 2004 and most recently modified on 26 February 2020. The Quarry Site, as approved by DA 344-11-2001, covers an area of 61.1 hectares (ha) and coincides with Mining Lease (ML) 1633 and proposed extensions (as applied for to the NSW Division of Resources & Geoscience (DRG) of the Department of Planning, Industry & Environment (DPIE) made on 19 June 2019).

Within the Quarry Site, DA 344-11-2001 approves disturbance up to a maximum of 28.6 ha for the purpose of quartzite and other hard rock extraction, processing, stockpiling, management and on-site disposal of non-saleable (overburden) materials, and ancillary infrastructure (refer to Figure 1.2). The Quarry is approved to produce 500 000 tonnes per year of hard rock aggregate material and sand.

Figure 1.2 displays the layout of the Quarry with operations undertaken as follows.

- Within the approved extraction area, vegetation is cleared and soil is stripped for use in rehabilitation activities.
    - Subject to the availability of areas to be rehabilitated, the cleared and stripped vegetation and soils will be selectively placed within areas being revegetated to take advantage of the existing seed bank.
    - If areas prepared for rehabilitation are not available, the vegetation and soil will be placed in stockpiles for future application to the final landform.

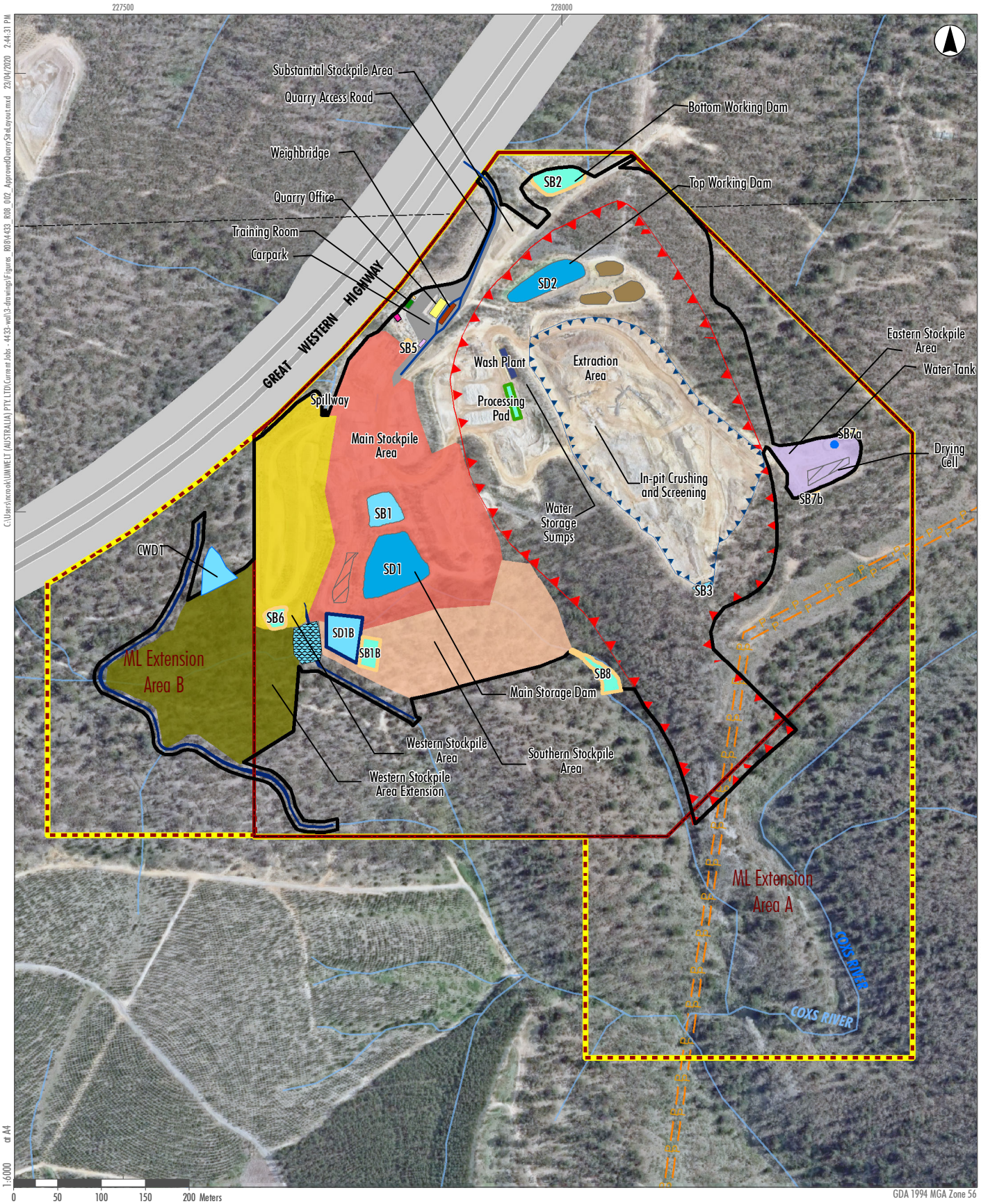


Legend

- Quarry Site Boundary
- Quarry Site ML Extension
- Quarry Site (ML1633)
- EL 4473
- State Forest
- NPWS Estate

FIGURE 1.1

Locality Plan



Legend

- Quarry Site Boundary
- Quarry Site (ML1633)
- Quarry Site ML Extension
- EL 4473
- Disturbed Areas for Modified Operations
- Approved Extraction Area
- Current Extent of Extraction Area
- Main Stockpile Area (935m AHD)
- Southern Stockpile Area (935m AHD)
- Western Stockpile Area
- Western Stockpile Extension (940m AHD)
- Eastern Stockpile Area
- Clean Water Diversion
- Sediment Basins
- Settlement Ponds
- Storage Dam
- Water Tank
- Rubbled Lined Drain
- Clean Water Dam
- Silt Cells
- P Electricity Transmission Lines

FIGURE 1.2

Approved Quarry Site Layout

Image Source: Nearmap (2020) Data source: Walker Quarries (2019); Umwelt (2019); NSW LPI DTDB (2019); CEH Survey (November 2016)

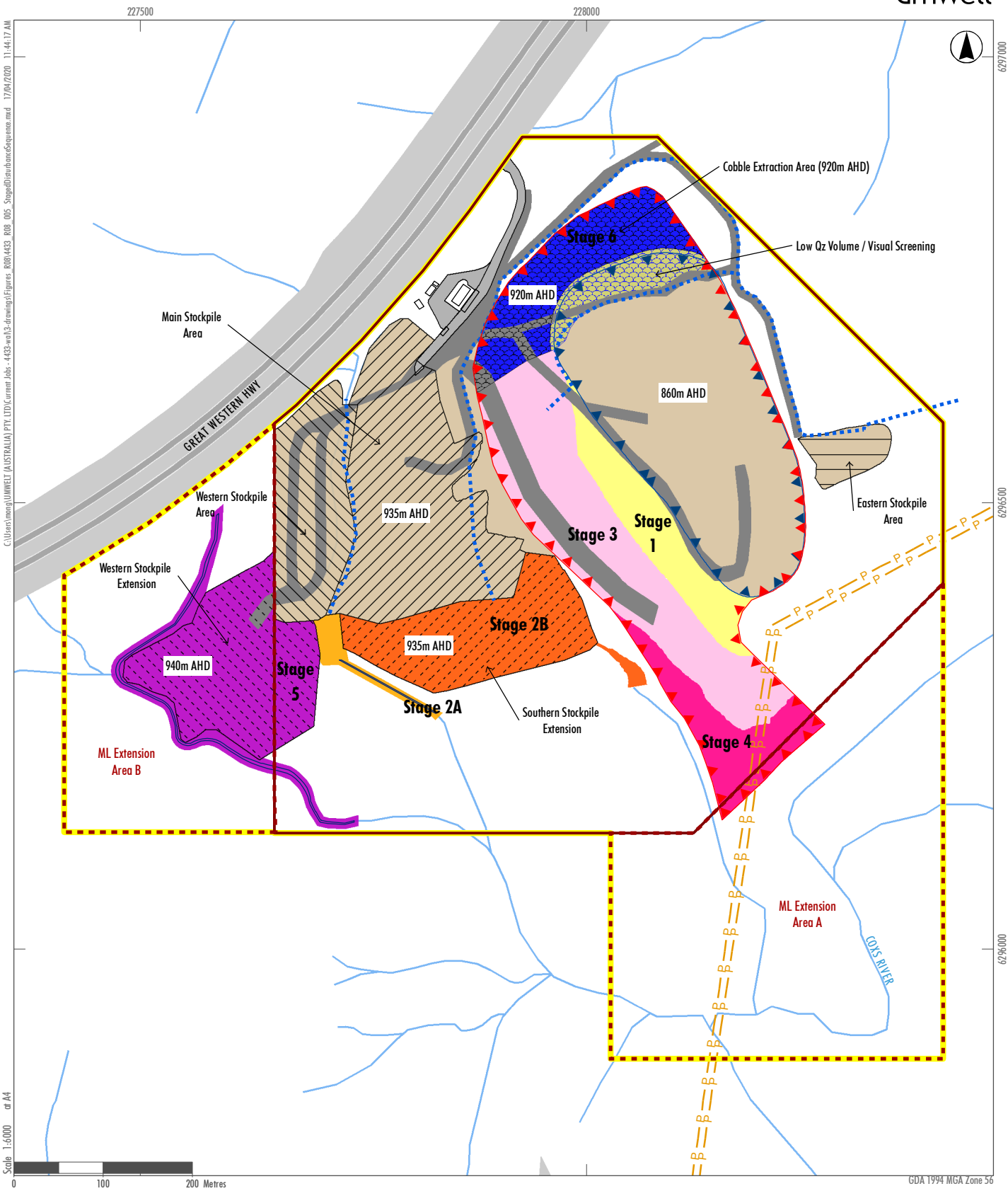
- Once exposed, the quartzite and other rock is extracted using conventional drill and blast, load and haul methods.
- Material with no saleable value, is either stockpiled temporarily within the footprint of the open cut before being used on-site for approved construction activities or used in the extension or lifting of the Quarry stockpile areas.
- The remaining rock is crushed and screened with smaller diameter aggregates and sand are transferred to a washing plant to produce sand and fine aggregate products.
- Quarry products are stockpiled separately according to material, size and application on the stockpile areas of the Quarry. The stockpile areas will potentially be extended over the life of the Quarry to accommodate increased production and disposal of non-saleable rock material.
- Quarry products are loaded to road registered trucks and despatched from the Quarry Site over a weighbridge and on to the Great Western Highway.
- Progressive rehabilitation of completed faces of the extraction area and other completed landforms will be undertaken in accordance with a Mining Operations Plan (which incorporates a Rehabilitation Management Plan required by *Condition 3(31)* of DA 344-11-2001)[1].

Potential impacts to flora and fauna within the Quarry Site relate principally to removal of native flora and fauna habitat, direct incidents caused by traffic within the Quarry Site and indirect impacts associated with artificial light, blasting, noise and dust impacts resulting from operations.

The disturbance associated with the extraction area and stockpile area extensions is proposed to increase over the life of the Quarry. It is noted that the maximum impact footprint may not be fully developed as DA 344-11-2001 currently limits the depth of extraction to 1 m above the groundwater table. Based on groundwater assessment completed by Jacobs Pty Ltd to support the most recent modification to DA 344-11-2001, the groundwater table is likely to vary between 875 m and 890 m across the extraction. This would limit the surface area required to develop the extraction area to this depth. This reduces the volume of non-saleable rock material which would be excavated from the extraction area and therefore reduces the area of stockpile extension required. Furthermore, Walker Quarries continues to seek additional markets for the non-quartzite rock extracted from the Quarry. As sales for the non-quartzite material increase, the requirement to extend the stockpiles areas for disposal of the material will reduce.

On the basis that the maximum impact footprint of the Quarry illustrated on **Figure 1.2** may not eventuate, and that the proposed disturbance is likely to occur in distinct stages over the life of the Quarry, the BDMP identifies four disturbance tranches nominated by Condition 3(28A) and Figure 2 of Appendix 1 of Da 344-11-2001). These tranches have been created by combining the disturbance stages nominated in the BDAR (Ecoplanning, 2019b) and SEE (Umwelt, 2019) which supported the most recent modification to DA 344-11-2001 (see **Figure 1.3** and **Table 1.1**).

[1] In accordance with Condition 31(d) of DA 344-11-2001, which requires the Rehabilitation Management Plan to be prepared in accordance with the relevant Resources Regulator guideline, the Rehabilitation Management Plan has been incorporated into the Quarry Mining Operations Plan [MOP] prepared in accordance with Resources Regulator Guideline ESG3 (Mining Operations Plan (MOP) Guidelines, September 2013).



Legend

- Quarry Site Boundary
- Quarry Site (ML1633)
- Quarry Site ML Extension Areas
- Watercourses
- Electricity Transmission Lines
- Site Infrastructure
- Sealed Internal Roads

Water Management Infrastructure

- Clean Water Diversion
- Buried Pipe Culvert
- Approved Extraction Area
- Main Stockpile Area (935m AHD)
- Southern Stockpile Area (935m AHD)
- Western Stockpile Area
- Western Stockpile Extension (940m AHD)
- Eastern Stockpile Area
- Cobble Extraction Area (920m AHD)
- Indicative Internal Roads

Quarry Extension Staging

- Stage 1 - Extraction Stage A
- Stage 2A - Flow Through Dam & Cleanwater Diversion
- Stage 2B - Southern Stockpile Extension & Sediment Basin
- Stage 3 - Extraction Stage B
- Stage 4 - Extraction Stage C
- Stage 5 - Western Stockpile Extension & Sediment Basin
- Stage 6 - Extraction Stage D (Cobble Extraction Area)
- Stage 6 - Extraction Stage D (Low Qz Volume & Visual Screening)
- Continued Operations

FIGURE 1.3

Staged Disturbance Sequence

Data source: Walker Quarries (2019) ; NSW LPI DTDB (2019); Umwelt (2020)

Table 1.1 Development (Disturbance Stages)

Tranche[1]	Stage[2]	Description	Area (ha)
A	1	The initial extension of the extraction area to the west, down to the 950 mAHD contour. This initial extension will target the outcropping quartzite and would allow for the immediate deepening of the quarry floor.	1.15
	3	Extension of the extraction area to the west (to the 920 mAHD contour).	2.91
B	2A	A diversion drain to allow for clean runoff from the Lidsdale State Forest to the west and Great Western highway to the north to be directed into a natural gully discharging into the Coxs River	0.4
	2B	Construction of the Southern Stockpile Area	3.05
	4	Extension of the extraction area to its southern and south-western perimeter, allowing for development of the Quarry down to the proposed maximum elevation of 860 m AHD.	1.2
C	5	Western Stockpile Extension would be prepared and constructed. A clean water drain would be constructed upstream to divert clean water from the second order drainage line originating within the Lidsdale State Forest to the south.	3.56
D	6	Northerly extension of the extraction area (also referred to as the Cobble Extraction Area) to recover the quartzite cobbles/pebbles which occur in seams within 5 to 20 m of the surface.	1.76

Notes: [1] As defined by Table 5A of Condition 3(28A) of DA 344-11-2001

[2] As identified by Ecoplanning (2019b) and Umwelt (2019)

1.3 Format

The BDMP has been prepared in 10 sections to address the requirements of *Condition 3(26)* of DA 34-11-2001 and the suggested contents provided by the *Guidelines for the Preparation of Biodiversity Management Plans for Major Projects* produced by (the former) NSW OEH as a draft in August 2014 (OEH, 2014a).

1.4 Document History

A Flora and Fauna Management Plan (FFMP) was originally prepared and submitted by Sitegoal Pty Ltd to the then Department of Planning & Environment (DPE – now DIPIE) (but not approved). Following an Independent Environmental Audit (IEA) completed in 2015, an updated FFMP was prepared by RW Corkery & Co Pty Limited (RWC) and approved by the Secretary of the DPE in September 2016.

Following the first modification to DA 344-11-2001, a BDMP was prepared to replace the FFMP (RWC, 2017) and this document has been reviewed and updated at regular intervals. This version of the BDMP (V2) was prepared following the approval of a MOD 3 to DA 344-11-2001 on 26 February 2020.

1.5 Legal and Other Regulatory Requirements

DA 344-11-2001 was modified on 26 February 2020 and updated the conditional requirement for a *Biodiversity Management Plan* (*Condition 3(26)*). DA 344-11-2001 includes several other conditions relevant to the management of biodiversity. **Table 1.2** identifies these conditions and identifies the section of this BDMP where each is addressed.

Table 1.2 Biodiversity Management Related Conditional Requirements of DA 344 – 11 – 2001

No	Condition	Section
Biodiversity Management Plan		
3(26)	The Applicant must prepare a BDMP for the development to the satisfaction of the Secretary. This plan must:	
	(a) be prepared by suitably qualified and experienced persons whose appointment has been endorsed by the Secretary;	App 1
	(b) be prepared in consultation with BCD;	1.7
	(c) be submitted to the Secretary within three months of providing a satisfactory BOS or by 31 March 2018, whichever is earlier;	NLA
	(d) describe the short, medium, and long term measures to be undertaken to manage the remnant vegetation and fauna habitat on the site;	4.0
	(e) include a detailed description of the measures described in paragraph (d) to be implemented over the next 3 years (to be updated for each 3-year period following initial approval of the plan) including the procedures to be implemented for:	
	○ maximising the salvage of environmental resources within the approved disturbance area, including tree hollows, vegetative and soil resources, for beneficial reuse in the enhancement of any biodiversity offset areas or site rehabilitation;	4.5
	○ restoring and enhancing the quality of native vegetation and fauna habitat in any biodiversity offset and rehabilitation areas through assisted natural regeneration, targeted vegetation establishment and the introduction of fauna habitat features;	4.6, 4.2, 4.5
	○ protecting vegetation and fauna habitat outside the approved disturbance area on-site;	4.4, 5.2
	○ minimising the impacts on native fauna, including undertaking pre-clearance surveys;	4.4.1
	○ ensuring minimal environmental consequences for threatened species, populations and habitats, including the Purple Copper Butterfly;	4.9
	○ collecting and propagating seed;	4.6
	○ controlling weeds and feral pests;	4.7
	○ controlling erosion; and	0
	○ managing bushfire risk;	4.10
	(f) include a program to monitor and report on the effectiveness of these measures, and progress against the performance and completion criteria;	6.0
	(g) identify the potential risks to the successful implementation of the BOS, and include a description of the contingency measures to be implemented to mitigate these risks; and	7.0
	(h) include details of who is responsible for monitoring, reviewing, and implementing the plan.	10.0
	The Applicant must implement the BDMP as approved from time to time by the Secretary.	
Management Plan Requirements		
5(3)	Management plans required under this consent must be prepared in accordance with relevant guidelines, and include: (a) a summary of relevant background or baseline data;	2.0
	(b) details of:	1.5

No	Condition	Section
	○ the relevant statutory requirements (including any relevant approval, licence or lease conditions);	
	○ any relevant limits or performance measures and criteria; and	4.0
	○ the specific performance indicators that are proposed to be used to judge the performance of, or guide the implementation of, the development or any management measures;	4.0
	(c) any relevant commitments or recommendations identified in the document/s listed in condition 2(c) of Schedule 2;	4.0, 5.0 & 6.0
	(d) a description of the measures to be implemented to comply with the relevant statutory requirements, limits, or performance measures and criteria;	4.0
	(e) a program to monitor and report on the: ○ impacts and environmental performance of the development; and ○ effectiveness of the management measures set out pursuant to condition 2(c) of Schedule 2;	5.0, 6.0
	(f) contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant impact assessment criteria as quickly as possible;	5.4
	(g) a program to investigate and implement ways to improve the environmental performance of the development over time;	7.0
	(h) a protocol for managing and reporting any: ○ incident, non-compliance or exceedance of the impact assessment criteria or performance criteria; ○ complaint; or ○ failure to comply with statutory requirements;	8.0
	(i) public sources of information and data to assist stakeholders in understanding environmental impacts of the development; and	9.0
	(j) a protocol for periodic review of the plan.	10.3
5(4)	The Applicant must continue to apply existing approved management plans, strategies or monitoring programs that have most recently been approved under this consent, until the approval of a similar plan, strategy or program under this consent.	10.0
5(5)	Within 3 months of the submission of an: (a) incident report under condition 9 below; (b) Annual Review under condition 11 below; (c) audit report under condition 12 below; and (d) any modifications to this consent, the Applicant must review the strategies, plans and programs required under this consent, to the satisfaction of the Secretary. The applicant must notify the Department in writing of any such review being undertaken. Where this review leads to revisions in any such document, then within 6 weeks of the review the revised document must be submitted for the approval of the Secretary.	12.0, App 1

DA 344-11-2001 also includes several conditions relating to the offsetting of disturbance at the Quarry. While several of these relate to actions to requirements which have been previously addressed, they are presented in **Table 1.3** which with the section of the BDMP where each is discussed.

Table 1.3 Biodiversity Offsetting and Related Conditional Requirements of DA 344 – 11 – 2001

<table>
<tr><th>No</th><th>Condition</th><th>Section</th></tr>
<tr><td colspan="3">Biodiversity Offset Strategy</td></tr>
<tr><td>3(24)</td><td>By 28 February 2018, the Applicant must provide a BOS in accordance with the Framework for Biodiversity Assessment - NSW Biodiversity Offsets Policy for Major Projects, for the retirement of ecosystem and species credits as set out in Table 5, to the satisfaction of the Secretary and BCD.
Table 5: Biodiversity credits to be retired
<table><tr><th>Credit type</th><th>Number of Credits</th></tr><tr><td>Ecosystem Credits</td><td></td></tr><tr><td>PCT 732 – Broad-leaved Peppermint - Ribbon Gum grassy open forest in the north east of the South Eastern Highlands Bioregion</td><td>120</td></tr><tr><td>PCT 1093 – Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion</td><td>34</td></tr><tr><td>Species Credits</td><td></td></tr><tr><td>Purple Copper Butterfly</td><td>184</td></tr></table></td><td>5.1</td></tr>
<tr><td colspan="3">Security of Offsets</td></tr>
<tr><td>3(25)</td><td>By 31 December 2018, unless otherwise agreed with the Secretary, the Applicant must make suitable arrangements to provide appropriate long-term security for the BOS, to the satisfaction of the Secretary. Any mechanism must remain in force in perpetuity.
Note: Mechanisms to provide appropriate long-term security to the land within the BOS in accordance with the NSW Biodiversity Offset Policy for Major Projects 2014.</td><td>5.1</td></tr>
<tr><td colspan="3">Conservation Bond</td></tr>
<tr><td>3(27)</td><td>Within six months of the approval of the BOS, unless otherwise agreed by the Secretary, the Applicant must lodge a Conservation Bond with the Department to ensure that the BOS is implemented in accordance with the performance and completion criteria in the BDMP. The sum of the bond must be determined by:
(a) calculating the full cost of implementing the BOS at third party rates (other than land acquisition costs); and
(b) employing a suitably qualified, independent and experienced person to verify the calculated costs.
The calculation of the Conservation Bond must be submitted to the Department for approval at least 1 month prior to the lodgment of the bond.</td><td>5.1</td></tr>
<tr><td>3(28)</td><td>The Conservation Bond must be reviewed and if required, an updated bond must be lodged with the Department within 3 months following:
(a) an update or revision to the BDMP;
(b) the completion of an Independent Environmental Audit in which recommendations relating to the implementation of the BOS have been made; or
(c) in response to a request by the Secretary.
If the BOS is completed generally in accordance with the completion criteria in the BDMP to the satisfaction of the Secretary, the Secretary will release the bond.
If the BOS is not completed generally in accordance with the completion criteria in the BDMP, the Secretary will call in all, or part of, the conservation bond, and arrange for the completion of the relevant works.</td><td>5.1</td></tr>
<tr><td>3(28A)</td><td>The Applicant must retire biodiversity credits for Stages A to D of the development approved under MOD 3 (Figure 2 in Appendix 1) as specified in Table 5A below, prior to commencing vegetation clearing in that Stage. The retirement of credits must be carried out in consultation with BCD and in accordance with the Biodiversity Offsets Scheme of the BC Act, to the satisfaction of the BCT.</td><td>5.2</td></tr>
</table>

No	Condition	Section
	Table 5A: Biodiversity credit requirements **Credit Type** / **Credits Required** Ecosystem Credits Tranche 1 - Credits to be retired for Stage A PCT 1093 – 100 credits PCT 732 – 36 credits: 136 Tranche 2 - Credits to be retired for Stage B PCT 1093 – 64 credits PCT 732 – 103 credits: 167 Tranche 3 - Credits to be retired for Stage C PCT 1093 – 52 credits PCT 732 – 75 credits: 127 Tranche 4 - Credits to be retired for Stage D PCT 1093 – 57 credits: 57 Note: The stages referenced in Table 5A are shown in Figure 2 in **Appendix 1**.	

1.6 Objectives and Outcomes

Table 1.4 presents the objectives and key performance outcomes relating to flora and fauna management for the BDMP and the Quarry.

Table 1.4 Objectives and Key Performance Outcomes

Objectives	Key Performance Outcomes
To ensure compliance with all relevant Quarry approval conditions, statements of commitment and reasonable community expectations.	• Compliance with all relevant criteria and reasonable community expectations, as determined in consultation with the relevant government agencies.
To minimise and measure impact to biodiversity.	• Implementation of the biodiversity management and mitigation measures nominated in the BDMP. • Establishment of performance indicators and targets. • Achievement of performance targets or implementation corrective actions. • Actively manage threats to biodiversity through innovative land and natural resource management practices.
To avoid or minimise impacts on threatened flora or fauna, including but not limited to the Purple Copper Butterfly.	• Threatened species, or their habitat identified and described. • Measures implemented to minimise direct and/or indirect impacts. • Appropriate offsets implemented
To offset any unavoidable impacts on biodiversity	• Implementation of a BOS in accordance with the NSW Biodiversity Offsets Scheme.
To appropriately manage sections of the Quarry Site with remaining vegetation to achieve the approved final landform and land use.	• Operations managed in a manner that does not result in off-site impacts and ensures that the identified final landform and land use is established.
To implement appropriate corrective and preventative actions, if required.	• Corrective and preventative actions implemented, if required.
To implement an appropriate incident reporting program, if required.	• Incidents (if any) reported in an appropriate manner.

1.7 Consultation

1.7.1 Biodiversity & Conservation Division/NSW Office of Environment & Heritage

Condition 26(b) of Schedule 3 requires the BDMP to be prepared in consultation with the Biodiversity and Conservation Division (BCD) of DPIE. The role of the current BCD was previously taken by the NSW Office of Environment & Heritage (OEH). The consultation undertaken in the preparation of the BDMP, including relevant consultation undertaken in the preparation of the previous versions of the BDMP, is as follows. Key documents, including emails, referenced below can be reviewed as **Appendix 1**.

1.7.1.1 Original BDMP (V0) Consultation

On 20 October 2017, an email was sent to the OEH seeking feedback in relation to the content requirements of the Plan. OEH responded on 2 November 2017 and endorsed the requirements of *Condition 3(26)*.

Table 1.2 identifies where each of these requirements have been addressed in the BDMP.

OEH suggests the format of the BDMP should reference the *Draft Guidelines for the Preparation of Biodiversity Management Plans for Major Projects* (OEH, 2014) as this provides an overview of the information OEH consider relevant to a BDMP.

OEH made specific reference to the following matters:

- delineation of the site into appropriate management zones (refer to **Section 2.4**)
- development of an appropriate monitoring program (refer to **Section 5.0**)
- creation of Key Performance Indicators (KPIs) that link into that monitoring plan (refer to **Section 4.0**), and
- development of a TARP to ensure that the KPIs are met (refer to **Section 7.0**).

OEH also requested that where a management zone requires “active” management, e.g. revegetation, the KPIs should consider relevant timeframes such that the expected ecological trajectory can be monitored and relevant response actions can be implemented.

The BDMP was updated following Modification 2 of DA 344-11-2001, however, no consultation was undertaken at this time given the minor nature of the modification (12 month extension to operations).

1.7.1.2 BDMP V2 Consultation

Following review of the BDMP following the most recent modification to DA 344-11-2001, an email was sent to the BCD on 18 March 2020 requesting any requirements for the update of the NMP. On 23 March 2020, Mr David Geering, Senior Conservation Planning Officer, North West of the BCD responded by phone requesting the BDMP be provided for review. The preference of Walker Quarries to obtain inclusion requirements prior to drafting the modified Biodiversity Management Plan was expressed to Mr Geering and as a result an email was received from the BCD referring again to OEH (2014).

The BDMP was submitted via the NSW Major Projects Planning Portal on 9 April 2020 where it was understood it would be referred to the BCD. After not receiving any further feedback, a query regarding status of review was emailed to the BCD on 28 April 2020 regarding the status of review. On 29 April, an email was received from Mr Geering of BCD noting that an initial request to review the BMP had been withdrawn and as a consequence BCD had not reviewed.

On 6 May 2020, a copy of the BDMP was emailed to the BCD for review and on 22 May 2020 a response containing recommendations following this review was received. **Table 1.5** presents the recommendations of the BCD's 22 May 2020 correspondence and where these are addressed in the BDMP.

Table 1.5 BCD Recommendations (22 May 2020)

Recommendation		Comment	Section
1.1	**Quantitative performance measures, targets and trigger points for corrective action be developed**	Additional quantitative performance and completion criteria included in relation to weed management.	**4.7.2** (**Table 4.6**)
1.2	**A detailed monitoring plan to track performance towards completion criteria be developed**	Additional detail on monitoring of weeds against the updated performance and completion criteria of **Section 4.7.2** (**Table 4.6**) is provided.	**6.3.3**
1.3	**Trigger points in the TARP be quantifiable and relate to performance or completion criteria**	Additional and quantified triggers included in **Table 7.1** with reference to the updated performance and completion criteria of **Section 4.7.2** (**Table 4.6**).	**7.0** (**Table 7.1**)
2.1	**The BMP to reflect the Consolidated Consent Conditions in regards retirement of the approved credit requirement**	The MOD 3 biodiversity offset strategy has been revised to reflect the requirements of Condition 28A. Reference to the initial retirement of credits has been removed, however, sections on Application of the Biodiversity Offsets Scheme, Credit Obligations and Implementation Strategy have been retained with modifications to reflect the requirements of Condition 3(28A).	**5.2**

Following submission in May 2020, the BDMP was referred to the BCD for further review, comments and recommendations provided by the BCD were provided by the DPIE with a request to address these. The correspondence from the BCD is included in **Appendix 1**. **Table 1.6** summarises the recommendations made by BCD, how these have been addressed and the relevant section.

Table 1.6 BCD Recommendations (7 September 2020)

BCD Recommendation		Response	Section
1.1	**Standard plot-based floristic surveys consistent with the BAM should be used to determine condition of vegetation and to track performance of rehabilitation areas towards completion criteria.**	This recommendation is accepted and planning is underway to undertake BAM based vegetation monitoring as part of the next (Spring) monitoring campaign.	**6.3.2**
1.2	**Monitoring of weeds should occur across the entire quarry in order to identify and control weeds as required.**	The scope of annual monitoring of the Quarry Site has been extended to allow for further survey of weed species distribution and density across the Quarry Site.	**6.3.3**
2.1	**Proactive management in consultation with a species expert should be undertaken to maximise the potential for the Purple Copper Butterfly to recolonize suitable areas of the quarry.**	A commitment to identify and consult with a species expert is included as a management measure.	**4.9.2**

BCD Recommendation		Response	Section
2.2	**Known feed plants for adult Purple Copper Butterflies should be included into the seed mix for rehabilitation areas.**	This was already identified under Purple Copper Butterfly Management, however, also now included under Rehabilitation Management	**4.2.2 & 4.9.2**
2.3	**The potential to establish additional patches of Bursaria should be explored within the Conservation Biodiversity Management Areas.**	Walker Quarries has committed to desktop and field investigations as part of the next monitoring campaign to identify suitable areas for re-establishment of Bursaria. If identified, the BDMP will be updated, in consultation with BCD, to include a replanting / re-establishment schedule.	**4.9.2, 4.9.3 & 6.4.1**
2.4	**Additional monitoring sites for the Purple Copper Butterfly should be established on rehabilitation areas where Bursaria becomes established.**	This commitment is now included in the BDMP	**6.4.2**
3.1	**The terminology used in the BMP should be standardised to ensure clarity.**	All references have been standardised to refer to Tranches (relating to Condition 28A) or Stages if reference is to the original staging of the BDAR	Throughout but mainly **Section 5.0**
3.2	**Clarification of point 2c of Section 5.4.2 is required. Further assessment of the credit obligation of previously assessed areas is not appropriate.**	The Implementation Strategy has been simplified and reference to credit obligation review removed	**5.2.4**
3.3	**The inclusion of BCF payment figures is not required in the BMP as the cost of retiring credits via payment to the BCF is updated quarterly and therefore may change over time.**	Noted and removed	**Table 5.3**
4.1	**BCD is to be consulted in regards any recommendations made relating to changes to monitoring or management actions.**	Understood and agreed. Reference to this review by BCD has been included in the BDMP along with a commitment to consult with BCD prior to any future updates to the BDMP.	**1.7.3**

1.7.2 Department of Planning, Industry & Environment (DPIE)

The DPIE was queried as to the relevance of *Conditions 3(24)* and *3(25)* in a telephone conversation of 23 March 2020. While noting the specific offsetting requirements referenced in these conditions had been completed, the DPIE noted the conditional requirement for a biodiversity offset strategy remained by virtue of *Condition 5(5)* which requires any strategies, plans and programs required under this consent, to be reviewed and updated following modification to DA 344-11-2001.

In this same discussion, the utility of an updated BOS to allow for alternative biodiversity credit retirement to that of *Condition 3(28A)* was confirmed, subject to satisfying the requirements of the BCD and Biodiversity Conservation Trust (BCT) (with the BCT being the statutory authority responsible for the effective implementation of the NSW Biodiversity Offsets Scheme).

1.7.3 Future Consultation

Prior to any future updates to the BDMP, the BCD will be consulted and any comments and recommendations considered in the updated version of the BDMP.

2.0 Local Setting

2.1 Landscape Context

The Quarry Site is located on land dominated by remnant native vegetation which is bounded to the north and west by the Great Western Highway, to the south by Lidsdale State forest plantation timber and to the east by the Coxs River. The terrain is steeply sloping to the south and east towards the Coxs River. **Table 2.1** provides various regional and local landscape features of the Quarry Site.

Table 2.1 Landscape Context of the Quarry Site

Landscape feature	Occurrence
Interim Biogeographic Regionalisation for Australia (IBRA) region	South Eastern Highlands
IBRA sub regions	Hill End (Extraction Area, Southern Stockpile Area and Eastern Stockpile Area) Capertee Uplands (Quarry Office, Main Stockpile Area, Western Stockpile Area)
NSW (Mitchell) Landscapes (within 1,500 m)	Mount Horrible Plateau[1]/Capertee Plateau/Bathurst Granites
Rivers, streams and estuaries	Ephemeral tributaries of the Coxs River flow from Lidsdale State Forest to the west in an easterly than southerly direction.
Wetlands	No local or important wetlands area present within the study area.
Habitat connectivity	The vegetation of the Quarry Site is connected to the south to Marrangaroo National Park.

Note [1] For the purposes of impact assessment and biodiversity credit calculations, the Mount Horrible Plateau NSW Landscape (which makes up the majority of the Quarry Site) has been used

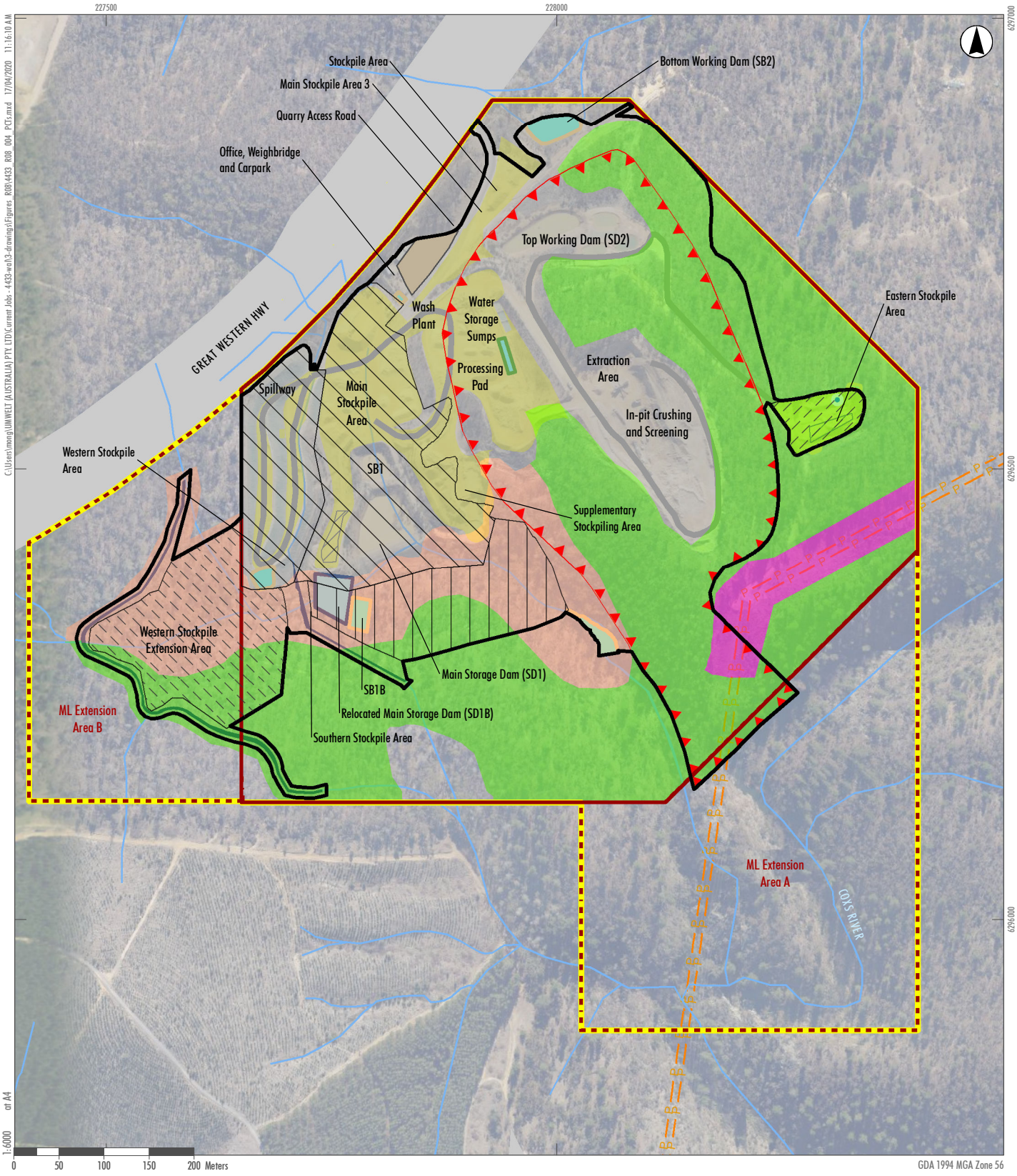
Source: Ecoplanning Pty Ltd (2019b)

2.2 Remnant Vegetation

The remnant vegetation of the Quarry Site and surrounds is presented on **Figure 2.1** as the following two Plant Community Types (PCTs).

- PCT 732 – Broad-leaved Peppermint Ribbon Gum grassy open forest in the north east of the South Eastern Highlands Bioregion.
- PCT 1093 – Red Stringybark Brittle Gum –Inland Scribbly Gum dry open forest of the tablelands South Eastern Highlands Bioregion.

Neither PCT is identified within the BioNet Vegetation Classification as Threatened Ecological Communities (TECs) (as listed under the *Biodiversity Conservation Act 2016*).



Legend

- Quarry Site Boundary
- Quarry Site (ML1633)
- Quarry Site ML Extension
- Approved Extraction Area
- Office, Weighbridge and Carpark
- Drying Cell
- Stockpile Area
- Haul Road
- Disturbed Areas for Modified Operations
- Watercourses
- P Electricity Transmission Lines
- Clean Water Diversion
- Sediment Basins
- Settlement Ponds
- Storage Dam
- Water Tank
- Rubbled Lined Drain
- Main Stockpile Area (935m AHD)
- Southern Stockpile Area (935m AHD)
- Western Stockpile Area
- Western Stockpile Extension (940m AHD)
- Eastern Stockpile Area

Plant Community Types (PCTs)

- 732 - Broad-leaved Peppermint Ribbon Gum grassy open forest in the north east of the South Eastern Highlands Bioregion, Intact
- 1093 - Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands South Eastern Highlands Bioregion, Intact
- 1093 - Red Stringybark - Brittle Gum - Inland Scribbly Gum dry open forest of the tablelands South Eastern Highlands Bioregion, Slash
- Other - cleared/disturbed vegetation

FIGURE 2.1

Plant Community Types of the Quarry Site

Image Source: ESRI World Imagery (2019) Data source: Walker Quarries (2019); Umwelt (2019); NSW LPI DTDB (2019); CEH Survey (November 2016)

2.3 Threatened Species

In accordance with the Biodiversity Assessment Methodology (BAM), a total of five flora and 18 fauna species credit species were identified as potentially occurring within the subject land[2] (Ecoplanning, 2019b)

Flora

- *Eucalyptus cannonii* (Capertee Stringybark)
- *Eucalyptus pulverulenta* (Silver-leafed Gum)
- *Grevillea divaricata*
- *Persoonia marginata* (Clandulla Geebung)
- *Veronica blakelyi*

Fauna

- Gang-gang cockatoo (*Callocephalon fimbriatum*) (breeding)[3]
- Glossy Black-Cockatoo (Breeding) (*Calyptorhynchus lathami*) (breeding)
- Eastern Pygmy-possum (*Cercartetus nanus*)
- Large-eared Pied Bat (*Chalinolobus dwyeri*)
- White-bellied Sea-Eagle (*Haliaeetus leucogaster*)
- Little Eagle (*Hieraaetus morphnoides*)
- Booroolong Frog (*Litoria booroolongensis*)
- Square-tailed Kite (*Lophoictinia isura*) (breeding)
- Barking Owl (*Ninox connivens*)
- Powerful Owl (*Ninox strenua*)
- Purple Copper Butterfly (*Paralucia spinifera*)[2]
- Squirrel Glider (*Petaurus norfolcensis*)
- Brush-tailed Phascogale (*Phascogale tapoatafa*)
- Koala (*Phascolarctos cinereus*) (breeding)[4]
- Masked Owl (*Tyto novaehollandiae*)

[2] It is noted this list includes additional species to those listed in the previous version of the BDMP. This reflects the adoption of the BAM for the most recent biodiversity assessment of the Quarry (Ecoplanning, 2019) compared to the Framework for Biodiversity Assessment used for previous biodiversity assessment.

[3] Has been identified on or adjacent to the Quarry Site.

[4] While Koala may occur locally due to the presence of the Ribbon Gum (*Eucalyptus viminalis*) which is a feed tree for the species, all field surveys have failed to identify a resident population of Koala or evidence of past habitation such as scats or scratches. In accordance with *State Environmental Planning Policy 44 – Koala Habitat Protection* the Quarry Site is therefore considered to be 'potential' Koala habitat but does not contain 'core' Koala habitat.

Of these, only the Purple Copper Butterfly has been identified on the Quarry Site. The Purple Copper Butterfly's life cycle[5] relies on a 'mutualistic' relationship with the ant, *Anonychomyrma itinerans* (CSIRO, 2002; Dexter & Kitching, 1991a). Monitoring for the presence of Purple Copper Butterfly and *Anonychomyrma itinerans* has been undertaken over the last four years (2016 – 2019) and despite the species being recorded at other locations within the locality, it has not been identified on the Quarry Site. As the Purple Copper Butterfly has a life-cycle with one generation completed annually, and neither the species nor attendant ant species has been detected by recent monitoring, it has been concluded by Ecoplanning (2019a) that the population(s) which once occurred within the Quarry, is likely to be locally extinct.

Other threatened species which have been identified on or adjoining the Quarry Site.

- Scarlet Robin (*Petroica boodang*): identified by Lesryk (2017a).
- Varied Sittella (*Daphoenositta chrysoptera*): identified by Lesryk (2016).
- Yellow-bellied Sheath-tail Bat (*Saccolaimus flaviventris*): identified by Wildthing (1999).

In each case, the Quarry Site has been identified as comprising only a minor portion of the range of each species with significant areas of equivalent habitat available in the immediate surrounds. Quarry operations have been assessed as unlikely to impact on the life cycle of each species as long as the habitat and fauna management measures described in **Section 4.0** are adhered to.

2.4 Biodiversity Management Areas

2.4.1 Introduction

The management of biodiversity within the Quarry Site has been divided into two Biodiversity Management Areas (BDMA):

- Impact BDMA: comprising the area of the Quarry Site which could be directly impacted by Quarry operations in accordance with DA 344-11-2001; and
- Conservation BDMA: comprising the area of the Quarry Site (excluding the powerline easement through Lot 6 DP872230 and Lot 7322 DP1149335) to remain undisturbed by the Quarry.

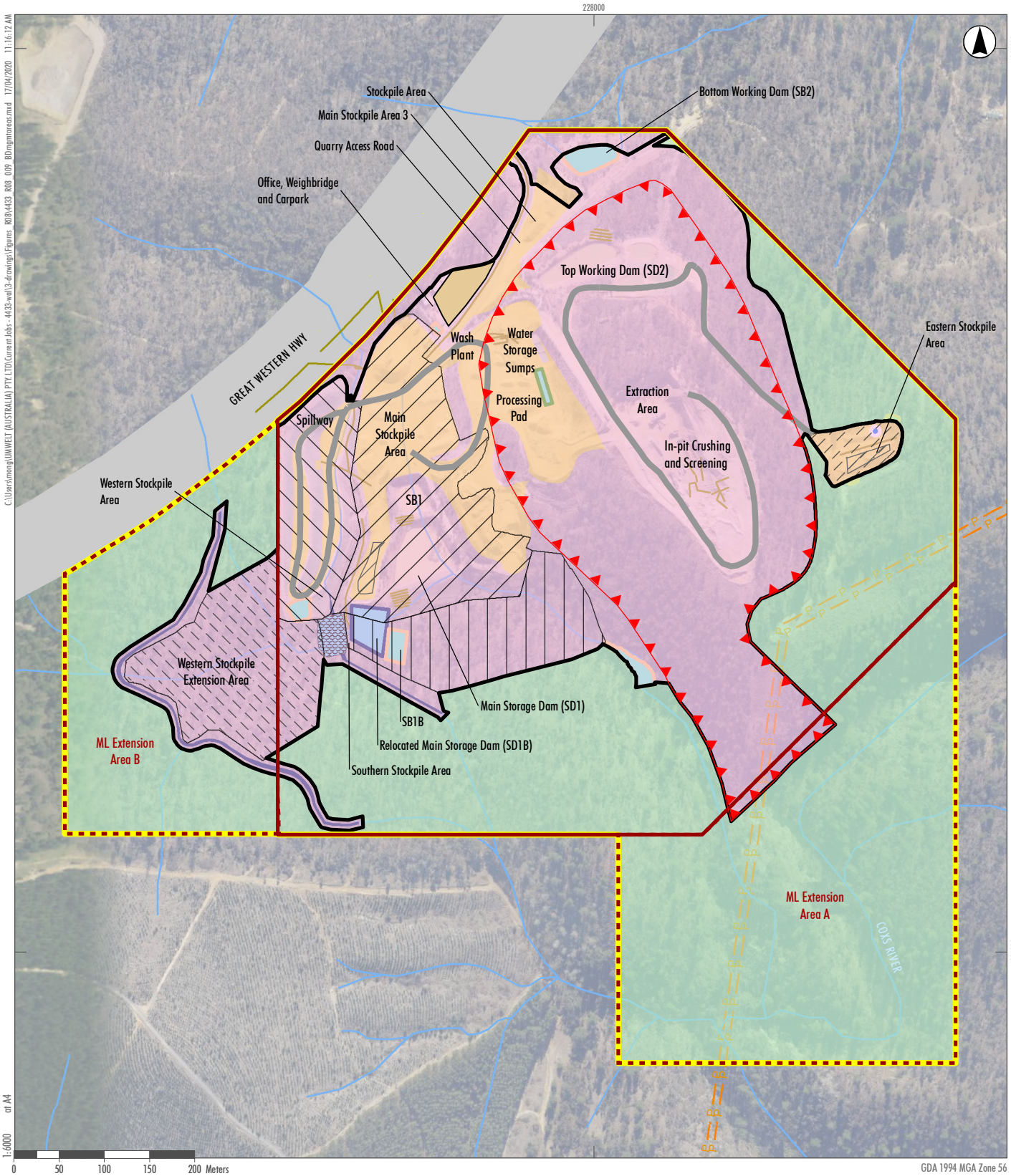
Figure 2.2 identifies the relative areas of these two BDMA.

2.4.2 Impact BDMA

2.4.2.1 Description

The approved extension to the extraction area and stockpile areas of the Quarry would result in additional disturbance at the Quarry of up to 14.1 ha. This includes approximately 8.6 ha of PCT 1093 (Red Stringybark Brittle Gum Inland Scribbly Gum dry open forest of the tablelands South Eastern Highlands Bioregion) and 5.5 ha of PCT 732 (Broad-leaved Peppermint Ribbon Gum grassy open forest in the north east of the South Eastern Highlands Bioregion). As discussed in **Section 2.2**, neither is identified as a TEC. As noted previously (**Section 1.2**), disturbance within the Impact BDMA has been staged and the full extent of disturbance may not occur.

[5] Refer to https://www.environment.nsw.gov.au/topics/animals-and-plants/native-animals/native-animal-facts/purple-copper-butterfly for further detail on Purple Copper Butterfly life cycles and mutualistic relationship with *Anonychomyrma itinerans*.



Legend

- Quarry Site Boundary
- Quarry Site (ML1633)
- Quarry Site ML Extension
- Approved Extraction Area
- Office, Weighbridge and Carpark
- Drying Cell
- Stockpile Area
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- Clean Water Diversion
- Sediment Basins
- Settlement Ponds
- Storage Dam
- Water Tank
- Rubbled Lined Drain
- Main Stockpile Area (935m AHD)
- Southern Stockpile Area (935m AHD)
- Western Stockpile Area
- Western Stockpile Extension (940m AHD)
- Eastern Stockpile Area

Biodiversity Management Areas (BMAs)

- Conservation BMA
- Impact BMA

FIGURE 2.2

Biodiversity Management Areas

Image Source: ESRI World Imagery (2019) Data source: Walker Quarries (2019); Umwelt (2019); NSW LPI DTDB (2019); CEH Survey (November 2016)

The vegetation of the Impact BDMA has been confirmed as potential habitat for a number of threatened species of flora and fauna. However, impacts to all species are associated with the disturbance to the vegetation and therefore subject to appropriate offsetting of disturbance (refer to **Section 5.0**), the 'no net loss standard' of the BAM would be achieved.

2.4.2.2 Objectives

The objectives of biodiversity management within the Impact BDMA are as follows.

- Restrict disturbance to the defined Impact BDMA.
- Manage weed and pest species, focusing on noxious species.
- Optimise use/recycling of the cleared vegetation and soils or vegetation requiring clearing or thinning.
- Rehabilitate the impacted areas to establish a safe and non-polluting landform and sustainable ecological communities.

Figure 2.3 provides a conceptual illustration of the proposed final landform and rehabilitation strategy. While subject to ongoing review which will be reflected in progressive updates to the Rehabilitation Management Plan (as part of the Quarry MOP), the following best describes the proposed approach to rehabilitation of the final landform.

Grassy Woodland has been identified as the primary vegetation community type with the aim being to establish vegetation commensurate with the two PCTs that would be disturbed, namely PCT 732 *Broad-leaved Peppermint – Ribbon Gum grassy open forest*, and PCT 1093 *Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest* by the Proposed Modification. Both communities are classified as grassy forest.

Native grassland would be re-established on the steeper slopes of the stockpile area landforms. The use of native grasses is proposed to improve the stability of the slope and prevent erosion. The use of trees and shrubs on these slopes could result in a reduced groundcover and hence lead to a greater risk of erosion. Over time, it is expected trees and shrub species will encroach, however, this would be after sufficient time for the slope and soil layers to stabilise.

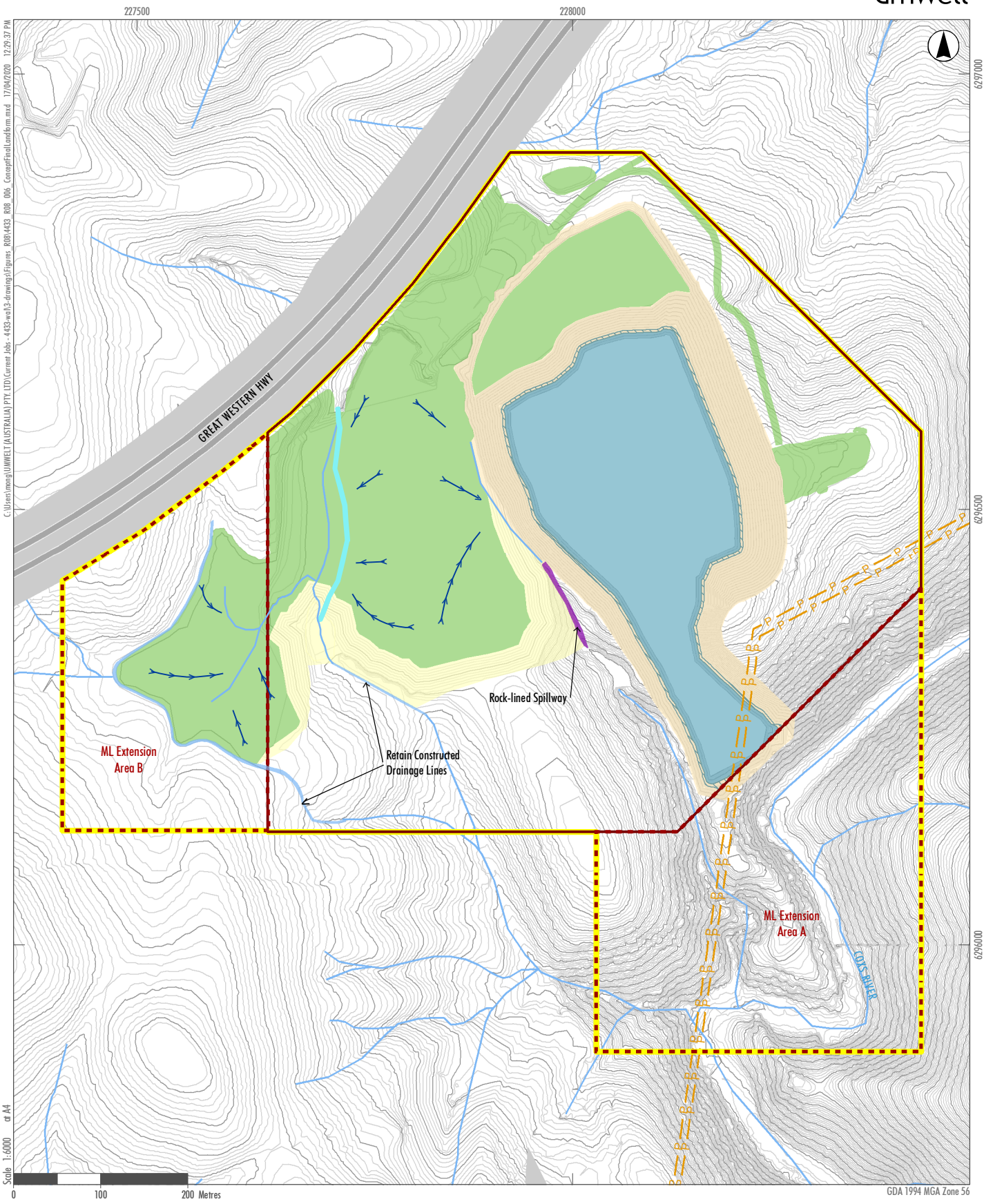
Native grassland with occasional trees has been proposed for the void floor in recognition that establishment of woodland will be difficult given the floor will be at least 30 m below surface, have reduced exposure to UV light and potentially affected by waterlogging. Noting that in response to concerns of the drainage of the final void, the Applicant has provided for the retention of runoff within the final void, the final landform is likely to be a repository of water.

More detailed objectives for the rehabilitation of Impact BDMA are provided in the MOP[6].

2.4.2.3 Threats

The threats to the biodiversity objectives of the Impact BDMA, which are discussed in **Section 3.1**, and associated biodiversity management measures to be implemented, which are discussed in **Section 4.0**, are identified in **Table 2.2**.

[6] Refer to **Figure 3** for the inter-relationship between the Plan and MOP.



Legend

- Quarry Site Boundary
- Quarry Site (ML1633)
- Quarry Site ML Extension Areas
- Watercourses
- P Electricity Transmission Lines

Final Landform Features

- Drainage Lines
- Water Storages
- Rock-lined Spillway
- Buried Pipe Culvert
- Indicative Drainage Direction

Final Landuse / Vegetation Communities

- Grassy Woodland
- Native Grassland (with shrubs & occasional trees)
- Stabilised Batters & Berms (Native trees and shrubs)
- Water Body (870m AHD)
- Fluctuating Waterbody (870-875m AHD)

FIGURE 2.3

Conceptual Final Landform (860m AHD)

Data source: Walker Quarries (2019) ; NSW LPI DTDB (2019)

Table 2.2 Summary of Threats and Associated Management Measures for the Impact BDMA

Management Measures	Threats								
	Vegetation Clearing (Section 3.1.1)	Disturbance to Habitat (Section 3.1.2)	Weeds (Section 3.1.3)	Feral Pest Species (Section 3.1.4)	Erosion and Sedimentation	Changes to Local Drainage (Section 3.1.6)	Noise and Dust Emissions (Section 3.1.7)	Vehicle Trauma (Section 3.1.8)	Land Contamination (Section 3.1.9)
Rehabilitation (Section 4.2)	✓		✓	✓	✓				✓
Access Tracks (Section 4.3)	✓	✓						✓	
Vegetation Clearing (Section 4.4)	✓	✓			✓	✓			
Salvage, Storage and Reuse of Environmental Resources (Section 4.5)	✓		✓						
Collection and Propagation of Seed (Section 4.6)		✓	✓						
Weed and Feral Pest Management (Section 4.7)			✓	✓					
Erosion and Sediment Control (Section 4.8)					✓				
Bursaria spinosa (Potential Purple Copper Butterfly Habitat) Management (Section 4.9)	✓	✓							
Bushfire Management (Section 4.10)	✓								

2.4.3 Conservation BDMA

2.4.3.1 Description

The Conservation BDMA incorporates land dominated by remnant native woodland which is to remain undisturbed by the Quarry (refer to **Figure 2.2**). As far as has been mapped by Ecoplanning (2019b), the Conservation BDMA is dominated by PCT 1093 on the slopes and PCT 732 in gullies and along local drainage lines. Dominant species including the Ribbon Gum, Snow Gum, Mountain Gum and Black Sallee. These canopy species are of varying ages with some containing hollows.

The understorey is sparse to non-existent and consists predominantly of younger specimens of the canopy species while the shrub layer consisted of Broom Heaths, Wattles, Finger Hakea, Narrow-leaved Geebung and Cherry Ballart. Groundcover is well established and included native grasses including Snow Grass, Three-awn Eargrass, Wallaby Grass, Forest Hedgehog Grass and Kangaroo Grass.

The area of land between the powerline easement and south-eastern boundary of the Quarry Site is excluded from the Conservation BDMA due to the restricted access created by the powerline easement and steep terrain.

2.4.3.2 Objectives

The objectives of biodiversity management within the Conservation BDMA are as follows.

- Prevent disturbance to native vegetation.
- Protect and enhance fauna habitat.
- Manage weed and feral pest species effectively.

2.4.3.3 Threats

The threats to the biodiversity objectives of the impact BDMA, which are discussed in **Section 3.1**, and associated biodiversity management measures to be implemented, which are discussed in **Section 4.0**, are identified in **Table 2.3**.

Table 2.3 Summary of Threats and Associated Management Measures for the Conservation BDMA

Management Measures	Threats								
	Vegetation Clearing (Section 3.1.1)	Disturbance to Habitat (Section 3.1.2)	Weeds (Section 3.1.3)	Feral Pest Species (Section 3.1.4)	Erosion and Sedimentation (Section 3.1.5)	Changes to Local Drainage (Section 3.1.6)	Noise and Dust Emissions (Section 3.1.7)	Vehicle Trauma (Section 3.1.8)	Land Contamination (Section 3.1.9)
Access Tracks (Section 4.3)	✓	✓						✓	
Weed and Feral Pest Management (Section 4.7)			✓	✓					
Erosion and Sediment Control (Section 4.8)					✓	✓			✓
Potential Purple Copper Butterfly Habitat Management (Section 4.9)	✓	✓					✓		
Bushfire Management (Section 4.10)	✓								

3.0 Threats to Biodiversity

3.1 Threat Identification

3.1.1 Vegetation Clearing

As noted in **Section 2.4.2.1**, up to 14.1 ha of native woodland vegetation (of both PCT 1093 and PCT 732) will be progressively disturbed under the existing limits of DA 344-11-2001. The clearing of vegetation has the potential to:

- result in a net loss to the biodiversity value of the region and state,
- reduce the extent of habitat for threatened flora and fauna (refer also to **Section 3.1.2**),
- cause direct harm or death to native fauna (refer to **Section 3.1.8**),
- lead to erosion and sedimentation (refer to **Section 3.1.5**), and
- promote the spread and establishment of noxious or environmental weeds, as well as vermin and other pest species (refer to **Sections 3.1.3** and **3.1.4**).

Progressive clearing and rehabilitation will ensure disturbance is undertaken in a planned manner and impacts to biodiversity values are progressively mitigated. Furthermore, tree clearing will be scheduled to minimise impact on breeding birds and other arboreal fauna (refer to **Section 4.4**).

The implementation of the Quarry BOS (refer to **Section 5.0**) will ensure that impacts to biodiversity are offset prior to disturbance and whilst rehabilitation is ongoing.

No significant impact will occur to any listed Threatened Ecological Community (TEC).

3.1.2 Disturbance to Habitat

Disturbance of habitat will be limited to the Impact BDMA. While various ecological assessments of the Quarry Site (Wildthing, 1999, 2002, Lesryk, 2017c, Ecoplanning 2017 and 2019) have concluded that the Quarry operations and disturbance within the Impact BDMA will not place any species, population or community at risk of local extinction, disturbance has included vegetation identified as known or potential habitat for the threatened Purple Copper Butterfly and other species.

No additional tracks or roads are to be constructed within the Conservation BDMA and as such there will be no direct disturbance to habitat within the Conservation BDMA. Disturbance as a result of the following indirect impacts on the Quarry Site could occur and will be managed.

- Spread of weed and feral pest species (**Sections 3.1.3** and **3.1.4**).
- Erosion of the landscape due to surface disturbance (**Section 3.1.5**).
- General changes to local drainage (**Section 3.1.6**).
- Noise and dust impacts associated with operations (**Section 3.1.7**).
- Vehicle trauma to native fauna (**Section 3.1.8**).

3.1.3 Weeds

Several exotic flora species have been identified on the Quarry Site, most notably *Hypericum perforatum* (St Johns Wort), *Pinus radiata* (Radiata Pine) and *Rubus ulmifolius* (Blackberry) (Ecoplanning, 2020), and could occur within both BDMAs.

Blackberry and St John's Wort are classified as noxious weed species of control class 4 (requiring 'the growth of the plant must be managed in a manner that continuously inhibits the ability of the plant to spread and the plant must not be sold, propagated or knowingly distributed').

Other weed species are expected to occur and have the potential to threaten the objectives of the BDMP (refer to **Table 1.4**) through competition with native species, in particular disturbance colonising species.

3.1.4 Feral Pest Species

During the most recent flora and fauna surveys of the Quarry Site (Lesryk, 2016, 2017c & Ecoplanning 2019a, 2020), no feral species were observed. It is likely, however, that introduced exotic species such as fox, cat, rabbit, European hare, starling and Indian minor will utilise the Quarry Site either on a permanent or temporary basis and could directly impact on endemic fauna and flora species through grazing, competition for resources or predation.

3.1.5 Erosion and Sedimentation

Removal of ground stratum from the Impact BDMA increases the potential for soil erosion by wind and water to shape and modify the local setting and downstream habitat. Under these conditions, valuable resources for rehabilitation and re-establishment of native biodiversity may be lost and the downstream ecology of watercourses (within the Conservation BDMA and beyond) adversely affected by discharge of turbid water with high sediment loads.

3.1.6 Changes to Local Drainage

Modified drainage within the Impact BDMA could influence the volume and quality of water discharged and flowing within the drainage lines of the Conservation BDMA. Modified flows have the potential to affect the type and density of vegetation, which in turn may impact on the habitat value of these watercourses for native fauna.

3.1.7 Noise and Dust Emissions

If overly noisy or dusty, native fauna may be discouraged from utilising the Conservation BDMA as breeding or foraging habitat.

3.1.8 Impact Trauma

The clearing of vegetation and movement of vehicles around the Quarry Site has the potential to directly harm native fauna. This is primarily a threat associated with the Impact BDMA, however, while movements within the Conservation BDMA will be restricted, there remains the potential for collision with native fauna.

Vegetation Clearance Protocols which are implemented by Walker Quarries (refer to **Section 4.4**) will significantly reduce the potential for harm, however, this threat cannot be completed removed.

3.1.9 Land Contamination

With the operation of the Quarry comes the risk of contamination through spillage of hydrocarbons. These have the potential to contaminate land and affect the ability of Walker Quarries to achieve the nominated biodiversity objectives for the two BDMA.

Silts washed from the sand products will be captured initially in silt dams before being transferred to the Eastern Stockpile Area for drying. Should these structures spill or leak, it is possible for runoff containing elevated concentration of suspended solids to discharge to local watercourses which could impact on the achievement of the nominated biodiversity objectives.

3.2 Risks to Achieving Outcomes

Table 3.1 summarises the risk(s) posed by each of the threats identified in **Section 3.1**, relevant performance objectives, the management strategies to be implemented and the overall risk associated with each threat. The management measures referenced, along with performance criteria, are further defined and described in **Section 4.0**.

Table 3.1 Threats to Biodiversity Outcomes

Threat	Performance Objectives	Management Strategies	Risk Level
Vegetation Clearing	Implement access track management strategy	Access tracks (**Section 4.3**).	Low
	All clearing undertaken within approved impact footprint.	Rehabilitation (**Section 4.2**). Vegetation clearing (**Section 4.4**).	Low
Habitat disturbance	No avoidable impacts on fauna habitat.	Access tracks (**Section 4.3**). Vegetation clearing (**Section 4.4**).	Low
	All pre and post vegetation clearing administrative controls implemented	Vegetation clearing (**Section 4.4**).	Low
	Maximise re-establishment of fauna habitat in final landform.	Salvage, storage and reuse of environmental resources (**Section 4.5**). Collection and propagation of seed (**Section 4.6**). Rehabilitation (**Section 4.2**).	Low
	Avoid additional impacts on threatened species.	Vegetation clearing (**Section 4.4**). Weed and feral pest management (**Section 4.7**). Purple Copper Butterfly and *Bursaria spinosa* management (**Section 4.9**).	Low
Weed and Feral Pest Species	Decrease in number and abundance of weed species.	Salvage, storage and reuse of environmental resources (**Section 4.5**). Collection and propagation of seed (**Section 4.6**). Rehabilitation (**Section 4.2**). Weed and feral pest management (**Section 4.7**).	Low
	Reduction in feral pest numbers.	Weed and feral pest management (**Section 4.7**).	Low

Threat	Performance Objectives	Management Strategies	Risk Level
Erosion and Sedimentation	Reduction in land area subject to active soil erosion and stream bed erosion.	Access tracks (**Section 4.3**). Vegetation clearing (**Section 4.4**). Erosion and sediment control management (ESCM) (**Section 4.8**).	Low
Changes to Local Drainage	Avoid adverse effects on drainage line habitat.	Vegetation clearing (**Section 4.4**). ESCM (**Section 4.8**).	Low
Noise and Dust Emissions	Minimise reduction in local fauna.	Salvage, storage and reuse of environmental resources (**Section 4.5**). Collection and propagation of seed (**Section 4.6**). Rehabilitation (**Section 4.2**). Weed and feral pest management (**Section 4.7**).	Low
Vehicle Trauma	Minimise fauna mortality	Access tracks (**Section 4.3**).	Low
Land Contamination	Prevent contamination of land and water.	Access tracks (**Section 4.3**). ESCM (**Section 4.8**).	Low

4.0 Biodiversity Management Measures

4.1 Introduction

The following sub-sections describe the measures to be implemented to achieve the objectives nominated in **Section 1.6** (for overall biodiversity management) and **Section 2.4** (for each BDMA individually) and manage the threats to biodiversity identified in **Section 3.0**.

Management measures are classified as occurring in either the short-, medium- or long-term. Short-term management measures include targeted activities with an approximate duration of between 18 months and two years. Medium-term management measures include activities, which require longer-term duration but have a defined end point, such as managing cleared vegetation, typically have an approximate duration of between two and five years. Long-term management measures include ongoing or repeat activities over the life of the Quarry or beyond, such as weed and feral pest management and bushfire risk management.

Performance targets and completion criteria are provided for each of the management measures are described with **Table 7.1** (refer to **Section 7.0**) identifying the triggers and actions, in the form of individual Trigger Action Response Plans (TARPs), to be implemented in response to these targets or criteria not being achieved.

4.2 Rehabilitation

4.2.1 Goals and Objectives

The post-mining land use goal for the Quarry Site is to establish a safe, stable and non-polluting landform and to re-establish native vegetation consistent with the surrounding remnant vegetation that is self-sustaining.

Figure 2.3 provides the nominated final landform and land use of the Quarry Site. In summary, rehabilitation aims to re-establish native woodland over the majority of the final landform, with selected areas retained as either:

- water storages
- roads, or
- retained quarry faces.

The long term rehabilitation objective is to establish a landform that is consistent with the surrounding vegetation and which does not require management input greater than that required for the surrounding landscape, that is, that native vegetation is successfully regenerating. Specific rehabilitation objectives, based on the type of disturbance and proposed final landform and land use objectives for that component of the Quarry Site are presented in *Section 5.2* and *Table 5.2* of the Quarry MOP (which also provides the information required of a Rehabilitation Management Plan in accordance with *Condition 3(31)* of DA 344-11-2001).

Progressive rehabilitation objectives for the Quarry Site are summarised as follows.

- Stabilisation of the land to minimise environmental impacts.
- Reshaping the processing pad and stockpile areas to resemble, as much as possible, the original landform.

- Modifying the final void to make it safe and stable.
- Establishing a native ecosystem over the entire site (excluding the access tracks to be retained and the water management features) to develop a landform that is self-sustaining, low maintenance, and closely resembling the ecosystem surrounding the Quarry Site.
- Removing all buildings and equipment.
- Retaining all water management features, including drains and dams that are included in the approved final landform.

4.2.2 Management Measures, Performance and Completion Criteria

Rehabilitation procedures, performance criteria and measurement, and approach to contingency and adaptive management (of the Impact BDMA) are addressed in the Quarry MOP, which can be viewed on Walker Quarries' website and are as follows.

- *Section 6* and *Table 17* present the performance indicators, measures and completion criteria for each phase of rehabilitation.
- *Section 7* and *Table 19* present the rehabilitation activities to be undertaken and status at the commencement and completion of the MOP period.
- *Section 8* describes the monitoring of rehabilitation to be undertaken.
- *Section 9*, *Table 20* and *Table 21* identify the risks to successful rehabilitation of the Quarry and present a Trigger Action Response Plan for each of the potential adverse outcomes associated with these.

As is noted in **Sections 4.9.2** and **4.9.3**, Bursaria spinosa will be included in seed mix and tubestock plantings on suitable areas of the final landform (when assisted revegetation undertaken). A qualified ecologist or species expert will be consulted prior to commencement of revegetation activities to ensure the most appropriate location is chose and best method of application used.

4.3 Site Security and Access Tracks

4.3.1 Management Measures

4.3.1.1 Site Security

The Quarry Site (ML 1633) boundary will be fenced to exclude access of trail bike riders, firewood cutters and other non-quarry or Forestry Corporation personnel.

Access to Forestry Corporation will be provided by existing trails which will be gated and locked.

4.3.1.2 Access Tracks

Existing tracks will be used in preference to new tracks wherever possible on the Quarry Site.

Where a new track is required, e.g. to enable activities such as weed and feral pest management, fire hazard reduction and monitoring, disturbance will be kept to a minimum. Approval for new access track construction will require approval by Walker Quarries Operations Manager (or equivalent), preparation and retention of a clearing plan, and implementation of all vegetation clearing protocols (refer to **Section 4.4.1**). Once no longer required, i.e. on completion of activities, the access track will be closed and rehabilitated.

4.3.2 Performance and Completion Criteria

Table 4.1 presents performance and completion criteria relevant to site security and access tracks within the Quarry Site.

Table 4.1 Performance and Completion Criteria – Access Tracks

Action	Performance Criteria	Completion Criteria
Fence the Quarry Site boundary	Installation of fencing and gates across established Lidsdale SF roads.	Completion of fencing by end 2020/2021 reporting period (30 June 2021).
Access track mapping	Map all existing tracks.	Up to date maps identifying all access tracks completed and maintained.
	Identify and map tracks to be retained.	Retained tracks restricted to those required by landowner for property management.
Avoid creation of new tracks	New tracks only created following review and authorisation by Operations Manager	Documentation completed and retained to confirm clearing plan and vegetation clearing protocol followed.
Access track management strategy	Complete redundant track rehabilitation (if required). Annual review of existing or new access tracks with redundant tracks rehabilitated.	Complete rehabilitation of all non-essential tracks. Identify any track rehabilitation in Annual Review of Quarry operations.

Section 7.0 (and **Table 7.1**) provides the relevant TARPs associated with the management measures nominated in **Table 4.1**.

4.4 Vegetation Clearing

4.4.1 Management Measures

Clearing will be limited to approved areas only and only following retirement of biodiversity credits in accordance with the Quarry BOS (refer to **Section 5.0**). Staged retirement of credits and progressive clearing will ensure that vegetation is retained for as long as possible and only removed immediately before an area is required for operations.

Vegetation clearing will be undertaken strictly in accordance with the Quarry MOP (which addresses the conditional requirement for a Rehabilitation Management Plan as required by *Condition 3(31)* of DA 344-11-2001). The following measures will be implemented to ensure that vegetation clearing is restricted to approved areas.

- Clearing will only proceed following confirmation of biodiversity credit retirement in accordance with the Quarry BOS (**Section 5.0**).
- All employees and contract staff will be inducted and trained on environmental requirements, including vegetation clearing restrictions and procedures.
- The extent of vegetation to be cleared will be restricted to that required for the subsequent 12 months operation as far as is practicable. It is noted that due to the very steep terrain of the Quarry Site, larger areas may be cleared due to the difficulty in moving earthmoving equipment into and out of these areas.
- Clearing will only proceed following the implementation of measures to manage the potential impacts of erosion and sedimentation (**Section 4.8**).

- All clearing will be undertaken in accordance with the **Vegetation Clearing Protocol** (as follows).

Vegetation Clearing Protocol

Prior to and during clearing activities, the following protocol will be implemented.

Desktop Review

- The area is to be identified on a legible map, including an accurate calculation of the area to be cleared.
- The map, area (in hectares) to be cleared, associated biodiversity credit requirement and certificate confirming retirement of biodiversity credits are to be provided to the Operations Manager (or delegate) for confirmation and/or further instruction.

Site Preparation

- The area of clearing will be identified and entry/exit points and laydown areas for equipment nominated and marked.
- Limits to clearing will be identified by survey markers, painted ground or flagging tape.
- The Operations Manager (or delegate responsible for the implementation of the Vegetation Clearing Protocol) will inspect and confirm the location as correct with respect to the approved maps. The inspection will confirm that survey markers, paint or tape is clearly visible from both possible directions of development.
- Erosion and sediment control features, e.g. diversion banks, sediment fencing, will be installed in accordance with the Quarry *Erosion and Sediment Control Plan*.

Pre-Clearance Inspections

- A qualified ecologist will be engaged to review the proposed area of clearing and determine whether threatened species or habitat trees are present.
- If threatened species are identified, and cannot be relocated, clearing will not commence until the animal can be relocated or relocates naturally.
- If habitat trees are identified, these will be inspected (unless impractical) for the presence of threatened arboreal species.
- Relocation will only be undertaken under the guidance of a qualified and licensed ecologist.

Clearing Operations

- Soil and groundcover will be directly transferred onto rehabilitation areas, where available for soil respreading, to maximise the opportunity for retention of the natural seed stock, and thereby maximise the revegetation of the final landform with endemic species.
- Large trees and those in which species have previously been identified will be carefully felled as follows.
    - Check for the presence of nesting or roosting fauna before felling or pushing then start tree removal immediately after visual inspection.
    - Initially nudging the tree to induce any fauna to vacate. This process should progressively increase in force.
    - Wait a period of 5 minutes to allow the fauna to vacate the tree. Repeat this step if necessary.
    - Select the preferred direction of fall and push the tree from a high point along the trunk towards the preferred direction of fall.

- If the tree is too strong to be pushed with all roots intact, some of the roots on the restraining side will be cut and/or excavated.
- The speed of fall and ground impact will be reduced where possible.

- If native arboreal species are detected, a 10 m buffer will be established around the tree and it will be left overnight to allow to animal to vacate the tree.

Post-clearing Management

- A post clearing survey of the cleared vegetation will be undertaken to determine if further species need relocating.
  - Hollows should be checked at the end of the process for wildlife.
  - Avoid leaving trees on ground unmanaged for more than two weeks as these would quickly become habitat for hollow dependent species.
- Where fauna remains or is captured during vegetation clearing the animal will be released into nearby native vegetation where it is considered that doing so does not put the species at risk of injury.
- Should clearing activities result in injury to any native fauna species, the local WIRES organisation or a suitable alternative will be contacted immediately for assistance.

4.4.2 Performance and Completion Criteria

Table 4.2 presents the performance and completion criteria relevant to vegetation clearing within the Quarry Site.

Table 4.2 Performance and Completion Criteria – Vegetation Clearing

Action	Performance Criteria	Completion Criteria
Identify areas to be cleared and detail management required in these areas.	Area to be cleared identified in Quarry MOP	All clearing undertaken within approved impact footprint.
	Biodiversity credits identified and retired prior to commencement.	Confirmation of credit retirement retained at Quarry Office. Disturbance/offset balance reported in Annual Review.
Implement Vegetation Clearing Protocol	Qualified ecologist (or other suitably qualified person) completes pre-clearance surveys prior to all non-trivial vegetation clearing	Pre-clearance and clearance procedures documented.
	Complete and retain records of clearing, including identification of any fauna.	No avoidable impacts on roosting or nesting native fauna.
	Qualified ecologist engaged to manage and undertake fauna relocation (if required).	Details of specific fauna management completed during (or immediately following) clearing documented.
	Procedures governing handling, relocation and management of fauna (including injured fauna) followed.	All administrative controls followed and documented.
Staff awareness of clearing protocols.	Identify administrative controls re: clearing during induction.	All inductions and training completed and documented.

Section 7.0 (and **Table 7.1**) provides the relevant TARPs associated with the management measures nominated in **Table 4.2**.

4.5 Salvage, Storage and Reuse of Environmental Resources

4.5.1 Management Measures

4.5.1.1 Trees and Vegetation

Cleared vegetation is managed to maximise the opportunity for recycling and reuse in rehabilitation of the Quarry Site.

Habitat Features

Large landscape features such as major tree trunks, limbs and, if possible, minor branches will be salvaged and where possible used directly in progressive rehabilitation activities. Where possible, leafy materials will also be placed on rehabilitation areas or stockpiled in order to retain any existing seed bank. Placing seed-laden branches to enhance natural regeneration in highly disturbed landforms is a viable rehabilitation option during vegetation clearing. This activity will create habitat with structural complexity and encourage many species into the rehabilitated areas.

To maximise the availability of these materials for use in rehabilitation, prior to each clearing campaign, Walker Quarries, or commissioned consultants, will identify areas of the Quarry Site available for rehabilitation (including stabilised slopes of dams and stockpile areas). The density of application of larger habitat features will be assessed based on the factors such as the intended final landform (slope) and land use (vegetation type) planned in accordance with the Quarry Mining Operations Plan (MOP). The density of these materials will be highest on areas of shallower slope where woodland vegetation is to be established and lowest (or excluded) on steeper slopes or where grassland vegetation is planned. Walker Quarries will review and report on opportunities for use of these materials as part of each Annual Review.

Tree Hollows

Tree-hollows are a particularly important resource for many native fauna species, and are vital for some species. The retention and protection of hollow-bearing trees is an important element in the maintenance of biodiversity. The following specific protocols relating to hollow-bearing trees will be implemented.

- Tree hollows will be identified as part of the Vegetation Clearing Protocol (refer to **Section 4.4.1**). This requires the trees of the area to be cleared to be inspected by a qualified ecologist and habitat trees and features identified and marked prior to commencement.
- A controlled felling technique will be used for clearing of hollowing-bearing trees (as described in **Section 4.4.1**).
- Once felled, these trees will be set-aside for special consideration of use prior to stockpiling, removal or mulching.
- In the event that significant rehabilitation is planned for the ensuing 12 to 24 months, these trees will not be mulched, rather stockpiled separately for replacement on sections of rehabilitated land.
- Subject to identification of available areas, hollow-bearing trees that have been felled will be placed in rehabilitation areas or undisturbed areas of the Quarry Site.
- Tree felling will only be undertaken following the implementation of the Vegetation Clearing Protocol described in **Section 4.4.1**.

Stockpiling and Mulching

Larger materials surplus to immediate requirements will be track rolled and stockpiled for future placement over final surfaces of the Quarry which have been covered with soil or other growth media. Where stockpiles of cleared vegetation are retained, or likely to be retained for in excess of 18 months, these will be mulched to reduce stockpile size and the potential for these as havens for vermin and weeds.

Mulching of branches and smaller tree limbs will be undertaken in preference to stockpiling where the material is to be retained in excess of 12 months (to reduce fire hazard and habitat for vermin and feral pests).

Based on the proposed rehabilitation of the Quarry documented in the MOP (incorporating a Rehabilitation Management Plan), **Table 4.3** identifies the volume of mulched vegetation (100 mm) and soil (300 mm) that is anticipated to be required for effective rehabilitation of each rehabilitation domain.

Table 4.3 Rehabilitation Materials Inventory

Domain	Description	Rehabilitation Material Requirement (m^3)	
		Mulched Vegetation	Soil
1E	Infrastructure returned to Woodland	2,000	6,100
3E	Water Storages returned to Woodland	2,200	6,600
5C	Stockpile Areas returned to Grassland	1,250	3,800
5E	Stockpile Areas returned to Woodland	8,900	26,800
6I(C)	Final Void floor returned to Grassland (Main Void)	-	7,000
6I(E)	Final Void floor returned to Grassland (Cobble Resource Void)	900	2,600
	Total	**15,250**	**52,900**

Sufficient volume of mulched vegetation will be retained on the Quarry Site for the planned rehabilitation of the ensuing 4 to 5 years. As rehabilitation is completed, and as part of the Annual Review, the rehabilitation materials inventory will be updated.

Material in excess of that which can be effectively used in Quarry rehabilitation will be removed from the Quarry Site so as to avoid creating a fire hazard or haven for vermin and pest species.

Remnant Vegetation and Offset Areas

The Quarry Site contains no biodiversity offset areas and there is currently no intention for offset areas to be established.

The Quarry Site includes areas of undisturbed native vegetation surrounding the Quarry disturbance and adjoining the Coxs River, native vegetation of Lidsdale State Forest and cleared private land. Walker Quarries currently monitors the condition of this vegetation (refer to **Section 6.3.2**) and based on monitoring to date can confirm the condition of this vegetation has not suffered since the commencement of Quarry operations in 2015. There is currently no intention to undertake any remedial vegetation management strategy on these undisturbed lands.

4.5.1.2 Soil

While the soil within the Quarry Site is shallow, the soil that can be salvaged will be stockpiled and retained for use in progressive or final rehabilitation activities.

Further information on the management of soil stripping, stockpiling and re-use is provide in the Quarry Erosion and Sediment Control Plan (ESCP) which has been prepared as a component of the Quarry Soil and Water Management Plan (SWMP). The following provides a summary of the key management measures relevant to soil retention and biodiversity management.

Soil Stripping

Care will be taken during soil stripping to avoid loss of structure or compaction. The following management measures will be implemented.

- Vegetation clearing will avoid contamination of the topsoil with large quantities of green material as this promotes biological degradation (composting) of this material (which would otherwise be a source of regrowth when the topsoil is respread).
- The area stripped of soil at any one time will be minimised consistent with operational requirements.
- Where a layer of soil is identified, this will be stripped to a depth of at least 200 mm ahead of excavation.
- All areas to be stripped of topsoil will be clearly identified in advance and the depth of topsoils and subsoils available determined.
- Care will be taken to ensure that subsoil clays are not removed with the topsoil (as this material is dispersive and will reduce the quality of material available for rehabilitation activities).
- Soil is to be loaded into trucks and either transported directly to areas being rehabilitated or to the stockpile area.

Soil Stockpiling

Care will be taken when forming stockpiles that the material is not overly compacted through the manual application process or by equipment driving over the stockpiles.

- All stockpiles will be constructed in accordance with Standard Drawing 4-1 of Managing Urban Stormwater: Soils and Construction, 2nd Ed, Volume 1 (Landcom, 2004) (refer to the Quarry ESCP).
- Soil stockpiles will remain less than 2m in height.
- Slopes of the stockpiles will be battered to provide a 2:1 (H:V) slope.
- Stockpiles will be at least 5m from a watercourse.
- Where the soil is not expected to be utilised for some time, the surface will be revegetated with a groundcover species to stabilise the surface and limit erosion from the stockpiles. Natural regeneration of native species will be encouraged, where this is not possible a sterile cover crop will be sown. Stockpiles will be stabilized to achieve a C-Factor of 0.1 within 60 days of formation (refer to *Table S3* of the Quarry ESCP).
- Timber, logs, rocks and other vegetative matter which will interfere with respreading applications or surface stability will be removed.
- Soil stockpiles will be located at the discretion of the Mine Manager within the defined disturbance footprint of the Quarry.

It is anticipated that as there will be limited opportunities for significant rehabilitation until close to Quarry completion, most soil will remain in stockpile for greater than 10 years. Where space is available on the Quarry Site, i.e. as bunds surrounding the extraction or stockpile areas, the soil will be retained on the Quarry Site. Soil surplus to Quarry Site stockpile areas will be transferred to Lot 6 DP872230 (which is owned by Sitegoal Pty Ltd, parent company of Walker Quarries).

Soil Respreading

- Wherever possible, topsoil will be directly transferred onto areas requiring rehabilitation. This approach will encourage the germination of the contained propagules, maximise the success of rehabilitation and reduce the need for soil stockpiling.
- Prior to respreading of the topsoil layer, the combined subsoil/imported soil profile layer will be ripped or scoured to allow keying of the topsoil.
- The respread soil will be sown with native species seed mix and watered as seasonal conditions dictate. Seedbed preparation will be carried out, i.e. in accordance with Standard Drawing 7-1 of Landcom (2004) (refer to the Quarry ESCP).

4.5.2 Performance and Completion Criteria

Table 4.4 presents the performance and completion criteria relevant to Salvage, Storage and Reuse of Environmental Resources within the Quarry Site.

Table 4.4 Performance and Completion Criteria – Salvage, Storage and Reuse of Environmental Resources

Action	Performance Criteria	Completion Criteria
Trees and Vegetation		
Salvage or recycle material removed.	Complete material salvage in accordance with nominated management measures.	Sufficient timber available for rehabilitation.
Retain cleared resources for future use in rehabilitation	Establish register/inventory of cleared and stockpiled vegetation.	Environmental Resource Inventory maintained.
	Update inventory annually and report each year.	
Tree Hollows		
Complete hollow removal in accordance with vegetation clearing measures	Document tree hollow removal, including temporary or final placement location. Report on tree hollow removal and replacement annually.	Use of tree hollows maximised in rehabilitation.
Soil Resources		
Strip soil to maximise value as rehabilitation resource.	Prepare a map identifying areas of soil stripping (over MOP period). Complete soil stripping in accordance with nominated management measures. Update the map in response to annual review of rehabilitation/revegetation progress against objectives (annual).	Sufficient soil available for rehabilitation.
Retain soil in stockpiles	Establish register/inventory of stockpiled soil. Update the soil inventory annually and report each year.	Soil reused for rehabilitation purposes.
	Soil retained in stockpiles is stabilised (non-eroding)	Groundcover >70% established on stockpiles (within 10 weeks of construction)

Section 7.0 (and **Table 7.1**) provides the relevant TARPs associated with the management measures nominated in **Table 4.4**.

4.6 Collection and Propagation of Seed

4.6.1 Management Measures

Walker Quarries principal strategy in relation to the propagation of seed will be through the replacement of the environmental resources salvaged and reused in the rehabilitation of final landform (refer to **Section 4.5.1**). This method ensures only endemic species, able to withstand the harsh climate of the area, will succeed.

Weed and feral pest control (**Section 4.7.1**) will be undertaken to promote the successful establishment of vegetation which germinates.

This unassisted revegetation strategy will be supplemented by assisted revegetation which will include:

- collection and propagation of seed material from the Quarry Site (Provenance Seed),
- purchase and propagation of seed (Commercial Seed), and
- application of hydromulch products.

Provenance Seed Collection, Propagation and Management

Seed has previously been collected and retained by Lithgow Community Nursery for future use in revegetation programs. The following management procedure for provenance seed management will be followed:

- Prior to clearing campaigns, Walker Quarries will review seed and tubestock held by the Lithgow Community Nursery (or other facility engaged to retain and maintained seed material and tubestock).
- Walker Quarries will report on the status of seed and tubestock held at nursery facilities annually as part of the Quarry Annual Review, along with plans to collect additional seed and restock.
- Where these stocks are diminished, Walker Quarries will engage the nursery, or alternative company or individual, to collect seed prior to clearing area. Seeds will be stored until sowing by being placed in labelled zip-lock bags and stored in a refrigerator until required (to reduce humidity or warmth that could cause seed to deteriorate or die from fungal disease or rotting). Most seed will remain viable in this way for many years.
- As required, the seed will be collected by revegetation contractor, incorporated into a site specific seed mix and sown over the final landform.

Commercial Seed Purchase

If provenance seed is not available, Walker Quarries will contact a local seed supplier to supply seed of the desired species for application to the final landform as part of rehabilitation activities, or propagation as tubestock for future planting.

Hydromulch Application

Landform features with steep slopes requiring stabilisation will have a hydromulch product (or equivalent stabilisation product) applied within 28 days of establishment.

4.6.2 Performance and Completion Criteria

Table 4.5 presents the performance and completion criteria relevant to Collection and Propagation of Seed within the Quarry Site.

Table 4.5 Performance and Completion Criteria - Collection and Propagation of Seed

Action	Performance Criteria	Completion Criteria
Promote collection of provenance seed	Review seed stock retained by nursery prior to each clearing campaign.	Inventory of available seed resource retained. Provenance seed and propagated tube stock available for rehabilitation.
Seed collection and application (if required)	Annual monitoring and review of species diversity of regenerating vegetation. Seed mix reflects vegetation of target community.	Species diversity and density of final vegetation community equivalent to analogue community site.
Hydromulch application	Apply within 2 weeks of soil application to steep slopes.	Records kept and available. No drilling or erosion of steep batter slopes.

Section 7.0 (and **Table 7.1**) provides the relevant TARPs associated with the management measures nominated in **Table 4.5**.

4.7 Weed and Feral Pest Management

4.7.1 Management Measures

4.7.1.1 Weeds

All noxious weeds will be managed and controlled in accordance with the requirements of the *Noxious Weeds Act 1993*.

Weed control within the Quarry Site will focuses upon the removal of Weeds of National Significance (WoNS), noxious weeds and reducing the risk of further weed invasion. This will be achieved by deterring the growth of weeds in recently disturbed areas and preventing the transportation of weeds into the Quarry Site.

Measures to control the spread and establishment of weed species are as follows.

- Any mobile equipment to be operated on the Quarry Site will be required to be cleaned (to remove any residual soil and vegetative material) prior to importation to the Quarry Site.
- Disturbance will be limited to only that required for the ensuing 12 months development (to reduce areas of bare ground more readily colonised by weed species).
- The Quarry Manager (or delegate) will periodically inspect cleared areas, soil stockpiles and rehabilitation areas for signs of noxious weeds, WoNS or other environmental weeds. If present, the Quarry Manager will engage a weed spraying contractor to apply a herbicide to the weed affected areas.
- Any weed spraying campaigns will consider the weather conditions, soil conditions and time available for spraying. All herbicides will be handled and applied generally in accordance with the manufacturer's instructions.

A list of declared weed species, their classification and suitable management approach for each species that is relevant to the Quarry is maintained by the Department of Primary Industries – Agriculture for the Upper Macquarie County Council (this Local Control Authority area includes the local council areas of Bathurst Regional Council, Blayney Shire Council, Lithgow City Council and Oberon Council).

4.7.1.2 Feral Pests

As noted in **Section 3.1.4**, feral pest species are not an identified feature of the local setting. While no controls are currently required, Walker Quarries makes the following commitments with respect to feral pest management.

- Subject to provision of appropriate safe work procedures and licences, Walker Quarries will comply with any requests of the Council or DPI in relation to access to the Quarry Site to undertake feral pest control measures.
- This BDMP will be updated to include any additional feral pest control measures should these be identified as necessary.

4.7.2 Performance and Completion Criteria

Table 4.6 presents the performance and completion criteria relevant to Weed and Feral Pest Management within the Quarry Site.

Table 4.6 Performance and Completion Criteria – Weed and Feral Pest Management

Action	Performance Criteria	Completion Criteria
Implement weed control/management programs.	Complete inventory of weed species and densities.	Annual monitoring completed and documented
	Reduce the diversity and extent of weed species.	Eradication of high threat exotic weeds. *Rubus ulmifolius* (Blackberry) and *Hypericum perforatum* (St Johns Wort) Weed species groundcover coverage <10% Weed species diversity (<20% total species richness)
	Develop specific weed control plans for target species. Undertake weed control/management in accordance with target species weed management plans	Complete annual weed spraying campaign.
Monitoring and Reporting.	Document any weed management activities.	Reports on weed control prepared and retained.

Section 7.0 (and **Table 7.1**) provides the relevant TARPs associated with the management measures nominated in **Table 4.6**.

4.8 Erosion and Sediment Controls

Erosion and sediment controls for the Quarry Site are described in the *Soil and Water Management Plan*. In summary, water management within the Quarry Site involves implementation and maintenance of the following:

- Temporary and permanent water management infrastructure such as sediment basins, storage dams and water diversions or drains.
- A stormwater management program that includes water discharge protocols.
- Other erosion and sediment controls, to be implemented as required, such as sediment fencing, rock armouring and strategic groundcover establishment.

A copy of the *Soil and Water Management Plan* can be viewed on Walker Quarries website.

4.9 Purple Copper Butterfly and *Bursaria spinosa* Management

4.9.1 Occurrence

While the population of Purple Copper Butterfly previously identified on the Quarry Site by Wildthing (1999, 2002) is considered to be locally extinct (Ecoplanning, 2019a) (refer to **Section 2.3**), the native Blackthorn plant (*Bursaria spinosa ssp lasiophylla*) on which the Purple Copper Butterfly is known to be dependent as a food source remains on the Quarry Site (refer to **Figure 4.1**).

4.9.2 Management Measures

Management of the species will be directed towards protection of the Blackthorn. The following measures will be implemented to protect and conserve Blackthorn within the Quarry Site.

- The removal of Blackthorn will be prevented by restricting any further clearing within the Conservation BDMA and applying the management measures related to Access Tracks.
- Existing Blackthorn populations will be marked on available Quarry plans so the site personnel will be able easily identify the species and avoid contact or unnecessary removal.
- Natural vegetation screenings will be maintained for the existing Blackthorn populations within the Quarry Site to minimise dust impacts from operations.
- Targeted monitoring of the Blackthorn and Purple Copper Butterfly will be undertaken by a qualified ecologist on an annual basis. Monitoring is described in more detail in **Section 6.3.1**.

The following measures will be undertaken to maximise the potential for the Purple Copper Butterfly to recolonize suitable areas of the Quarry Site should it recolonise the local area.

- Blackthorn populations will be included in revegetation activities associated with progressive rehabilitation of the Quarry Site. A suitably qualified person will be commissioned to provide advice on preferred slope and aspect for establishment of the Blackthorn to encourage development of suitable habitat for the Purple Copper Butterfly.
- Prior to the Spring 2020 biodiversity monitoring campaign, desktop analysis of the Quarry Site aerial photography and topographic mapping to identify potential locations where Blackthorn could be established to provide habitat for Purple Copper Butterfly.

- As part of the Spring 2020 Biodiversity monitoring campaign (refer to **Section 6.3.2**), these areas will be physically inspected to determine if the existing slope, aspect and community structure suitable for successful Blackthorn establishment.
- Where suitable landforms and community structure is confirmed, Walker Quarries (in consultation with the consulting ecologist) will provide for progressive planting of Blackthorn. The area and density of plantings will be at least comparable (subject to available area) to the stands of Blackthorn contained within the approved impact areas.
- The results of desktop and field investigations of suitable landforms and community types will be documented in the annual biodiversity monitoring report and Annual Review. This BDMP will be updated to reflect the recommendations contained within the annual biodiversity monitoring report.
- Walker Quarries, or the consulting ecologist, will identify a species expert and consult with them to review whether there are any additional management measures which could be implemented to increase the potential for Purple Copper Butterfly to recolonise the Quarry Site. The results of this consultation, and any recommendations will be included in the subsequent biodiversity monitoring report and Annual Review.

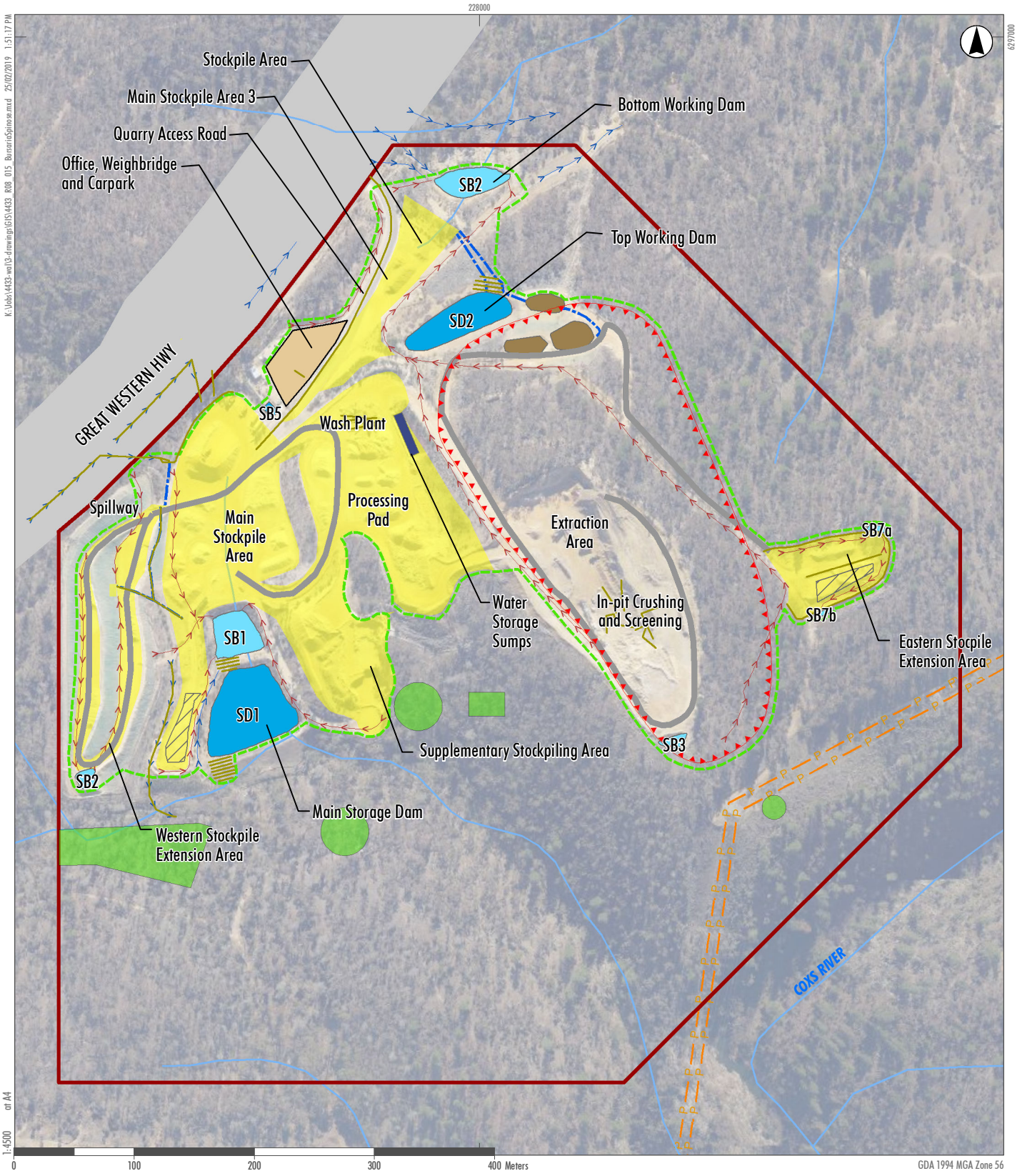
4.9.3 Performance and Completion Criteria

Table 4.7 presents the performance and completion criteria relevant to Purple Copper Butterfly Management within the Quarry Site.

Table 4.7 Performance and Completion Criteria – Purple Copper Butterfly Management

Action	Performance Criteria	Completion Criteria
Clearance of Bursaria spinosa avoided	Maintain a map of *Bursaria spinosa* and update if additional patches identified Implement protective measures on identified patches.	Remnant *Bursaria spinosa* of the Conservation BDMA retained in situ. Update the mapping of Blackthorn following annual monitoring.
Include Bursaria spinosa in rehabilitation	Include *Bursaria spinosa* in seed mix (when assisted revegetation undertaken)	*Bursaria spinosa* included in vegetation community of the final landform.
Identify suitable landforms for re-establishment of Bursaria spinosa	Map, by desktop and field investigations, suitable areas for re-establishment	Document desktop and field investigations in annual biodiversity monitoring. Complete during Spring 2020 and at least every three years following.
Replant Bursaria spinosa	Replacement (by density and area) of Blackthorn to be removed by Quarry disturbance (subject to available landform being present)	Include a replanting schedule in future versions of the BDMP. Document completion of replanting in Annual Reviews.
Complete annual monitoring	Complete monitoring in October each year.	Reporting completed each year.

Section 7.0 (and **Table 7.1**) provides the relevant TARPs associated with the management measures nominated in **Table 4.7**.



Legend

- Quarry Site - ML1633
- Approved Extraction Area
- Approved Area of Disturbance
- Office, Weighbridge and Carpark
- Drying Cell
- Stockpile Area
- Sediment Basin
- Silt Cell
- Storage Dam
- Water Storage Sumps
- Clean Water Drain
- Dirty water drain
- Haul Road
- Water Pipeline
- Watercourses
- Electricity Transmission Lines
- Remnant Patches of Bursaria spinosa

FIGURE 4.1

Identified Bursaria spinosa of the Quarry Site

Image Source: ESRI World Imagery (2019) Data source: Walker Quarries (2019); Umwelt (2019); NSW LPI DTDB (2019); CEH Survey (November 2016)

4.10 Bushfire Management

4.10.1 Management Measures

Bushfire management is described in the *Bushfire Management Plan* (BFMP) for the Quarry (refer to Walker Quarries' website).

The management measures nominated in the BFMP are repeated below.

4.10.1.1 Prevention and Management of On-Site Fire

Operational controls and safeguards to be implemented to minimise the risk of fire on at the Quarry are as follows.

Earthmoving Machinery

- All earthmoving machinery will be maintained in good working order with efficient exhaust systems and spark arrestors. Regular inspections will be carried out.
- All earthmoving machinery and mobile equipment will be fitted with appropriately sized and approved fire extinguishers suitable for the control of flammable liquid and electrical fires. Some of the heavy machinery will be fitted with independent fire suppression systems in addition to two 80:BE rated fire extinguishers while all light vehicles will be fitted with one fire extinguisher.

Workshops and Offices

- All workshops and offices will be installed with an approved 80:BE rated fire extinguisher. Their location will be indicated by an appropriate sign.

Fuel and Oil Management

- All fuel and oil storage will be located and constructed in accordance with the requirements of the *Dangerous Goods Act*.
- Fuel and oil storage areas will be signposted as to the contents of the storages and will be fitted with approved 80:BE rated fire extinguishers.
- All fuel tanks on-site will be fully or self-bunded to ensure that in the event of a leak or rupture, no fuel escapes from the bunded area. Each bunded area will have the capacity of at least 110% of the largest tank. Bunds may be integrated, i.e. form part of the tank structure, or be external.

No Smoking Areas

Designated "No Smoking" areas will be clearly marked on-site. These will include:

- fuel and oil storage areas
- within areas flagged or barricaded areas in preparation for blasting
- when transporting explosives or within 20 m of a vehicle transporting explosives
- within workshops
- all buildings and offices
- any gas cylinder storage areas.

No smoking will be permitted in any forested areas during the Bushfire Danger Period of October to March.

Fire Equipment

- Provision of fire equipment on-site will be in accordance with the requirements of legislation.
- All fire extinguishers will comply with AS/NZS 1841.11:1997 will be compatible with those of the Rural Fire Service.
- All fire equipment will be kept in a serviceable condition and be inspected at Pre-start and inspected every 6 months.
- The water truck (see below) will be maintained on-site to provide immediate response to a bushfire.

Water Truck

- A water truck will be:
    - available for use when the open cut quarry is in operation
    - tested at least monthly for mobility and operation of the water pump
    - properly maintained, with operators trained in the use of all equipment
    - able to be supplied with water from operating mobile water trucks should the need arise, and
    - equipped with:
        - 2 x 80:BE fire extinguishers
        - Hose and fittings to fill Rural Fire Service Truck.
- Most fire equipment will be compatible with that of the RFS.

Fixed Plant

Approved 80:BE rated extinguishers shall be installed and maintained at the following locations.

- Fuel and Lube Bay: 2 x Extinguishers.
- Offices: 2 x Extinguishers.
- Workshops: 2 x Extinguishers.

Equipment Storage

- Equipment will not be stored on uncleared ground.

Water Supply

- Water will be retained within the Main Storage Dam (SD1) and Top Storage Dam (SD2) at all times.

Clearing Operations

- Walker Quarries will enforce clearing restrictions. If clearing is required during the Bushfire Danger Period (October to March), specific protocols will be followed.
- Immediately prior to and during clearing campaigns during the fire season, Walker Quarries will refer to the FCNSW daily Colour Code and observe all requirements and restrictions as per FC NSW's regulations.

- Stockpiling of cleared vegetation will be avoided. This will be mulched or chipped when safe to do so and used in rehabilitation of the Quarry. If stockpiling of cleared vegetation is unavoidable, it will be stockpiled away from potential ignition sources and will not be burned.
- All vehicle movements will be confined to defined roads or tracks.
- Where appropriate, controlled high intensity short term grazing will be employed on privately owned lands to assist in the reduction of vegetative fuel loads.

Fire Breaks

- To prevent the potential for ignition of vegetation as a result of operations on the Quarry Site, an effective fire break will be established and maintained (in accordance with relevant legislation and RFS Guidelines) beyond these activities to ensure that equipment does not operate within 6 m of the surrounding vegetation.

Blasting Operations

- All blasting operations will be carried out and confined to the open cut.
- All flammable material will be removed by pre-stripping the topsoil prior to any drilling and blasting operations taking place.
- All blasting will be carried out in accordance with the Guideline as set out by Wallerawang Quarry Blast Management and Explosives Control Plan.

Welding/Hot Work Operations

- All welding activities will, as far as practicable, be conducted and confined to the workshop.
- The area within a 20 m radius will be cleared of all flammable material.
- All oils and greases will be cleared from the work area.
- Fire extinguishers of an 80:BE rating will be positioned within 10 m of the work area.
- A water truck will be put on stand-by during the welding or cutting operations.
- During welding, a second person will be present to observe the welding area.

Rehabilitated Area

- Fire prevention and fuel load reduction (if required) in rehabilitated quarry areas will be undertaken in accordance with the Quarry Biodiversity Management Plan. This could include:
    - Installation of fire breaks
    - short periods of high intensity grazing on privately owned lands and/or
    - controlled burns (in consultation with the RFS and FCNSW).
- Fuel load/fire security in rehabilitated areas will be inspected bi-annually.

4.10.1.2 Active Bushfire Response and Management

Preparation for Bushfire Event

The following measures will be implemented to enable appropriate management of active or bushfires identified in the local area and with the potential to impact on the Quarry.

- Incorporate the BFMP into the overarching Emergency Response Plan for the Quarry.
- Provide for equipment noted in **Section 4.10.1.1** for management of ember attack on Quarry buildings and other structures.
- All mobile equipment will be equipped with appropriate communication equipment, including two-way radios and/or mobile telephones.
- Establish compatible connection points from the Quarry's water infrastructure to permit the accessibility of this water to firefighting equipment.
- Maintain all internal access roads and tracks to ensure safe access and egress from the Quarry Site in the event evacuation is called.
- All tracks will be regularly checked and kept clear of all obstructions and debris to permit the safe ingress and egress of personnel from the Quarry Site.
- The RFS Fires Near Me App/Webpage will be checked regularly.
- Appropriate fire breaks will be maintained within and around the perimeter of the Quarry Site.
- Training will be provided by the Quarry Fire Officer to site personnel in relation to the use of the fire equipment nominated in **Section 4.10.1.1** and specific fire fighting tasks and procedures.

Managing Active Bushfire

Following identification of an imminent bush fire threat, the following management measures will be implemented.

- Human life is the most important asset to be protected. If it is safe to do so, then property is the second asset to consider preserving.
- The fire will be reported to Emergency Services using the **000** telephone number. Once emergency services have been notified, contact the FC NSW 24 hr fire duty officer on 02 6332 4812.
- If a fire has started in close proximity to a work area and the facilities are on hand to put it out and it is safe to do so then it should be contained and extinguished as quickly as possible, possibly in conjunction with Rural Fire Service operations.
- If the fire is not in close proximity and it is determined to be safe to do so, work will continue with the following provisions.
    - Fire fighting equipment, including the water truck and extinguishers will be brought close to hand.
    - UHF radio, local AM radio and RFS Fires Near Me App/Website monitored for fire updates.
    - Check regularly to determine if the fire front is moving closer.
- In the event of a local bushfire which threatens the Quarry boundary, all personnel on the Quarry Site would be directed to assemble at the designated Emergency Assembly Area. A head count would be undertaken to confirm all site personnel and visitors are accounted for. At this time, instructions as to specific procedures to be followed, i.e. site protection or evacuation, would be provided in accordance with the Emergency Management Plan and any advice provided by the RFS.

4.10.1.3 Managing Bushfire Risks – Agency Cooperation

As bushfires typically impact on more than one property, Walker Quarries is committed to ensuring that the RFS and other Emergency Services, as well as other agencies responsible for emergency response such as Mines Rescue, are adequately informed of activities within the Quarry Site.

Walker Quarries representatives will, at the request of relevant officers of FC NSW, the RFS or LCC, provide for an inspection of the Quarry Site to identify potential fire hazards, identify areas where fuel load reduction may be required and discuss any other relevant matters.

Walker Quarries will assist emergency services to the extent practicable if there is a fire in the vicinity of the Quarry Site.

There are no recently recorded fire events within the Quarry Site. Any requirements for mosaic burning will be undertaken in accordance with directions from the NSW Rural Fire Service (RFS).

4.10.2 Performance and Completion Criteria

Table 4.8 presents the performance and completion criteria relevant to Fire Management within the Quarry Site.

Table 4.8 Performance and Completion Criteria – Fire Management

Action	Performance Criteria	Completion Criteria
Reduce risk of fire initiation.	Implement all nominated management measures	No fires initiated on the Quarry Site.
Engage RFS (if required) to provide advice and bush fire risk planning.	Consult with local RFS (as required).	Implement any RFS written advice.

5.0 Biodiversity Offset Strategy

5.1 MOD 1 BOS (DA 344-11-2001 MOD 1)

Condition 3(24) of DA 344-11-2001 requires the development a BOS for the retirement of ecosystem and species credits generated by the disturbance to 2.4 ha of native vegetation associated with Modification 1 of DA 344-11-2001. As a result of delays in the determination of the biodiversity credits required to be retired, an Interim BOS was submitted on 27 February 2018. Following confirmation by BCD (formerly OEH) as to the biodiversity credits to be retired on 14 June 2018 (refer to **Appendix 2**), a Final BOS was submitted on 13 July 2018 (hereafter referred to the Stage 1 BOS).

In accordance with the Final (MOD 1) BOS, which is included in full as **Appendix 3**, Walker Quarries has retired the ecosystem and species credits identified in **Table 5.1** by payment into the Biodiversity Conservation Fund (refer to **Appendix 4**).

Table 5.1 Biodiversity Offset Requirements

Credit type	Area of impact (ha)	No. credits	Cost/credit (ex GST)[1]	Total
Ecosystem credits				
PCT 732 – Broad-leaved Peppermint Ribbon Gum grassy open forest in the north east of the South Eastern Highlands Bioregion	1.90	65	$2,515.29	$168,493.83
PCT 1093 – Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	0.5	19	$2,515.29	$47,790.50
Species credits				
Purple Copper Butterfly	2.4	96	$486.10	$60,191.33

Note 1: Price based on the Biodiversity Offsets Payment Calculator Public Tool (BOPC) as of 31 October 2018

Conditions 3(25), 3(27) and *3(28)* of the DA 344-11-2001 require the establishment and payment of a conservation bond associated with the BOS. The sum of the conservation bond is to be determined by:

(a) calculating the full cost of implementing the BOS at third party rates (other than land acquisition costs), and

(b) employing a suitably qualified, independent and experienced person to verify the calculated costs.

Payment into the Biodiversity Conservation Fund for the require 96 credits (**Table 5.1**) constitutes the required conservation bond (in satisfaction of *Conditions 3(27)* and *3(28)*) (refer to **Section 2.0**).

5.2 MOD 3 BOS (DA 344-11-2001 MOD 3)

5.2.1 Scope

Condition 3(28A) of DA 344-11-2001 requires the retirement of biodiversity credits associated with the increased disturbance area of MOD 3 prior to the commencement of vegetation clearing. The retirement of these credits is required to be carried out in accordance with the Biodiversity Offsets Scheme of the BC Act and to the satisfaction of the BCT.

This second BOS, hereafter referred to as the MOD 3 BOS, has been prepared to demonstrate the retirement of credits will be in accordance with the requirements of the Biodiversity Offsets Scheme.

5.2.2 Application of the Biodiversity Offsets Scheme

Table 5.2 identifies the five key steps of the Biodiversity Offsets Scheme and how each has been addressed in the development of the MOD 3 BOS.

Table 5.2 The Biodiversity Offsets Scheme

Step	Application
1. The proponent determines whether the Biodiversity Offsets Scheme applies	The Quarry is State Significant Development and has not received dispensation from the Secretary of DPIE that the project is not likely to have a significant impact
2. An accredited assessor applies the BAM and offsetting rules to the activity	A BDAR was prepared to support the application to modify DA 344-11-2001. The BDAR satisfactorily demonstrated how the development has applied steps to avoid and minimise impacts on biodiversity, and setting out the number and type of ecosystem and species credits required to offset residual impacts of the activity on biodiversity ('credit obligation'). On the basis of the proposed staged disturbance of the Quarry, the BDAR calculated the credit obligation for seven separate stages of development.
3. The consent authority assesses the application and determines whether to approve of refuse the application.	Approval to modify DA 344-11-2001 was granted under delegation of the Minister for Planning on 26 February 2020.
4. The consent authority determines the application and sets the offset obligation.	*Condition 3(28A)* provides for a consolidation of the development stages nominated in the BDAR into four Tranches.
5. The Proponent satisfies its credit obligation and can begin the approved activity.	The MOD 3 BOS sets out the proposed approach to meeting its credit obligation.

5.2.3 Credit Obligation

Table 5.3 presents the credit obligation of Walker Quarries for DA 344-11-2001. **Table 5.3** identifies both the Tranches nominated by *Condition 3(28A)*, as well as the original stages assessed by the BDAR (Ecoplanning, 2019b). The Tranches are identified on **Figure 5.1**.

Table 5.3 Biodiversity Credit Obligations

Tranche[1]	Stage[2]	Vegetation (PCT)	Area (ha)	Credit Requirement	
				PCT 1093	PCT 732
1	1	PCT 1093	1.15	39	
	3	PCT 1093	1.75	61	
		PCT 732	0.92		36
2	2A	PCT 1093	0.15	5	
		PCT 732	0.25		10
	2B	PCT 1093	0.63	20	
		PCT 732	2.42		93
	4	PCT 1093	1.2	39	
3	5	PCT 1093	1.61	52	
		PCT 732	1.95		75
4	6	PCT 1093	1.76	57	
Total			**14.05**	**273**	**214**

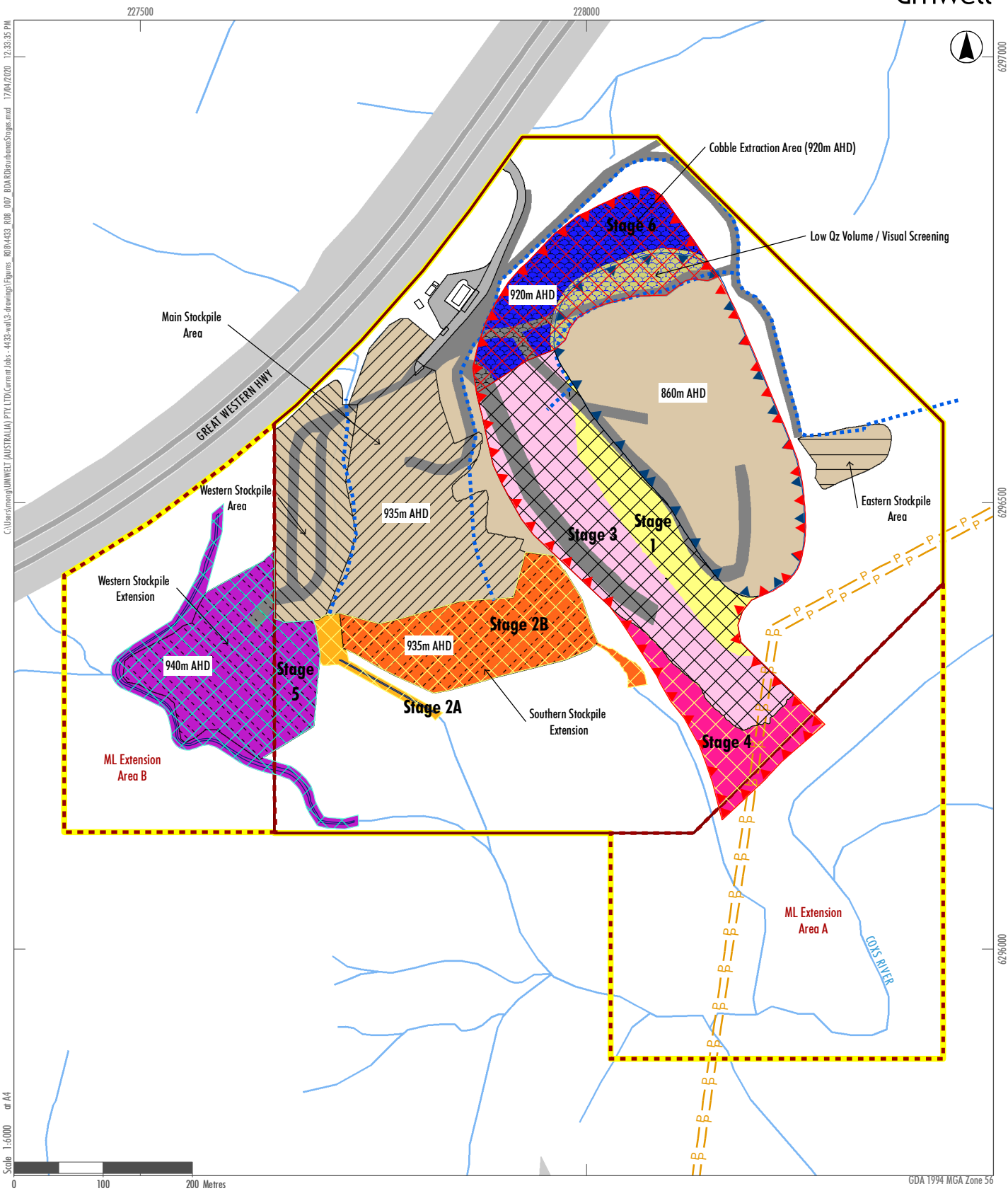
Notes: [1] As identified by Table 5A of DA 344-11-2001,
[2] As nominated by BDAR (Ecoplanning, 2019b),

It is noted that the intent of the NSW Biodiversity Offsets Scheme is to ensure offset obligations are retired prior to disturbance. It is also noted that the credit obligation of **Table 5.3** is for the maximum impact footprint of the Quarry and reflects the current credit price for the two PCTs.

As nominated in the BDAR, the credit obligations of *Condition 3(28A)* and *Table 5A* of DA 344-11-2001 will be progressively retired over the life of the Quarry to reflect the actual disturbance footprint of the Quarry and actual credit value of the PCTs at that time. With reference to the Biodiversity Offsets Scheme as described in **Section 5.2.2**, the credits will be retired through one of the following mechanisms.

1. Purchase of 'like for like' credits in the market via the Biodiversity Offsets and Agreement Management System (BOAMS).
2. Establishment of a Biodiversity Stewardship Site and Biodiversity Stewardship Site Agreement for credits (or a portion of).
3. Use the offsets payment calculator to determine the cost of the credit obligation, and transfer this amount to the Biodiversity Conservation Fund via the BOAMS. Once payment is accepted, the responsibility for identifying and securing the credit obligation transfers to the Biodiversity Conservation Trust.

Section 5.2.4 provides the implementation strategy with respect to the credit obligations nominated in **Table 5.3.**



Legend

- Quarry Site Boundary
- Quarry Site (ML1633)
- Quarry Site ML Extension Areas
- Watercourses
- Electricity Transmission Lines
- Site Infrastructure
- Sealed Internal Roads

Water Management Infrastructure

- Clean Water Diversion
- Buried Pipe Culvert
- Approved Extraction Area
- Main Stockpile Area (935m AHD)
- Southern Stockpile Area (935m AHD)
- Western Stockpile Area
- Western Stockpile Extension (940m AHD)
- Eastern Stockpile Area
- Cobble Extraction Area (920m AHD)
- Indicative Internal Roads

Quarry Extension Staging

- Stage 1 - Extraction Stage A
- Stage 2A - Flow Through Dam & Cleanwater Diversion
- Stage 2B - Southern Stockpile Extension & Sediment Basin
- Stage 3 - Extraction Stage B
- Stage 4 - Extraction Stage C
- Stage 5 - Western Stockpile Extension & Sediment Basin
- Stage 6 - Extraction Stage D (Cobble Extraction Area)
- Stage 6 - Extraction Stage D (Low Qz Volume & Visual Screening)
- Continued Operations

Condion 28A Tranche

- Tranches 1
- Tranches 2
- Tranches 3
- Tranches 6

FIGURE 5.1

BDAR Distrubance Stages and Table 5A Tranches

Data source: Walker Quarries (2019) ; NSW LPI DTDB (2019); Umwelt (2020)

5.2.4 Implementation Strategy

As proposed in the BDAR, and confirmed by *Condition 3(28A)* of DA 344-11-2001, a staged retirement of offset credit obligations is to be undertaken by Walker Quarries. The staging of *Condition 28A* (Tranches) has been pre-empted by the BDAR (Stages 1 to 6).

Walker Quarries will approach the retirement of offset credits as follows.

1. Walker Quarries will identify the area to be disturbed (with respect to the Tranches identified by Condition 28A (refer to Table 5.3).
2. Walker Quarries will review the relative merits of the three credit retirement options identified in **Section 5.2.3**.

    i. Walker Quarries will lodge a 'Credits Wanted' application on the BOAMS website and undertake relevant searches Biodiversity Offsets Scheme Public Register. In the event that credits for PCT 732 or 1093 are available, contact with the credit owner will be made in order to review quantity and cost.

    ii. Walker Quarries will review the availability of property within the local area and applicability as a Biodiversity Stewardship Site.

    iii. Walker Quarries will calculate the cost of retiring the credit obligation through the BCF.

    The approach to credit obligation retirement taken will consider:

    a. availability of credits on the open market,

    b. availability of land for purchase, likelihood of containing allowable credits, condition of vegetation and management measures required,

    c. likely time to complete application process and retire credits, and

    d. total cost.

    Walker Quarries acknowledges that cost will remain an important consideration in approach.

3. On identification of the preferred credit retirement option, Walker Quarries will make the relevant application through BOAMS, including justification for the proposed approach.

    This is to demonstrate that all three options have been given consideration and the most reasonable and feasible option taken.

4. The nominated offset transaction will be completed with BOAMS.

6.0 Biodiversity Monitoring Program

6.1 Introduction

This section provides detail on the ecological and rehabilitation monitoring program for the Quarry. The monitoring is designed to assess the adequacy of the ecological management strategies to be undertaken as part of the BDMP.

6.2 Objectives of the Monitoring Program

The objectives of the monitoring program are to:

- evaluate the success of flora and fauna management strategies,
- facilitate continuous improvement in rehabilitation and revegetation practices,
- record and document changes in retained vegetation within the Quarry Site, and allow for comparison with previous records,
- record and document fauna population changes and identify any breeding and critical habitat, and
- ensure the ecological significance of the remnant vegetation or rehabilitated areas are maintained or improved as a result of ongoing management practices.

6.3 Monitoring Locations, Frequency and Procedures

6.3.1 Purple Copper Butterfly

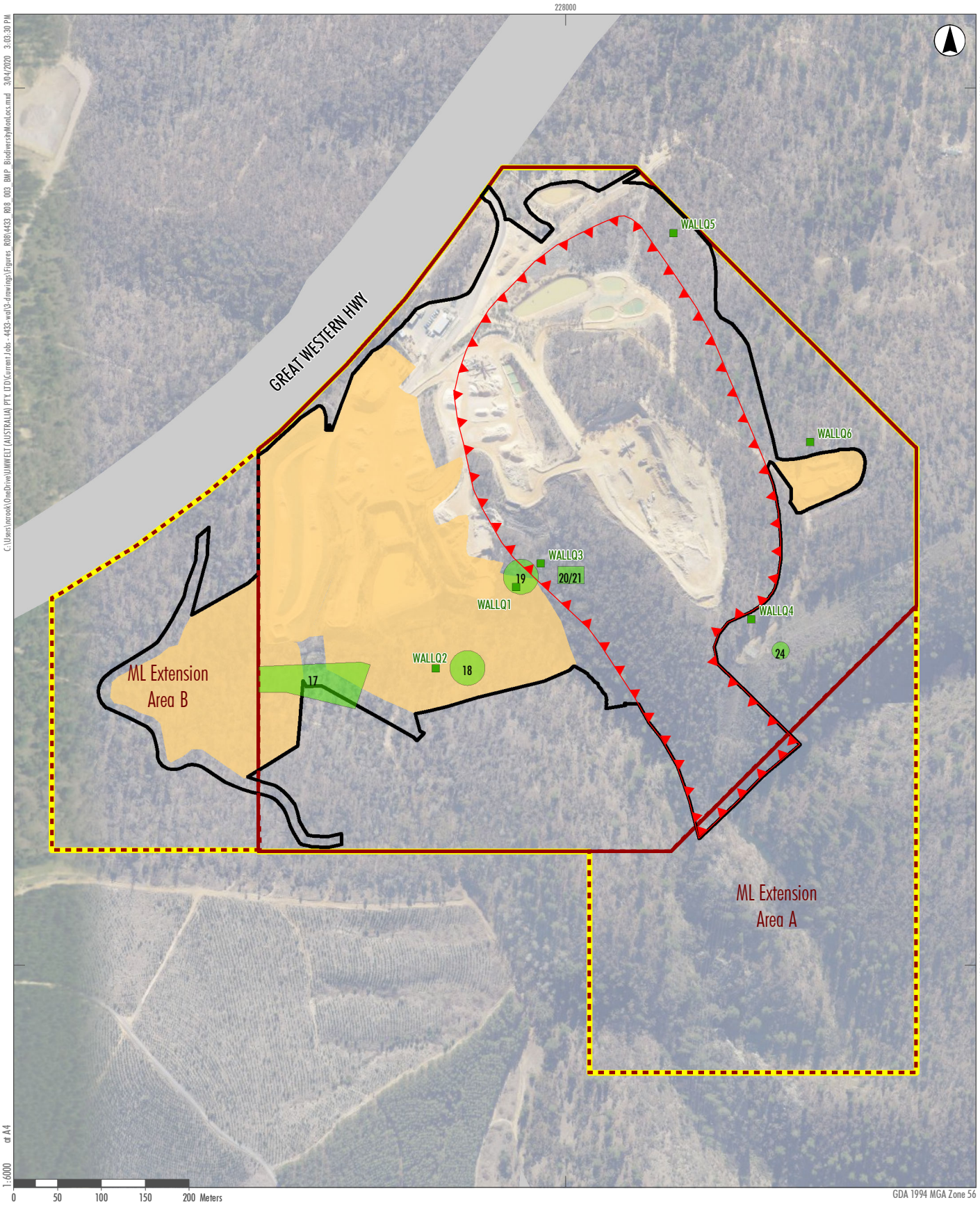
Remnant vegetation of the Quarry Site will be monitored annually by a qualified ecologist who will measure/monitor for evidence of Purple Copper Butterfly and the health and distribution of Blackthorn.

Five patches of Blackthorn (**Figure 6.1**) will be monitored in October each year with the following objectives.

- Determine if any Purple Copper Butterfly is present on the Quarry Site.
- Determine if the ant species *Anonychomyrma itinerans* is present (this ant having a mutualistic relationship with the butterfly).
- Identify the general condition of each site and if any new Blackthorn seedlings have established.
- Determine any further recommendations that should be adopted to ensure each of the five sites remains as habitat for the Purple Copper Butterfly.

The field survey will be completed by a qualified ecologist, generally in accordance with the following.

- On the day of the field survey, weather conditions will be noted.



Legend

- Quarry Site Boundary
- Quarry Site - ML1633
- Quarry Site ML Extension
- Approved Extraction Area
- Approved Area of Disturbance
- Disturbed Area for Modified Operations
- Biodiversity Monitoring Locations
- Remnant Patches of Bursaria spinosa
- Power Line

FIGURE 6.1

Biodiversity Monitoring Locations

Image Source: ESRI World Imagery (2019) Data source: Walker Quarries (2019); Umwelt (2019); NSW LPI DTDB (2019); CEH Survey (November 2016)

- At least one of three control sites, being sites where the Purple Copper Butterfly is known to occur, will be inspected to confirm the species as active. These sites are currently:
    - Cox's Creek, Wallerawang – this site located around 6.5 km north of the Quarry on the eastern side of the Castlereagh Highway,
    - Eusdale Road, Yetholme – located approximately 23 km west of the Quarry, this site present east and south of Eusdale Road, and/or
    - Cheetham Flats Travelling Stock Route (TSR) – located at Hampton Road, Rydal, approximately 13 km south-west of the Quarry
- At each of the monitoring and control sites the following methods will be employed.
    - The ecologist will position themselves to survey the site and conduct visual inspections to observe any butterfly activity for at least 10 minutes per site.
    - Random plants will be searched for butterfly caterpillars.
    - Random plants will be selected and searched for ants.
    - Select Blackthorn plants will be gently shaken to trigger a flight response from any butterflies if present.
    - The age of plants (large plants and seedlings present), health (any new shoots present) and evidence of grazing (chewed leaves) will be recorded.
- A net will be used to collect any butterflies observed. Any butterflies collected will be keyed out in accordance with the field guide, Butterflies of Australia (Braby, 2016).
- All animals collected were released at their point of capture.

Ecological surveys will be undertaken to coincide with the adult flying season of the Purple Copper Butterfly which is generally between September and November.

6.3.2 Vegetation

Monitoring of local vegetation to assess the level of impact, if any, of the Quarry on the local ecological setting will be undertaken annually.

Standard plot-based floristic surveys consistent with the NSW Biodiversity Assessment Method (BAM) (NSW Government 2017) will be undertaken at six locations (identified on **Figure 6.1**) as follows.

- East of the Supplementary Stockpile Area (WALLQ1).
- South of the main storage dam (SD1) (WALLQ2).
- South of the extraction area (WALLQ3).
- East of the extraction area (WALLQ4).
- Northeast of the top working dam (WALLQ5).
- Northeast of the extraction area (WALLQ6).

A star-picket is located at the north-western corner of each plot (which have previously been surveyed as 10 x 10 m plots).

In accordance with the BAM survey will be as follows:

- The survey plots consisted of nested 20m x 50m and 20m x 20m plots
- Species composition and structure (species and percent cover) data collected from within 20m x 20m plot
- Vegetation function data (size and number of trees, presence of hollow-bearing trees and woody debris) collected from within 20m x 50m plot
- Percent of litter cover data collected within five 1m x 1m squares positioned at 5m, 15m, 25m, 35m and 45m points of 50m transect

In keeping with previous field survey, a photo of each plot will be taken from the north-western corner.

Within the six monitoring plots, and future monitoring plots on rehabilitation under maintenance, the following information on weeds will be collected.

- Exotic species richness (no. exotic species).
- Occurrence of weeds defined as high threat exotic weeds, under the BAM.
- Ground coverage percentage by exotic species.
- Trends associated with the above across monitoring campaigns.

6.3.3 Weeds

As part of annual vegetation monitoring, the consulting ecologist will complete a more general walkover of the Quarry Site and record the type, location and density of weed species.

Where weed species or density is identified as impact on the biodiversity values of the Quarry Site, the consulting ecologist will provide immediate advice and recommendations to the Quarry Manager on control or management measures which should be implemented.

The results, advice and recommendations on weed management requirements will also be included in the annual biodiversity monitoring report prepared by the consulting ecologist.

The locations of subsequent weed spraying or other management will be recorded and these areas inspected by the consulting ecologist during the next years vegetation monitoring to determine success or progress towards the completion criteria of **Table 4.6**.

6.3.4 Local Fauna

Observations of local fauna will be made through visual observation, call recognition and assessment of scat or signs of fauna.

6.4 Future Modifications to Monitoring

6.4.1 Relocation of Monitoring Sites

It is noted that three of the vegetation monitoring sites (WALLQ1 to WALLQ3), and four Purple Copper Butterfly monitoring sites (17, 18, 19 and 20/21) are located within the approved disturbance footprint of the Quarry. With refence to the Quarry MOP, none of these sites will be disturbed for several years.

However, on the basis that may eventually be disturbed, the following is planned with respect to future monitoring.

Vegetation Monitoring

The existing sites will continue to be monitored for as long as they remain uncleared by Quarry development. Forward planning schedules for clearing will be reviewed annually and when clearing of a site is planned within the upcoming 12 months, an alternative site will be identified. The new site will be surveyed for at least one year concurrent with the site to be disturbed using the same methods to establish it as a reasonable replicate of the site to be cleared. This will allow for assessment of trends to be continued.

Purple Copper Butterfly Monitoring

The existing monitoring sites represent the patches of available habitat on the Quarry Site. No other habitat is known to occur and as such, immediate replication of these monitoring sites will not be possible. It is noted that disturbance to this habitat has been assessed as part of the BDAR completed for the Quarry modification and offsetting requirements calculated.

However, as supplementary plantings of Blackthorn are established on the Quarry Site, either through revegetation of the rehabilitated final landform or within suitable areas of the Quarry Site Conservation BDMA, Walker Quarries will commence monitoring for Purple Copper Butterfly within these areas.

In the event of any change to the location or number of monitoring sites, this BDMP will be updated in consultation with BCD.

6.4.2 Rehabilitation Monitoring Sites

As rehabilitation of the Quarry Site is completed, additional quadrats will be established to allow for comparison of the vegetation of rehabilitated landform to the surrounding landforms.

The establishment of Blackthorn on suitable landforms will be prioritised and once established will be included in the annual monitoring for Purple Copper Butterfly.

On establishment of monitoring sites, this BDMP will be updated in consultation with BCD.

6.5 Analysis of Results and Contingency Management

The results of the annual Purple Copper Butterfly, vegetation, weed and fauna monitoring will be reviewed by the ecologist to assess whether there are any observable or significant trends in the occurrence of specific species or quality/quantity of available habitat. Recommendations of the ecologist engaged to undertake the monitoring will be sought and these implemented, potentially in consultation with the BCD, if deemed reasonable and feasible.

Should annual monitoring identify additional threatened species not previously identified, further advice from the ecologist and/or BCD will be sought. If additional monitoring or alternative management measures are developed in response to the identification of additional threatened species, the BDMP will be updated to include these.

Should annual monitoring identify an incident involving material impacts, or the potential for material impacts on biodiversity which is not approved by DA 344-11-2001, Walker Quarries will immediately notify the DPIE and BCD. Within seven days of the date of the incident, Walker Quarries will provide the DPIE and BCD with a detailed report on the incident, including the time and date of the incident, details of the incident, measures implemented to prevent re-occurrence. Additional reports will be prepared and provided to DPIE and BCD as requested.

7.0 Risks to Successful Implementation and Contingency Management

Condition 3(26)(g) of DA 344-11-2001 requires the BDMP to:

> "*identify the potential risks to the successful implementation of the biodiversity offset strategy, and include a description of the contingency measures that would be implemented to mitigate these risks*".

As described in **Section 5.0**, the BOS provides for retirement of biodiversity credits prior to commencement of disturbance as part of a staged strategy and hence risks to implementation are mitigated.

Table 7.1 identifies the key risks to successful achievement of the biodiversity performance objectives of the BMP (**Table 3.1**) (based on the key threats described in **Section 3.1**) and outlines the approach to contingency management in the form of Trigger Action Response Plans (TARP). These TARPs address the requirement of

Table 7.1 Trigger Action Response Plans

Threat	Objective	Potential Adverse Outcome	Trigger	Action/Response
Vegetation Clearing	Implement access track management strategy.	Uncontrolled access on Quarry Site and disturbance to vegetation.	Evidence of uncontrolled access observed.	Implement additional training or instruction to workforce. Remediate any damage caused by uncontrolled Quarry-related vehicular access.
	All clearing undertaken within approved impact footprint.	Unauthorised impacts on native flora & fauna.	Clearing beyond approved impact footprint.	Notification of the DPIE and BCD. Remediation and rehabilitation of cleared area in conjunction with other instruction provided by regulatory authorities. Review and update (as required) of vegetation clearing protocol.
Habitat Disturbance	No avoidable impacts on fauna habitat. All pre and post vegetation clearing administrative controls implemented	Unauthorised impacts on native flora and fauna.	Observed injury/death to native fauna.	Transfer of injured wildlife to wildlife rescue service. Notification of relevant regulatory authority. Review and update (as required) of vegetation clearing protocol.
	Maximise re-establishment of fauna habitat in final landform.	Final land use objectives not achieved	Rehabilitation commitments of the Quarry MOP not achieved, i.e. completion of progressive rehabilitation phases.	Prepare and implement a plan for accelerated rehabilitation. Undertake remedial rehabilitation works.

Threat	Objective	Potential Adverse Outcome	Trigger	Action/Response
Weed and Feral Pest Species	Decrease in number and abundance of weed species.	Occurrence of weed species	High threat exotic weeds, as defined under the Biodiversity Assessment Method identified	Include specific species and areas in annual weed spaying program.
		Increased abundance/ coverage of weed species	No. weed species within vegetation plots >20% total species richness Ground coverage by weed species > 10%	
	Reduction in feral pest numbers.	Feral pests observed in significant numbers.	Identification in annual biodiversity monitoring. Observation by personnel.	Consult with local pest management authorities. Review and propose management controls. Implement reasonable and feasible controls.
Erosion and Sedimentation	Reduction in land area subject to active soil erosion and stream bed erosion.	Reduction in habitat value of downstream drainage lines.	Observation of sedimentation below Quarry water storages. Elevated total suspended sediment (TSS) in discharge (refer to Soil and Water Management Plan)	Remove sediment and review on-site water management strategies as part of Soil and Water Management Plan review.
Changes to Local Drainage	Avoid adverse effects on drainage line habitat.			
Land Contamination	Prevent contamination of land and water.			
Vehicle Trauma	Minimise fauna mortality	Reduced biodiversity	Observed fauna mortality.	Report to relevant agency (ies), e.g. BCD.

Where notification to the DPIE and BCD is nominated, this will be undertaken in accordance with *Conditions 5(9)* and *5(10)* of DA 344-11-2001.

- Should the trigger represent an incident involving material impacts, or the potential for material impacts on biodiversity which is not approved by DA 344-11-2001, Walker Quarries will immediately notify the DPE and BCD.
- Within 7 days of the date of the incident, the Applicant will provide the DPE and BCD with a detailed report on the incident, including the time and date of the incident, details of the incident, measures implemented to prevent re-occurrence. Additional reports will be prepared and provided to DPE and BCD as requested.

Section 8.0 provides further information on incident identification, management, notification and reporting.

8.0 Incident Management, Notification and Reporting

8.1 Incident Identification

In accordance with *Condition 5(9)*, Walker Quarries will immediately notify the DPIE and BCD of an incident which results in, or has the potential to cause material harm to local biodiversity (in addition to that approved by DA 344-11-2001). The definition of 'material harm' has been modified after Section 147 of the *Protection of the Environment Operations Act 1997* (POEO Act), where harm to the environment is considered material if:

- *it involves actual or potential harm to ecosystems that is not trivial; or*
- *it results in actual or potential damage to biodiversity which requires remediation.*

8.2 Incident Management, Notification and Reporting

On identification of an incident as defined in **Section 8.1**, which may follow receipt of a complaint or notification by an external party, the Quarry Manager will be notified and an investigation commenced. The form of investigation will vary depending on the nature of the incident (or potential incident) but follow the general steps nominated below:

- The Quarry Manager (or delegate) will inspect the location where the incident has been identified.
- Where the incident involves clearing, the Quarry Manager will review any disturbance against plans included in the MOP and the management measures nominated in **Sections 4.3** to **4.10**.
- If the disturbance has been undertaken in compliance with the MOP and BDMP management measures, no further action will be taken and in the case of a complaint, the Quarry Manager will confirm with the complainant that the incident has been investigated.
- If the Quarry Manager is not satisfied the disturbance is compliant, Walker Quarries will immediately notify the DPIE and BCD.
- Where the disturbance is determined by the Quarry Manager (or delegate) to be minor and will not impact on any threatened flora or fauna, a plan to remediate the area of disturbance will be prepared.
- Where the Quarry Manager is unable to confirm the disturbance as minor, or unlikely to impact on any threatened flora or fauna, Walker Quarries will commission a qualified ecologist to advise on appropriate mitigation.
- Within seven days of the date of the incident, the Applicant will provide the DPIE and BCD with a report on the incident, including the time and date of the incident, details of the incident, measures to be implemented to mitigate the impacts of the incident and measures to be implemented to prevent re-occurrence.
- Additional reports will be prepared and provided to DPIE and BCD in accordance with commitments made in the initial incident report or as requested.

Following implementation and review of the corrective measures, a short description of the incident, actions taken, and results of the corrective actions will be documented by the Quarry Manager.

Within three months of the submission of the initial incident report to the DPIE and BCD, Walker Quarries will review this BDMP and any other relevant strategies, plans and programs required under DA 344-11-2001 and revise them as required. Walker Quarries will notify the DPIE in writing that this review is being undertaken. If the review does lead to revision, Walker Quarries will submit the revised BDMP to DPIE within three months of the incident for approval.

A summary of all incidents, including dates of occurrence, corrective measures taken, and success of these measures will be compiled and reported in the Annual Review to DPIE.

9.0 Data Management, Reporting and Documentation Requirements

9.1 Review and Recording of Monitoring Data

Walker Quarries will retain records of ecological monitoring for a minimum period of four years. Monitoring records will be made available to relevant government authorities following a written request.

9.2 Reporting and Publication of Monitoring Data

Information on biodiversity management, against the objectives and performance criteria of the BDMP, will be provided annually in the Annual Review prepared for the Quarry. Walker Quarries will include all ecological monitoring reports as appendices to the Annual Review.

The Annual Review is a requirement of DA 344-11-2001 and also satisfies the requirement for an Annual Environmental Management Report for ML 1633. The Annual Review will be provided to the Compliance Divisions of the DPIE and Resources Regulator. Other government agencies will also be provided with a copy of the Annual Review, including:

- Environment Protection Authority (EPA).
- Department of Industry – Crown Lands and Water.
- NSW Biodiversity & Conservation Division within the DPIE.
- Lithgow City Council.
- Any other agencies with a statutory interest in the site.

The Annual Review, once approved by the relevant government agencies, would be published on Walker Quarries website.

10.0 Plan Implementation

10.1 Roles and Responsibilities

Table 10.1 outlines the roles and responsibilities of personnel with reference to management of flora and fauna.

Table 10.1 Roles and Responsibilities of Personnel with Respect to Management of Biodiversity

Roles	Responsibility
Operations Manager/ Compliance Manager	• Accountable for the overall environmental performance of the Quarry, including the outcomes of the BDMP. • Must ensure adequate resources are available to enable implementation of the Plan. • Manage the implementation the biodiversity management measures nominated in **Section 4.0**. • Ensure suitably trained personnel are available to implement the responsibilities of the Quarry Manager during any time of the Quarry Manager's absence from site. • Approve implementation of contingency measures as required. • Coordinate the review of the BDMP (**Section 10.3**).
Quarry Manager/ Supervisor	• Ensure the implementation of the BDMP, including reporting of non-compliances with the trigger values, and subsequent implementation of the relevant action plan. • Ensure monitoring is undertaken in accordance with the BDMP. • Review and analyse all monitoring data. • Review performance against performance criteria and initiate contingencies (in consultation with Operations Manager) as required. • Ensure all internal and external reporting requirements are met. • Initiate investigations of complaints as received from the public or government agency.
Employees and Contractors	• Operate in a manner that minimises risks of incidents to themselves, fellow workers and biodiversity values of the Mine Site. • Ensure operations are undertaken in accordance with instructions. • Ensure appropriate notification and response in the event of an environmental incident. • Show due care not to cause environmental harm. • Follow direction provided by the Operations, Compliance or Quarry Manager. • Show due care not to cause environmental harm. • Notify Supervisor or Quarry management of any biodiversity-related or environmental incident.

10.2 Competence Training and Awareness

All personnel and contractors working at the Quarry undergo an induction. This induction includes information on the management of biodiversity while working on site.

After completing the induction, workers will sign a statement of attendance and records of this are kept in the administration office.

Toolbox meetings are held to discuss whole-of-site production, management, safety and environmental issues.

The Quarry Operations Manager shall be responsible for ensuring the appropriate protection of biodiversity across the site.

10.3 Plan Review and Continual Improvement Protocol

In accordance with the *Environmental Management Strategy*, and *Condition 5(5)* of DA 344-11-2001, this BDMP will be reviewed within three months of the submission of an:

- incident as defined by **Section 8.1**
- Annual Review
- an Independent Environmental Audit completed in accordance with Condition 13 of Schedule 5 of DA 344-11-2001, and
- any modifications to this consent.

Walker Quarries will notify the DPIE in writing of any review being undertaken and if this review results in any revisions to the BDMP, submit a copy to the Secretary of the DPIE for approval (within 6 weeks of the review). Walker Quarries will consult with BCD as part of any review and update to the BDMP.

The reviews will ensure the adequacy of the BDMP and allow for opportunities of adaptive management and continual improvement. Each review will also evaluate the effectiveness of the overall biodiversity monitoring program and whether it needs to be modified.

11.0 References

Braby, M. (2016). The Complete Field Guide to Butterflies of Australia, 2nd eds, April 2016. CSIRO Publishing.

CSIRO (2002). Conservation Genetics of *Paralucia spinifera*, Bathurst Copper Butterfly.

Department of Environment and Conservation (DECC) (2006). The Vegetation of the Western Blue Mountains, including the Capertee, Coxs, Jenolan and Gurnang Areas. Unpublished report funded by the Hawkesbury Nepean Catchment Management Authority

Ecoplanning Pty Ltd (Ecoplanning) (2018a). Biodiversity Offset Strategy, Wallerawang Quarry. Prepared for: Walker Quarries, 13 July 2018.

Ecoplanning Pty Ltd (Ecoplanning) (2018b). Wallerawang Quarry Proposed modification – field survey update August 2018 (unpublished).

Ecoplanning Pty Ltd (Ecoplanning) (2019a). Biodiversity monitoring 2018 Walker Quarry, Wallerawang, NSW. Prepared for: Walker Quarries, 05 February 2019 Version: Final

Ecoplanning Pty Ltd (Ecoplanning) (2019b). Biodiversity Development Assessment Report. Wallerawang Quarry, Great Western Highway, Wallerawang, NSW. Prepared for: Walker Quarries, 30 May 2019 Version: Final 1.2

Ecoplanning Pty Ltd (Ecoplanning) (2019c). Biodiversity Offset Strategy, Wallerawang Quarry. Letter Report to Umwelt (Australia) Pty Ltd

Ecoplanning Pty Ltd (Ecoplanning) (2020). Biodiversity monitoring 2019 Walker Quarry, Wallerawang, NSW. Prepared for: Walker Quarries, 26 February 2020 Version: Final

Dexter & Kitching (1991a). Nomination for the Register of the National Estate.

Lesryk Environmental (2016). Purple Copper Butterfly Targeted Investigation Walker Quarry, Wallerawang, NSW, October 2016.

Lesryk Environmental (2017a). Ecological Investigation: Walker Quarry, Wallerawang, NSW, March 2017.

Lesryk Environmental (2017b). Purple Copper Butterfly Monitoring Report #2. Walker Quarry, Wallerawang, NSW, December 2017.

Lesryk Environmental (2017c). Vegetation Monitoring. Walker Quarry, Wallerawang, NSW, December 2017.

Office of Environment & Heritage (OEH) (2014a). Draft Guidelines for the Preparation of Biodiversity Management Plans for Major Projects – August 2014.

Office of Environment & Heritage (OEH) (2014b). Framework for Biodiversity Assessment : NSW Biodiversity Offsets Policy for Major Projects, September 2014 (Publication No. OEH 2014/0675)

Pacrim Environmental (Pacrim) (2001). Environmental Impact Statement Proposed Wallerawang Quarry. Prepared for Sitegoal Pty. Limited, November 2001 (report 01/206.1).

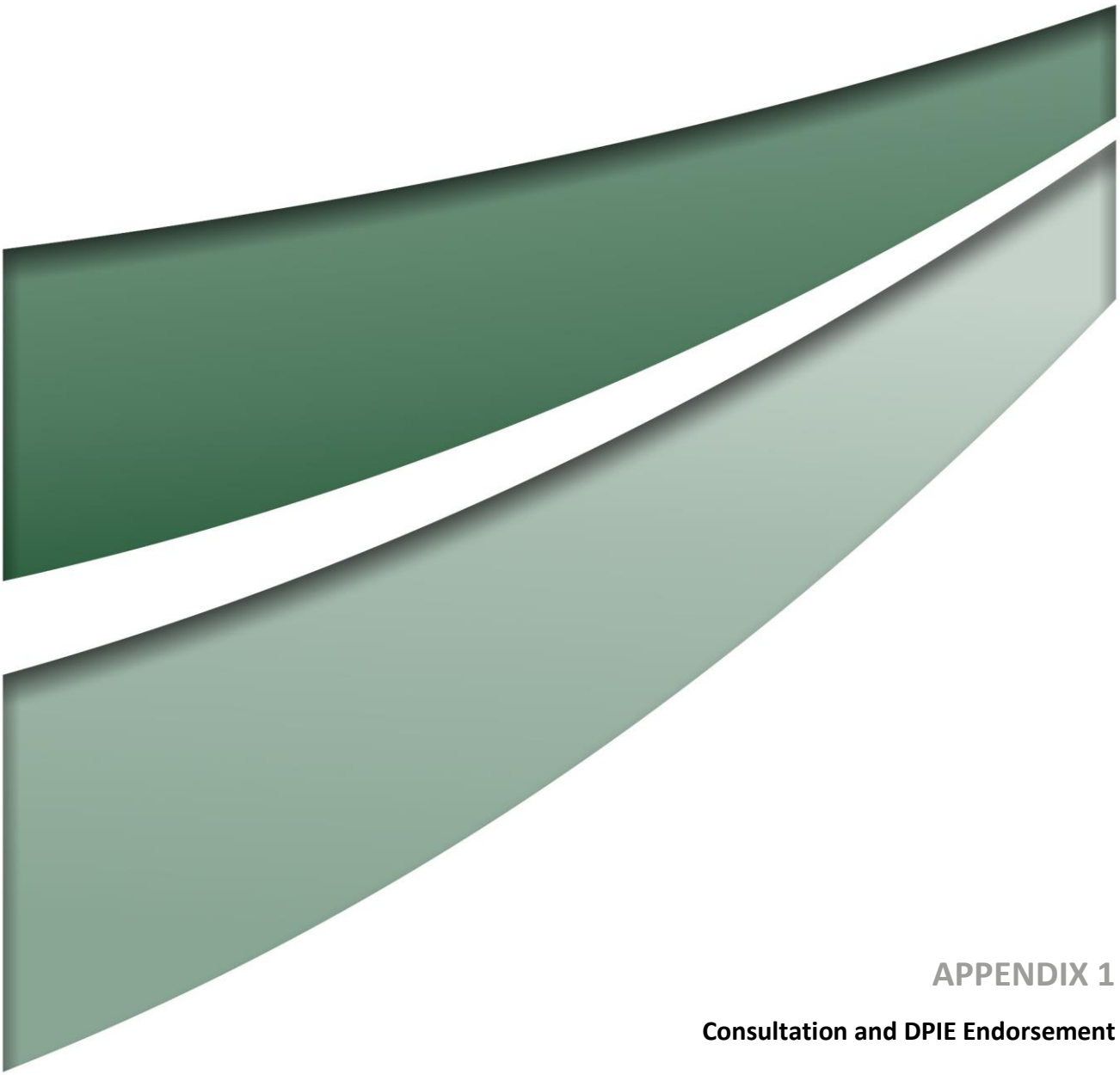
RW Corkery & Co. Pty Limited (RWC) (2017). Environmental Assessment for the Modification to the Operations at the Wallerawang Quarry (DA 344-11-2001), May 2017. Prepared on behalf of Walker Quarries Pty Ltd.

RW Corkery & Co. Pty Limited (RWC) (2018). Mining Operations Plan (incorporating Rehabilitation Management Plan). March 2018. Prepared on behalf of Walker Quarries Pty Ltd.

Umwelt (Australia) Pty Limited (Umwelt) (2019). Statement of Environmental Effects Wallerawang Quarry Modification 3 (DA 344-11-2001).

Wildthing Environmental Consultants (Wildthing) (1999). Statement of Effect on Threatened Flora and Fauna over land proposed for development of a Hard Rock Quarry within EL 44473 near Wallerawang NSW.

Wildthing Environmental Consultants (Wildthing) (2002). *Paralucia spinifera* (Bathurst Copper Butterfly) Survey for the Proposed Wallerawang Quarry near Wallerawang NSW.



APPENDIX 1

Consultation and DPIE Endorsement

Planning, Industry & Environment

Mr Alex Walker
Principal Environmental Consultant

Wallerawang Quarry
963 Great Western Highway
MARRANGAROO NSW 2790

28/05/2020

Dear Mr Irwin

Wallerawang Quarry (DA344-11-2001)
Approval of Expert for Management Plan Preparation

I refer to your request for the Planning Secretary's approval of suitably qualified persons to prepare three management plans required under the Wallerawang Quarry (DA344-11-2001) development consent.

The Department has reviewed the nomination of Mr Alex Walker, and the supporting information you have provided, and is satisfied that Mr Walker is suitably qualified and experienced. The Department also notes that Mr Walker has been previously approved by the Department to prepare the management plans listed below.

Consequently, I can advise that the Planning Secretary approves the appointment of Mr Walker to prepare and/or revise the following management plans:

- Soils and Water Management Plan (as required by condition 18(a) of Schedule 3);
- Biodiversity Management Plan (as required by condition 26(a) of Schedule 3); and
- Rehabilitation Management Plan (as required by condition 31(a) of Schedule 3).

If you wish to discuss the matter further, please contact Melissa Anderson on 8275 1392.

Yours sincerely

Matthew Sprott
Director
Resource Assessments (Coal & Quarries)

As nominee of the Planning Secretary

Alex Irwin

From: Renee Shepherd <Renee.Shepherd@environment.nsw.gov.au>
Sent: 2 November 2017 12:16 PM
To: Alex Irwin
Cc: Gen Seed; Samantha Wynn
Subject: RE: 949 - Wallerawang Quarry - Requirement to Consult with OEH
Attachments: OEH NW Draft BMP Guidelines_August 2014.doc.PDF

Hi Alex,

As discussed on Tuesday please find attached some draft guidelines for the preparation of Biodiversity Management Plans. Please note that these guidelines are now 3 years old and the new legislation has superseded some of the advice, but in general it provides an understanding of the information that we look for in a BMP.

Of particular importance is the description of the site, delineation of the site into appropriate management zones, development of an appropriate monitoring program, creation of KPIs that link into that monitoring plan, and development of a TARP to ensure that the KPIs are met.

Where a management zone requires "active" management (eg. revegetation) ensure that KPIs are developed for relevant timeframes (eg. 2, 5, 10, 15 years etc) so that the expected ecological trajectory can be monitored and relevant response actions can be implemented where the KPIs aren't met.

Ensure that all of the components in Schedule 3 Condition 26 of the project approval are addressed in the BMP.

Relevant information from the existing Flora and Fauna Management Plan can be inserted into the BMP if/where it is appropriate.

If you have any other questions please do not hesitate to contact me.

Regards,
Renee.

Renee Shepherd
Senior Conservation Planning Officer
North West Branch
Regional Operations Division
Office of Environment and Heritage
48-52 Wingewarra Street (PO Box 2111) Dubbo NSW 2830
Ph: 02 6883 5355
W: www.environment.nsw.gov.au

Please note that I work Tuesday, Thursday, Friday

From: Alex Irwin [mailto:alex@rwcorkery.com]
Sent: Friday, 20 October 2017 3:50 PM
To: Renee Shepherd <Renee.Shepherd@environment.nsw.gov.au>
Subject: 949 - Wallerawang Quarry - Requirement to Consult with OEH

Good afternoon Renee,

Walker Quarries Pty Ltd received approval for a modification to the project approval for the Wallerawang Quarry (DA 344-11-2001) on 25 August 2017 (attached).

Conditions 3(5) and 3(18) of DA 344-11-2001 require Walker Quarries to consult with OEH in the preparation of a Biodiversity Management Plan and Rehabilitation Management Plan respectively.

With respect to the nominated conditions, and noting that Walker Quarries is currently operating under a Floral and Fauna Management Plan (also attached), can you provide any specific requirements of OEH for the preparation and/or update of these.

I note DA 344-11-2001 requires the RMP to be submitted to the Secretary for approval by 25 November 2017 (the Biodiversity MP is not required until 31 March 2018) and so we would appreciate any advice as soon as possible.

Regards,

Alex Irwin
Senior Environmental Consultant
(Mobile 0429 635 975)

RW Corkery & Co Pty Limited

Geological and Environmental Consultants

Local Government PROCUREMENT
APPROVED CONTRACTOR

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Alex Irwin

From: Denise Wallace <Denise.Wallace@environment.nsw.gov.au> on behalf of OEH ROD BAM Support Mailbox <bam.support@environment.nsw.gov.au>
Sent: Wednesday, 18 March 2020 3:00 PM
To: Alex Irwin
Subject: BSM-661 4433_Requirement to consult with BCD

Alex

Your request has been forwarded to the relevant officer and they will be in contact soon.

This call is now closed.

Regards
The BAM Support Team

From: Alex Irwin <airwin@umwelt.com.au>
Sent: Wednesday, 18 March 2020 11:44 AM
To: OEH ROD BAM Support Mailbox <bam.support@environment.nsw.gov.au>
Subject: 4433_Requirement to consult with BCD

To the relevant Officer,

As discussed with one of your personnel, the recently modified development consent for the Wallerawang Quarry (SSD 344-11-2001) includes a condition requiring a Biodiversity Management Plan to be prepared in consultation with the Biodiversity & Conservation Division (BCD) of the DPIE.

I've attached 344-11-2001. The relevant condition is 26(b) of Schedule 3 (on page 14).

In the first instance, I am seeking guidance as to who within the BCD should be consulted.

If such consultation is outside the scope of the BCD's responsibilities, an email to confirm is requested such that I can discuss further with the compliance division of DPIE to confirm that the conditional requirement is satisfied.

Regards,

Alex Irwin
Principal Environmental Consultant

Umwelt (Australia) Pty Limited
Office 1, 3 Hampden Avenue
Orange, NSW 2800

Phone: (02) 4950 5322
Mobile: 0436 606 529

www.umwelt.com.au

Alex Irwin

From: David Geering <David.Geering@environment.nsw.gov.au>
Sent: Monday, 23 March 2020 3:01 PM
To: Alex Irwin
Subject: RE: MBP guidelines

Hi Alex

I would suggest you discuss this with your colleagues as I imagine that someone in Umwelt will have experience with the preparation of these documents.

Regards

David

David Geering
Senior Conservation Planning Officer, North West
Biodiversity and Conservation Division | Department of Planning, Industry and Environment

48-52 Wingewarra Street, Dubbo 2830
PO Box 2111 Dubbo NSW 2830
T: 02-6883-5335 | E david.geering@environment.nsw.gov.au
www.dpie.nsw.gov.au

From: Alex Irwin <airwin@umwelt.com.au>
Sent: Monday, 23 March 2020 2:56 PM
To: David Geering <David.Geering@environment.nsw.gov.au>
Subject: RE: MBP guidelines

Thanks David,

The reference to the guideline is appreciated. I note that there is a Biodiversity Management Plan for the Wallerawang Quarry so hopefully we will not have to revise / reinvent too much.

I also note that the consent for Wallerawang Quarry also contains a condition requiring a Biodiversity Offset Strategy to be prepared in consultation with BCD (see attached). I had originally considered this as redundant as it references the offset requirements of Mod 1 and completion by February 2018, however, on further discussion with the Department of Planning, Industry and Environment I understand this ought to be updated to reflect Modification 3. Furthermore, it is refenced in the condition requiring a Biodiversity Management Plan.

Is there anyone within BCD I can discuss the preparation of an updated Biodiversity Offset Strategy with? In particular, I am interested in discussing the relationship between Condition 24, 26 and 28A.

Regards,

Alex Irwin
Principal Environmental Consultant

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From: David Geering <David.Geering@environment.nsw.gov.au>
Sent: Monday, 23 March 2020 1:26 PM
To: Alex Irwin <airwin@umwelt.com.au>
Subject: MBP guidelines

Hi Alex

I've attached some unofficial guidelines for the preparation of BMPs. These guidelines are some 6 years old but the basic principles will be the same.

Again, it is important that the document is clear and that the targets are measurable and realistic.

Regards

David

David Geering
Senior Conservation Planning Officer, North West
Biodiversity and Conservation Division | Department of Planning, Industry and Environment

48-52 Wingewarra Street, Dubbo 2830
PO Box 2111 Dubbo NSW 2830
T: 02-6883-5335 | E david.geering@environment.nsw.gov.au
www.dpie.nsw.gov.au

Alex Irwin

From: David Geering <David.Geering@environment.nsw.gov.au>
Sent: Friday, 22 May 2020 8:47 AM
To: Alex Irwin
Subject: Wallerawang Quarry Biodiversity Management Plan
Attachments: BCD response - Wallerawang Quarry BMP.pdf

Hi Alex

Please find attached OEH's comments on the Wallerawang Quarry BMP.

Please let me know if you have any questions.

David

David Geering
Senior Conservation Planning Officer, North West
Biodiversity and Conservation Division | Department of Planning, Industry and Environment

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Our Vision: Together, we create thriving environments, communities and economies.

From: Alex Irwin <airwin@umwelt.com.au>
Sent: Wednesday, 6 May 2020 9:40 AM
To: David Geering <David.Geering@environment.nsw.gov.au>
Subject: HPE CM: RE: 4433_Wallerawang Quarry Biodiversity Management Plan

David,

Please find attached. For your information and hopefully ease of review) updated / revised information from the previous version (of April 2019) is identified in blue text.

Thank you for getting back to me on this matter.

Regards,

Alex Irwin
Principal Environmental Consultant

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From: David Geering <David.Geering@environment.nsw.gov.au>
Sent: Wednesday, 6 May 2020 9:37 AM
To: Alex Irwin <airwin@umwelt.com.au>
Subject: RE: 4433_Wallerawang Quarry Biodiversity Management Plan

Alex

Further to your query on 28 April 2020 about the BMP for Wallerawang Quarry. I still have not received this document. If you wish us to review it you will need to forward it to me again.

Cheers

David

David Geering
Senior Conservation Planning Officer, North West
Biodiversity and Conservation Division | Department of Planning, Industry and Environment

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Our Vision: Together, we create thriving environments, communities and economies.

From: David Geering
Sent: Wednesday, 29 April 2020 8:53 AM
To: Alex Irwin <airwin@umwelt.com.au>

Cc: Samantha Wynn <Samantha.Wynn@environment.nsw.gov.au>
Subject: RE: 4433_Wallerawang Quarry Biodiversity Management Plan

Alex

A request to review the BMP did come through the Major Projects portal but this was withdrawn almost immediately, again as a notification in the Major Projects portal. As a consequence this BMP was not reviewed.

Regards

David

David Geering
Senior Conservation Planning Officer, North West
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www.dpie.nsw.gov.au

From: Alex Irwin <airwin@umwelt.com.au>
Sent: Tuesday, 28 April 2020 2:14 PM
To: David Geering <David.Geering@environment.nsw.gov.au>
Subject: 4433_Wallerawang Quarry Biodiversity Management Plan

David,

We spoke in late March regarding the preparation of a revised Biodiversity Management Plan (BMP) and Biodiversity Offset Strategy (BOS) for the Wallerawang Quarry (as approved on 26 February as SSD DA 344-11-2001).

Taking note of the draft *Guidelines for the Preparation of Biodiversity Management Plans for Major Projects* provided, I submitted the document to DPIE on 9 April 2020 under the understanding / instruction the document was to have been forwarded to BCD for review.

Not sure if this has occurred.

The Proponent is keen to progress retirement of first lot of biodiversity credits and therefore seek confirmation of the proposed biodiversity offset strategy contained in the BMP. Can you review and confirm the proposed BOS on behalf of BCD?

Or would you advise the Proponent commence application to retire biodiversity offset credits?

Regards,

Alex Irwin
Principal Environmental Consultant

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PLEASE CONSIDER THE ENVIRONMENT BEFORE PRINTING THIS EMAIL

Our ref: DOC20/353524
Senders ref:

Mr Alex Irwin
Principal Environmental Consultant
Unwelt (Australia) Pty Ltd
airwin@umwelt.com.au

Dear Alex,

Wallerawang Quarry - Biodiversity Management Plan

Thank you for your email dated 6 May 2020 to the Biodiversity and Conservation Division (BCD) requesting review of the Wallerawang Quarry Biodiversity Management Plan (BMP).

BCD has reviewed the BMP. Recommendations are provided in **Attachment A** and detailed comments are provided in **Attachment B**.

Should you require further clarification on the items above please contact David Geering, Senior Conservation Planning Officer, via david.geering@environment.nsw.gov.au or 02 6883 5335.

Yours sincerely

Samantha Wynn
Senior Team Leader Planning - North West
Biodiversity and Conservation Division

21 May 2020

BCD's recommendations

Wallerawang Quarry – Biodiversity Management Plan

1.1 Quantitative performance measures, targets and trigger points for corrective action be developed.

1.2 A detailed monitoring plan to track performance towards completion criteria be developed.

1.3 Trigger points in the TARP be quantifiable and relate to performance or completion criteria.

2.1 The BMP to reflect the Consolidated Consent Conditions in regards to the retirement of the approved credit requirement.

BCD's detailed comments

Wallerawang Quarry – Biodiversity Management Plan

1 Targets should be clear and quantifiable

Successful management plans include tailored, quantitative performance measures and targets, completion criteria, monitoring and trigger points for corrective action which adhere to the SMART principles (specific, measurable, achievable, realistic, timely). Management targets must be measurable and expressed in a manner that assists in the evaluation of progress toward the strategic goals that define the completion criteria.

BCD notes that for weed management the BMP includes actions to establish baseline weed occurrence and densities and weed control and management. Performance and completion currently indicate the eradication of noxious weed species and no increase in the area of occupancy of environmental weeds. The weed control program should aim for a decrease in percent cover of environmental weeds on the site, for example less than 10% of ground cover. Targets should be quantitative and measurable.

It is also not clear how weeds will be monitored on site other than observations of type, distribution and density of weed species. It is noted that six vegetation monitoring plots are proposed with data on weed species and percentage cover being collected. This proposed monitoring may be sufficient; however, this is not clear in the BMP. A detailed monitoring plan outlining what will be done and when should be provided.

While a Trigger Action Response Plan is provided the section relating to weeds is general, i.e. the trigger for further action being an increase in weeds. Tigger points should be quantifiable and relate to performance or completion criteria.

Recommendations:

1.1 Quantitative performance measures, targets and trigger points for corrective action be developed.

1.2 A detailed monitoring plan to track performance towards completion criteria be developed.

1.3 Trigger points in the TARP be quantifiable and relate to performance or completion criteria.

2. Biodiversity Offset Strategy is not required for Modification 3

BCD notes that Section 5.2 of the BMP refers to *Condition 3(28A)* of DA 344-11-2001 and the retirement of biodiversity credits associated with the increased disturbance area of Modification 3.

The consent conditions clearly state that "*The Applicant must retire biodiversity credits for Stages A to D … prior to commencing vegetation clearing in that Stage*". The BMP however suggests that credits relating only to the actual disturbance may be retired. Section 5.2.4.1 specifically states "*Prior to application to retire offset credit obligations, Walker Quarries will define the area against the relevant Stage and Tranche defined by Table 5.3, and provide for the retirement of the appropriate proportion of the credit obligation*".

It is a condition of the consent that the entire credit obligation for the stage, as detailed in Table 5A, be retired prior to the commencement of vegetation clearing in that stage. If clearing of a particular stage were not to occur, then there would be no obligation to retire the credit obligation for that stage. The entire offset obligation for a stage must be retired in full prior to impact. Retirement of a portion of a stage is not permissible under the biodiversity offset scheme. The BMP should be revised to ensure consistency with the consent conditions and the Biodiversity Conservation Act 2016.

Recommendation:

2.1 The BMP to reflect the Consolidated Consent Conditions in regards retirement of the approved credit requirement.

Our ref: DOC20/692587
Senders ref:

Mr Wayne Jones
Team Leader Post Approval
Planning & Assessment Group
wayne.jones@planning.nsw.gov.au

Dear Wayne,

Wallerawang Quarry - Biodiversity Management Plan

Thank you for your email dated 19 August 2020 to the Biodiversity and Conservation Division (BCD) requesting a further review of the revised Wallerawang Quarry Biodiversity Management Plan (BMP).

In regard to our previous comments, BCD note that quantitative performance measures, targets and trigger point have been included in the BMP; however, the monitoring plan particularly for vegetation is still considered insufficient to achieve the BMP's stated objectives. Clarity is also required around the staging of the retirement of the biodiversity offset obligation.

Recommendations are provided in **Attachment A** and detailed comments are provided in **Attachment B**.

Should you require further clarification on the items above please contact David Geering, Senior Conservation Planning Officer, via david.geering@environment.nsw.gov.au or 02 6883 5335.

Yours sincerely

Samantha Wynn
Senior Team Leader Planning - North West
Biodiversity and Conservation Division

7 September 2020

BCD's recommendations

Wallerawang Quarry – Biodiversity Management Plan

1.1 Standard plot-based floristic surveys consistent with the BAM should be used to determine condition of vegetation and to track performance of rehabilitation areas towards completion criteria.

1.2 Monitoring of weeds should occur across the entire quarry in order to identify and control weeds as required.

2.1 Proactive management in consultation with a species expert should be undertaken to maximise the potential for the Purple Copper Butterfly to recolonize suitable areas of the quarry.

2.2 Known feed plants for adult Purple Copper Butterflies should be included into the seed mix for rehabilitation areas.

2.3 The potential to establish additional patches of *Bursaria* should be explored within the Conservation Biodiversity Management Areas.

2.4 Additional monitoring sites for the Purple Copper Butterfly should be established on rehabilitation areas where *Bursaria* becomes established.

3.1 The terminology used in the BMP should be standardised to ensure clarity.

3.2 Clarification of point 2c of Section 5.4.2 is required. Further assessment of the credit obligation of previously assessed areas is not appropriate.

3.3 The inclusion of BCF payment figures is not required in the BMP as the cost of retiring credits via payment to the BCF is updated quarterly and therefore may change over time.

4.1 BCD is to be consulted in regards any recommendations made relating to changes to monitoring or management actions.

BCD's detailed comments

Wallerawang Quarry – Biodiversity Management Plan

1 A rigorous monitoring plan should be developed

BCDs previous comments dated 21 May 2020 recommended that a detailed monitoring plan to track performance towards completion criteria be developed.

The objectives of monitoring, outlined in Section 6 of the BMP, include:

- evaluate the success of flora and fauna management strategies,
- facilitate continuous improvement in rehabilitation and revegetation practices,
- record and document changes in retained vegetation within the Quarry Site, and allow for comparison with previous records, and
- ensure the ecological significance of the remnant vegetation or rehabilitated areas are maintained or improved as a result of ongoing management practices.

The BMP indicates that vegetation monitoring will identify the abundance of all vascular plant species, the dominant species and the foliage cover in each stratum in six 10 m by 10 m quadrats with additional quadrats established in rehabilitated areas. The size of the quadrats, combined with the proposed survey methodology, is unlikely to provide data representative of the vegetation communities sampled that can be used as a benchmark or identify changes in condition in a timely manner. It is also unlikely to capture the variability that might be expected in rehabilitation. For the BMP's objectives to be achieved a more rigorous survey methodology is required.

BCD recommends that standard plot-based floristic surveys, consistent with the Biodiversity Assessment Method (BAM), be used to determine condition of the vegetation of the six analogue sites and to track performance of rehabilitation areas towards completion criteria.

The BMP also suggests that monitoring of weeds will also be undertaken within the vegetation monitoring quadrats. It is important that monitoring of weeds occurs across the entire quarry in order to identify and control weeds as required.

Recommendations:

1.1 Standard plot-based floristic surveys consistent with the BAM should be used to determine condition of vegetation and to track performance of rehabilitation areas towards completion criteria.

1.2 Monitoring of weeds should occur across the entire quarry in order to identify and control weeds as required.

2. Management measures for Purple Copper Butterfly should be proactive

Section 4.9 of the BMP outlines the management measures for Purple Copper Butterfly and *Bursaria spinosa*.

It is noted that the Purple Copper Butterfly is considered extinct on the quarry site as it has not been identified during four years of monitoring (2016-2019) although it is acknowledged that this species has been recorded at other sites within the locality of the quarry. The BMP further states that the attendant ant species has also not been detected within the quarry during these survey periods.

The absence of the butterfly and the attendant ant species should not be taken as evidence that the species is extinct at a site. The ant is often difficult to detect when there are no butterfly larvae present and the butterfly is capable of colonising sites in favourable years. There is also evidence to suggest that the attendant ant species may disappear and then recolonise areas where butterflies are not present.

BCD therefore recommends that proactive management, in consultation with a species expert, be undertaken to maximise the potential for recolonization of the quarry by the Purple Copper Butterfly. This should include actions to revitalise areas of senescing *Bursaria* as well as including known feed plants for adult butterflies (such as *Cymbonotus lawsonianus, Asperula conferta, Ranunculus lappaceus*, *Davesia latefolia, Hardenbergia violacea* and *Hovea linearis*) into the seed mix for rehabilitation areas. The potential to establish additional patches of *Bursaria*, where suitable microhabitat conditions occur, should be explored within the Conservation Biodiversity Management Areas.

It is noted that the BMP commits to monitoring five patches of *Bursaria* each year; however, four of the monitoring sites occur within or immediately adjacent to the approved area of disturbance. The BMP states that no alternative monitoring sites will be established. BCD recommends that as *Bursaria* is included in the seed mix on rehabilitation areas, monitoring sites for the Purple Copper Butterfly be established at sites where *Bursaria* becomes established.

Recommendations:

2.1 Proactive management in consultation with a species expert should be undertaken to maximise the potential for the Purple Copper Butterfly to recolonize suitable areas of the quarry.

2.2 Known feed plants for adult Purple Copper Butterflies should be included into the seed mix for rehabilitation areas.

2.3 The potential to establish additional patches of *Bursaria* should be explored within the Conservation Biodiversity Management Areas.

2.4 Additional monitoring sites for the Purple Copper Butterfly should be established on rehabilitation areas where *Bursaria* becomes established.

3. Staging of the retirement of the biodiversity offset obligation needs to be clearly articulated

Section 5.2.4 of the BMP is difficult to follow. This could be improved with the consistent use of terminology. For example, there is reference to “packets”, “portions”, and “stages” within Tranches and “packages” of offsets. Table 5.3 refers to stages of the development. This should be the term used throughout the BMP when referring to the staging of the retirement of the offset obligations.

The intent of point 2c of Section 5.2.4 is unclear. It appears to imply that a modification of the development may be required if the credit requirement of the stages is deemed to have varied due to a change in the vegetation integrity score over time. The credit obligation of the development was assessed in the BDAR for the project. Further assessment of these areas is not appropriate.

Table 5 of the BMP includes the Biodiversity Conservation Fund (BCF) payment figures based on the credit value for PCTs at the time. These values change in accordance with updates of the Biodiversity Offsets Payment Calculator (BOPC). As the retirement of biodiversity credits for the project will be staged it is probable that the credit values presented in Table 5 will be inaccurate at the time of retirement of the credits. The inclusion of these payment figures is not required in the BMP.

Recommendations:

3.1 The terminology used in the BMP should be standardised to ensure clarity.

3.2 Clarification of point 2c of Section 5.4.2 is required. Further assessment of the credit obligation of previously assessed areas is not appropriate.

3.3 The inclusion of BCF payment figures is not required in the BMP as the cost of retiring credits via payment to the BCF is updated quarterly and therefore may change over time.

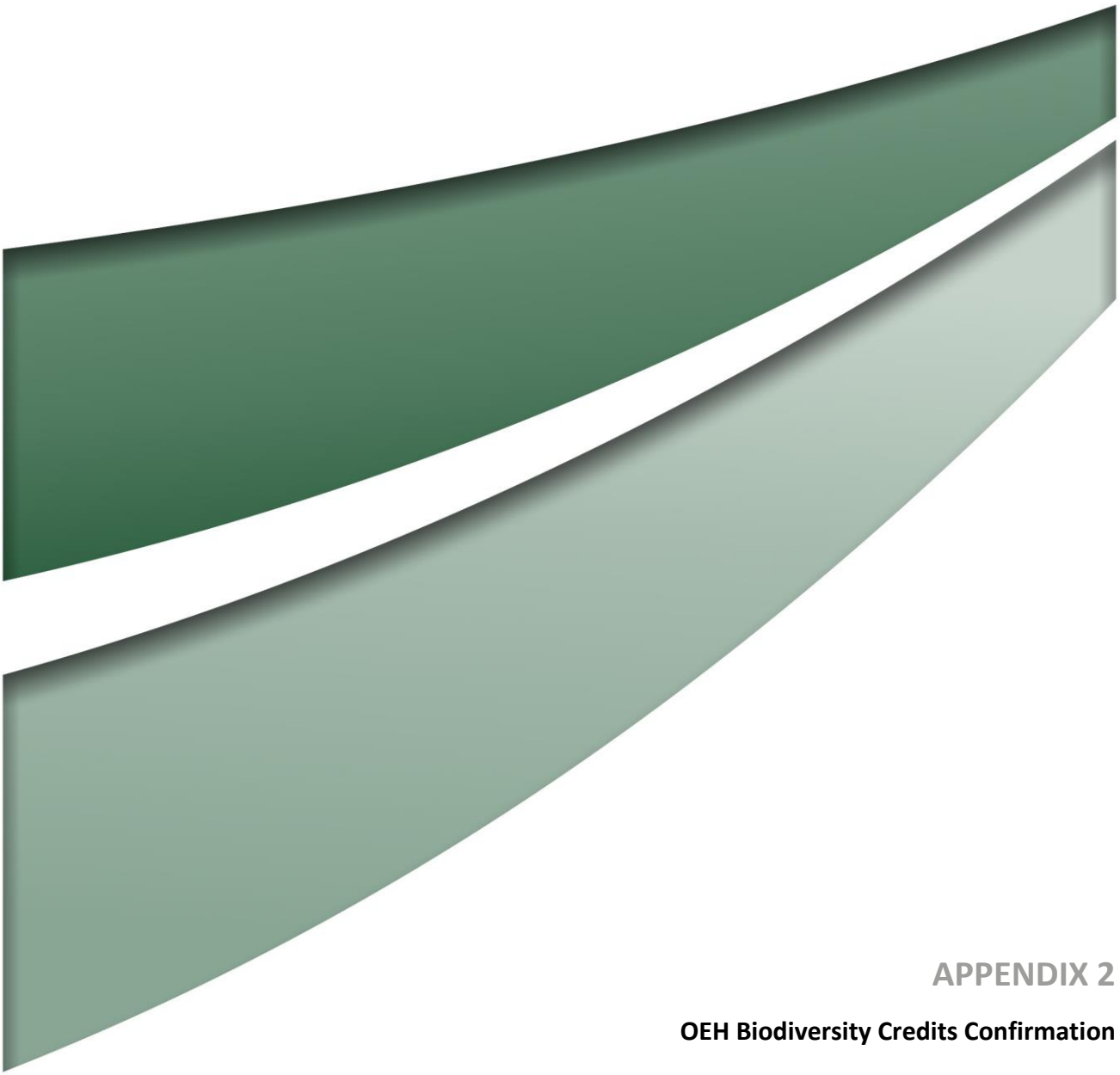
4. Changes to monitoring or management actions should be undertaken in consultation with BCD

BMPs should utilise an adaptive management approach with management measures amended in response to monitoring results to ensure more effective management and mitigation are implemented over time.

It is stated in Section 6.5 that "*recommendations of the ecologist engaged to undertake the monitoring will be sought and these implemented, potentially in consultation with the BCD, if deemed reasonable and feasible*". BCD wishes to be consulted with regards to any recommendations made relating to changes to monitoring or management actions.

Recommendation:

4.1 BCD is to be consulted in regards any recommendations made relating to changes to monitoring or management actions.



APPENDIX 2

OEH Biodiversity Credits Confirmation

Appendix 2

Consultation with OEH

Alex Irwin

From: Renee Shepherd <Renee.Shepherd@environment.nsw.gov.au>
Sent: 2 November 2017 12:16 PM
To: Alex Irwin
Cc: Gen Seed; Samantha Wynn
Subject: RE: 949 - Wallerawang Quarry - Requirement to Consult with OEH
Attachments: OEH NW Draft BMP Guidelines_August 2014.doc.PDF

Hi Alex,

As discussed on Tuesday please find attached some draft guidelines for the preparation of Biodiversity Management Plans. Please note that these guidelines are now 3 years old and the new legislation has superseded some of the advice, but in general it provides an understanding of the information that we look for in a BMP.

Of particular importance is the description of the site, delineation of the site into appropriate management zones, development of an appropriate monitoring program, creation of KPIs that link into that monitoring plan, and development of a TARP to ensure that the KPIs are met.

Where a management zone requires "active" management (eg. revegetation) ensure that KPIs are developed for relevant timeframes (eg. 2, 5, 10, 15 years etc) so that the expected ecological trajectory can be monitored and relevant response actions can be implemented where the KPIs aren't met.

Ensure that all of the components in Schedule 3 Condition 26 of the project approval are addressed in the BMP.

Relevant information from the existing Flora and Fauna Management Plan can be inserted into the BMP if/where it is appropriate.

If you have any other questions please do not hesitate to contact me.

Regards,
Renee.

Renee Shepherd
Senior Conservation Planning Officer
North West Branch
Regional Operations Division
Office of Environment and Heritage
48-52 Wingewarra Street (PO Box 2111) Dubbo NSW 2830
Ph: 02 6883 5355
W: www.environment.nsw.gov.au

Please note that I work Tuesday, Thursday, Friday

From: Alex Irwin [mailto:alex@rwcorkery.com]
Sent: Friday, 20 October 2017 3:50 PM
To: Renee Shepherd <Renee.Shepherd@environment.nsw.gov.au>
Subject: 949 - Wallerawang Quarry - Requirement to Consult with OEH

Good afternoon Renee,

Walker Quarries Pty Ltd received approval for a modification to the project approval for the Wallerawang Quarry (DA 344-11-2001) on 25 August 2017 (attached).

Conditions 3(5) and 3(18) of DA 344-11-2001 require Walker Quarries to consult with OEH in the preparation of a Biodiversity Management Plan and Rehabilitation Management Plan respectively.

With respect to the nominated conditions, and noting that Walker Quarries is currently operating under a Floral and Fauna Management Plan (also attached), can you provide any specific requirements of OEH for the preparation and/or update of these.

I note DA 344-11-2001 requires the RMP to be submitted to the Secretary for approval by 25 November 2017 (the Biodiversity MP is not required until 31 March 2018) and so we would appreciate any advice as soon as possible.

Regards,

Alex Irwin
Senior Environmental Consultant
(Mobile 0429 635 975)

RW Corkery & Co Pty Limited

Geological and Environmental Consultants

Local Government PROCUREMENT
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Office of Environment & Heritage

DOC18/370808

Statement of assessment of reasonable equivalence of biodiversity credits

A delegate of the Chief Executive of the Office of Environment and Heritage has determined that the number of biodiversity credits required to be retired under the *Threatened Species Conservation Act 1995* (**TSC Act**) as part of the development consent listed in Part 1, are reasonably equivalent to the number and class of biodiversity credits under the *Biodiversity Conservation Act 2016* (**BC Act**) set out in Part 2.

This document outlines that determination, made in accordance with clause 22(3) of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*.

Part 1 Existing statutory obligation to retire credits

Request made by:	Walker Quarries Pty Ltd (ACN 003 061 890)
Date received	23rd April 2018
Development Consent number	DA 344-11-2001
Development name	Wallerawang Quarry, Lot 6, Great Western Highway, Wallerawang NSW

Existing statutory obligation reference	Biodiversity credit name (Plant Community Type name and ID, or threatened species name)	IBRA sub region	Number of credits
DA 344-11-2001	Broad-leaved Peppermint-Ribbon Gum Grassy open forest in the north east of the South Eastern Highlands Bioregion (PCT 732)	Oberon – Hawkesbury/Nepean	120
DA 344-11-2001	Red Stringybark -Brittle Gum-Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion (PCT 1093)	Oberon – Hawkesbury/Nepean	34
DA 344-11-2001	Purple Copper Butterfly	NA	184

Part 2 Determination of reasonable equivalence

The number and class of biodiversity credits that are reasonably equivalent under the BC Act are:

Ecosystem Credits

1. **Name of Plant Community Type** Broad-leaved Peppermint-Ribbon Gum Grassy open forest in the north east of the South Eastern Highlands Bioregion (PCT 732)

Number of ecosystem credits required	65
Offset trading group	Grassy Woodlands - percent cleared value greater than or equal to 50% and less than 70%
Vegetation class	Grassy Woodlands
Vegetation formation	Southern tableland Grassy Woodlands
IBRA[1] subregion	Oberon - Hawkesbury/Nepean

2. **Name of Plant Community Type** Red Stringybark -Brittle Gum-Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion (PCT 1093)

Number of ecosystem credits required	19
Offset trading group	Dry Sclerophyll forests (shrubby sub-formation) - percent cleared value greater than or equal to 50% and less than 70%
Vegetation class	Dry Sclerophyll forests (shrubby sub-formation)
Vegetation formation	Southern Tableland Dry Sclerophyll Forests
IBRA[2] subregion	Oberon - Hawkesbury/Nepean

[1] Interim Biogeographic Regionalisation for Australia
[2] Interim Biogeographic Regionalisation for Australia

Species Credits

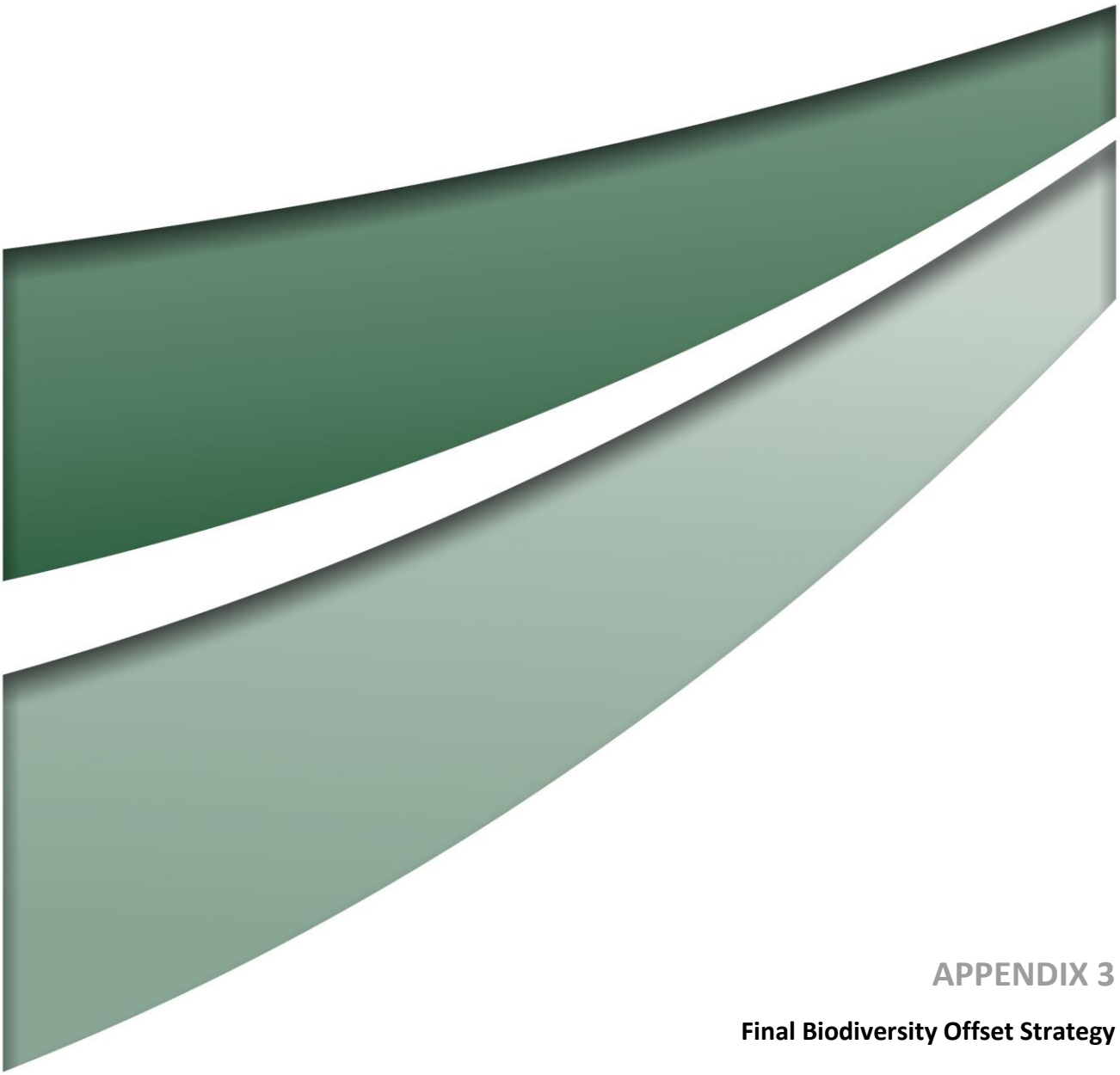
1. **Name of threatened species** Purple Copper Butterfly *Paralucia spinifera*

Number of species credits required	96
IBRA region	N/A

This statement was issued on 14 June 2018.

Authorised by: Jane Cibbs
Director, Ecosystem Assessment & Planning

Delegate of Chief Executive Officer
Office of Environment and Heritage



APPENDIX 3

Final Biodiversity Offset Strategy

Appendix 4

Biodiversity Offset Strategy

ecoplanning

ecology | planning | offsets

Biodiversity Offset Strategy

Wallerawang Quarry

Prepared for: Walker Quarries

13 July 2018

PROJECT NUMBER	2017-111	
PROJECT NAME	Wallerawang Quarry – Biodiversity Offset Strategy	
PROJECT ADDRESS	Lot 6 // DP 872230, 963 Great Western Highway, Marrangaroo NSW 2791	
PREPARED FOR	Walker Quarries	
AUTHOR/S	Brian Towle, Lucas McKinnon	
REVIEW	Lucas McKinnon	
VERSION	**Version**	**Date to client**
	1.0 – Draft	26 February 2018
	1.0 – Final	27 February 2018
	1.1 – Draft	13 July 2018
	1.1 – Final	13 July 2018

This report should be cited as: *Ecoplanning (2018). Wallerawang Quarry – Biodiversity Offset Strategy. Prepared for Walker Quarries.*

ECOPLANNING PTY LTD | 74 HUTTON AVE BULLI NSW 2516 | M: 0421 603 549

Contents

Figures

Tables

Glossary and abbreviations

ACRONYM	DESCRIPTION
BAM	Biodiversity Assessment Methodology – Established under the BC Act
BBAM	BioBanking Assessment Methodology
BBCC	BioBanking Credit Calculator
BC Act	NSW *Biodiversity Conservation Act 2016*
BSA	Biodiversity Stewardship Agreement
BOA	Biodiversity Offset Area
BOS	Biodiversity Offset Strategy
DA	Development Application
FBA	Framework for Biodiversity Assessment – Now replaced by the BAM
OEH	NSW Office of Environment and Heritage
TSC Act	NSW *Threatened Species Conservation Act 1995*

1. Introduction

Walker Quarries, a subsidiary of Sitegoal Pty Ltd, operates the Wallerawang Quarry under development consent DA 344-11-2001 issued on 19 October 2004. Wallerawang Quarry is located approximately 2.5 km south-east of the town of Wallerawang (**Figure 1.1**) and produces quartzite and rock aggregates, sands and other products.

DA 344-11-2001 was modified on 25 August 2017 to address and regularise non-compliant clearing (2.4 ha) on the Quarry Site (**Figure 1.1**). Condition 3(24) of the Notice of Modification for DA 344-11-2001 requires the development a Biodiversity Offset Strategy (BOS) for the retirement of ecosystem and species credits as set out in **Table 1.1**.

Table 1.1: Offset requirements outlined in the Notice of Modification.

Credit type	Area of impact (ha)	Number of credits
Ecosystem credits		
PCT 732 – Broad-leaved Peppermint Ribbon Gum grassy open forest in the north east of the South Eastern Highlands Bioregion	1.90	120
PCT 1093 – Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	0.5	34
Species credits		
Purple Copper Butterfly	2.4	184

The Notice of Modification (DPE 2017), specifies that the BOS must be prepared in accordance with the 'Framework for Biodiversity Assessment' (FBA; OEH 2014a) for retirement of the necessary biodiversity credits. The FBA underpins the 'Biodiversity Offsets Policy for Major Projects' (BOPMP; OEH 2014b). It contains the assessment methodology that is adopted by the policy to quantify and describe the impact assessment requirements and offset guidance that apply to Major Projects (OEH 2014b). It uses the BioBanking Assessment Methodology (BBAM; OEH 2014c) established under Part 7A of the NSW *Threatened Species Conservation Act 1995* (TSC Act), to generate biodiversity credits that can be traded to offset impacts of major projects.

On 25 August 2017 the *NSW Biodiversity Conservation Act* 2016 (BC Act) came into force repealing the TSC Act and establishing a new offset scheme using the 'Biodiversity Assessment Methodology' (BAM). Section 22(2) of the *Biodiversity Conservation (Savings and Transitional) Regulation* 2017 (the 'transitional arrangements') states that:

> *If biodiversity credits that are required to be retired under any such obligation* [conditions of a development consent] *have not been retired on the commencement of the new Act, the obligation is to be construed as requiring the retirement of biodiversity credits under the new Act that remain to be retired.*

Consequently, despite the specification within the Notice of Modification to prepare the BOS in accordance with the FBA, the transitional arrangements under the BC Act specify that the BAM must be used to calculate biodiversity credit *generation*. This position has been confirmed in correspondence with the NSW Office of Environment and Heritage (OEH).

Under the BC Act the generation of biodiversity credits is through the establishment of a Biodiversity Stewardship Agreement (BSA). The biodiversity credit obligations under the two methodologies (FBA and BAM) are not equal and section 22(3) of the transitional arrangements specify that: *the Environment Agency Head may determine the biodiversity credits under the new Act that are reasonably equivalent to the remaining biodiversity credits under the TSC Act*. A 'Statement of assessment of reasonable equivalence of biodiversity credits' was received from OEH, dated 14 June 2018 (DOC18/370808) (**Table 1.2**; see also **Appendix A**).

Table 1.2: Offset requirements outlined in the Notice of Modification.

Credit type	Area of impact (ha)	Number of credits
Ecosystem credits		
PCT 732 – Broad-leaved Peppermint Ribbon Gum grassy open forest in the north east of the South Eastern Highlands Bioregion	1.90	65
PCT 1093 – Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	0.5	19
Species credits		
Purple Copper Butterfly	2.4	96

Conditions 3(25), 3(27) and 3(28) of the Notice of Modification require the establishment and payment of a conservation bond associated with the BOS. The sum of the conservation bond is to be determined by:

(a) calculating the full cost of implementing the Biodiversity Offset Strategy at third party rates (other than land acquisition costs); and

(b) employing a suitably qualified, independent and experienced person to verify the calculated costs.

This BOS provides for payment into the Biodiversity Conservation Fund, established under the BC Act. Payment into the Biodiversity Conservation Fund for the number of reasonably equivalent credits (**Table 1.2**) would constitute the required conservation bond (in satisfaction of Conditions 3(27) and 3(28)) (see **Section 2**).

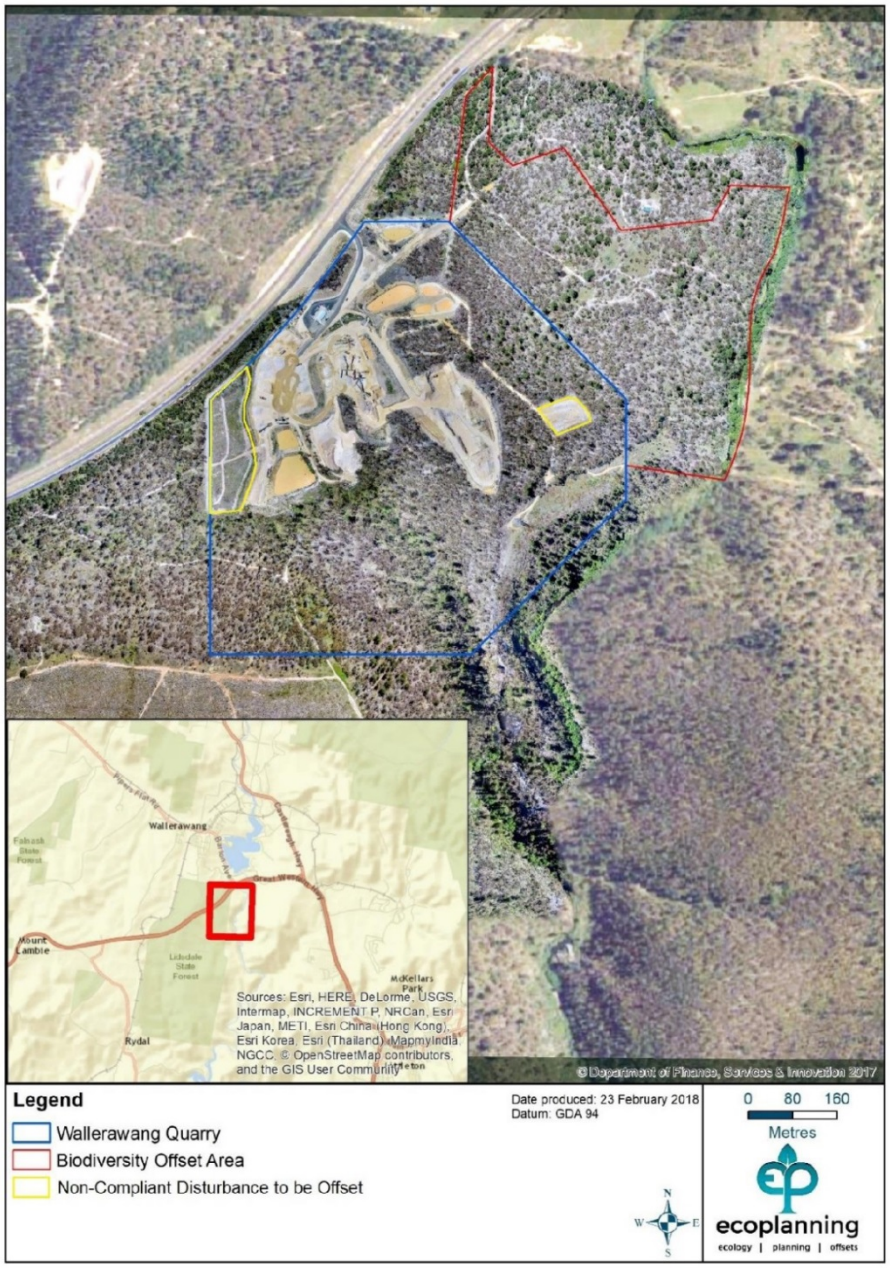


Figure 1.1: Location of Wallerawang Quarry and the proposed Biodiversity Offset Area.

2. Biodiversity Offset Strategy

Under the BOPMP (OEH 2014a), Principle 5 states that:

*…biobanking agreements **must** be used to secure offsets if any of the following conditions are met:*

- *there are appropriate credits available on the market for purchase (noting that 'reasonable steps' to locate offsets includes a requirement that an expression of interest be put on the biobanking credit register for a minimum of six months)*
- *the fund has been established, or*
- *a service agreement for establishment of biobanking agreements has been put in place by OEH.*

Prior to the BC Act coming into force, attempts were made by RW Corkery to purchase and retire the required credits using the Biobanking Public Register. That is to find, purchase and retire the required credits which have been generated from a BioBanking Agreement (RW Corkery 2017). No established BioBanking Agreements generating the credits required were identified.

Further, calculation of credit generation potential over residual land adjacent at the quarry (identified as the Biodiversity Offset Area on **Figure 1.1**) was investigated (Ecoplanning 2018). Following receipt of the reasonably equivalent credit requirement (OEH 2018b), it was determined that the credit generation of this initially proposed Biodiversity Offset Area would not meet the entire credit obligation. Consequently, the desired approach of Walker Quarries to meet the biodiversity credits obligations is payment into the Biodiversity Conservation Fund.

The costs for payment into the fund is outlined within the BAM Calculator and the 'Offsets Payment Calculator public tool' (OEH 2018b). The costs for payment into the Biodiversity Conservation Fund for the required credits are outlined in **Table 2.1**.

Table 2.1: Credit prices for payment into the BCF calculated using the 'Biodiversity Offsets Payment Calculator (OEH 2018b)'.

Credit type	Cost / credit (ex GST)[1]	Reasonably equivalent credit	Total
Ecosystem credits			
PCT 732 – Broad-leaved Peppermint Ribbon Gum grassy open forest in the north east of the South Eastern Highlands Bioregion	$3,486.75	65	$226,638.43
PCT 1093 – Red Stringybark – Brittle Gum – Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	$3,486.175	19	$66,248.16
		Ecosystem credits sub-total (ex. GST)	**$292,886.59**
Species credits			
Purple Copper Butterfly	$316.96	96	$36,377.81
		Species credit sub-total (ex. GST)	**$36,377.81**
		Total (ex GST)	**$329,264.40**
		Grand Total (incl. GST)	**$362.190.84**

[1] Price based on BOPC as 13 July 2018 (OEH 2018b)

The process of purchasing and retiring credits from the BCF is provided in **Figure 2.1**.

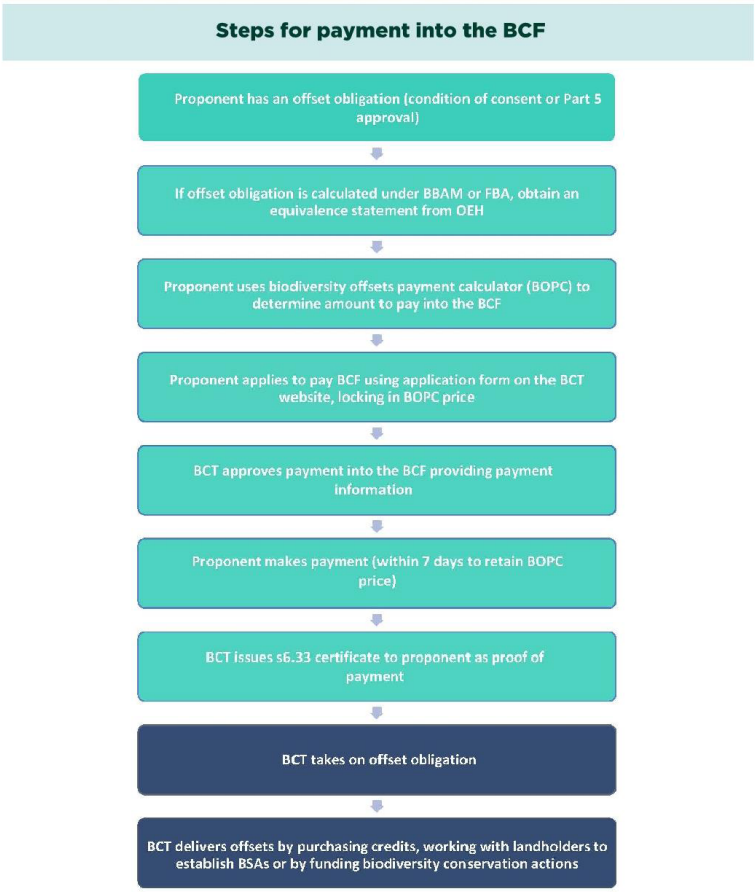


Figure 2.1: Steps for payment into the Biodiversity Conservation Fund (Source BCT 2018).

In accordance with Condition 3(25), payment will be made into the BCF by 31 December 2018. It is noted that the final value of payment required to retire the biodiversity credits will be subject to the following:

- Any fluctuation (change) in the credit costs for the credit types identified in **Table 2.1** (this may be up or down).
- Any reduction in final cost applicable (in accordance with the BC Act) for disturbance on land contained within Lidsdale State Forest (equivalent to payments already made to Forestry Corporation NSW for the disturbance of this vegetation).

Should equivalent credits (of the type and quantum nominated in **Table 1.2**) become available prior to 31 December 2018, or the price rises in the BOPC (OEH 2018b) so as make the establishment of a Biodiversity Stewardship site more cost effective, Walker Quarries reserve the right modify this BOS.

References

Ecoplanning (2018). Wallerawang Quarry – Interim Biodiversity Offset Strategy. Prepared for Walker Quarries (v 1.0).

NSW Biodiversity Conservation Trust (BCT) (2018). BCT Factsheet for Assessors: Biodiversity Conservation Fund.

NSW Department of Planning and Environment (2017). Notice of Modification to Development Consent (DA344-11-2001). Section 75W of the *Environmental Planning and Assessment Act 1979, dated 25 August 2017.*

NSW Office of Environment and Heritage (2014a). *Framework for Biodiversity Assessment.* State of NSW and Office of Environment and Heritage, Sydney.

NSW Office of Environment and Heritage (2014b). NSW Biodiversity Offsets Policy for Major Projects. State of NSW and Office of Environment and Heritage, Sydney.

NSW Office of Environment and Heritage (2014c). *BioBanking Assessment Methodology 2014.* State of NSW and Office of Environment and Heritage, Sydney.

NSW Office of Environment and Heritage (2018a). BioNet Vegetation Classification. Accessed at: http://www.environment.nsw.gov.au/NSWVCA20PRapp/default.aspx

NSW Office of Environment and Heritage (2018b). Biodiversity Offset Payment Calculator: https://www.lmbc.nsw.gov.au/offsetpaycalc

R.W. Corkery & CO. (2017) Response to Submissions for the Wallerawang Quarry. Unpublished report prepared for Walker Quarries, dated July 2017.

Appendix A: Statement of reasonable equivalence

NSW GOVERNMENT Office of Environment & Heritage

DOC18/370808

Statement of assessment of reasonable equivalence of biodiversity credits

A delegate of the Chief Executive of the Office of Environment and Heritage has determined that the number of biodiversity credits required to be retired under the *Threatened Species Conservation Act 1995* (**TSC Act**) as part of the development consent listed in Part 1, are reasonably equivalent to the number and class of biodiversity credits under the *Biodiversity Conservation Act 2016* (**BC Act**) set out in Part 2.

This document outlines that determination, made in accordance with clause 22(3) of the *Biodiversity Conservation (Savings and Transitional) Regulation 2017*.

Part 1 Existing statutory obligation to retire credits

Request made by:	Walker Quarries Pty Ltd (ACN 003 061 890)
Date received	23rd April 2018
Development Consent number	DA 344-11-2001
Development name	Wallerawang Quarry, Lot 6, Great Western Highway, Wallerawang NSW

Existing statutory obligation reference	Biodiversity credit name (Plant Community Type name and ID, or threatened species name)	IBRA sub region	Number of credits
DA 344-11-2001	Broad-leaved Peppermint-Ribbon Gum Grassy open forest in the north east of the South Eastern Highlands Bioregion (PCT 732)	Oberon – Hawkesbury/Nepean	120
DA 344-11-2001	Red Stringybark -Brittle Gum-Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion (PCT 1093)	Oberon – Hawkesbury/Nepean	34
DA 344-11-2001	Purple Copper Butterfly	NA	184

2

Part 2 Determination of reasonable equivalence

The number and class of biodiversity credits that are reasonably equivalent under the BC Act are:

Ecosystem Credits

1. **Name of Plant Community Type** Broad-leaved Peppermint-Ribbon Gum Grassy open forest in the north east of the South Eastern Highlands Bioregion (PCT 732)

Number of ecosystem credits required	65
Offset trading group	Grassy Woodlands - percent cleared value greater than or equal to 50% and less than 70%
Vegetation class	Grassy Woodlands
Vegetation formation	Southern tableland Grassy Woodlands
IBRA[1] subregion	Oberon - Hawkesbury/Nepean

2. **Name of Plant Community Type** Red Stringybark -Brittle Gum-Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion (PCT 1093)

Number of ecosystem credits required	19
Offset trading group	Dry Sclerophyll forests (shrubby sub-formation) - percent cleared value greater than or equal to 50% and less than 70%
Vegetation class	Dry Sclerophyll forests (shrubby sub-formation)
Vegetation formation	Southern Tableland Dry Sclerophyll Forests
IBRA[2] subregion	Oberon - Hawkesbury/Nepean

[1] Interim Biogeographic Regionalisation for Australia
[2] Interim Biogeographic Regionalisation for Australia

3

Species Credits

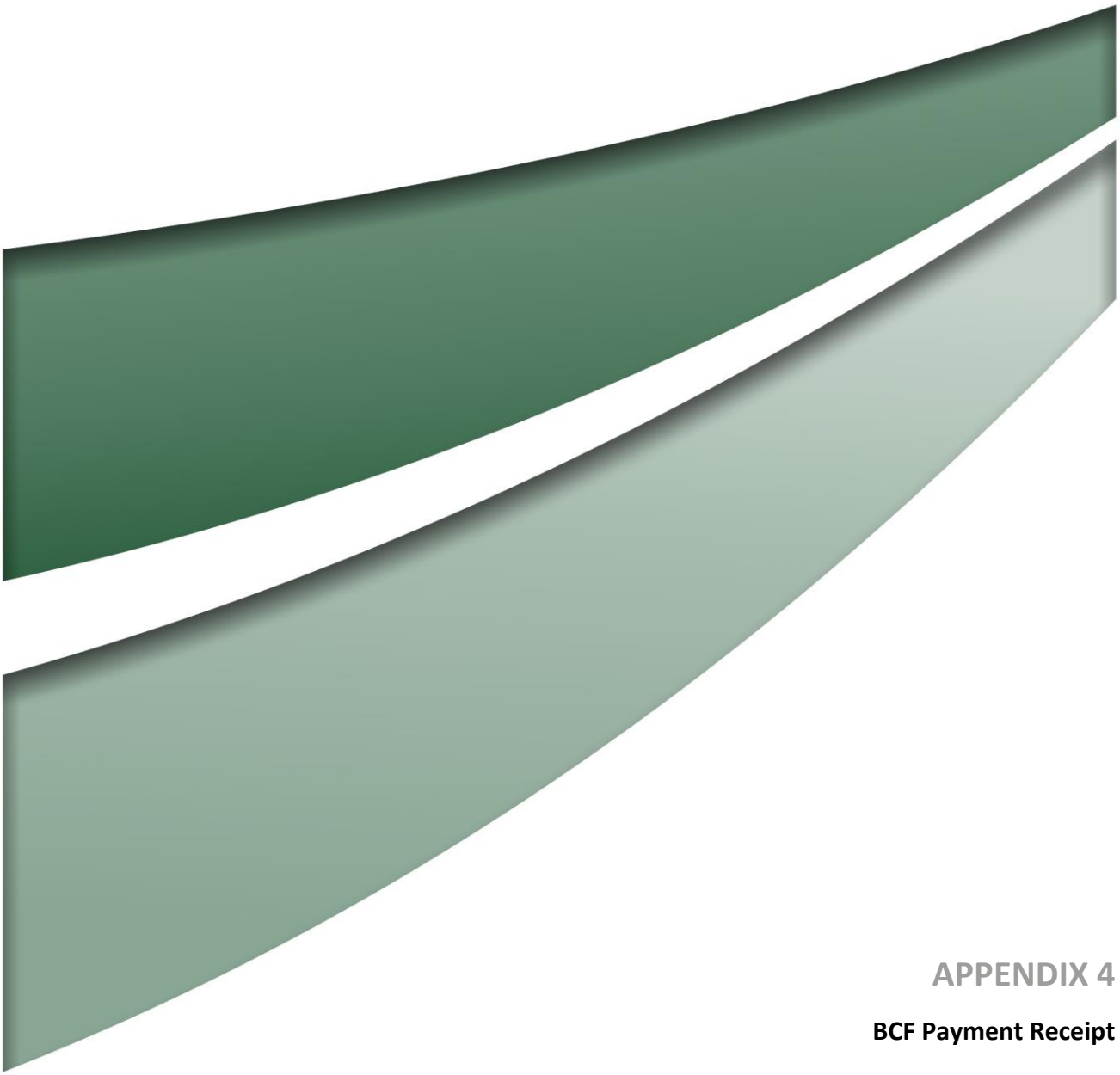
1. **Name of threatened species** Purple Copper Butterfly *Paralucia spinifera*

Number of species credits required	96
IBRA region	N/A

This statement was issued on 14 June 2018.

Authorised by: Jane Cibbs Director, Ecosystem Assessments & Planning

Delegate of Chief Executive Officer
Office of Environment and Heritage



APPENDIX 4

BCF Payment Receipt

NSW GOVERNMENT | Biodiversity Conservation Trust

Statement confirming payment into the Biodiversity Conservation Fund for an offset obligation

Pursuant to section 6.33 of the *Biodiversity Conservation Act 2016*, the NSW Biodiversity Conservation Trust confirms that the following payments have been made into the Biodiversity Conservation Fund under section 6.30(1) of the Act to satisfy an obligation to retire biodiversity credits.

Payment made by	Walker Quarries Pty Ltd
Date received	29 November 2018
Existing statutory obligation reference[1]	DA 344-11-2001
BCT Reference	BCF015

Biodiversity credit retirement obligations satisfied by payment to the Biodiversity Conservation Fund:

Biodiversity credit ID number	Biodiversity credit name	Number of credits	Cost per credit	Total payment per credit type
PCT 732	Broad-leaved peppermint- Ribbon Gum Grassy open forest in the north east of the South Eastern Highlands Bioregion	65	$2,515.29	$163,493.83
PCT 1093	Red Stringybark- Brittle Gum- Inland Scribbly Gum dry open forest of the tablelands, South Eastern Highlands Bioregion	19	$2,515.29	$47,790.50
10586	Purple Copper Butterfly	96	626.99	$60,191.33
Total (incl GST)				**$298,623.22** *GST of $27,147.56 is included in this amount*

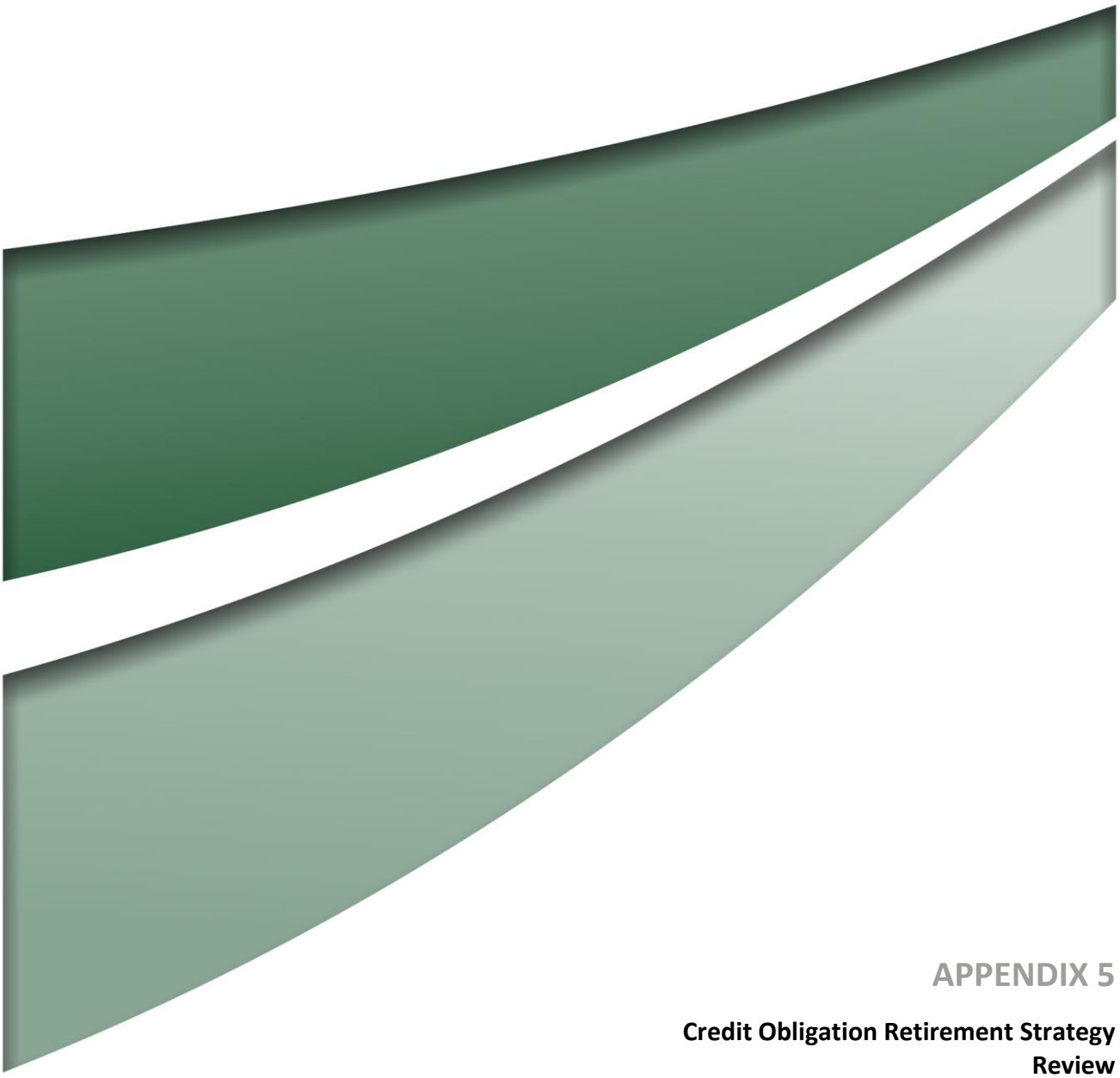
Paul Elton

Executive Director and Chief Executive

Date: 6.12.18

Paul Elton

[1] This refers to either; a development application number for a development consent under Part 4 of the *Environmental Planning and Assessment Act 1979* (**EP&A Act**), a State significant infrastructure approval under the previous Part 5.1 (now Part 5, Division 5.2) of the EP&A Act, a decision of a determining authority to carry out or approve the carrying out of an activity under Part 5 of the EP&A Act, or a biobank statement number or biodiversity certification number.



APPENDIX 5

Credit Obligation Retirement Strategy Review

ecoplanning
ecology | planning | offsets

Mr Alex Irwin
Principal Environmental Consultant
Umwelt (Australia) Pty Limited
Office 1, 3 Hampden Avenue
Orange, NSW 2800
delivered via email

19 December 2018

Re: Biodiversity Offset Strategy, Wallerawang Quarry

Dear Alex

This letter has been prepared to outline the potential biodiversity credit generation potential of land adjacent to the Wallerawang Quarry. The Wallerawang Quarry is located on land adjoining the Great Western Highway to the south of Wallerawang, approximately 8 km northwest of Lithgow. An application to extend Wallerawang Quarry has been submitted to the NSW Department of Planning, Industry and Environment (DPIE) including a Biodiversity Development Assessment Report (BDAR). The biodiversity credit obligation of the proposed quarry extension, as calculated in the BDAR and presented in the draft condition of consent, is outlined in Error! Reference source not found., including the cost of meeting the offset obligations through payment into the Biodiversity Conservation Fund (BCF). Biodiversity credits generated from land adjacent to the Wallerawang Quarry would be used to meet the offset obligations of the proposed quarry extension.

Under the NSW *Biodiversity Conservation Act 2016* (BC Act), the only mechanism to generate biodiversity credits is through the establishment of a Biodiversity Stewardship Agreement (BSA). A BSA is a legal agreement that provides for the permanent (in-perpetuity) protection and management of land for biodiversity conservation purposes.

Table 1: Biodiversity credit obligations for the proposed quarry extension and costs for payment into the BCF (as of 12 November 2019)

Tranche	Ecosystem credit requirement		Cost for payment into BCF (ex GST)#
	PCT 1093 ($4,633.76#)	PCT 732 ($8,396.50#)	
Tranche 1 (stages 1 and 3)	100	36	$765,650.00
Tranche 2 (stages 2 and 4)	64	103	$1,161,400.14
Tranche 3 (Stage 5)	52	75	$870,693.02
Tranche 4 (Stage 6)	57	-	$264,124.32
Total	**273**	**214**	**$3,061,867.48**

Prices are subject to change. Prices indicated are correct as of 18 December 2019.

Biodiversity Stewardship Site

A proposed Biodiversity Stewardship Site (BSS) has been nominated which maximises the overall area of the BSS and the number of biodiversity credits which can be generated. The proposed BSS includes all land north of the limit of the quarry infrastructure and is located across Lots 6 and 7 // DP 872230 (**Figure 1**). The total area of the proposed BSS is approximately 35.7 ha. However, for the purposes of this assessment, credit generation estimates have been limited to those areas currently supporting native woodland/forest vegetation, as determined from aerial photographic interpretation, as the credit generation from derived grasslands can be highly variable depending upon the quality of the grasslands. Further field assessment would be required to provide accurate estimates of the credit generation potential and associated costs for management of these grassland areas. An area of 30.75 ha within the BSS was identified as supporting native woodland/forest vegetation and credit generation across these areas have been calculated.

Estimation of biodiversity credit generation

The biodiversity credit generation potential of a portion of the proposed BSS (Lot 6 // DP 872230) has previously been assessed in accordance with the Biodiversity Assessment Methodology (BAM; OEH 2017a) including sampling Vegetation Integrity (VI) in VI plots. This assessment has used the results of this earlier investigation and extrapolated results across the entire proposed BSS. Mapping of Plant Community Types (PCTs) across the southern portion of the proposed BSS (Lot 6) is the result of field investigations as part of the BDAR for the proposed quarry extension and earlier offsetting investigations. Mapping of PCTs across the northern portion of the BSS (Lot 7) is based upon a review of regional vegetation mapping (DEC 2006) and extrapolation of filed validated vegetation mapping across the southern portion of the BSS (Lot 6). It is noted that this assessment is based upon a combination of field validated mapping and unvalidated regional vegetation mapping and does not represent a complete assessment in accordance with the BAM. If a formal BSS were to be established additional vegetation mapping and vegetation integrity plots would be required and the results of this additional survey may vary the results as present within this assessment. Nonetheless, the results of this assessment are considered to represent an informative guide to the likely credit generation potential of the proposed BSS which would enable a decision as to whether to proceed with more detailed investigations.

The potential for the BSS to generate species credits has not been assessed as species credits are considered a 'bonus credit', and do not yield high values in the market (order of $100's/credit) compared to ecosystem credits (order of $1,000-10,000/credit). Additionally, based upon surveys completed for the BDAR for the quarry extension, few if any species credit species may be detected during targeted surveys of the BSS.

Using the BAM Calculator, the number and type of ecosystem credits which could be generated from the BSS have been calculated with results presented in **Table 2**. Two calculations of the quantum of credits able to be generated area provided based upon required management actions at a BSS (passive management) and active management. The required management actions at a BSS and active management actions that may be undertaken out at a BSS are outlined within the BAM and replicated in **Table 3** and **Table 4**. Calculations of credit generation based upon active management have assumed that all active management actions will be undertaken, where relevant, to improve vegetation integrity scores to benchmark condition over 20 years.

An estimated 123 ecosystem credits (20 PCT 1093 and 103 PCT 732) could be generated through active management of the proposed BSS (**Table 2**). The value of these credits, as determined by the cost through payment into the BCF, is $957,514.70. It is noted that further credit generation could occur through re-vegetation of the cleared areas in the north of the proposed BSS, however, further field investigations would be required in order to give reliable advice on the number and types of ecosystem credits which could be generated by this land.

Table 2: Biodiversity credit generation

PCT	Area (ha)	Number of credits	
		Active management (Value#)	Passive management (Value#)
PCT 1093	6.85	20 ($92,675.20)	9 ($41,703.84)
PCT 732	23.90	103 ($864,839.50)	30 ($251,895)
Total	**30.75**	**123 ($957,514.70)**	**39 ($293,598.84)**

Represents the value of the credits based upon the credit price for payment into the BCF. It is noted that credit prices are subject to change.

In Perpetuity Management Costs

An estimate of the 'In Perpetuity Management Costs' is provided in the attached spreadsheet. This spreadsheet estimates the costs associated with active management of the BSS including activities such as fencing, weed control, re-vegetation, litter removal, feral animal control, access control and administrative reporting. The 'In Perpetuity Management Costs' have been estimated based on assumptions on costs for similar sites and include assumptions about natural regeneration, resilience and weed densities. These cost estimates can be revised and updated following more detailed site inspections and discussions with a suitably qualified bush regeneration company. These costs are indicative only, and Walker Quarries may be able to utilise existing staff and resources to undertake some of the management actions.

The Biodiversity Conservation Trust require that the costs to undertake these management activities are calculated at commercial rates and placed in a Total Fund Deposit (TFD). This amount is known as the 'Part A' cost. The TFD for the proposed BSS is displayed in the attachments. Please note that the TFD is not the annual cost of management but the cumulative, "in perpetuity" cost of managing the BSS. This is the total amount held by the Trust Fund. The Trust Fund then generates returns to provide the annual management costs, which are paid to the landholder (including any future landholder) to provide for the conservation management of the area.

Conclusions

The proposed BSS has the potential to generate ecosystem credits which would be able to meet a portion of the offset requirements of the proposed quarry extension. The estimated costs for management of the BSS (the 'trust fund deposit') are broadly similar to the cost of meeting an offset obligation of equal size to that being generated from the BSS, however, establishment of the BSS has the advantage that management costs are paid back over a 20 year period. It is also likely that some of the costs included in the estimates of management cost, including fencing, represent current ongoing costs to the quarry. Other benefits

associated with the establishment of a BSS would include that land within the BSS is exempt from land tax.

In order to meet a larger proportion of the biodiversity offset obligations of the quarry extension, a larger BSS would be required.

Yours sincerely,

Brian Towle

Senior Ecologist | Accredited Biobanking (#229) and BAM Assessor (#17057)
BEnvSc (Hons I)
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References

NSW Office of Environment and Heritage (2017). *Biodiversity Assessment Method.* Accessed at: https://www.environment.nsw.gov.au/-/media/OEH/Corporate-Site/Documents/Animals-and-plants/Biodiversity/biodiversity-assessment-method-170206.pdf.

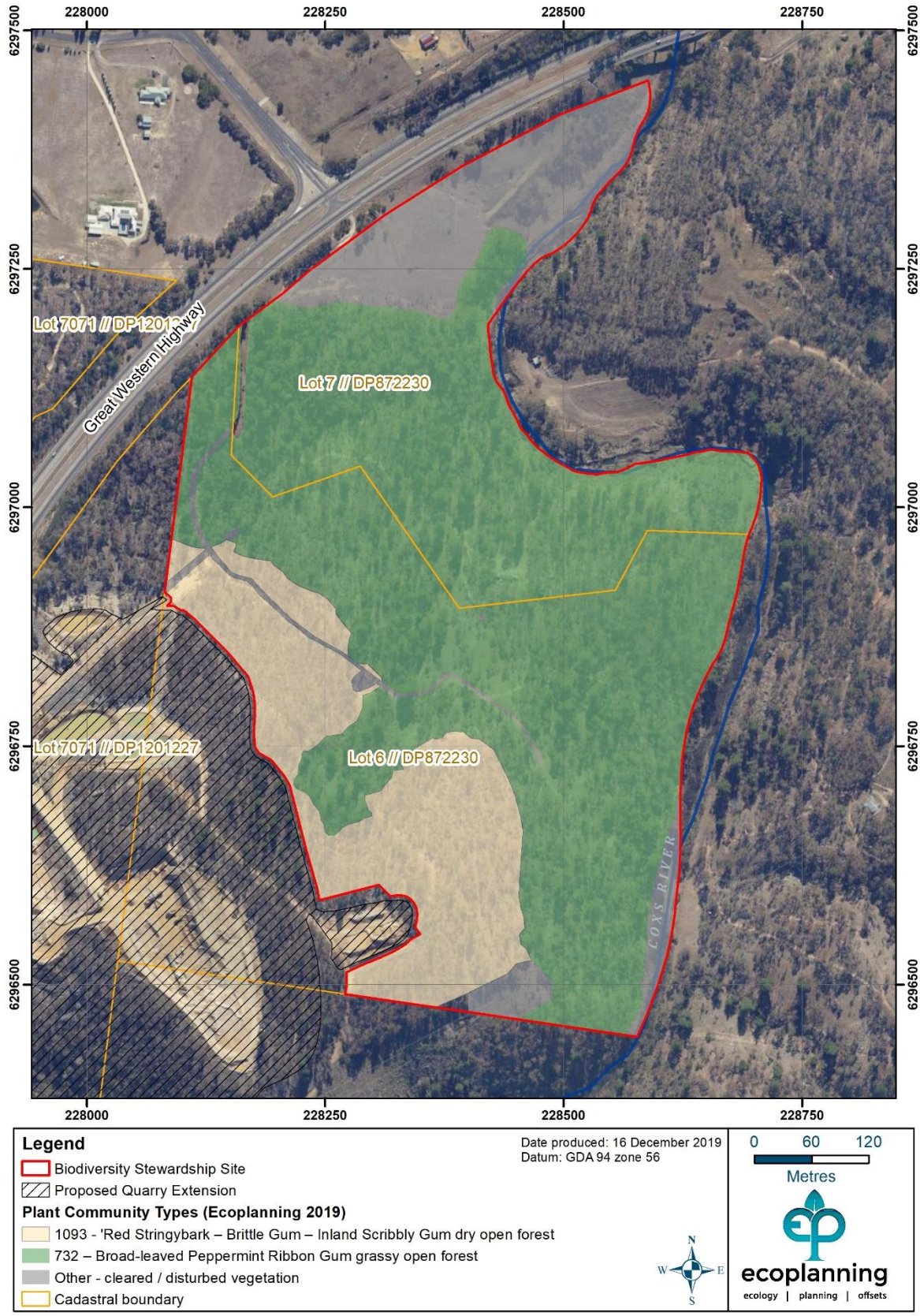

Figure 1: Proposed Biodiversity Stewardship Site and vegetation mapping

Table 3: Required management actions at a biodiversity stewardship site

Required management action	Types of management activities that may be undertaken as part of the required management action for ecosystem credits and species credits
Preparation of a management plan	Preparation of a management plan for the biodiversity stewardship agreement for the site
Fire management	Undertake ecological burning activities Prevention of fire
Grazing management	Fencing to exclude stock Strategic grazing of stock
Native vegetation management	Restore/rehabilitate native vegetation Retain and manage regrowth Undertake nutrient control Threatened species habitat management activities related to native vegetation
Threatened species habitat management	Protection of breeding habitat features or sites Undertake any other required management action identified in the Threatened Biodiversity Data Collection to create species credits or ecosystem credits required for that threatened species
Integrated pest animal control	Undertake feral pest management including control of foxes, cats, pigs, goats, avian pests, horses and any other miscellaneous species as required
Integrated weed management and control of high threat weeds	Undertake weed management and activities to control high threat exotic and other exotic vegetation Fine-scale intensive removal of high threat exotic and other exotic vegetation
Management of human disturbance	Exclude development and clearing activities except those listed as permissible in the biodiversity stewardship agreement Identify sensitive locations and protect from disturbance Undertake rubbish removal Implement measures to restrict access to the site where necessary (vehicles, etc.)
Monitoring	Monitoring for evidence of disease Assessment of the management plan and activities against the performance measures Establishment of permanent plots to provide a baseline for assessing biodiversity outcomes Establishment of 360° photo points Review of the management plan and management activities

Table 4: Active management actions at a biodiversity stewardship site

Active restoration management actions	Types of management activities that may be undertaken as part of the active restoration management actions for ecosystem credits and species credits
Habitat enhancement	Inclusion of artificial nesting boxes and the management plan specifies ongoing management, replacement and maintenance Relocation of fallen logs onto biodiversity stewardship site from appropriate sources Addition of rocks from appropriate sources Relocation and securing of dead hollow bearing stag trees from appropriate sources
Native vegetation and habitat management and augmentation	Undertake targeted supplementary planting to: • increase native plant richness and cover above the level determined for management gain • restore or enhance the condition and species composition of recognisable PCTs • improve habitat suitability for specific threatened species Restoration of PCTs through changed hydrological flows
Integrated weed management and control of high threat exotic vegetation	Removal of high threat exotic vegetation through appropriate methods (e.g. scalping) and replacement with native vegetation Other approved methods to reduce cover of high threat exotic vegetation
Hydrology management	Create artificial frog ponds or wetlands Manage drainage Install sediment trap(s) Manage debris Undertake nutrient control
Monitoring	Assessment of performance measures of outcomes related to the active restoration components such as: • evidence of occupation of and condition of artificial hollows or relocated logs and stags • persistence and abundance of species targeted by supplementary plantings or sowings

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