INTEGRATED ENVIRONMENTAL MANAGEMENT AUSTRALIA

DOLWENDEE QUARRY

Biodiversity and Rehabilitation Management Plan

Prepared for:
Upper Hunter Holdings
Brunkerville, NSW
2323

June 2026

PREPARED BY:

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DISCLAIMER

DOCUMENT CONTROL

Reference	Date	Prepared	Authorised
V0.8	June 2026	Chris Jones (IEMA), Olivia Hulbert (IEMA) and Daniel Pogson (RestoreAg)	Chris Jones
V0.7	August 2021	Chris Jones (IEMA) and Trevor Allen (Pitt and Sherry)	Chris Jones
V0.6	May 2021	Chris Jones (IEMA) and Trevor Allen (Pitt and Sherry)	Chris Jones
V0.5	December 2020	Chris Jones (IEMA)	Chris Jones
V0.4	2 September 2020	Chris Jones (SLR Consulting)	Chris Jones
V0.3	July 2020	Chris Jones (SLR Consulting)	Chris Jones
V0.2	April 2020	Chris Jones (SLR Consulting)	Chris Jones
V0.1	January 2019	Umwelt	-

Content

DOCUMENT REFERENCES

TABLES

FIGURES

APPENDICES

1 INTRODUCTION

1.1 Background

Upper Hunter Holdings Pty Ltd (UHH) have approval to commence works on the Dolwendee Quarry (the Quarry), a sandstone and conglomerate quarry located just north of the Golden Highway, approximately seven kilometres (km) north-west of Denman and 20 km south-west of Muswellbrook (refer to **Figure 1**).

The Quarry is located in Lot 2 DP 1160936 with the haul road from the Golden Highway passing through parts of Lot 5 and Lot 6 DP 1160936, and also makes use of sections of the Golden Highway Road reserve and Lot 4 DP 1160936 (see **Figure 2**). The Quarry is located within the Muswellbrook Shire Council local government area where Lots 2 and 4 DP 11650936 and lots 5 and 6 DP 1160936 are zoned Ru1 Primary Production under the Muswellbrook Local Environmental Plan 2009 (LEP) that permits without development consent extensive agriculture on this land. The quarry and access road footprint on this land are not subject to the terrestrial biodiversity or environmental sensitive land provisions of the LEP. The Quarry will supply its materials for use in construction of local rural and regional roads.

The Quarry will operate in accordance with Development Consent (SSD-6519) issued by the NSW Minister for Planning on 25 November 2016 under Section 89E of the *Environmental Planning and Assessment Act 1979* (EP&A Act). SSD-6519-MOD 1 was approved on 27 March 2026, permitting the relocation of the haul road and a reduction in its length to 1.1 km, along with changes to its intersection with the Golden Highway.

The Development Consent permits the extraction and processing of up to 250,000 tonnes per annum (tpa) for a period of 21 years from the date of commencement. In addition, no more than 30 laden trucks can be dispatched from the site on any day.

1.2 Document History

2019 Document

Umwelt Australia Pty Limited (Umwelt) prepared the initial version of the Dolwendee Quarry Biodiversity and Rehabilitation Management Plan (BRMP). This document was submitted to the Department of Planning Industry and Environment (DPIE) in January 2019, with comments provided by DPIE on 20 June 2019.

2020 - 2021 Updates

SLR Consulting Australia Pty Ltd was engaged by UHH to revise and update the BRMP with this being noted as the April, July and September 2020 versions. The following sections were updated or added:

- Document History (New Section);
- Stakeholder Consultation (New Section);
- Vegetation Screening (New Section);
- Final Landform (New Section);
- Summary of Biodiversity and Rehabilitation Bonds (New Section);
- Integration between Rehabilitation and Biodiversity (New Section); and
- Preliminary Performance and Criteria (updated to include biodiversity management); and
- Updates to Reporting and Compliance Management.

There were other small updates in sections, with a track changes comment provided to DPIE for review. The update completed by IEMA has been noted as the December 2020 version. Note, there were some changes to the table of contents in the December 2020 version to allow for a better document flow. Changes were required in May 2021 and August 2021 to cover correspondence with DPIE.

2026 Updates

The 2026 updates included general document revisions to incorporate Modification 1, including the relocation and reduction in size of the haul road and the Golden Highway intersection. The footprint of the quarry has not changed. Other key updates include revisions to the Rehabilitation and Biodiversity Offset Bonds.

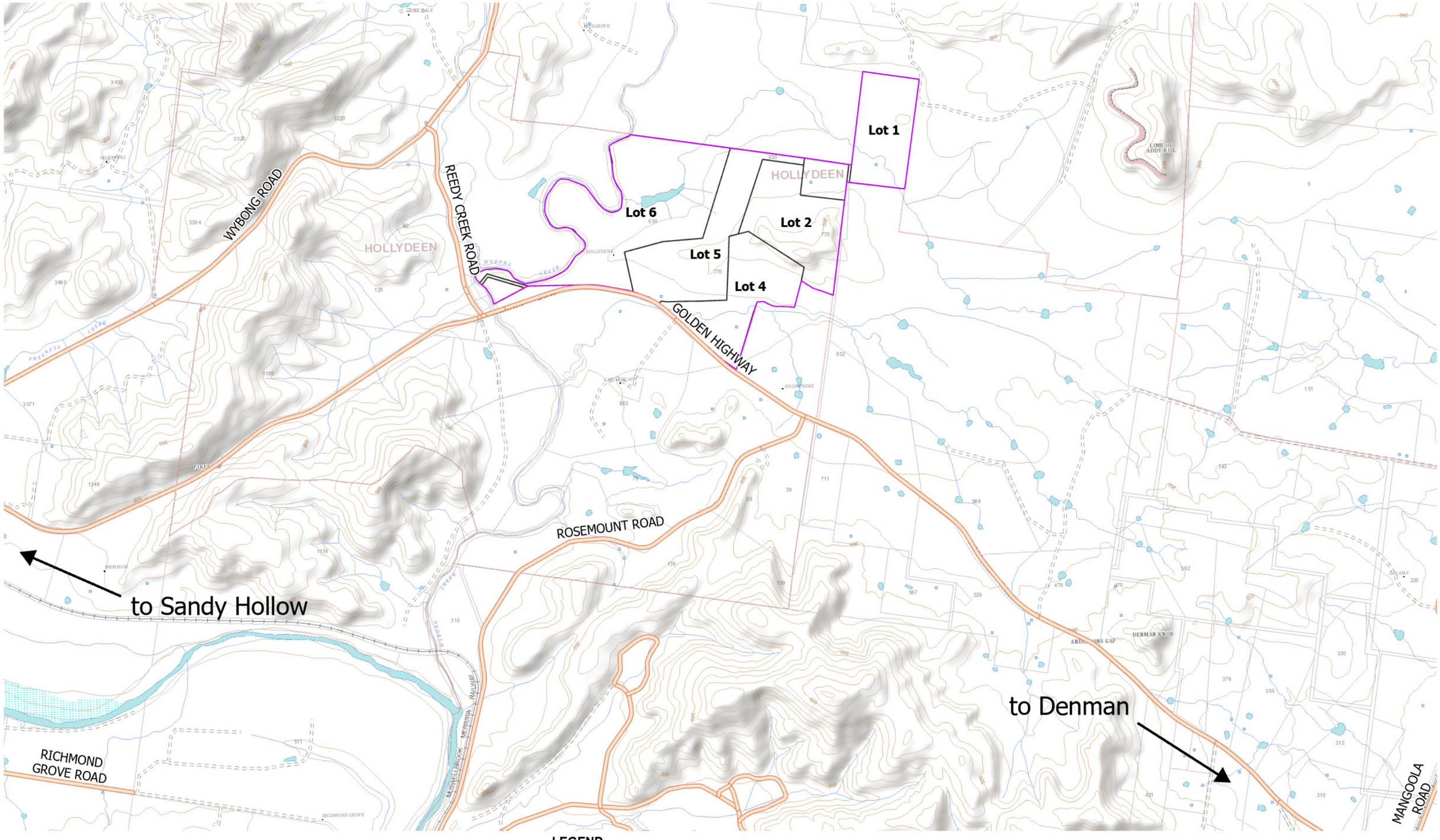
1.3 Purpose and Scope

Schedule 3 Condition 31 of the Development Consent outlines the requirement of a Biodiversity and Rehabilitation Management Plan for the Quarry. The purpose of this BRMP is to describe the biodiversity management strategies, procedures, controls and monitoring programs to be implemented for the management of approved biodiversity and rehabilitation impacts from the operation of the Quarry. The Quarry is going to be completed in phases, with this report covering the Phase 1 – Quarry Establishment and Road Works and Phase 2 – Quarry Operations. This initial construction phase does not include excavation or operation of the Quarry except for minor extraction for the works described below.

To be clear, this version of the BRMP is focussed on the first 3 years of construction and operations, following approval of the plan, as required under Condition 31(g) of the consent; however, the rehabilitation methods outlined will generally remain consistent throughout the life of the quarry. In the event of sudden closure this document would also be updated.

Phases 1 and 2 are detailed in

Table 1, noting that this construction program is indicative only and the order in which the various stages are undertaken may change.



Upper Hunter Holdings

Site Location

Dolwendee Quarry Modification

pitt&sherry

MAP REF: P.22.1614 **AUTHOR:** DP
REV: B
DATE: 22/04/2024
DATA SOURCES: Aerial imagery from ESRI, Data from Spatial Collaboration Portal, Project Specific Data

LEGEND

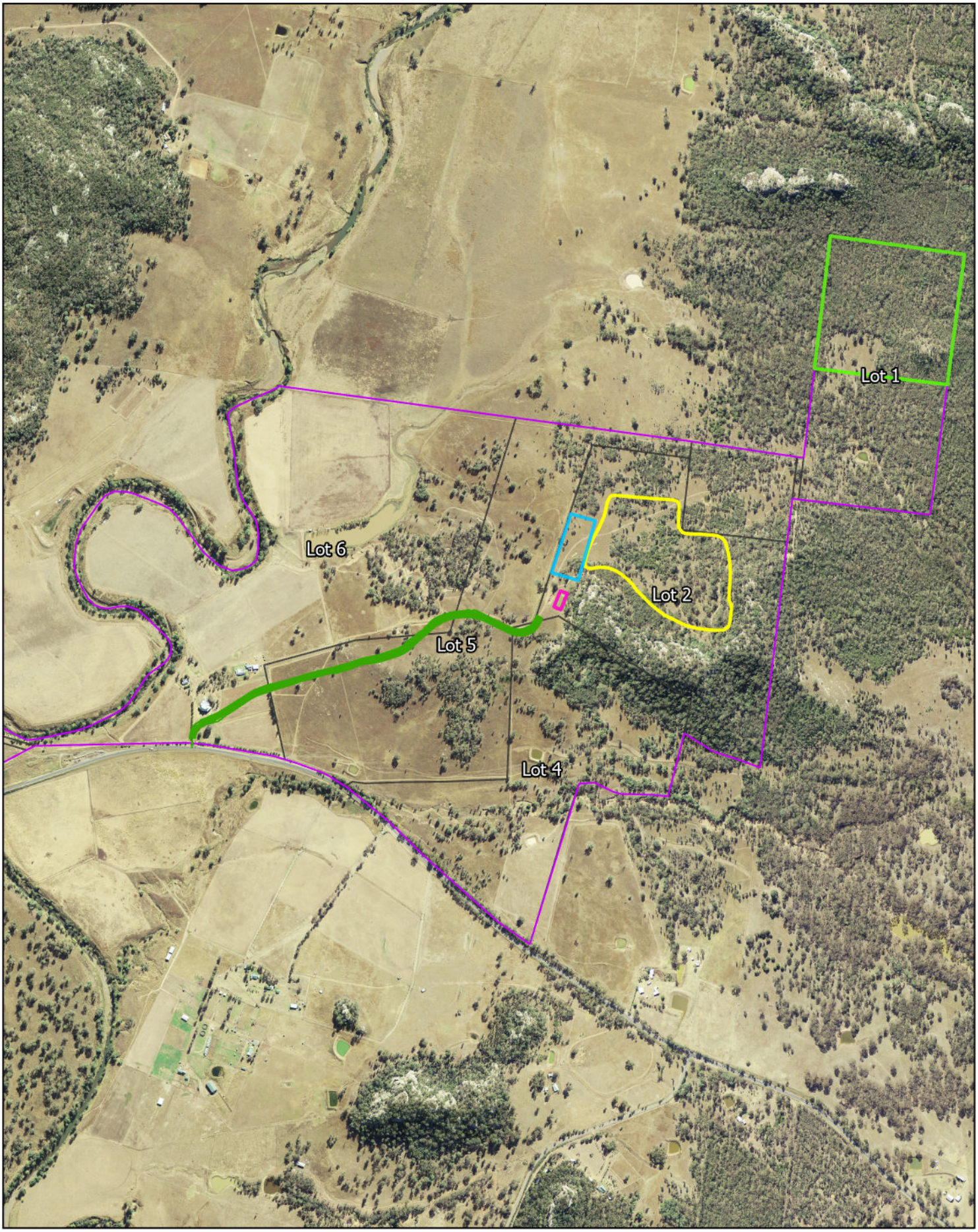
- Lot Boundary (DP1160936)
- Site Boundary
- Road

N

0 500 1,000 1,500
Metres

Scale: 1:25,000 @A3

Coordinate System: GDA 1994 MGA Zone 56



Upper Hunter Holdings

Dolwendee Quarry Modification

Site Layout

pitt&sherry

N

0 0.13 0.25 0.5 km

Coordinate System: GDA 1994 MGA Zone 56
1:15,000 When Printed at A4

MAP REF	P.22.1614
AUTHOR	JB
REVISION	RevA
DATE	28/04/2026

DATA SOURCES	Base data and map from The LIST Tasmanian Government Project specific data

Legend

- Proposed Modified Haul Road
- Biodiversity Offset Area
- Site Boundary
- Material Processing Area
- Office Area and Carpark
- Quarry Footprint

Table 1 - Phase 1 and 2 Summary

Activity	Description
PHASE 1 – CONSTRUCTION (PRE QUARRYING)	
Site establishment	Set up site office, car park, laydown and stockpile areas; install signage, define work areas, implement erosion and sediment controls, and undertake clearing, stripping, and initial earthworks including initial extraction area (source gravels for haul road establishment).
Haul road & Infrastructure	Construct haul road and site facilities, including office and basic operational infrastructure.
Intersection work	Upgrade haul road intersection with the Golden Highway, including traffic controls, drainage, and associated earthworks.
Drainage Infrastructure	Construct table drains and sediment basins with associated excavation, compaction, and stabilisation.
PHASE 2 – QUARRYING OPERATIONS	
Initial operations (Years 0 – 5)	Pre-strip overburden, establish quarry floor, and commence drilling, excavation, and material haulage.
Mid-stage operations (Years 5–15)	Continue extraction with changes to quarry orientation and progression, including ongoing blasting and material processing.
Long-term operations (15+ years	Continue westward quarry expansion with ongoing extraction, crushing, and transport activities.

Phase 3 will include the post operational activities. Further information regarding this stage will be completed in subsequent reviews. Biodiversity and Rehabilitation management measures are detailed in **Section 5.**

1.3.1 Objectives of BRMP

The primary objective of this BRMP is to direct the short to long term management and enhancement of the biodiversity values of the Quarry and its offset, as well as provide a detailed description of the measures to be implemented to achieve this over the next 3 year period (starting from the commencement of construction and operation, following approval of this plan).

The other objectives of the BRMP are to:

- Identify and describe the areas of land that will be required to be managed in accordance with this BRMP;
- Identify the phases of development and the ongoing updating of this BRMP to reflect each phase or phases;
- Provide clear and concise instructions for the management measures to be implemented in accordance with the Development Consent Conditions to achieve the conservation management objectives and minimise the impacts of key threats;
- Provide a working schedule for the implementation of activities required from the BRMP; and
- Describe monitoring, performance evaluation and reporting procedures that are informative, practical and achievable.

Schedule 3 Condition 29 of the Development Consent identifies the Rehabilitation Objectives for the development. An update on how the site is tracking against these objectives will be provided in future Annual Reviews which is a requirement of Schedule 5 Condition 9.

2 REGULATORY REQUIREMENTS

2.1 Development Consent

Table 2 outlines the relevant conditions under SSD-6519 and where they have been addressed within the BRMP. It is noted that major site rehabilitation works are unlikely to occur during Phase 1, with rehabilitation to commence in Phase 2. Rehabilitation works within this period would be mainly limited to rehabilitation of areas disturbed temporarily during construction of the haul road.

Major rehabilitation works would occur as part of quarry closure, some 20 years or more into the future. As such many of the requirements of the approval conditions are not currently applicable and will be addressed in future updated versions of this BRMP.

Table 2 - Biodiversity and Rehabilitation Related Development Consent Conditions

Condition	Description	Section/s Addressed
SSD-6519		
Biodiversity Offset Strategy		
Schedule 3 Condition 27	The Applicant must implement the Biodiversity Offset Strategy, described in the EIS and shown conceptually in Appendix 5, to the satisfaction of the Planning Secretary .	Section 4
Schedule 3 Condition 28	Within 12 months of the date of commencement of development under this consent, unless otherwise agreed with the Planning Secretary, the Applicant must make suitable arrangements to provide appropriate long-term security for the Biodiversity Offset Strategy, to the satisfaction of the Planning Secretary. ***Note: Mechanisms to provide appropriate long-term security to the land within the Biodiversity Offset Strategy include a Biodiversity Stewardship Agreement, or an alternative mechanism that provides for a similar conservation outcome. Any mechanism must remain in force in perpetuity*** .	Section 4
Rehabilitation Objectives		

<table>
<tr><th>Condition</th><th>Description</th><th>Section/s Addressed</th></tr>
<tr><td>Schedule 3 Condition 29</td><td>The Applicant must rehabilitate the site to the satisfaction of the Planning Secretary. This rehabilitation must be generally consistent with the rehabilitation strategy in the EIS and the conceptual rehabilitation plan in Appendix 5 and must comply with the objectives in Table 4.

Table 4: Rehabilitation Objectives<table><tr><th>Feature</th><th>Objective</th></tr><tr><td>Site (as a whole)</td><td>• Safe, stable and non-polluting
• Final landform integrated with surrounding natural landforms as far as reasonable and feasible, and minimising visual impacts when viewed f surrounding land</td></tr><tr><td>Surface Infrastructure</td><td>• Decommissioned and removed, unless otherwise agreed by the Plan Secretary; and
• Landscaped and revegetated using native flora species</td></tr><tr><td>Quarry benches and pit floor</td><td>Landscaped and revegetated using native flora species</td></tr><tr><td>Final Void</td><td>• Minimise the size, depth and slope of the batters of the final void
• Minimise the drainage catchment of the final void</td></tr></table></td><td>Rehabilitation actions over the next 3 years in Section 5.2 will contribute to the objectives of the condition.</td></tr>
<tr><td colspan="3">Progressive Rehabilitation</td></tr>
<tr><td>Schedule 3 Condition 30</td><td>The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim stabilisation measures must be implemented where reasonable and feasible to control dust emissions in disturbed areas that are not active and which are not ready for final rehabilitation.

Note: it is accepted that parts of the site that are progressively rehabilitated may be subject to further disturbance in future.</td><td>Section 5.2</td></tr>
<tr><td colspan="3">Biodiversity and Rehabilitation Management Plan</td></tr>
<tr><td rowspan="6">Schedule 3 Condition 31</td><td rowspan="6">The Applicant must prepare a Biodiversity and Rehabilitation Management Plan for the development to the satisfaction of the Planning Secretary. This plan must:

(a) be prepared in consultation with Council and CPHR;

(b) be submitted to the Planning Secretary for approval prior to the commencement of development under this consent, unless otherwise agreed;

(c) provide details of the conceptual final landform and associated land uses for the site;

(d) describe how the implementation of the Biodiversity Offset Strategy would be integrated with the overall rehabilitation of the site;

(e) include detailed performance and completion criteria for evaluating the performance of the Biodiversity Offset Strategy and rehabilitation of the site, including triggers for any necessary remedial action;</td><td>This BRMP</td></tr>
<tr><td>a) Section 2.3</td></tr>
<tr><td>b) Section 2.3</td></tr>
<tr><td>c) Section 5.8</td></tr>
<tr><td>d) Section 5.10</td></tr>
<tr><td>e) Section 6</td></tr>
</table>

Condition	Description	Section/s Addressed
	(f) describe the short, medium- and long-term measures that would be implemented to:	f) Section 5
	• manage remnant vegetation and habitat on site, including within the Biodiversity Offset Strategy area; and	f - 1 Section 5.1.1
	• ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this consent;	f) – 2 Section 1.3.1 and Section 6
	(g) include a detailed description of the measures that would 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:	g) Section 5
	1. 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 the offset area or site rehabilitation;	1. Section 5.1
	2. restoring and enhancing the quality of native vegetation and fauna habitat in the biodiversity offset and rehabilitation areas through assisted natural regeneration, targeted vegetation establishment and the introduction of fauna habitat features;	2. Section 5.1 and 5.2
	3. protecting native vegetation and fauna habitat outside the approved disturbance area onsite;	3. Section 5.1 (disturbance limits)
	4. minimising the impacts on native fauna, including undertaking pre- clearance surveys for the quarry site, haul road and the supplementary water supply pipeline;	4. Section 5.1
	5. establishing vegetation screening to minimise the visual impacts of the site on surrounding receivers	5. Section 5.7
	6. ensuring minimal environmental consequences for threatened species, populations and habitats, including for the quarry site, haul road and supplementary water supply pipeline;	6. Section 5.1 (Land Disturbance Controls)
	7. avoiding and minimising the spread of Myrtle Rust, Phytophthora cinnamomi (Phytophthora) and Chytrid fungus;	7. Section 5.5
	8. collecting and propagating seed;	8. Section 5.1.3
	9. controlling weeds and feral pests;	9. Section 5.4 and 5.5
	10. controlling erosion;	10. Section 5.6
	11. managing bushfire risk;	11. Section 5.11

Condition	Description	Section/s Addressed
	(h) include a program to monitor and report on the effectiveness of these measures and progress against the performance and completion criteria; (i) 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; (j) include details of who would be responsible for monitoring, reviewing and implementing the plan. The Applicant must implement the approved Biodiversity and Rehabilitation Management Plan as approved from time to time by the Secretary.	h) Section 7 and Section 8 i) Controls for risks covered in Section 6. j) Section 7 and Section 8
Biodiversity and Rehabilitation Bond		
Schedule 3 Condition 32	Within 6 months of the approval the Biodiversity and Rehabilitation Management Plan, the Applicant must lodge a Biodiversity and Rehabilitation Bond with the Department to ensure that the Biodiversity Offset Strategy and rehabilitation of the site are implemented in accordance with the performance and completion criteria set out in the plan (Figure 9 in Appendix 6) and relevant conditions of this consent. The sum of the bond must be determined by: (a) calculating the cost of implementing the Biodiversity Offset Strategy over the next 3 years; (b) calculating the cost of rehabilitating all disturbed areas of the site, taking into account the likely surface disturbance over the next 3 years of quarrying operations; and (c) employing a suitably qualified quantity surveyor or other expert to verify the calculated costs, to the satisfaction of the Planning Secretary. *Notes:* • *If capital and other expenditure required by the Biodiversity and Rehabilitation Management Plan is largely complete, the Planning Secretary may waive the requirement for lodgment of a bond in respect of the remaining expenditure.* • *If the Biodiversity Offset Strategy and/or rehabilitation of the site area are completed (or partially completed) to the satisfaction of the Planning Secretary, then the Planning Secretary will release the bond (or relevant part of the bond). If the Biodiversity Offset Strategy and rehabilitation of the site are not completed to the satisfaction of the Planning Secretary, then the Planning Secretary will call in all or part of the bond and arrange for the completion of the relevant works.*	Bond calculations are attached in Appendix A and B. Also see Section 5.9.

Condition	Description	Section/s Addressed
Schedule 3 Condition 33	Within 3 months of each Independent Environmental Audit (see condition 10 of Schedule 5), the Applicant must review, and if necessary, revise, the sum of the Rehabilitation and/or Conservation Bonds to the satisfaction of the Planning Secretary. This review must consider the: (a) effects of inflation; (b) likely cost of implementing the Biodiversity Offset Strategy and rehabilitating the site (taking into account the likely surface disturbance over the next 3 years of the development); and (c) performance of the implementation of the Biodiversity Offset Strategy and rehabilitation of the site to date.	Section 5.9

Condition	Description	Section/s Addressed
Schedule 5, Condition 2	The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include: (a) detailed baseline data; (b) a description of: • the relevant statutory requirements (including any relevant approval, license or lease conditions); • any relevant limits or performance measures/criteria; and • 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; (c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria; (d) a program to monitor and report on the: • impacts and environmental performance of the development; and • effectiveness of any management measures (see (c) above); (e) a 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; (f) a program to investigate and implement ways to improve the environmental performance of the development over time; (g) a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and (h) a protocol for periodic review of the plan.	a) Section 3 b) Section 2 c) This documentation d) Section 5 e) Section 6 and Section 8.5 f) Section 8 g) Section 8 h) Section 8.6

2.2 Rehabilitation and Biodiversity Related EIS Management Commitments

In accordance with Schedule 2 Condition 2 of the Consent, the Quarry must be developed and operated generally in accordance with the environmental impact assessment prepared for the development.

Table 3 summarises the safeguards and management controls relating to biodiversity and rehabilitation management that have been identified in the Environmental Assessment reports prepared for SSD-6519.

Table 3 - Relevant EIS Biodiversity Commitments

Reference	Description	Section/s Addressed
Ecological Assessment Dolwendee Quarry (Umwelt 2015) – Section 6.1.1	A range of general management strategies will be used to limit impacts on native flora and fauna in the Project Area. The strategies will include: • feral animal and weed control • management of erosion and sedimentation to ensure that adjoining vegetation communities and aquatic systems are not adversely impacted	Section 5
	• Adaptive management, as required, if a previously unrecorded or assessed threatened species is identified in the Project Area during operations	Section 5
	• A robust tree felling procedure will be implemented to minimise the potential for impacts on native fauna species (including threatened species) as a result of the clearing of hollow-bearing trees	Section 5
	• All personnel who will capture/handle/house and/or transport native fauna species (injured or uninjured) will be appropriately licensed under the requirements of the NSW Animal Ethics Committee.	Section 5
	• Site personnel (particularly vehicle operators) will be briefed on fauna awareness issues and will be required to report incidents involving injury to native wildlife. Assistance from a wildlife carer or veterinarian will be sought if injured native wildlife are encountered.	Section 5

2.3 Stakeholder Consultation

2.3.1 Consultation 2019 to 2021

In accordance with Schedule 3, Condition 31 of SSD-6519, this BRMP was prepared in consultation with the Office of Environment and Heritage – now the Conservation Programs, Heritage and Regulation (CPHR) and Muswellbrook Shire Council (**Table 4**). The correspondence from council and BCD on the BRMP are provided in **Appendix C** and **Appendix D** respectively.

Table 4 - 2019 – 2021 Stakeholder Consultation

Department	Date Sent out by Proponent	Comments Received
BCD (now CPHR)	11 April 2019	Email received on 4th February 2019 stating BCD will await until plan is submitted to DPHI and they then request BCD review. • Comments were later received by BCD in October 2020. • Appendix D contains the October 2020 correspondence letters (2019 and 2020) from BCD and UHH response table.
Muswellbrook Shire Council	11 April 2019	• Comments received on 18 March 2019. • Appendix C contains the March 2019 correspondence letter from MSC and UHH response table.
DPHI	5 April 2019	• Comments received from DPHI on 20 June 2019, 27 July 2020, 9 October 2020 and 15 January 2021. • Appendix E contains the 2020 correspondence letters from DPIE including UHH response tables.
	13 August 2021 Microsoft Teams Meeting	Discuss two outstanding matters to the BRMP. Present at this meeting were James McDonough and Sarah Clibborn from DPHI, Chris Jones from IEMA and Trevor Allen from Pitt and Sherry. Following this call, Section 4.2 (Remnant Vegetation and Habitat on Site) and Section 5.7 (vegetation Screening were updated). A copy of the proposed wording was sent to Sarah Clibborn on 13 August 2021.

2.3.2 Consultation 2026

SSD-6519 Modification 1 was submitted via the NSW Major Projects Portal on the 25 July 2025. A total of five submissions were received from Government Agencies, including Conservation Programs, Heritage & Regulation Group (CPHR), Environment Protection Authority (EPA), Heritage NSW, Muswellbrook Shire Council and Transport for NSW (TtNSW). In response to the biodiversity related queries raised by CPHR and Muswellbrook Shire Council, UHH undertook further investigations and assessments to inform the preparation of an updated BDAR.

Future updates to the BRMP will be submitted via the Major Projects Portal for approval by the Planning Secretary. Between 2019 - 2021, consultation was undertaken with BCD (now CPHR) and Council regarding the BRMP. No further consultation with Council or CPHR is proposed where updates are consistent with the approved consent. However, any major updates to the BRMP will be undertaken in consultation with both CPHR and Council.

3 EXISTING ON-SITE BIODIVERSITY VALUES

The key on-site biodiversity values that will be managed under this BRMP are described in this section. Further detail regarding the biodiversity features and values of the Quarry and associated offset site can be found in Section 4 and Section 7.2 of the Ecological Assessment (Umwelt, 2015), respectively and the Dolwendee Quarry Project EIS (KMH Environmental 2015).

3.1 Quarry Site and Haul Road

The Quarry is located within the Sydney Basin Interim Biogeographic Regionalisation of Australia (IBRA) bioregion and the Kerrabee IBRA subregion. The Quarry contains two biometric vegetation communities as identified by Umwelt (2015). The vegetation communities include:

- HU905 (PCT 3431 DNG) – Narrow-leaved Ironbark - Grey Box Grassy Woodland of the Central and Upper Hunter – Low Condition Derived Native Grassland, (this includes the haul road) and
- HU905 (PCT 3431 EEC) – Narrow-leaved Ironbark - Grey Box Grassy Woodland of the Central and Upper Hunter – Moderate to Good Condition (consistent with Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions endangered ecological community (EEC) (listed under the Biodiversity Conservation Act 2016 (BC Act).

An additional six vegetation communities occur in the vicinity of the Quarry disturbance area. Further details can be found in the Ecological Assessment (Umwelt 2015).

The following threatened flora and fauna species and threatened populations have also been identified in the vicinity of the Project Disturbance Area or the Quarry:

- Pine donkey orchid (*Diuris tricolor*) – vulnerable under the BC Act;
- Pine donkey orchid (*Diuris tricolor*) population in the Muswellbrook local government area – endangered population under the BC Act;
- Speckled warbler (*Chthonicola saggitata*) – vulnerable under the BC Act; and
- Grey-crowned babbler (*Pomatostomus temporalis temporalis*) – vulnerable under the BC Act.

The haul road relocation approved under Modification 1 revised the alignment to avoid impacts on the Pine Donkey Orchid. Individuals identified in proximity to the haul road have been protected through the installation of fencing and appropriate signage to prevent encroachment by domestic livestock, rabbits, and plant or machinery, and will be subject to ongoing weed management.

Exotic plant species include:

- Scarlet pimpernel *(Anagallis arvensis);*
- Common prickly pear (*Opuntia stricta var. stricta*);
- Tiger pear (*Opuntia aurantiaca*);
- Creeping pear *(Opuntia humifusa);*
- Fireweed (*Senecio madagascariensis*) and
- Narrow-leaved cotton bush (*Gomphocarpus fruticosus*).

Feral animal species identified include:

- Domestic dog *(Canis lupus familiaris);*
- Rabbit *(Oryctolagus cuniculus);*
- Red fox *(Vulpes vulpes);*
- Brown hare *(Lepus capensis);*
- Fallow deer *(Dama dama*); and
- Cat *(Felis catus).*

3.2 Remnant vegetation and habitat on Site

For the purposes of this BRMP, remnant vegetation and habitat on site refers to land within the development consent boundary that lies outside the extraction area, including vegetation outside the approved haul road footprint. Remnant vegetation and habitat that are not disturbed by the development do not require rehabilitation. Key species identified within the offset area will be incorporated into the rehabilitation seed mix for Dolwendee Quarry, consistent with the appropriate PCT.

Once rehabilitation is successfully established, the rehabilitation and offset areas will be managed concurrently for land management purposes, including pest and weed control, with pest and weed management also undertaken within areas of remnant vegetation on site.

4 BIODIVERSITY OFFSET STRATEGY

Description of vegetation impacted by Operation

Schedule 3 Condition 27 of Development Consent SSD-6519 requires the implementation of a Biodiversity Offset Strategy (BOS) as described in the Environmental Impact Statement (EIS) and the final landform design as shown in Appendix 5 of the Development Consent. The following sections describe biodiversity impacts and offset requirements separately for the Quarry Site and the Haul Road.

Quarry Site

The Quarry will result in the loss of approximately 22.2 ha of native vegetation. This includes 7.4 ha of vegetation equivalent to PCT 3431 (*Narrow-leaved Ironbark – Grey Box Grassy Woodland of the Central and Upper Hunter*, which corresponds to the *Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions* listed as an Endangered Ecological Community (EEC) under the *Biodiversity Conservation Act 2016 (BC Act)*.

The remaining 14.8 ha comprises PCT 3431 Derived Native Grassland (*Narrow-leaved Ironbark – Grey Box Grassy Woodland of the Central and Upper Hunter – Derived Native Grassland)*, which is not listed as a threatened ecological community.

The Quarry will result in the removal of seven individuals of *Diuris tricolor* (Pine Donkey Orchid), a species listed as vulnerable under the BC Act. In addition, the impacted vegetation provides habitat across both the woodland (7.4 ha) and derived native grassland (14.8 ha), including known habitat for the speckled warbler (*Chthonicola sagittata*), which is listed as vulnerable under the BC Act.

Haul Road

The haul road location, as detailed in SSD-6519 (Modification 1), will impact 1.87ha of native vegetation equivalent to PCT 3431. The new haul road location has been adjusted to fully avoid impacts on threatened flora species including *Diuris tricolor* (Pine Donkey Orchid).

Many of these species are synonymous with the Central Hunter Grey Box – Ironbark Woodland EEC and represent the loss of habitat for the woodland-dependent birds and micro-bats. Accordingly, the BOS has been developed to compensate for residual impacts of the Project on these species, habitats or features. The key features to be addressed in the BOS are outlined in **Table 5.**

Table 5 - Significant Ecological Features Addressed in the Biodiversity Offset Strategy

Ecological Feature	Area of Impact/Number of Individuals
Central Hunter Grey Box – Ironbark Woodland EEC (Woodland Habitat)	7.4 hectares
Pine donkey orchid (*Diuris tricolor*)	7 individuals (Quarry site only, no impact from haul road)
Speckled warbler (*Chthonicola sagittata)*	5 individuals

4.1 Security of Biodiversity Offset Strategy

Schedule 3 Condition 28 of the Development Consent requires UHH to make suitable arrangements to provide long-term security of the BOS within 12 months from the date of commencement of development. UHH currently owns and manages the land on which the Biodiversity Offset Area is located, being Lot 1 in DP1160936. UHH is currently in consultation with DPHI and CPHR regarding the most appropriate mechanism to satisfy the requirements of Schedule 3, Condition 28. An extension of time has been granted to UHH until August 2026 to comply with this condition.

4.2 Biodiversity Offset Area

The biodiversity offset area is located north of the Quarry and is currently owned and managed by UHH. The offset area is approximately 16 ha and is shown on **Figure 1** and **Figure 2**. The Biodiversity Offset Area adjoins a dedicated conservation offset for the Mangoola Coal project to the north, south and east.

The vegetation communities present within the Biodiversity Offset Area includes:

- HU905 (PCT 3431) - Moderate to Good Condition - Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter. This community conforms to the final determination of the Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions Endangered Ecological Community listed under the BC Act. A total of 13 hectares of this community has been mapped within the Offset Area;
- HU730 (PCT 3314) – White Box x Grey Box; Red Gum; Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley – Moderate to Good Condition. This community conforms to the final determination of the White Box Yellow Box Blakely's Red Gum Endangered Ecological Community under the BC Act. A total of 1.6 hectares of this community has been mapped within the Biodiversity Offset Area; and
- HU730 (PCT 3314 DNG) – White Box x Grey Box; Red Gum; Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley – Derived Native Grassland (DNG). This community does not conform to the EEC. A total of 1.3 hectares of this DNG community has been mapped. It is likely to have once supported White Box-Yellow Box-Blakely's Red Gum Woodland.

The following threatened flora, fauna and populations occur within the Biodiversity Offset Area:

- Pine donkey orchid (*Diuris tricolor*) – vulnerable under the BC Act, a total of 247 individuals were recorded;
- Pine donkey orchid population in the Muswellbrook local government area – endangered population under the BC Act; and
- Speckled warbler (Chthonicola saggitata) – vulnerable under the BC Act.

Other threatened species have been recorded in adjacent areas to the Biodiversity Offset Area and Quarry (Umwelt 2015). These species include:

- Tarengo leek orchid (*Prasophyllum petilum*) – endangered under the BC Act and Commonwealth.

Species listed under the Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act), recorded near the site include:

- Glossy black-cockatoo (*Calyptorhynchus lathami*) – vulnerable under the BC Act;
- Brown treecreeper (eastern subspecies) (*Climacteris picumnus victoriae*) – vulnerable under the BC Act;
- Squirrel glider (*Petaurus norfolcensis*) – vulnerable under the BC Act;
- Yellow-bellied sheathtail-bat (*Saccolaimus flaviventris*) – vulnerable under the BC Act;
- Little bentwing-bat (*Miniopterus australis*) – vulnerable under the BC Act;
- Eastern bentwing-bat (*Miniopterus schreibersii oceanensis*) – vulnerable under the BC Act; and
- Large-eared pied bat (*Chalinolobus dwyeri*) – vulnerable under the BC Act and EPBC Act.

Many of these species are mobile and may utilise both the Quarry site and the Biodiversity Offset Area.

4.3 Biodiversity Offset Strategy Implementation and Management

Biodiversity management, maintenance and monitoring activities within the offset site will be implemented by UHH in accordance with the Development Consent and the Biodiversity Offset Management Plan associated with the Biodiversity Offset Bond (see **Appendix A**). The implementation of the BOS will occur following the commencement of initial quarrying activities.

Full details of the biodiversity management, maintenance and monitoring can be found in **Appendix A**, however key activities include;

- Ecological baseline monitoring;
- Weed control;
- Revegetation planting if required; and
- Vertebrate pest management.

5 BIODIVERSITY AND REHABILITATION MANAGEMENT MEASURES

A range of controls and strategies have been formulated to minimise and mitigate direct impacts associated with the Quarry, particularly in relation to land clearing and ground-disturbance and minimising impacts on the range of threatened species that are known to occur on the site.

These management controls are aimed at ensuring that the purpose of the BRMP as described in **Section 1.3.1**, are achieved. the impact mitigation measures will be implemented over the next three years in accordance with SSD-6519 Schedule 3, Condition 31; however, these measures are generally intended to apply throughout the operational life of the Quarry.

5.1 Land Disturbance Management Controls

The following measures apply to works associated with land clearing and ground disturbance within the Quarry area during operation.

5.1.1 Defining Limits of Clearing

The limits of clearing for each stage of clearing works will be clearly delineated prior to clearing. This is to ensure that clearing does not have an impact to remnant vegetation. To avoid unnecessary or inadvertent vegetation and habitat removal, disturbance must be restricted to the delineated area, and no stockpiling of equipment, machinery, soil or vegetation will occur beyond this boundary.

Attention will be paid to demarcation of records of Pine Donkey Orchid (*Diuris tricolor*) located adjacent to the approved extraction areas and haul road. This includes the fully fenced, vermin-proof enclosure of the Pine Donkey Orchid located adjacent to haul road.

The person/s responsible for the clearing activities will be responsible for ensuring that the boundary markers, barriers and permanent signs are installed to enable the suitable environmental and technical inspections of the proposed disturbance to be undertaken.

Site inductions are to be given to ensure all site workers and visitors are aware of any sensitive vegetation. No clearance will be completed until site inductions have been completed.

Prior to clearing the Quarry Manager (or their delegate) will check the marked clearing limits and provide approval of the disturbance boundary. Approval must be granted before clearing commences.

5.1.2 Pre-Clearance Surveys

Pre-clearing surveys will be undertaken by a suitably experienced and licensed ecologist, no more than 2 weeks prior to felling. This will include marking of hollow-bearing trees, as well as any other notable features such as fallen timber, hollow logs or boulders suitable for salvage; active nests, dreys or dens requiring consideration, and seed-bearing trees for salvage. Surveys will include detailed searches for threatened flora and fauna species including microbats.

5.1.3 Timing of Clearing/Seed Collection

Timing of Clearing

As far as practicable, vegetation clearing is to be planned for periods outside of the breeding season for threatened species known to nest in the site or surrounds and outside of torpor periods for hollow-roosting microbat species known to occur within the site or vicinity. **Table 6** identifies the critical periods of use for threatened species recorded on site.

Clearing of hollow resources suitable for breeding will also be conducted outside of the winter period (June and July) and will not be cleared during the suspected breeding period for these species. This is generally between October and January

Table 6 - Critical Periods of use for Threatened Species known to occur within or surrounding the Site

Species Name	Recorded in Wider Study Area	Recorded in Project Disturbance Area	Resource Utilisation in Extraction Area*	Critical Periods of Use
glossy black cockatoo *Calyptorhynchus lathami*	✓	x	Requires large hollow- bearing eucalypts as nest sites	Breeds from March to August
brown treecreeper *Climacteris picumnus victoriae*	✓	x	Hollows in standing live or dead trees and tree stumps required for nesting	Breeds from May to December
speckled warbler *Chthonicola saggitata*	✓	✓	Utilises slight hollows at ground or base of low dense plants often amid fallen branches and litter for nesting	Breeds from August to January
grey-crowned babbler *Pomatostomus temporalis*	✓	✓	Builds conspicuous dome-shaped nests in shrubs or young eucalypts	Breeds from July to February
squirrel glider *Petaurus norfolcensis*	✓	x	Requires abundant tree hollows for refuge and nest sites	Breeding usually occurs between April and November, with a peak in winter and spring, with up to two litters a year
yellow-bellied sheathtail bat *Saccolaimus flaviventris*	✓	x	Roosts in tree hollows and buildings and occasionally mammal burrows	Breeds between December and mid-March
large-eared pied bat *Chalinolobus dwyeri*	✓	x	Roosts in caves, crevices in cliffs old mines, and disused Fairy Martin nests.	Breeds from November to January
little bentwing-bat *Miniopterus australis*	✓	x	Roosts in caves, tunnels, tree hollows, abandoned mines, stormwater drains, culverts, bridges and sometimes buildings.	Maternity colonies form in spring and birthing occurs in early summer. Males and juveniles disperse in summer.
eastern bentwing-bat *Miniopterus schreibersii oceanensis*	✓	x	Roosts primarily in caves but also derelict mines, storm water tunnels, buildings, and other man-made structures	Maternity colonies form in spring and summer

Note: * = information from NSW Threatened Biodiversity Profile Database (2018)

Seed Collection

Seed will be collected and propagated for rehabilitation purposes in accordance with the advice of suitably qualified ecologist or bush regenerator. Details of collection and propagation will be documented in the Annual Review. In October 2020, the former Biodiversity and Conservation Division (BCD), now CPHR recommended that seed collection and propagation be undertaken in accordance with the Florabank guidelines (Greening Australia). UHH will ensure that the appointed ecologist or bush regenerator applies these guidelines during seed collection and propagation activities.

5.1.4 Tree Felling Procedure

- A robust tree felling procedure will be implemented to minimise the potential for impacts on native fauna species (including threatened species) because of the clearing of hollow-bearing trees. The tree felling procedure is designed to minimise impacts to hollow-dependent fauna. The procedure includes the following:Pre-clearing surveys by a suitably experienced and licensed ecologist, no more than 2 weeks prior to felling (refer **Section 5.1.2**);
- Removal of trees without hollows/vegetation on the day or as close to the date of clearing of habitat trees as possible (in order to discourage fauna usage of the area). Removal of vegetation identified as not providing tree-hollows during pre-clearing surveys encourages hollow-dependent fauna to vacate clearing areas prior to the clearing of habitat trees, reducing the likelihood of mortality during clearing. It is not considered necessary for a suitably experienced and licensed person to be present to supervise such works, providing pre-clearing surveys have been completed within the designated timeframe;
- Visual canopy inspection of all trees to be removed on the day of clearing by suitably experienced and licensed person to ensure that fauna is not injured during tree felling operations on the day of clearing;
- Detailed hollow-bearing tree felling procedures, including (but not limited to):
  - Supervision of all hollow-bearing tree felling works by a suitably experienced and licensed person. Where necessary, this can be undertaken by the Environmental Officer with instruction by a suitably experience and licensed person off site;
  - Visual canopy inspection on the day of the felling of hollow-bearing trees for fauna species and active nests;
  - Shaking of hollow-bearing tree (with heavy machinery) for at least 30 seconds to encourage resident fauna to abandon tree, prior to felling;
  - Lowering of hollow-bearing trees as gently with heavy machinery;
  - Inspection of all hollows in felled trees;
  - Capture of any displaced/injured fauna. Any injured fauna will be taken to a wildlife carer or vet;
  - Release of unharmed fauna into nearby secure habitats;
  - Felled trees to be rolled so that the number of hollows blocked against the ground are minimised;
  - All felled trees to remain in place overnight to allow any unidentified fauna to escape; and
  - Salvage of suitable hollows (i.e. hollows of appropriate size and structural integrity and that can be salvaged safely) for treatment and installation within rehabilitation and revegetation areas as compensatory habitat, where feasible.

If threatened fauna are located within hollow-bearing trees during pre-clearance surveys or tree felling, no works will be undertaken within 5 metres of the identified tree until the species is captured and relocated, or moves from within the clearing area of its own volition.

All personnel who will capture/handle/house and/or transport native fauna species (injured or uninjured) will be appropriately licensed under the requirements of the NSW Animal Ethics Committee.

Site personnel (particularly vehicle operators) will be briefed on fauna awareness issues and will be required to report incidents involving injury to native wildlife. Assistance from a wildlife carer or veterinarian will be sought if injured native wildlife are encountered.

5.2 Progressive and Final Rehabilitation

Rehabilitation will be undertaken progressively to minimise the potential for erosion, dust generation and disturbance to native vegetation and fauna habitat. **Section 5.2** outlines the progressive rehabilitation.

There are two areas where progressive rehabilitation is proposed, with these being:

Temporary stabilisation (within first three years) – hydromulching will be used in areas that were disturbed as part of the initial clearing that remain as infrastructure. This includes areas such as bunds and would be completed within one month of disturbance occurring. UHH will liaise with a specialist regarding the hydromulching seed mix, with the goal to be using native grass seed.

Benches (After the first three years) – Once a bench is no longer required for extraction or operations, it is to be made safe (a consideration during creation of the bench and associated faces and subject to a risk assessment then rehabilitation would be completed during the operational phase as per **Section 5.**

There is no final rehabilitation of benches planned in the first three years (ie. final shaping, topsoil and seeding), therefore hydromulching would be used for benches. All benches at closure will need to be rehabilitated using a seed mix consistent with PCT 905.

Remaining Areas (At Closure) – the remaining areas at site will need to be active during operation with no rehabilitation completed until closure. These would include infrastructure areas (buildings, roads plant), much of the quarry pit and water management areas.

5.2.1 Removal of Infrastructure

Schedule 3, Condition 29, Table 4 of the Development Consent requires all surface infrastructure to be removed, unless otherwise agreed by the Planning Secretary and landscaped and revegetated using native flora species. This includes the site office, car park, amenities and the crushing and screening plant. There are no proposed powerlines associated with the project, with power supplied by diesel generator. It is noted, however, that there is an intention to retain the haul road for future use following cessation of quarrying, subject to approval by the Planning Secretary.

5.2.2 Topsoil Management

The key method of rehabilitation involves the transfer of topsoil and brush material obtained directly from cleared areas prior to their excavation. This material will be utilised in rehabilitation as:

- A seed source;
- Mulch;
- Erosion control; and
- Habitat for small fauna.

The direct return topsoil and brush matting is the chief method employed for revegetation of native vegetation for Phase 1. The timing of the clearing and return of soil and brush material is programmed to ensure that the maximum number of viable seed and the best growing conditions coincide to produce the best chance of achieving high species diversity.

Topsoil extracted during the construction of the Quarry will be managed in accordance with the topsoil management measures outlined below to protect topsoil quality and enhance rehabilitation outcomes:

- Where possible, topsoil will be stripped when moist to help maintain viability and to reduce dust generation.
- The topsoil stripped will be between 100 - 300 mm in depth (dependent on the soil type present);

- Where practical, topsoil will be directly returned to disturbed areas available for revegetation during the construction of Phase 1 and 2 of the Quarry;
- Topsoil stockpiles are to be located away from quarrying, traffic areas and watercourses and positioned within the perimeter of the closed water management system;
- Topsoil stockpiles will be located within the Quarry disturbance area and not within conservation or other areas adjacent to the Quarry;
- Level or gently sloping areas will be selected as stockpiles sites to minimise erosion and potential soil loss;
- Silt fences will be established clear of drainage lines and will be installed at the base of stockpiles to prevent soil loss to the surrounding area;
- Stockpiles will be generally less than 3 m high and will be set out in windrows to maximise surface exposure and biological activity;
- Stockpiles to be kept longer than 3 months (i.e. approximately how long it will take to establish a stable vegetative cover) will be sown with a suitable cover crop of native grass seeds to minimise soil erosion and invasion of weed species. This will assist with natural regeneration of native seeds in the soil stockpiles;
- Weed growth will be monitored monthly and controlled either by removing by hand or spraying if large areas (i.e. >40 m2) are observed; and
- Prior to re-spreading, weed growth will be scalped from the top of the stockpiles to minimise the transport of weeds into rehabilitated areas. Soil testing should be completed prior to respreading, with ameliorants used to improve soil if required.

See **Table 9** for information regarding soil management.

5.2.3 Direct Seeding and Planting

In addition to the topsoil management, direct seeding and / or planting will also occur during progressive rehabilitation of the site. This will include sowing and / or planting of native grass species and utilisation of a suitable cover crop to assist with erosion control where required.

Seeds and plant material (cuttings) used to augment the rehabilitation areas will be sourced locally. Tube stock utilised will preferentially be 6 - 9 months old at the time of planting to maximise the potential for successful rehabilitation. Seeds and tube stock will comprise species consistent with the remnant native vegetation community; PCT 3431 - Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter. The baseline ecological survey will assist in determining the most suitable species for rehabilitation. A seed list will be provided in the first Annual Review document.

Section 5.1 outlines the process of clearing. Key habitat features such as fallen timber, hollow logs or boulders suitable will be stored onsite for salvage and used in the rehabilitation area. At this point it is not proposed that these features would be used for habitat enhancement in the offset area. This will assist in the restoration, enhancement and rehabilitation of native vegetation and introduction of fauna habitat features.

Thorough site preparation will be undertaken to ensure rapid establishment and growth of seedlings. All areas proposed for seeding will be deep ripped to an approximate depth of 400 – 500mm.

Where ripping on slopes is required, the ripping will be undertaken around the contour of the land at right angles to water flow. Benches will be deep ripped to actively promote infiltration of water which will enhance soil moisture requirements for direct tree seeding and minimise surface runoff to underlying benches and the pit floor dirty water control system. Revegetation will also visually screen disturbed areas and will re-establish habitat for native fauna.

5.3 Weed Management

Consistent with the Development Consent conditions, an effective weed control program will be implemented to limit the spread and colonisation of noxious and environmental weeds within the Quarry.

In general, the weed control program for the Quarry will include:

- General observations of the presence of weeds will also be made as part of the bi-monthly inspections (refer to **Section 7**);
- Undertake appropriate, targeted weed control activities (including minimum disturbance techniques such as hand removal where feasible), specific to the weed species identified; and
- Assess the effectiveness of the control programs and in response make any necessary modifications.

In particular, the presence of fireweed (*Senecio madagascariensis*), tiger pear (*Opuntia aurantiaca*), common prickly pear (*Opuntia stricta var. stricta*), Paterson's curse (*Echium plantagineum*), and African boxthorn (*Lycium ferocissimum*) have been recorded within the site and vicinity and are declared priority weeds under the NSW Biosecurity Act 2015 for the Muswellbrook Shire Council and the Hunter Local Land Services region (Department of Primary Industries (DPI) 2018). Under the NSW Biosecurity Act 2015, these plants are regulated with a general biosecurity duty to prevent, eliminate or minimise any biosecurity risk it poses. Any person who deals with these plants has a duty to ensure the risk is prevented, eliminated or minimised, so far as is reasonably practical. The specific methodologies for the control of declared weeds within the site are as follows:

- All areas of declared weeds will be removed mechanically and/or chemically (depending on the most suitable method for the maturity of the weed) and stockpiled within the area of infestation to ensure it is isolated from native vegetation;
- Stockpiled areas of declared weeds are to be dealt with either by use of herbicides or through burning;
- Topsoil within areas of declared weeds can only be translocated into rehabilitation areas of the site after being treated with the measures listed above; and
- No declared weeds or topsoil within declared weed infestations will be transferred offsite.

Weed control works will include the development and implementation of an eradication plan applicable to the circumstances, which may include manual removal, spot spraying or biological control. The specific method selected will consider the known locations of threatened flora and fauna species. Low impact weed management techniques such as manual removal will be used within 40 metres of known threatened species records.

The weed control works will also consider:

- Minimisation of vegetation disturbance by reducing the number of tracks;
- Minimisation of clearing and other disturbance of vegetation associated with civil works; and

Maintenance of topsoil stockpiles to eradicate weed infestation. Weed management programs will focus on disturbed areas, areas of rehabilitation and the offset area.

5.4 Pest Management

Pest management will be conducted as required based on the bi-monthly inspection results (refer to **Section 7**) or reports from neighbours or other authorities. Experienced pest control contractors will be engaged to perform any control programs required, including baiting, trapping, warren ripping and open range shooting. When necessary, UHH, will work in collaboration with neighbouring landowners to develop a strategic approach to pest management. Pest management will be undertaken for the entire site.

Monitoring of pest species populations and the effectiveness of the control program will be undertaken and reported annually as part of general biodiversity monitoring. Recommendations and the proposed control program for subsequent years will also be included as an outcome of the monitoring.

5.5 Plant Disease Management

Schedule 3 Condition 31 g) outlines the requirement to *avoid & minimise the spread of phytophthora, myrtle rust and chytrid fungus.*

Key controls are outlined on the NSW Department of Primary Industries (DPI) website and will include:

- Staff and contractors are to be made aware of the signs of myrtle rust and phytophthora in the site induction;
- All vehicles and equipment are to be cleaned before attending site; and
- Clearance and rehabilitation completed by experienced contractors; and
- Chemical treatment and effective disposal if plants are found. If the disease was found, then the site would report it to the BCD.

In the unlikely event that chytrid fungus is found in frogs during ecological surveys, then the ecologist will liaise with Dolwenedee Quarry or would report the issue to the BCD. A management plan would be prepared and implemented between the site and the BCD.

5.6 Sediment and Erosion Control

Erosion and migration of sediment from within the site into adjacent vegetation and aquatic systems has the potential to facilitate weed invasion through the introduction of weed seeds and nutrients that favour weed species.

This potential impact will be avoided through the implementation of appropriate erosion and sediment control measures in accordance with the Soil and Water Management Plan. This will include:

- Clearly identifying and delineating areas required to be disturbed and ensuring that disturbance is limited to those areas;
- Clearing as little vegetation as required and minimising machinery disturbance outside of these areas;
- Installing appropriate erosion and sediment controls prior to stripping topsoil or disturbing areas;
- Limiting the number of roads and tracks established;
- Stabilising site entry/exit points to ensure sediment is not tracked onto sealed roadways;
- Construction of drains upslope of areas to be disturbed to convey clean runoff away from most disturbed areas where required;
- Reshaping, topsoiling and vegetating road and cut and fill batters as soon as practical;
- Construction of sediment dams where required to capture and treat runoff from disturbed catchment areas;
- Diversion of surface and road runoff away from disturbed areas;
- Regular maintenance of all erosion control works and rehabilitated areas; and
- Revegetation of areas as soon as practical following the completion of earthworks or operations.

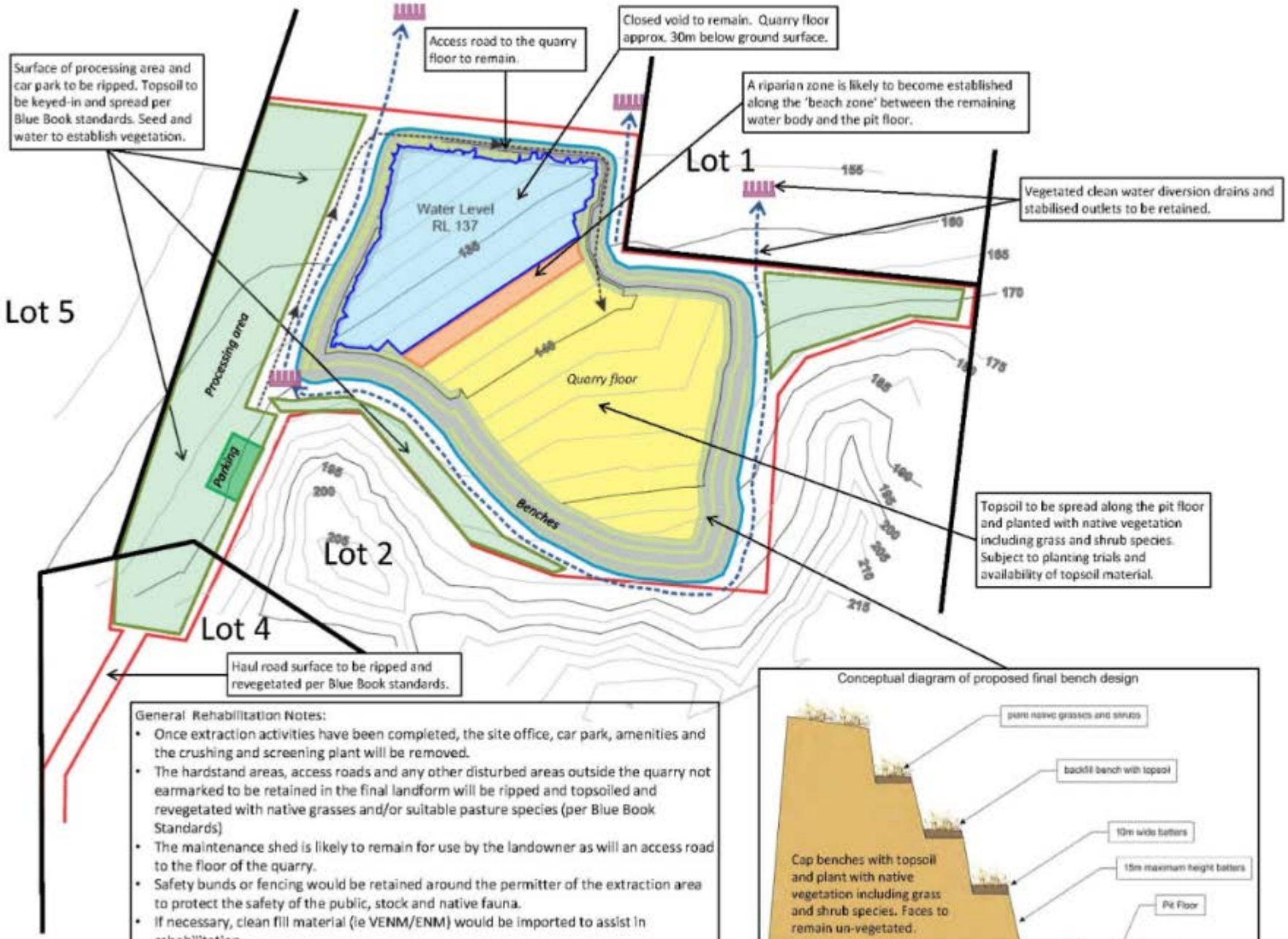
5.7 Vegetation Screening

If in the event, a receiver (identified in the EIS) was to identify they are visually impacted by the quarry operations area, the quarry operator would consult with the resident and DPIE to discuss if there is a need for mitigation measures. If vegetation screening was required, tube stock planting would be completed using appropriate species associated with PCT 905.

5.8 Final Landform

The proposed Final landform is included in the Development Consent under Appendix 6**.** The key management aspects are outlined below. A summary of the figure colours is outlined below:

- The yellow colour area (Quarry Floor) identified in the **Figure 3** will be shaped at closure. The topography of the final landform will consist of stepped benches formed in an amphitheatre configuration, each with a revegetated bench;
- A section of the final void at closure will fill with water, with an indicative location outlined in the area below (blue colour area); and
- The apricot colour area illustrates a riparian zone between the final void and the quarry floor.



General Rehabilitation Notes:

- Once extraction activities have been completed, the site office, car park, amenities and the crushing and screening plant will be removed.
- The hardstand areas, access roads and any other disturbed areas outside the quarry not earmarked to be retained in the final landform will be ripped and topsoiled and revegetated with native grasses and/or suitable pasture species (per Blue Book Standards)
- The maintenance shed is likely to remain for use by the landowner as will an access road to the floor of the quarry.
- Safety bunds or fencing would be retained around the permitter of the extraction area to protect the safety of the public, stock and native fauna.
- If necessary, clean fill material (ie VENM/ENM) would be imported to assist in rehabilitation.

Conceptual diagram of proposed final bench design

N

0 100 200m

Conceptual Rehabilitation Plan
Dolwendee Quarry
2013.006

Created by:	Erik Larson
Reviewed by:	Adam Bishop
Approved by:	Adam Bishop

KMH ENVIRONMENTAL

5.9 Summary of Biodiversity and Rehabilitation Bonds

Separate Biodiversity and Rehabilitation Bonds have been prepared to meet the requirement of Schedule 3 Condition 32 of the Development Consent:

Within 6 months of the date of approval of the Biodiversity and Rehabilitation Management Plan, the Applicant must lodge a Biodiversity and Rehabilitation Bond with the Department to ensure that the Biodiversity Offset Strategy and rehabilitation of the site is implemented in accordance with the performance and completion criteria set out in the plan (Figure 9 in Appendix 6) and relevant conditions of this consent. The sum of the bond must be determined by:

a) calculating the cost of implementing the Biodiversity Offset Strategy over the next 3 years;

b) calculating the cost of rehabilitating all disturbed areas of the site, taking into account the likely surface disturbance over the next 3 years of quarrying operations; and

c) employing a suitably qualified quantity surveyor or other expert to verify the calculated costs, to the satisfaction of the Secretary.

Notes:

- *If capital and other expenditure required by the Biodiversity and Rehabilitation Management Plan is largely complete, the Secretary may waive the requirement for lodgement of a bond in respect of the remaining expenditure.*
- *If the Biodiversity Offset Strategy and/or rehabilitation of the site area are completed (or partially completed) to the satisfaction of the Secretary, then the Secretary will release the bond (or relevant part of the bond). If the Biodiversity Offset Strategy and rehabilitation of the site are not completed to the satisfaction of the Secretary, then the Secretary will call in all or part of the bond and arrange for the completion of the relevant works.*

Schedule 5 Condition 10 states that *Within 3 months of each Independent Environmental Audit (see condition 10 of Schedule 5), the Applicant must review, and if necessary revise, the sum of the Rehabilitation and/or Conservation Bonds to the satisfaction of the Secretary.*

The CV's for Chris Jones (IEMA) and Fiona Iolinni (SLR) were provided under a separate cover letter to DPHI for endorsement as specialists for the 2021 updates. These same people have assisted within the 2026 updates.

5.9.1 Rehabilitation Bond

The Rehabilitation Bond has been prepared based on a previous version of the Division of Resources and Geosciences Guideline for Rehabilitation Cost Estimate (RCE). The 2026 review of the RCE has checked against recent rates from the 2026 Resource Regulator's RCE tool and the bond has been updated accordingly.

- The Rehabilitation Bond covers rehabilitation of the site at Year 3;
- The full disturbance area of the quarry will not be reached until well after Year 3;
- A separate bond for offset areas is provided in **Section 5.9.2,**
- The bond has been prepared to rehabilitate the site to Appendix 6 of the Development Consent;
- This includes removal of infrastructure, rehabilitation of benches, rehabilitation of a section of the quarry floor; and
- A void will remain at closure and has been costed based on the area in Appendix 6 of the Development Consent. However as the Bond is based on Year 3, we have costed to rehabilitate the entire disturbed area of the pit and benches.

5.9.2 Offset Bond

The Offset Bond was calculated using the NSW Department of Planning, Industry and Environment method for calculating Biodiversity Stewardship Sites. Key aspects of the Offset bond include:

- Fencing;
- Weed control and vertebrate pest control;
- Seed collection and propagation – where viable;
- Rehabilitation planting – where applicable;
- Ecological monitoring surveys

5.10 Integration between Rehabilitation and Biodiversity

This section has been prepared to satisfy Schedule 3 Condition 31 d) of the Development Consent.

The nature of the quarrying process indicates it is unlikely there will be significant final rehabilitation at the Quarry until close to quarry closure**.** There will be co-ordinated weed and pest management between the quarry and the offset area during the life of the operation with this outlined in **Section** 5**.**

Where final rehabilitation can occur, e.g. along the clean water diversion swale, future ecological monitoring will be completed in both offset and rehabilitation areas. Key learnings from inspections and monitoring of offset areas will assist informing future rehabilitation practices with the objective that the final rehabilitation areas have or are beginning to have, floristic characteristics like PCT 3431 in the offset area.

5.11 Bushfire Management

This section has been prepared to satisfy Schedule 3 Condition 31 g) concerning managing bushfire risk. UHH will ensure there is sufficient equipment available to assist with bushfire management as required under Schedule 3 Condition 39 of the Development Consent.

> *The Applicant must:*
>
> *(a) Ensure that the development is suitably equipped to respond to any fires on site; and*
>
> *(b) Assist the RFS and emergency services as much as possible if there is a fire in the vicinity of the site.*

In terms of bushfire risk in the offset area this will be assessed during weed management programs. If additional controls are required within the offset area the site will liaise with the NSW Rural Fire Service.

6 PRELIMINARY PERFORMANCE AND COMPLETION CRITERIA

Preliminary performance and completion criteria will be utilised to demonstrate achievement of management objectives.

The preliminary performance and completion criteria will be reviewed and revised and used as the basis for further refinement prior to the commencement of further phases of the Quarry, rehabilitation activities, along with consideration of the results of rehabilitation monitoring programs and stakeholder feedback.

Schedule 3 Condition 31 i) of the Development Consent states the proponent must "*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".* These risks are outlined in **Table 7** through the 'Trigger for Action' column.

A risk that is not covered under **Table 6** relates to funding to complete biodiversity and rehabilitation management. Funding will be provided for the Project to satisfy the implementation of the offset bond and rehabilitation bond.

Criteria within **Table 7** relate to final rehabilitation and not meeting criteria during operations does not constitute an exceedance. **Table 8** refers to criteria for the biodiversity offset area and if triggers occur during operations they will be reported in the Annual Review. However, this does not constitute an exceedance of a criteria.

Table 7 - Preliminary Performance and Completion Criteria for Rehabilitation Areas

Aspect	Preliminary Rehabilitation Performance and Completion Criteria	Trigger for Action	Potential Corrective Action
Weed and Pests	• Bi-monthly inspections indicate declining weed diversity, density and abundance and decline in feral animal activity.	• Increased noxious or environmental weeds and evidence of feral animal activity.	• Undertake weed/feral animal control as required.
	• No increase in priority weeds listed for the Muswellbrook Shire Council and Hunter Local Land Services Regions.	• Priority weeds listed for Muswellbrook and Hunter LLS Regions increase.	• Undertake weed/feral animal control as required
	• There is no evidence of significant damage resulting from feral animal activity.	• Evidence of significant feral animal damage to rehabilitation area.	• Adapt/modify feral animal control strategy.
Soil	• Topsoil or a suitable alternative has been spread uniformly over the rehabilitation surface. See **Section 5.2** for methodology. • Monitoring demonstrates soil profile development in rehabilitated areas (e.g. development of organic layer, litter layer).	• Non-uniform spreading of topsoil or alternative on rehabilitated surface. • No evidence of soil profile development in rehabilitated areas.	• Monthly inspection to identify need for corrective action. Topsoil to be re-worked to achieve uniform distribution. Additional ameliorants may be required. • Soil profile development influenced by original placement techniques and vegetation growth. Corrective actions to be developed based on specific conditions.
Landform	• Rehabilitated slopes are stableNo significant erosion is present that would constitute a safety hazard or compromise the capability of supporting the end land use.	• Rehabilitated slopes are unstable or eroding. • Erosion causing a safety issue or impacting final land use.	• Stabilise slopes via erosion control or earthworks, or drainage controls as appropriate. • Adapt erosion control strategy to stabilise landform.

Aspect	Preliminary Rehabilitation Performance and Completion Criteria	Trigger for Action	Potential Corrective Action
Vegetation Composition, Function and Structure	• Specific performance and completion criteria will be developed throughout phase 1 and early phase 2, once an ecological monitoring program (including analogue/reference ecosystems) has been established. • Rehabilitation performance criteria will be age-based, with interim targets reflecting expected trajectories for vegetation composition, structure and function. • Additional indicators (e.g. species survivorship, cover, species richness, recruitment) will be considered and included where relevant, at the recommendation from ecologists, once monitoring has commenced.	• Specific trigger thresholds will be determined as part of the rehabilitation performance framework, based on ecological criteria developed from baseline monitoring and aligned with rehabilitation age. • Action will be triggered where monitoring results fall below agreed age-appropriate thresholds for key indicators	• Undertake rehabilitation maintenance activities as informed by monitoring results (e.g. infill planting, weed control, soil amelioration). • Review and update rehabilitation methods and targets as required.
Water	• Runoff water quality from the site does not pose a threat to downstream water quality.	• Poor quality runoff downstream. Water samples not within the range of the EPL criteria. Section 7.2 of the approved Water Management Plan states: *Prior to discharging from sedimentation basins over the design storm, the following criteria will be achieved:* • *50 mg/L Total Suspended Solids (TSS)* • *No visual oil and grease; and* • *pH between 6.5 and 8.5.*	• Review water quality results and determine activities/site locations contributing to water quality. Modify erosion control/water treatment measures as required.

Table 8 - Completion Criteria for Offset Area

Aspect	Preliminary Rehabilitation Performance and Completion Criteria	Trigger for Action	Potential Corrective Action
Weed and Pests	• Regular bi-monthly inspections indicate declining weed diversity, density and abundance and a decline in signs of feral animal activity.	• Increased noxious or environmental weeds and evidence of feral animal activity.	• Undertake weed/feral animal control as required.
	• No increase in priority weeds under listed for the Muswellbrook Shire Council and Hunter Local Land Services Regions.	• Priority weeds under listed for the Muswellbrook Shire Council and Hunter Local Land Services Regions high threat weed species increase.	• Undertake weed/feral animal control as required.
	• There is no evidence of significant damage resulting from feral animal activity.	• Evidence of significant feral animal damage to offset area.	• Adapt/modify feral animal control strategy.
Landform	• The offset area is stable. • No significant erosion is present that would constitute a safety hazard for the longterm landform stability.	• The offset area slopes are unstable or eroding. • Erosion causing a safety issue or impacting longterm landform stability.	• Stabilise slopes via erosion control or earthworks, or drainage controls as appropriate. • Adapt erosion control strategy to stabilise landform.
Vegetation Composition, Function and Structure	Key BAM offset criteria for vegetation, composition and structure are generally consistent with analogue monitoring sites based on the ecological monitoring program.	• Offset monitoring locations are greater than 20% outside the preferred BAM criteria compared to analogue sites.	• Increase maintenance. • Possible additional work such as replanting or seeding.
Water	• Runoff water quality from the site does not pose a threat to downstream water quality. Note there is no EPL criteria associated with the offset area.	• Poor quality runoff downstream.	• Water quality testing if required. Modify erosion control/water treatment measures as required.

7 MONITORING AND INSPECTIONS

7.1 Proposed Ecological Monitoring of Offset Area

An ecological baseline survey has been completed in the offset area during September 2025 and used methods consistent with the Ecological Monitoring Module (EMM), with field data collected using the Survey123 app for BAM floristics; vegetation cover, stem counts and soil function.

UHH will undertake ecological monitoring every two years. In the intervening years, the site manager will carry out qualitative assessments of the condition, extent, and progress of both temporary and permanent rehabilitation areas, with findings reported in the Annual Review in accordance with Schedule 5, Condition 9. Ecological monitoring reports will be included as appendices in Annual Reviews.

The monitoring program will also assess performance against the criteria outlined in Section 6. A total of three monitoring plots has been established within the offset area, representing PCT 3314, PCT 3314 (Derived Native Grassland), and PCT 3431.

7.2 Proposed Rehabilitation Monitoring

Rehabilitation monitoring will be completed once there have been areas of final rehabilitation. It is proposed the following:

- As per the timing of the offset ecological monitoring (every two years until operations cease at the site);
- Same methodology as the offset ecological monitoring;
- Comparison of results to analogue sites.

7.3 Proposed Inspection Program

A walkover of the site should be conducted on a bi-monthly basis when the site is operational by completing an inspection checklist. The checklist will include but not be limited to, the following:

- Date of inspection;
- Location of weed, pest species, taken using a GPS;
- Name of pest species or weed species recorded;
- Number of individuals of the pest or weed species recorded;
- Photo if appropriate; and
- Methods of control implemented.

This walkover will include disturbed areas required for active mining, remnant vegetation and any rehabilitation areas.

8 REPORTING AND COMPLIANCE MANAGEMENT

8.1 Annual Review

In accordance with Schedule 5 Condition 9 of the Development Consent, the annual review will include a summary of the ecological monitoring undertaken in rehabilitated and biodiversity offset areas (see **Section 7)**. The Annual Review will be prepared and submitted to the Secretary, in accordance with the requirements of Schedule 5 Condition 9.

The Annual Review will be made available to the public on the Quarry's website once developed and. A qualitative discussion of the effectiveness of the biodiversity management controls utilised will be reported to DPHI in the Annual Review. This will be supplemented every second year by a discussion of the quantitative effectiveness of the controls following the formal two-year ecological monitoring process. The Annual Review will also identify whether any change to existing or additional management controls are required to be implemented at the Quarry to achieve the rehabilitation objectives or completion criteria.

8.2 External Reporting

In accordance with Schedule 5 Condition 8 of the Development Consent, UHH will provide regular reporting on the environmental performance of the operations on its website. This will include outcomes of plans and programs as contained within this BRMP.

8.3 Incident/ Non-Compliance Reporting

Incident (as defined by SSD-6519)

A set of circumstances that:

• *causes or threatens to cause material harm to the environment; and/or*

• *breaches or exceeds the limits or performance measures/criteria in this consent*

In accordance with Schedule 5, Condition 7 of the Development Consent, UHH will notify the department within 24-hours of becoming aware of an incident. The notification will be made via the NSW Planning Portal (Major Projects) and will address details of the incident including:

(a) date, time and location;

(b) a brief description of what occurred and why it has been classified as an incident;

(c) a description of what immediate steps were taken in relation to the incident; and

(d) identifying a contact person for further communication regarding the incident.

In addition to the 24-hour notification, within 7 days (or as otherwise agreed by the Planning Secretary) of the immediate (24-hour) incident notification, UHH will submit a subsequent incident report that aligns with Appendix 7 of the Development Consent and includes:

(a) identifies how the incident was detected;

(b) identifies when the Applicant became aware of the incident;

(c) identifies any actual or potential non-compliance with conditions of consent;

(d) identifies further action(s) that will be taken in relation to the incident; and

(e) a summary of the incident;

(f) outcomes of an incident investigation, including identification of the cause of the incident;

(g) details of the corrective and preventative actions that have been, or will be, implemented to address the incident and prevent recurrence, including the period for implementing any corrective and/or preventative actions; and

(h) details of any communication with other stakeholders regarding the incident.

Non-Compliance

If non – compliances of the Development Consent have been identified, they will be reported to DPHI in the Annual Review, in accordance with Schedule 5, Condition 9.

8.4 Complaints Management

If there are any complaints related to rehabilitation or biodiversity management these will be managed in accordance with the Environmental Management Strategy.

8.5 Adaptive Management

In accordance with Schedule 5, Condition 5 of the Development Consent, UHH will assess and manage biodiversity related risks to ensure compliance with the objectives and completion criteria outlined in this plan.

Where a non-compliance relating to biodiversity impact has occurred, UHH, at the earliest opportunity will:

- Take all reasonable and feasible steps to ensure the incident ceases and does not reoccur;
- Consider all reasonable and feasible options for remediation (where relevant) and submit a report to the Department describing those options and any preferred remediation measures or other course of action; and
- Implement remediation measures as directed by the Secretary, to the satisfaction of the Planning Secretary.

Contingency measures that will be implemented while reasonable and feasible options are being explored include demarcating affected areas to prevent further access, implementing additional sediment and erosion controls to minimise potential for further disturbance.

8.6 Document Review

Schedule 5, Condition 3 of the Development Consent states management plans should be reviewed:

Within 3 months of the submission of an:

a) Annual Review under condition 9 below;

b) incident report under condition 7 below;

c) audit report under condition 10 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. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.

The requirement to update management plans at the site will be assessed as part of each Annual Review, unless triggered earlier under this consent condition. If no update is required, then no management plan review will be completed.

8.7 Accountabilities

Environmental management at the Quarry will be the responsibility of all employees and contractors, with the Quarry Manager having overall responsibility for environmental management of the operations.

Environmental roles and responsibilities related to biodiversity and rehabilitation management for the project personnel are outlined in **Table 9.**

Table 9 - Roles and Responsibilities

Role	Accountabilities for this document
Quarry Manager	• Approve appropriate resources for the effective implementation of this plan. • Coordinate and assist with the review of this plan in accordance with the requirements of the Development Consent. • Coordinate the implementation of biodiversity management controls and strategies in accordance with this Plan. • Coordinate the biodiversity monitoring requirements of this plan. • Ensure monitoring records are effectively maintained on site. • Ensure that the personnel involved in carrying out and monitoring of the activities required under this plan are suitably qualified, licensed and experienced to undertake the task. • Ensure all internal and external biodiversity reporting requirements are met. • Periodically review monitoring results and progress against targets and performance indicators in accordance with the requirements of this plan. • Assess the effectiveness of the management strategies and instigate the adaptive management process as required. • Identify any corrective actions required to meet the objectives and targets of this plan. • Coordinate biodiversity related incident investigations and reporting as required by legislation and internal standards and guidelines. • Review of this plan as required by the Development Consent. • Comply with all requirements in this Plan. • Report all potential environmental incidents to the Quarry Manager immediately. • Seek approval from the Quarry Manager prior to making changes to infrastructure/ processes which may result in increased biodiversity risks.

9 DEFINITIONS

The terminology utilised within this BRMP is defined in **Table 10** below.

Table 10 - Definitions

Term	Definition
BC Act	NSW *Biodiversity Conservation Act 2016*
BCD	Biodiversity Conservation Division
BRMP	Biodiversity and Rehabilitation Management Plan
CCC	Community Consultative Committee
Development Consent	DA SSD-6519
DNG	Derived Native Grassland
DPI	Department of Primary Industries
EEC	Endangered Ecological Community
EP&A Act	NSW *Environmental Planning and Assessment Act 1979*
EPBC Act	Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*
EIS	Environmental Impact Statement
DA	Development Application
DPE	Department of Planning and Environment
Incident	An occurrence or set of circumstances that: Causes, or threatens to cause material harm to the environment; or results in non- compliance with the consent
Secretary	The Secretary of the NSW Department of Planning and Environment, including any authorised delegate or nominee.
UHH	Upper Hunter Holdings Pty Ltd

10 REFERENCES

Department of Primary Industries (DPI) 2018, *Priority Weeds for the Hunter*, viewed December 2018, https://weeds.dpi.nsw.gov.au/WeedBiosecurities?AreaId=95.

KMH Environmental 2015, *Dolwendee Quarry Project Environmental Impact Statement*, report prepared for Upper Hunter Holdings.

NSW Rural Fire Service 2006a, *Bush Fire Environmental Assessment Code for New South Wales*.

NSW Rural Fire Service 2006b, *Threatened Species Hazard Reduction Lists for the Bush Fire Environmental Assessment Code*.

National Parks and Wildlife Service (NPWS) 2004, *Guidelines for Ecologically Sustainable Fire Management*.

Office of Environment and Heritage (OEH) 2018, *Threatened Biodiversity Profile*, viewed December 2018, https://www.environment.nsw.gov.au/threatenedSpeciesApp/.

Umwelt (Australia) Pty Ltd 2015, *Ecological Assessment Dolwendee Quarry*, report prepared for Upper Hunter Holdings Pty Ltd.

Umwelt (Australia) Pty Ltd 2006, *Ecological Assessment Anvil Hill Project*, report prepared for Centennial Hunter Pty Ltd, June 2006.

Ascent Ecology Pty Ltd 2026, *Biodiversity Development Assessment Report – Haul Road Modification SSD 6519 Dolwendee Quarry Project*, report prepared for Upper Hunter Holdings Pty Ltd, Billinudgel, NSW.

EcoPath Consulting 2025, *Dolwendee Quarry Biodiversity Offset Ecological Monitoring Baseline Surveys September 2025 Summary Report*, report prepared for RestoreAg Pty Ltd.

Pitt & Sherry 2025, *MOD1 – Haul Road Modification Application Dolwendee Quarry SSD 6519*, report prepared for Garry Williams.

11 APPENDICES

INTEGRATED ENVIRONMENTAL MANAGEMENT AUSTRALIA

APPENDIX A

Rehabilitation Bond (2026 Update)

Site Registration

Date May 2026

Complete the following fields prior to calculating the Security Deposit.

Mine Name:	Dolwendee Quarry Project		
Lease(s):	No Leases		
Title Holder:	Upper Hunter Holdings Pty Ltd		
Mine Operator:	Upper Hunter Holdings Pty Ltd		
Term of RCE:	N/A		
Current Security:	$247,144	**Date of last Security Deposit review**	1/03/2024
Mine Contact:	Gary Williams		
Position:			
Address:	Lot 1 DP 1160936 Lot 2 DP 1160936 Lot 3 DP 1160936 Lot 4 DP 1160936 Lot 5 DP 1160936 Lot 6 DP 1160936 Lot 1 DP 1178562		
Phone:	427016101	**Email:**	gary@united.services

NSW GOVERNMENT | Regional NSW

Open Cut Summary Rehabilitation Cost Estimation

Note: Sections of this page are automatically filled in from the registration page

Mine Name:	Dolwendee Quarry Project
Lease(s):	No Leases
Authorisation Owner:	Upper Hunter Holdings Pty Ltd
Mine Operator:	Upper Hunter Holdings Pty Ltd
Term of RCE:	N/A
Current Security:	$247,144
Date of Last Security Deposit Review:	1/03/2024
Mine Contact:	Gary Williams
Position:	
Address:	Lot 1 DP 1160936 Lot 2 DP 1160936 Lot 3 DP 1160936 Lot 4 DP 1160936 Lot 5 DP 1160936 Lot 6 DP 1160936 Lot 1 DP 1178562
Phone:	427016101
Email:	gary@united.services

Domain		Security Deposit
Domain 1: Infrastructure		$82,078
Domain 2: Tailings & Rejects		
Domain 3: Overburden & Waste		
Domain 4: Active Mine & Voids		$135,000
Domain 5: Management Activities		$28,710
Subtotal (Domains and Sundry Items)		**$245,788**
Contingency	**10%**	$24,579
Post Closure Environmental Monitoring	**10%**	$24,579
Project Management and Surveying	**10%**	$24,579
Total Security Deposit for the Mining Project (excl. of GST)		**$319,524**

Note: GST is not included in the above calculation or as part of rehabilitation security deposits required by the Department.

☐ Alterations have been made to unit prices within this spreadsheet. (Attach a separate sheet providing details of changes).

☐ The proposed rehabilitation design is generally consistent with the development consent for the project.

This Registration Form, Summary Report and calculation pages are to be printed and attached as an appendix the AEMR or MOP.

This mine security calculation has been estimated using the best available information at the time.
It is a true and accurate reflection of the total rehabilitation liability held by this mine.

Company Respresentative's Name **Date**

Company Representative's Role / Responsibility **Signature**

Open Cut Operations

Domain 1a: Infrastructure

Total Cost for Infrastructure Domain $82,078

Additional Assumptions: *Record any relevant assumptions to this domain below:*

Based on discussions with site and review of information there will be 3.2ha of infrastructure that will require rehabilitation at end of yr 3 of operations.	**Key Rehabilitation Area Data for Domain**	**Enter data below manually**
Haul road is to be removed. Gravel haul road with cost for ripping and seeding. This is 2.96 ha. See Row 124.	**Total Landform Establishment:**	
Cost for rehabilitation maintenance of laydown area and haul road (after rehabilitation), is included in Row 171.	**Total Growth Media Development:**	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
Termination of Services and Demolition Works	Disconnect and terminate all services (Water, electricity, gas etc at point of attachment to site)	Y	0	allow	$35,000		$0	No cost. Power by generator.	For disconnection of all services, at building boundaries, physical cut at the point of attachment or distribution location. If infrastructure is not consolidated (i.e., administration, camp and workshops are in separate places), consider multiple disconnection fees.
	Disconnect and terminate services at remote areas (i.e. pump stations, remote workshops, sewage treatment plant etc.)	Y	0	allow	$5,850		$0		Used for infrastructure remote from primary connection. Can also be used for small mines / quarries that do not have dedicated supplies from supply authorities such as steel lattice power lines.
	Removal of low/medium voltage powerlines including disconnection, rolling up the wires and removing the poles - does not include the removal of substations	Y	0	km	$15,000		$0	No powerlines for this project. Diesel generators used for power.	Applies to power lines on stobie, concrete or similar poles.
	Removal of power lines on tower or lattice structures (this includes disconnection, rolling up the wires and removing the structures) - does not include the removal of substations	Y	0	km	$100,000		$0		Applies to power lines on steel tower and steel lattice structures assuming 3 towers / km.
	Remove small rail, road, water course overpass - manage potential interruptions and demolish and remove bridge supports/pylons/bridge structure etc. and dispose of waste material on-site/locally	Y	0	Item	$350,000		$0		Smaller structures - minimal civil works to demolish (constructed for the purposes of mining related works - does not include transport to regional disposal facility or equivalent).
	Remove medium rail, road, water course overpass - manage potential interruptions and demolish and remove bridge supports/pylons/bridge structure etc. and dispose of waste material on-site/locally	Y	0	Item	$500,000		$0		Medium structures - minimal civil works to demolish (constructed for the purposes of mining related works - does not include transport to regional disposal facility or equivalent).
	Remove large / significant rail, road, water course overpass - manage potential interruptions and demolish and remove bridge supports/pylons/bridge structure etc. and dispose of waste material on-site/locally	Y	0	Item	$1,300,000		$0		Large structures - includes significant water management e.g. watercourse diversion and civil works to demolish (constructed for the purposes of mining related works - does not include transport to regional disposal facility or equivalent).
	Demolish and/or remove substations (assumes they are in a closed building). Dispose of waste material on-site/locally	Y	0	m2	$100.00		$0		Simple structure to demolish mechanically (no labour required), assumes single story building with no asbestos and segregation of contents for scrap as applicable.
	Demolish and remove switchyard. Dispose of waste material on-site/locally	Y	0	m2	$75.00		$0		Includes demolition and removal of all switchgear and transformers etc. and segregation of contents for scrap as applicable.
	Demolish and remove demountable structures on concrete stumps. Assumes not being re-used	Y	40	m2	$40.00	$57.63	$2,305	Based on 2026 RR cost schedule. General area based on information from Dolwendee Quarry representatives. Portable building removal cost	Crib huts, temporary offices and other 'non permanent' structures. Does not include transport to regional disposal facility or equivalent.
	Demolish and remove small buildings/tanks (admin buildings, single story accommodation etc) and disposal on-site/locally	Y	0	m2	$61.00		$0		Simple structure to demolish, assumes no greater than 2 stories high. Does not include transport to regional disposal facility or equivalent.
	Demolish and remove light industrial buildings and disposal on-site/locally	Y	0	m2/floor	$90.00		$0		Needs to be calculated per floor/level (Assume 1 floor/level = 3-4 m) - does not include transport to regional disposal facility or equivalent. Assumes asbestos free and mechanically demolished.
	Demolish and remove industrial buildings (workshops tyre change and servicing area etc not CHPP/process plant) and disposal on-site/locally	Y	0	m2/floor	$130.00		$0	N/A to site	Needs to be calculated per floor/level (Assume 1 floor/level = 3-4 m). Does not include transport to regional disposal facility or equivalent.
	Demolish and remove CHPP/process plant (include the area of each floor of the structure) and disposal on-site/locally	Y	0	m2/floor	$225.00		$0		Needs to be calculated per floor/level (Assume 1 floor/level = 3-4 m). Does not include transport to regional disposal facility or equivalent.
	Collapse, demolish and remove washery, crushers, hoppers, mills, furnaces, agglomeration, electrowinning, floatation, sizing stations, rotary breakers, etc (include the area of each floor of the structure) and disposal on-site/locally	Y	0	m2/floor	$225.00		$0	No cost proposed. Dolwendee Quarry representatives are stating that all plant will be temporary (ie. No fixed plant).	Needs to be calculated per floor/level (Assume 1 floor/level = 3-4 m). Does not include transport to regional disposal facility or equivalent.
	Collapse, demolish and remove stacker OR reclaimer (radial or luffing etc. with maneuverability for stockpile control) and disposal on-site/locally	Y	0	allow	$750,000		$0		Cost for removal of stacker or reclaim unit only. Does not include terminate services, remove rails and ballast etc. Does not include transport to regional disposal facility or equivalent.
	Collapse, demolish and remove bucket wheel stacker/reclaimer and disposal on-site/locally	Y	0	allow	$2,000,000		$0		Cost for just removal of the bucket wheel stacker/reclaim units. Does not include terminate services, remove rails and ballast etc. Does not include transport to regional disposal facility or equivalent.
	Remove stacker/reclaimer rails and ballast and demolish and remove concrete footings etc and disposal on-site/locally	Y	0	m	$75.00		$0		Includes both rails, does not include the conveyor system. Does not include transport to regional disposal facility or equivalent.

Collapse, Cut and Remove 5000T coal silo and disposal on-site/locally	Y	0	allow	$92,500		$0		Collapse structure and remove. Does not include transport to regional disposal facility or equivalent.
Collapse, Cut and Remove 3000 T coal silo and disposal on-site/locally	Y	0	allow	$77,500		$0		Collapse structure and remove. Does not include transport to regional disposal facility or equivalent.
Collapse, Cut and Remove 1250 T coal silo and disposal on-site/locally	Y	0	allow	$62,500		$0		Collapse structure and remove. Does not include transport to regional disposal facility or equivalent.
Collapse, Cut and Remove rail loading bins and disposal on-site/locally	Y	0	allow	$65,000		$0		Collapse structure and remove. Does not include transport to regional disposal facility or equivalent.
Demolish and Remove large concrete rail loading bin - and disposal on-site/locally	Y	0	allow	$460,000		$0		Collapse structure and remove. Does not include transport to regional disposal facility or equivalent.
Demolish and remove onground conveyors, transfer stations & gantries (scrap only – does not include dismantling for reuse at another site) and disposal on-site/locally	Y	0	m	$185.00		$0	**No cost proposed. Dolwendee Quarry representatives are stating that all plant will be temporary (ie. No fixed plant).**	Estimate for on-ground conveyor including anything up to 10 m off the ground. Does not include transport to regional disposal facility or equivalent.
Demolish and remove elevated conveyors, transfer stations & gantries (scrap only, does not include dismantling for reuse at another site) and disposal on-site/locally	Y	0	m	$295.00		$0		Estimate for elevated conveyor up to ~10 m off the ground. Does not include transport to regional disposal facility or equivalent.
Demolish and remove overhead conveyors, transfer stations & gantries (scrap only, does not include dismantling for reuse at another site) and disposal on-site/locally. This may include small scale fixed material stacking infrastructure	Y	0	m	$850		$0		Estimate for overhead conveyor including conveyors that are >10 m off the ground that require a crane to remove. Does not include transport to regional disposal facility or equivalent.
Remove and demolish conveyor from reclaim tunnel (Does not include excavation and demolition of reclaim tunnel roof)	Y	0	m	$150.00		$0		Due to no canopy or infrastructure attached.
Demolition of reclaim tunnel concrete (Assumes complete removal and dumping in mine pit void)	Y	0	m	$950.00		$0		Assumes this area will be used for another land-use that requires the structure to be dug up and re-buried somewhere else.
Demolition and removal of vent raise fans, electrical substation and winch and disposal on-site/locally	Y	0	allow	$25,000		$0		Does not include filling and capping the shaft. Does not include transport to regional disposal facility or equivalent.
Demolish and remove small tank clean (Thickener etc 3 - 9 m diameter) and disposal on-site/locally	Y	0	allow	$10,000		$0		Assume tank is clean - contents removed. If tank is full allow extra 30% for excavator and 2 men to dig out and dispose. Does not include transport to regional disposal facility or equivalent.
Demolish and remove medium tank clean (Thickener etc 10 - 15 m diameter) and disposal on-site/locally	Y	0	allow	$30,000		$0		Assume tank is clean - contents removed. If tank is full allow extra 30% for excavator and 2 men to dig out and dispose. Does not include transport to regional disposal facility or equivalent.
Demolish and remove large tank clean (Thickener etc 15 - 30 m diameter) and disposal on-site/locally	Y	0	allow	$45,000		$0		Assume tank is clean - contents removed. If tank is full allow extra 30% for excavator and 2 men to dig out and dispose. Does not include transport to regional disposal facility or equivalent.
Demolish and remove extra large tank clean (Thickener etc >30 m diameter) and disposal on-site/locally	Y	0	allow	$100,000		$0		Assume tank is clean - contents removed. If tank is full allow extra 30% for excavator and 2 men to dig out and dispose. Does not include transport to regional disposal facility or equivalent.
Demolish and remove tank clean (Thickener etc) >50 m diameter and disposal on-site/locally	Y	0	allow	$100,000		$0		Estimate only - may require a detailed assessment from demolition expert due to specialised equipment required for removal. Does not include transport to regional disposal facility or equivalent.
Removal of UG tank <5000 L - including pipes, bunds etc. and disposal on-site/locally	Y	0	allow	$21,000		$0		Assume tank is clean (contents removed), does not include transport to regional disposal facility or equivalent.
Removal of UG tank 5000 L - 15000 L - including pipes, bunds etc. and disposal on-site/locally	Y	0	allow	$30,000.00		$0		Assume tank is clean (contents removed), does not include transport to regional disposal facility or equivalent.
Remove small underground pipe and disposal on-site/locally	Y	0	m	$25.00		$0		For example: 300 mm pipes - 0.5 m deep, does not include transport to regional disposal facility or equivalent.
Remove medium underground pipe and disposal on-site/locally	Y	0	m	$60.00		$0		For example: 500 mm pipes - 1 m deep, does not include transport to regional disposal facility or equivalent.
Remove large underground pipe and disposal on-site/locally	Y	0	m	$165.00		$0		For example: 1 m pipes - 2 m deep.
Remove above ground pipe (supported) and disposal on-site/locally	Y	0	m	$12.00		$0		~300 mm pipes and assumes pipes are in close proximity to infrastructure areas. Does not include transport to regional disposal facility or equivalent.
Remove surface pipelines (unsupported) and disposal on-site/locally	Y	0	m	$15		$0		~300 mm pipes and assumes pipes are used for water transfer between pits (or similar) and remotely located. Does not include transport to regional disposal facility or equivalent.
Remove pump and pontoon from small lake or dam including pipes and electrical supply or diesel tank/s	Y	0	allow	$20,000.00		$0		Includes equipment for retrieval - boats, etc. and labour. Does not include transport to regional disposal facility or equivalent.
Remove bitumen (car park and access roads) and dispose on-site/locally	Y	0	m2	$10.00		$0		Scalp bitumen and stabilised material. Generally haulage rates will be $0.60 - $1.20 / km, depending on truck fleet, loaders etc. For off-site disposal use alternate rate option and add $0.90 / km for transport.
Remove bitumen (airstrip) and dispose on-site/locally	Y	0	m2	$20.00		$0		Scalp bitumen and stabilised material. Generally haulage rates will be $0.60 - $1.20 / km, depending on truck fleet, loaders etc. For off-site disposal use alternate rate option and add $0.90 / km for transport.

	Remove concrete pads & footings (<300 mm thickness) and disposal on-site/locally	Y	0	m2	$36.00		$0	No cost proposed. Dolwendee Quarry representatives are stating that all plant will be temporary (ie. No fixed plant).	Breaking up slab and disposal or for conversion to aggregate. Generally haulage rates will be $0.60 - $1.20 / km, depending on truck fleet, loaders etc. For off-site disposal use alternate rate option and add $0.90 / km for transport.
	Remove concrete pads & footings (>300 mm thickness) and disposal on-site/locally	Y	0	m2	$75.00		$0		Breaking up slab and disposal or for conversion to aggregate. Generally haulage rates will be $0.60 - $1.20 / km, depending on truck fleet, loaders etc. For off-site disposal use alternate rate option and add $0.90 / km for transport.
	Crush concrete to make road aggregate - 75 mm	Y	0	tonne	$10.00		$0		Does not include haulage of materials - assumes crushing plant is readily available.
	Crush concrete to make road aggregate - 50 mm	Y	0	tonne	$13.00		$0		Does not include haulage of materials - assumes crushing plant is readily available.
	Crush concrete to make road aggregate - 30 mm	Y	0	tonne	$15.00		$0		Does not include haulage of materials - assumes crushing plant is readily available.
	Remove fence (cyclone/wire fence) and disposal on-site/locally	Y	0	m	$20.00		$0		Roll up fence and remove posts.
	Removal of small plastic tanks	Y	0	each	$1,000.00		$0		Remove small poly tanks used for water storage, etc.
	Demolish and remove galvanised/corrugated light weight tanks	Y	0	each	$500.00		$0		Demolish and remove small lightweight metal tanks. No costs included for managing liquids, etc.
	Demolish and remove communication towers	Y	0	each	$5,000.00		$0		Cost includes demolition and removal of tower only; separate costs required for disconnection of services, demolition of footings, etc.
	Removal of UG services (power within main gate areas, etc.)	Y	0	allow	$50,000.00		$0		Assume service disconnection at the mine boundary is at surface level. This cost covers all fees and charges
	Waste disposal to Council landfill (general waste) - haulage >10 km but <15 km	Y	0	tonne	$7.00		$0		Rate accounts for round trip haulage to Council landfill but excludes landfill fees. Input quantity against Waste disposal to Council landfill - fees for relevant waste type.
	Waste disposal to Council landfill (general waste) - haulage >15 km but <25 km	Y	0	tonne	$9.00		$0		Rate accounts for round trip haulage to Council landfill but excludes landfill fees. Input quantity against Waste disposal to Council landfill - fees for relevant waste type.
	Waste disposal to Council landfill (general waste) - haulage >25 km but <50 km	Y	0	tonne	$12.50		$0		Rate accounts for round trip haulage to Council landfill but excludes landfill fees. Input quantity against Waste disposal to Council landfill - fees for relevant waste type.
	Waste disposal to Council landfill (industrial demolition / concrete / scrap metal) - haulage >10 km but <15 km	Y	0	tonne	$32.00		$0		Rate accounts for round trip haulage to Council landfill but excludes landfill fees. Input quantity against Waste disposal to Council landfill - fees for relevant waste type.
	Waste disposal to Council landfill (industrial demolition / concrete / scrap metal) - haulage >15 km but <25 km	Y	0	tonne	$36.00		$0		Rate accounts for round trip haulage to Council landfill but excludes landfill fees. Input quantity against Waste disposal to Council landfill - fees for relevant waste type.
	Waste disposal to Council landfill (industrial demolition / concrete / scrap metal) - haulage >25 km but <50 km	Y	0	allow	Use alternate rate cell		$0		Rate accounts for round trip haulage to Council landfill but excludes landfill fees. Input quantity against Waste disposal to Council landfill - fees for relevant waste type.
	Waste disposal to Council landfill - fees (general waste)	Y	0	tonne	$193.00		$0		Fee for waste disposal of general waste to local Council landfill; transport rates separate. Please note that this is not applicable to operations with approval for building and demolition waste disposal on site.
	Waste disposal to Council landfill - fees (industrial demolition / concrete / scrap metal)	Y	0	tonne	$174.00		$0		Fee for waste disposal of industrial demolition / concrete / scrap metal waste to local Council landfill; transport rates separate. Rate does not assume material is recyclable. Please note that this is not applicable to operations with approval for building and demolition waste disposal on site.
						Termination of Services and Demolition Works Subtotal	$2,305		
Rail Infrastructure	Remove rail loop and spur, ballast etc. and disposal on-site/locally	Y	0	m	$60.00		$0		Remove all materials to allow area to be reshaped and rehabilitated - does not include transport to regional disposal facility or equivalent.
	Remove train loading facilities and disposal on-site/locally	Y	0	m2	$185.00		$0		Remove rail load point infrastructure including gantries and control structures. Does not include transport to regional disposal facility or equivalent.
	Reshape rail spur and load out areas. Does not include growth media and revegetation	Y	0	ha	$2,860		$0		D10 Dozer and 16 H Grader (50% utilisation).
						Rail Infrastructure Subtotal	$0		
Contaminated Materials	Undertake a preliminary site investigation (Phase 1). This accounts for current and historical locations where areas of disturbance are clustered. If there are multiple cluster areas on site, multiple studies may be required.	Y	0	Cluster	$15,000		$0		The preliminary investigation would include at minimum a desktop assessment of the area and site history, incidents, etc. as per the National Environmental Protection (Site Contamination) Measure (NEPM) Phase 1 assessment (EP Act Section 389 (2) (iv)) or similar approved and recognised assessment method. A cluster may include: - Mine infrastructure (i.e., fuel / chemical store, workshop, vehicle wash-down, sewage treatment etc.) - Processing plants (i.e., ore and product storage, mine waste storage and disposal, rail load-out etc.) - Remote pit-top facilities (i.e., vehicle re-fuel, sewage treatment, secondary workshop, chemical storage etc.)

Undertake an intrusive site investigation on sites with small footprints to investigate e.g. ≤15 ha. This accounts for current and historical locations where areas of disturbance are clustered. If there are multiple cluster areas on site, multiple intrusive investigations should be included.	**Y**	0	Cluster	**$44,000**		**$0**		The intrusive investigation would include at minimum a site walkover and field sampling as per the National Environmental Protection (Site Contamination) Measure (NEPM) Phase 2 intrusive investigation (EP Act Section 389 (2) (iv)) or similar approved and recognised assessment method. Note: An intrusive investigation is not required for all contaminated areas and should be applied considering the rehabilitation program, site history, location, etc. A cluster area where it is highly anticipated that contamination has occurred (i.e., underground tanks / pipes that are known to have leaked, chemical stores with earthen bunds, around ineffective oil/water separators etc.) and further field work is required involving intrusive investigation. Assumes site is easily accessible and a small area e.g. ~10-15 ha requires investigation and testing (test pits, boreholes, etc.) based on Sampling and Analysis Quality Plan. Includes SAQP, fieldwork, sampling and analysis.
Undertake an intrusive site investigation on sites with large footprints to investigate e.g. >15 ha. This accounts for current and historical locations where areas of disturbance are clustered. If there are multiple cluster areas on site, multiple intrusive investigations should be included.	**Y**	0	Cluster	**$106,000**		**$0**		The intrusive investigation would include at minimum a site walkover and field sampling as per the National Environmental Protection (Site Contamination) Measure (NEPM) Phase 2 intrusive investigation (EP Act Section 389 (2) (iv)) or similar approved and recognised assessment method. Note: An intrusive investigation is not required for all contaminated areas and should be applied considering the rehabilitation program, site history, location, etc. A cluster area where it is highly anticipated that contamination has occurred (i.e., underground tanks / pipes that are known to have leaked, chemical stores with earthen bunds, around ineffective oil/water separators etc.) and further field work is required involving intrusive investigation. Assume site has a history of contamination and/or a large area >15 ha requires investigation and testing (test pits, boreholes, etc.) based on Sampling and Analysis Quality Plan. Includes SAQP, fieldwork, sampling and analysis.
Develop a Remediation Action Plan on sites with small footprints based on outcomes of intrusive investigation including strategies to address contamination exceedances	**Y**	0	allow	**$35,000**		**$0**		Develop remediation plan for approval including designs and detailed costs. Costs may increase if detailed designs required for construction.
Develop a Remediation Action Plan on sites with large footprints based on outcomes of intrusive investigation including strategies to address contamination exceedances	**Y**	0	allow	**Use alternate rate cell**		**$0**		Assumes complex site; detailed design drawings required for cover.
Removal and disposal of contaminated water from tanks, bunded areas and sumps	**Y**	0	L	**$0.35**		**$0**		Cost for recent sump clean-up from resource activity - requires specialists to treat.
Remove material (carbonaceous / metalliferous spillage or otherwise) from footprint of the process facility (leach pads) / stockpile area (ROM product) / roads and dump in a void on-site (Select Haul Distance from list)	**Y**	0	m3	**Select from List**			**Select Haul Distance Here**	This item includes scraping and removal of the volume of carbonaceous material using dozer, grader etc. to make safe an area and enable the establishment of rehabilitation.
Load, cart and dispose of Hazardous classified contaminated material off site to a licensed landfill. Assumes cartage to a licensed landfill.	**Y**	0	m3	**$800.00**		**$0**		Includes load, haul and dump fees to a licensed facility.
Load, cart and disposal of Restricted classified contaminated material off site to a licensed landfill. Add $50/m3 for cartage from regional areas	**Y**	0	m4	**$660.00**		**$0**		Includes load, haul and dump fees to a licensed facility.
Load, cart and disposal of Low Level contaminated material off site to a licensed landfill. Add $50/m3 for cartage to regional landfill	**Y**	0	m3	**$220.00**		**$0**		Includes load, haul and dump fees to a licensed facility.
Onsite remediation of hydrocarbon contaminated soils manual land farming (Select Volume from List)	**Y**	0	m3	**Select from List**			**Select Volume Here**	Spreading of contaminated soils on a prepared surface and stimulation of aerobic microbial activity within the soils through aeration and/or the addition of minerals, nutrients and moisture to promote the aerobic degradation of organic chemicals - time frame of up to 24 months
Mobilisation of cement stabilisation plant and equipment for hydrocarbon (i.e., PAH, long chain hydrocarbons, etc.) contaminated soil treatment	**Y**	0	Item	**$150,000**		**$0**		Required if treatment of hydrocarbon contamination is required to be fast tracked.
On-site remediation of hydrocarbon contaminated soils - using a mobile treatment unit	**Y**	0	m3	**$165.00**		**$0**		Additional cost as the treatment process is fast tracked.
Remove and dispose of asbestos (<750 m2)	**Y**	0	m2	**$50.00**		**$0**		Where an assessment/estimation has been made to confirm the volume of asbestos to be removed.
Remove and dispose of asbestos (>750 m2)	**Y**	0	m2	**$40**		**$0**		Where an assessment/estimation has been made to confirm the volume of asbestos to be removed.
Waste disposal to Council landfill - fees (asbestos)	**Y**	0	tonne	**$290**		**$0**		Landfill fees to regional landfill.
Treatment of known Acid Sulfate Soils	**Y**	0	ha	**$2,580**		**$0**		Assumes ASS is treatable via neutralisation and does not require capping and isolation. Assumes 1% by weight lime addition and treatment to 100 mm depth only.
Removal and disposal of plastic liner (i.e. dam, leach pad, sump etc.)	**Y**	0	m2	**$1**		**$0**		Provisional sum for cutting using ripping tynes and on-site disposal of the liner.
							Select Haul Distance Here	

	Long haulage brine/salt for disposal (Select Haul Distance from list)	Y	0	tonne	Select from List				Costs for haulage to location for authorised disposal.
	Brine disposal to landfill - fees only	Y	0	tonne	$288		$0		Rate for trackable liquid levy of $78.20 per tonne and authorised disposal to landfill.
	Long haulage water (clean or contaminated) (Select Haul Distance from list)	Y	0	tonne	Select from List			Select Haul Distance Here	Assumes transport in a 20,000 L tanker. Add disposal costs to additional items where warranted.
						Contaminated Materials Subtotal	$0		
Vents, Shafts and Boreholes	Option 1 - Coal bore hole Exploration boreholes – rehabilitate coal boreholes and drill pads as required	Y	0	depth (m)	$44.55		$0		Cost to grout and cap an open exploration borehole. Assume a 20 m x 20 m drill pad requires rehabilitation - push cover of nearby growth media, rip and seed.
	Option 3 - Mineral RAB and aircore drill holes Exploration boreholes – backfill open Rotary Airblast (RAB) or aircore drill holes with cuttings	Y	0	allow	$43		$0		May include cutting of casing, installation of a casing cap, and/or manually backfilling the hole with drill cuttings. Does not include reshaping / ripping the drill pad, amelioration / seeding etc.
	Option 2 - Mineral drill hole requiring grouting Exploration boreholes – grout and cap open bore holes	Y	0	allow	$5,700		$0		Includes grouting and capping 100 - 200 m exploration boreholes to meet the requirements of Departmental Guidelines.
	Boreholes – cap and seal open bore holes with steel casing (i.e., goaf drainage etc.)	Y	0	allow	$6,960		$0		Holes deeper than 100 m - includes cutting steel collar 6 m below surface, grouting and capping.
	Boreholes – cap and seal open bore holes - surface-to-in-seam gas drainage	Y	0	allow	$17,890		$0		Surface-to-in-seam gas drainage boreholes.
	Boreholes – cap and seal open bore holes - vertical gas drainage	Y	0	allow	$16,000		$0		Vertical gas drainage boreholes.
	Boreholes – grout (with concrete) cap and seal bore holes (i.e. where sealing aquifers)	Y	0	allow	$35,000		$0		Includes multi skin sleaves to prevent aquifer mixing.
	Boreholes – cap and seal service boreholes for UG coal operations	Y	0	allow	$45,000		$0		Includes large diameter boreholes used for supplying electricity (66kV), compressed air, water, solsenic etc.
	Option 4 - Mineral diamond drill hole Rehabilitation of diamond drill holes and pad including sealing drill holes for mineral exploration	Y	0	Item	$2,070		$0		Bog out cuttings, remove fencing, remove rubbish, push sumps in, rehabilitate pads and tracks, cut and plug collars. Includes labour and equipment, disposal of rubbish locally on site
	Option 5 - Mineral reverse circulation drill holes Rehabilitation of reverse circulation drill holes and pad including sealing drill holes for mineral exploration	Y	0	Item	$1,340		$0		Sealing required, but not complete filling with concrete/grout
	Option 6 - Rehabilitation of drill hole collars Rehabilitation of drill hole collars (mineral exploration)	Y	0	each	$415		$0		Cut collar, remove, cap, backfill capped collar and cover with nearby organic or growth material
						Vents, Shafts and Boreholes Subtotal	$0		
Roads and Tracks	Unsealed roads / vehicle park-up areas – minor works including deep rip and trim	Y	0	ha	$1,040.00		$0	Site will run on septic system. However there is an approval for an approved dwelling at the property, therefore this will remain. No cost.	Assumes ~6 m road width - 16H Grader.
	Unsealed roads / access tracks / vehicle park-up areas with windrows and/or small earthen bunds – minor earthworks and deep rip and trim	Y	0	ha	$1,500		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - no seed
	Unsealed roads / vehicle park-up areas – Minor earthworks, final trim and deep rip and seed (pasture grass)	Y	0	ha	$3,700		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - pasture grass seed
	Unsealed roads / vehicle park-up areas – Minor earthworks, final trim and deep rip, ameliorate and seed (native tree/shrub/grass)	Y	0	ha	$4,485		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - native tree/shrub seed
	Unsealed roads / haul roads / vehicle park-up areas with windrows and/or small earthen bunds – Minor earthworks, final trim and deep rip, ameliorate and seed (pasture grass)	Y	2.96	ha	$4,870	$7,450	$22,052	Based on 2026 RR cost schedule. New Haul Road 1.1km long, 20m wide haul road.	D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - pasture grass seed
	Unsealed roads / haul roads / vehicle park-up areas with windrows and/or small earthen bunds – Minor earthworks, final trim and deep rip, ameliorate and seed (native tree/shrub/grass)	Y	0	ha	$7,025		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - native tree/shrub seed
	Remove stabilised material (blue metal, aggregate etc.) from roadways and disposal on-site/locally (Select Haul Distance from list)	Y	0	m3	Select from List			Select Haul Distance Here	This item includes the scraping and removal of the volume of stabilised material from the road, laydown or other surface using an excavator, dozer and grader to enable the establishment of rehabilitation.
						Roads and Tracks Subtotal	$22,052		
Earthworks / Structural Works (Landform Establishment)	Major bulk pushing to achieve grades nominated in the approval/permit – Select Push Length	Y	0	m3	Select from List			Select Push Length Here	Major bulk pushing to achieve grades nominated in the approval/permit
	Minor reshaping and pushing	Y	3.2	ha	$3,900		$12,480	Cost included for minor shaping.	D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation).
	Structural works, banks, waterways - contour banks, drainage channels and other soil conservation measures	Y	0	ha	$1,600		$0		Combination of dozer and excavator work plus grader for ~4 hours each per ha.
	Fill dams, voids etc. - Source local material, cart and spread to cap or backfill, cap thickness determined by approval / permit (Select Haul Distance from List)	Y	0	m3	Select from List			Select Haul Distance Here	This item includes the volume of material requiring backfill using an excavator and scraper to fill the void and enable the establishment of rehabilitation.
	Shotcrete application on cuttings and steep slopes	Y	0	m2	$185.00		$0		This rate is used to rehabilitate steep slopes of weathered rock, roadway cuttings, etc that cannot be cut back and stabilised.
	Trim, rock rake & deep rip (includes levelling / landscaping and rip in 1 direction)	Y	3.2	ha	$1,130.00	$1,230.19	$3,937	Based on 2026 RR cost schedule.	Undertaken using D10 dozer and 16M grader.
	Deep rip hard stand / lay down areas	Y	0	ha	$960.00		$0		D10 deep ripping.

	Construction of spine drains / drop structures and/or stabilising water course entry points - required for large catchments	Y	0	m2	$27.00		$0		Installation of on-site rock material (rip-rap) where managing water run-off from disturbed land and/or upon entry to water courses - prevents erosion of gully head (assumes competent material is locally available). If required to be sourced off site, assume an additional $20/m2.
	Earthworks / Structural Works (Landform Establishment) Subtotal						**$16,417**		
Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment)	Source, cart and spread growth media - haul distance <1 km	Y	3200	m3	$3.26	$3.80	$12,160	< =1km Based on 2026 RR cost schedule. Estimate of 3.2 ha x 0.1m of topsoil.	Undertaken with 623 scraper and 14 M grader.
	Planting mature trees (>15 cm)	Y	0	allow	$15.00		$0		4 m centres.
	Planting tube stock (<15 cm)	Y	0	allow	$6.60		$0		4 m centres.
	Direct seeding / fertiliser (pasture grass species)	Y	0	ha	$1,875		$0		Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Direct seeding / fertiliser (tree or native grass species)	Y	3.2	ha	$4,135	$4,366	$13,971	Based on 2026 RR cost schedule. Soil amelioration and seeding. Woodland seed mix.	Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Hydro-seeding with straw mulching and bitumen tack with native seed	Y	0	m2	$1.90		$0		Process to be used on flat well prepared surfaces under irrigation e.g. sewage treatment irrigation areas. Ranges from $0.15 - $0.50 depending on size and input variables. Native seed +$1.00
	Hydro-seeding with straw mulching and bitumen tack with pasture seed	Y	0	m2	$0.43		$0		Process to be used on flat well prepared surfaces under irrigation e.g. sewage treatment irrigation areas. Ranges from $0.15 - $0.50 depending on size and input variables. Pasture seed +$0.10
	Hydromulch - base grade or standard for flat areas that can be irrigated by water cart	Y	0	m2	$0.80		$0		Assumes use on flat areas with a gradient of less than 4:1, and where irrigation from water cart may be possible. Industry standard application rate of 2500kg/ha. Product will last short term (less than 3 months) and vegetation is required to grow ASAP for stability. This cost includes cover crop only, additional seeding required.
	Hydromulch - bonded fibre matrix grade for steep areas to stabilise up to 12 months	Y	0	m2	$1.80		$0		Assumes use on steep areas where stabilisation is required for up to 12 months. Application rate of ~3500kg/ha. This cost includes cover crop only, additional seeding required.
	Hydromulch - high performance flexible growth medium grade	Y	0	m2	$2.50		$0		Assumes use on extreme slopes where stabilisation is required for up to 18 months. Application rate of ~4,000kg/ha minimum. This cost includes cover crop only, additional seeding required.
	Single application of fertiliser (pasture)	Y	0	ha	$420.00		$0		Assumes 250 kg / ha. These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
	Single application of fertiliser (trees)	Y	0	ha	$140.00		$0		These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
	Spoil amelioration (adding lime / gypsum etc.)	Y	3.2	ha	$1,000.00	$2,465.37	$7,889	Based on 2026 RR cost schedule. Soil amelioration and seeding.	Assumes 2.5 t / ha as an average application rate.
	growth media amelioration with biosolids	Y	0	ha	$1,015		$0		Recent experience with agronomy projects.
	Construct no-climb stock fence around rehabilitated areas	Y	0	m	$22.00		$0		Standard rate for no-climb stock fencing.
	Construct standard stock fence around rehabilitated areas	Y	0	m	$13.00		$0		Standard rate for standard stock fencing.
	Purchase and erect warning signs	Y	0	allow	$250.00		$0		Compliance with AS 1319-1994 - Safety signs for the occupational environment - installed every 25 m.
	Supply from external sources virgin excavated natural material (VENM) for growth media.	Y	0	m3	$80.80		$0		D7 to spread material at $205/hr, Excavator ($220/hr) load Artic Trucks (90c/km) from imported stockpile - allow nominal rate of $70/m3 for imported fill material.
	Supply from external sources a combination of virgin excavated natural material (VENM) and spoil from large excavation for filing voids and/or capping etc.	Y	0	m3	$72.50		$0		D10 push into void at $270/hr, Excavator ($220/hr) load Artic Trucks (90c/km) from imported stockpile - allow nominal rate of $60/m3 for imported fill material.
	Clearing and grubbing of trees and vegetation	Y	0	ha	$4,730.00		$0		Clearing and grubbing of light vegetation growth e.g. regrowth
	Topsoil stripping	Y	0	m3	$4.86		$0		Stripping or topsoil at an approximate depth of 0.2 m into stockpiles; load and haul to final rehabilitation location required or respreading where necessary.
	Growth media supplementation with manure	Y	0	ha	$747.50		$0		Addition of manure to improve soil quality.
	Utilise biotic soil media - organic topsoil alternative	Y	0	m2	$2.50		$0		Material that can be applied as an alternative to spreading topsoil prior to hydromulching.
	Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment) Subtotal						**$34,020**		
Water Management	Clean water dams to be retained after decommissioning – make safe and minor earthworks	Y	0	allow	$2,500		$0		Provisional sum for earthworks and revegetation required to rehabilitate dam batters etc suitable for re-use by an alternate land-user - D6 Dozer (or similar) @ ~$200 per hour and pasture grass.
	Large clean water dams (i.e. ≥ 2 ha) to be retained after mine closure – make safe and minor earthworks	Y	0	allow	$10,500		$0		Provisional sum for earthworks and revegetation required to rehabilitate dam batters etc suitable for re-use by an alternate land-user - D6 Dozer (or similar) + pasture grass.
	Remove sediments from the floor of the dam to							Select Haul Distance Here	This item includes the volume of

	enable it to be converted into clean water structure (Select Haul Distance from list)	Y	0	m3	Select from List				contaminated sediment requiring removal using an excavator, truck and dozer to clean out the dam.
	Removal of evaporation fans and/or other water transfer and management infrastructure	Y	0	allow	$25,000		$0		Provisional sum for removal of water management infrastructure.
						Water Management Subtotal	$0		
Maintenance of Rehabilitated Areas	Maintenance of areas that have been shaped and seeded and revegetation has been 'successful'	Y	6.95	ha	$925	$1,048	$7,284	Based on 2026 RR cost schedule. Included as there will be maintenance requirements for any disturbed areas. Ie. maintenance of proposed rehabilitation areas. This is proposed laydown (infrastructure area and haul road).	Rehabilitation maintenance might include re-seeding, watering, fertilising, minor re-shaping, erosion control, inspections/audits - does not include major repair works.
	Existing rehabilitation repair - minor	Y	0	ha	$1,200		$0		Areas requiring minor repair - rills, minor growth media replacement.
	Existing rehabilitation repair - moderate	Y	0	ha	$1,700		$0		Areas requiring moderate repair - rills, significant growth media replacement.
	Existing rehabilitation repair - major	Y	0	ha	$2,500		$0		Areas requiring major repair - rills, gullies, growth media replacement, some level of additional surface water management.
	Existing rehabilitation repair - total failure of landform	Y	0	ha	$40,000		$0		Areas that require extensive rehabilitation repair - re-design and re-construction of landform.
						Maintenance of Rehabilitated Areas Subtotal	$7,284		
Additional Items	Other 1 <insert>	N		ha	This is				This item includes <<to be added by the operator>>
	Other 2 <insert>	N	0		deliberately				This item includes <<to be added by the operator>>
	Other 3 <insert>	N	0		left blank				This item includes <<to be added by the operator>>
						Additional Items Subtotal	$0		
						Total Cost for Infrastructure Domain		$82,078	

Open Cut Operations

Domain 2a: Tailings & Rejects

Total Cost for Tailings & Rejects Domain **$0**

Additional Assumptions: *Record any relevant assumptions to this domain below:*

No tailimngs at site, hence no cost.	**Key Rehabilitation Area Data for Domain**	**Enter data below manually**
	Total Landform Establishment:	
	Total Growth Media Development:	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
Contaminated Materials	Undertake a preliminary site investigation (Phase 1). This accounts for current and historical locations where areas of disturbance are clustered. If there are multiple cluster areas on site, multiple studies may be required.	**Y**	0	Cluster	**$15,000**		**$0**	**No tailings associated with this quary**	The preliminary investigation would include at minimum a desktop assessment of the area and site history, incidents, etc. as per the National Environmental Protection (Site Contamination) Measure (NEPM) Phase 1 assessment (EP Act Section 389 (2) (iv)) or similar approved and recognised assessment method. A cluster may include: - Mine infrastructure (i.e., fuel / chemical store, workshop, vehicle wash-down, sewage treatment etc.) - Processing plants (i.e., ore and product storage, mine waste storage and disposal, rail load-out etc.) - Remote pit-top facilities (i.e., vehicle re fuel, sewage treatment, secondary workshop, chemical storage etc.)
	Undertake an intrusive site investigation on sites with small footprints to investigate e.g. ≤15 ha. This accounts for current and historical locations where areas of disturbance are clustered. If there are multiple cluster areas on site, multiple intrusive investigations should be included.	**Y**	0	Cluster	**$44,000**		**$0**		The intrusive investigation would include at minimum a site walkover and field sampling as per the National Environmental Protection (Site Contamination) Measure (NEPM) Phase 2 intrusive investigation (EP Act Section 389 (2) (iv)) or similar approved and recognised assessment method. Note: An intrusive investigation is not required for all contaminated areas and should be applied considering the rehabilitation program, site history, location, etc. A cluster area where it is highly anticipated that contamination has occurred (i.e., underground tanks / pipes that are known to have leaked, chemical stores with earthen bunds, around ineffective oil/water separators etc.) and further field work is required involving intrusive investigation. Assumes site is easily accessible and a small area e.g. ~10-15 ha requires investigation and testing (test pits, boreholes, etc.) based on Sampling and Analysis Quality Plan. Includes SAQP, fieldwork, sampling and analysis.
	Undertake an intrusive site investigation on sites with large footprints to investigate e.g. >15 ha. This accounts for current and historical locations where areas of disturbance are clustered. If there are multiple cluster areas on site, multiple intrusive investigations should be included.	**Y**	0	Cluster	**$106,000**		**$0**		The intrusive investigation would include at minimum a site walkover and field sampling as per the National Environmental Protection (Site Contamination) Measure (NEPM) Phase 2 intrusive investigation (EP Act Section 389 (2) (iv)) or similar approved and recognised assessment method. Note: An intrusive investigation is not required for all contaminated areas and should be applied considering the rehabilitation program, site history, location, etc. A cluster area where it is highly anticipated that contamination has occurred (i.e., underground tanks / pipes that are known to have leaked, chemical stores with earthen bunds, around ineffective oil/water separators etc.) and further field work is required involving intrusive investigation. Assume site has a history of contamination and/or a large area >15 ha requires investigation and testing (test pits, boreholes, etc.) based on Sampling and Analysis Quality Plan. Includes SAQP, fieldwork, sampling and analysis.
	Develop a Remediation Action Plan on sites with small footprints based on outcomes of intrusive investigation including strategies to address contamination exceedances	**Y**	0	allow	**$35,000**		**$0**		Develop remediation plan for approval including designs and detailed costs. Costs may increase if detailed designs required for construction.
	Develop a Remediation Action Plan on sites with large footprints based on outcomes of intrusive investigation including strategies to address contamination exceedances	**N**	0	allow	**Use alternate rate cell**				Assumes complex site; detailed design drawings required for cover.
	Removal and disposal of contaminated water from tanks, bunded areas and sumps	**Y**	0	L	**$0.35**		**$0**		Cost for recent sump clean-up from resource activity - requires specialists to treat.
	Remove material (carbonaceous / metalliferous spillage or otherwise) from footprint of the process facility (leach pads) / stockpile area (ROM product) / roads and dump in a void on-site (Select Haul Distance from list)	**Y**	0	m3	**Select from List**			**Select Haul Distance Here**	This item includes scraping and removal of the volume of carbonaceous material using dozer, grader etc. to make safe an area and enable the establishment of rehabilitation.
	Load, cart and dispose of Hazardous classified contaminated material off site to a licensed landfill. Assumes cartage to a licensed landfill.	**Y**	0	m3	**$800.00**		**$0**		Includes load, haul and dump fees to a licensed facility.

	Load, cart and disposal of Restricted classified contaminated material off site to a licensed landfill. Add $50/m3 for cartage from regional areas	Y	0	m4	$660.00		$0		Includes load, haul and dump fees to a licensed facility.
	Load, cart and disposal of Low Level contaminated material off site to a licensed landfill. Add $50/m3 for cartage to regional landfill	Y	0	m3	$220.00		$0		Includes load, haul and dump fees to a licensed facility.
	Onsite remediation of hydrocarbon contaminated soils manual land farming (Select Volume from List)	Y	0	m3	Select from List			Select Volume Here	Spreading of contaminated soils on a prepared surface and stimulation of aerobic microbial activity within the soils through aeration and/or the addition of minerals, nutrients and moisture to promote the aerobic degradation of organic chemicals - time frame of up to 24 months.
	Mobilisation of cement stabilisation plant and equipment for hydrocarbon (i.e., PAH, long chain hydrocarbons, etc.) contaminated soil treatment	Y	0	Item	$150,000		$0		Required if treatment of hydrocarbon contamination is required to be fast tracked.
	On-site remediation of hydrocarbon contaminated soils - using a mobile treatment unit	Y	0	m3	$165.00		$0		Additional cost as the treatment process is fast tracked.
	Remove and dispose of asbestos (<750 m2)	Y	0	m2	$50.00		$0		Where an assessment/estimation has been made to confirm the volume of asbestos to be removed.
	Remove and dispose of asbestos (>750 m2)	Y	0	m2	$40.00		$0		Where an assessment/estimation has been made to confirm the volume of asbestos to be removed.
	Waste disposal to Council landfill - fees (asbestos)	Y	0	tonne	$290		$0		Landfill fees to regional landfill.
						Contaminated Materials Subtotal	$0		
Roads and Tracks	Unsealed roads / vehicle park-up areas – minor works including deep rip and trim	Y	0	ha	$1,040.00		$0		Assumes ~6 m road width - 16H Grader.
	Unsealed roads / access tracks / vehicle park-up areas with windrows and/or small earthen bunds – minor earthworks and deep rip and trim	Y	0	ha	$1,500		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - no seed
	Unsealed roads / vehicle park-up areas – Minor earthworks, final trim and deep rip and seed (pasture grass)	Y	0	ha	$3,700		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - pasture grass seed
	Unsealed roads / vehicle park-up areas – Minor earthworks, final trim and deep rip, ameliorate and seed (native tree/shrub/grass)	Y	0	ha	$4,485		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - native tree/shrub seed
	Unsealed roads / haul roads / vehicle park-up areas with windrows and/or small earthen bunds – Minor earthworks, final trim and deep rip, ameliorate and seed (pasture grass)	Y	0	ha	$4,870		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - pasture grass seed
	Unsealed roads / haul roads / vehicle park-up areas with windrows and/or small earthen bunds – Minor earthworks, final trim and deep rip, ameliorate and seed (native tree/shrub/grass)	Y	0	ha	$7,025		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - native tree/shrub seed
	Remove stabilised material (blue metal, aggregate etc.) from roadways and disposal on-site/locally (Select Haul Distance from list)	Y	0	m3	Select from List			Select Haul Distance Here	This item includes the scraping and removal of the volume of stabilised material from the road, laydown or other surface using an excavator, dozer and grader to enable the establishment of rehabilitation.
						Earthworks / Structural Works (Landform Establishment) Subtotal	$0		
Earthworks / Structural Works (Landform Establishment)	Major bulk pushing to achieve grades nominated in the approval/permit – Select Push Length	Y	0	m3	Select from List			Select Push Length Here	Major bulk pushing to achieve grades nominated in the approval/permit
	Minor reshaping and pushing	Y	0	ha	$3,900		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation).
	Fill dams, voids etc. - Source local material, cart and spread to cap or backfill, cap thickness determined by approval / permit (Select Haul Distance from List)	y	0	m3	Select from List			Select Haul Distance Here	This item includes the volume of material requiring backfill using an excavator and scraper to fill the void and enable the establishment of rehabilitation.
	Trim, rock rake & deep rip (includes levelling / landscaping and rip in 1 direction)	Y	0	ha	$1,130.00		$0		Undertaken using D10 dozer and 16M grader.
	Structural works, banks, waterways - contour banks, drainage channels and other soil conservation measures	Y	0	ha	$1,600		$0		Combination of dozer and excavator work plus grader for ~4 hours each per ha.
	Construction of spine drains / drop structures and/or stabilising water course entry points - required for large catchments	Y	0	m2	$27.00		$0		Installation of on-site rock material (rip-rap) where managing water run-off from disturbed land and/or upon entry to water courses - prevents erosion of gully head (assumes competent material is locally available). If required to be sourced off site, assume an additional $20/m2.
						Earthworks / Structural Works (Landform Establishment) Subtotal	$0		
Mine Waste	Ideal Tailings Capping - reshaping, capping / sealing of trafficable tailings facility with little chemical reactivity (no to low risk Potential Acid Forming (PAF) / Neutral Mine Drainage (NMD) / Saline Mine Drainage (SMD) and/or low to moderate propensity for spontaneous combustion) and good physical properties (not significantly hydrophilic, shear strength does not limit equipment choice, no artificial strengthening required)	Y	0	ha	$82,000		$0		This includes sourcing, carting, spreading, moisture conditioning and compaction of a suitable volume material with the appropriate chemical and physical properties. This rate assumes suitable capping material is available on site within 10 km, and an average cap thickness of approximately 0.5 m to 1 mand 0.15 m - 0.2 m growth media (assume at least 1 m thick cover required for carbonaceous material covers). Water quality from runoff, seepage etc. meets site-specific environment water quality values. If site haulage longer than 10 km round trip add the volume of the relevant material requiring haulage for this distance in 8.05 (spreading costs for tailings cap material included in rate). If additional material to make up landform, provide buttress or other works aside from tailings cap, use rate from 9.02 for relevant haulage and spreading in additional to any long haulage volume in 8.05.
	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	Y	0	allow	Use alternate rate cell		$0		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).

Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	**Y**	0	allow	**Use alternate rate cell**		**$0**		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
Efficient Tailings Capping - reshaping, capping / sealing of trafficable tailings facility with moderate chemical reactivity (low to medium risk Potential Acid Forming (PAF) / Neutral Mine Drainage (NMD) / Saline Mine Drainage (SMD) and/or low to moderate propensity for spontaneous combustion) and moderate physical properties (not significantly hydrophilic, shear strength limits equipment choice somewhat, no artificial strengthening required)	**Y**	0	ha	**$146,500**		**$0**		This item includes sourcing, carting, spreading, moisture conditioning and compaction of a suitable volume of material to cap / cover facilities where the tailings or rejects base is at a strength that enables economically efficient construction methods with small plant. This rate assumes suitable capping material is available on site within 10 km, and an average cap thickness ranging from >1 m to 2 m thickness constructed in 1 m layers + growth media up to 0.2 m depth. This may require additional materials (such as capillary breaks, geofabric, etc.) - use alternate rate cells below, specific material types (e.g. acid neutralising / consuming materials, competent rock etc.) , and associated activities (i.e., load / haul / place / crush / screen / borrow etc.). Costs for haulage of specialised/additional materials must be added separately if required. If site haulage longer than 10 km round trip add the volume of the relevant material requiring haulage for this distance in 8.05 (spreading costs for tailings cap material included in rate). If additional material to make up landform, provide buttress or other works aside from tailings cap, use rate from 9.02 for relevant haulage and spreading in additional to any long haulage volume in 8.05.
Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	**Y**	0	allow	**Use alternate rate cell**		**$0**		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	**Y**	0	allow	**Use alternate rate cell**		**$0**		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
Adverse Tailings Capping - reshaping, capping / sealing of trafficable tailings facility with moderate chemical reactivity (medium to high risk Potential Acid Forming (PAF) / Neutral Mine Drainage (NMD) / Saline Mine Drainage (SMD) and/or moderate to high propensity for spontaneous combustion) and moderate physical properties (not significantly hydrophilic, shear strength limits equipment choice somewhat, no artificial strengthening required)	**Y**	0	ha	**$313,000**		**$0**		This item includes sourcing, carting, spreading, moisture conditioning and compaction of a suitable volume of material to cap / cover facilities of high geochemical risk, and / or low shear strength that prohibits economically efficient construction methods. This rate assumes suitable capping material/s are available on site within 10 km, and an average cap thickness of approximately >2 m + growth media up to 0.2 m depth. This may require additional materials (i.e., capillary breaks, geofabric, etc.), specific material types (e.g. acid neutralising / consuming materials, competent rock etc.), and associated activities (i.e., load / haul / place / crush / screen / borrow etc.). Costs for haulage of specialised materials must be added separately if required. If site haulage longer than 10 km round trip add the volume of the relevant material requiring haulage for this distance in 8.05 (spreading costs for tailings cap material included in rate). If additional material to make up landform, provide buttress or other works aside from tailings cap, use rate from 9.02 for relevant haulage and spreading in additional to any long haulage volume in 8.05.
Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	**Y**	0	allow	**Use alternate rate cell**		**$0**		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	**Y**	0	allow	**Use alternate rate cell**		**$0**		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
Difficult Tailings Capping- reshaping, capping / sealing of weak or soft surfaced tailings facility with poor physical properties (significantly hydrophilic, low shear strength limits equipment choice greatly, artificial strengthening required) OR visible adverse impacts on legacy sites from chemical reactivity over lengthy exposure prior to rehabilitation	**Y**	0	ha	**$843,000**		**$0**		This option is typically driven by time constraints and/or when tailings properties significantly restrict adequate desiccation, resulting in a tailings shear strength that is very weak excluding access by conventional small plant. Small equipment used for rehabilitation. This excludes any additional material required to form the final landform profile in addition to this cap. If site haulage longer than 10 km round trip add the volume of the relevant material requiring haulage for this distance in 8.05 (spreading costs for tailings cap material included in rate). If additional material to make up landform, provide buttress or other works aside from tailings cap, use rate from 9.02 for relevant haulage and spreading in additional to any long haulage volume in 8.05.

	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	Y	0	allow	Use alternate rate cell		$0		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	Y	0	allow	Use alternate rate cell		$0		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Long haulage soil / weathered rock / sediment e.g. capping/covers, removal of contamination, etc. (Select Haul Distance from List)	Y	0	m3	Select from List			Select Haul Distance Here	Capping/cover material available within 50 km round trip e.g. waste / overburden dumps, borrow areas, etc.
						Mine Waste Subtotal	$0		
Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment)	Source, cart and spread growth media (Select Haul Distance from List)	Y	0	m3	Select from List			Select Haul Distance Here	If topsoil is not available on-site, then Virgin Excavated Natural Material (VENM) may need to be externally sourced.
	Direct seeding / fertiliser (pasture grass species)	Y	0	ha	$1,875		$0		Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Direct seeding / fertiliser (tree or native grass species)	Y	0	ha	$4,135		$0		Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Hydro-seeding with straw mulching and bitumen tack with native seed	Y	0	m2	$1.90		$0		Process to be used on flat well prepared surfaces under irrigation e.g. sewage treatment irrigation areas. Ranges from $0.15 - $0.50 depending on size and input variables. Native seed +$1.00
	Hydro-seeding with straw mulching and bitumen tack with pasture seed	Y	0	m2	$0.43		$0		Process to be used on flat well prepared surfaces under irrigation e.g. sewage treatment irrigation areas. Ranges from $0.15 - $0.50 depending on size and input variables. Pasture seed +$0.10
	Hydromulch - base grade or standard for flat areas that can be irrigated by water cart	Y	0	m2	$0.80		$0		Assumes use on flat areas with a gradient of less than 4:1, and where irrigation from water cart may be possible. Industry standard application rate of 2500kg/ha. Product will last short term (less than 3 months) and vegetation is required to grow ASAP for stability. This cost includes cover crop only, additional seeding required.
	Hydromulch - bonded fibre matrix grade for steep areas to stabilise up to 12 months	Y	0	m2	$1.80		$0		Assumes use on steep areas where stabilisation is required for up to 12 months. Application rate of ~3500kg/ha. This cost includes cover crop only, additional seeding required.
	Hydromulch - high performance flexible growth medium grade	Y	0	m2	$2.50		$0		Assumes use on extreme slopes where stabilisation is required for up to 18 months. Application rate of ~4,000kg/ha minimum. This cost includes cover crop only, additional seeding required.
	Single application of fertiliser (pasture)	Y	0	ha	$420.00		$0		Assumes 250 kg / ha. These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
	Single application of fertiliser (trees)	Y	0	ha	$140.00		$0		These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
	Spoil amelioration (adding lime / gypsum etc.)	Y	0	ha	$1,000.00		$0		Assumes 2.5 t / ha as an average application rate.
	growth media amelioration with biosolids	Y	0	ha	$1,015		$0		Recent experience with agronomy projects.
	Construct no-climb stock fence around rehabilitated areas	Y	0	m	$22.00		$0		Standard rate for no-climb stock fencing.
	Construct standard stock fence around rehabilitated areas	Y	0	m	$13.00		$0		Standard rate for standard stock fencing.
	Purchase and erect warning signs	Y	0	allow	$250.00		$0		Compliance with AS 1319-1994 - Safety signs for the occupational environment - installed every 25 m.
	Supply from external sources virgin excavated natural material (VENM) for growth media.	Y	0	m3	$80.80		$0		D7 to spread material at $205/hr, Excavator ($220/hr) load Artic Trucks (90c/km) from imported stockpile - allow nominal rate of $70/m3 for imported fill material.
	Supply from external sources a combination of virgin excavated natural material (VENM) and spoil from large excavation for filing voids and/or capping etc.	Y	0	m3	$72.50		$0		D10 push into void at $270/hr, Excavator ($220/hr) load Artic Trucks (90c/km) from imported stockpile - allow nominal rate of $60/m3 for imported fill material.
	Clearing and grubbing of trees and vegetation	Y	0	ha	$4,730.00		$0		Clearing and grubbing of light vegetation growth e.g. regrowth
	Topsoil stripping	Y	0	m3	$4.86		$0		Stripping or topsoil at an approximate depth of 0.2 m into stockpiles; load and haul to final rehabilitation location required or respreading where necessary.
	Growth media supplementation with manure	Y	0	ha	$747.50		$0		Addition of manure to improve soil quality.
	Utilise biotic soil media - organic topsoil alternative	Y	0	m2	$2.50		$0		Material that can be applied as an alternative to spreading topsoil prior to hydromulching.
						Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment) Subtotal	$0		
Water Management	Clean water dams to be retained after decommissioning – make safe and minor earthworks	Y	0	allow	$2,500		$0		Provisional sum for earthworks and revegetation required to rehabilitate dam batters etc suitable for re-use by an alternate land-user - D6 Dozer (or similar) @ ~$200 per hour and pasture grass.
	Large clean water dams (i.e. ≥ 2 ha) to be retained after mine closure – make safe and minor earthworks	Y	0	allow	$10,500		$0		Provisional sum for earthworks and revegetation required to rehabilitate dam batters etc suitable for re-use by an alternate land-user - D6 Dozer (or similar) + pasture grass.
	Remove sediments from the floor of the dam to							Select Haul Distance Here	This item includes the volume of

	Remove sediments from the floor of the dam to enable it to be converted into clean water structure (Select Haul Distance from list)	Y	0	m3	Select from List				contaminated sediment requiring removal using an excavator, truck and dozer to clean out the dam.
						Water Management Subtotal	$0		
Maintenance of Rehabilitated Areas	Maintenance of areas that have been shaped and seeded and revegetation has been 'successful'	Y	0	ha	$925		$0		Rehabilitation maintenance might include re-seeding, watering, fertilising, minor re-shaping, erosion control, inspections/audits - does not include major repair works.
	Existing rehabilitation repair - minor	Y	0	ha	$1,200		$0		Areas requiring minor repair - rills, minor growth media replacement.
	Existing rehabilitation repair - moderate	Y	0	ha	$1,700		$0		Areas requiring moderate repair - rills, significant growth media replacement.
	Existing rehabilitation repair - major	Y	0	ha	$2,500		$0		Areas requiring major repair - rills, gullies, growth media replacement, some level of additional surface water management.
	Existing rehabilitation repair - total failure of landform	Y	0	ha	$40,000		$0		Areas that require extensive rehabilitation repair - re-design and re-construction of landform.
						Maintenance of Rehabilitated Areas Subtotal	$0		
Additional Items	Other 1 <insert>	N	0		This is				This item includes <<to be added by the operator>>
	Other 2 <insert>	N	0		deliberately				This item includes <<to be added by the operator>>
	Other 3 <insert>	N	0		left blank				This item includes <<to be added by the operator>>
						Additional Items Subtotal	$0		
Total Cost for Tailings & Rejects Domain							$0		

Open Cut Operations

Domain 3a: Overburden & Waste

Total Cost for Overburden & Waste Domain $0

Additional Assumptions: *Record any relevant assumptions to this domain below:*

No areas classified as waste rock dumps at Yr 3. All covered under 'Active Quarry and Voids'.	**Key Rehabilitation Area Data for Domain**	**Enter data below manually**
	Total Landform Establishment:	
	Total Growth Media Development:	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
Contaminated Materials	Treatment of known Acid Sulfate Soils	Y	0	ha	$2,580		$0		Assumes ASS is treatable via neutralisation and does not require capping and isolation. Assumes 1% by weight lime addition and treatment to 100 mm depth only.
	Removal and disposal of plastic liner (i.e. dam, leach pad, sump etc.)	Y	0	m2	$1		$0		Provisional sum for cutting using ripping tynes and on-site disposal of the liner.
	Long haulage brine/salt for disposal (Select Haul Distance from list)	Y	0	tonne	Select from List			Select Haul Distance Here	Costs for haulage to location for authorised disposal.
	Brine disposal to landfill - fees only	Y	0	tonne	$288		$0		Rate for trackable liquid levy of $78.20 per tonne and authorised disposal to landfill.
	Long haulage water (clean or contaminated) (Select Haul Distance from list)	Y	0	tonne	Select from List			Select Haul Distance Here	Assumes transport in a 20,000 L tanker. Add disposal costs to additional items where warranted.
						Contaminated Materials Subtotal	$0		
Roads and Tracks	Unsealed roads / vehicle park-up areas – minor works including deep rip and trim	Y	0	ha	$1,040.00		$0		Assumes ~6 m road width - 16H Grader.
	Unsealed roads / access tracks / vehicle park-up areas with windrows and/or small earthen bunds – minor earthworks and deep rip and trim	Y	0	ha	$1,500		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - no seed
	Unsealed roads / vehicle park-up areas – Minor earthworks, final trim and deep rip and seed (pasture grass)	Y	0	ha	$3,700		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - pasture grass seed
	Unsealed roads / vehicle park-up areas – Minor earthworks, final trim and deep rip, ameliorate and seed (native tree/shrub/grass)	Y	0	ha	$4,485		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - native tree/shrub seed
	Unsealed roads / haul roads / vehicle park-up areas with windrows and/or small earthen bunds – Minor earthworks, final trim and deep rip, ameliorate and seed (pasture grass)	Y	0	ha	$4,870		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - pasture grass seed
	Unsealed roads / haul roads / vehicle park-up areas with windrows and/or small earthen bunds – Minor earthworks, final trim and deep rip, ameliorate and seed (native tree/shrub/grass)	Y	0	ha	$7,025		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation) - native tree/shrub seed
	Remove stabilised material (blue metal, aggregate etc.) from roadways and disposal on-site/locally (Select Haul Distance from list)	Y	0	m3	Select from List			Select Haul Distance Here	This item includes the scraping and removal of the volume of stabilised material from the road, laydown or other surface using an excavator, dozer and grader to enable the establishment of rehabilitation.
						Roads and Tracks Subtotal	$0		
Earthworks / Structural Works (Landform Establishment)	Major bulk pushing to achieve grades nominated in the approval/permit – Select Push Length	Y	0	m3	Select from List			Select Push Length Here	Major bulk pushing to achieve grades nominated in the approval/permit
	Minor reshaping and pushing	Y	0	ha	$3,900		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation).
	Fill dams, voids etc. - Source local material, cart and spread to cap or backfill, cap thickness determined by approval / permit (Select Haul Distance from List)	Y	0	m3	Select from List			Select Haul Distance Here	This item includes the volume of material requiring backfill using an excavator and scraper to fill the void and enable the establishment of rehabilitation.
	Shotcrete application on cuttings and steep slopes	Y	0	m2	$185.00		$0		This rate is used to rehabilitate steep slopes of weathered rock, roadway cuttings, etc that cannot be cut back and stabilised.
	Trim, rock rake & deep rip (includes levelling / landscaping and rip in 1 direction)	Y	0	ha	$1,130.00		$0		Undertaken using D10 dozer and 16M grader.
	Structural works, banks, waterways - contour banks, drainage channels and other soil conservation measures	Y	0	ha	$1,600		$0		Combination of dozer and excavator work plus grader for ~4 hours each per ha.
	Construction of spine drains / drop structures and/or stabilising water course entry points - required for large catchments	Y	0	m2	$27.00		$0		Installation of on-site rock material (rip-rap) where managing water run-off from disturbed land and/or upon entry to water courses - prevents erosion of gully head (assumes competent material is locally available). If required to be sourced off site, assume an additional $20/m2.
						Earthworks / Structural Works (Landform Establishment) Subtotal	$0		

Mine Waste	Ideal Tailings Capping - reshaping, capping / sealing of trafficable tailings facility with little chemical reactivity (no to low risk Potential Acid Forming (PAF) / Neutral Mine Drainage (NMD) / Saline Mine Drainage (SMD) and/or low to moderate propensity for spontaneous combustion) and good physical properties (not significantly hydrophilic, shear strength does not limit equipment choice, no artificial strengthening required)	**Y**	0	ha	**$82,000**		**$0**		This includes sourcing, carting, spreading, moisture conditioning and compaction of a suitable volume material with the appropriate chemical and physical properties. This rate assumes suitable capping material is available on site within 10 km, and an average cap thickness of approximately 0.5 m to 1 mand 0.15 m - 0.2 m growth media (assume at least 1 m thick cover required for carbonaceous material covers). Water quality from runoff, seepage etc. meets site-specific environment water quality values. If site haulage longer than 10 km round trip add the volume of the relevant material requiring haulage for this distance in 8.05 (spreading costs for tailings cap material included in rate). If additional material to make up landform, provide buttress or other works aside from tailings cap, use rate from 9.02 for relevant haulage and spreading in additional to any long haulage volume in 8.05.
	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	**Y**	0	allow	**Use alternate rate cell**		**$0**		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	**Y**	0	allow	**Use alternate rate cell**		**$0**		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Efficient Tailings Capping - reshaping, capping / sealing of trafficable tailings facility with moderate chemical reactivity (low to medium risk Potential Acid Forming (PAF) / Neutral Mine Drainage (NMD) / Saline Mine Drainage (SMD) and/or low to moderate propensity for spontaneous combustion) and moderate physical properties (not significantly hydrophilic, shear strength limits equipment choice somewhat, no artificial strengthening required)	**Y**	0	ha	**$146,500**		**$0**		This item includes sourcing, carting, spreading, moisture conditioning and compaction of a suitable volume of material to cap / cover facilities where the tailings or rejects base is at a strength that enables economically efficient construction methods with small plant. This rate assumes suitable capping material is available on site within 10 km, and an average cap thickness ranging from >1 m to 2 m thickness constructed in 1 m layers + growth media up to 0.2 m depth. This may require additional materials (such as capillary breaks, geofabric, etc.) - use alternate rate cells below, specific material types (e.g. acid neutralising / consuming materials, competent rock etc.) , and associated activities (i.e., load / haul / place / crush / screen / borrow etc.). Costs for haulage of specialised/additional materials must be added separately if required. If site haulage longer than 10 km round trip add the volume of the relevant material requiring haulage for this distance in 8.05 (spreading costs for tailings cap material included in rate). If additional material to make up landform, provide buttress or other works aside from tailings cap, use rate from 9.02 for relevant haulage and spreading in additional to any long haulage volume in 8.05.
	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	**N**	0	allow	**Use alternate rate cell**				Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	**Y**	0	allow	**Use alternate rate cell**		**$0**		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Adverse Tailings Capping - reshaping, capping / sealing of trafficable tailings facility with moderate chemical reactivity (medium to high risk Potential Acid Forming (PAF) / Neutral Mine Drainage (NMD) / Saline Mine Drainage (SMD) and/or moderate to high propensity for spontaneous combustion) and moderate physical properties (not significantly hydrophilic, shear strength limits equipment choice somewhat, no artificial strengthening required)	**Y**	0	ha	**$313,000**		**$0**		This item includes sourcing, carting, spreading, moisture conditioning and compaction of a suitable volume of material to cap / cover facilities of high geochemical risk, and / or low shear strength that prohibits economically efficient construction methods. This rate assumes suitable capping material/s are available on site within 10 km, and an average cap thickness of approximately >2 m + growth media up to 0.2 m depth. This may require additional materials (i.e., capillary breaks, geofabric, etc.), specific material types (e.g. acid neutralising / consuming materials, competent rock etc.), and associated activities (i.e., load / haul / place / crush / screen / borrow etc.). Costs for haulage of specialised materials must be added separately if required. If site haulage longer than 10 km round trip add the volume of the relevant material requiring haulage for this distance in 8.05 (spreading costs for tailings cap material included in rate). If additional material to make up landform, provide buttress or other works aside from tailings cap, use rate from 9.02 for relevant haulage and spreading in additional to any long haulage volume in 8.05.

	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	Y	0	allow	Use alternate rate cell		$0		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	Y	0	allow	Use alternate rate cell		$0		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Difficult Tailings Capping- reshaping, capping / sealing of weak or soft surfaced tailings facility with poor physical properties (significantly hydrophilic, low shear strength limits equipment choice greatly, artificial strengthening required) OR visible adverse impacts on legacy sites from chemical reactivity over lengthy exposure prior to rehabilitation	Y	0	ha	$843,000		$0		This option is typically driven by time constraints and/or when tailings properties significantly restrict adequate desiccation, resulting in a tailings shear strength that is very weak excluding access by conventional small plant. Small equipment used for rehabilitation. This excludes any additional material required to form the final landform profile in addition to this cap. If site haulage longer than 10 km round trip add the volume of the relevant material requiring haulage for this distance in 8.05 (spreading costs for tailings cap material included in rate). If additional material to make up landform, provide buttress or other works aside from tailings cap, use rate from 9.02 for relevant haulage and spreading in additional to any long haulage volume in 8.05.
	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	Y	0	allow	Use alternate rate cell		$0		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Additional materials required for reshaping, capping / sealing of structure to facilitate water quality from runoff, seepage etc. meeting site-specific environment water quality values.	Y	0	allow	Use alternate rate cell		$0		Include additional cost to import materials (i.e., shale / clay, competent drainage materials etc.) and / or additional requirements (i.e., geofabric / composite lining etc.).
	Long haulage soil / weathered rock / sediment e.g. capping/covers, removal of contamination, etc. (Select Haul Distance from List)	Y	0	m3	Select from List			Select Haul Distance Here	Capping/cover material available within 50 km round trip e.g. waste / overburden dumps, borrow areas, etc.
						Mine Waste Subtotal	$0		
Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment)	Source, cart and spread growth media (Select Haul Distance from List)	Y	0	m3	Select from List			Select Haul Distance Here	If topsoil is not available on-site, then Virgin Excavated Natural Material (VENM) may need to be externally sourced.
	Planting mature trees (>15 cm)	Y	0	allow	$15.00		$0		4 m centres.
	Planting tube stock (<15 cm)	Y	0	allow	$6.60		$0		4 m centres.
	Direct seeding / fertiliser (pasture grass species)	Y	0	ha	$1,875		$0		Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Direct seeding / fertiliser (tree or native grass species)	Y	0	ha	$4,135		$0		Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Hydro-seeding with straw mulching and bitumen tack with native seed	Y	0	m2	$1.90		$0		Process to be used on flat well prepared surfaces under irrigation e.g. sewage treatment irrigation areas. Ranges from $0.15 - $0.50 depending on size and input variables. Native seed +$1.00
	Hydro-seeding with straw mulching and bitumen tack with pasture seed	Y	0	m2	$0.43		$0		Process to be used on flat well prepared surfaces under irrigation e.g. sewage treatment irrigation areas. Ranges from $0.15 - $0.50 depending on size and input variables. Pasture seed +$0.10
	Hydromulch - base grade or standard for flat areas that can be irrigated by water cart	Y	0	m2	$0.80		$0		Assumes use on flat areas with a gradient of less than 4:1, and where irrigation from water cart may be possible. Industry standard application rate of 2500kg/ha. Product will last short term (less than 3 months) and vegetation is required to grow ASAP for stability. This cost includes cover crop only, additional seeding required.
	Hydromulch - bonded fibre matrix grade for steep areas to stabilise up to 12 months	Y	0	m2	$1.80		$0		Assumes use on steep areas where stabilisation is required for up to 12 months. Application rate of ~3500kg/ha. This cost includes cover crop only, additional seeding required.
	Hydromulch - high performance flexible growth medium grade	Y	0	m2	$2.50		$0		Assumes use on extreme slopes where stabilisation is required for up to 18 months. Application rate of ~4,000kg/ha minimum. This cost includes cover crop only, additional seeding required.
	Single application of fertiliser (pasture)	Y	0	ha	$420.00		$0		Assumes 250 kg / ha. These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
	Single application of fertiliser (trees)	Y	0	ha	$140.00		$0		These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
	Spoil amelioration (adding lime / gypsum etc.)	Y	0	ha	$1,000		$0		Assumes 2.5 t / ha as an average application rate.
	growth media amelioration with biosolids	Y	0	ha	$1,015		$0		Recent experience with agronomy projects.
	Construct no-climb stock fence around rehabilitated areas	Y	0	m	$22.00		$0		Standard rate for no-climb stock fencing.
	Construct standard stock fence around rehabilitated areas	Y	0	m	$13.00		$0		Standard rate for standard stock fencing.
	Purchase and erect warning signs	Y	0	allow	$250.00		$0		Compliance with AS 1319-1994 - Safety signs for the occupational environment - installed every 25 m.

	Supply from external sources virgin excavated natural material (VENM) for growth media.	Y	0	m3	$80.80		$0		D7 to spread material at $205/hr, Excavator ($220/hr) load Artic Trucks (90c/km) from imported stockpile - allow nominal rate of $70/m3 for imported fill material.
	Supply from external sources a combination of virgin excavated natural material (VENM) and spoil from large excavation for filing voids and/or capping etc.	Y	0	m3	$72.50		$0		D10 push into void at $270/hr, Excavator ($220/hr) load Artic Trucks (90c/km) from imported stockpile - allow nominal rate of $60/m3 for imported fill material.
	Clearing and grubbing of trees and vegetation	Y	0	ha	$4,730.00		$0		Clearing and grubbing of light vegetation growth e.g. regrowth
	Topsoil stripping	Y	0	m3	$4.86		$0		Stripping or topsoil at an approximate depth of 0.2 m into stockpiles; load and haul to final rehabilitation location required or respreading where necessary.
	Growth media supplementation with manure	Y	0	ha	$747.50		$0		Addition of manure to improve soil quality.
	Utilise biotic soil media - organic topsoil alternative	Y	0	m2	$2.50		$0		Material that can be applied as an alternative to spreading topsoil prior to hydromulching.
Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment) Subtotal							$0		
Water Management	Clean water dams to be retained after decommissioning – make safe and minor earthworks	Y	0	allow	$2,500		$0		Provisional sum for earthworks and revegetation required to rehabilitate dam batters etc suitable for re-use by an alternate land-user - D6 Dozer (or similar) @ ~$200 per hour and pasture grass.
	Large clean water dams (i.e. ≥ 2 ha) to be retained after mine closure – make safe and minor earthworks	Y	0	allow	$10,500		$0		Provisional sum for earthworks and revegetation required to rehabilitate dam batters etc suitable for re-use by an alternate land-user - D6 Dozer (or similar) + pasture grass.
	Remove sediments from the floor of the dam to enable it to be converted into clean water structure (Select Haul Distance from list)	Y	0	m3	Select from List			Select Haul Distance Here	This item includes the volume of contaminated sediment requiring removal using an excavator, truck and dozer to clean out the dam.
Water Management Subtotal							$0		
Maintenance of Rehabilitated Areas	Maintenance of areas that have been shaped and seeded and revegetation has been 'successful'	Y	0	ha	$925		$0		Rehabilitation maintenance might include re-seeding, watering, fertilising, minor re-shaping, erosion control, inspections/audits - does not include major repair works.
	Existing rehabilitation repair - minor	Y	0	ha	$1,200		$0		Areas requiring minor repair - rills, minor growth media replacement.
	Existing rehabilitation repair - moderate	Y	0	ha	$1,700		$0		Areas requiring moderate repair - rills, significant growth media replacement.
	Existing rehabilitation repair - major	Y	0	ha	$2,500		$0		Areas requiring major repair - rills, gullies, growth media replacement, some level of additional surface water management.
	Existing rehabilitation repair - total failure of landform	Y	0	ha	$40,000		$0		Areas that require extensive rehabilitation repair - re-design and re-construction of landform.
Maintenance of Rehabilitated Areas Subtotal							$0		
Additional Items	Other 1 <insert>	N	0		This is				This item includes **<<to be added by the operator>>**
	Other 2 <insert>	N	0		deliberately				This item includes **<<to be added by the operator>>**
	Other 3 <insert>	N	0		left blank				This item includes **<<to be added by the operator>>**
Additional Items Subtotal							$0		
Total Cost for Overburden & Waste Domain							**$0**		

Open Cut Operations

Domain 4a: Active Mine & Voids

Total Cost for Active Mine & Voids Domain $135,000

Additional Assumptions: *Record any relevant assumptions to this domain below:*

Based on site in formation, at Yr 3 the active area will be approximately 2.85 ha.	Key Rehabilitation Area Data for Domain	Enter data below manually
	Total Landform Establishment:	
	Total Growth Media Development:	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
Open Cut	Active pit area – benches blasted and doze to acceptable grade	Y	0	Lm	$1.93		$0	Assuming at Year 3 only minor reshaping in active pit area.	Blasting in a 8x9 pattern of bench height 25 m with D11 push of 50-75 m.
	Drill & blast faces to make safe	Y	0	m3	$0.95		$0	Covered under 'Active Pit area'.	Bulk Drilling say 8*9 pattern, assuming a stem height of 6 m, charge length of 19 m, explosive density of 0.9, diameter of 229 mm, explosives at 665.3 kg/hole with a powder factor of 0.37 with an approximate bench height of 25 m.
	High wall treatment – (trench and safety berm)	Y	300	m	$90.00	$55.32	$16,596	Based on 2026 RR cost schedule. Estimate at Yr 3 there would be approximately 300m of steeper highwall areas. Estimation only. Cost to make safe if closure to occur at Yr 3.	D10 dozer, 16H Grader and revegetation with pasture grass.
						Open Cut Subtotal	$16,596		
Earthworks / Structural Works (Landform Establishment)	Major bulk pushing to achieve grades nominated in the approval/permit – 75 m-100 m push length)	Y	0	m3	$1.42		$0	> 100m - 150m < push Assuming at Year 3 only minor reshaping of some benches would be required. No major bulk pushing.	Assumes D11 dozer push @ 250 bcm/hr.
	Minor reshaping and pushing	Y	0	ha	$3,900		$0		D10 Dozer @ $400 per hour and 16 H grader @ $230 per hour (50% utilisation).
	Fill dams, voids etc. - Source local material, cart and spread to cap or backfill, cap thickness determined by approval / permit (Select Haul Distance from List)	Y	0	m3	Select from List			Select Haul Distance Here	This item includes the volume of material requiring backfill using an excavator and scraper to fill the void and enable the establishment of rehabilitation.
	Shotcrete application on cuttings and steep slopes	Y	0	m2	$185.00		$0		This rate is used to rehabilitate steep slopes of weathered rock, roadway cuttings, etc that cannot be cut back and stabilised.
	Trim, rock rake & deep rip (includes levelling / landscaping and rip in 1 direction)	Y	2.85	ha	$1,130.00	$1,230.19	$3,506	Based on 2026 RR cost schedule. Area provided at Yr 3 is 2.85 ha. Includes some benches and pit areas. Assumes that there will be no final void at that point, therefore full cost of rehab area.	Undertaken using D10 dozer and 16M grader.
	Structural works, banks, waterways - contour banks, drainage channels and other soil conservation measures	Y	2.85	ha	$1,600	$4,174	$11,896	Based on 2026 RR cost schedule. Area provided at Yr 3 is 2.85 ha. Includes some benches and pit areas. Assumes that there will be no final void at that point, therefore full cost of rehab area.	Combination of dozer and excavator work plus grader for ~4 hours each per ha.
	Construction of spine drains / drop structures and/or stabilising water course entry points - required for large catchments	Y	0	m2	$27.00		$0		Installation of on-site rock material (rip-rap) where managing water run-off from disturbed land and/or upon entry to water courses - prevents erosion of gully head (assumes competent material is locally available). If required to be sourced off site, assume an additional $20/m2.
						Earthworks / Structural Works (Landform Establishment) Subtotal	$15,402		
Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment)	Source, cart and spread growth media - haul distance <1 km	Y	2850	m3	$3.26	$3.80	$10,830	< =1km Based on 2026 RR cost schedule. 10cm of topsoil x 28500m2. Low rate used due to small	Undertaken with 623 scraper and 14 M grader.
	Planting mature trees (>15 cm)	Y	0	allow	$15.00		$0		4 m centres.
	Planting tube stock (<15 cm)	Y	0	allow	$6.60		$0		4 m centres.
	Direct seeding / fertiliser (pasture grass species)	Y	0	ha	$1,875		$0		Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Direct seeding / fertiliser (tree or native grass species)	Y	2.85	ha	$4,135	$4,366	$12,443	Based on 2026 RR cost schedule. Area provided at Yr 3 is 2.85 ha. Includes some benches and pit areas. Assumes that there will be no final void at that point, therefore full cost of rehab area. Woodland seed mix.	Includes treating, weighing, mixing with fertiliser + spreading by tractor or helicopter (aerial seeding).
	Hydro-seeding with straw mulching and bitumen tack with native seed	Y	0	m2	$1.90		$0		Process to be used on flat well prepared surfaces under irrigation e.g. sewage treatment irrigation areas. Ranges from $0.15 - $0.50 depending on size and input variables. Native seed +$1.00

	Hydro-seeding with straw mulching and bitumen tack with pasture seed	Y	0	m2	$0.43		$0		Process to be used on flat well prepared surfaces under irrigation e.g. sewage treatment irrigation areas. Ranges from $0.15 - $0.50 depending on size and input variables. Pasture seed +$0.10
	Hydromulch - base grade or standard for flat areas that can be irrigated by water cart	Y	0	m2	$0.80		$0		Assumes use on flat areas with a gradient of less than 4:1, and where irrigation from water cart may be possible. Industry standard application rate of 2500kg/ha. Product will last short term (less than 3 months) and vegetation is required to grow ASAP for stability. This cost includes cover crop only, additional seeding required.
	Hydromulch - bonded fibre matrix grade for steep areas to stabilise up to 12 months	Y	0	m2	$1.80		$0		Assumes use on steep areas where stabilisation is required for up to 12 months. Application rate of ~3500kg/ha. This cost includes cover crop only, additional seeding required.
	Hydromulch - high performance flexible growth medium grade	Y	0	m2	$2.50		$0		Assumes use on extreme slopes where stabilisation is required for up to 18 months. Application rate of ~4,000kg/ha minimum. This cost includes cover crop only, additional seeding required.
	Single application of fertiliser (pasture)	Y	0	ha	$420.00		$0		Assumes 250 kg / ha. These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
	Single application of fertiliser (trees)	Y	0	ha	$140.00		$0		These rates have fluctuated over the last few years however in light of current conditions (lower fuel prices, reduced demand etc) this is a suitable standard rate.
	Spoil amelioration (adding lime / gypsum etc.)	Y	2.85	ha	$1,000.00	$2,465.37	$7,026	Based on 2026 RR cost schedule. Area provided at Yr 3 is 2.85 ha. Includes some benches and pit areas. Assumes that there will be no final void at that point, therefore full cost of rehab area.	Assumes 2.5 t / ha as an average application rate.
	growth media amelioration with biosolids	Y	0	ha	$1,015		$0		Recent experience with agronomy projects.
	Security fence around steep section of high wall	Y	300	m	$64.00	$224.97	$67,491	Based on 2026 RR cost schedule. Estimate at Yr 3 there would be approximately 300m of steeper highwall areas. Estimation only. Cost to make safe if closure to occur at Yr 3.	1800mm x 3 barb chain-link mesh security fence and gate standard 2.5mm mesh & 32 mm post not concreted
	Purchase and erect warning signs	Y	0	allow	$250.00		$0		Compliance with AS 1319-1994 - Safety signs for the occupational environment - installed every 25 m.
	Supply from external sources virgin excavated natural material (VENM) for growth media.	Y	0	m3	$80.80		$0		D7 to spread material at $205/hr, Excavator ($220/hr) load Artic Trucks (90c/km) from imported stockpile - allow nominal rate of $70/m3 for imported fill material.
	Supply from external sources a combination of virgin excavated natural material (VENM) and spoil from large excavation for filing voids and/or capping etc.	Y	0	m3	$72.50		$0		D10 push into void at $270/hr, Excavator ($220/hr) load Artic Trucks (90c/km) from imported stockpile - allow nominal rate of $60/m3 for imported fill material.
	Clearing and grubbing of trees and vegetation	Y	0	ha	$4,730.00		$0		Clearing and grubbing of light vegetation growth e.g. regrowth
	Topsoil stripping	Y	0	m3	$4.86		$0		Stripping or topsoil at an approximate depth of 0.2 m into stockpiles; load and haul to final rehabilitation location required or respreading where necessary.
	Growth media supplementation with manure	Y	0	ha	$747.50		$0		Addition of manure to improve soil quality.
	Utilise biotic soil media - organic topsoil alternative	Y	0	m2	$2.50		$0		Material that can be applied as an alternative to spreading topsoil prior to hydromulching.
Land Preparation and Revegetation (Growth Media Development and Ecosystem Establishment) Subtotal							**$97,790**		
Water Management	Clean water dams to be retained after decommissioning – make safe and minor earthworks	Y	0	allow	$2,500		$0		Provisional sum for earthworks and revegetation required to rehabilitate dam batters etc suitable for re-use by an alternate land-user - D6 Dozer (or similar) @ ~$200 per hour and pasture grass.
	Large clean water dams (i.e. ≥ 2 ha) to be retained after mine closure – make safe and minor earthworks	Y	0	allow	$10,500		$0		Provisional sum for earthworks and revegetation required to rehabilitate dam batters etc suitable for re-use by an alternate land-user - D6 Dozer (or similar) + pasture grass.
	Remove sediments from the floor of the dam to enable it to be converted into clean water structure (haul distance >1km but <2km)	Y	500	m3	$4.45		$2,225	> 1km but < = 2km Based on removing 0.5m of sediment from 1 onsite Dam. Estimate of 40m2 x 0.5m depth. Other small dams on site also included. Dams to be remained onsite at closure.	Undertaken with excavator, trucks, 16 M grader and D10 Dozer
Water Management Subtotal							**$2,225**		
Maintenance of Rehabilitated Areas	Maintenance of areas that have been shaped and seeded and revegetation has been 'successful'	Y	2.85	ha	$925	$1,048	$2,987	Based on 2026 RR cost schedule. Added to cover maintaince of rehabilitated areas. Ie. disturbed areas that need to be rehabilitated.	Rehabilitation maintenance might include re-seeding, watering, fertilising, minor re-shaping, erosion control, inspections/audits - does not include major repair works.

	Existing rehabilitation repair - minor	Y	0	ha	$1,200		$0		Areas requiring minor repair - rills, minor growth media replacement.
	Existing rehabilitation repair - moderate	Y	0	ha	$1,700		$0		Areas requiring moderate repair - rills, significant growth media replacement.
	Existing rehabilitation repair - major	Y	0	ha	$2,500		$0		Areas requiring major repair - rills, gullies, growth media replacement, some level of additional surface water management.
	Existing rehabilitation repair - total failure of landform	Y	0	ha	$40,000		$0		Areas that require extensive rehabilitation repair - re-design and re-construction of landform.
						Maintenance of Rehabilitated Areas Subtotal	$2,987		
Additional Items	Other 1 <insert>	N	0		This is				This item includes <<to be added by the operator>>
	Other 2 <insert>	N	0		deliberately				This item includes <<to be added by the operator>>
	Other 3 <insert>	N	0		left blank				This item includes <<to be added by the operator>>
						Additional Items Subtotal	$0		
						Total Cost for Active Mine & Voids Domain	$135,000		

Open Cut Operations

Domain 5a: Management Activities

Total Cost for Management Activities $28,710

Additional Assumptions: *Record any relevant assumptions to this domain below:*

	Key Rehabilitation Area Data for Domain	Enter data below manually
	Total Landform Establishment:	
	Total Growth Media Development:	
	Total Ecosystem Establishment:	

Management Precinct	Activity / Description	Applicable (Y or N)	Quantity	Unit	Default Unit Rate	Alternative Unit Rate	Total Cost	Basis for Costs Estimation and Additional Relevant Information	Description / Notes:
Water Management	On-site treatment of contaminated water due to high salt (includes removal of metals etc, brine disposal and cost of mobile water treatment unit)	Y	0	ML	$3,600		$0		Rate can fluctuate depending on treatment type however this is a suitable standard rate for current programs at mining operations.
	On-site treatment of contaminated water due to low pH (incudes removal of metals etc, neutralisation treatments and cost of mobile water treatment unit	Y	0	ML	$1,500		$0		Rate can fluctuate depending on treatment type however this is a suitable standard rate for current programs at mining operations.
						Water Management Subtotal	$0		
Creek Diversions	Repairs and/or stabilisation of new or compromised water course diversion	Y	0	m	$2,500		$0		Assumes material is suitable for revegetating and has a reasonable chance of stabilising.
	Long term maintenance of water course diversion – Channel constructed through backfilled material	Y	0	m	$1,500		$0		Assumes maintenance has been kept up and significant works are not required.
	Long term maintenance of water course diversion – Channel constructed through competent material	Y	0	m	$750.00		$0		Assumes maintenance has been kept up and significant works are not required.
	Installation of rock armouring	Y	0	m2	$6.00		$0		Assumes competent material is locally available - multiply costs by 2 for sourcing and transporting from offsite location.
						Creek Diversions Subtotal	$0		
Maintenance of Rehabilitated Areas	Pest management on buffer lands, non-disturbed, and rehabilitated areas	Y	0	ha	$150.00		$0		Feral animal baiting programs if required and waste materials required to be removed.
	Land management of undisturbed areas (rehabilitation, weeds, ferals, erosion and sediment control works)	Y	0	ha	$400.00		$0		Undisturbed areas within the lease boundary that require land management activities.
						Maintenance of Rehabilitated Areas Subtotal	$0		
Heritage Items	The restoration and care and maintenance of items that have heritage significance	Y	0	allow	Use alternate rate cell		$0		Item for the redistribution of Aboriginal artefacts, preservation of European heritage items or a combination of activities.
						Heritage Items Subtotal	$0		
Sundry Items	Development of an 'Unplanned' Project Closure Plan - State Significant Development with closure planning well progressed i.e. preferred cover design, closure environment modelled e.g. groundwater /subsidence / pit lakes, preliminary seal designs, etc. and only finalisation of detailed engineering deigns required	Y	0	allow	$100,000		$0		Provisional sum to be used to refine the conceptual closure plan into a detailed closure plan with execution strategies for rehabilitation activities. Assumes outcomes of studies readily available including modelling, landform design, geochemistry, demolition, etc. Costs to finalise options by domain and finalise designs for construction. Assume a simple site e.g. single open cut, no legacy operations historic in the area, little social dependence, etc. Depending on site size, complexity, final land use requirements and knowledge base investigations can range from ~$75k to >$1 M. Sites with more than 1 pit to add $50,000 to rate.
	Development of an 'Unplanned' Project Closure Plan - Non State Significant Development with at least ≥2 of the following aspects requiring closure planning, but no significant issues realised at this time: previous subsidence, medium or higher geochemistry risk and/or spontaneous combustion propensity, known/ likely contamination, tailings / rejects, final void	Y	0	allow	$90,000		$0		Provisional sum to be used to refine the conceptual closure plan into a detailed closure plan with execution strategies for rehabilitation activities. Estimated cost for developing closure plan including studies - basic to satisfy risks and decisions - includes risk assessment, options analysis, Closure Plan. Sites with more than 1 pit to add $50,000 to rate.
	Development of an 'Unplanned' Project Closure Plan - Non State Significant Development with no EPL and/or only one of the following relevant aspects: previous subsidence, low to medium geochemistry risk and/or spontaneous combustion propensity, known limited contamination, small approved final void	Y	1	allow	$15,000	$16,710	$16,710	Estimated Cost - $15K	Assumes sediment control is the key concern for rehabilitation e.g. small mines, exploration operations. Includes risk assessment, sampling and analyses on <5 samples, one study and Closure Plan.
	Development of an 'Unplanned' Project Closure Plan - State Significant Development with only preliminary to conceptual closure planning in place	Y	0	allow	$300,000		$0		Includes costs for key investigations and studies including designs e.g. geochemistry, Contamination Remediation Action Plan, subsidence risk, cover/capping and final landform, site wide surface water, etc. Provisional sum to be used to refine the conceptual closure plan into a detailed closure plan with execution strategies for rehabilitation activities. Assume at least 15 types of studies required ranging from geotechnical to ecology and social, development of a closure plan including address of obligations. Assume a simple site e.g. single open cut, no legacy operations historic in the area, little social dependence, etc. Depending on site size, complexity, final land use requirements and knowledge base investigations can range to >$3 M. Sites with more than 1 pit to add $50,000 to rate.

	Development of an 'Unplanned' Project Closure Plan - Non State Significant Development with at least ≥2 of the following aspects resulting in significant issues requiring remediation: previous subsidence, medium or higher geochemistry risk and/or spontaneous combustion propensity, known/ likely contamination, tailings / rejects, final void	Y	0	allow	$125,000		$0		Includes costs for key investigations and studies including economic treatments and designs e.g. geochemistry, Contamination Remediation Action Plan, subsidence risk, cover/capping and final landform, site wide surface water, etc. Provisional sum to be used to refine the conceptual closure plan into a detailed closure plan with execution strategies for rehabilitation activities.
	Develop a Review of Environmental Factors (REF) to facilitate rehabilitation including contamination works.	Y	0	allow	$27,950		$0		Based on experience for a REF after completion of a detailed closure study (e.g. contamination investigation) costs could range from $10,000 to $100,000 ex GST. Note this does not apply to a Statement of Environmental Effects or Environmental Impact Statement.
	Site security during closure	Y	0	yr.	$75,000		$0	The site does not believe security is required during closure. Fencing, signage is adequete.	Provisional sum for site security measures required during closure. This includes nightly patrols and first response in the event of an out of hours incident.
	Choose type of HAZMAT Clean-up required - cleaning and decontaminating plant and equipment, chemical storage locations, oil and grease traps, tanks, vessels, and pipe work etc	Y	0	allow	$0		$0	Select type of HAZMAT Clean-up Required	Type of HAZMAT Clean-up required - cleaning and decontaminating plant and equipment, chemical storage locations, oil and grease traps, tanks, vessels, and pipe work etc
	Removal and disposal of radiation devices	Y	0	each	$31,630		$0		Provisional sum for removal and disposal of monitoring devices on conveyors using a radiation source (i.e., Americium – 241, Plutonium – 238, Caesium - 137 etc). Source Isotope type, quantity, strength, weight, source holder type, source holder weight, pick-up location (among others) will directly affect pricing.
	Additional fees for accessing State, Crown or other public lands for rehabilitation/remediation activities	Y	0	allow	Use alternate rate cell		$0		Provisional sum.
						Sundry Items Subtotal	$16,710		
Mobilisation and Demobilisation	Mobilisation & Demobilisation for small mine or quarry - small fleet	Y	1	Item	$12,000		$12,000	Cost would have to be determined (justified) on the basis of the equipment required and the distance of the mine from the likely contractor to be used.	May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation for small mine or quarry - medium to large fleet	Y	0	Item	$35,000		$0		May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation (Distance to site <150 km)	Y	0	item	$100,000		$0		May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation (Distance to site >150 km but <500 km)	Y	0	item	$150,000		$0		May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation (Distance to site >500 km but <1000 km)	Y	0	item	$300,000		$0		May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
	Mobilisation & Demobilisation (Distance to site >1000 km)	Y	0	item	$500,000		$0		May include specialist demolition equipment and/or suitable plant to execute bulk earthworks as required.
						Mobilisation and Demobilisation Subtotal	$12,000		
Additional Items	Other 1 <insert>	N	0		This is				This item includes <<to be added by the operator>>
	Other 2 <insert>	N	0		deliberately				This item includes <<to be added by the operator>>
	Other 3 <insert>	N	0		left blank				This item includes <<to be added by the operator>>
						Additional Items Subtotal	$0		
Total Cost for Management Activities							$28,710		

INTEGRATED ENVIRONMENTAL MANAGEMENT AUSTRALIA

APPENDIX B

Offset Bond (2026 Update)

Total Fund Deposit Calculator

Site name	**Dolwendee Quarry Offset**
Site location (Lot/DP or address)	**Part Lot 1 Golden Hwy Hollydeen**

Add row for 'Management action cost'

Add row for 'Other recurring cost'

Discount rate
3.20%

Management plan section	TFD item #	Management action item	Timing			Estimated annual cost ($)	Year		
			Start year	End year	Frequency		1	2	3
2 Disturbance and infrastructure	2.1	Livestock Exclusion Fencing [COMPLETED] Southern boundary only (400m) as per Umwelt recommendation	1				0	0	0
2 Disturbance and infrastructure	2.2	Fence and waste removal [COMPLETED]	1	3	1		0	0	0
2 Disturbance and infrastructure	2.3	Fence maintenance (equivalent to 5% cost every year). Day rate fencing contractor including materials @$600. Funding provided from year 5	5		1	600	0	0	0
2 Disturbance and infrastructure	2.4	Gate installation [COMPLETED] three (3) gates to be installed	1				0	0	0
2 Disturbance and infrastructure	2.5	Gate maintenance (3 gates replaced every 10 years if needed)	11		10	900	0	0	0
2 Disturbance and infrastructure	2.6	Install and maintain BSA signs (4 signs @$42 each + $120 labour)	1		10	288	288	0	0
2 Disturbance and infrastructure	2.7	Maintenance of access tracks (1.2 km) and boundary maintenance zone (1.6 km). Costed as $700 every 2 years, includes tractor slasher hire, grader/dozer hire and	1		2	700	700	0	700
3 Weed management and control	3.1	Primary weed management (@$2,000 a week for a team of 1 bush regenerators for 1.5 weeks - including herbicide)	1	5	1	3,000	3,000	3,000	3,000
3 Weed management and control	3.2	Secondary weed management (@$2,000 a week for a team of 1 bush regenerators for 1.0 weeks)	6	10	1	2,000	0	0	0
3 Weed management and control	3.3	Maintenance weed management (@$2,000 a week for a team of 1 bush regenerators for 0.5 weeks)	11	19	1	1,000	0	0	0
3 Weed management and control	3.4	Post 20 year weed management [N.A.]	20				0	0	0
4 Pest animal controls	4.1	Ground baiting if needed (foxes). One baiting session per year @$500/person/day. Baits costed at $500 per annum	1		1	1,000	1,000	1,000	1,000
4 Pest animal controls	4.2	Rabbit warren fumigation (if needed) - costed every 3 years @$500	1	3	3	3	3	0	0
4 Pest animal controls	4.3	Ground shooting (if needed) of feral goats, pigs, rabbits, and cats. Costed at $100/hr for one person up to 10 hrs - including ammunition	1		1	1,000	1,000	1,000	1,000
5 PCTs and TECs	5.1	Seed Collection and Propagation for Offset site PCT 3314_DNG area	2	3	1	500	0	500	500
5 PCTs and TECs	5.2	Seed Collection and Propagation for haul road & Quarry rehab.Various natives associated with PCT's 3314 &3431. Including grasses suitable verges (e.g. Q.	1	3	1	500	500	500	500
6 Threatened species habitat	6.1	Salvage hollows/rocks/other habitat features from haul road construction clearance area to be used as ground habitat in the Offset Area	1	1	1	1,000	1,000	0	0
6 Threatened species habitat	6.2	Salvage hollows//rocks/other habitat features from quarry construction clearance zones to be used as ground habitat in the Offset Area	2	2	1	2,000	0	2,000	0
6 Threatened species habitat	6.3	Diurus tricolor - haul road site fence construction [COMPLETED]. Fence maintenance and Weed management as per Items 2.1, 2.2, 2.3,2.4,2.5,2.6,3.1, 3.2 &.	1				0	0	0
Management plan section	**TFD item #**	**Other recurring management items and costs**				**Estimated annual cost ($)**			
		Annual reporting fee (2024-25 financial year)	1		1	1,860	1,860	1,860	1,860
9 Monitoring and adaptive management	9.1	Five (5) yearly review and update to the Management Plan. Includes application fee to vary Biodiversity Stewardship Agreement (any other case) - if required	5	20	5	2,000	0	0	0
9 Monitoring and adaptive management	9.2	General annual monitoring - annual reporting, photo points (VI Monitoring Plots - 3 Plots - see Baseline Survey), feral animal observations (Years 1 to 19)	1	19	1	5,000	5,000	5,000	5,000
9 Monitoring and adaptive management	9.3	Ecological Baseline Survey EMM Reporting. One team of two, conducted every 5 years [COMPLETED OCTOBER 2025]	1				0	0	0
9 Monitoring and adaptive management	9.4	Required Monitoring (Years 1 - 20) - 12 VI plots. Four days for a team of two qualified personnel. Includes full floristics and photo points.	1	19	5	7,000	7,000	0	0
9 Monitoring and adaptive management	9.5	Threatened Flora monitoring within 3 BAM VI Plots. Conducted every 5 years as part of the general VI monitoring (Central Hunter Grey Box - IronbarkWoodland EEC;	5		5	1,000	0	0	0
9 Monitoring and adaptive management	9.6	Threatened Fauna (Speckled warbler) monitoring. Area Searches & Call Playback in habitat area and analysis	5		5	1,000	0	0	0
9 Monitoring and adaptive management	9.7	Contingency for unforseen events every year (e.e. fire, flooding, weeds, feral animals, erosion, etc.)	2		1	1,000	0	1,000	1,000
		Rates (e.g. Council)	1		1	1,200	1,200	1,200	1,200
		Insurance (e.g. fences,public liability)	1		1	750	750	750	750
						0	0	0	0
						0	0	0	0
					Site management cost in today's value		23,301	17,810	16,510
					Present Value (PV) of the site management cost		23,301	17,258	15,502

Discount factor	100%	97%	94%

	Year		
	1	2	3
Annual site management costs in today's values	$23,301	$17,810	$16,510
Annual reporting fee	$1,860	$1,860	$1,860
Total amount payable to landowner (excluding GST	$21,441	$15,950	$14,650
GST payable to landowner	$2,144	$1,595	$1,465
Total amount payable to landowner (including GST	$23,585	$17,545	$16,115

Management Plan – Dolwendee Biodiversity Offset Site Mod 1 - April 2026 Update

Section 1: General requirements

1. This Management Plan sets out the Management Actions that the Landowner must comply with as set out in Dolwendee Quarry Mod 1 Consent 2026 ~~as set out under Part D of a Biodiversity Stewardship Agreement (BSA).~~
2. The objectives of this Management Plan and its implementation are to:
   a) manage, protect and restore Plant Community Types (PCTs) and Threatened Ecological Communities (TECs) ~~for which ecosystem credits have been created under the BSA~~
   b) manage, protect, restore habitat for Threatened Species including protection of breeding habitat features. ~~for which species credits have been created under the BSA~~.
3. All Management Actions apply to the entire Offset Site otherwise stated.
4. Implementation of the Management Plan does not authorise the Landowner to harm, damage or desecrate an Aboriginal Object or Aboriginal Place.

5. An Annual Report must be prepared in accordance with the template published by DPHI including the information as set out within this Management Plan.
6. Ecological monitoring must be undertaken by a suitably qualified person in accordance with the requirements set out in Section 9 of the Management Plan and consistent with any guidance from the BCT.
7. A review of the Management Plan, including evaluation of progress in the objectives of the Management Plan and each of the operations schedules is to be undertaken every five years ~~in accordance with Biodiversity Stewardship Agreement~~. The review of the Management Plan must be provided to DPHI.
8. The Management Plan may be amended to ensure the conservation of Biodiversity and Biodiversity Values through a variation to the associated BRMP.

1. This Management Plan sets out the Management Actions that the Landowner must comply with as set out in Dolwendee Quarry Mod 1 Consent 2026 ~~as set out under Part D of a Biodiversity Stewardship Agreement (BSA).~~
2. The objectives of this Management Plan and its implementation are to:
   a) manage, protect and restore Plant Community Types (PCTs) and Threatened Ecological Communities (TECs) ~~for which ecosystem credits have been created under the BSA~~
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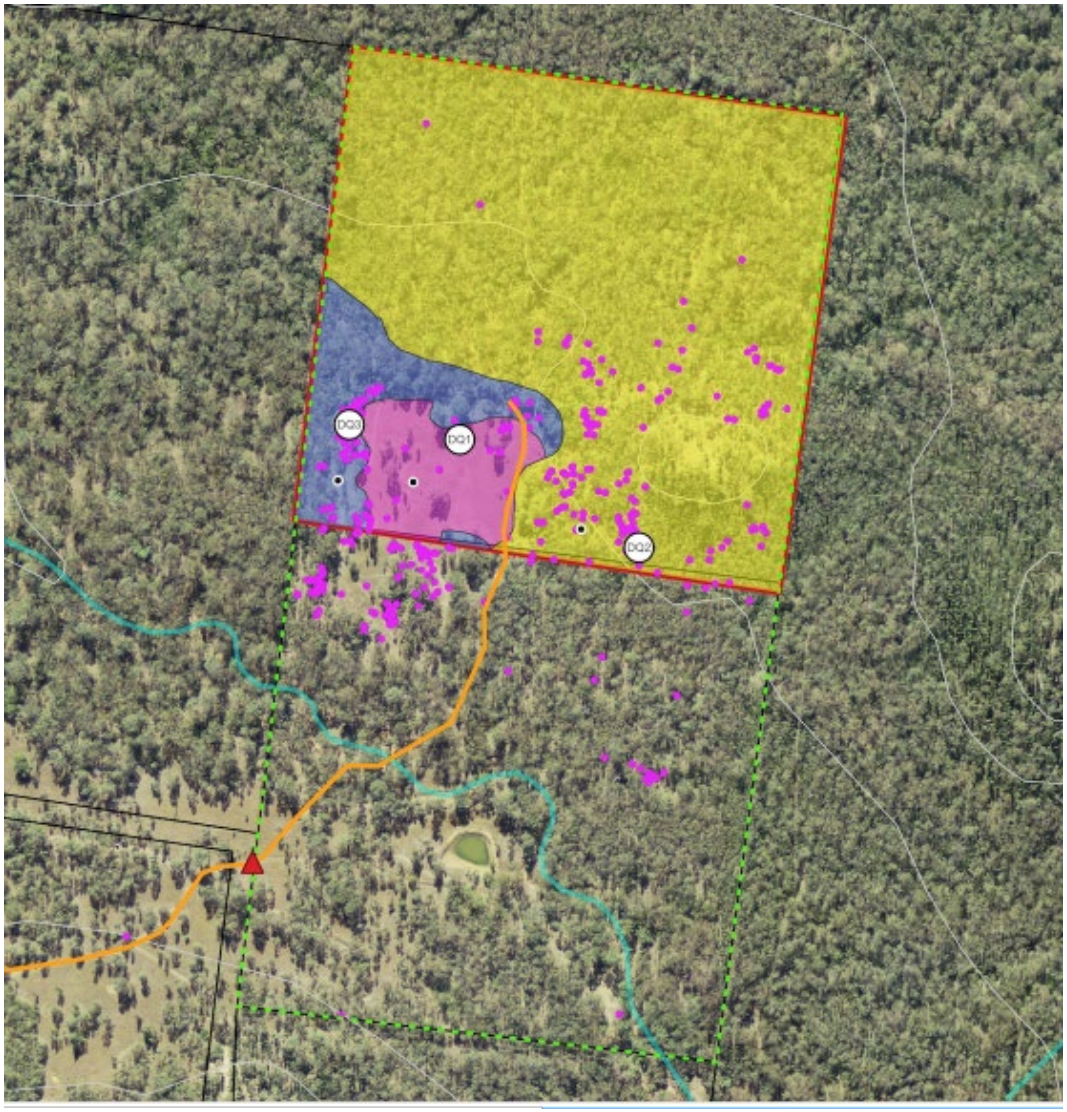
Management Plan Site Map



Legend

- Dolwendee Quarry Biodiversity Offset
- Trails
- Fences
- Gates
- Drainage line
- Contours (10m)
- Cadastre

Monitoring plot locations

- Start
- End

Vegetation Zones

- 3314_DNG
- 3314_Intact
- 3431_Intact
- Pine Donkey Orchid (Diuris tricolor) records

Dolwendee Quarry Biodiversity Offset
Lot1 (DP1160936) Golden Highway, Hollydeen
Upper Hunter Holdings

Section 2: Management actions – Disturbance and infrastructure

Management actions

9. Management to reduce disturbance is to be undertaken in accordance with Operations Schedule for this section and the Management Plan Site Map.
10. Waste must not be stored, disposed of, or caused, or permitted to be disposed of, on the ~~Biodiversity Stewardship~~ Offset Site, and any new waste must be removed as soon as possible, or according to the timing set out in the Operations Schedule.
11. No structures, dams or access tracks are to be retained or constructed unless shown on the Management Plan Site Map.
12. Fire trails and access tracks shown on the Management Plan Site Map must be maintained in accordance with the Operations Schedule to permit the carrying out of Management Actions, and at an appropriate standard to minimise erosion and run-off.
13. All reasonable steps must be taken to prevent, control and remedy erosion, including obtaining advice from a suitable expert.
14. Sediment traps must be installed in accordance with the Operations Schedule if there is a risk of soil or sediment or runoff entering waterways.
15. The location and type of fencing specified in the Operations Schedule must be of a type that can minimise harm to native fauna and allows for ease of movement for native fauna on and off the Biodiversity Stewardship Site.
16. Natural hydrology must be retained and no artificial structures such as dams, levee banks or other construction or works can be established unless shown on the Management Plan Site Map and constructed in accordance with the Operations Schedule.

Record keeping

17. The Landowner must retain the following diary records and include in the annual report to DPHI
    a) management actions for disturbance and infrastructure set out in the Operations Schedule that have been implemented during the year
    b) any observations of new disturbance events – such as, erosion or rubbish dumping, illegal access
    c) any minor variations from the Operations Schedule
    d) results of monitoring against performance measures.

Operations Schedule – Disturbance and infrastructure

Table 1: List of actions and timing for addressing disturbance and infrastructure (add/remove rows as needed)

TFD Item	Activity	Action/treatment/specifications	Frequency/timing	Performance measures
2,1	Livestock Exclusion Fence installation	[COMPLETED]Southern boundary only (400m) as per Umwelt recommendatio	N.A.	Southern boundary of Offset Area only (400m) completed
2.2	Fence and Waste removal	[COMPLETED]	N.A,	Internal fence and waste cleared on Offset Area
2.3	Fence maintenance	1.6 km of boundary fencing is maintained	Fence maintenance to commence from Year 5, or as required.	Fencing is maintained in good condition.
2.4	Gates	[COMPLETED] three (3) gates to be installed	N.A	3 Gates in place
2.5	Gate maintenance and replacement	Three (3) gates to be maintained. Gates to be replaced every 10 years if required (i.e., if loss of function is likely to occur). If replacement is deemed unnecessary, costs to be used for maintenance of gates until replacement is required.	Replacement every 10 years, or as required, from year 11.	Gates are intact, functional, and lockable each year.
2.6	Install and maintain BSA signs	Four (4) BCT signs will be installed at the Offset Site, Signs will be placed at external gates and strategic locations around the boundary. Signs will be obtained from the BCT. Four BCT signs will be maintained and replaced every 10 years or as required.	Signs installed in year 1. Replacement every 10 years, or as required.	Four BCT signs installed by the end of year 1. Signs maintained to a good standard each year and replaced when required.
2.7	Roads, tracks and fire trails	Bmoundary fence maintenance zone – ~1.6 km fence maintenance zone of 3.5 m wide must be maintained. If required, vegetation will be slashed/trittered from the perimeter of the boundary fence to allow access for machinery and equipment for fence maintenance and management action implementation.	Roads, tracks, and fire trails maintained when required and ongoing from Year 1. Maintained at least once every 2 years.	Tracks maintained to a suitable standard for light vehicle access. Boundary fence 3.5m zone maintained

TFD Item	Activity	Action/treatment/specifications	Frequency/timing	Performance measures
		Internal access tracks – ~1.2 km of track maintenance at 3.5 m wide must be maintained to allow access. Tracks moderate condition are to be recut/fixed maintained in good condition using a grader or F/E loader for light vehicle access.		
N/A	Erosion remediation	No erosion identified on this site. In the event erosion is identified on the site it is managed within 12 months. Costing included in contingency funding.	NA	

Section 3: Management actions – Weed management and control

Management actions

18. Management of the ~~Biodiversity Stewardship~~ Offset Site to control and remove weeds is to be undertaken in accordance with the Operations Schedule for this section and the Weed Management Map.
19. Removal and control of weed species is to enable an increase in the abundance, cover and diversity of Native Vegetation and protect and restore Threatened Species habitat through natural regeneration and/or undertaking Supplementary Planting.
20. Measures to reduce the risk of introducing new weed species or spreading existing weed species on the ~~Biodiversity Stewardship~~ Offset Site must be implemented in accordance with the Operations Schedule.
21. Any other weed species not listed in the Operations Schedule that occur on the ~~Biodiversity Stewardship~~ Offset site at any time are to be controlled and removed using methods of control and management consistent with similar species identified in the Operations Schedule.
22. The use of herbicide or other chemicals for weed management and control must be undertaken in accordance with APVMA requirements or current industry standards.

Record keeping

23. The Landowner must retain the following records and include in the annual report to the DPHI
    a) weed management actions set out in the Operations Schedule that have been implemented during the year
    b) any observations of the density and the distribution of weed species present on the ~~Biodiversity Stewardship~~ Offset Site
    c) any minor variations from the Operations Schedule
    d) progress on meeting performance measures for weed management actions set out in the Operations Schedule that have been implemented during the year or require reporting on during the year
    e) Pesticide application records required by the NSW Environmental Protection Authority (EPA).

Operations Schedule – Weed management

Table 2: List of weeds targeted for management and their weed management group (add/remove rows as needed)

Common name	Scientific name	Weed management group
Prickly Pear	*Opuntia stricta*	Woody weed - HTW
Tiger Pear	*Opuntia aurantiaca*	Woody weed - HTW
Fireweed	*Senecio madagascariensis*	Herb - HTW
Onion Grass	*Romulea rosea var. australis*	Grass - HTW
Scarlett Pimpernel	*Lysimachia arvensis*	Herb
Narrow-leaved Cottonbush	*Gomphocarpus fruticosus*	Herb
Catsear	*Hypochaeris radicata*	Herb
Annual Trampweed	*Facelis retusa.*	Herb

Table 3: Methods of weed control and management (add/remove rows as needed)

TFD Item	Weed management group	Map location	Method of control/management	Frequency/ timing	Performance measures

3.1, 3.2, 3.3	**Common Prickly Pear (HTW)**
	(*Opuntia stricta* var. *stricta*)
	Scattered across Offset Site
		All WZs	A combination of Physical control methods may be undertaken for Common Prickly Pear (methods for small infestations as observed on site):
			• Physical control:
			  ○ Hand pulling – Dig up plants using mattock or other tools. Wear appropriate protective clothing and gloves to protect against injuries.
			  ○ Disposal – Bury at least one metre deep or burn in a hot fire. Contact local council for information on other disposal options.
			• Chemical control:
			  ○ Spot spraying – useful for scattered infestations. Spray actively growing plants and cover all parts of
				Primary weed management:
				Annually, Years 1 –5
				Secondary weed management:
				Annually, Years 6 – 10
				Maintenance weed management:
				Annually, Years 11 – 19
				Use of biological control to be investigated in Year 11 if performance measures are not being met. Cost sourced from contingency fund (TFD item 9.8).
					Primary weed management:
					Maintained at Very Low (<1%).
					Secondary weed management:
					Maintained at Very Low (<1%).
					Maintenance weed management
					Maintained at Very Low (<1%).

			the plant with herbicide (refer to NSW WeedWise for appropriate herbicide (e.g. Triclopyr 600 g/L).
			• Biological control:
			  ○ There are two successful biological control agents for Common Prickly Pear: Cactoblastis moth and Cochineal bug. The cactoblastis moth is widespread and does not need to be redistributed.
			  ○ Cut and stack the cactus in a pile to attract the cactoblastis moth in spring or summer. The moths will multiply in the stack.
			  ○ The cochineal bug is suitable for redistribution. It is important to use the right species of cochineal for each species of cactus. Contact your local weeds officer for more information about using cochineal to control Commo Prickly Pear.
			Information detailed here is sourced from NSW WeedWise. For further information visit the website:
			https://weeds.dpi.nsw.gov.au/Weeds/CommonPear#control		

3.1, 3.2, 3.3	**Tiger Pear (HTW)** *Opuntia aurantiaca* Scattered across Offset Site	All WZs	Successful control relies on follow up after the initial efforts. This means looking for and killing regrowth or new plants. Using a combination of control methods is usually more successful. **Prevention** Avoid driving or walking through areas with tiger pear. Check tyres, under vehicles, footwear and machinery before leaving infested area. Remove all plant parts using pliers or tongs. Dispose of them appropriately. **Disposal** Dispose of tiger pear by burying it at least one metre deep or by burning in a hot fire. Contact local council for information about other disposal options. **Physical control** Dig up small or isolated plants using a mattock or other tools. Wear appropriate protective clothing and gloves to protect against injuries. Larger infestations may be controlled by machinery. Ensure the roots are dug out and that all plant parts are disposed of. **Biological control**	As above for: **Common Prickly Pear (HTW) (*Opuntia stricta* var. *stricta*)**	As above for: **Common Prickly Pear (HTW) (*Opuntia stricta* var. *stricta*)**

			Cochineal insects (*Dactylopius austrinus)* effectively control tiger pear, especially on core infestations. There are several species of *Dactylopius* that look similar but they each control different species of cactus. It is important to use the correct species of cochineal for each species of cactus. Contact local weeds officer for information about using cochineal to control tiger pear. There are also two moths that provide some control, but they are not as effective as the cochineal: the Cactoblastis moth (*Cactoblastis cactorum*) and the stem-boring moth *(Tucumania tapiacola)*. The moths are widespread and there is no need for redistribution. The cochineal insect controls tiger pear better than the moths during hot dry summers. Biological control is less effective in wetter years because it produces new cladodes faster than they can be controlled by biological control insects. **Chemical control** Herbicides e.g. Picloram 100 g/L + Triclopyr 300 g/L + Aminopyralid 8 g/L (Grazon® Extra) Rate: 500 mL in 100 L of water, are especially useful for sparse, scattered infestations. Spray actively growing plants. Cover all parts of the plant with herbicide. Check treated plants and control new growth. Information detailed here is sourced from NSW WeedWise. For further information visit the website: https://weeds.dpi.nsw.gov.au/Weed/TigerPear		
3.1, 3.2, 3.3	**Fireweed [HTW]** *Senecio madagascariensis* Scattered across Offset Site	All WZs	Detailed control information is available in the Fireweed (Senecio madagascariensis) National Best Practice Management Manual 2023. Long-term fireweed control needs to consider that: • most new seedlings appear in autumn • many new seedlings appear after rain when temperatures are 15–27°C • seedlings grow fast and can flower 6–10 weeks after emerging • flowering and seeding occur mostly in spring • most plants die off by late spring • some plants live for up to three years - the tops die back in spring and regrow the following autumn	*Primary weed management:* Annually, Years 1 –5 *Secondary weed management*: Annually, Years 6 – 10 *Maintenance weed management:*	*Primary weed management:* Reduced from Low to Very Low (<1%) by the end of year 5. *Secondary weed management:* Maintained at Very Low (<1%). *Maintenance weed management:* Maintained at Very Low (<1%).

			• fireweed seed buried deeper than two centimetres is unlikely to germinate • long-term follow up is essential because about 15% of seeds remain dormant for over 10 years. **Hand weeding** Pull out individual plants in small, isolated patches or sensitive environmental areas. Wear gloves to protect skin from the plant's poisons. Bag and dispose of pulled plants. They are still poisonous to livestock and produce viable seeds if they have flowers. **Slashing and mulching** Careful slashing or mulching can reduce fireweed seeding when done: • before late spring • when less than 25% of plants are flowering • at least every six weeks if pastures can recover faster than the cut fireweed plants Avoid slashing or mulching in late spring, or when more than 25% of plants are flowering. This can trigger plants to regrow, surviving into summer rather than dying off at the end of spring. That makes next season's control harder. **Biological control** There are no effective biological control agents available for fireweed. It's difficult to find a biological control that's harmless to the native *Senecio* species. These insects can attack and sometimes destroy fireweed plants: • A chrysomelid beetle *(Chalcolampra species)* • A magpie moth *(Nyctemera amica)* • A blue stem borer moth *(Patagoniodes farinaria).* They cannot be relied on for control. The damage usually occurs after the plants have produced seeds **Chemical control** Herbicides e.g. **Aminocyclopyrachlor 240 g/L** (Method® 240 SL) Rate: 200-500 mL per 100 L of water Comments: Spot spray with a handgun, - are most effective in combination with healthy, competitive native pastures. The best time to treat fireweed with herbicide is late autumn.		

			This controls the peak numbers of seedlings and young plants. By late winter herbicide treatments are much less effective. Used correctly, selective herbicides don't kill grasses but do slow their growth. They can kill legumes, which are important pasture plants. Blanket applications of selective herbicide are problematic because pasture growth is set back. Wherever possible limit the application areas in paddocks. Bromoxynil herbicides cause the least damage to legumes but only kill young fireweed plants. Protect native legumes by applying only when the maximum daily air temperature will be below 20°C. Metsulfuron-methyl herbicides can kill older fireweed plants, but also kill pasture legumes. Flowering plants can be spot sprayed with herbicides containing aminopyralid or metsulfuron-methyl. Information detailed here is sourced from NSW WeedWise. For further information visit the website: https://weeds.dpi.nsw.gov.au/Weed/Fireweed		
3.1, 3.2, 3.3	**Onion Grass [HTW]** *Romulea rosea var. australis* Scattered across Offset Site	All WZs	Weed control methods may include: • Hand pulling small infestations of weeds where possible, bag seed heads and dispose of appropriately (i.e. compost off-site, green-waste recycling) • Chipping out plants using a mattock or similar tool • Spot spraying with broad-leave selective registered herbicide • Slashing prior to seed development. Any spot spraying is to take in consideration current local and expected future weather conditions to minimise the risk of spray drift (in windy conditions) or mobilisation (following rainfall). Assessment of suitable conditions is to be undertaken prior to any spraying on the Biodiversity Stewardship Site. Only herbicides registered for use in sensitive environments are to be used within 100 m of the top of bank of riparian zones (this includes the creek along the north eastern boundary of the BSA). Preventative early control through targeted spraying is recommended at locations with high weed cover through late spring to allow the germination and establishment of native grass cover through early to late summer.	*Primary weed management:* Annually, Years 1 –5 *Secondary weed management*: Annually, Years 6 – 10 *Maintenance weed management:* Annually, Years 11 – 19	*Primary weed management:* Reduced from Low to Very Low (<1%) by the end of year 5. *Secondary weed management:* Maintained at Very Low (<1%). *Maintenance weed management:* Maintained at Very Low (<1%).

			If areas are without weeds, they do not need control but will be investigated regularly as part of monitoring, quarterly / annual walkovers and adaptive management.		
3.1, 3.2, 3.3	**All other exotic herbs** Scattered across Offset Site	All WZs	As above for **Herbs- Fireweed [HTW]**	*Primary weed management:* Annually, Years 1 –5 *Secondary weed management*: Annually, Years 6 – 10 *Maintenance weed management:* Annually, Years 11 – 19	*Primary weed management:* Reduced from Low to Very Low (<1%) by the end of year 5. *Secondary weed management:* Maintained at Very Low (<1%). *Maintenance weed management:* Maintained at Very Low (<1%).
3.1, 3.2, 3.3	**All other exotic grasses** Scattered across Offset Site	All WZs	As above for **Grasses - Onion Grass [HTW]**	*Primary weed management:* Annually, Years 1 –5 *Secondary weed management*: Annually, Years 6 – 10 *Maintenance weed management:* Annually, Years 11 – 19	*Primary weed management:* Reduced from Low to Very Low (<1%) by the end of year 5. *Secondary weed management:* Maintained at Very Low (<1%). *Maintenance weed management:* Maintained at Very Low (<1%).
3.1, 3.2, 3.3	**All**	**All**	Any new weed species and/or infestations to be included in weed management plan, mapping, and controlled during weed control events.	As required	Any new weed species identified is recorded, mapped, and treated within 6 months of detection.

Weed Management Map

Note: A Weed Management Map is not submitted as ~~may not be required if~~ the Biodiversity Stewardship Agreement site has only scattered weeds.

Section 4: Pest animal controls

Management actions

24. Management of the Offset Site ~~Biodiversity Stewardship Site~~ to control and remove pests is to be undertaken in accordance with Operations Schedule Pest Animal controls for this section and the Management Plan Site Map.
25. Removal and control of pest species is to enable increased recovery of native fauna and flora by reducing predation, grazing pressure, and competition.
26. The Landowner must obtain advice from Local Land Services on legal requirements and effective control methods prior to commencing any control activities. Advice from Local Land Services is to be obtained prior to the 5-yearly review of the Management Plan).
27. If any methods advised or recommended by Local Land Services differ from those identified in this Management Plan, the Landowner must advise BCT in writing prior to commencing control activities.
28. Any other pest animals not listed in the Operations Schedule are to be controlled and managed using methods of control and management that are consistent with similar species identified in the Operations Schedule, or methods recommended by Local Land Services.
29. Where possible, the Landowner will seek to coordinate implementation of pest animal control activities with neighbouring landowners.

Record keeping

30. The Landowner must retain the following records and include in the annual report to the BCT:
    a) feral pest control actions set out in the Operations Schedule Pest animal controls that have been implemented during the year
    b) results of feral pest control actions implemented during the year including list of target species, estimated number of target species culled or removed from the ~~Biodiversity Stewardship~~ Offset Site
    c) any observations of the density and the distribution of feral pests present on the Biodiversity Stewardship Site
    d) any minor variations from the Operations Schedule Pest Animal Controls
    e) results of monitoring against performance measures
    f) chemical application records required by the EPA
    g) records of any new pest animals that are sighted within the ~~Biodiversity Stewardship~~ Offset Site.

Operations Schedule – Pest animal controls

Table 4: List of pest animals, control methods and timing for actions (add/remove rows as needed)

TFD item	Common name	Map location	Method of control/management	Frequency/ timing	Performance measures
4.1	European Fox (*Vulpes vulpes*)	Applicable to whole site	Low presence of foxes was recorded on the subject land. **Ground baiting:** Baiting of foxes using 1080 poison along fences, tracks and trails in June and July	**Ground baiting** – Ongoing/ as required, and if/when regional control programs are running. Timing	Performance measures for control are based on Local Land Service (LLS) density categories: • **High** - abundant evidence, individuals easily visible

			following the Standard Operating Procedure (SOP-FOX001) (Sharp, 2013). It is preferable not to undertake baiting programs when vixens are lactating (i.e. August and September). This is also the time when vixens are moving around least within their territory thus reducing the likelihood of finding baits. To minimise the potential for toxic baits to be lethal to non-target animals, the following baiting strategies are recommended: • Bait size and concentration of 1080 – baits should be large enough so that small native animals cannot eat enough of them to ingest a lethal dose. Each bait should contain a precise amount of 1080 (3mg) which is sufficient to deliver a lethal dose to a fox. The rate is calculated to minimise sublethal doses and overdosing. • Burial placement of baits – bury baits 10 cm underground. Buried baits are less likely to be removed by native species. • Distance between bait stations – space baits at least 100m apart to minimise the risk of native animals finding multiple baits. • Palatability and attractiveness to baits – ensure that bait types used are highly attractive to foxes and less attractive to non-target species. Some native animals may not be attracted to meat or may be unable to eat some bait types. • Marking of bait stations – mark the location of buried baits so that any baits remaining at the end of the program can be collected and destroyed. • Position bait where foxes are more likely to access it, such as open areas rather than arboreal habitats. Where the risk to non-target species is unknown, bait stations using buried, un-poisoned baits should be established and monitored. If baits are taken or disturbed by non-target animals, then poison baiting should not be continued in the area.	preferably Autumn to Spring. Conducted in conjunction with Rabbit baiting for one session every year.	• **Medium** - active areas present, recent signs of animals observed • **Low** - some signs observed, may not be recent • **Zero** - no sign. Fox populations to be maintained at low to zero within the site in perpetuity. Control activities conducted within 3 months of detection of pest species. Monitoring to be undertaken opportunistically and during annual site inspections as outlined in section 9.

4.2	Wild Rabbit (*Oryctolagus cuniculus*)	Applicable to whole site	Low rabbit presence was recorded on the subject land. **Biological controls**: The Hunter Local Land Service is known to coordinate the release of biological controls (e.g. Rabbit Haemorrhagic Disease Virus – RHDV K5 strain). Ground baiting using RHDV is an effective method of controlling rabbit populations, however, it is not meant to be used as a stand-alone method. The use of this method should follow the Standard Operating Procedure (SOP-RAB011) (Sharp, 2016a). Biological controls are widespread in the environment and expected to be operating at this BSA. The landowner should keep themselves up to date with current and emerging biological controls used by LLS (action not costed). **Rabbit Warren Fumigation**: Any rabbit warren fumigations need to be consistent with the Standard Operating Procedure (SOP-RAB004) (Sharp, 2012e). **Ground shooting:** Ground shooting is suitable and should follow the Standard Operating Procedure (SOP – RAB008) for Rabbits (Sharp, 2016b). Shooting to be undertaken in conjunction with shooting of goats, pigs, and feral cats, where applicable. *Note*: Baiting has not been included for the control of rabbits as the bait is more likely to impact Brush-tailed Phascogales and other non-target animals. The landowner should participate in coordinated programs for rabbit control by LLS (action not costed).	**Biological control** - As part of regional control programs. **Rabbit Warren Fumigation** – As required. **Ground shooting** (when required). Every 2 years from year 1 onwards. The need for shooting is dependent on monitoring results and rabbit presence. Ongoing/ as required, and if/when regional control programs are running.	Rabbit populations to be maintained at low to zero in perpetuity. Should rabbits be recorded, then ground shooting and/or fumigation to be implemented within 3 months to achieve performance measure. Monitoring to be undertaken during annual site inspection as outlined in section 9.
4.3	Feral Goat (*Capra hircus*)	Applicable to whole site	Low goat presence was recorded on the subject land. They are expected to occur in the general area and likely to occasionally occur on site. **Ground Shooting**: Ground shooting is suitable and should follow the Standard Operating Procedure (SOP – GOA001) for Goats (Sharp, 2012b). The best time to shoot feral goats is when they are most active; that is, in the early morning and late afternoon.	**Ground shooting** (when required) – (April to July). Annually from year 1 onwards. The need for shooting is dependent on monitoring results and Goat presence. Ongoing/ as required, and if/when regional control programs are running.	Goat populations to be maintained at low to zero in perpetuity. Control activities conducted within 3 months of detection of pest species. Monitoring to be undertaken during annual site inspection as outlined in section 9.

			Where possible, shooting should be coordinated at the landscape scale e.g. via a strategic program coordinated by Local Land Service (LLS). Costs for control actions conducted within 3 months of feral pest species detection are included with overall secondary and maintenance control efforts for all other pest species included in ground shooting.		
4.3	Feral Pig (*Sus scrofa*)	Applicable to whole site	Significant pig presence was recorded on the subject land. They are expected to occur in the general area and occur on site. (see **EMM** Ecopath Sep 2025) **Ground Shooting**: Ground shooting is suitable and should follow the Standard Operating Procedure (SOP – PIG003) for Feral Pigs (Sharp T., 2012b). The best time to shoot Feral Pigs is when they are most active; that is, in the early morning and late afternoon, or throughout the night if spotlights are used. See above (Goats) for animal welfare and TFD costing considerations. If ground shooting of feral pigs fails to maintain low to zero population densities, baiting or trapping can be undertaken when appropriate. Funding to be sourced from contingency costs (TFD item 9.8). Ground baiting is to adhere to the Standard Operating Procedure (PIG005) (Sharp, 2012f), as is trapping (PIG001) (Sharp, 2012g). Funding to be sourced from contingency costs (TFD item 9.7).	**Ground shooting** – as per shooting for Goats. The need for shooting will be dependent on monitoring results and Pig presence. Ongoing/ as required, and if/when regional control programs are running.	Pig populations to be maintained at low to zero in perpetuity. Control activities conducted within 3 months of detection of pest species. Monitoring to be undertaken during annual site inspection as outlined in section 9.
4.3	Feral Cat (*Felis catus*)	Applicable to whole site	Lowferal cat presence was recorded on the subject land. They are expected to occur in the general area and likely to occur on site. **Ground Shooting**: Ground shooting is suitable and should follow the Standard Operating Procedure (SOP – CAT001) for Feral (Sharp T., 2005). The best time to shoot Feral Cats is throughout the night when they are most active.	**Ground shooting** – As required (conducted and costed with Goats and Pigs shooting).	Cat presence to be maintained at low to zero within the site in perpetuity. Should cats be recorded during annual site monitoring, then ground shooting to be implemented within 3 months to achieve performance measure. Monitoring to be undertaken during annual site inspection as outlined in section 9.

Section 5: Plant Community Types and Threatened Ecological Communities (Native Vegetation)

Management actions

31. Management of the Biodiversity Stewardship Site to protect, restore and enhance native vegetation is to be undertaken in accordance with the Operations Schedules for this section and the Management Plan Site Map.
32. Native Vegetation must not be cut down, felled, thinned, logged, killed, destroyed, poisoned, ringbarked, uprooted, burnt or otherwise removed, except in accordance with the Operations Schedule.
33. Dead timber (whether standing or fallen and including branches and leaf litter) must not be removed from or moved, except for the personal (non-commercial) use by the Landowner for firewood for one dwelling only or for repair of fences (not for construction of fences).
34. The Landowner must prevent Fertilisers and other sources of nutrients – for example, manure – other than those that would occur as a result of natural ecosystem function, or from approved stock grazing activities from entering or being used except in accordance with the Operations Schedule.
35. Pesticides must not be applied except in accordance with the Operations Schedules.
36. Replanting and other activities to enhance Plant Community Types (PCT) and/or Threatened Ecological Communities (TEC) must occur in accordance with the Operations Schedules.
37. If replanting or seeding, the Operations Schedule must set out measures as required to assist survival and establishment of native species such as watering, weed control, replacement planting.

Record keeping

38. The Landowner must retain the following diary records and include in the Annual Report:
    a) dates of planting/seeding
    b) source of seed/seedlings
    c) survival rates of planting/seeding
    d) dates and results of monitoring against performance measures
    e) activities related to the collection of firewood or the repair of fences.

Operations Schedule – PCTs and TECs (Native Vegetation)

Table 5: Management action method s for PCTs and TECs (add/remove rows as needed)

TFD item	Map location	Methods (including site preparation and maintenance methods)	Timing/frequency	Performance measures
5.1		Seed Collection and Propagation for Offset site DNG area	Year 2,3 Spring	75% germination
5.2		Seed Collection and Propagation for haul road & Quarry rehab.	Year 2,3 -Post construction	75% germination

Table 6.A: Replanting for PCT 3314_DNG – Species list (add/remove rows and replicate or delete table as needed)

Management zone	Common name (Scientific name)	Timing (years)	Number of plants per area (e.g. hectare)	Planting method	Performance measures
Offset site PCT 3314_DNG	Assemblage of native species associated with PCT 3314	2 &3	4 per 10m2	Seeding in spring preferably after wet winter	75% germination

Table 6.B: Replanting for Quarry & Haul Road Construction Zone – Species list (add/remove rows and replicate or delete table as needed)

Management zone	Common name (Scientific name)	Timing (years)	Number of plants per area (e.g. hectare)	Planting method	Performance measures
Quarry & haul rd construction zone	Assemblage of native species associated with PCT's 3314 &3431. Including grasses suitable verges (e.g. Q. bluegrass assemblage)	2 &3	12 per 10m2	Seeding in spring or post-construction in any month not starting with a **'J'**. Haul irrigation water as necessary to enhance germination	75% germination

Section 6: Threatened species habitat

Management actions

39. Management of the Biodiversity Stewardship Site to protect, restore and enhance Threatened Species habitat (for ecosystem credits and species credits) is to be undertaken in accordance with the Operations Schedule for this section and the Threatened Species Habitat Map.
40. Breeding habitat features – for example, hollow-bearing trees – and other habitat features for Threatened Species, including any breeding sites and other habitat features are to be retained and not removed or impacted by any activities shown on the Threatened Species Habitat Map.
41. Threatened Species habitat elements such as bush rocks, termite mounds and fallen logs, must not be moved or removed except in accordance with the Threatened Species Operations Schedule.

Record keeping

42. The Landowner must retain the following diary records and include in the annual report to the BCT:
    a) management actions set out in the Threatened Species habitat Operations Schedule that have been implemented during the year
    b) any observations of changes in the number or area of Threatened Species and their habitat
    c) any minor variations from the Threatened Species habitat Operations Schedule
    d) records of any new Threatened Species recorded on the Biodiversity Stewardship Site
    e) results of monitoring against performance measures.

Operations Schedule – Threatened species habitat

Table 7: List of methods and timing for threatened species habitat management actions (add/remove rows as needed)

TFD Item	Common name (Scientific name)	Map location	Method/action	Timing/frequency	Performance measure
6.1	Various and associated with PCT's 3314 &3431.	All Z	Salvage hollows rocks/other habitat features from haul road construction clearance area to be used as ground habitat in the Offset Area	Y1	Suitable habitat features from haul road construction clearing now forming ground habitat in the Offset Area.
6.2	Various and associated with PCT's 3314 &3431.	All Z	Salvage hollows/rocks/other habitat features from quarry construction clearance area to be used as ground habitat in the Offset Area	Y1 and completion within 3 months of each clearing stage	Suitable habitat features from quarry construction clearing now forming ground habitat in the Offset Area.
6.3	***Diurus tricolor***	*Diurus tricolor* species points & fenced area haul rd	Fence construction [completed]. Fence maintenance and Weed management as per Items 2.1. 2.2, 2.3,2.4,2.5,2.6,3.1, 3.2 &. 3.3	Y1-20	As per Items 2.1. 2.2, 2.3,2.4,2.5,2.6,3.1, 3.2 &. 3.3
6.5	***Speckled Warbler***	*Speckled Warbler points*	No required action.	NA	NA

Section 7: Grazing management

This section is to be included for BSAs where grazing is suitable (see BSA Application Guide). Grazing is excluded on all other BSAs.

Management actions

43. Stock grazing on the Biodiversity Stewardship Site is only to be carried out in accordance with the Operations Schedule for this section and in the areas identified on the Management Actions Map. (Or Stock grazing is not permitted to occur on the Biodiversity Stewardship site)
44. The Operations Schedule Grazing management is to identify Healthy Condition thresholds for ground cover taking into account seasonal, climatic and Site conditions. Thresholds for Healthy Condition are based on regional rainfall (annual averages) and the dominant grass species present. Thresholds for Healthy Condition must include grazing pressure from native herbivores and any pest herbivores.
45. Stock grazing regime is to:
    a) assist enhancing the diversity and cover of native flora species, enhance habitat for native fauna species, control weeds and promote natural regeneration rather than be for the purpose of agricultural productivity
    b) be confined to appropriate grassy ecosystems on the Biodiversity Stewardship site
    c) be excluded from riparian and other sensitive areas shown on the Management Actions Map using appropriate fencing
    d) ensure ground cover is maintained above Healthy Condition thresholds.
    e) be put on hold during periods when the Healthy Condition thresholds are not met within a grazing location listed in the Operations Schedule for this section
    f) be undertaken during defined times to allow native species to flower, set seed and germinate in order encourage future recruitment of native plants.
46. Stock must be removed immediately (grazing must cease) in any area of the Biodiversity Stewardship Site where the groundcover or sward height is below the Performance Measures in the Operations Schedule.
47. Grazing must not occur in map locations that contain replanted areas, and/or areas where natural regeneration of tree cover is occurring until tree stems are at height (metres) or diameter breast height (centimetres) that is set out in the Healthy Condition performance measures listed in the Operations Schedule.
48. The Landowner must take all reasonable precautions to minimise the risk of introducing new weed species, or the spread of known weed species when stock enter onto or within the Biodiversity Stewardship Site.

Record keeping

49. The Landowner must retain the following diary records and include in the annual report to the BCT:
    a) Dates, duration and intensity of grazing for each grazing area
    b) Other management actions implemented set out in the Operations Schedule Grazing Management that have been implemented during the year, including records of any quarantine measures
    c) Details of any unauthorised grazing and action taken
    d) any minor variations to the Operations Schedule Grazing Management
    e) observations of the management objectives and results of monitoring against healthy condition performance measures.

Operations Schedule – Grazing management

Table 8: Grazing management methods, timing and performance measures (add/remove rows as needed)

TFD Item	Map location	Stock type	Method (cell/rotational/crash)	Timing/Frequency	Healthy Condition performance measures

Section 8: Management actions – Fire management

This section is only to be included for BSAs with fire management requirements (see BSA Application Guide)

Management actions

50. Ecological burns of Native Vegetation may be undertaken to help stimulate Native Plant regeneration, control weeds and enhance Biodiversity in accordance with the Operations Schedule for this section (including performance measures) and the Fire Management Map. (Or Ecological burning is not required to be undertaken)
51. Burns are to be undertaken at a frequency and intensity suitable for the PCTs and Threatened Species.
52. Burning should only be undertaken when and where it is safe to do so without major risk to property, infrastructure or Biodiversity that is sensitive to fire. The Fire Management Map must identify these areas as fire exclusion zones.
53. Ecological Burns are to be carried out in a mosaic-pattern of different burn intervals to ensure refuge areas for native fauna are available at all times. Reasonable measures are to be taken prior to the burn event to flush out native animals.
54. Prior to each instance of an ecological burn being undertaken, an operational burn plan must be prepared by a suitably qualified and/or experienced person. Each operational burn plan should have regard to the other management actions in this Management Plan, and must:
    a) identify site access and notification requirements
    b) specify the ignition pattern (consider planning the burn path to allow for safe corridors of retained vegetation for fauna to retreat away from the fire to nearby bushland)
    c) identify containment lines that will restrict the spread of fire to within the planned burn unit and maintain the fire exclusion zones
    d) describe desirable weather conditions for when to conduct the burn
    e) conduct a work safety and risk assessment
    f) identify the permits and approvals required for conducting the burn
    g) specify communication procedures and protocols.
55. Following a wildfire event or a hazard reduction burn undertaken by Rural Fire Service, an Ecological Burn must only be carried out on any area of the Biodiversity Stewardship Site according to the frequency specified in the Operations Schedule to stimulate Native Plant regeneration, control weeds and enhance Biodiversity.
56. Ecological Burns should be carried out in accordance with the Bush Fire Environmental Assessment Code including the Threatened Species Hazard Reduction List for Plants, Animals and Threatened Ecological Communities (NSW Rural Fire Service), except for an ecological burn that is being undertaken in accordance with the Operations Schedule Fire management and the Biodiversity Stewardship Agreement.

Record keeping

57. The Landowner must retain the following diary records and provide the following in the annual report to the BCT:
    a) date, cause, area (hectares), and relative intensity of any fire event that occurred within the Biodiversity Stewardship Site
    b) weather conditions and observations such as the scorch height on tree species and any impacts on threatened species
    c) contractors involved in management of any burns – for example, RFS or a cultural burn practitioner.
    d) response of PCTs and native plants to any fire events.

Operations Schedule – Fire management

Table 9: Fire management methods, timing and performance measures (add/remove rows as needed)

TFD Item	Ecological burn unit	Timing of burn	Fire frequency	Fire intensity	Other methods	Performance measures

Section 9: Management actions – Monitoring and adaptive management

Management actions

58. Monitoring and adaptive management under this Management Plan will be in accordance with the performance measures described in each section and the Operations Schedule for this section and the Monitoring Map.
59. Ecological Monitoring Points are to be established in accordance with the Operations Schedule for Monitoring and adaptive management with the locations of each point shown on the Monitoring Map (a minimum of one Ecological Monitoring Point in each vegetation zone) within 12 months of the Agreement Date).
60. Photographs must be taken at each Ecological Monitoring Point within 12 months of the Agreement Date and then at least every 12 months thereafter showing all 360 degrees and must:
    a) be taken from each end of the transect length at the same location, with the same starting direction for the commencement and direction of the sweep, with the camera held at the same location, height and angle
    b) show exactly the same field of view each monitoring event, to enable comparison across years
    c) be clear and of suitable resolution to show detail and taken at appropriate light conditions to display optimal contrast
    d) be dated and labelled and retained by the Landowner.

Record keeping

61. The Landowner must retain the following diary records and include in the annual report to the BCT:
    a) management actions set out in the Operations Schedule for monitoring and adaptive management that have been implemented during the year
    b) photographs and any observations taken from the photo points
    c) any minor variations from the Operations Schedule Monitoring and adaptive management.

Operations Schedule – Monitoring and adaptive management

Table 10: Monitoring and adaptive management methods, timing and performance measures (add/remove rows as needed)

TFD Item	Map location	Method	Frequency/timing	Performance measures
9.1	N/A	Undertake a **5-year review** of the management plan. This includes the option to update the BRMP (any other case).	**Every five years** from commencement of BRMP	**Review of current Management Plan** completed every five years.

9.2	Reporting and monitoring: entire site opportunistically Photo points: DQ 1 to DQ 3	**Annual reporting to the DPHI** A report needs to be prepared and submitted to the DPHI annually. It is a requirement on the implementation of management actions (See Record Keeping in each section of this Management Plan). **Annual photo-points*:*** To be conducted at Vegetation Integrity (VI) monitoring plots (MP) in accordance with section 5.6 of the EMM Operational Manual and this Management Plan. **Feral animal population monitoring:** Opportunistic observations to be undertaken every year during annual site inspections, and during other described monitoring where applicable (i.e. VI monitoring plots).	**Annual Report** submitted to the DPHI each year. Qualitative opportunistic assessment as part of site walkovers to be included in the annual report. **Photo monitoring** to be conducted annually. **Feral animal monitoring** annually during photo monitoring and opportunistically at site walk overs.	**Annual report** submitted to DPHI and compliance with management actions for Record Keeping in each section of this Management Plan. **Photo-point monitoring** to be conducted as described in this Management Plan and EMM. **Feral animal monitoring** conducted as described in this Management Plan and monitoring results to inform Section 4: Pest Animal Controls.
9.4	DQ 1 to DQ 3	**Vegetation Integrity Monitoring Plot (MP - VI):** To be conducted in accordance with the full floristic plot (20x20m) methods outlined in the Ecological Monitoring Module (EMM) and Operational Manual published by the BCT. This is the same floristic survey as part of the standard VI plot (20x20m) in the BAM. Refer to Section 4 of EMM Operational Manual:	**VI Monitoring Plots** to be conducted in spring every 5 years until Year 19, starting in Year 5 (item 9.6). Post 20-year monitoring to be conducted in spring every 10 years from Year 29.	**Vegetation Integrity (VI) Monitoring Plot** surveys to be conducted as described in this Management Plan and EMM. VI Performance measures are based on the Vegetation Zone Future Vegetation Integrity (VI) score 'with management' provided in the BAM-C (see table below). Comparison of plot data (VI Scores and individual VI Attributes) against benchmarks shows a natural progression of vegetation on the BSA site towards future vegetation integrity with management.
9.5	DQ 2 & DQ3	**Threatened Flora monitoring:** • *Diuris tricolor* – Known location in two VI monitoring plots (MP 1 and 2). Within these plots count all individuals and estimate population area of occupancy. Record age class (adult juvenile) of each individual. *Note: Threatened species monitoring will be conducted every 5 years to align with VI plot and other monitoring surveys.*	**Threatened Flora monitoring** to be conducted every 5 years, starting Year 5	Population to be maintained (at a minimum) or enhanced from baseline monitoring results.
9.6	DQ1 to DQ3	**Threatened Fauna monitoring – Speckled Warbler** *Pyrrholaemus sagittatus* Area Searches & Call Playback in habitat areas	**Threatened Fauna monitoring** to be conducted every 5 years, starting Year 5	Individuals of each species to be recorded each monitoring survey.
9.7	N/A	**Contingency** for unforeseen events every year (e.g. flooding, fire, weeds, erosion, ferals animals, etc.)	**Annual funding start year 2.**	N/A

Table 11: Ecological response monitoring (add/remove rows as needed)

Point ID	Zone/Species	Biodiversity Target	Easting	Northing	Frequency	Baseline	Target
DQ1	3314_DNG	**Vegetation Integrity (VI) Plot Monitoring** (Includes annual photo points)	279067	6421731	5Y	see EMM 2025	34.3 (VI score from BAMC)
DQ2	3431_Intact		279216	6421638		see EMM 2025	72.7 (VI score from BAMC)
DQ3	3414_Intact		278981	6421741		see EMM 2025	71.5 (VI score from BAMC)
DQ2	3431_Intact	***Diurus tricolor* population monitoring** (Includes annual photo points)	279216	6421638	5Y	see EMM 2025	*Diurus tricolor* (Individuals recorded each monitoring survey)
DQ3	3431_Intact		278981	6421741			
DQ1	3314_DNG	**Speckled Warbler** *Pyrrholaemus sagittatus* ***population*** **monitoring** (Includes Call Playback & Area Searches)	279067	6421731	5Y	see EMM 2025	Individuals recorded each monitoring survey.
DQ2	3431_Intact		279216	6421638			
DQ3	3431_Intact		278981	6421741			

Definitions

This Management Plan uses the same definitions from Attachment 1 of the BSA. Additional definitions specific to the Management Plan are:

APVMA means the Australian Pesticides and Veterinary Medicines Authority

Ecological Burn means burning of Native Vegetation undertaken to help stimulate Native Plant regeneration, control weeds and enhance Biodiversity

Ecological Monitoring Point means location identified in Section 9 of this Management Plan at which photographs are to be taken to show the ecological response in all directions (360°) from that point on the land for the purpose of monitoring ecological condition over time

Habitat means an area or areas occupied, or periodically or occasionally occupied, by a species or ecological community, including any biotic or abiotic habitat component used by the species

Healthy Condition means the minimum percent of groundcover and average grass sward height specified in Section 6 that is to be maintained in areas where stock grazing is permitted on the Biodiversity Stewardship Site

Pest means animal species not native to Australia including fox, cat, pig, goat, horse, avian species and any other non-native animal species

Fertiliser means a substance that consists of or contains nitrogen, phosphorus or potassium (or any combination of these) manufactured, represented, sold or used to directly or indirectly supply nutrients to enhance the growth, productivity, quality or reproductive capacity of vegetation

Weed Species means a vascular plant species not native to Australia

Large Woody Debris means fallen dead tree branches and trunks

Living Ground Cover means all living vegetation below 1 metre in height including native and non-native ground cover species

Management Action means the management actions, activities and controls within this Management Plan

Native Vegetation has the same meaning as in section 1.6 of the BC Act and section 60B of the LLS Act

Operations Schedule means the program of management actions, activities and controls that are to be undertaken on the Biodiversity Stewardship Site

Plant Community Type (PCT) means the plant community types which are the subject of biodiversity credits created under the BSA and identified using the NSW PCT classification system

Pesticide means an agricultural chemical product or veterinary chemical product (within the meaning of the Agvet Code) that is represented as being suitable for, or is manufactured, supplied or used for, the external control of ectoparasites of animals, and is not prescribed under the Stock Medicines Act 1989 as a low-risk veterinary chemical product. A pesticide continues to be regarded as a pesticide even when it is mixed with some other substance (whether the other substance is a pesticide)

Sediment Trap means a temporary or permanent structure used to collect, trap and store sediment to prevent entry of sediment to a waterway

Species Polygon means the area or count and location of suitable habitat for a species for which the BSA generates biodiversity credits

Stock means cattle and sheep kept by the Owner. Horses, camels' goats, alpacas, llamas, pigs, deer, ostriches, emus or any other animal kept by the Landowner are prohibited from grazing on the Biodiversity Stewardship Site

Supplementary Planting means planting of locally indigenous native plants in one or more areas of the Biodiversity Stewardship Site to:

a) increase Native Plant species richness and foliage cover and/or
b) restore or enhance the native plant species composition and structure of recognisable PCTs and/or
c) improve habitat suitability for specific Threatened Species.

Threatened Ecological Community (TEC) means the threatened ecological community which are the subject of biodiversity credits created under the BSA.

Vegetation Integrity Survey Plot means an area within a vegetation zone in which condition attributes are assessed in accordance with the BAM (composition, structure and function)

Vegetation Zone means an area of similar native vegetation on the Biodiversity Stewardship Site with the same PCT and condition state.

Waste means any substance (whether solid, liquid or gaseous) that is discharged, emitted or deposited in the environment including substance that is discarded, rejected, unwanted, surplus or abandoned substance, including when it is intended for recycling or reuse.

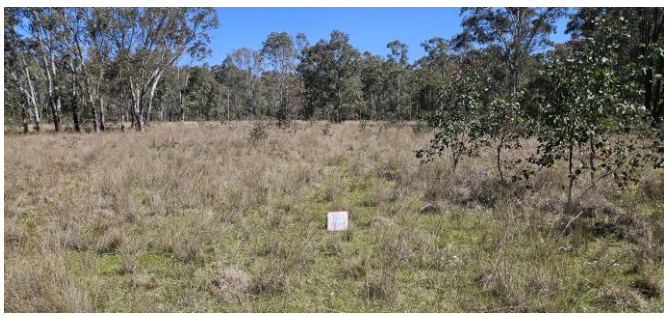
Weed management group means the group of weeds defined in the Operations Schedule that are subject to the same weed control and management actions.

Dolwendee Quarry Biodiversity Offset

Ecological Monitoring

Baseline Surveys - September 2025

Summary Report



Prepared for RestoreAg Pty Ltd

15 October 2025

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DOLWENDEE QUARRY BIODIVERSITY OFFSET ECOLOGICAL MONITORING
BASELINE SURVEYS – SEPTEMBER 2025

Summary Report

Report and spatial products developed for:
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Cover photos: Monitoring location Plot DQ1 (top left), Dwyer's Snake (*Suta dwyeri*) on site (middle left), monitoring location Plot DQ2 (bottom left) and Pine Donkey Orchid (*Diuris tricolor*) (right portrait frame).

Authors and contributors

Feature	Dolwendee biodiversity offset site	Task performed
Andrew Carty	Principal Botanist BAM Accredited Assessor (BAAS20021)	Author, field data collection
Jack Morrow	Ecologist	Field data collection

CONTENTS

1. INTRODUCTION

1.1 Background

RestoreAg Pty Ltd commissioned Ecopath Consulting Pty Ltd to undertake ecological monitoring at Dolwendee Quarry Biodiversity Offset site (the site).

The site is proposed as an offset for the Dolwendee Quarry, supporting similar habitats, threatened species and Threatened Ecological Communities as those found on the Dolwendee Quarry Site as detailed in the Ecological Assessment (Umwelt 2015) for the project.

Subsequently a Biodiversity and Rehabilitation Management Plan was developed for the Dolwendee Quarry by Integrated Environmental Management Australia (2021), which list some key management activities including stock exclusion, weed control, vertebrate pest management, revegetation (if required) and ecological baseline monitoring.

This summary report provides a brief description of methods and results of the ecological baseline monitoring conducted during September 2025.

1.2 Project scope

The scope includes desktop assessment, establishment of monitoring locations, photo monitoring points including installation of permanently marked plots, field monitoring surveys to collect the required data and prepare a summary report including maps and photographs. The project scope includes:

- Desktop assessment to determine the required number of monitoring points and background of the site.
- Establish monitoring locations and photo monitoring points including installation of permanently marked plots
- Field monitoring surveys to collect the required data from the minimum number of plots, using the EMM Monitoring Survey 123 App.
- Prepare a draft summary report for the monitoring including maps and photographs
- Finalise and submit data to the BCT through the Survey 123 App.

1.3 Dolwendee Biodiversity Offset

The Dolwendee biodiversity offset site is in the Upper Hunter valley region, approximately seven kilometres (km) north-west of Denman and 20 km south-west of Muswellbrook. It is around 16 hectares in area and is located on the same property as the Dolwendee Quarry. The major features of the Dolwendee biodiversity offset are listed in Table 1-1.

Table 1-1 Dolwendee Quarry biodiversity offset site

Feature	Dolwendee biodiversity offset site
Address	Golden Highway, Wybong
Lot/DP	Lot 2 DP 1160936
Local Government Area	Muswellbrook Shire Council
Offset type	A funded Conservation Agreement (CA)
Bioregion	Sydney Basin
Subregion	Kerrabee
Mitchell Landscape	Upper Hunter Channels and Floodplain
Geology	Newcastle Coal Measures and Widden Brook Conglomerate
Threatened Ecological Communities (TECs)	Central Hunter Grey Box – Ironbark Woodland in the NSW North Coast and Sydney Basin Bioregions Listed as an Endangered Ecological Community (EEC) under the *Biodiversity Conservation Act 2016* (BC Act)
Threatened species	Pine Donkey Orchid (*Diuris tricolor*) has been recorded on the offset site with up to 247 individuals being recorded in the past (Umwelt Pty Ltd 2015). Known to provide habitat for Speckled Warbler and potential habitat for a minimum of 13 additional threatened fauna species.

The location of the Dolwendee biodiversity offset site including the distribution of IBRA subregions and Mitchell Landscapes is displayed in Figure 1.

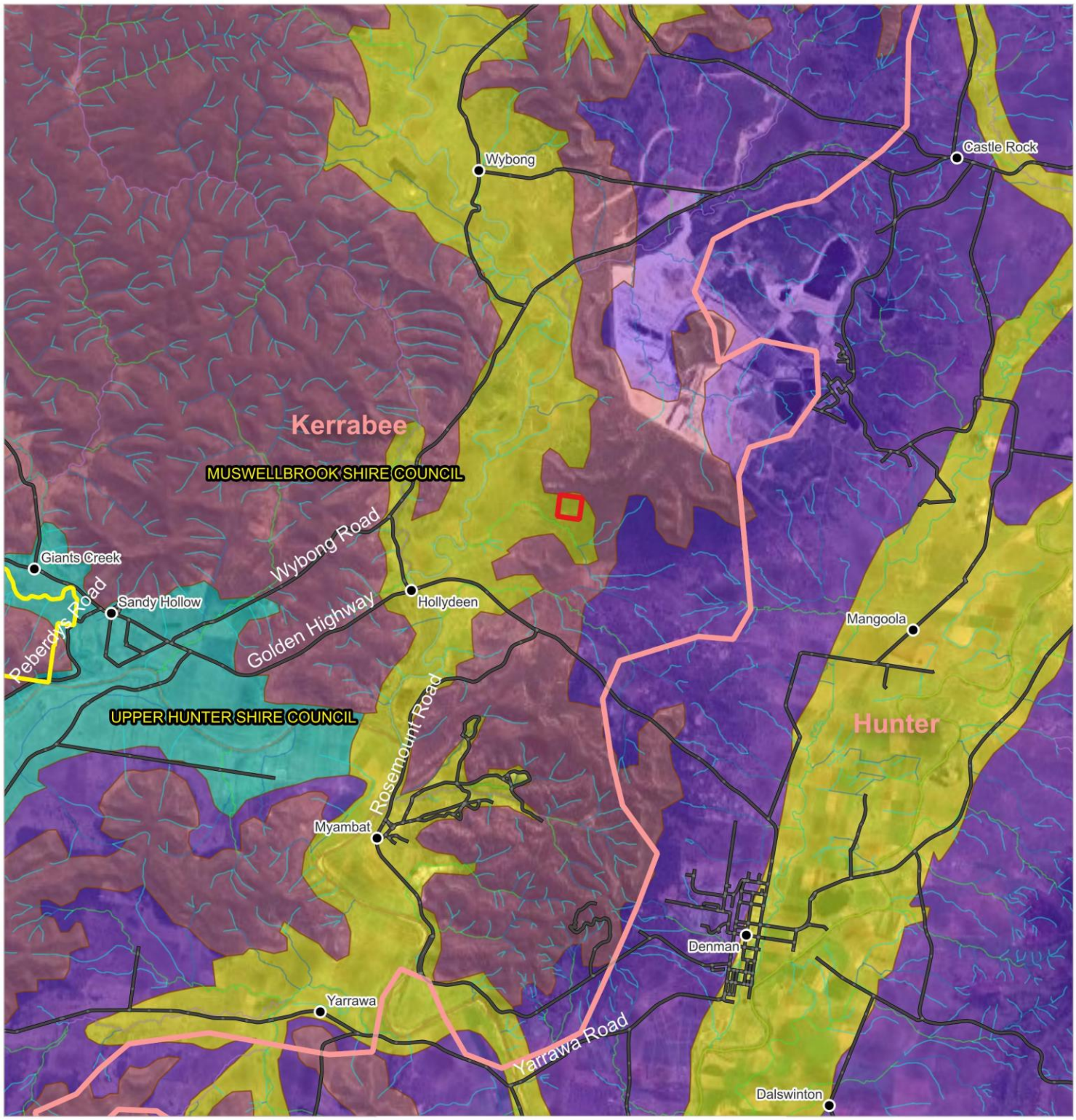


Figure 1: Location Map – Dolwendee Quarry Biodiversity Offset

2. METHODS

This section describes the monitoring requirements according to the Biodiversity Conservation Trust (BCT) EMM Monitoring Module (BCT 2021) and the Operational Manual (BCT 2024) for the Dolwendee biodiversity offset site.

2.1 Monitoring plan

The available information has been used to develop a monitoring plan based on the available information from previous surveys (Umwelt 2015) and the Biodiversity and Rehabilitation Management Plan (IEMA 2021). The key features of the biodiversity offset and the proposed monitoring approach is listed in Table 2-1.

Table 2-1 Key factors determining the monitoring approach

Item	Monitoring approach
Funded Conservation Agreement	High priority for BCT monitoring to be undertaken (Table 1 of the Operational Manual (BCT 2024)).
Management Intensity	Moderate management intensity has been assigned to the site, based on the site not being subject to active restoration measures or high-risk grazing activities or any other higher intensity management actions (refer to Section 2.2.1 of the Operational Manual (BCT 2024)). The monitoring categories for the site (Table 3 of the Operational Manual (BCT 2024)) would be: • C for intact vegetation zones; and • B/C for areas of Derived Native Grassland (DNG)
Monitoring prescriptions	All monitoring prescriptions will be included as listed in Table 4 of the Operational Manual (BCT 2024) apart from biomass enclosures and dung counts. The items to be monitored on the site include: • Full Floristic • Tree Stems • Vegetation cover (point-intercept cover) • Soil function
Minimum number of plots	One monitoring plot location per vegetation zone is required on the site. As per Table 5 of the Operational Manual (BCT 2024) with the site having a moderate management intensity and monitoring category of B or C.
Plant Community Types	Umwelt (2015) describes two PCTs as occurring on the site which have now been superseded with a revised PCT classification. The PCTs previously recorded include: PCT 618 White Box x Grey Box - red gum - Rough-barked Apple grassy woodland on rich soils on hills in the upper Hunter Valley (equivalent to revised PCT 3314?) PCT 1691 Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter (EEC) (equivalent to revised PCT 3431)
Vegetation Zones	Three vegetation zones have been delineated on the site (Umwelt 2015) and have been adapted to equivalent revised PCTs comprising: • 1: 3431_Intact • 2: 3314_Intact • 3:3314_DNG
Threatened flora species	One threatened flora species the Pine Donkey Orchid (*Diuris tricolor*) has been recorded on the offset site with up to 247 individuals being recorded in the past (Umwelt Pty Ltd 2015). Ecological monitoring surveys will target the flowering period of this species (early September to late October)

All plots are permanently marked using two star picket posts (1,650 millimetres) with a cap and high visible tape, erected at the 0 metre and 50 metre points on the midline transect, with the bearing from the 0m post recorded. Waypoints were recorded at the 0 metre and 50 metre post location.

2.2 Collect field data

Field surveys were undertaken 18 and 19 September 2025. Field data was collected using the Survey123 App for BAM floristics, vegetation cover, stem counts and soil function. These surveys are described below in Table 2-2.

Table 2-2 Survey methods for field data collection

Method	Survey attributes
BAM floristics	• Three permanent, full floristic plots (20x20 metre) established. • All flora species are recorded within the plot, full scientific name (Genus, species, and subspecific epithet if known). • Estimated percentage foliage cover of each species with individuals rooted in or overhanging the plot. Cover should be recorded in decimals if less than 1% (0.1, 0.2, 0.3…), or whole numbers up to 5% (1, 2, 3…), or to the nearest 5% where greater than 5% cover (5, 10, 15…). • Estimated abundance of each species, using the following intervals: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100, 200, 300, 400, 500, 600, 700, 800, 900, 1000, 2000, 3000, etc. • Whether the species is native, exotic, or high threat exotic.

Vegetation cover	• Vegetation cover was assessed along the central 50 metre transect within the 20x50 metre plot at 0.5 metre intervals.
	• Two cover assessments one 'lower stratum' and one 'upper strata' were recorded at each of 100 points (i.e. 200 data points).
	• For each intercept assessment, one of the following categories should be recorded:
	  • Native vascular plant (living)
	  • Exotic vascular plant (living)
	  • Litter (lower stratum only)
	  • Cryptogram (lower stratum only)
	  • Log / standing dead / coarse woody debris
	  • Rock / water (lower stratum only)
	  • Bare ground (lower stratum only) / no intercept (upper strata only)
	• For the lower stratum, at each point, cover category is assessed based on the material intercepting the vertical line between the ground and one metre height.
	• For the upper strata, at each point, two values are recorded: cover category, assessed based on the first material intersecting a vertical line upwards from one metre height at

Method	Survey attributes
	each point; and which sub-stratum the intercept occurs within either 1-3 metre, 3-5 metre, or >5 metre height.
Stem Counts	• Counts of the total number of trees with stems originating within the 20x50 metre plot, for each species separately, by stem size class. • Trees comprise all species allocated to the tree growth form group. • Tree stem size should be measured at 1.3m above ground height (diameter at breast height over bark or DBH). For stems less than 1.3 metre high, stem diameter at ground level should be used instead of DBH. • DBH classes are: <1 cm, 1-5 cm, 5–9 cm, 10–19 cm, 20–29 cm, 30–49 cm, 50–79 cm, and >80 cm DBH.
Soil function	• Soil functions attributes were recorded within five 1x1 metre quadrats along the central 50metre transect at the 5, 15, 25, 35 and 25 metre mark. • The attributes recorded comprise: plant foliage cover, plant basal cover, litter cover, litter depth, litter origin, litter incorporation, cryptogram cover, erosion severity, deposited materials, surface roughness, surface resistance, crust stability and soil texture.
Photo points	• Two photos are to be taken at each vegetation integrity plot during each resurvey event from either end of the central 50 metre transect. • A photo-board has been included with the plot identification and date clearly displayed.

2.3 Data analysis

The collected data was submitted to the Biodiversity Conservation Trust (BCT) through the Survey123 App. A quality check of the data was under taken by the BCT and an export of the data provided in spreadsheet workbook format. Biodiversity Conservation Trust (BCT).

This is the first monitoring event and so will comprise the baseline data for comparison against future monitoring events. Data analysis of baseline data is limited to some basic statistics provided in the results section. Data analysis between monitoring datasets will be undertaken following future monitoring events.

3. RESULTS

This section summarises the results of the monitoring to be used as the baseline data for the ecological monitoring including a photographic record.

3.1 Monitoring plots

A total of three monitoring point locations has been established, one in each zone of the offset site. The monitoring plots established at the Dolwendee biodiversity offset in Table 3-1.

Table 3-1 Monitoring plots

Plot ID	Date	Bearing	Easting Start	Northing Start	Easting End	Northing End	PCTID	Veg Zone	*Diuris tricolor*	Purpose
DQ1	18/09/2025	235	279067	6421731	279029	6421698	3314	3314 DNG	No	Baseline
DQ2	19/09/2025	317	279216	6421638	279170	6421655	3431	3431 Intact	Yes	Baseline
DQ3	19/09/2025	206	278981	6421741	278971	6421696	3314	3314 Intact	Yes	Baseline

The location of the monitoring plots including vegetation zones/PCTs and threatened flora are displayed in Figure 2.

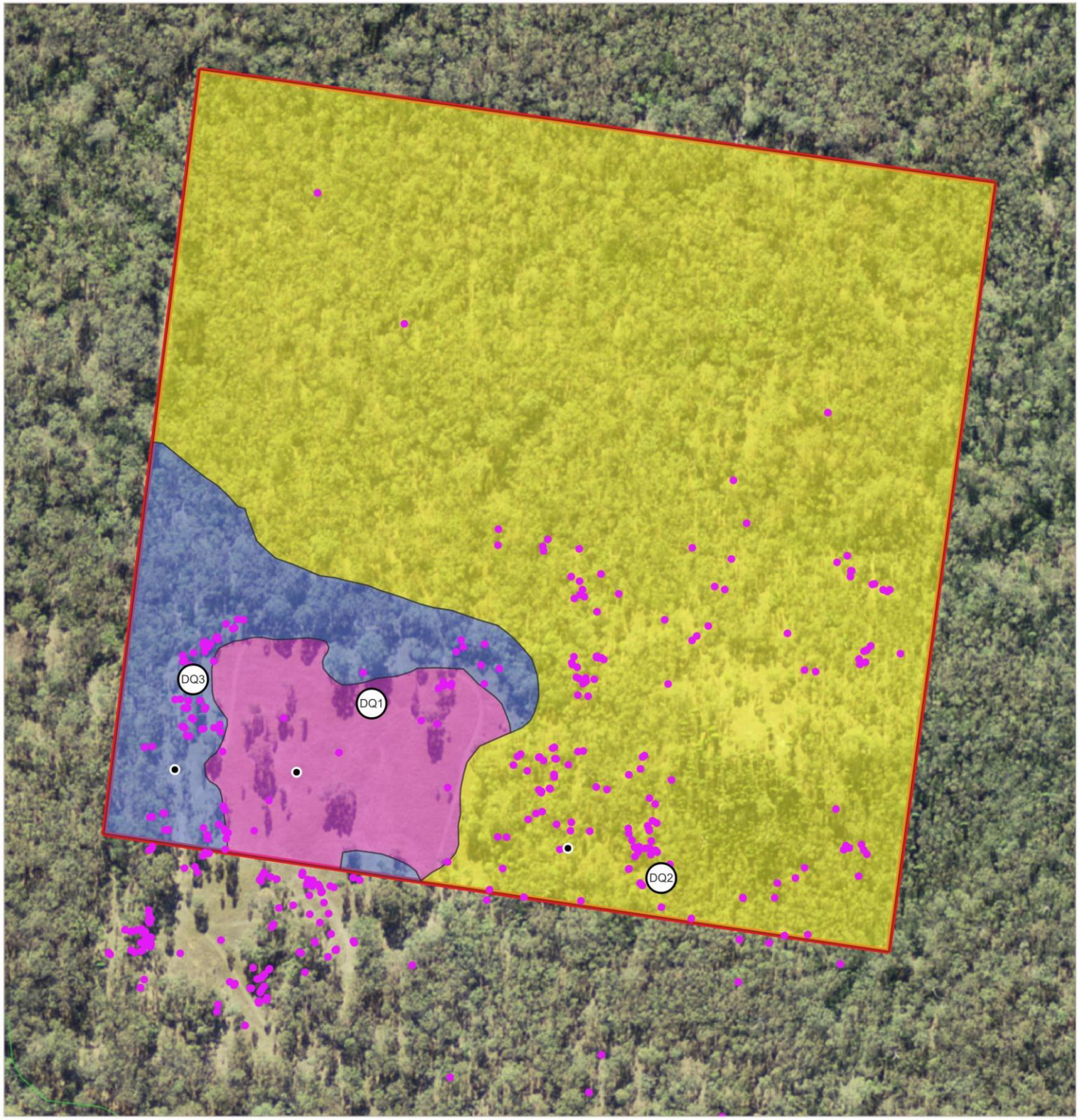


Figure 2: Monitoring Plot Locations - Dolwendee Quarry Biodiversity Offset

3.2 Baseline monitoring results

The results of the baseline monitoring are discussed below including floristics, vegetation cover, stem classes, and threatened flora species.

Floristics

The results of floristic surveys undertaken within the 20x20 metre plot are summarised below in Table 3-2 including counts of species with each growth form and the sum of cover for the species within each growth form.

Table 3-2 Summary of floristic data collected

Plot ID	Count Tree	Count Shrub	Count Grass	Count Forb	Count Fern	Count Other	Cover Tree %	Cover Shrub %	Cover Grass %	Cover Forb %	Cover Fern %	Cover Other %	Cover HTW %
DQ1	1	0	4	11	1	1	5	0	32	7	1	0.1	6.1
DQ2	3	7	7	18	1	2	10.5	46.5	24.9	5.6	0.4	0.2	0.5
DQ3	3	4	8	14	1	1	26.5	4.5	42.2	3.4	1	0.2	0.5

Vegetation Cover

The results of point intercept vegetation cover assessment undertaken along the central 50 metre transect within each 20x50 metre plot are summarised below in Table 3-3.

Table 3-3 Summary of point intercept vegetation cover assessment

Plot ID	Lower Native %	Lower Exotic %	Lower Litter %	Lower Cryptogram %	Lower Bare %	Upper 1-3 m %	Upper 3-5 m %	Upper +5 m %
DQ1	47	43	9	0	1	0	0	0
DQ2	53	14	15	11	7	19	5	19
DQ3	38	15	44	0	3	8	15	50

Stem classes

The results of stem class assessment undertaken within the 20x50 metre plots are summarised below in Table 3-4 comprising number of stems for each species within each of the specified DBH ranges.

Table 3-4 Summary of stem class assessment

Species	DBH < 1 cm	DBH 1-5 cm	DBH 5-9 cm	DBH 10-19 cm	DBH 20-29 cm	DBH 30-49 cm	DBH 50-79 cm	DBH > 80 cm
DQ1								
Eucalyptus tereticornis	70	90	0	0	0	0	0	0
DQ2								
Allocasuarina luehmannii	0	5	0	3	1	0	0	0
Eucalyptus crebra	18	8	6	12	5	0	0	0
DQ3								
Allocasuarina luehmannii	24	28	6	5	2	0	0	0
Eucalyptus crebra	4	1	2	3	0	0	0	0
Eucalyptus tereticornis	1	6	6	7	2	4	0	0
Notelaea microcarpa	0	1	0	0	0	0	0	0

Threatened flora species

One threatened flora species Pine Donkey Orchid (*Diuris tricolor*) has been recorded on site and was recorded in two of the monitoring plots (DQ2 and DQ3). Some individuals were still budding (not in full flower) and it is likely that additional individuals are present within all plots including Plot DQ1. The number and location of Pine Donkey Orchid in the 20x20 metre plot is provided in Table 3-5, comprising number of stems in each 10x10 metre quarter of the plots (the orientation for left and right refers to facing the plot from the 0 metre mark).

*Table 3-5 Pine Donkey Orchid (*Diuris tricolor*)*

Plot ID	Right side 0-10 metre	Right side 10-20 metre	Left side 0-10 metre	Left side 10-20 metre	Total
DQ1	0	0	0	0	0
DQ2	3	7	0	0	10
DQ3	0	0	0	1	1

Introduced weed species

Introduced weed species recorded on site in the monitoring plots are listed below in Table 3-6, including identification of high threat weeds and cover recorded in each plot. High Threat Weeds should be targeted for removal and ongoing management as a priority.

Table 3-6 Introduced Weed Species

Scientific Name	Common Name	High Threat Weed	Cover (%)		
			DQ1	DQ2	DQ3
Briza minor	Shivery Grass		3		
Conyza canadensis var. canadensis	Canadian Fleabane		0.1		0.1
Facelis retusa	Annual Trampweed		6		0.1
Gamochaeta spp.	Cudweed			0.1	0.1
Gomphocarpus fruticosus	Narrow-leaved Cotton Bush		0.1		
Hypochaeris radicata	Catsear		35	3	10
Lysimachia arvensis	Scarlet Pimpernel		15	1	0.5
Medicago polymorpha	Burr Medic		0.1		
Opuntia aurantiaca	Tiger Pear	Yes	0.1		
Opuntia stricta	Common Prickly Pear		0.1	0.1	
Parentucellia latifolia	Red Bartsia		0.1		
Paronychia brasiliana	Chilean Whitlow Wort		0.1		
Petrorhagia nanteuilii	Proliferous Pink		0.5		
Richardia brasiliensis	Mexican Clover		0.1	0.1	0.1
Romulea minutiflora	Small-flowered Onion Grass		0.1		
Romulea rosea var. australis	Onion Grass	Yes	3		
Senecio madagascariensis	Fireweed	Yes	3	0.5	0.5
Sida rhombifolia	Paddy's Lucerne				0.1
Sonchus oleraceus	Common Sowthistle			0.1	0.1
Taraxacum officinale	Dandelion		0.1		
Verbascum virgatum	Twiggy Mullein		0.1		
Vulpia spp.	Rat's-tail Fescue			0.1	
		SUM TOTAL	**67%**	**5%**	**12%**

4. CONCLUSIONS AND RECOMMENDATIONS

The following conclusions and recommendations for the monitoring project have been established:

- Three monitoring locations have been established in accordance with the EMM Monitoring Module (BCT 2021) and the Operational Manual (BCT 2024).
- The site is in relatively good condition apart from the areas of DNG which support a higher abundance of exotics, although mainly limited to minor pasture weeds.
- Pine Donkey Orchid (*Diuris tricolor*) has been recorded at some of the monitoring locations and future monitoring events should target the flowering time for this species (September-October).
- Surveys were undertaken in early spring, and species richness and composition recorded in floristic plots will vary seasonally, with additional species being visible or identifiable during summer/autumn.
- Weed species should be controlled on site and native regeneration facilitated where possible, the flowering and seed-set of annual weeds should be suppressed and any high threat weeds removed.
- Weed control activities should be avoided or highly targeted to specific weeds during spring (September to November) to avoid inadvertently impacting Pine Donkey Orchid plants.
- Damage from feral pigs was observed on site and ongoing control of pigs and other feral animal species is required.

5. REFERENCES AND BIBLIOGRAPHY

BioNet 2025. The website for the Atlas of NSW Wildlife. Search criteria: Valid Records of Threatened Flora and Fauna available at http://www.environment.nsw.gov.au/atlaspublicapp/UI_Modules/ATLAS_/atlasreport.aspx.

Colquhoun G.P., Hughes K.S., Deyssing L., Ballard J.C., Folkes C.B, Phillips G., Troedson A.L. & Fitzherbert J.A. (2022). New South Wales Seamless Geology dataset, version 2.2 [Digital Dataset]. Geological Survey of New South Wales, Department of Regional NSW, Maitland.

DAWE. 2020. Interim Biogeographic Regionalisation of Australia Version 7. Department of Agriculture, Water and the Environment (DAWE). Accessed Oct 2020 at http://www.environment.gov.au/land/nrs/science/ibra

Integrated Environmental Management Australia (2021). Dolwendee Quarry Biodiversity and Rehabilitation Management Plan. Prepared for Upper Hunter Holdings Brunkerville, NSW. May 2021.

NSW Biodiversity Conservation Trust (2021) Ecological Monitoring Module. Last update February 2021. NSW Biodiversity Conservation Trust (BCT).

NSW Biodiversity Conservation Trust (2024) Ecological Monitoring Module: Operational Manual. Last update September 2024. NSW Biodiversity Conservation Trust (BCT).

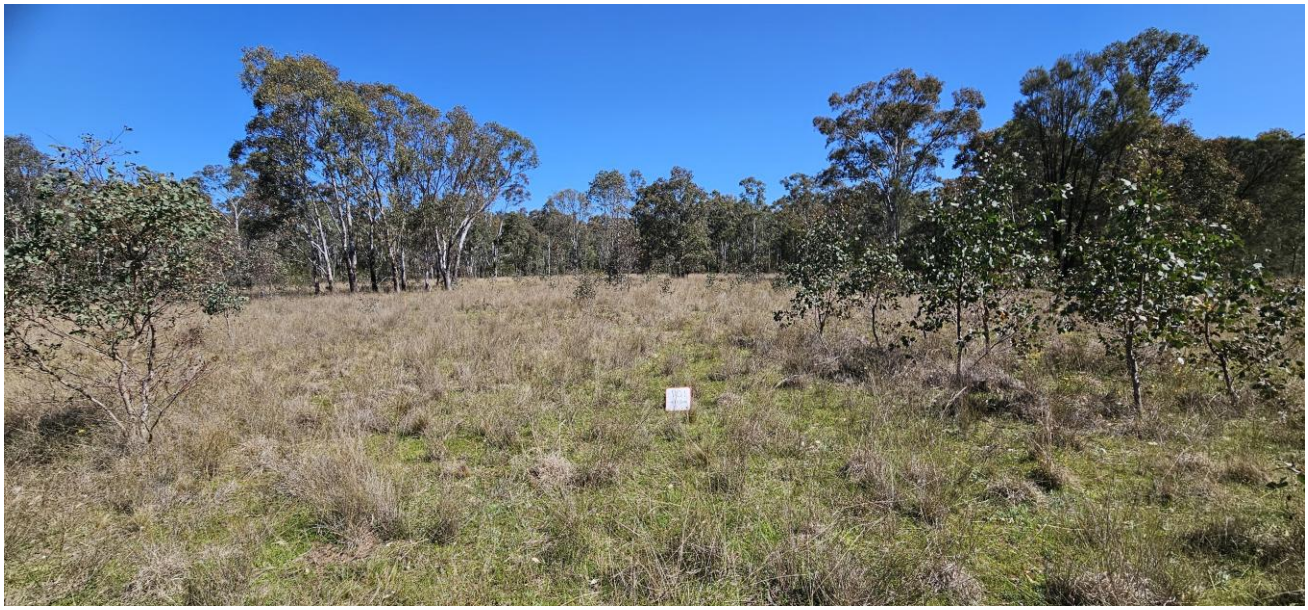
NSW Department of Climate Change, Energy, the Environment and Water (2024). NSW State Vegetation Type Map. Release C2.0M2.0 (November 2024). NSW Department of Climate Change, Energy, the Environment and Water (DCCEEW)

NSW Department of Planning, Industry and Environment (2021) Soil Group (GSG) Soil Type map of NSW - Version 4.5, Department of Planning, Industry and Environment (DPIE), Parramatta.

PlantNET. 2020. The NSW Plant Information Network System. Royal Botanic Gardens and Domain Trust, Sydney. http://plantnet.rbgsyd.nsw.gov.au. Accessed August - October 2020.

Umwelt Pty Ltd (2015). Ecological Assessment Dolwendee Quarry. Prepared for Upper Hunter Holdings Pty Ltd. September 2015.

APPENDIX – PHOTOGRAPHIC RECORD



Plot DQ1 – wide angle (taken 0m mark on central 50 metre transect)

Plot DQ1 – Start (0m mark on central 50 metre transect)

Plot DQ1 – End (50m mark on central 50 metre transect)

Plot DQ2 – wide angle (taken 0m mark on central 50 metre transect)

Plot DQ2 – Start (0m mark on central 50 metre transect)

Plot DQ2 – End (50m mark on central 50 metre transect)

Plot DQ3 – wide angle (taken 0m mark on central 50 metre transect)

Plot DQ3 – Start (0m mark on central 50 metre transect)

Plot DQ3 – End (50m mark on central 50 metre transect)


eco path
CONSULTING

INTEGRATED ENVIRONMENTAL MANAGEMENT AUSTRALIA

APPENDIX C

Correspondence from Muswellbrook Shire Council.

muswellbrook shire council

Enquiries
Please ask for Sharon Pope
Direct 02 6549 3868
Our reference
Your reference **SSD 6519**

18 March 2019

Trevor Allen Project Manager
Associate Senior Environmental Planner
Pitt & Sherry
info@pittsh.com.au

Dear Mr Allen,

Dolwendee Quarry – Stage 1 (SSD 6519)
Request for Input into draft Biodiversity & Rehabilitation Management Plan

I refer to your email dated 5 February 2019, requesting Council's input on the draft Biodiversity and Rehabilitation Management Plan (B&RMP) for stage 1 of the above project. Council thanks you for the opportunity to provide comments.

It is noted that Stage 1 of the proposal is to construct the new intersection and internal haul road, along with associated drainage and sediment control infrastructure, a car park and site office and initial quarry extraction for material required for the haul road.

While unlikely, it is possible that works on site may not progress beyond Stage 1. On this basis, the following comments are made:

1. **Soils and Land Degradation –** Council understands that there are erosion issues in the area, low soil fertility, high salinity and structural issues. Detailed assessment of the soils and geology of the site, and areas that will receive stormwater flows from the site, will need to be included in the soil and water management plan. Weed and erosion monitoring, as part of the B&RMP, should note if salinity is becoming an issue for maintenance of ground cover or encouraging the growth of weeds. Detailed rehabilitation plans should also account for this salinity issue.
2. **Rehabilitation of all surface infrastructure in Stage 1 should be contemplated in current documents –** Council has a keen interest in ensuring that the rehabilitation of quarry sites is completed to high standards, in line with industry best practice and to support post quarry land uses. The B&RMP should include information on the decommissioning, removal and intended rehabilitation of surface infrastructure, as required by condition 29 of the approval. If no further stages of the proposal proceed beyond Stage 1, this rehabilitation work should occur no later than 21 years from the commencement of Stage 1 works. Condition 29 provides the proponent with an opportunity to seek an alternative to rehabilitation from the Secretary. It is expected that this would be contemplated closer to cessation of quarry operations, if a land use is anticipated that requires the surface infrastructure to remain.
3. **Rehabilitation of Quarry after extraction for haul road -** The B&RMP should include information on rehabilitation of the quarry if no further stages of the proposal proceed beyond Stage 1. This rehabilitation work should occur no later than 21

years from the commencement of Stage 1 works. Consideration should be given to the employment of micro-relief to the site, in line with the principles of Geofluv design, to ensure long-term site stability and erosion control, and to create a more natural looking landscape post development.

4. **Biodiversity** and **Rehabilitation Bond** – Works in Stage 1 will result in removal of some vegetation and other site disturbances. The B&RMP should calculate the Bond required to cover rehabilitation of the Stage 1 works, as required by condition 32 & identified in condition 29.
5. **Advice on Acacia saligna and Rhodes grass –** These to plant species have been used in the past as part of rehabilitation of mine sites. Both these species have been shown to behave as weed species in the upper Hunter and their use should be avoided.

Other aspects of the draft B&RMP appear to be satisfactory.

Council appreciates the opportunity to comment and would be pleased to provide additional information if requested.

Yours faithfully

Sharon Pope
Assistant Director Environment and Community Services
sharon.pope@muswellbrook.nsw.gov.au

The Council provided feedback on the B&RMP on 18 March 2019.

Feedback from Council – March 2019

Item	Feedback	Proponent Response
1	Soils and Land Degradation – Council understands that there are erosion issues in the area, low soil fertility, high salinity and structural issues. Detailed assessment of the soils and geology of the site, and areas that will receive stormwater flows from the site, will need to be included in the soil and water management plan. Weed and erosion monitoring, as part of the B&RMP, should note if salinity is becoming an issue for maintenance of ground cover or encouraging the growth of weeds. Detailed rehabilitation plans should also account for this salinity issue.	Soil testing should be completed prior to respreading, with ameliorants used to improve soil if required.
2	Rehabilitation of all surface infrastructure in Stage 1 should be contemplated in current documents – Council has a keen interest in ensuring that the rehabilitation of quarry sites is completed to high standards, in line with industry best practice and to support post quarry land uses. The B&RMP should include information on the decommissioning, removal and intended rehabilitation of surface infrastructure, as required by condition 29 of the approval. If no further stages of the proposal proceed beyond Stage 1, this rehabilitation work should occur no later than 21 years from the commencement of Stage 1 works. Condition 29 provides the proponent with an opportunity to seek an alternative to rehabilitation from the Secretary. It is expected that this would be contemplated closer to cessation of quarry operations, if a land use is anticipated that requires the surface infrastructure to remain.	Noted. See Section 5 outlines biodiversity and rehabilitation activities in the first three years.
3	Rehabilitation of Quarry after extraction for haul road - The B&RMP should include information on rehabilitation of the quarry if no further stages of the proposal proceed beyond Stage 1. This rehabilitation work should occur no later than 21 years from the commencement of Stage 1 works. Consideration should be given to the employment of micro-relief to the site, in line with the principles of Geofluv design, to ensure long-term site stability and erosion control, and to create a more natural looking landscape post development.	Section 5.8 outlines landform shaping.
4	Biodiversity and Rehabilitation Bond – Works in Stage 1 will result in removal of some vegetation and other site disturbances. The B&RMP should calculate the Bond required to cover rehabilitation of the Stage 1 works, as required by condition 32 & identified in condition 29.	Covers rehabilitation and biodiversity costs at end of Year 3 as required by the condition. See Appendix A and B.
5	Advice on *Acacia saligna* and Rhodes grass – These two plant species have been used in the past as part of rehabilitation of mine sites. Both these species have been shown to behave as weed species in the upper Hunter and their use should be avoided.	Noted. These will not be in the seed mix.

INTEGRATED ENVIRONMENTAL MANAGEMENT AUSTRALIA

APPENDIX D

Correspondence with CPHR

Trevor Allen

From: Steven Cox <Steven.Cox@environment.nsw.gov.au>
Sent: Monday, 4 February 2019 1:51 PM
To: Trevor Allen
Subject: RE: Dolwendee Quarry - consultation on AHCMP and Biodiversity Rehabilitation Management Plan for Development Consent 6519

Hi Trevor,

Thanks for the option to comment on the management plans at this stage of the process.

However we will wait until you have submitted the plans to the Department of Planning and Environment, and the Department then requests our review.

Regards
Steven

Steven Cox
Senior Team Leader Planning
Hunter Central Coast Branch
Conservation and Regional Delivery Division
Office of Environment & Heritage

Level 4/26 Honeysuckle Drive Newcastle NSW 2300
Locked Bag 1002 Dangar NSW 2309
T 02 4927 3140
M 0472 800 088

From: Trevor Allen <tallen@pittsh.com.au>
Sent: Monday, 4 February 2019 9:04 AM
To: OEH ROD Hunter Central Coast Mailbox <rog.hcc@environment.nsw.gov.au>
Subject: FW: Dolwendee Quarry - consultation on AHCMP and Biodiversity Rehabilitation Management Plan for Development Consent 6519

Attention: Robert Gibson

Please find attached Letter containing **Attachment 1** and **Attachment 2** provided separately for your consideration.

Regards

pitt&sherry

Trevor Allen

Senior Associate Environmental Planner
B.C.A; B.A.(Hons.); GDip. Nat. Res. Law & Policy

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Newcastle Office — Level 1, 81 Hunter Street
Newcastle New South Wales 2300 | Phone +61 2 4910 3600

Our ref: DOC20/688011-19
Your ref: SSD 6519

Ms Sarah Clibborn

Senior Environmental Assessment Officer
Minerals Quarry Assessments
Planning and Assessment Group
Department of Planning, Industry and Assessment
Sarah.Clibborn@planning.nsw.gov.au

Dear Ms Clibborn

Dolwendee Quarry (SSD 6519) – review of Biodiversity and Rehabilitation Management Plan

I refer to the e-mail from Planning and Assessment Group dated 21 August 2020 inviting Biodiversity and Conservation Division (BCD) to review the draft Biodiversity and Rehabilitation Management Plan (BRMP) for the Dolwendee Quarry. On 25 September 2020 you provided BCD with an updated version of the BRMP. The BRMP, written by SLR Consulting Australia Pty Ltd (dated 2 September 2020), has been prepared to meet Schedule 3, Conditions 31 and 32.

BCD's recommendations are provided in **Attachment A** and detailed comments are provided in **Attachment B**. If you require any further information regarding this matter, please contact Robert Gibson, Regional Biodiversity Conservation Officer, on 4927 3154 or via email at rog.hcc@environment.nsw.gov.au

Yours sincerely

16 October 2020

STEVEN COX
Senior Team Leader Planning
Hunter Central Coast Branch
Biodiversity and Conservation Division

Enclosure: Attachments A and B

Attachment A

BCD's recommendations

Dolwendee Quarry – Biodiversity and Rehabilitation Management Plan

1. BCD recommends that BRMP includes details of how the proponent will secure the biodiversity offset on Lot 1 DP 1160936 within 12 months of commencement.

2. BCD recommends that the final version of the BRMP includes details of the early and progressive implementation of rehabilitation.

3. BCD recommends that the BRMP includes details that link rehabilitation actions and objectives to the Biodiversity Offset Strategy.

4. BCD recommends that topsoil piles more than three months old are sown with a cover crop of native groundcover species found in the Plant Community Type HU905 Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter.

5. BCD recommends that the native species used in Landform Shaping are species from Plant Community Type HU905 Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter. If any pasture species are also used, then BCD recommends that they are species that have no chance on spreading to adjacent areas.

6. BCD recommends that the native species propagule collection for the project follows Florabank guidelines.

7. BCD recommends that Table 9 and Table 10 include vegetation composition, function and structure measurable performance and completion criteria.

8. BCD recommends that the management and monitoring of ecological rehabilitation follows the 'National standards for the practice of ecological restoration in Australia'.

9. BCD recommends that the performance measures, trigger points for adaptive management, and completion criteria in Table 9 and Table 10 follow 'SMART' principles.

10. BCD recommends that the monitoring of flora and fauna on site follows the Biodiversity Assessment Method.

11. BCD recommends that the weed and pest species monitoring gathers data to help determine if local populations are reproducing, and trends in their population.

12. BCD recommends that all field data collected in the rehabilitation areas is provided in the Annual Review.

13. BCD recommends that Figure 4 is redrawn so that all text is clear and legible and that it has a legend that explains the meaning behind the colours used.

14. BCD recommends that refences to 'OEH' are updated to the current agency titles.

BCD's detailed comments

Dolwendee Quarry–Biodiversity and Rehabilitation Management Plan

1. More details are required of how the proponent will secure the biodiversity offset

Section 3.1 of the Biodiversity and Rehabilitation Management Plan (BRMP) prepared by SLR Consulting Australia Pty Ltd (dated 2 September 2020) has the commitment from the proponent to provide a suitable arrangement for securing the biodiversity offset on Lot 1 in Deposited Plan 1160936. Schedule 3, Condition 28 of the consent provides 12 months from the commencement of development for the offset to be secured. The Biodiversity Conservation Trust is the lead agency for securing biodiversity offsets, and the process may take more than 12 months to be completed.

Recommendation 1

BCD recommends that BRMP includes details of how the proponent will secure the biodiversity offset on Lot 1 DP 1160936 within 12 months of commencement.

2. On-going rehabilitation is required in order to meet consent conditions

Sections 2.1 and 5.10 of the BRMP state that major rehabilitation works would not occur until 20 years or more into the future, associated with quarry closure; but this not in agreement with Schedule 3, Condition 30 of the consent.

Recommendation 2

BCD recommends that the final version of the BRMP includes details of the early and progressive implementation of rehabilitation.

3. The integration between rehabilitation and biodiversity needs to be explained

Section 5.10 'Integration between Rehabilitation and Biodiversity' does not describe how these two aspects of the project are linked. For example, how will rehabilitation of the site be done to favour particular local threatened species? What is the planned use of the site following cessation of quarrying activities? How does rehabilitation of the quarry site relate to the Biodiversity Offset land to the north east?

Recommendation 3

BCD recommends that the BRMP includes details that link rehabilitation actions and objectives to the Biodiversity Offset Strategy.

4. Topsoil stockpiles should be managed to preserve local biodiversity values

Section 5.2.3 of the BRMP summarises topsoil management planned for the site and identifies the stages of development likely to require soil stockpiling in Table 1 'Phase 1 and 2 Summary'. No details have been provided of the 'suitable cover crop' that would be used for soil stockpiles more than three months old. There is the risk that cover crops of species such as Rhodes Grass (*Chrloris gayana*), Couch (*Cynodon dactylon*) or African Lovegrass (*Eragrostis curvula*) could act as weeds that inhibit regeneration when the topsoil is respread.

Recommendation 4

BCD recommends that topsoil piles more than three months old are sown with a cover crop of native groundcover species found in the Plant Community Type HU905 Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter.

5. More details are required on the plant species mix to be used in Landform Shaping

Section 5.2.2 'Landform Shaping' states that disturbed areas outside of the quarry that are not planned to be retained in the final landform will be ripped and revegetated with either native species or pasture species as per the 'Blue Book'. BCD recommends that the native species chosen are species found in Plant Community Type HU905 Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter.

The 'Blue Book' (Managing Urban Stormwater: Soils and Construction by Landcom (2004)) is written primarily for urban areas where the use of a largely exotic pasture mix to stabilise landforms is more appropriate. However, the Dolwendee Quarry Site is within a large remnant of primarily native vegetation, so care is needed when adding exotic plants to the site, where they may become weeds.

Recommendation 5

BCD recommends that the native species used in Landform Shaping are species from Plant Community Type HU905 Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter. If any pasture species are also used, then BCD recommends that they are species that have no chance on spreading to adjacent areas.

6. Seed and propagule collection from local plants should follow Florabank guidelines

Section 5.2.4 'Direct Seeding and Planting' states that seeds and plant materials to augment rehabilitation will be sourced locally, but few details of how this will be done are provided. BCD recommends that Florabank guidelines are followed to ensure that current best-practice seed and propagule collection is applied. The Florabank guidelines are available at https://www.greeningaustralia.org.au/publications/

Recommendation 6

BCD recommends that the native species propagule collection for the project follows Florabank guidelines.

7. Preliminary Performance and Completion Criteria require measurements for vegetation composition, function and structure

Table 9 'Preliminary Performance and Completion Criteria for Rehabilitation Areas' and Table 10 'Completion Criteria for Offset Area' do not include measurements of vegetation composition, function or structure. BCD recommends that those aspects are added to Tables 9 and 10. That would enable those features to be tracked over time. This would best ensure that the rehabilitation and the management of remnant native vegetation achieves the required outcomes in a timely and cost-effective way.

Recommendation 7

BCD recommends that Table 9 and Table 10 include vegetation composition, function and structure measurable performance and completion criteria.

8. Management of rehabilitation areas should follow best-practice guidelines

Table 9 covers only four aspects of rehabilitation (weeds and pests, soil, landform and water) which therefore miss other aspects that influence the success of rehabilitation. Current best-

practise for ecological rehabilitation is defined in the 'National standards for the practice of ecological restoration in Australia' [https://www.seraustralasia.com/standards/National%20Restoration%20Standards%202nd%20Edition.pdf], and describes ecological rehabilitation through six ecosystem goals (species composition, structural diversity, ecosystem function, external exchanges, absence of threats, and physical conditions), each with three sub-attributes.

Recommendation 8

BCD recommends that the management and monitoring of ecological rehabilitation follows the 'National standards for the practice of ecological restoration in Australia'.

9. Preliminary Performance and Completion Criteria for rehabilitation areas and the biodiversity offset require tangible trigger points set at appropriate levels

Table 9 'Preliminary Performance and Completion Criteria for Rehabilitation Areas' and Table 10 'Completion Criteria for Offset Area' include poorly defined targets and trigger points, such as the use of undefined terms like 'increased', 'decline', and 'significant'. These relatively defined thresholds and goals are difficult to implement and interpret. BCD recommends that quantitative criteria are set, that follow the 'SMART' principles (i.e. specific, measurable, attainable, relevant and time-bound), so that trigger points, rehabilitation milestones, and completion criteria are clearly measurable, and allow for the quick use of adaptive management, if needed.

Recommendation 9

BCD recommends that the performance measures, trigger points for adaptive management, and completion criteria in Table 9 and Table 10 follow 'SMART' principles.

10. Ecological monitoring requires consideration of vegetation composition, function and structure

Chapter 7 'Ecological Monitoring' does not include details of vegetation monitoring. BCD acknowledges that such details are planned to be included in a latter version of the BRMP. However, the means of measuring and monitoring vegetation is available now, through the implementation of the Biodiversity Assessment Method [https://www.environment.nsw.gov.au/topics/animals-and-plants/biodiversity/biodiversity-assessment-method].

Recommendation 10

BCD recommends that the monitoring of flora and fauna on site follows the Biodiversity Assessment Method.

11. Weed and pest monitoring requires collection of data on reproductive state and numbers of individuals to determine population trends

Chapter 7 'Ecological Monitoring' provides a checklist of some of the data to be monitored about weeds and pests on the project site. BCD notes that this is not an exhaustive list, but recommends that the following details are also recorded:

- Reproductive state (e.g. juvenile, mature, in flower, in fruit / with young)
- Numbers of individuals
- Numbers of individuals in each reproductive state.

Recommendation 11

BCD recommends that the weed and pest species monitoring gathers data to help determine if local populations are reproducing, and trends in their population.

12. Background data behind monitoring provides more meaning to monitoring results

Chapter 8 'Reporting and Compliance Management' describes that a summary of biodiversity monitoring results will be provided in the Annual Review for the project, and that the Annual Reviews and regular reports of environmental performance will be posted on the project's website. The presentation of the background data behind the monitoring, such as the flora species found and their cover and abundance scores, enables monitoring results to be better understood, particularly by seeing which species are having the biggest influence of site variables, and whether any large changes are likely if short-lived species (such as some species of *Acacia*) are present. This in turn helps identify if rehabilitation issues may be present, and whether rehabilitation outcomes are likely to be met.

Recommendation 12

BCD recommends that all field data collected in the rehabilitation areas is provided in the Annual Review.

13. All details in Figure 4 needs to be clear and easily read

Figure 4 'Conceptual Rehabilitation Plan/Final Landform' in the Draft Biodiversity and Rehabilitation Management Plan has text that is small, grainy and often hard to read. It does not have a legend to explain the colours applied in the map. BCD recommends that this map has text that is easy to read, clear symbols, and a legend.

Recommendation 13

BCD recommends that Figure 4 is redrawn so that all text is clear and legible and that it has a legend that explains the meaning behind the colours used.

14. References to OEH as a current agency need to be changed to BCD

The BRMP includes 13 references to the Office of Environment and Heritage (OEH). References to the current agency, where it pertains to feedback on the BRMP in Table 5, should be changed to Biodiversity and Conservation Division (BCD).

Recommendation 14

BCD recommends that refences to 'OEH' are updated to the current agency titles.

BCD Feedback and Response to 16 October 2020 Comments

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
BCD – R1	**More details are required of how the proponent will secure the biodiversity offset** Section 3.1 of the Biodiversity and Rehabilitation Management Plan (BRMP) prepared by SLR Consulting Australia Pty Ltd (dated 2 September 2020) has the commitment from the proponent to provide a suitable arrangement for securing the biodiversity offset on Lot 1 in Deposited Plan 1160936. Schedule 3, Condition 28 of the consent provides 12 months from the commencement of development for the offset to be secured. The Biodiversity Conservation Trust is the lead agency for securing biodiversity offsets, and the process may take more than 12 months to be completed. **Recommendation 1** BCD recommends that BRMP includes details of how the proponent will secure the biodiversity offset on Lot 1 DP 1160936 within 12 months of commencement.	UHH will be engaging an ecologist to assist with implementing the 'Security of Offsets' under Schedule 3 Condition 28 of the Development Consent . The condition requires the proponent will secure the biodiversity offset on Lot 1 DP 1160936 within 12 months of commencement. See link to the offset guidelines. https://www.bct.nsw.gov.au/biodiversity-offsets-program	Section 3.1
BCD – R2	**On-going rehabilitation is required in order to meet consent conditions** Sections 2.1 and 5.10 of the BRMP state that major rehabilitation works would not occur until 20 years or more into the future, associated with quarry closure; but this not in agreement with Schedule 3, Condition 30 of the consent. **Recommendation 2** BCD recommends that the final version of the BRMP includes details of the early and progressive implementation of rehabilitation.	Section numbers of changed now. Section 5.2 outlines the progressive and final rehabilitation. This provides further details about temporary stabilisation, rehabilitation of benches and remaining areas over the next three years and beyond.	Section 5.2
BCD – R3	The integration between rehabilitation and biodiversity needs to be explained Section 5.10 'Integration between Rehabilitation and Biodiversity' does not describe how these two aspects of the project are linked. For example, how will rehabilitation of the site be done to favour particular local threatened species? What	Weed and pest management will continue in both areas over the next three years. Future ecological monitoring will be completed in both offset and rehabilitation areas. Key learnings from inspections and monitoring of offset areas will assist informing future rehabilitation practices.	Section 5.10

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
	is the planned use of the site following cessation of quarrying activities? How does rehabilitation of the quarry site relate to the Biodiversity Offset land to the north east? **Recommendation 3** BCD recommends that the BRMP includes details that link rehabilitation actions and objectives to the Biodiversity Offset Strategy.	The final rehabilitation seed mix will be consistent with some of the species from *PCT HU905 Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter.* For the next three years hydromulching of the benches will be completed. For final rehabilitation refer to Figure 3 in this management plan. It illustrates the rehabilitation of the different components of the site at final rehabilitation. Progressive final rehabilitation will contribute to rehabilitation outcomes in Figure 3.	
BCD – R4	**Topsoil stockpiles should be managed to preserve local biodiversity values** Section 5.2.3 of the BRMP summarises topsoil management planned for the site and identifies the stages of development likely to require soil stockpiling in Table 1 'Phase 1 and 2 Summary'. No details have been provided of the 'suitable cover crop' that would be used for soil stockpiles more than three months old. There is the risk that cover crops of species such as Rhodes Grass (*Chrloris gayana*), Couch (*Cynodon dactylon*) or African Lovegrass (*Eragrostis curvula*) could act as weeds that inhibit regeneration when the topsoil is respread. **Recommendation 4** BCD recommends that topsoil piles more than three months old are sown with a cover crop of native groundcover species found in the Plant Community Type HU905 Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter.	Note, Section 6.6.11 of the EIS states that pasture seed mix could be used for grassland. *Stockpiles should be trimmed, scarified and immediately sown with permanent pasture species to reduce erosion and minimise weed establishment* We have however updated Section 5.2.3 to state: *Stockpiles to be kept longer than 3 months (i.e. approximately how long it will take to establish a stable vegetative cover) will be sown with a suitable cover crop of native grass seeds to minimise soil erosion and invasion of weed species. This will assist with natural regeneration of native seeds in the soil stockpiles.*	Section 5.2.3
BCD – R5	**More details are required on the plant species mix to be used in Landform Shaping** Section 5.2.2 'Landform Shaping' states that disturbed areas outside of the quarry that are not planned to be retained in the final landform will be ripped and revegetated with either native species or pasture species as per the 'Blue Book'. BCD	A PCT HU905 seed mix will be used at site for longterm rehabilitation at site. Section 5.2.2 has been removed as this information is covered in other sections, including Section 5.8 – Final Landform.	See Section 5.1.3 for seed mix and Section 5.8 for Final Landform.

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
	recommends that the native species chosen are species found in Plant Community Type HU905 Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter. The 'Blue Book' (Managing Urban Stormwater: Soils and Construction by Landcom (2004)) is written primarily for urban areas where the use of a largely exotic pasture mix to stabilise landforms is more appropriate. However, the Dolwendee Quarry Site is within a large remnant of primarily native vegetation, so care is needed when adding exotic plants to the site, where they may become weeds. **Recommendation 5** BCD recommends that the native species used in Landform Shaping are species from Plant Community Type HU905 Narrow-leaved Ironbark – Grey Box grassy woodland of the central and upper Hunter. If any pasture species are also used, then BCD recommends that they are species that have no chance on spreading to adjacent areas.		
BCD – R6	**Seed and propagule collection from local plants should follow Florabank guidelines** Section 5.2.4 'Direct Seeding and Planting' states that seeds and plant materials to augment rehabilitation will be sourced locally, but few details of how this will be done are provided. BCD recommends that Florabank guidelines are followed to ensure that current best-practice seed and propagule collection is applied. The Florabank guidelines are available at https://www.greeningaustralia.org.au/publications/ **Recommendation 6** BCD recommends that the native species propagule collection for the project follows Florabank guidelines.	Guidelines have been referenced. Section 5.2.3 has been added in have: *Seed will be collected and propagated for rehabilitation. This would be completed in accordance with the advice of an ecologist/bush regenerator. Details of collection and propagation would be included in the Annual Review. In October 2020, BCD recommended that seed collection and propagation is completed as per the Florabank guidelines.* https://www.greeningaustralia.org.au/publications/ *UHH will inform the ecologist/bush regenerator that these guidelines are to be used.*	Section 5.2.3
BCD – R7	Preliminary Performance and Completion Criteria require measurements for vegetation composition, function and structure	Note, Section 7.1 now states:	Section 7.1 and 6

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
	Table 7 'Preliminary Performance and Completion Criteria for Rehabilitation Areas' and **Table 8** 'Completion Criteria for Offset Area' do not include measurements of vegetation composition, function or structure. BCD recommends that those aspects are added to **Table 7** and **Table 8**. That would enable those features to be tracked over time. This would best ensure that the rehabilitation and the management of remnant native vegetation achieves the required outcomes in a timely and cost-effective way. **Recommendation 7** BCD recommends that **Table 7** and **Table 8** include vegetation composition, function and structure measurable performance and completion criteria.	*"Analogue sites will be selected as part of the ecological monitoring program, with these to be developed based on the advice of the ecologist".* **Table 7** (Rehabilitation Criteria) in Section 6 has been updated, with the Performance Criteria being: *Key BAM rehabilitation criteria for vegetation, composition and structure are generally consistent with analogue monitoring sites based on the ecological monitoring program.* **Table 8** (Offset Criteria) in Section 6 has been updated, with the Performance Criteria being: *Key BAM offset criteria for vegetation, composition and structure are generally consistent with analogue monitoring sites based on the ecological monitoring program.* There are then triggers and actions.	
BCD – R8	**Management of rehabilitation areas should follow best-practice guidelines** Table 9 covers only four aspects of rehabilitation (weeds and pests, soil, landform and water) which therefore miss other aspects that influence the success of rehabilitation. Current best practise for ecological rehabilitation is defined in the 'National standards for the practice of ecological restoration in Australia' [https://www.seraustralasia.com/standards/National%20Restoration%20Standards%202nd%20Edition.pdf], and describes ecological rehabilitation through six ecosystem goals (species composition, structural diversity, ecosystem function, external exchanges, absence of threats, and physical conditions), each with three sub-attributes. **Recommendation 8**	The Development Consent does not refer or require this requirement. This guideline has not been referenced. The management plan has specifically been prepared to cover the next three years of biodiversity and rehabilitation management and then provide conceptual information following that three year period. Rehabilitation and offset monitoring will be completed as per the BAM, with this outlined in Section 7.1.	See Section 7 for monitoring.

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
	BCD recommends that the management and monitoring of ecological rehabilitation follows the 'National standards for the practice of ecological restoration in Australia'.		
BCD – R9	**Preliminary Performance and Completion Criteria for rehabilitation areas and the biodiversity offset require tangible trigger points set at appropriate levels** **Table 7** 'Preliminary Performance and Completion Criteria for Rehabilitation Areas' and **Table 8** 'Completion Criteria for Offset Area' include poorly defined targets and trigger points, such as the use of undefined terms like 'increased', 'decline', and 'significant'. These relatively defined thresholds and goals are difficult to implement and interpret. BCD recommends that quantitative criteria are set, that follow the 'SMART' principles (i.e. specific, measurable, attainable, relevant and time-bound), so that trigger points, rehabilitation milestones, and completion criteria are clearly measurable, and allow for the quick use of adaptive management, if needed. **Recommendation 9** BCD recommends that the performance measures, trigger points for adaptive management, and completion criteria in **Table 7** and **Table 8** follow 'SMART' principles.	It's too early have detailed smart criteria. Additional ecological monitoring is required at both the offset area and the main site to determine SMART criteria. SMART criteria can be developed for the next iteration of the BRMP. There has however been new criteria added vegetation, composition and structure (see BCD – R7). If SMART criteria at the moment were to be developed they would not be site specific or based on science. Section 7.1 of the BRMP outlines that - *An ecological baseline survey will be completed in the offset area prior to quarry commencement and then monitoring is to be completed every two years.*	Table 7 and Table 8 (Section 6) Section 7 for monitoring.
BCD – R10	**Ecological monitoring requires consideration of vegetation composition, function and structure** Chapter 7 'Ecological Monitoring' does not include details of vegetation monitoring. BCD acknowledges that such details are planned to be included in a latter version of the BRMP. However, the means of measuring and monitoring vegetation is available now, through the implementation of the Biodiversity Assessment Method [https://www.environment.nsw.gov.au/topics/animals-and plants/biodiversity/biodiversityassessment- method]. **Recommendation 10** BCD recommends that the monitoring of flora and fauna on site follows the Biodiversity Assessment Method.	BAM will be used for the baseline ecological monitoring and at this point future ecological monitoring. An ecologist will engaged to develop this program.	Section 7

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
BCD – R11	**Weed and pest monitoring requires collection of data on reproductive state and numbers of individuals to determine population trends** Chapter 7 'Ecological Monitoring' provides a checklist of some of the data to be monitored about weeds and pests on the project site. BCD notes that this is not an exhaustive list, but recommends that the following details are also recorded: □ Reproductive state (e.g. juvenile, mature, in flower, in fruit / with young) □ Numbers of individuals □ Numbers of individuals in each reproductive state. **Recommendation 11** BCD recommends that the weed and pest species monitoring gathers data to help determine if local populations are reproducing, and trends in their population.	Noted. New sentence added Section 7. *The BCD has recommended (see Section 2.3) that additional information is included about recording of weeds as part of ecological monitoring. This will include:* • *Reproductive state (e.g. juvenile, mature, in flower, in fruit / with young);* • *Numbers of individuals; and* • *Numbers of individuals in each reproductive state.*	Section 7
BCD – R12	**Background data behind monitoring provides more meaning to monitoring results** Chapter 8 'Reporting and Compliance Management' describes that a summary of biodiversity monitoring results will be provided in the Annual Review for the project, and that the Annual Reviews and regular reports of environmental performance will be posted on the project's website. The presentation of the background data behind the monitoring, such as the flora species found and their cover and abundance scores, enables monitoring results to be better understood, particularly by seeing which species are having the biggest influence of site variables, and whether any large changes are likely if short-lived species (such as some species of Acacia) are present. This in turn helps identify if rehabilitation issues may be present, and whether rehabilitation outcomes are likely to be met. **Recommendation 12** BCD recommends that all field data collected in the rehabilitation areas is provided in the Annual Review.	Agreed. Section 7.1 now states: *A summary of the latest biodiversity monitoring results will be provided in the Quarry Annual Review, with any ecological/rehabilitation monitoring reports attached. Information about inspections will also be included.*	Section 7.1
BCD – R13	**All details in Figure 3 needs to be clear and easily read** Figure 3 'Conceptual Rehabilitation Plan/Final Landform' in the Draft Biodiversity and Rehabilitation Management Plan has text	Figure to stay in the document. It is now clearer as it has been put in as a JPEG.	Section 5.8

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
	that is small, grainy and often hard to read. It does not have a legend to explain the colours applied in the map. BCD recommends that this map has text that is easy to read, clear symbols, and a legend. **Recommendation 13** BCD recommends that Figure 3 is redrawn so that all text is clear and legible and that it has a legend that explains the meaning behind the colours used.	Information about colours has been added.	
BCD – R14	**References to OEH as a current agency need to be changed to BCD** The BRMP includes 13 references to the Office of Environment and Heritage (OEH). References to the current agency, where it pertains to feedback on the BRMP in Table 5, should be changed to Biodiversity and Conservation Division (BCD). **Recommendation 14** BCD recommends that refences to 'OEH' are updated to the current agency titles.	OK. Change has been made.	Throughout

INTEGRATED ENVIRONMENTAL MANAGEMENT AUSTRALIA

APPENDIX E

DPHI Comments

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Biodiversity and Rehabilitation Plan, Condition 27, Schedule 3	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Applicant must implement the Biodiversity Offset Strategy, described in the EIS and shown conceptually in Appendix 5, to the satisfaction of the Secretary.	Yes	**Section 3** provides information regarding the Biodiversity Offset Strategy**.**		**Nil**
Biodiversity and Rehabilitation Plan, Condition 28, Schedule 3	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
Within 12 months of the date of commencement of development under this consent, unless otherwise agreed with the Secretary, the Applicant must make suitable arrangements to provide appropriate long-term security for the Biodiversity Offset Strategy, to the satisfaction of the Secretary. *Note: Mechanisms to provide appropriate long-term security to the land within the Biodiversity Offset Strategy in accordance with the NSW Biodiversity Offset Policy for Major Projects 2014, include a Biobanking Agreement, Conservation Agreement or an alternative mechanism that provides for a similar conservation outcome. Any mechanism must remain in force in perpetuity.*	Partial	**Section 3** provides information regarding the Biodiversity Offset Strategy. As the development is yet to commence, this condition has not yet been triggered. **Section 3.1** discusses the commitment to securing the offset in perpetuity within 12 months of the commencement of development.		**Nil**
Biodiversity and Rehabilitation Plan, Condition 29, Schedule 3	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Applicant must rehabilitate the site to the satisfaction of the Secretary. This rehabilitation must be generally consistent with the rehabilitation strategy in the EIS and the conceptual rehabilitation plan in Appendix 5 and must comply with the objectives in Table 4. *Table 4: Rehabilitation Objectives*	No	It is stated in **Table 2** that: "These are the current rehabilitation objectives of the site. Rehabilitation of the Quarry Site is to be addressed in a subsequent update of this BRMP	Include information regarding conceptual rehabilitation plans and timings for rehabilitation milestones.	**Section 5.2 has had info added:** *There are two areas where progressive rehabilitation could be possible, with these being:*

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Feature	***Objective***				
Site (as a whole)	• Safe, stable and non-polluting • Final landform integrated with surrounding natural landforms as far as is reasonable and feasible, and minimising visual impacts when viewed from surrounding land		prior to site closure and rehabilitation". Conceptual plans for rehabilitation should be outlined in this version of the BRMP to satisfy this condition.		*Temporary stabilisation – hydromulching would be used in areas that were disturbed as part of the initial clearing that remain as infrastructure. These would include areas such as bunds and would be completed within one month of disturbance occurring. Disturbance will be kept to a minimum therefore little temporary stabilisation is expected;* *Benches – Once a bench is not required for operations the site will complete a risk assessment to assess whether rehabilitation of benches can be completed. If it is deemed safe then rehabilitation would be completed as per* ***Section 5.***
Surface Infrastructure	• Decommissioned and removed, unless otherwise agreed by the Secretary; and • Landscaped and revegetated using native flora species				
Quarry benches and pit floor	Landscaped and revegetated using native flora species				
Final Void	• Minimise the size, depth and slope of the batters of the final void • Minimise the drainage catchment of the final void				
Biodiversity and Rehabilitation Plan, Condition 30, Schedule 3		**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Applicant must rehabilitate the site progressively, that is, as soon as reasonably practicable following disturbance. All reasonable and feasible measures must be taken to minimise the total area exposed for dust generation at any time. Interim stabilisation measures must be implemented where reasonable and feasible to control dust emissions in disturbed areas that are not active and which are not ready for final rehabilitation. *Note: It is accepted that parts of the site that are progressively rehabilitated may be subject to further disturbance in future.*		No	**Section 5.15** is noted as providing information on progressive rehabilitation. **Section 5.2** is titled "Progressive and Final Rehabilitation", stating that where practical, rehabilitation will be undertaken progressively, and that **Sections 5.2.1 and 5.2.2** outline progressive rehabilitation. These sections only outline rehabilitation to be undertaken at the cessation of quarrying. This response is not adequate, and the proposed	Provide information regarding plans for progressive rehabilitation. Information regarding progressive rehabilitation should also include proposed timings for rehabilitation milestones.	See information as per above added to Section 5.2 detailing information about the potential progressive rehabilitation of stabilisation areas and benches.

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		actions do not constitute progressive rehabilitation.		
Biodiversity and Rehabilitation Plan, Condition 31, Schedule 3	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Applicant must prepare a Biodiversity and Rehabilitation Management Plan for the development to the satisfaction of the Secretary. This plan must:				
(a) be prepared in consultation with Council and OEH;	No	**Section 2.3** – States that correspondence demonstrating consultation with Council and BCD (formerly OEH) will be provided in a future version of the BRMP. It is also stated in this section that a reply was received from the EPA stating that they do not comment on management plans. It is possible that the correct agency did not receive a copy of the plan.	Provide proof of correspondence in this version of the BRMP. Re-submit a copy of this plan to the Biodiversity and Conservation Division for comment. Also update OEH to BCD throughout the document to ensure that the correct agency name is being used.	Consultation was completed in version 1 of the management plan This was added to Section 2.3 *No further consultation was completed by Upper Hunter Holdings in the 2020 update, with consultation completed in 2019. Refer to Appendix C and D of BRMP*
(b) be submitted to the Secretary for approval prior to the commencement of development under this consent, unless otherwise agreed;	Yes	**Section 2.3** – This plan.		Nil
(c) provide details of the conceptual final landform and associated land uses for the site;	Yes	**Section 5.8** – describes the final landform and provides a figure taken from Appendix 6 of the Development Consent.		Nil
(d) describe how the implementation of the Biodiversity Offset Strategy would be integrated with the overall rehabilitation of the site;	No	**Section 5.10** – states that there is no proposed rehabilitation until close to Quarry closure.	This response does not meet the requirement of this condition. Please provide information	See information as per above added to Section 5.2 detailing information about the potential progressive rehabilitation of stabilisation areas and benches.

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			regarding rehabilitation strategies and integration with the Biodiversity Offset Strategy as per the consent condition.	Section 5.10 states: *There will be no proposed rehabilitation at the Quarry until close to quarry closure, unless it is deemed appropriate as per Section 5.2. However there can still be some co-ordinated weed and pest management between the quarry and the offset area during the life of the operation with this outlined in Section 5.3 and 5.4.*
(e) include detailed performance and completion criteria for evaluating the performance of the Biodiversity Offset Strategy and rehabilitation of the site, including triggers for any necessary remedial action;	Partial	**Section 6** and **Tables 9 and 10** outline the performance and completion criteria for the Biodiversity Offset and rehabilitation. Comments from the previous DPIE review noted issues with lack of context for soil and landform criteria. This has been amended by adding information into **Sections 5.2.2 and 5.2.3**. It is also stated that the water quality criteria has been updated, however, this has only been done for **Table 9**. **Table 10** still only states "poor quality runoff", and while it is noted that there are no EPL requirements for the Biodiversity Offset, a quantitative measure is still required. A vague statement is made in **Section 6** regarding risks around lack of funding to complete biodiversity and rehabilitation management – "Funding will be provided for the Project to satisfy	Update **Table 2** to reference **Sections 5.2.2 and 5.2.3** to provide context for landform and soil criteria. Suggest adopting EPL water quality criteria to monitor runoff quality from Biodiversity Offset against. Include more detailed information regarding security of funding.	Security of funding is not required in condition. This is outside of scope of condition and DPIE authority. The EPL requirement (including criteria) is not included as part of the offset area. This only covers the operational part of the site, therefore there are no plans to create specific criteria. No change made.

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		the implementation of the offset bon and rehabilitation bond." This does not provide a pathway or any surety in regard to funding, and more detail is required.		
(f) describe the short, medium and long term measures that would be implemented to: • manage remnant vegetation and habitat on site, including within the Biodiversity Offset Strategy area; and • ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this consent;	No	**Table 2** states that this information can be found in **Section 5.1.5**, however, there is no **Section 5.1.5**. A word search locates some information in section **1.3.1** regarding the objectives of the BRMP being to provide direction for the short to long term management and enhancement of biodiversity values, however this does not satisfy this condition. It is stated that **Section 5** contains information regarding management of remnant vegetation and habitat on site and in the Biodiversity Offset area. However, **Section 5** only stipulates that delineation of vegetation will occur prior to clearing to ensure there is no impact on remnant vegetation. This is not an adequate control measure to ensure that accidental clearing of remnant vegetation does not occur, nor does it provide for good management of remnant vegetation. Remnant vegetation outside of the active Quarry	Address comments, make necessary corrections to section references and add in the required information and adequate controls and procedures for managing remnant vegetation and for performing progressive rehabilitation. Information regarding progressive rehabilitation should also include proposed timings for rehabilitation milestones.	<u>Signage:</u> Section 5.1.1 already had information about signage, with a small change to the sentence. *The person/s responsible for the clearing activities will be responsible for ensuring that the boundary markers, barriers and permanent signs are installed to enable the suitable environmental and technical inspections of the proposed disturbance to be undertaken.* *Site inductions are to be given to ensure all site workers and visitors are aware of any sensitive vegetation. No clearance will be completed until site inductions have been completed.* <u>Progressive rehabilitation.</u> See information as per above added to Section 5.2 detailing information about the potential progressive rehabilitation of stabilisation areas and benches.

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		footprint should be clearly demarcated and permanent signage erected to identify the BOS area. **Sections 5** is also noted as providing information on progressive rehabilitation. **Section 5.2** is titled "Progressive and Final Rehabilitation", stating that where practical, rehabilitation will be undertaken progressively, and that **Sections 5.2.1 and 5.2.2** outline progressive rehabilitation. These sections only outline rehabilitation to be undertaken at the cessation of quarrying. This response is not adequate, and the proposed actions do not constitute progressive rehabilitation.		
(g) include a detailed description of the measures that would 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 the offset area or site rehabilitation;	Yes	Stated as being in **Section 5.1**, however, it is actually in **Section 5.1.2**. Also reference to this condition in **Section 5.2.4**.	Amend references in **Table 2**.	Amendments made.
• restoring and enhancing the quality of native vegetation and fauna habitat in the biodiversity offset and rehabilitation areas through assisted natural	Partial	**Section 5.8** describes final landform only, nothing about restoration, enhancement or rehabilitation. **Section 5.2.4**	More detail required regarding restoration, enhancement and rehabilitation of native	The document covers Phases 1 and 2. Further information added to Section 1.3. *Phase 3 will include the post operational*

regeneration, targeted vegetation establishment and the introduction of fauna habitat features;		refers only to direct seeding and planting during Phase 1 and 2.	vegetation and introduction of fauna habitat features.	*activities. Further information regarding this stage will be completed in subsequent reviews.* Most of this information is already covered in Section 5.2.4. Minor edits have been made: *Seeds and plant material (cuttings) used to augment the rehabilitation areas will be sourced locally. Tubestock utilised will preferentially be 6 - 9 months old at the time of planting to maximise the potential for successful rehabilitation. Seeds and tubestock will comprise species consistent with the remnant native vegetation community; HU905 - Narrow-leaved Ironbark - Grey Box grassy woodland of the central and upper Hunter.* *Section 5.1 outlines the process of clearing. Key habitat features such as fallen timber, hollow logs or boulders suitable will be stored onsite for salvage and used in the rehabilitation area. At this point it is not proposed that these features would be used for habitat enhancement in the offset area. This will assist in the restoration, enhancement and rehabilitation of native vegetation and introduction of fauna habitat features.*
• protecting native vegetation and fauna habitat outside the approved disturbance area onsite;	Partial	See **Section 5.1.1**.	See previous comments regarding **Section 5.1.1** above.	<u>Signage:</u>

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				Section 5.1.1 already had information about signage, with a small change to the sentence. *The person/s responsible for the clearing activities will be responsible for ensuring that the boundary markers, barriers and permanent signs are installed to enable the suitable environmental and technical inspections of the proposed disturbance to be undertaken.* *Site inductions are to be given to ensure all site workers and visitors are aware of any sensitive vegetation. No clearance will be completed until site inductions have been completed.*
• minimising the impacts on native fauna, including undertaking pre-clearance surveys for the quarry site, haul road and the supplementary water supply pipeline;	Yes	**Section 5.1.2** outlines preclearance survey methods.		Nil
• establishing vegetation screening to minimise the visual impacts of the site on surrounding receivers;	No	**Section 5.7** quotes the EIS, claiming that screening is not required. However, the conditions of consent take precedence, therefore screening is required unless a modification is sought and approved to remove this condition.	Add relevant information and methods to achieve suitable vegetation screening. Include timings for when planting will occur.	Already address this in previous management plan comments to DPIE. Pitt and sherry matter.
• ensuring minimal environmental consequences for threatened species, populations and habitats, including for	Yes	**Sections 5 and 6** satisfy this condition.		Nil

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the quarry site, haul road and supplementary water supply pipeline;				
• avoiding and minimising the spread of Myrtle Rust, *Phytophthora cinnamomi* (Phytophthora) and Chytrid fungus;	Partial	**Section 5.5** outlines management measures for myrtle rust, but not for phytophthora or chytrid fungus.	Add more information regarding management measures for phytophthora and chytrid fungus.	Updates have been made to Section 5.5: *Key controls are outlined on the NSW Department of Primary Industries (DPI) website and will include:* • *Staff and contractors are to be made aware of the signs of myrtle rust and phytophthora in the site induction;* • *All vehicles and equipment are to be cleaned before attending site; and* • *Clearance and rehabilitation completed by experienced contractors; and* • *Chemical treatment and effective disposal if plants are found. If the disease was found then the site would report it to the BCD.* *In the unlikely event that chytrid fungus is found in frogs during ecological surveys, then the ecologist will liaise with Dolwenedee Quarry or would report the issue to the BCD. A management plan would be prepared and implemented between the site and the BCD.*
• collecting and propagating seed;	No	**Table 2** lists Section **5.2** as providing information regarding collecting and propagating seed,	Provide information regarding the collection and propagation of seed from site.	Table 2 refers to Section 5.1. Further details have now been added:

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		however, there is no reference to this in this section.		*Where practical seed will be collected and propagated for rehabilitation. This would be completed in accordance with the advice of an ecologist/bush regenerator. Details of collection and propagation would be included in the Annual Review.*
• controlling weeds and feral pests;	Yes	**Sections 5.3 and 5.4** satisfy this condition.		Nil
• controlling erosion;	Yes	**Section 5.6** satisfies this condition.		Nil
• managing bushfire risk;	Partial	**Section 5.11** addresses bushfire management, and quotes the EIS regarding the preparation of a Fire Management Plan in consultation with the NSW RFS. It would appear that this document is yet to be written, as it is not referred to in this plan.	Prepare Fire Management Plan in consultation with NSW RFS and refer to it and it's requirements within this plan.	Consent does not specifically require a Fire Management Plan. Schedule 3 Condition 39 prevails over Condition 31g and prevails over the EIS as per Schedule 2 Condition 3.
(h) include a program to monitor and report on the effectiveness of these measures and progress against the performance and completion criteria;	No	**Section 7** is stated as providing this information, however, **Section 7** only contains a very brief overview of what is referred to as "Ecological Monitoring", but appears to actually be a bi-monthly site inspection that notes the whereabouts of weed and pest species.	This condition refers to **all** of the measures listed in the previous condition. Provide information on a monitoring and reporting program that effectively captures progress and performance against **all** of the measures.	Wording has been added in Section 7. *An ecological baseline survey will be completed in the offset area prior to quarry commencement and then monitoring is to be completed every five years. Dolwendee Quarry is still liaising with the ecologists about the components of this monitoring program for the offset area, however it will be developed to be a further review of the baseline information completed for the EIS. The report will review performance against*

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				the criteria in Section 6 and outline specific methods. *Monitoring would likely include components from the EIS specialist report (Umwelt 2015):* *Flora and weed survey;* *Review of vegetation mapping; and* *Terrestrial fauna survey.*
(i) 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;	No	Information stated as being in **Section 5**, however, it is actually in **Section 6**. This condition is also incorrectly referenced as being condition (g), instead of (i). It also incorrectly states within **Section 6** that the risks are outlined in **Table 9**, when it is in fact **Table 10** that refers to the Biodiversity Offset. In addition, the information provided in **Table 10** does not satisfy this condition.	Amend references as per comments. Provide information that satisfies the condition.	Errors in referencing have been updated. Table 10 outlines key aspects including weeds and pests, soil, landform and water risks. It also has triggers and actions. These are the main biodiversity risks to the site and we believe this information sufficiently covers this section.
(j) include details of who would be responsible for monitoring, reviewing and implementing the plan.	No	Stated as being in **Section 7**, but this information cannot be located in this section or elsewhere in the document.	Provide information as per the condition.	Updated to be Section 9
The Applicant must implement the approved Biodiversity and Rehabilitation Management Plan as approved from time to time by the Secretary.	NA			Nil
Biodiversity and Rehabilitation Plan, Condition 32, Schedule 3	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
Within 6 months of the date of approval of the Biodiversity and Rehabilitation Management Plan, the Applicant must lodge a Biodiversity and Rehabilitation Bond with the	Yes	Bonds attached as **Appendix A and Appendix B**, information also provided in **Section 5.9**.	There is a reference to Karuah East in Appendix A – amend and check for	Reference updated in Appendix A

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Department to ensure that the Biodiversity Offset Strategy and rehabilitation of the site is implemented in accordance with the performance and completion criteria set out in the plan (Figure 9 in Appendix 6) and relevant conditions of this consent. The sum of the bond must be determined by:			references to other developments.	
(a) calculating the cost of implementing the Biodiversity Offset Strategy over the next 3 years;	Yes	**Appendix B**.	As a general comment, it is noted that in the calculations for the Offset Bond, weed management at the site ceases at year 5. Suggest amending this, as weeds are required to be managed for the life of the project. Will also need to review cost estimates.	The condition only requires calculating costs over the next three years, which has been completed. No change proposed.
(b) calculating the cost of rehabilitating all disturbed areas of the site, taking into account the likely surface disturbance over the next 3 years of quarrying operations; and	Yes	**Appendix B**.		Nil
(c) employing a suitably qualified quantity surveyor or other expert to verify the calculated costs, to the satisfaction of the Secretary.	No	No evidence of this having occurred.	Provide evidence.	Chris Jones and Fiona Iolini from SLR have completed the bond and have had past experience completing bonds.
Notes: • *If capital and other expenditure required by the Biodiversity and Rehabilitation Management Plan is largely complete, the Secretary may waive the requirement for lodgement of a bond in respect of the remaining expenditure.* • *If the Biodiversity Offset Strategy and/or rehabilitation of the site area are completed (or partially completed) to the satisfaction of the Secretary, then the Secretary will release the bond (or relevant part of the bond). If the Biodiversity Offset Strategy and rehabilitation of the site are not completed to the*	NA			

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satisfaction of the Secretary, then the Secretary will call in all or part of the bond and arrange for the completion of the relevant works.				
Biodiversity and Rehabilitation Plan, Condition 33, Schedule 3	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
Within 3 months of each Independent Environmental Audit (see condition 10 of Schedule 5), the Applicant must review, and if necessary revise, the sum of the Rehabilitation and/or Conservation Bonds to the satisfaction of the Secretary. This review must consider the:	NA	Not yet applicable as the first Independent Environmental Audit is yet to take place. However, this condition is incorrectly referred to as "Schedule 3 Condition 5" in **Section 5.9**.	Amend reference.	Updated to be Schedule 5 Condition 10
(a) manage on-site sewage treatment and disposal in accordance with the requirements of its EPL, and to the satisfaction of the EPA and Council;	NA			
(b) minimise the waste generated by the development;	NA			
(c) ensure that the waste generated by the development is appropriately stored, handled, and disposed of; and	NA			
(d) report on waste management and minimisation in the Annual Review, to the satisfaction of the Secretary.	NA			
Biodiversity and Rehabilitation Management Plan, Condition 2, Schedule 5	**Sufficient (Yes/No/Partial)**	**Document reference and comment**	**Action Required**	**Company Response**
The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines, and include:				
(a) detailed baseline data;	No	**Table 2** states "NA" for this condition. This does not satisfy the requirements of this condition.	For the purposes of this plan, and as the Quarry is yet to commence, detailed baseline data for the site can be found in the Ecological Assessment	Table has been updated. *Section 4 of the management plan. Section 6.2 of EIS. Ecology Assessment for the EIS.*

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			that forms Appendix K of the EIS. Its is suggested that this plan refers to Section 6.2 of the EIS and the Ecological Assessment and takes into account and incorporates any recommendations or commitments therein.	
(b) a description of: • the relevant statutory requirements (including any relevant approval, licence or lease conditions); • any relevant limits or performance measures/criteria; and • 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;	Partial	**Section 2** outlines the statutory requirements regarding the BRMP, however, as noted in comments above, many responses to these requirements are inadequate and require further review.	Provide more detailed information as per previous comments.	Been updated
(c) a description of the measures that would be implemented to comply with the relevant statutory requirements, limits, or performance measures/criteria;	Partial	This document – however refer to previous comments regarding adequacy.	Provide more detailed information as per previous comments.	Sections have been updated.
(d) a program to monitor and report on the: • impacts and environmental performance of the development; and • effectiveness of any management measures (see (c) above);	No	Stated as being in **Section 7**. Refer to previous comments regarding the adequacy of this section.	Provide more detailed information as per previous comments.	Sections have been updated.
(e) a contingency plan to manage any unpredicted impacts and their consequences and to ensure that ongoing impacts reduce to levels below relevant	Partial	Noted as being in **Sections 6 and 8.5**. Refer to previous comments regarding **Section 6**. **Section 8.5** in the BRMP refers	Provide more detailed information as per previous comments.	Sections have been updated.

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	impact assessment criteria as quickly as possible;		to condition 5 of Schedule 5, and not this condition.		
(f)	a program to investigate and implement ways to improve the environmental performance of the development over time;	Partial	**Section 8** refers to the Annual Review, External Reporting, Incident Reporting, Complaints Management, Adaptive Management and Document Review. However, some of the methods proposed within the BRMP are not adequate as per previous comments.	Provide more detailed information as per previous comments.	The information in Section 8 is based on reporting as per the statutory requirements and best practice. There only minor changes to Section 8.
(g)	a protocol for managing and reporting any: • incidents; • complaints; • non-compliances with statutory requirements; and • exceedances of the impact assessment criteria and/or performance criteria; and	Partial	**Section 8** provides most of this information. There is no mention of management and reporting of exceedances or non-compliances, only incidents, complaints and material harm of the environment.	Provide more detailed information as per comments.	Additional wording added to Section 6 to discuss 'exceedances' *Criteria within Table 9 relate to final rehabilitation, and not meeting a criteria during operations does not constitute an exceedance. Table 10 refers to criteria for the biodiversity offset area and if triggers are enacted during operations they will be reported in the Annual Review. However this does not constitute an exceedance of a criteria.*
(h)	a protocol for periodic review of the plan.	Partial	**Section 8.6** states that management plans will be assessed as part of each Annual Review. This is good practice, however, there are other triggers for management plan reviews within the consent that should also be noted.	Provide more detailed information as per comments.	Section 8.6 covers this information. Minor change to wording. New wording included: *Schedule 5 Condition 3 of the Development Consent states management plans should be reviewed:* *Within 3 months of the submission of an:* *a) Annual Review under condition 9 below;*

Planning, Industry & Environment

Document: Biodiversity and Rehabilitation Management Plan
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Reviewed: Sarah Clibborn on 16 July 2020

				b) incident report under condition 7 below; *c) audit report under condition 10 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. Where this review leads to revisions in any such document, then within 4 weeks of the review the revised document must be submitted for the approval of the Secretary.* *The requirement to update management plans at the site will be assessed as part of each Annual review, unless triggered earlier under this consent condition. If no update is required, then no management plan review will be completed.*
Note: The Secretary may waive some of these requirements if they are unnecessary or unwarranted for particular management plans.				
General Comments			**Action Required**	**Company Response**
Other Agency Comments			**Action Required**	**Company Response**

Planning, Industry & Environment

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Planning, Industry & Environment

Mr Trevor Allen
Senior Associate Environmental Planner
Pitt & Sherry
Level1, 81 Hunter Street
Newcastle, NSW, 2300

09/10/2020

Dear Mr Allen

Dolwendee Quarry (SSD 6519)
Biodiversity and Rehabilitation Management Plan - Request for Additional Information

I refer to the Biodiversity and Rehabilitation Management Plan (BRMP) submitted to the Department as required under condition 31, Schedule 3 of SSD 6519. After careful consideration, the Department is requesting that you provide additional information.

You are requested to submit a revised document that addresses the requirements of the following conditions:

- **Condition 29 of Schedule 3** – Provide information regarding conceptual rehabilitation plans and rehabilitation milestones. The providing of information regarding temporary stabilisation and potential bench rehabilitation is not an adequate response.
- **Condition 30 of Schedule 3** – Provide information regarding progressive rehabilitation. Stating that rehabilitation may be done if it is deemed safe, following a risk assessment, is not an adequate response. Quarry design should allow for a safe and stable landform that can readily be rehabilitated in a progressive manner throughout the life of the operation.
- **Condition 31(d) of Schedule 3** – Provide information regarding how implementation of the Biodiversity Offset Strategy would be integrated with the overall site rehabilitation. Stating that there will be no rehabilitation until close to quarry closure and referring to weed and pest management is not an adequate response.
- **Condition 31(e) of Schedule 3** – Update tables and sections as per the requests made in the Review conducted by Sarah Clibborn dated 16 July 2020. Provide quantitative measures regarding water quality criteria for rehabilitated areas.
- **Condition 31(f) of Schedule 3** – Provide information addressing the comments in the Review conducted by Sarah Clibborn dated 16 July 2020. The information provided thus far does not adequately address the requirements of this condition.
- **Condition 31(g) of Schedule 3** – Information was requested regarding vegetation screening. Your response indicates that this has been addressed in previous comments to the Department. Please provide evidence of this correspondence as an Appendix to the BRMP and refer to it in the relevant section/s.
- **Condition 31(i) of Schedule 3** – Provide further information in Table 10. Information provided to date refers to completion criteria for the Offset Area and does not sufficiently address or satisfy the condition. This condition requires identification of the potential risks and contingency measures for the successful implementation of the Biodiversity Offset Strategy.
- **Condition 32(c) of Schedule 3** – This condition requires the employment of suitably qualified experts to verify of cost calculations to the satisfaction of the Secretary. Providing consultants' names and stating that they have past experience does not satisfy this condition.

Please provide evidence that the Secretary is satisfied with, and approved, these consultants.

- **Condition 32(g) of Schedule 3** – The response to the request made in the Review conducted by Sarah Clibborn dated 16 July 202 does not address the requirement of the condition. Please provide more information in Section 8 as previously requested.

You are requested to provide the information, or notification that the information will not be provided, to the Department by Friday 30 October 2020. If you are unable to provide the requested information within this timeframe, you are required to provide, and commit to, a timeframe detailing the provision of this information.

If you have any questions, or would like to arrange a meeting to discuss these requests in more detail, please contact Sarah Clibborn on (02) 8837 6095 or at sarah.clibborn@planning.nsw.gov.au.

Yours sincerely

Colin Phillips
Team Leader
Resource Assessments (Coal & Quarries)

DPHI Feedback and Response to July 2020 Comments

Biodiversity and Rehabilitation Management Plan – Schedule 3, Condition 31	**Satisfactory (Yes/No/Partial)**	**Comment**	**Action Requested from DPIE**	**UHH Response/Section Reference**
The Applicant must prepare a Biodiversity and Rehabilitation Management Plan for the development to the satisfaction of the Secretary. This plan must:	-	N/A	N/A	Nil
(a) be prepared in consultation with Council and OEH;	Partial	Partial The BRMP was referred to Council and BCD for comment. Please confirm whether any further comments were provided by Council, following email correspondence dated 11 April 2019.	Finalise consultation with Council and document the outcomes in the BRMP.	Section 2.3
(b) be submitted to the Secretary for approval prior to the commencement of development under this consent, unless otherwise agreed;	Satisfied	N/A	N/A	Nil
(c) provide details of the conceptual final landform and associated land uses for the site;	No	Section 2.0 indicates that the final landform will be addressed in future iterations of the BRMP. The Department considers that this is a foundational component of the BRMP and should be included in the Stage 1 document.	Update the plan to include details of the conceptual final landform and consult further with Council as required.	Section 5.8 has been added.
(d) describe how the implementation of the Biodiversity Offset Strategy would be integrated with the overall rehabilitation of the site;	No	Section 2.0 indicates that this requirement will be addressed in future iterations of the BRMP. The Department considers that this should be addressed in the Stage 1 document, noting that the integration of the offset and	Note the comments and amend the plan accordingly	Section 5.8 has been prepared. Separate Rehabilitation and Conversation Bonds have been prepared to cover Schedule 3

Biodiversity and Rehabilitation Management Plan – Schedule 3, Condition 31	Satisfactory (Yes/No/Partial)	Comment	Action Requested from DPIE	UHH Response/Section Reference
		rehabilitation strategies can be further developed in future iterations of the BRMP. Section 3.2 states that the implementation of the Biodiversity Offset Strategy will occur following the commencement of initial quarrying activities. This appears to conflict with Section 3.1 and condition 28 of Schedule 3.		Condition 32 and is attached as Appendix A and B. Also see Section 5.9.
(e) include detailed performance and completion criteria for evaluating the performance of the Biodiversity Offset Strategy and rehabilitation of the site, including triggers for any necessary remedial action;	Partial	Partially satisfied – see Section 6. However: • no performance or completion criteria are provided in relation to the biodiversity offset area; • the 'soil' and 'landform' criteria lack context as there is no discussion regarding rehabilitation works and no supporting figures are provided; and • the 'water' trigger needs to be more specific (ie what is 'poor quality runoff'?)	Note the comments and amend the plan accordingly	Section 6 has been updated for criteria. Section 5.8 provide context for Landform Shaping. Section 5.2.2 provide context for topsoil management. Water quality criteria has been updated.
(f) describe the short, medium and long-term measures that would be implemented to: • manage remnant vegetation and habitat on site, including within the Biodiversity Offset Strategy area; and • ensure compliance with the rehabilitation objectives and progressive rehabilitation obligations in this consent;	Partial	• Not satisfied – to be included in the Stage 1 document. • Not satisfied – to be included in the Stage 1 document.	Note the comments and amend the plan accordingly	Further information regarding remnant areas added - Section 4. and 5.1. Further information on objectives provided in Section 1.3.1.

Biodiversity and Rehabilitation Management Plan – Schedule 3, Condition 31	Satisfactory (Yes/No/Partial)	Comment	Action Requested from DPIE	UHH Response/Section Reference
(g) include a detailed description of the measures that would 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 the offset area or site rehabilitation;	Partial	The Department also notes that the Biodiversity and Rehabilitation Management Bond (condition 32 of Schedule 3) is triggered by the approval of the BRMP (even if it only relates to initial construction works). The BRMP, in its current form, does not provide sufficient detail to enable these costs to be calculated. • Satisfied – see Section 5.1	Note the comments and amend the plan accordingly	Progressive rehabilitation over the next three years is outlined in Section 5.2. Separate Rehabilitation and Conversation Bonds have been prepared to cover Schedule 3 Condition 32 and are attached as Appendix A and B. Also see Section 5.9.
• restoring and enhancing the quality of native vegetation and fauna habitat in the biodiversity offset and rehabilitation areas through assisted natural regeneration, targeted vegetation establishment and the introduction of fauna habitat features; • protecting native vegetation and fauna habitat outside the approved disturbance area onsite; • minimising the impacts on native fauna, including undertaking pre-clearance surveys for the quarry site, haul road and the supplementary water supply pipeline; • establishing vegetation screening to minimise the visual impacts of the site on surrounding receivers; • ensuring minimal environmental consequences for threatened species, populations	Partial	• Not satisfied – to be included in the Stage 1 document. • Satisfied – see Section 5.1.1 • Satisfied – see Section 5.1.1 • Not satisfied – the BRMP should consider the need for vegetation screening during the first 3 years of		Section 5 covers the biodiversity and rehabilitation management process over the next three years. Section 5.7 covers

Biodiversity and Rehabilitation Management Plan – Schedule 3, Condition 31	**Satisfactory (Yes/No/Partial)**	**Comment**	**Action Requested from DPIE**	**UHH Response/Section Reference**
and habitats, including for the quarry site, haul road and supplementary water supply pipeline; • avoiding and minimising the spread of Myrtle Rust, *Phytophthora Cinnamomi* (Phytophthora) and Chytrid fungus; • collecting and propagating seed; • controlling weeds and feral pests; • controlling erosion; • managing bushfire risk;		the project, including initial construction works. • Satisfied – see Section 5.1.1 • Not satisfied – to be included in the Stage 1 document. • Satisfied – see Section 5.2 • Satisfied – see Sections 5.3 and 5.4 • Satisfied - Section 5.5 • Not satisfied – to be included in the Stage 1 document.		vegetation screening. Section 5.5 covers plant disease management. Section 5.11 covers bushfire risk.
(h) include a program to monitor and report on the effectiveness of these measures and progress against the performance and completion criteria;	Yes	Satisfied – see Section 7. However, there appears to be a conflict between Sections 5.2.1, 5.3 and Table 6.1 regarding the frequency of weed inspections (ie monthly or bi-monthly).	Note the comments and amend the plan accordingly	Nil
(i) 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;	No	Not satisfied – to be included in the Stage 1 document.	Note the comments and amend the plan accordingly	Covered under Section 6 Performance Criteria. Criteria added for biodiversity management.
(j) include details of who would be responsible for monitoring, reviewing and implementing the plan.	Yes	Satisfied – see Section 7	N/A	Nil
• Please ensure that the description of the project stages is consistent throughout the various management plans. For example, Section 1.2 of the BRMP indicates that the plan applies to “Phase 1” of the project, which includes the construction of the highway				• Covers Phase 1 and 2

Biodiversity and Rehabilitation Management Plan – Schedule 3, Condition 31	Satisfactory (Yes/No/Partial)	Comment	Action Requested from DPIE	UHH Response/Section Reference
intersection construction. This appears to conflict with Pitt & Sherry's letter dated 4 April 2019 which explains the staging of the plans. Please clarify. • Please correct the typographical error in Section 5.4: "Pest management will be undertaken the entire site". • In Section 1.2.1, please revise the 3-year timeframe to begin in 2019.				• Typo fixed (now Section 4.7) • Timeframe updated 'starting from the date of the approval of management plans.

DPIE Feedback and Response to 9 October 2020 Comments

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
DPIE – R1	**Condition 29 of Schedule 3** – Provide information regarding conceptual rehabilitation plans and rehabilitation milestones. The providing of information regarding temporary stabilisation and potential bench rehabilitation is not an adequate response.	There are two areas where progressive rehabilitation is proposed with these being: Temporary stabilisation (within first three years) – hydromulching will be used in areas that were disturbed as part of the initial clearing that remain as infrastructure. These will include areas such as bunds and would be completed within one month of disturbance occurring. UHH will liaise with a specialist regarding the hydromulching seed mix, with the goal to be using native grass seed. Benches (After the first three years) – Once a bench is no longer required for extraction or operations, it is to be made safe (a consideration during creation of the bench and adjacent faces and subject to a risk assessment) then rehabilitation would be completed during the operational phase as per Section 5. There is no final rehabilitation of benches planned in the first three years (ie. final shaping, topsoil and seeding)., therefore hydromulching will be used for benches during these thirst three years. All benches at closure will need to be rehabilitated using a seed mix consistent with PCT 905.	Section 5.2
DPIE – R2	**Condition 30 of Schedule 3** – Provide information regarding progressive rehabilitation. Stating that rehabilitation may be done if it is deemed safe, following a risk assessment, is not an adequate response. Quarry design should allow for a safe and stable landform that can readily be rehabilitated in a progressive manner throughout the life of the operation.	See DPIE – R1 response regarding benches.	Section 5.2
DPIE – R3	**Condition 31(d) of Schedule 3** – Provide information regarding how implementation of the Biodiversity Offset Strategy would be integrated with the overall site rehabilitation. Stating that there will be no rehabilitation until close to quarry closure and referring to weed and pest management is not an adequate response.	There will be not be significant final rehabilitation of the quarry until close to quarry closure. There will be some co-ordinated weed and pest management in the quarry and the offset areas during the life of the operation with this outlined in Section 5.4 and 5.5. Following the completion of the ecological baseline survey, UHH will undertake formal ecological monitoring to be completed every	Section 5.10

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
		two years. In the intervening years, the site manager will qualitatively monitor the progress, area and status of temporary and permanent rehabilitation areas in the annual report under Schedule 5 Condition 9. Annual and seasonal ecological monitoring and reporting as recommended by DPIE would not be reasonable or feasible in terms detecting change sufficient to meaningfully informing modifying management practices. A combined annual qualitative and two year quantitative monitoring program is a more reasonable and feasible monitoring program.	
DPIE – R4	**Condition 31(e) of Schedule 3** – Update tables and sections as per the requests made in the Review conducted by Sarah Clibborn dated 16 July 2020. Provide quantitative measures regarding water quality criteria for rehabilitated areas.	Reference to the criteria within the Soil and Water MP have been added to **Table 8** (Section 6).	Section 6
DPIE – R5	**Condition 31(f) of Schedule 3** – Provide information addressing the comments in the Review conducted by Sarah Clibborn dated 16 July 2020. The information provided thus far does not adequately address the requirements of this condition.	No change required. Discussions were had about the fencing and signage and this is adequate. Progressive rehabilitation commitments will cover this.	Section 5.2 – Progressive Rehabilitation
DPIE – R6	**Condition 31(g) of Schedule 3** – Information was requested regarding vegetation screening. Your response indicates that this has been addressed in previous comments to the Department. Please provide evidence of this correspondence as an Appendix to the BRMP and refer to it in the relevant section/s.	Additional information has been provided, including details of discussions between DPIE and environmental consultants from Pitt and Sherry.	Section 5.7
DPIE – R7	**Condition 31(i) of Schedule 3** – Provide further information in **Table 8**. Information provided to date refers to completion criteria for the Offset Area and does not sufficiently address or satisfy the condition. This condition requires identification of the potential risks and contingency measures for the successful implementation of the Biodiversity Offset Strategy.	No change required. Its covered already. See wording in Section 6: *A risk that is not covered under **Table 7** and **Table 8** relates to funding to complete biodiversity and rehabilitation management. Funding will be provided for the Project to satisfy the implementation of the offset bond and rehabilitation bond.*	Section 6

Aspect Number	Comment from Government Department	Comment from UHH	MP Section Reference
DPIE – R8	**Condition 32(c) of Schedule 3** – This condition requires the employment of suitably qualified experts to verify of cost calculations to the satisfaction of the Secretary. Providing consultants' names and stating that they have past experience does not satisfy this condition. Please provide evidence that the Secretary is satisfied with, and approved, these consultants.	This will be provided following the submission of this report. Noting this is not required until *"Within 6 months of the date of approval of the Biodiversity and Rehabilitation Management Plan"*	Section 5.9
DPIE – R9	**Condition 32(g) of Schedule 3** – The response to the request made in the Review conducted by Sarah Clibborn dated 16 July 2020 does not address the requirement of the condition. Please provide more information in Section 8 as previously requested.	This is a typo from DPIE. This condition actually refers to Schedule 5 Condition 2 g) – minor change required. It has been changed to incident/non – compliance response.	Section 8.3.

DPHI Feedback and Response to 15 January 2021 Comments

DPIE comments on 15th January 2021		
Comment	**Response**	**Section Covered**
• Condition 29, Schedule 3 – the response is to this condition remains inadequate. The condition states that the Applicant must rehabilitate the site to the satisfaction of the Secretary, and that this rehabilitation must be generally consistent with the EIS:	UHH disagree with this query. The Draft BRMP has been prepared under Condition 31 for the first 3 year period following commencement of operations. *Condition 29 Rehabilitation Objectives* concerns **final** rehabilitation of site. There is no question of rehabilitating the site with UHH committed to this. It should also be noted that there is Rehabilitation Bond under Condition 32. Final rehabilitation will be completed at site. It is just unlikely to occur in the first 3 years due to quarry planning as well as the benches still being required for access. The benches will likely not be fully formed at Year 3.	Table 2 amended. *Rehabilitation actions over the next 3 years in Section 5.2 will contribute to the objectives of the condition.*
O The wording "There are two areas where progressive rehabilitation could be possible" does not address the requirements of the condition. Rehabilitation must be possible and must be carried out.	UHH Agree. See amended wording that hydromulching will be undertaken in areas. It should be noted that benches will not be left unrehabilitated at closure.	Table 6: DPIE R1 amended. DPIE R3 amended. Section 5.2 amended.
O The statement that "once a bench is not required for operations the site will complete a risk assessment to assess whether rehabilitation of benches can be completed" also does not satisfy the condition and is not an acceptable approach. The Applicant must rehabilitate the site. The quarry should be designed with final rehabilitation in mind, and therefore, the aim should be to create benches that are safe to rehabilitate.	UHH Agree. *Rehabilitation* is defined by the consent "*The restoration of land disturbed by the development to a good condition and for the purpose of establishing a* ***safe, stable*** *and non-polluting environment".* Wording now states: *Once a bench is no longer required for extraction or operations, it is to be made safe*	Section 5.2 amended.
• Condition 30, Schedule 3 states that the Applicant must rehabilitate the site progressively. Stating that there are "two areas where progressive rehabilitation could be possible" and then stating that "the site will complete a risk assessment to assess whether rehabilitation of benches can be completed" does not satisfy this condition. It is understood that final rehabilitation will not occur in the near future, however, this condition does not refer to final rehabilitation. It instead refers to ongoing, progressive rehabilitation aimed at minimising the	Partly agree. Condition 30 **also** contains the terms *reasonably practicable* and *reasonable and feasible.* *Reasonable* is defined in the consent. *"Reasonable relates to the application of judgement in arriving at a decision, taking into account: mitigation benefits,*	Section 5.2 amended.

DPIE comments on 15th January 2021		
Comment	**Response**	**Section Covered**
total area exposed and therefore minimising the potential for dust generation during operation (throughout the life of the quarry, not just at closure). Hydromulching exposed areas and benches and/or establishing/maintaining vegetative cover is an example of acceptable temporary, progressive rehabilitation that will aid in minimising dust emissions from the site. This condition also notes that it is accepted that "parts of the site that are progressively rehabilitated may be subject to further disturbance in future." The progressive rehabilitation, and final rehabilitation should be consistent with Appendix 6 of the development consent.	*cost of mitigation versus benefits provided, community views and the nature and extent of potential improvements."* Final rehabilitation is not yet considered in detail as BRMP is for next 3 years. Final rehabilitation will be completed at site. It is just unlikely to occur in the first 3 yrs due to quarry planning as well as the benches still being required for access.	
• Suggest removal of phrases throughout the document including "where practical' and "could be possible" and replace with phrases such as "will be carried out".	Agree. There is however one line that remains under Section 5.2.2. *Where practical, topsoil will be direct-returned to disturbed areas available for revegetation during the construction of Phase 1 and 2 of the Quarry.*	Edits made throughout under track changes.
• Suggest changing Section 5.7. The condition requires the following: *Condition 31, Schedule 3 – The Applicant must prepare a Biodiversity and Rehabilitation Management Plan for the development to the satisfaction of the Secretary. This plan must:* *g. include a **detailed description of the measures that would 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:* *• **establishing vegetation screening** to minimise the visual impacts of the site on surrounding receivers;*	UHH believe that activities proposed for the next three years are covered are Section 5	Section 5
The key words for the condition are in bold above. The condition requires inclusion of a detailed description of measures/ procedures to be implemented over the next 3 years for establishing a vegetation screen. To state that there is no vegetation screening proposed at all for the project under any circumstance, and that the project is "justifiably non-compliant" is not an appropriate response. This condition could be satisfied simply by stating that there are no plans to establish vegetation screening during the first 3 years of the project as there is no operation to screen at this stage. However, should the need to screen the operation arise in the future (as a result of impacts to sensitive visual receivers), detailed procedures would be developed and implemented.	**Vegetation Screening** Section 5.7 has been updated in the August 2021 updated BRMP: *Section 6.13 of the EIS assessed the visual impacts of the proposed quarry as low and hence did not identify required mitigation measures. Page 135 of the EIS states "The proposed quarry would only be visible from a very limited number of areas because of topography and vegetation. These areas are located to the west and northwest of the site, but not from any residences. At any offsite public or private location where the proposed quarry is visible, the distance to the quarry and the small percentage of the quarry in the field of view suggest the visual impact would be very low".* *If in the event, a receiver (identified in the EIS) were to identify they are visually impacted by the quarry operations*	Section 5.7

DPIE comments on 15th January 2021		
Comment	**Response**	**Section Covered**
	area, the quarry operator would consult with the resident and DPIE to discuss if there is a need for mitigation measures. *If vegetation screening was required, tube stock planting would be completed using appropriate species associated with PCT 905.*	
• Regarding the integration of Rehabilitation and the Biodiversity Offset, Condition 31 (d), Schedule 3 requests that the applicant 'describe how the implementation of the Biodiversity Offset Strategy would be integrated with the overall rehabilitation of the site'. Section 5.10 of the BRMP notes that "There is bushland between the Project Application Area and the proposed biodiversity offset area, with this assisting with the movement of fauna between the two areas". More information is required regarding the management practices that will be utilised to ensure that this corridor is maintained, enhanced and protected to enable integration between rehabilitated areas and the biodiversity offset.	Section 5.10 now states: *Key learnings from inspections and monitoring of offset areas will assist informing future rehabilitation practices with the objective that the final rehabilitation areas have or are beginning to have, floristic characteristics similar to Plant Community 905 in the offset area.* Section 4.2 has been edited in the August 2021 review. This section now states: *For the purposes of this BRMP, remnant vegetation and habitat on site concerns land outside of and to the north, east and south of the extraction area and within the development consent boundary and vegetation outside of the haul road footprint in Figure 2 (derived from Appendix 2 of Development Consent). If remnant vegetation and habitat is not disturbed by the development it does not require rehabilitation.* *Key species found within the offset area will be used in the rehabilitation seed mix for Dolwendee Quarry which will be consistent with PCT 905. Once rehabilitation is established the rehabilitation and offset areas will be managed concurrently for land management (including pest and weed management). Pest and weed management would also be undertaken in areas of remnant vegetation onsite.*	Section 4.2 and Section 5.10
• Section 8.3 states that 'There are no specific development consent conditions relating to the reporting of non-compliances'. This is incorrect. Condition 2(g), Schedule 5 requires that:	Agreed. Section amended.	Section 8.3
'The Applicant must ensure that the management plans required under this consent are prepared in accordance with any relevant guidelines and include:	Noted.	
(g) a protocol for managing and reporting any:		
□ non-compliances with statutory requirements'		
The Annual Review must also report on details of non-compliances as outlined in condition 9 (c), Schedule 5.	Noted.	

DPIE comments on 15th January 2021		
Comment	**Response**	**Section Covered**
• In response to BCD – R9, it is indicated that an ecological baseline survey will be completed in the offset prior to quarry commencement and then monitoring will be completed every 5 years. This has also been added to Section 7, however Section 8 suggests that biodiversity monitoring results will be provided in the Annual Review document. Section 5.4 also suggests that pest species will be monitored and reported annually as part of general biodiversity monitoring. A 5 yearly monitoring regime is inadequate and too infrequent for this stage of the project. Biodiversity monitoring should be conducted annually and across all seasons.	Monitoring is now proposed every two years. Section 7.1 states: *Following the completion of the ecological baseline survey, UHH will undertake formal ecological monitoring every two years. In the intervening years, the site manager will qualitatively monitor the progress, area and status of temporary and permanent rehabilitation areas in the annual report under Schedule 5 Condition 9.*	Section 7.1
• Ensure all recommendations from BCD's review have been adequately addressed. For example, the response to BCD – R3 still does not demonstrate integration of rehabilitation and the Biodiversity Offset (see comments regarding condition 31(d), Schedule 3), and the figures referred to in BCD – R13 are still grainy and difficult to read even though they have been reinserted as JPEG files.	Disagree – refer to response to Condition 31(d). Disagree - BCD comments may be true but DPIE did not raise this issue prior. Consent doesn't require final BRMP to be submitted to BCD. Regardless, clear figure attached.	Figure 3 reinserted.