

OFFSET IMPLEMENTATION PLAN THREE

OFFSET 3A – TARGETTED ECOLOGICAL RESTORATION
OFFSET 3B – STRATEGIC RESTORATION

WORSLEY MINE EXPANSION - REVISED PROPOSAL
(EPBC 2019/8437)

WORSLEY ALUMINA (ABN 58 008 905 155)

DATE: MARCH 2024 VERSION: 1.0

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1 DECLARATION OF ACCURACY

I declare that:

1. To the best of my knowledge, all the information contained in or accompanying this Management Plan for South32 Worsley Alumina Offset Implementation Plan 1 is complete, current and correct.
2. I am the designated proponent or the approval holder for this action.
3. I am aware that:
 - a. Section 490 of the Environment Protection and Biodiversity Conservation Act 1999 (Cth) (EPBC Act) makes it an offence for an approval holder to provide information in response to an approval condition where the person is reckless as to whether the information is false or misleading.
 - b. Section 491 of the EPBC Act makes it an offence for a person to provide information or documents to specified persons who are known by the person to be performing a duty or carrying out a function under the EPBC Act or the Environment Protection and Biodiversity Conservation Regulations 2000 (Cth) where the person knows the information or document is false or misleading.
 - c. The above offences are punishable on conviction by imprisonment, a fine or both.

Signed

Full name (please print)

Organisation (please print)

South32 Worsley Alumina Pty Ltd

Insert the title and version number of the plan so that it is clear which is being declared accurate

Date: / /

2 EXECUTIVE SUMMARY

EPBC NUMBER 2019/8437

2.1 PURPOSE

Offset Implementation Plan 3 (OIP#3) has been prepared to support the Biodiversity Offset Plan (BOP) prepared by South32 Worsley Alumina Pty Ltd for the Worsley Mine Expansion – Revised Proposal. The BOP and Environmental Review Document (ERD) have included provision of offsets to benefit the Matters of National Environmental Significance listed below:

- Baudin's black cockatoo (*Zanda baudinii*);
- Carnaby's black cockatoo (*Zanda latirostris*);
- Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*);
- Chuditch (*Dasyurus geoffroi*), and
- Numbat (*Myrmecobius fasciatus*).

OIP#3 also will provide benefits for other MNES and conservation significant species including:

- Red-tailed Phascogale (*Phascogale calura*) (through ecological restoration and connection), and
- Woylie (*Bettongia penicillata ogilbyi*) (through improved connection).
- State conservation significant species (eg Brush Tailed Phascogale, Peregrine Falcon, Southern Brown Bandicoot, Western Brush Wallaby, Western False Pipistrelle)

OIP#3 will introduce the offsets and outline the proposed plans to deliver the conservation benefit required to address the activities' Residual Significant Impact (RSI) on the habitat of the listed Matters of National Environmental Significance. In addition OIP#3 includes a further 3,000ha of offset land which is proposed for landscape scale regional environmental improvements, particularly focusing on connectivity, buffer enhancement of existing remnant vegetation parcels, improvement of degraded land (eg salt effected) and improvements to inland waters.

The objectives for areas of habitat protection and ecological restoration are as follows:

- Protecting and improving the habitat for the following species: Baudins, Carnaby & Forest Red tailed black cockatoos, Chuditch, and Numbat;
- Undertaking ecological restoration in areas of pastures;
- Preserving the existing trees that serve as habitats for the three species of Black Cockatoos;
- Managing and minimising the presence of feral predators within the area;
- Managing and minimising the activity of pigs within the area;
- Managing weeds across the property, and
- Managing the frequency of fires to enhance the development of the habitat for the listed species.

The goals for restoring ecological balance is:

- To see the return of the black cockatoos foraging in the area within 8 years;
- To see the return of the chuditch to the offset within 10 years;
- To see the return of the numbat to the offset within 20 years;
- To create an ecological connection between remnant forest islands and where practical more substantial forest blocks;
- To support an improvement in river/stream surface water quality with appropriate riparian zone restoration, and
- To support an improvement in land quality by targeting areas of degraded land for restoration.

Worsley Alumina retains the optionality to utilise a Biodiversity Offsets Fund to satisfy the outcomes of the remaining offset for any residual significant impact, should one become available.

Table 1: Key Risks and Primary Management Strategies

| Key Risks | Management Strategies |
|---|--|
| Rehabilitated ecosystem fails to develop. | Monitoring program with completion criteria, triggers levels and management actions. |
| Non return of MNES functional habitat | Habitat regeneration plan for areas of existing overstorey trees |
| Non return of MNES functional habitat | Revegetation plan for areas of cleared pasture |
| MNES predation by feral animals | A feral animal control program implementation |
| MNES return is limited / dieback impacting habitat | Hygiene Management Plan implementation |
| Habitat return is limited by competition from weeds | Weed Management Plan implementation |
| Habitat return limited by fire | Fire Management Plan implementation |



3 CONDITIONS OF APPROVAL REFERENCE TABLE

Table 2: Summary of EPBC Act Approval Conditions

| REF | CONDITION | CONDITION REQUIREMENTS | PLAN REF | OIP KEY COMMITMENTS |
|-----|-----------|------------------------|----------|---------------------|
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4 INTRODUCTION

4.1 PURPOSE OF THIS OFFSET IMPLEMENTATION PLAN

OIP#3 has been prepared to support the Biodiversity Offset Plan (BOP) for the Worsley Mine Expansion – Revised Proposal and has been submitted as part of the Revised Proposal. This OIP will describe the offset and outline the plan to deliver the conservation benefit required to address the activities' Residual Significant Impact (RSI) on:

- Baudin's black cockatoo (*Zanda baudinii*)¹;
- Carnaby's black cockatoo (*Zanda latirostris*)¹;
- Forest red-tailed black cockatoo (*Calyptorhynchus banksii naso*);
- Chuditch (*Dasyurus geoffroi*), and
- Numbat (*Myrmecobius fasciatus*).

Benefits for other conservation significant species will also be realised by the offset, in both Offset 3a and 3b including the following MNES species:

- Red-tailed Phascogale (*Phascogale calura*) (through ecological restoration and connection), and
- Woylie (*Bettongia penicillata ogilbyi*) (through improved connection).

4.2 SCOPE

This document has been developed to outline the details of the offset (the detail of the proposed properties has been provided confidentially to the Western Australia and Commonwealth Governments), as well as tasks, timing and responsibilities for the offset.

4.3 OBJECTIVE OF THE OFFSET

4.3.1 Offset 3a

The objectives for areas of restoration are:

- Secure land for ecological restoration and conservation by placing a conservation covenant over the property to protect it from future development;
- Undertaking ecological restoration in areas of pastures;
- Preserving the existing trees that serve as habitats for the three species of Black Cockatoos;
- Managing and minimising the presence of feral predators within the area;
- Managing and minimising the activity of pigs within the area;
- Managing weeds across the property, and
- Managing the frequency of fires to enhance the development of the habitat for the listed species.

The goal for restoring ecological balance:

- To see the return of Black Cockatoos foraging within 8 years;
- To see return of the Chuditch within 10 years;
- To see the return of the Numbat within 20 years, and
- To create ecological connections between remnant native vegetation, with particular focus on connecting forest blocks within the Conservation Estate.

4.3.2 Offset 3b

The goal is to restore ecological balance across the landscape through:

- The creation of ecological connections between remnant forest islands and where practical more substantial forest blocks;
- To support an improvement in river/stream surface water quality with appropriate riparian zone restoration;
- To support an improvement in land quality by targeting areas of degraded land for restoration;
- To support Improvements to Northern Jarrah Forest/Western Wheatbelt vegetation representation, and
- To provide benefits for MNES species and conservation significant species.

4.4 DESCRIPTION OF THE OFFSET

4.4.1 Location, Parcel and Ownership

4.4.1.1 Offset 3a

The proposed offset is made up of multiple properties **owned** (freehold) by Worsley Alumina Joint Venture and located in the Shire of Boddington the Shire of Collie and the Shire of Harvey (Worsley Alumina's potential properties available to satisfy the requirements of this offset include over 7000ha). This information has been provided confidentially to the Western Australia and Commonwealth Government for review, and the specifics for which properties will be utilised will be further developed in accordance with the clearing planned for the second and third mining tranche. This offset identifies suitable land which represents strategic benefit to the ecological restoration and management of habitat for the Baudin's, Carnaby, and Forest Red Tailed Black Cockatoo's and the Chuditch in priority locations within the range of the species. ¹

4.4.1.2 Offset 3b

The proposed offset will be focused on a catchment scale approach surrounding the operational area. As with Offset 3a property identification and development will be in accordance with the clearing planned for the second and third mining tranche.

4.4.2 Proximity to Conservation Reserves

Worsley Alumina's potential properties available to satisfy the requirements of this offset include over 7000ha of land within the Boddington, Collie and Harvey Shires and all of them present an exceptional opportunity to link reserves/state forests within the WA Conservation Estate. Available land includes properties between the Saddleback Timber Reserve and the Dwellingup State Forest, the Marradong Timber Reserve and the Hotham River as well as between the Wellington National Park and the Harris River State Forest. Currently the majority of these properties present an ecological barrier between the reserves, the intent of the offset would be to remove this barrier via ecological restoration.

4.4.3 Mechanism for Protection

Worsley Alumina will place a conservation covenant over agreed properties once they have been confirmed for use as offsets. This covenant will be lodged under the Part IVA of the Soil and Land Conservation Act 1945 (WA).

Worsley Alumina will continue to manage the agreed properties for the purpose of conservation for the period of disturbance. Once completed Worsley Alumina will pursue an agreement with the Department of Biodiversity Conservation Attractions (DBCA) to incorporate the area of these combined Lots into the overall State Conservation Estate. It is expected that the area would be required to meet the requirements of state forest restoration activities currently undertaken by Worsley Alumina for this to be acceptable.

4.5 MATTERS OF NATIONAL ENVIRONMENTAL SIGNIFICANCE

The Matters of National Environmental Significance (MNES) that this offset will address are outlined in Table 3 which includes the remaining hectares of Offset required for the second and third mining tranche (also included is the remaining hectares of offset 3a once the RSI has been fully discharged, as calculated using the Commonwealth calculator).

The calculation of the required offset for the second and third mining tranche (6-10 years and 11-15 years) shows that OIP#3 ecological restoration provides an excess of 90% of the RSI for the Baudin's, Caranby's Forest Red Tail Black Cockatoos, Chuditch, and Numbat.

Commencement of activities in relation to OIP#3 will occur in anticipation of approval and the complete offset (Habitat Protection and Ecological Restoration) will be implemented to counterbalance the first five-year mining tranche.

Table 3 Offset Balance for the Second and Third Mining Tranche against OIP#3 Ecological Restoration.

| Offset and species | Type | BBC | CBC | CHU | FRTBC | QUO | RTPH | WOY | WRTP | NUM |
|---|------------------------|------|------|------|-------|------|------|------|------|------|
| Direct offset 3a (BBC, CBC, FRTBC, CHU) | Ecological Restoration | 1520 | 3678 | 2014 | 3086 | 0 | 0 | 0 | 0 | 1008 |
| REMAINING AREA FOR OIP3 | | 2709 | 551 | 2214 | 1143 | 3283 | 4229 | 4229 | 4229 | 3221 |

Note

¹ Please note the genus name change for Carnaby's and Baudin's cockatoos from *Calyptorhynchus* to *Zanda*.¹

4.6 MANAGEMENT MEASURES TO SEE THE RETURN OF MNES

The various species will be encouraged to return to the offset via the following actions:

See the return of the Black Cockatoos foraging in the areas within eight years through the following actions, in accordance with species fauna profiles (Baudin's DBCA, 2017), (Carnaby's DBCA, 2017), (Forest Red-tailed DBCA, 2017):

- Ecological restoration of pasture with a known food source tree species (eg *Corymbia calophylla*), and
- Protection of existing habitat trees.

See the return of Chuditch (DEC, 2012) and Numbat (DEC, 2017) through the implementation of the various Recovery Plans. This includes:

- Ecological restoration of remanent vegetation (establish lower and mid-storey vegetation under existing remanent trees);
- Ecological restoration of areas of pasture (establish a continuous canopy of native plant lower, mid and canopy species across the offset);
- Provision of habitat log piles;
- Weed control across offset area;
- Feral animal control across offset area, and
- Provide fire management across the offset area to protect the habitat.

4.7 LOCATION GENERAL DESCRIPTION

As locations have not been finalised this information is currently not available. Potential properties have been provided to the regulators.

4.8 VEGETATION DESCRIPTION

Baseline flora assessments will be undertaken to support the selection of appropriate properties for Offset 3.

4.9 FAUNA HABITAT DESCRIPTION

Baseline fauna assessments will be undertaken for any areas proposed as habitat protection for Offset 3.

4.10 METHOD FOR CALCULATING OFFSET SITE SUITABILITY

The suitability of the site as an offset will be assessed using the EPBC Act Offsets Assessments Guide to ensure it meets the requirements of the Department's EPBC Act *Environmental Offsets Policy* (October 2012). The calculation methodology and approach will be as described in the BOP.

To calculate the offset value, the attributes will be confirmed via baseline surveys and applied as outlined in Table 4.

Table 4 Summary attributes utilised in the Offset Calculation

| Attribute | Habitat Protection (including rehabilitation) | Ecological Restoration |
|---|---|--------------------------------------|
| Start Quality of the Offset | 7 | 0 |
| Future Quality without Offset | 6 | 0 |
| Future Quality with Offset | 8 | 6 |
| Time Horizon over which loss is averted | 20 | 20 |
| Time until Ecological Benefit | BBC, CBC, FRTBC: 5 CHU, NUM: 5 | BBC, CBC, FRTBC: 8 CHU 10, NUM 20 |
| Risk of loss without Offset | 13% | 13% |
| Risk of loss with Offset | 0 | 0 |
| Confidence in Result | 90% | 90% |

5 METHODOLOGY

This section describes the management actions and monitoring activities necessary to meet the identified outcomes of the proposed offset area. The actions and management measures proposed are designed to provide positive conservation outcomes for the chuditch, numbat and black cockatoos. This work will also provide an effective ecological linkage between forest blocks and potentially support hydrological improvements to an area with multiple low-lying drainage lines. Conservation actions will also bring an overall improvement in the condition and quality of a wide range of native species present within the offset area.

It must be noted that this plan is preliminary and has been provided to indicate the process for implementing Offset 3. The plan will require resubmission once the properties have been identified and the plan will require endorsement by both the State and Commonwealth Ministers.

5.1 ACTION PLAN

5.1.1 Land Management Activities

In line with other proposed OIP's the following land management and restoration activities will be undertaken to ensure the property is suitably prepared and that restoration will provide an improvement to the habitat values for the species identified to benefit from this proposed offset.

The following activities will be undertaken in line with planning of Mining Tranche Two and Three:

- Destocking – removal of all livestock from the property allowing for access agreements to expire;
- Improvement/replacement of boundary fencing to prevent stock from entering from adjacent properties. Signs will be placed on all access gates and at strategic locations on the boundary fence to indicate the property is being managed for conservation;
- Maintenance/construction of fire breaks;
- Identification of any contaminated sites and planning for appropriate removal or restoration;
- Weed management (for land preparation and fire risk minimization) – a weed survey will be undertaken to determine the presence of noxious weeds, resulting in appropriate mapping and weed management plan;
- Disease Mapping and development of a hygiene management plan;
- Baseline fauna and feral species monitoring will be undertaken and repeated in accordance with the existing monitoring program undertaken by Worsley Alumina using existing (or newly established) forest control plot, and
- Feral animal control will involve baiting the property six times per year with 1080. This will be completed under contract with DBCA's existing Western Shield Program. Alternative control measures (Felixer Grooming Trap) will also be trialled.

5.1.2 Restoration and Revegetation Planning and Design

Once Land Management activities have been completed baseline surveys, land assessment and mapping of restoration units (including remnant vegetation) will be undertaken. The definition of the restoration units will assist in determining species composition, seed/seedling rates, and any specific management actions associated with establishing the required vegetation and habitat. Seed and seedlings for this work will be sourced from the relevant provenance zone and will be consistent with regional vegetation.

Restoration activities will commence in line with the disturbance from Mining Tranche Two and Three and will likely include:

- Targeted restoration within stands of remnant vegetation through natural regeneration following destocking (initially spontaneous regeneration). Where regeneration is not successful in line with established criteria for understory supplementary seeding or planting (facilitated regeneration) will be carried out;
- Installation of appropriate structures to improve habitat value (including but not limited to nest boxes and habitat piles); will be determined as per the Worsley Alumina Biodiversity and Forest Management Plan, and
- Any required restoration earthworks and planting will be undertaken by suitably experienced restoration contractors and supervised appropriately by Worsley Alumina or a select third-party contractor/consultant. The timing of works will be dependent on seasonal requirements and will be completed in line with existing, well-proven techniques currently employed at BBM.

Restoration activities, in areas of open pasture, will commence in a similar time period and will be primarily based on mine rehabilitation techniques currently employed at BBM and documented in the Biodiversity and Forest Management Plan (BFMP) including:

- Targeted weed control;

- Installation of habitat structures as required;
- Preparation of area for seeding and planting, and
- Seeding and planting.

Worsley commits to developing a site-specific restoration plan which includes targeted restoration for a stable productive forest ecosystem, to maintain conservation and nominated forest values as is appropriate to the soil and landform types of the property, prior to commencing any ecological restoration works..

Worsley commits to the development of individual management plans for control of feral fauna species, weeds, fire and disease within 24 months of acceptance of the OIP.

5.1.3 Monitoring, Completion Criteria and Trigger Levels

Monitoring of the offset properties will be incorporated into the Worsley Alumina annual monitoring program. Monitoring in this program is undertaken to capture periods representative of Initial Establishment (> 2 years), Successful Establishment (>2 - < 10 years), Ecosystem Resilience (> 10 years) and Rehabilitation Closure (> 12 years).

Mattiske (2016) undertook a review of the previously collected mine rehabilitation data back to 1985 to develop the existing DRAFT Completion Criteria which DBCA is currently reviewing. During 2021 these draft completion criteria and metrics were assessed for their relevance against the Western Australian Biodiversity and Science Institute (WABSI) Completion Criteria Framework (2021) as endorsed by the WA Department of Mines, Industry Regulation and Safety (DMIRS) (Young, et al., 2019). The report considered the key components and principles of the WABSI Framework and discussed them in relation to the draft Worsley criteria. The review identified strong links to the Framework with principles and objectives linked to already agreed stakeholder-reviewed documents and standards. Apart from specific examples for improvements within the metrics of the draft criteria, 'the Worsley completion criteria appear to be suitable and to generally align well with the Framework' (Stantec, 2021).

The monitoring program with completion criteria, trigger levels and management actions are listed in Table 5.

Photo monitoring points will be established to monitor restoration works as well as remnant vegetation areas, photos will be taken annually to provide baseline and ongoing imagery, including:

- GPS location of the photo point;
- Date, time and number of the photo, and
- Direction in which the photo was taken.

Table 5: Monitoring Program, with Associated Completion Criteria, Trigger Levels and Management Actions.

| Period | Monitoring Program | Completion Criteria | Trigger Levels | Management Actions |
|------------------------------------|--|---|-------------------------------|---|
| Initial Growth (> 2 Years) | Native legume density (m ²) | > 1 | < 1 | Supplementary Seeding or Planting will occur |
| | Tree stems per ha | 600 | <500 or > 700 | < 500 Supplementary Planting / > 700 thinning |
| | Native Non-Legume Density (m ²) | 1 | < 1 | Supplementary Seeding or Planting will occur |
| | Average native plant density (m ²) | 3 | < 3 | Supplementary Seeding or Planting will occur |
| | Weed density (per m ²) | < 5 | > 5 | Target weed management for area / repeated annually until resolved |
| | Declared Weed Density (m ²) | 0 | > 0 | Target weed management for area / repeated annually until resolved |
| Successful Est (>2 - <10 Years) | Density of Native Plants (0.1 ha) | 1000 | > 1000 | Supplementary Planting will occur |
| | Landform Stability | Gullies < 50cm in depth Area > 100m ² in extent | > 50 cm >100m ² | Repair with appropriate earth moving equipment on an as needs basis |
| | Native Plant Species Richness | ≥ 40 native species / 80 m ² | 25 | Supplementary Seeding or Planting will occur |
| | Native plant Foliar Cover | ≥ 40% foliar cover | ≥ 30% | Supplementary Seeding or Planting will occur |

| Period | Monitoring Program | Completion Criteria | Tigger Levels | Management Actions |
|------------------------------------|---|--|---------------|--|
| Ecosystem Resilience (>10 Years) | Overstorey Density | > 200 tree/ha | < 200 | Supplementary Seeding or Planting will occur |
| | Declared Weeds | 0 | > 0 | Target weed management for area / repeated annually until resolved |
| | Average weed foliar cover | < 2% | > 2% | Target weed management for area / repeated annually until resolved |
| | Understorey Composition | > 35% | < 35% | Supplementary Planting will occur in consultation with DBCA |
| | Overstorey Density (stems/ha) | > 200 trees/ha | < 200 | Supplementary Planting will occur in consultation with DBCA |
| Rehab Closure (≥ 12 Years) | Overstorey Density (stems/ha) | > 200 trees/ha | < 200 | Continue to monitor plots on ten year cycle/provision of additional time for system development |
| Triennial Fauna Monitoring Program | Black Cockatoo Annual Field observation (after 8 years) | Evidence of foraging in restoration areas (Chewed Gum Nuts ¹ .) | | Continue annual observations for foraging / assess food resource in area / supplementary planting as required |
| | Chuditch (after 10 years) | Absence/Presence | < 1 | Assess habitat quality / install nest boxes / undertake additional feral animal monitoring and control |
| | Numbats (after 20 years) | Absence/Presence | < 1 | Assess habitat quality / install log habitat structures / undertake additional feral animal monitoring and control |
| | Feral Predators | Occurrence recorded lower than 1 std of observations from adjoining forest reserve | > 1 std | Assess other additional control options for the feral species recorded. |

5.1.4 Risk Management

There is a range of potential risks or situations where completion criteria may not be achieved. The key risk of OIP#3 not succeeding and the MNES not returning to the area relates to poor fire management, high numbers of feral predators, poor vegetation establishment and poor weed control. A list of potential risks associated with completion criteria not being met is provided in Appendix 1, along with corrective actions incorporated into this management plan (Table 1 and Table 5).

5.2 RESPONSIBILITIES FOR LAND MANAGEMENT, RESTORATION, REVEGETATION, MONITORING AND MANAGEMENT RESPONSES.

The management actions listed in Table 6 are solely the responsibility of Worsley Alumina.

5.3 REPORTING AND ADAPTIVE MANAGEMENT

Management activities and monitoring data for OIP#3 will be provided in the Annual Biodiversity Offset Report (ABOR) which will be provided as an appendix to the Annual Environmental Report (AER).

A review of this OIP performance will be completed in conjunction with the proposed BOAG (as defined in the Biodiversity Offset Plan), at a minimum of every five years, or earlier if triggered by completion criteria defined in the Plan. The intent of this review is to facilitate adaptive management and ensure areas of focus are consistent with outcomes for ongoing biodiversity protection and are changing focus areas. This could include (but not be limited to) changes in the status of conservation significant species, outcomes of different research and realignment/collaborative focus with government and industry.

6 ROLES AND RESPONSIBILITIES

Table 6: OIP#3 Roles and Responsibilities

| Role | Responsibility |
|---|--|
| Principal - Environmental Offset | Implementation, monitoring, reviewing and adaptive management of Offset Implementation Plan. |
| Manager Environment, Heritage and Approvals | Providing support and resources for Offset Plan. |
| Vice President Operations Worsley Alumina | Ensure provision of financial support for delivery of the Offset Plan. |

7 REPORTING

7.1 ANNUAL BIODIVERSITY OFFSET REPORT (ABOR)

Progress against this plan will be provided in the Annual Biodiversity Offset Report (ABOR), which will be provided as an appendix to the Annual Environmental Report (AER).

8 OFFSET ACQUITTAL

The offset acquittal process is undertaken using the EPBC Act Offsets assessment guide. The EPBC Act Offsets assessment guide requires the key ecological attributes of the species or ecological community to be quantified.

9 DEFINITIONS, TERMS AND ABBREVIATIONS

| Term | Description |
|----------|---|
| ABOR | Annual Biodiversity Offset Report |
| AER | Annual Environmental Report |
| BBC | Baudin's Black Cockatoo |
| BOAG | Biodiversity Offsets Advisory Group |
| BOP | Biodiversity Offsets Plan |
| CBC | Carnaby's Black Cockatoo |
| CBME | Contingency Bauxite Mining Envelope |
| CHU | Chuditch |
| ERD | Environmental Review Document |
| DAWE | Department of Agriculture, Water and the Environment |
| DBCA | Department of Biodiversity, Conservation and Attractions (WA) |
| DWER | Department of Water and Environmental Regulation |
| EPBC Act | <i>Environmental Protection and Biodiversity Act 1999</i> |
| FRTBC | Forest Red Tailed Black Cockatoo |
| JV | Joint Venture |
| OIP | Offset Implementation Plan |
| QUO | Quokka |
| RTPH | Red Tailed Phascogale |
| SRI | Significant Residual Impact |
| WOY | Woylie |
| WRTP | Western Ringtail Possum |

10 REFERENCES

| | |
|---------|---|
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11 DOCUMENT CONTROL

Reviewer Circulation

| Role | Name | Endorsed | Date |
|---|----------------|----------|------|
| Manager Environment, Heritage and Approvals | Claire Reid | | |
| Manager Planning | Cameron McKean | | |
| Manager Group Planning | Lakhvir Pooni | | |

Approval Circulation

| Role | Name | Approved | Date |
|---------------------------|-----------------|----------|------|
| Vice President Operations | Erwin Schaufler | | |

12 APPENDIX

| Source of Risk (eg: hazard) | Risk Event | Causes / Failures (Direct and Contributing) | Existing Controls | Description of expected harm, injury or loss - list all | Maximum Potential Impact (MPI) | | | Residual Risk Rating | | | | Further Actions (Reduce to ALARP) | Responsible Person | Due Date | Residual Risk Rating | | |
|------------------------------------|---|---|-------------------|--|--------------------------------|-----------------|------|----------------------|-------------|-----|------|--------------------------------------|---|--------------|----------------------|------|------|
| | | | | | Impact Type | Basis of MPI | HSEC | US\$M | Impact Type | Sev | Like | | | | RRR | Sev | like |
| Establishment | fire burns through offset area | no firebreak maintenance | not maintained | fire burns through offset area setting back vegetation development and handover to DBCA | Environment | | L3 | | Environment | 30 | 1 | 30 | Fire breaks maintenance completed / fire management plan implemented | Mike Harwood | 30 | 0.3 | 9 |
| | active erosion across some areas of the offset (minimal veg cover) | bare open areas sheeting off water | none | poor seedling establishment / eroding landscape / not acceptable for inclusion into forest reserve by DBCA | Environment | | L3 | | Environment | 30 | 1 | 30 | Cross ripping of open hardstand areas during seeding | Mike Harwood | 30 | 0.3 | 9 |
| | person/fauna injuries on remanent equipment | remanent equipment left onsite from the previous land uses | none | remanent equipment onsite, area unsafe for person/fauna not acceptable by DBCA for inclusion into Forestry Reserve | Reputation | | L3 | | Reputation | 30 | 1 | 30 | Complete site audit for infrastructure for removal / PM removal and disposal of equipment | Mike Harwood | 30 | 0.03 | 0.9 |
| | stock/kangaroos grazing pressure across offset area | fences poorly maintained or missing | none | limited seedling establishment, poor ongoing vegetation development, not acceptable by DBCA for inclusion into FR | Environment | | L3 | | Environment | 30 | 1 | 30 | A complete audit of fences and organise replacements as required. Complete works before seeding/planting offset | Mike Harwood | 30 | 0.03 | 0.9 |
| | presence of declared weeds | no weed control on site | none | presence of declared weeds in offset is not acceptable by DBCA | Reputation | | L3 | | Reputation | 30 | 1 | 30 | Complete a site audit for declared weeds and organise a control program based on audit results (Mine Rehabilitation Maintenance Procedure (00100865)) | Mike Harwood | 30 | 0.3 | 9 |
| | residual contaminated sites | old farm rubbish dump, old asbestos building, old chemical storage area | none | presence of contaminated sites is not acceptable by DBCA for inclusion into a forest reserve | Environment | | L3 | | Environment | 30 | 1 | 30 | Audit offset for contaminated sites and organise a clean-up program based on these results. | Mike Harwood | 30 | 0.03 | 0.9 |
| | MNES predation by feral animals | no previous control of feral animals onsite | none | offset has limited benefit to MNES due to feral animal predation not acceptable by DBCA | Environment | | L3 | | Environment | 30 | 1 | 30 | Undertake baseline feral animal monitoring for the site and organise a control program based on these results | Mike Harwood | 30 | 1 | 30 |
| | Limited habitat quality for MNES | no habitat piles placed in reconstructed landscape / no artificial fauna habitats installed | none | offset has limited benefit to MNES due to the lack of habitat | Environment | | L3 | | Environment | 30 | 1 | 30 | Before seed and planting, construct appropriate habitat across the offset area | Mike Harwood | 30 | 0.03 | 0.9 |
| | dieback spread across the site through management activities | forest hygiene management plan not completed and implemented | none | dieback spread across the site, limiting the potential to develop suitable vegetation for inclusion in FR | Reputation | | L3 | | Reputation | 30 | 1 | 30 | Undertake dieback assessment of offset and implement Forest Hygiene Management Procedure (001010465) | Mike Harwood | 30 | 0.03 | 0.9 |
| Initial Establishment (> 2 years), | doesn't meet 2-year veg criteria | poor seedling survival (low rainfall) | none | limited seedling establishment, poor ongoing vegetation development, not acceptable by DBCA for inclusion into FR | Environment | | L3 | | Environment | 10 | 1 | 10 | assessment of area and provision of supplementary planting (rehab maintenance procedure) | Mike Harwood | 30 | 0.3 | 9 |
| | stock/kangaroos grazing revegetation | fencing audit and repairs completed before the start of the project | | fence damaged through tree fall; kangaroo burrows under the fence etc | Environment | | L2 | | Environment | 10 | 1 | 10 | inspect fence and repair damage as required, remove animals | Mike Harwood | 3 | 0.1 | 0.3 |
| | disturbance by fire | fire breaks maintained/constructed before work starting / low fuel levels | | fire can not establish in a revegetation area with low ground cover to carry fire / could burn through the regeneration area | Environment | | L2 | | Environment | 10 | 0.1 | 1 | | | | | |
| | competition weed species | weed spraying before seeding | | establishment of weed species in a specific area of rehab, limiting the establishment of seedlings | Reputation | | L3 | | Reputation | 10 | 1 | 10 | increased frequency of weed control maintenance | Mike Harwood | 3 | 0.3 | 0.9 |
| | heavy summer rainfall events cause erosion in the rehabilitated landscape | cross ripping across the landscape before seeding to slow water runoff | | limited erosion in specific locations | Environment | | L3 | | Reputation | 1 | 3 | 3 | repairs to erosion damage with a small excavator etc. Worsley Rehabilitation Maintenance Procedure | Mike Harwood | 1 | 1 | 1 |
| | presence of dieback limits species' survival | assessment of disease risk in the area and implementation of a hygiene management plan | | unexpected spread of dieback in a limited area | Reputation | | L2 | | Reputation | 1 | 0.3 | 0.3 | reassess Hygiene Management Plan for the site / consider species mix with tolerant species | Mike Harwood | 1 | 0.03 | 0.03 |
| | Feral animal predation of MNES increases | The original control program in place | | loss of MNEs species | Environment | | L4 | | Environment | 10 | 1 | 10 | undertake feral animal monitoring engage the professional shooter to undertake specific control of the population | Mike Harwood | 10 | 0.03 | 0.3 |

| Source of Risk (eg: hazard) | Risk Event | Causes / Failures (Direct and Contributing) | Existing Controls | Description of expected harm, injury or loss - list all | Maximum Potential Impact (MPI) | | | Residual Risk Rating | | | | Further Actions (Reduce to ALARP) | Responsible Person | Due Date | Residual Risk Rating | | | |
|---|---|---|---|--|--------------------------------|-----------------|------|----------------------|-------------|-----|------|--------------------------------------|--|--------------|----------------------|-----|------|-----|
| | | | | | Impact Type | Basis of MPI | HSEC | US\$M | Impact Type | Sev | Like | | | | RRR | Sev | like | RRR |
| Successful Establishment (>2 - < 10 years) | doesn't meet 2 - 10 year completion criteria | competition weed species | weed spraying before seeding | establishment of weed species in a specific area of rehab, limiting the establishment of seedlings | Reputation | | L2 | | Reputation | 3 | 0.3 | 0.9 | increased frequency of weed control maintenance | Mike Harwood | | 3 | 0.1 | 0.3 |
| | | Understorey foliar cover doesn't meet CC > 30% | Monitoring and Rehabilitation Maintenance Procedure | limited seedling establishment, poor ongoing vegetation development, not acceptable by DBCA for inclusion into FR | Environment | | L4 | | Environment | 30 | 1 | 30 | assessment of area and provision of supplementary planting | Mike Harwood | | 30 | 0.3 | 9 |
| | | understorey species richness doesn't meet CC > 25/80m² | Monitoring and Rehabilitation Maintenance Procedure | limited seedling establishment, poor ongoing vegetation development, not acceptable by DBCA for inclusion into FR | Environment | | L4 | | Environment | 30 | 1 | 30 | assessment of area and provision of supplementary planting | Mike Harwood | | 30 | 0.3 | 9 |
| | | overstorey stems/ha (200) doesn't meet the specification | Monitoring and Rehabilitation Maintenance Procedure | limited seedling establishment, poor ongoing vegetation development, not acceptable by DBCA for inclusion into FR | Environment | | L4 | | Environment | 30 | 1 | 30 | assessment of area and provision of supplementary planting | Mike Harwood | | 30 | 0.3 | 9 |
| | | heavy summer rainfall events cause erosion in the rehabilitated landscape | Monitoring and Rehabilitation Maintenance Procedure | limited erosion in specific locations | Environment | | L2 | | Environment | 1 | 1 | 1 | repairs to erosion damage with a small excavator etc | Mike Harwood | | 1 | 1 | 1 |
| | | feral animal predation of MNES increases | The original control program in place | loss of MNES species | Environment | | L2 | | Environment | 30 | 1 | 30 | undertake feral animal monitoring engage the professional shooter to undertake specific control of the population | Mike Harwood | | 30 | 0.03 | 0.9 |
| Ecosystem Resilience (> 10 years) | doesn't meet > 10 year completion criteria | Average weed foliar cover (> 2%) | weed spraying before seeding | establishment of weed species in a specific area of rehab, limiting the establishment of seedlings | Reputation | | L2 | | Reputation | 3 | 1 | 3 | increased frequency of weed control maintenance | Mike Harwood | | 3 | 1 | 3 |
| | | Understorey Composition (< 35%) | previous monitoring | limited seedling establishment, poor ongoing vegetation development, not acceptable by DBCA for inclusion into FR | Environment | | L4 | | Environment | 30 | 1 | 30 | assessment of area and provision of supplementary planting | Mike Harwood | | 30 | 0.3 | 9 |
| | | Overstorey Density (200 stems/ha) | previous monitoring | limited seedling establishment, poor ongoing vegetation development, not acceptable by DBCA for inclusion into FR | Environment | | L4 | | Environment | 30 | 1 | 30 | assessment of area and provision of supplementary planting | Mike Harwood | | 30 | 0.3 | 9 |
| | | heavy summer rainfall events cause erosion in the rehabilitated landscape | established vegetation and litter cover over the ground | limited erosion in specific locations | Reputation | | L2 | | Reputation | 1 | 1 | 1 | repairs to erosion damage with a small excavator etc | Mike Harwood | | 1 | 1 | 1 |
| | | feral animal predation of MNES increases | The original control program in place | loss of MNES species | Environment | | L3 | | Environment | 30 | 1 | 30 | undertake feral animal monitoring engage the professional shooter to undertake specific control of the population | Mike Harwood | | 30 | 0.03 | 0.9 |
| | | fire in the rehabilitation/revegetation system | The fire management plan, fire breaks, DBCA working relationship, cross-operational fire response arrangements with DFES and Newmont Mining | loss of veg and habitat | Environment | | L3 | | Environment | 10 | 1 | 10 | The fire management plan, fire breaks, DBCA working relationship, cross-operational fire response arrangements with DFES and Newmont Mining | Mike Harwood | | 10 | 1 | 10 |
| Rehabilitation Closure (> 12 years). | doesn't meet > 12 year completion criteria | overstorey density (200 stems/ha) | none | limited seedling establishment, poor ongoing vegetation development, not acceptable by DBCA for inclusion into FR | Reputation | | L3 | | Environment | 10 | 3 | 30 | assessment of area and provision of supplementary planting | Mike Harwood | | 30 | 0.3 | 9 |
| | | fire in the rehabilitation/revegetation system | The fire management plan, fire breaks, DBCA working relationship, cross-operational fire response arrangements with DFES and Newmont Mining | loss of veg and habitat | Environment | | L3 | | Environment | 10 | 1 | 10 | The fire management plan, fire breaks, DBCA working relationship, cross-operational fire response arrangements with DFES and Newmont Mining | Mike Harwood | | 10 | 1 | 10 |