Australian Government
Department of Climate Change, Energy, the Environment and Water

EPBC ref: 2015/7436

Ms Tanya Perry
Head of Sustainability and Environment
Arafura Rare Earths Limited
tperry@arultd.com

**Approval of variation of conditions and Biodiversity Management Plan for Nolans Rare Earth Project, 135 km North-West of Alice Springs, Northern Territory**

Dear Ms Perry,

Thank you for your correspondence dated 25 March 2024 to the department requesting variation of conditions attached to the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) approval 2015/7436, dated 11 May 2018. Thank you also for your correspondence dated 17 May 2024 to the department requesting approval of the Biodiversity Management Plan in accordance with condition 5 of the approval.

Officers of this department have reviewed the variation request. As delegate of the Minister for the Environment and Water, I have varied the conditions and Attachments attached to EPBC Act approval 2015/7436 under section 143(1)(c) of the EPBC Act. The action must now be taken in accordance with the varied conditions specified in the variation notification, which has been attached for your information.

I note the 25 March 2024 variation request also sought the addition of new tenements to the approved project area to accommodate an explosives magazine, gravel borrow pits, and additional access points associated with the approved activity. As advised by officers of this department, the proposed additional tenements were not considered to be within scope of the approved action and therefore, could not be considered as part of a variation. As such the requested additional tenements were not contemplated and have not been approved.

Officers of this department have advised me on the Biodiversity Management Plan (Rev 4.0, 17 May 2024) and the requirements of the conditions of the approval for this project. On this basis, and as a delegate of the Minister for the Environment and Water, I have decided to approve the Biodiversity Management Plan (Rev 4.0, 17 May 2024). This plan must now be implemented.

As you are aware, the department has an active monitoring program which includes monitoring inspections, desk top document reviews and audits. Please ensure that you maintain accurate records of all activities associated with, or relevant to, the conditions of approval so that they can be made available to the department on request.

Should you require any further information please contact Thomas Sands by email to PostApproval@dcceew.gov.au.

Yours sincerely

Rachel Short
Branch Head,
Environment Assessments (Vic and Tas) and Post Approvals Branch
Nature Positive Regulation Division

24 October 2024

Attachment A: Variation of conditions

# BIODIVERSITY MANAGEMENT PLAN

| | |
|---|---|
| Document No: | ARMS-0000-H-PLN-N-0002 Rev 4.0 |
| Project Name: | Nolans Rare Earths |
| Date of Plan: | 17 May 2024 |
| EPBC Approval: | EPBC 2015/7436 |
| Proponent: | Arafura Nolans Project Pty Ltd<br>(ABN: 88 118 158 900) |
| Proposed Action: | To construct and operate an open pit rare earths mine, intermediate processing facility using a phosphoric acid pre-leach process and associated support infrastructure, approximately 135 km north-west of Alice Springs, Northern Territory. |

## REVISION HISTORY

| Date | Revision | Description | Prepared | Reviewed | Approved |
|---|---|---|---|---|---|
| 17/05/2024 | Rev 4.0 | Issue for Use from DCCEEW comments | T. Ewers-Reilly EcOz Environmental Consultants | T. Perry Head of Sustainability and Environment | T. Perry Head of Sustainability and Environment |
| 08/04/2023 | Rev 3.0 | Issue for Use from DCCEEW comments | T. Ewers-Reilly EcOz Environmental Consultants | Y. Smythe McGuinness S. Environmental Scientist | T. Perry Head of Sustainability and Environment |
| 04/10/2023 | Rev 2.1 | Issue for Use from DCCEEW comments | T. Ewers-Reilly EcOz Environmental Consultants | M. Robinson ESG Manager | M. Robinson ESG Manager |
| 17/04/2023 | Rev 2 | Issue for Use from DCCEEW comments | T. Ewers-Reilly EcOz Environmental Consultants | M. Robinson ESG Manager | S.Watkins GM Projects |
| 01/07/2022 | Rev 1 | Issue for Use | M. Robinson ESG Manager | M. Robinson ESG Manager | S.Watkins GM Projects |
| 23/07/2021 | Rev 0 | Issue for Use | M. Robinson ESG Manager | B.Fowler GM NT & Sustainability | S.Watkins GM Projects |

## DECLARATION OF ACCURACY

In making this declaration, I am aware that section 491 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) makes it an offence in certain circumstances to knowingly provide false or misleading information or documents to specified persons who are known to be performing a duty or carrying out a function under the EPBC Act or the *Environment Protection and Biodiversity Conservation Regulations 2000* (Cth). The offence is punishable on conviction by imprisonment or a fine, or both. I am authorised to bind the approval holder to this declaration and that I have no knowledge of that authorisation being revoked at the time of making this declaration.

Signed 

Full name (please print) DARRYL CUZZUBBO

Organisation (please print) Arafura Rare Earths Limited

Date 17 / 05 / 2024

## TABLE OF CONTENTS

## INDEX OF FIGURES



## INDEX OF TABLES

# 1.0 INTRODUCTION

Arafura Rare Earths Limited (Arafura, the Company) proposes to develop and operate the Nolans Rare Earth Project (Nolans, or the Project), a rare earth mining and processing operation located approximately 135 km north-northwest of Alice Springs in the Northern Territory (NT). The Project is situated approximately 10 km west of Aileron Roadhouse and comprises four main areas – mine site, processing facility, accommodation village and a borefield (Figure 3-1).

## 1.1 Purpose

The purpose of the Biodiversity Management Plan (BMP or the Plan) is to provide a framework for the Project that will ultimately identify, mitigate and monitor potential biodiversity impacts.

This document and its subsequent revisions form part of the Nolans Mining Management Plan (MMP), which supports Mining Authorisation 1127 granted under Part 4 Division 2 of the *Mining Management Act 2001*.

All referenced company policies, standards, registers, operational procedures, activity specific documents, forms and templates are stored and can be accessed from within the Arafura Resources Management System (ARMS).

To manage biodiversity impacts the Company has adopted the following approach:

- Identify the legal commitments related to biodiversity management.
- Describe the existing environment of the Project area.
- Understand the potential risks imposed by the Project on biodiversity values.
- Identify the key biodiversity objectives of the Project.
- Describe monitoring, measurement, trigger points and reporting requirements.
- Provide an action plan for biodiversity management for the reporting period.

The BMP was developed prior to disturbance activities occurring and implemented during the pre-construction phase of the Project. It is intended that the plan is adaptive and will be maintained throughout the construction (2023-2025), operations (38 years) and closure phases of the Project.

A full description of the Project is referenced in the Nolans MMP.

# 2.0 MANAGEMENT FRAMEWORK

## 2.1 Approvals and Legislation

This BMP has been developed to facilitate compliance with the Northern Territory and Commonwealth legislation. The current regulatory approvals and legislation relevant to biodiversity management are summarised in Table 2 1.

**Table 2-1 Approvals and Legislation**

| Jurisdiction | Legislation | Details |
|---|---|---|
| Northern Territory | *Environment Protection Act 2019* | Administered by the Northern Territory Environment Protection Authority (NT EPA), this Act and subordinate procedures establish the framework for the assessment of potential or anticipated environmental impacts of development.<br>The Nolans Rare Earth Project was assessed at the level of an Environmental Impact Statement (EIS). The Assessment Report was completed by the NT EPA 21 December 2017 (Assessment Report 84).<br>Recommendation 11 of Assessment Report 84 stipulates minimum expectations for the BMP:<br>▪ An identification of potential project impacts and risks, mitigation measures and preventative actions for the protection of biodiversity values and habitat for threatened species.<br>▪ A procedure for pre-clearing surveys for threatened species, including the Great Desert Skink and Central Australian Rock-wallaby (previously known as the Black-footed Rock-wallaby *Petrogale lateralis* MacDonnell Ranges race). Pre-clearing surveys will also target Brush-tailed Mulgara *Dasycercus blythi*.<br>(Note that this species was listed as Vulnerable under the Territory Parks and Wildlife Conservation Act 1976 (TPWC Act) at the time of Project approval, although not listed under the EPBC Act. The species status has since been downgraded to Least Concern under the TPWC Act – refer to Section 3.3.6 for more details) and continues not to be listed under the EPBC Act.<br>▪ The final alignment of the borefield access track, incorporating a buffer of at least 200m around the known previously occupied warren of Great Desert Skink.<br>▪ The scope, standards and timeframes for a flora and fauna monitoring program<br>▪ Procedures for managing fire risk from the Project on habitat for threatened species.<br>▪ Weed hygiene and control procedures for avoiding the introduction and/or spread of weeds into habitat for threatened species.<br>▪ Procedures for avoiding and/or managing the risk of introduced fauna on threatened species.<br>▪ Goals, measures, and criteria for the rehabilitation of habitat for threatened species following the closure and decommissioning of the Project. |
| | *Mining Management Act* (and | Mining operations are regulated by the Mining Management Act.<br>A Mining Authorisation for the Project was provided to Arafura Resources following assessment under the Environmental Assessment Act. Authorisation 1127-01 was granted on 10 November 2022. |

| Jurisdiction | Legislation | Details |
|---|---|---|
| | regulations) *2001* | Arafura submits a Mining Management Plan (MMP) annual report to the NT Department of Industry Tourism and Trade (November 2022) outlining progress against the previous MMP and plans for the upcoming reporting period.<br>No subsequent versions of the MMP have been submitted.<br>The MMP contains the legal commitments pertaining to the mining operation. |
| | Bushfire Management Act 2016 | This Act establishes the framework for the management of fire in rural and regional (non-urban) areas of the Northern Territory for the protection of life, property and the environment.<br>Bushfires NT administers the Act and provide permits for burning within fire management zones and fire protection zones, as required. |
| | *Weeds Management Act 2001* | This Act obligates all land owners and/or occupiers to control and manage weeds on their land. Weeds are categorised under the Act and requirements for their control and management are established under each category. |
| Commonwealth | *Environment Protection and Biodiversity Conservation Act 1999*<br>(EPBC Act) | The Project was assessed and approved with conditions under the *EPBC act* on the 11 May 2018 (EPBC 2015/7436). The approval remains in effect until 31 December 2069.<br>Conditions of the *EPBC Act* in regards to biodiversity management are as follows:<br>▪ **Condition 1:** The approval holder must not clear more than 4530 ha of vegetation within the project area, including no more than:<br>- 267 ha of Central Australian Rock-wallaby habitat<br>- 123 ha of Great Desert Skink habitat<br>- 125 ha of Brush-tailed Mulgara habitat<br>▪ **Condition 5:** To manage the impacts of terrestrial fauna and flora, the approval holder must submit to the Minister for approval, a Biodiversity Management Plan that meets requirements a) to h) of recommendation 11 of Assessment Report 84 (NT EPA, 2018).<br>▪ **Condition 6:** Surveys required under condition 5 of this approval must be undertaken in accordance with survey guidelines and by a suitably qualified expert. Buffers of at least 200 m must be applied to any additional Great Desert Skink warren identified during surveys required under condition 5 of this approval.<br>It is noted that there are several other conditions for the Project, however these are covered in other specific documentation.<br>Ensure that annual compliance reports (and associated independent audit report of compliance) are published as per EPBC conditions. |

## 2.2 Threat Abatement Plans

Under the EPBC Act, threat abatement plans establish a national framework to guide and coordinate Australia's response to key threatening processes. The plans identify research, management and other actions needed to ensure the long-term survival of native species and ecological communities affected by key threatening processes. Threat abatement plans directly relevant to fauna at the Project include:

- Threat Abatement Plan for Predation by European Red Fox – 2008 (https://www.dcceew.gov.au/sites/default/files/documents/tap-fox-report.pdf); and

- Threat Abatement Plan for Predation by Feral Cats – 2015 (https://www.dcceew.gov.au/sites/default/files/documents/tap-predation-feral-cats-2015.pdf).

EPBC listed threatened species considered to be at high risk of predation by feral cats and/or foxes identified for the Project area include the Central Australian Rock-wallaby and Great Desert Skink. Accordingly, monitoring must focus on these threatened species and the threats posed within the broader landscape of the Project.

## 2.3 Related Management Plans

This BMP is one of several management plans that support the Nolans MMP. Together these plans provide the company with an environmental management framework.

Specific management plans relevant to this BMP include:

- Weed Management Plan (Appendix A of MMP)
- Air Quality and Dust Management Plan (Appendix C of MMP)
- Waste Management Plan (Appendix D of MMP)
- Erosion and Sediment Control Plan (Appendix F of MMP)
- Emergency Response Management Plan (Appendix I of MMP)
- Noise, Vibration and Light Management Plan (Appendix J of MMP)
- Water Abstraction Management Plan (Appendix R of MMP)

## 2.4 Reporting

### 2.4.1 Compliance Reporting

Two key environmental legislative reporting items that must be complied with by the Company. A summary of the impacts and findings on biodiversity must be included within these reports as identified in Table 2-2.

**Table 2-2 Compliance Reporting**

| Directive | Summary of Condition | Details to be Provided | Due date |
|---|---|---|---|
| EPBC 2015/7436: Condition 11 | The approval holder must publish a report on their website addressing compliance with each of the conditions of this approval, including implementation of the management plan.<br>Documentary evidence providing proof of the date of publication and non-compliance with any of the conditions of this approval must be provided to the Department at the same time as the compliance report is published. | Additional impacts and risks identified during the reporting year.<br>Results from pre-clearance surveys conducted.<br>Details of any buffers imposed around any Great Desert Skink burrows identified.<br>Details of and summary findings from flora and fauna monitoring programs.<br>Evidence of weed hygiene controls implemented onsite. | Within 3 months of 11 May annually. |

| Directive | Summary of Condition | Details to be Provided | Due date |
|---|---|---|---|
| Mining Authority 1127-01 | The Operator must submit an Environmental Mining Report (EMR) covering environmental performance for the previous 12-month reporting period. | The EMR will be used to report environmental performance to the regulator. Reporting against biodiversity performance is not specified however key outcomes and details of the monitoring programs and events of incident/trigger exceedances should be included. | On or before 1 May annually. |

### 2.4.2 Incident Reporting

Triggers that would initiate a reportable biodiversity related incident have been included within the monitoring programs in Section 4.5 – Internal Ground Disturbance Permitting and Pre-Clearing Surveys.

The triggers are indicative of the minimum level of change accepted by the Company prior to action and investigation being implemented. Although conservative, triggers are also a point where possible environmental harm may be occurring. Subsequently, Arafura consider an exceedance of the trigger a reportable incident and will follow reporting processes under the *Mining Management Act 2001* (the MM Act) accordingly.

Under Section 29 of the MM Act environmental incidents must be reported. An environmental incident is an unplanned event that results in environmental harm. Environmental harm is defined in the MM Act as any harm to, or adverse effect on, the environment; or any potential harm (including the risk of harm and future harm) to or potential adverse effect on the environment, of any degree or duration and includes environmental nuisance. Reporting will be carried out as soon as practicable after the mine site operator becomes aware of the occurrence of an environmental incident. Details of the internal reporting processes are documented within the Arafura Incident/Accident Reporting Form, as referenced within the approved Nolans Project Mine Management Plan (MMP).

## 2.5 Training and Competency

Staff induction and environmental awareness programs are to include reference to biodiversity values of the Project site, with particular emphasis on threatened species, project related hazards and how they will be managed. The site induction is to include the following components for biodiversity management:

- Summary of biodiversity at the Project including ecologically sensitive areas and threatened species.
- Identification of potential impacts to biodiversity from the Project activities.
- Requirement to enter and exit site through recognised vehicle access points, and to travel around site using existing or approved roads and tracks only.
- Requirement for speed restrictions across the Project.
- No vegetation or land clearing / disturbance activities to be undertaken without an approved Ground Disturbance Permit (GDP).

Competent and suitably trained people (whether internal staff or contractors) are to undertake the following:

- Assessment of Ground Disturbance Permit (GDP) applications.
- Vegetation condition surveys.
- Threatened species pre-clearing surveys and monitoring (to be conducted by a suitable qualified expert as per the definition provided in the EPBC approval conditions: a person who has professional qualifications, training, skills and a minimum of ten years demonstrated experience related to the nominated subject matter that can provide an authoritative independent assessment and/or advice on performance relative to the subject matter using the relevant protocols, standards, methods and/or literature).
- Weed pre-clearing surveys and monitoring.
- Weed treatment, including safe handling and use of chemicals.
- Fire management (protection burns and/or maintenance of fire breaks).
- Feral animal control.

Arafura has engaged EcOz Environmental Consultants as the preferred specialists to undertake required ecological surveys and monitoring. EcOz employ a number of staff with diverse expertise that is suited to the ecological assessment and management needs of the Nolans Project.

The lead Ecologist at EcOz for the Nolans Project is Tom Reilly, who has extensive ecological consulting experience in the Northern Territory, extending from the central deserts to the Top End. All ecological work for the Nolans Project is completed under Tom's guidance, and he is responsible for ensuring that relevant EcOz resources are allocated to complete the needs of each defined scope.

See APPENDIX A for a copy of EcOz's capability statement and CV for Tom Reilly.

# 3.0 ENVIRONMENTAL CONTEXT

This section provides background context relevant to management of key biodiversity values of the Project. Information has been prepared using biodiversity information obtained from studies conducted as part of the approvals process.

## 3.1 Previous studies

A summary of baseline investigations relevant to biodiversity is provided in Table 3-1 which focused studies on the mine site, borefield, and surrounding areas where relevant.

**Table 3-1. Summary of baseline flora and fauna studies for the Project**

| Date | Company | Description |
|---|---|---|
| 4 – 7 May 2006 | Low Ecological Services | Flora and fauna survey of mine site only. |
| 21 – 24 November 2006 | Low Ecological Services | Flora and fauna survey of mine site. |
| 16 – 25 August 2010 | GHD | Baseline flora survey of mine site and a proposed haul route (note: haul route no longer included in proposed project footprint). |
| 30 August – 8 September 2010 | GHD | Baseline fauna survey of mine site and a proposed haul route (note: haul route no longer included in proposed project footprint). |
| 6 – 8 December 2011 | GHD | Baseline flora survey of the proposed transport corridor (noting that this transport corridor was abandoned prior to EIS submission). |
| 8 – 9 December 2011 | GHD | Targeted Central Australian Rock-wallaby survey of mine site only. |
| 27 April – 3 May 2015 | GHD | Baseline flora and fauna survey of current study area including mine site, processing site, accommodation facility, access roads, utilities corridor (potable water pipeline, water supply pipeline, power line corridor) and borefield area. |
| 21 – 23 July 2015 | GHD | Targeted survey of the borefield area to detect presence of any threatened species including the Great Desert Skink, Brush-tailed Mulgara and Greater Bilby. |
| 23 – 26 July 2015 | GHD | Targeted surveys for Central Australian Rock-wallaby in the eastern end of the Reynolds Range, Hann Range, Reaphook Hills and outcrops in between. |
| 18 – 19 October 2016 | Desert Wildlife Services | Vegetation survey of Day Creek and associated floodplain<br>(EIS Supplement Appendix 9) |
| 6 May 2022<br>31 August 2022<br>25-28 September 2022<br>13 – 14 October 2022 | Low Ecological services | Threatened species and weed pre-clearance surveys to identify the presence (absence) and location, if present, of threatened fauna, which may occur within and surrounding the Project footprint for early works. |
| February 2023 | Low Ecological services | Revision of the vegetation community mapping produced for the EIS (GHD 2016) to align with current (as of December 2022) project footprint and mineral tenements – which includes extractives areas that are currently under application. |

## 3.2 Vegetation communities

Vegetation communities and associated landforms have been described and mapped for the Project area. Main vegetation groups have been shown in Table 3-2, Table 3-1 and Figure 3-1 (refer to baseline report for more detailed maps) (GHD 2016a; Low Ecological 2022). Baseline surveys indicated there are no threatened ecological communities present within or surrounding the Project area; however, some are considered as sensitive vegetation communities and / or provide suitable habitat for threatened species known to occur in the area (described below).

The mine area comprises of red earth plains, alluvial plains, rocky hills and several moderate sized drainage features (Kerosene Creek and associated tributaries). The red earth plains support a Mulga shrubland over either tussock grassland or spinifex grassland. The alluvial plains support a mixed open woodland over tussock grasses, with the occasional calcareous low rise that supports Senna shrubs. Several rock hills and outcrop areas are present which support an open shrubland of Acacia or mallee (*Eucalyptus spp*.) over spinifex. The larger drainage channels are typically lined with River Red Gum (*Eucalyptus camaldulensis)* over tussock grasses (including the weed Buffel Grass *Cenchrus ciliaris*). Small channels generally do not support River Red Gum.

The process area predominantly comprises of flat red earth plains that support Mulga shrubland / low woodland over tussock grasses. The northern part of the process area comprises of alluvial plains, gravel rises and some isolated low rocky hills.

The camp site is situated on flat alluvial plains and red earth plain that either support a Mulga shrubland or mixed woodland over either tussock grass or spinifex grass. There are some low rocky hills on the eastern side of the camp that support Acacia shrubland over spinifex – these are flanked.

There are several extractive areas located off the main access road, these areas support rocky hills, gravel or rocky rises, alluvial plains and red earth plains. A Coolabah Swamp (V14) is present within one extractive area to the south of the main access road, which is considered as a wetland under the NT *Land Clearing Guidelines* (DEPWS 2021), which is a habitat type that requires protection / management in the NT.

The bore field occurs within an extensive spinifex sandplain (flat to gently undulating) that supports an open shrubland (various species) over spinifex (*Triodia basedowii*). There is local variation in structure and species within this vegetation community, which is mostly likely to be associated with fire regime. Further to the west is the Day Creek alluvial floodplain, which supports low gravel rises (with either Mulga or Witchetty Bush) that transitions into alluvial plain and large drainage channel (Day Creek) lined with River Red Gum. The Day Creek floodplain areas were surveyed (and reported on) separately by Desert Wildlife Services in 2016 as part of the Groundwater Dependent Ecosystem/vegetation assessment as such this information has not been presented in this BMP.

The following communities are considered as significant / important at a regional scale:

- **Riparian woodland (V1)** – considered as a sensitive vegetation type in the NT under the Land Clearing Guidelines (DEPWS 2021). It is mostly present within the mine area associated with Kerosene Creek and its associated tributaries; however, there are small occurrences elsewhere.

- **Coolabah swamp (V14)** – important vegetation type of the Burt bioregion and considered as a wetland under the NT Land Clearing Guidelines. Small swamp located within an extractives area.

The following communities are considered as suitable habitat for threatened species known to occur within, or surrounding, the Project area:

- **Acacia shrubland on rocky outcrops (V7)** – potential habitat for the threatened Central Australian Rock-wallaby
- **Rocky or gravelly gneiss or schist outcrops with no spinifex (V8)** – potential habitat for the threatened Central Australian Rock-wallaby.
- ***Triodia basedowii* hummock (spinifex) grassland on sandplains (V12)** – potential habitat for the threatened Great Desert Skink and the Brush-tailed Mulgara (no longer threatened).

**Table 3-2 Vegetation Community Descriptions**

| | |
|---|---|
| **DRAINAGE FEATURES** | |
| 1 | Riparian woodland along watercourses and drainage channels |
| 10 | Claypans with chenopods and herbs |
| 14 | Coolabah swamp associated with claypans |
| **ALLUVIAL PLAINS** | |
| 3a | Mixed woodland over tussock grasses on alluvial plains |
| 3b | Mixed woodland over spinifex on alluvial plains |
| 3c | Mixed woodland over a highly disturbed understory dominated by Buffel Grass |
| 5 | Hakea / Senna shrubland on calcareous alluvial plains and low rises |
| 11 | Cottonbush chenopod shrubland on highly erodible duplex soils |
| **MULGA SHRUBLANDS / PLAINS** | |
| 2a | Mulga shrubland on sandy red earths over spinifex |
| 2b | Mulga shrubland on sand red earths over tussock grasses |
| 2c | Mulga shrubland on sandy red earths over chenopods |
| **HUMMOCK GRASSLANDS** | |
| 12 | Hummock grassland (*Triodia basedowii*) on sandplains |
| **LOW ROCKY OR GRAVELLY RISES** | |
| 9 | *Acacia kempeana* and/or Mulga shrubland on gravel |
| 13 | Senna shrubland on quartz |
| **ROCKY SLOPES AND OUTCROP** | |
| 6 | Eucalyptus (mallee) / *Acacia kempeana* shrubland over hummock grass (spinifex) on rocky slopes |
| 7 | Acacia shrubland over spinifex on rocky slopes |
| 8 | Acacia / Senna shrubland on rocky gneiss or schist outcrops with no spinifex |

Full vegetation community descriptions are provided in Appendix M – Flora and Vegetation Report of the Nolans Project Environmental Impact Statement (GHD May 2016).

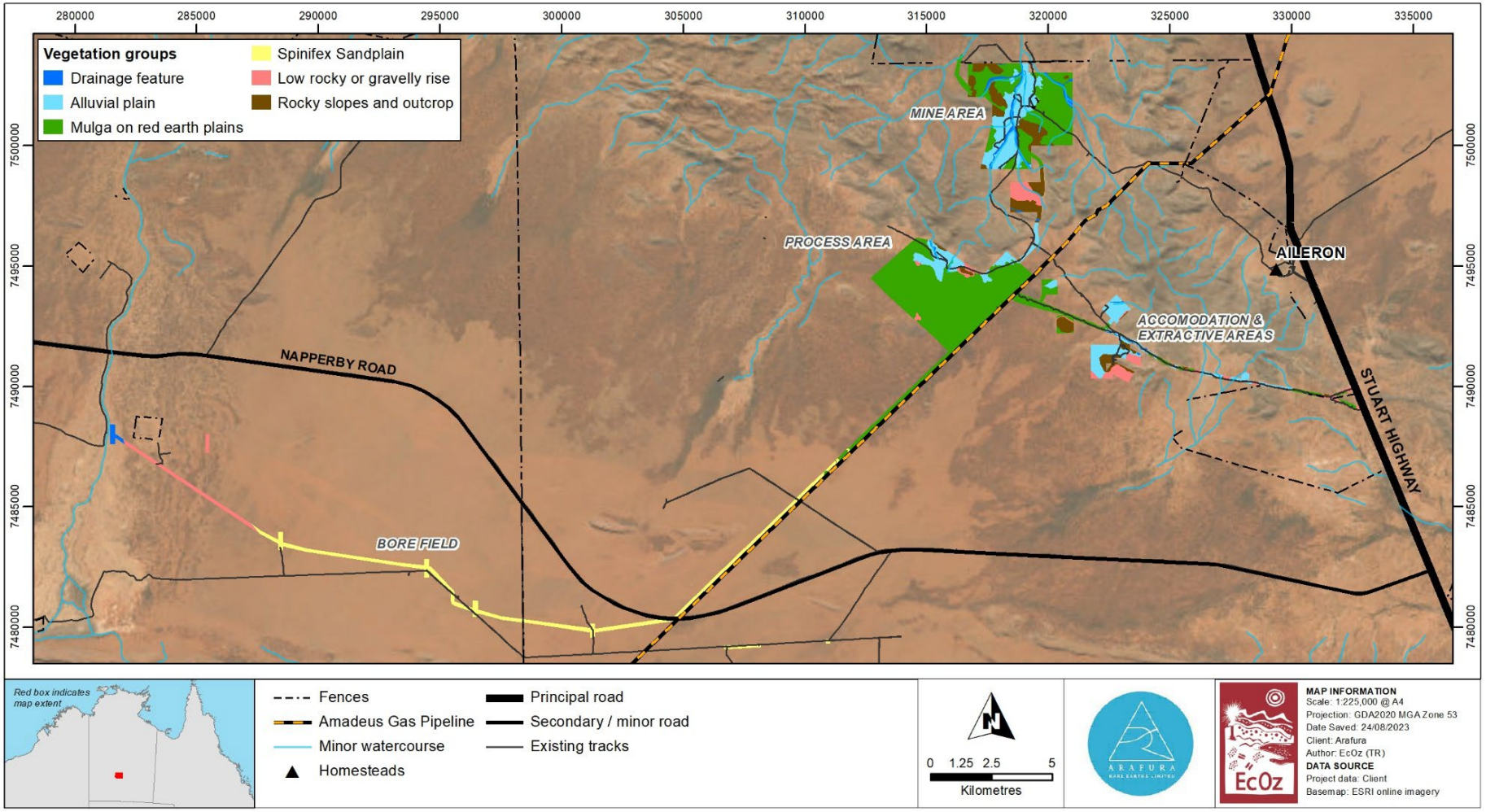


**Figure 3-1 Map of vegetation Landform Groups within the Lease Areas**

## 3.3 Threatened species

A total of 172 native vertebrate fauna species have been recorded during baseline studies for the Project, including 25 mammals, 103 birds, 41 reptiles and three amphibians (GHD 2016b). Of these, two species are currently listed as threatened under EPBC Act and/or TPWC Act and as such there are regulatory requirements as per the EPBC Act approval conditions and EP Act recommendations:

- Central Australian Rock-wallaby (*Petrogale lateralis centralis*) (previously known as the Black-footed Rock-wallaby *Petrogale lateralis* MacDonnell Ranges race) (Vulnerable EPBC Act; Near Threatened TPWC Act)
- Great Desert Skink (*Liopholis kintorei*) (Vulnerable EPBC Act and TPWC Act).

The following threatened species are considered to have potential to occur within or surrounding the Project area, however baseline studies did not record any evidence to suspect species presence:

- Greater Bilby (*Macrotis lagotis*)
- Princess Parrot (*Polytelis alexandrae*)
- Grey Falcon (*Falco hypoleucos*).

The Brush-tailed Mulgara (*Dasycercus blythi*) was included as a threatened species (Vulnerable under the TPWC Act) in the NT EPA Assessment Report 84 and previous EIS approval documents. However, this species is no longer listed as a threatened species under the TPWC Act – it is now considered as Least Concern under the TPWC Act. However, as this species was listed as Vulnerable under the TPWC Act at the time of Project approvals, there are regulatory requirements that will be adhered to (such as habitat clearance threshold of 125 ha), and as such it is included for management within this plan.

A total of 315 native flora species have been recorded during baseline studies for the Project. None are listed as threatened, or require specific conservation management.

### 3.3.1 Central Australian Rock Wallaby (species known to occur within Project area)

The Central Australian Rock-wallaby (*Petrogale lateralis centralis*) is listed a Vulnerable under the EPBC Act (Commonwealth) and Near Threatened under the TPWC Act (Northern Territory). It is a small to moderately sized macropod found in central Australia and is a habitat specialist that occurs in rocky ranges and slopes (Geelen 1999), including areas of outcrop (see Figure 3-2 and Figure 3-3). They shelter during the day in caves and under boulders, where relative humidity is higher and air temperatures cooler. They emerge in the later afternoon / early evening to feed. They may bask in the sun during the early morning following a cold night (NRETAS 2006).

Major threats include predation by introduced species (fox and cat) and to a lesser extent native species (Dingo) (NRETAS 2006; Read and Ward 2011). Habitat degradation caused by changed fire regimes and grazing by introduced herbivores are also a key threat to this species (NRETAS 2006; Read and Ward 2011). With their specific habitat requirements, the species can be limited in their ability to disperse.

Targeted surveys in 2010, 2011 and 2015 confirmed that Central Australian Rock-wallaby inhabits rocky ranges and hills located within the Project area (GHD 2016b). Suitable habitat within the Project area is shown on Figure 3-4**.** Survey data, and NT Atlas records, indicates that the species is widespread within the surrounding ranges and hills.

Most areas where Central Australian Rock-wallaby were recorded are not within the Project footprint or associated infrastructure corridors, with very few records within 2 km from the mine site area. Therefore, direct impacts from the mine are expected to be minimal. However, potential for indirect impacts on the population in the broader area arise with increased wildfire events and introduced predators – and as such management measures will be implemented to minimise these effects.

**Figure 3-2 Photograph of Central Australian Rock Wallaby (taken at Finke Gorge National Park)**

**Figure 3-3 Photograph of indicative habitat for Central Australian Rock Wallaby**

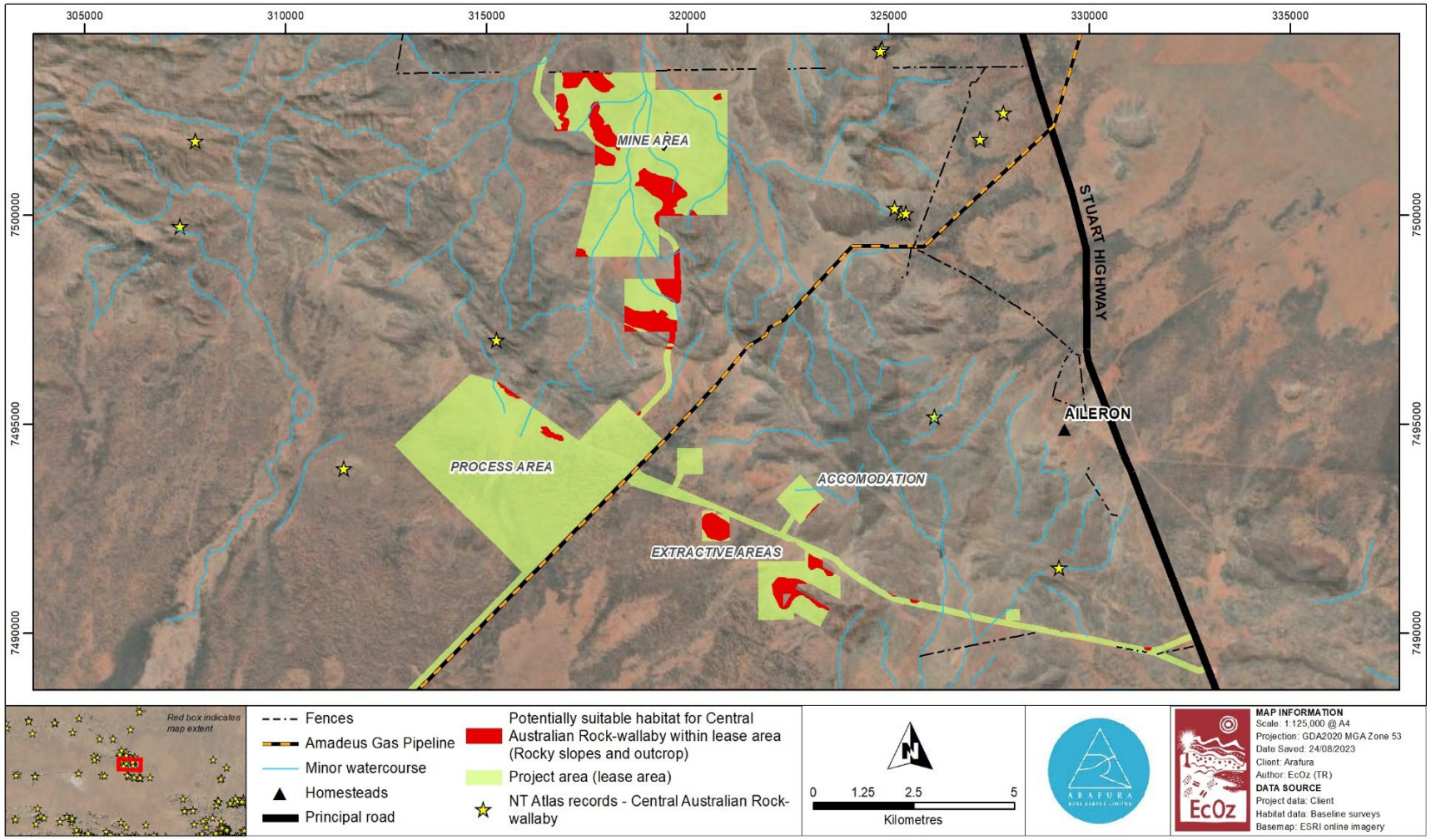


**Figure 3-4 Map of suitable habitat for Central Australian Rock Wallaby within Project Area**

### 3.3.2 Great Desert Skink (species known to occur within Project area)

The Great Desert Skink (*Liopholis kintorei*) is listed as Vulnerable under the EPBC Act (Commonwealth) and the TPWC Act (Northern Territory). The Great Desert Skink is a large burrowing skink that occurs in sandplain and dune swales that support hummock grassland and scattered shrubs / trees, and a low fire impacted vegetation community (McAlphin 2001; McAlpin et al. 2011). They construct communal burrow systems (also referred to as warrens) that can have 5 to 10 entrances and support up to 10 individuals. Each burrow system has at least one latrine located at the surface, where animals defecate over an area of 1 to 3 $m^2$. Camera trap photograph from baseline surveys is provided in Figure 3-5; and habitat, latrines and scats observed within the borefield area are shown in Figure 3-6.

They forage relatively close to their burrows at dusk and at night. Most individuals enter hibernation by the end of May and generally position themselves in burrows about 30 cm from the surface (i.e. close enough to detect seasonal changes). Lizards emerge in September or October (McAlpin 1997). Breeding is generally from December to February, and young usually leave birth burrows after two or three years.

Threats include intense large-scale fires, predation by foxes and cats, and rabbits digging up burrow systems.

Baseline surveys (conducted in 2015, GHD 2016b) detected two Great Desert Skink (*Liopholis kintorei*) burrows in the borefield (see Figure 3-7):

- Burrow 1: easting 295713, northing 7481271 (Zone 53, GDA2020)
- Burrow 2: easting 295732, northing 7481273 (Zone 53, GDA2020)

No other sign / evidence of the species was detected (during baseline studies) along the proposed access roads and water pipeline corridor, or in the area surrounding a historic record 3 km north of the proposed alignment close to Napperby Road.

All parts of the Project area that are spinifex-dominated sandplain provide potentially suitable habitat for Great Desert Skink, and will be considered to potentially support the species.

**Figure 3-5 Photograph of Great Desert Skink from Baseline surveys in 2015 (camera trap image)**

Area where Great Desert Skink burrow/latrine was detected

Great Desert Skink latrine

Great Desert Skink burrows beside latrine

Great Desert Skink scat, showing large size

**Figure 3-6 Photographs of Great Desert Skink habitat, latrine/scats and burrows observed within the borefield area in 2015 (GHD 2016)**

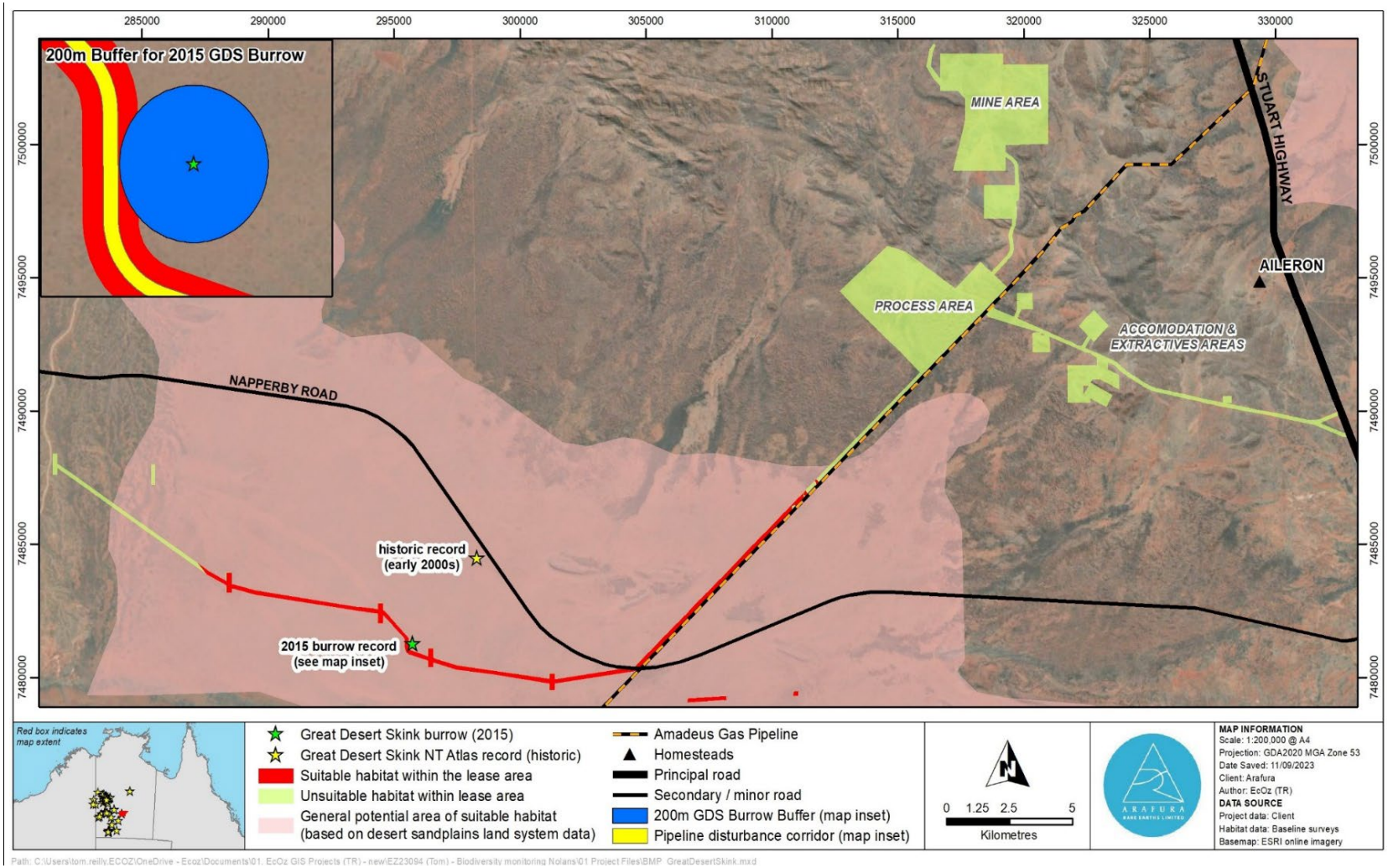


**Figure 3-7 Map of Great Desert Skink suitable habitat and previous records**

### 3.3.3 Greater Bilby (species with potential to occur within Project area)

Greater Bilby (*Macrotis lagotis*) is listed as Vulnerable under the EPBC Act (Commonwealth) and the TPWC Act (Northern Territory). The Project area occurs within the known distribution of the species however there are no recent or historic records in close proximity. Baseline fauna surveys did not detect Greater Bilby within the Project area. However, suitable habitat is present (spinifex sandplains where the borefield is planned to be developed – as per Great Desert Skink suitable habitat area, Figure 3-7), and because the species is highly mobile and can expand in abundance and occupied area when favourable conditions persist (Woinarski *et al.* 2007), there is potential that the species could expand into the Project area when suitable conditions persist.

Greater Bilby are considered to potentially occur within the spinifex sandplains of the borefield area, and unlikely to occupy habitat within the mine site area.

### 3.3.4 Princess Parrot (species with potential to occur within Project area)

Princess Parrot (*Polytelis alexandrae*) is listed as Vulnerable under the EPBC Act (Commonwealth) and the TPWC Act (Northern Territory). The Project area occurs within the known distribution of the species however there are no recent or historic records in close proximity. Baseline fauna surveys did not detect Princess Parrot within the Project area. Suitable habitat is present (spinifex sandplains where the borefield is planned to be developed – as per Great Desert Skink suitable habitat area, Figure 3-7); however the absence of dune and swale habitats reduces occurrence probability of the species.

Baseline surveys indicated that preferred nesting habitat (i.e. large Eucalyptus trees or Desert Oak *Allocasuarina decaisneana*) does not occur within the Project area, so a sighting/observation of the species will likely only be associated with transiting (flyover) or short term foraging.

The absence of nesting habitat reduces potential impacts on this species (as breeding and roosting will not be interrupted). As such, the species is considered to be a possible (non-breeding) occasional visitor within the Project area (particularly within the spinifex sandplain habitat).

### 3.3.5 Grey Falcon (species with potential to occur within Project area)

Grey Falcon (*Falco hypoleucos*) is listed as Vulnerable under the EPBC Act (Commonwealth) and the TPWC Act (Northern Territory). The Project area occurs within the known distribution of the species, however there are no recent or historic records within the local region; nor was the species detected during baseline fauna surveys. Grey Falcon are known to occur in lightly wooded lowland plains that have tree-lined water courses (DoEE 2020). They forage over a variety of habitat types; and prefer to nest in tall trees on waterways (particularly River Red Gum), or at the top of telecommunication towers (Falkenberg 2011).

The Project area is considered to support suitable foraging / hunting habitat; however nesting habitat is restricted to tree-lined creeks within the mine area (vegetation types 1 and 14 – see Figure 3-1), particularly creeks that support Red River Gum (*Eucalyptus camaldulensis*). Potential impacts to this species from the Project would be via disturbance or removal of active/occupied nest sites (disturbance of foraging habitat is considered to be insignificant for this species).

### 3.3.6 Brush-tailed Mulgara (species known to occur within Project area)

The Brush-tailed Mulgara is currently listed as Least Concern under the TPWC Act and the International Union for Conservation of Nature (IUCN) Red List and is not listed under the EPBC Act. At the time of Project approvals, the species was listed as Vulnerable under the TPWC and was not listed under the EPBC Act. However, since approvals, the species status was revised (in 2020) from Vulnerable to Least Concern under the TPWC. This was based on the results of recent long-term monitoring programs of the species in the NT identifying no evidence of current decline (refer to https://depws.nt.gov.au/consultation-publications/nt-threatened-species-review-2020/remove-from-nt-threatened-species-list).

Brush-tailed Mulgara is widespread in arid Australia, and occupy sandplains dominated by mature hummock (spinifex) grasslands, and other vegetation types adjacent to hummock grasslands (Menkhorst and Knight 2011). It is a nocturnal species (although are known to be active during the day when conditions are suitable) with a diet that consists of insects and small vertebrates (Menkhorst and Knight 2011). Populations can fluctuate with quality of seasons (i.e. populations can 'boom' after high rainfall summers when food resources are plentiful which triggers breeding), and 'bust' during dry times when food resources are scarce. Populations of the species can be impacted by frequent fire, predation (cats and fox) and habitat change (i.e. grazing / climate change).

Brush-tailed Mulgara were detected in the spinifex sandplains during baseline surveys (in 2015) within the borefield area (GHD 2016b). Results indicated that the species is present in relatively high numbers (indicative of a boom period) and are widespread in areas of suitable spinifex sandplain habitat within the borefield area (GHD 2016b). As such, all spinifex-dominated areas on the sandplains within the borefield area are considered to have potential to support the species (habitat is sympatric to that used by Great Desert Skink shown in Figure 3-7). The age of spinifex will likely have an influence on presence/abundance with patches of older more established spinifex expected to have a higher chance of supporting the species. Habitat within and adjacent to the process plant, accommodation and mine area are not expected to support the species as suitable habitat is not available.

Potential impacts to Brush-tailed Mulgara from the project are from activities conducted within the borefield area, such as direct disturbance of active burrows, reduction of area of suitable habitat and increase in predator numbers. Measures will be in place to minimise these impacts to ensure the species and its population distribution are not significantly impacted. (See Table 4-1 and Table 4-3).

**Figure 3-8 Brush-tailed Mulgara (left) and habitat (right) (baseline survey photos)**

## 3.4 Threatening processes

### 3.4.1 Weeds

Baseline studies identified several weed species within the Project area (listed in Table 3-3). Except for Buffel Grass (*Cenchrus ciliaris*), all species generally occur in low abundances / isolated plants. One of these species – Caltrop (*Tribulus terrestris*) – is declared as a Class B (spread must be controlled) species under the *Weeds Management Act 2001* (Northern Territory). This species was found in low abundance throughout all vegetation types within the Project area and can be spread by cattle and vehicle movement. Of note, it is now considered uncertain whether this species is introduced. *Alice Springs Regional Weeds Strategy 2021-2026* (DEPWS 2021) states it's to be controlled around tracks, parks and other infrastructure due to spiny fruit nuisance.

Baseline surveys recorded Buffel Grass predominantly within floodplain and riparian vegetation types and in disturbed areas (i.e. tracks, cattle yards, Amadeus Gas Pipeline corridor, and mineral exploration areas) – particularly in the mine site area, accommodation village and northern part of the process area. It was absent (or at very low densities) in all other project areas and non-alluvial habitat types.

Although not a declared species in the Northern Territory, Buffel Grass is a Category 2 species in the *Alice Springs Regional Weeds Strategy 2021-2026* (DEPWS 2021), which means that the species warrants strategic control across the landscape due to the high impact on land managers and on broader economic and environmental values. The species can alter the composition and structure of vegetation communities by outcompeting native taxa, and increasing fire severity due to its ability to rapidly accumulate high amounts of combustible biomass compared to native species (Miller *et al.* 2010).

**Table 3-3. Weed species recorded within the Project area during baseline studies**

| Scientific name | Common name | WMA Status | ASRWS Category |
|---|---|---|---|
| *Tribulus terrestris* | Caltrop | Class B / C | Category 4 |
| *Bidens bipinnata* | Cobblers Peg | - | - |
| *Cenchrus ciliaris* | Buffel Grass | - | Category 2 |
| *Chloris barbata* | Purple-topped Chloris | - | - |
| *Chloris virgata* | - | - | - |
| *Citrullus lanatus* | Paddymelon | - | - |
| *Cynodon dactylon* | Couch Grass | - | - |
| *Digitaria ciliaris* | Summer Grass | - | - |
| *Eragrostis barrelieri* | Pitted Lovegrass | - | Category 3 |
| *Eragrostis trichophora* | - | - | Category 3 |
| *Eragrostis minor* | Lovegrass | - | Category 3 |
| *Malvastrum americanum* | Spiked Malvastrum | - | - |
| *Sonchus oleraceus* | Milk Thistle | - | - |

WMA – *Weeds Management Act 2001* NT Status. ASRWS – Alice Springs Regional Weed Strategy 2021 – 2026.

### 3.4.2 Feral animals

Feral animals are prevalent in the region within which the Project is located. Although their presence is not a direct result of mining activities, Arafura is responsible for the land management of its leases, and is required to conduct feral animal management so that the Project does not increase current feral animal populations within the region. Feral animals can impact native species directly, through competition, predation or poisoning. They can have indirect impacts through habitat change and also pose a risk to rehabilitation, through grazing and trampling of revegetation, and compacting soil.

Baseline surveys identified six introduced fauna species (Table 3-4). Of these species, Cat, Red Fox and Rabbit are listed as a key threatening process under the EPBC Act as they can have significant impacts on many native species, including threatened species known to occur within the Project area and surrounds.

**Table 3-4 Feral Animal recorded within the Project Area during baseline studies**

| Common name | Scientific name | Baseline occurrence summary |
|---|---|---|
| Cat | *Felis catus* | Widespread evidence observed (tracks, camera trap). |
| Red Fox | *Vulpes vulpes* | Suspected tracks observed in 2015 (GHD 2015). |
| Rabbit | *Oryctolagus cuniculus* | Low numbers within the mine site area in 2010 |
| Camel | *Camelus dromedarius* | Widespread evidence observed (tracks, sightings, camera trap, scats) |
| House Mouse | *Mus musculus* | Captured in small numbers during fauna surveys |

| | | |
|---|---|---|
| Native Dingoes | *Canis famiiaris* | Acknowledged as native and present within the Project area. Dingoes are commonly influenced by mining activities and increased population can cause potential predatory pressures on some native fauna. |

### 3.4.3 Bushfire

Fire is a frequent occurrence in the region and poses a risk to people, property, flora and fauna. Management of fire within the region surrounding the Project is essential for reducing threats to the infrastructure, personnel, threatened species and general biodiversity. The North Australia and Rangelands Fire Information (NAFI) website (https://firenorth.org.au/nafi3/) provides live fire tracking and fire histories, at 250m x 250m pixels for Northern Australia (FireNorth 2017). This resource has been used to describe the general fire history of the region within the past 20 years.

The Project area has experienced six bush fire events since the year 2000 - in years 2001, 2002, 2011, 2012, 2013, 2022. A map of 'time since last burn' is provided in Figure 3-9. This dataset indicates that several areas have not burnt between 2000 - 2023 and therefore may contain high fuel loads.

Fuel load reduction is the responsibility of, and will be managed by, the neighbouring stations. Arafura will implement controls to manage the risk of ignition and create firebreaks within the Project area to protect assets and ensure fire doesn't spread during the event of a mine related fire.

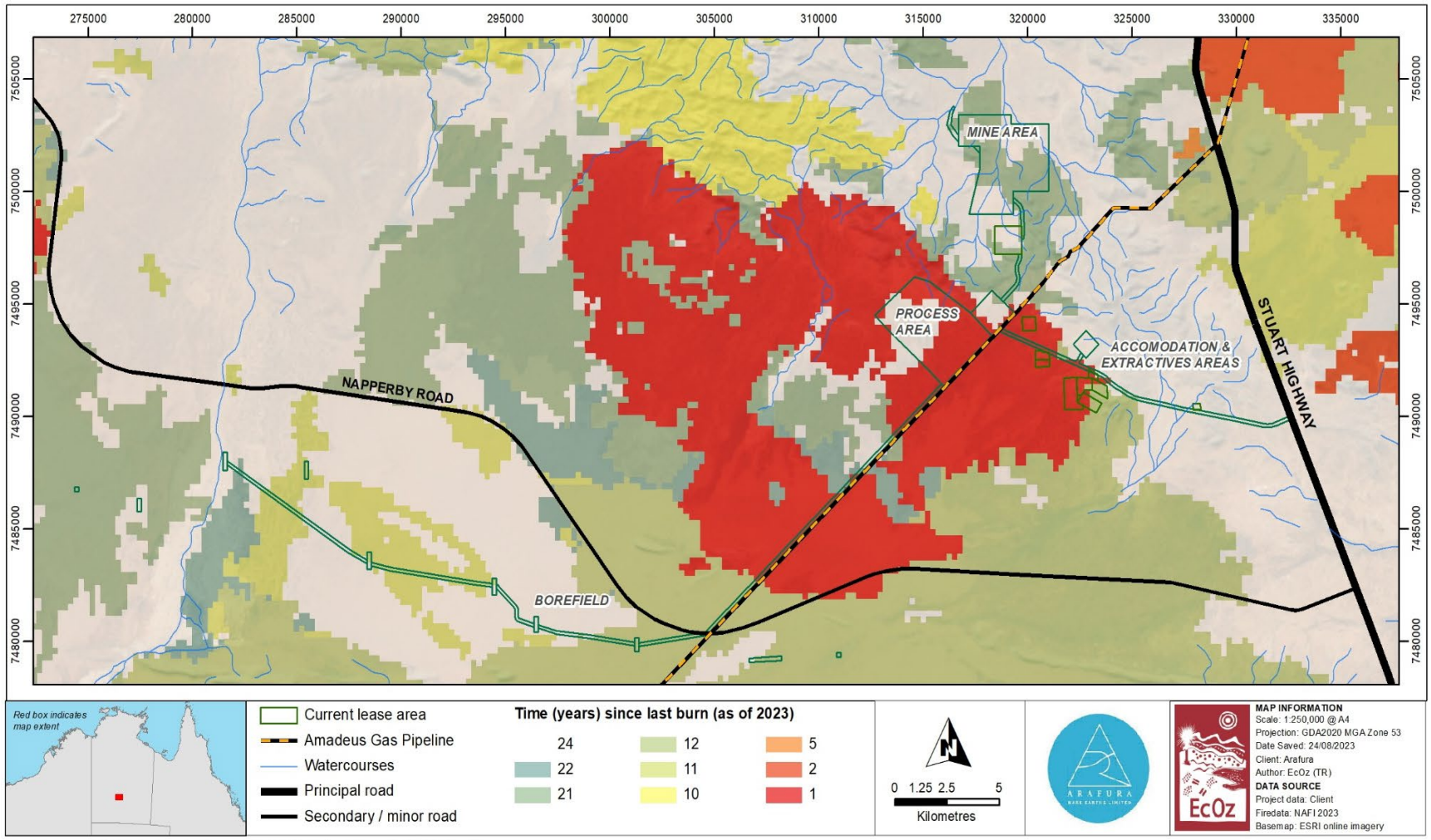


**Figure 3-9 Map of fire history (time since last burn)**

# 4.0 BIODIVERSITY MANAGEMENT

## 4.1 Approach

As identified within the Project MMP, the approach to environmental management for the Nolans project is systematic and is applied to all environmental aspects identified within the Project. The approach has been standardised across the Project to ensure that Project risks are adequately identified to ensure that the desired objectives can be achieved. Once the mitigation measures are identified, clear linkages are made to a performance framework enabling the Company to assess the effectives off the control and continually improve processes to maximise environmental management potential.

The following steps are fundamental to managing Biodiversity at Nolans:

- Identification of risk associated with key mining activities.
- Establishment of biodiversity objectives.
- Implementation of mitigation strategies to avoid potential impacts.
- Development of a performance framework that will determine the effectiveness of the mitigation strategies to achieve the desired biodiversity outcomes.
- Identification and implementation of specific training regimens to support the implementation of the BMP.

## 4.2 Key Activities, Risks and Impacts

Key activities, risks and impacts associated with biodiversity have been summarised in Table 4-1. To manage the effectiveness of the assigned mitigation measures, each risk pathway has been linked to the performance framework described within Table 4-3.

**Table 4-1 Managing Key Risks**

| Item | Activity | Risk Pathway | Key Impact | Mitigation Measure | Link to Performance Framework |
|---|---|---|---|---|---|
| **1.1** | Clearing of habitat | Uncontrolled vegetation clearing may lead to larger disturbance footprint, increase habitat/vegetation disturbance, and potential impacts to important communities and species. | Non-compliance with environmental approvals, land access or heritage agreements. | Prior to clearing a Ground Disturbance Permit is required to be issued by Arafura Environmental Manager (Section 4.5).<br>Ensure that vegetation clearing complies with condition 1 of EPBC Approval (EPBC 2015/7436), which states that the total cleared area must not exceed 4530 hectares, including no more than:<br>• 267 hectares of Central Australian Rock-wallaby habitat<br>• 123 hectares of Great Desert Skink habitat<br>• 125 hectares of Brush-tailed Mulgara habitat | Performance Framework Item 1.1<br>Performance Framework Item 1.2 |
| **1.2** | | Vegetation clearing / disturbance activities have the potential to directly impact (i.e. kill or injure) or indirectly impact (i.e. displace, reduce habitat quality) the following biodiversity values:<br>▪ Known threatened species:<br>- Central Australian Rock-wallaby<br>- Great Desert Skink<br>- Brush-tailed Mulgara (threatened under the TPWC Act at the time | Threatened species in rocky areas:<br>▪ Central Australian Rock-wallaby<br>Threatened species in spinifex sandplain:<br>▪ Great Desert Skink<br>▪ Brush-tailed Mulgara<br>▪ Greater Bilby<br>▪ Princess Parrot<br>Threatened species with nesting habitat within creeks: | Use previously disturbed areas before clearing vegetation from undisturbed areas.<br>Minimise ground disturbance at all locations and specifically at/near riparian zones.<br>Maximum clearing easements for haul roads and access roads will be complied with.<br>Clearly mark areas of land to be cleared and areas to be retained (No-Go areas), so that impacts do not extend any further than necessary into important habitat. | Performance Framework Item 1.1<br>Performance Framework Item 1.2 |

| Item | Activity | Risk Pathway | Key Impact | Mitigation Measure | Link to Performance Framework |
|---|---|---|---|---|---|
| **1.3** | | of Project approvals – refer to Section 3.3.6)<br>▪ Potential threatened species:<br>- Greater Bilby<br>- Princess Parrot<br>- Grey Falcon<br>▪ Native flora and fauna species (in general)<br>▪ Sensitive vegetation (riparian, Coolabah swamps)<br>▪ Vegetation communities and habitat (in general). | ▪ Grey Falcon | A suitably qualified expert (as defined in EPBC approval conditions and outlined in Section 2.5) will complete pre-clearing surveys in areas that support suitable habitat for threatened species (refer to Section 4.5.1).<br>Pre-clearing surveys will aim to determine risks and inform management mitigations. Infrastructure will detour around / buffer or move away from identified locations (such as active burrows or nests from threatened species) (refer to Section 4.5.1).<br>No clearing works to be undertaken within 200 m of known active Great Desert Skink burrows (i.e. 200 m buffer from burrow system).<br>If an active burrow/nest from a potential threatened species is identified, a protection buffer will be implemented until confirmed (appropriate buffer distance to be determined in consultation with DEPWS).<br>Mitigation measures for Brush-tailed Mulgara will incorporate current conservation advice for management of the species in the NT, which are focused on minimising clearance of suitable habitat and minimising direct disturbance of active burrows. | Performance Framework Item 2.0<br>Performance Framework Item 2.1 |
| **1.4** | | Increased weed establishment | Weed infestation can lead to degraded habitat quality and increased fire risk. | A Weed Management Plan has been prepared and will be implemented for this Project (Refer to Nolans MMP, Appendix A). The plan | Performance Management Framework Item1.3 and 1.4. |

| Item | Activity | Risk Pathway | Key Impact | Mitigation Measure | Link to Performance Framework |
|---|---|---|---|---|---|
| | | | | includes the following key mitigations for biodiversity management:<br>▪ All vehicles/machinery/equipment entering the Project area to be cleaned and free of soil and vegetative matter and have a valid weed hygiene declaration prior to entering Project area.<br>▪ Spot checks on vehicle/equipment/machinery to ensure inspections are completed correctly.<br>▪ All vehicles, machinery and equipment to stay on formed access tracks, except for those involved in clearing.<br>▪ Site environmental inductions for all personnel and contractors to include vehicle weed hygiene requirements.<br>▪ All personnel and contractors made aware of existing infestation locations and educated in the identification of existing weeds and potential priority weeds in the region.<br>▪ Pre-clearing weed survey to identify weed infestations to be avoided or managed under the GDP. | |
| **1.5** | | Failure to implement adequate rehabilitation activities that will meet the desired closure criteria post operations. | Native vegetation habitat including threatened species. | Refer to Nolans MMP; Appendix F - Mine Closure Plan | Refer to Section 7.0. |

| Item | Activity | Risk Pathway | Key Impact | Mitigation Measure | Link to Performance Framework |
|---|---|---|---|---|---|
| **2.0** | Dust - generating activities (e.g., habitat clearing, drilling, blasting, excavation, haulage and movement of vehicles, handling of materials) | Increased dust levels from general Project activities may result in:<br>▪ Reduced habitat quality in surrounding vegetation<br>▪ Sedimentation of waterways. | Habitats proximal to the Projects area. | An Air Quality and Dust Management Plan has been prepared and will be implemented for this Project (Refer to Nolans MMP, Appendix C).<br>Use of water carts for dust suppression.<br>▪ Tailings kept moist<br>▪ Sealed Site Access Road (SAR)<br>▪ Sprayers to be installed along conveyor transfer points. | Performance framework Item 1.5. |
| **3.0** | Activities generating noise and vibration<br>(e.g., habitat clearing, drilling, blasting, excavation, haulage and movement of vehicles, handling of materials) | Increased noise and vibrations from general Project activities may result in displacement of native fauna by disrupting nesting, roosting, foraging habits and/or changing behaviour. | All species, but particularly birds and nocturnal fauna. | A Noise and Vibration Management Plan has been prepared and will include the following measures:<br>▪ Assessment of alternative quieter equipment<br>▪ Close engine covers when operating<br>▪ Broadband reversing alarms. | Performance Framework Item 2.0<br>Performance Framework Item 2.1 |
| **4.0** | Use of permanent/ | Increased light (permanent or long-term) within Project area may lead to: | Nocturnal fauna, particularly in areas near the mine and processing facilities, in particular: | Conformance with the National Light Pollution Guidelines for Wildlife – Appendix A Best | Low Risk: No performance framework assigned. |

| Item | Activity | Risk Pathway | Key Impact | Mitigation Measure | Link to Performance Framework |
|---|---|---|---|---|---|
| | long-term lighting | ▪ Displacement of native fauna<br>▪ Increased susceptibility to predation<br>▪ Disruption of nesting/roosting behavior<br>▪ Disorientation of nocturnal bird and bats<br>▪ Attraction, disorientation and altered breeding behaviour of amphibians<br>▪ Altered activity rhythms. | ▪ Central Australian Rock-wallaby<br>▪ Spectacled Hare-wallaby<br>▪ Northern Nailtail Wallaby. | Practice Lighting Design (DCCEEW 2020), including:<br>▪ Use adaptive controls<br>▪ Light only the intended area<br>▪ Use appropriate lighting<br>▪ Use of non-reflective surfaces<br>▪ Use lights with filtered out blue, violet, and ultraviolet wavelengths. | |
| **5.0** | Activities that could start an unplanned wildfire (e.g., hot work) | Proliferation of weeds in disturbed areas and surrounding areas may lead to reduced habitat quality and increased fire hazard / fuel loads. | ▪ Excessive habitat loss due to unseasonal wildfire.<br>▪ Rapid and widespread changes of native flora composition. | Fuel load reduction is the responsibility of, and will be managed by, the neighbouring stations.<br>Arafura will implement controls to manage the risk of ignition and create firebreaks to protect assets and ensure fire doesn't spread during the event of a mine related fire.<br>The following measures will be implemented:<br>▪ Awareness of pastoral landholder fire management obligations and strategies<br>▪ No hot works are permitted on total fire ban days without written approval from a fire control officer or fire warden<br>▪ Maintenance of fire access trails and fire breaks around infrastructure<br>▪ Communication system for monitoring bushfire alerts in the area | Refer to the Emergency Management Plan for performance framework. |

| Item | Activity | Risk Pathway | Key Impact | Mitigation Measure | Link to Performance Framework |
|---|---|---|---|---|---|
| | | | | ▪ Monitor the NAFI website (and SecureNT) and adhere to total fire ban days. Updates provided at daily toolbox meetings<br>▪ Fire extinguishers fitted to all vehicles<br>▪ Clean out vehicle engine bay regularly, with special attention paid on red alert days, to prevent grass igniting on the hot vehicle components<br>▪ Smoking only allowed in designated smoking areas. | |
| **6.0** | Refuse/ garbage management and storage – Pest management | Attraction of feral animals (cats, fox, rabbits) and native predators (dingo, raptors) associated with:<br>▪ Waste management, particularly putrescible waste (i.e. rubbish, landfill)<br>▪ Increased available surface water<br>▪ General site infrastructure can be used as refuge / shelter. | Some species in habitats where people congregate and where rubbish bins exist.<br><br>Landfill management will be limited to industrial refuse. | General site wastes will be managed to prevent/reduce interaction with fauna. Waste management includes:<br>▪ Regular covering of the landfill<br>▪ Dingo proof fencing installed surrounding the landfill to restrict interaction with fauna<br>▪ Waste storage outside of the landfill is to be situated in bins with lids secured<br>▪ Waste oils and/or hazardous substances will be kept in sealed containers and/or covered<br>▪ All domestic waste outside the landfill/waste-storage facility is to be stored in vermin-proof bins with lids secured. | Performance Framework Item 3.0 |

| Item | Activity | Risk Pathway | Key Impact | Mitigation Measure | Link to Performance Framework |
|---|---|---|---|---|---|
| **7.0** | Storage of contaminated water (e.g., Tailings) | Presence of contaminated surface water bodies, including the RSF decant pond may lead to poisoning of fauna from consuming water leading to death or injury to native fauna; or drowning. | All fauna species | Reduce attractiveness (to wildlife) of the Residue Storage Facility, sediment basins and process water Ponds through the implementation of Best Practice Guidelines for Reducing Impacts of Tailings Storage Facilities on Avian Wildlife (DME, 1998).<br>Installation of fauna egress matting in lined facilities.<br>All water dams will be fenced. | Performance frameworks included within:<br>▪ Residue Storage Facility Management Plan<br>▪ Surface Water Management Plan. |
| **8.0** | Alteration to hydrological processes | Hydrological processes have the potential to be altered through the extraction of groundwater or the diversion of water courses. | Groundwater Dependent Ecosystems downstream of the Reaphooks borefield.<br>Up and downstream ecosystems associated with Kerosene creek. | Mitigation measures to protect GDE have been incorporated into the GWEL L10013 Conditions and associated Water Abstraction Management Plan.<br>Mitigation measures to protect ecosystems associated with Kerosene Creek have been incorporated within the Kerosene Creek Diversion Management Plan. | Performance frameworks included within:<br>▪ Water Abstraction Management Plan.<br>▪ Kerosene Creek Diversion Management Plan |
| **9.0** | Construction of roads, hard stands or embankments<br>Haulage and movement of vehicles | Vehicle movement / traffic within the Project area may lead to:<br>▪ Road kill or injury to native fauna, including threatened species<br>▪ Safety issues for mine site personnel, contractors and visitors. | All fauna species | Keep the proposed road network to a minimum and upgrade and utilise existing vehicle tracks.<br>Ensure that all vehicles travel on these designated roads, and not on secondary or short-cut roads/tracks.<br>Implement slower speed limits for all vehicles moving at night, and a sensitive time of the day in sensitive habitat areas, to reduce the likelihood of roadkill. | Low Risk: No performance framework assigned. |

| Item | Activity | Risk Pathway | Key Impact | Mitigation Measure | Link to Performance Framework |
|---|---|---|---|---|---|
| | | | | Upgrade high-use areas to be safer for vehicles and fauna (e.g. no blind curves, wider shrub-free verges).<br>Site environmental officers will be trained in wildlife first aid. In addition, if injured fauna is encountered, assess the situation and potential requirement to euthanize and/or contact Wild Care Alice Spring for advice:<br>M: 0419 221 128<br>E: wildcareasp@gmail.com | |

## 4.3 Biodiversity Objectives

The key biodiversity management objectives associated with the Project are outline in Table 4-2. Arafura biodiversity objectives consider key biodiversity values identified by baseline studies and regulator feedback to ensure the Project does not have a significant impact on biodiversity values within the Project area and surrounding region.

**Table 4-2 Biodiversity Management Objectives**

| Aspect | Key Biodiversity Objectives |
|---|---|
| Vegetation communities | Limit the direct impacts to vegetation communities resulting from the development of the Project.<br>No unfavourable impacts on vegetation condition / habitat quality within and surrounding the Project footprint, particularly sensitive communities and threatened species habitat. |
| Native fauna | Limit the direct loss of threatened species habitat, particularly threatened species known to occur within the Project area. Ensure that the Project operations do not negatively influence the natural populations of threatened species within or adjacent to the Project area. |
| Threatening processes | Animal pests and invasive weeds influenced by the Project, are controlled such that there are no impacts to native fauna and vegetation communities. |

## 4.4 Performance Framework

The performance management framework (Table 4-3) has been developed to accurately measure the Company's performance towards meeting biodiversity objectives. Taking into consideration the impacts and mitigation measures presented in Section 4.2, the performance management framework identifies specific targets and performance criteria that should be achieved if the mitigation measures are implemented successfully. Details of monitoring and/or evidence required to support the performance criteria have been included within the performance management framework to provide a quantifiable record that supports the performance outcomes.

**Table 4-3. Performance Management Framework**

| Item | Related Objective | Mine phase | Target | Performance Criteria | Monitoring/Evidence |
|---|---|---|---|---|---|
| **1.1** | Vegetation | Construction/Operation | Prevent any unnecessary removal of vegetation or habitat (i.e. minimise habitat loss / project footprint). | No occurrence of clearing outside of Project tenements or the approval area. | Annual verification and reporting of authorised clearing. |
| **1.2** | | Construction/Operation | | No event of non-conformance with approval conditions. | Ground disturbance tracking and post clearing assessment by environmental department. |
| **1.3** | | Construction/Operation | No spread of existing Declared weeds within the Project area. | No significant change to the extent and distribution of Declared weeds within one year of completion of construction activities compared to the extent and distribution of weeds prior to construction. | Weed surveillance monitoring of the Project area and adjoining vegetation. |
| **1.4** | | Construction/Operation | Prevent the introduction of new Declared weed species across the Project. | Zero occurrences of new weed species. | Weed surveillance monitoring of the Project area and adjoining vegetation. |
| **1.5** | | Construction/Operation | No reports of dust impacts from the Project at sensitive receptors. | No reported incidents of dust deposition at selected sensitive receptor sites. | Work area inspection report observations on visible dust. |
| **2.0** | Native fauna | Construction/Operation | Minimise adverse impacts on Central Australian Rock Wallaby populations proximal to the Project. | Recordings within moderate acceptable change (as defined in Table 5-2) of Central Australian Rock-wallaby populations. | Refer to Section 5.2; Central Australian Rock-wallaby Monitoring Program.<br>Pre-clearing reports in accordance with Section 4.5.1. |
| **2.1** | | Construction/Operation | Minimise adverse impacts on Great Desert Skink populations proximal to the Project. | No recordings of small acceptable change (as defined in Table 5-2) of Great Desert Skink populations. | Refer to Section 0; Greater Desert Skink Monitoring Program.<br>Pre-clearing reports in accordance with Section 4.5.1. |

| Item | Related Objective | Mine phase | Target | Performance Criteria | Monitoring/Evidence |
|---|---|---|---|---|---|
| | | | | No clearing works to be undertaken within 200 m of known active Great Desert Skink burrows (i.e. 200 m buffer from burrow system).<br>If active burrows are found in the project area during biodiversity surveys and other opportunistic observations, then DEPWS will be consulted for management advice on feral animals and fire management and no further vegetation clearing will occur within 200 metres of the active burrows. | |
| **2.2** | | Construction/Operation | Minimise adverse impacts on Brush-tailed Mulgara populations proximal to the Project as per current conservation advice for the species in the NT (see Section 3.3.6 for more details). | Recordings within large acceptable change (as defined in Table 5-2) of Brush-tailed Mulgara populations.<br>Where possible, active burrows will be avoided. In cases where avoidance of active burrows is not possible, the proposed clearance area will be designed to minimise direct impacts to active burrows. This will ensure that the colony/population within the bore field area will not be significantly impacted. | Pre-clearing reports in accordance with Section 4.5.1. |
| **2.3** | | Operation | Contaminated water storage bodies do not adversely impact native fauna populations. | No regular occurrence (>2 events in consecutive months) of fauna deaths recorded within water storage bodies. | RSF daily monitoring check.<br>Hazard and Incident Registers and reports. |
| **3.0** | Threatening Processes - Pests | Construction/Operation | Pest fauna will not adversely impact native fauna because of the Project. | No increase of pest fauna richness or abundance in areas within and surrounding the Project site compared to reference sites. | Refer to Section 0; Invasive Species Monitoring Program. |

## 4.5 Internal Ground Disturbance Permitting and Pre-Clearing Surveys.

Ground disturbance permitting (GDP) is an internal Company process that ensures that all ground disturbance is conducted in compliance with the Company's environmental approvals and requirements. All proposed disturbance is assessed by an Arafura environmental professional prior to being acknowledged and approved by Arafura management prior to physical disturbance or clearing of the land. Surveys or inspections related to threatened species will be undertaken by a suitable qualified expert (as defined in EPBC Approval Conditions and detailed in Section 2.5).

### 4.5.1 Pre-Clearing Surveys

Pre-clearing surveys will be undertaken prior to ground disturbance where there is significant biodiversity risk to threatened species, threatened species habitat, or significant weed colonisation/spread. The prerequisites for a pre-clearing survey have been provided in Table 4-4 below:

**Table 4-4 Prerequisite for pre-clearing surveys at the Nolans Project**

| Prerequisite | Responsibility | Timing | Method | Evidence |
|---|---|---|---|---|
| The proposed activity is within or close to known threatened species occurrences, or in areas considered to be potentially suitable habitat for threatened species (including those species that are known to occur, or potentially occur, or targeted species that have been delisted since approvals within the Project area). | To be arranged by Arafura environmental personnel prior to ground disturbance activities taking place.<br>The survey will be conducted by a suitably qualified expert (as defined in EPBC Approval Conditions and detailed in Section 2.5) in accordance with the pre-clearing protocols. | No more than 8 weeks prior to clearing. | The survey will be conducted by walking transects 20 m apart over the entire area proposed to be cleared.<br>The surveyor will search for target species sign (i.e. scats, burrows, tracks, nest).<br>If sign is detected, a field assessment will be made to determine current activity / occupancy.<br>The surveyor(s) will then conduct a wider search in the surrounding 200 m to check for additional sign. | Field report including survey map showing GPS track log, and survey results, and recommendations to avoid / minimise impacts where relevant (i.e. buffers). |
| The proposed activity is within or close to a known weed infestation that needs to be managed. | To be conducted by Arafura environmental personnel prior to ground disturbance activities taking place. | No more than 8 weeks prior to clearing. | The survey will be conducted by walking representative transects within the area proposed to be cleared to record weed occurrence. | Field report including survey map showing GPS track log, and any weed occurrences.<br>Provide recommendations for weed management where relevant. |

# 5.0 MONITORING PROGRAMS

## 5.1 Monitoring Approach

This chapter describes the monitoring programs and inspections that will be implemented as part of the performance assessment process for this BMP. This process allows for adaptive management of aspects relevant to biodiversity management. The assessments and associated measurement criteria will be established to allow baseline information to be compared against subsequent repeat surveys. If monitoring indicates that the current management measures are inadequate, then revised or additional measures will be determined and implemented to meet the objectives of the BMP (under consultation with experts and/or relevant authorities).

### 5.1.1 Assessment Criteria

Monitoring of (current) threatened species and management of pest species population density within the Project area will be undertaken at agreed intervals as detailed in Table 5-3, Table 5-4 and Table 5-5, this includes:

- Central Australian Rock-wallaby
- Great Desert Skink
- Key predator species (Cat, Fox and Dingo)

A monitoring program for Brush-tailed Mulgara has not been proposed because it was removed from the TPWC Act threatened species list in 2020 (and was/is not listed under the EPBC Act). However, monitoring data on Brush-tailed Mulgara will be incidentally collected as part of the Great Desert Skink and predator monitoring programs. As such, presence and activity estimates of the Brush-tailed Mulgara will be reported using available data collected to ensure that regulatory approvals and commitments for the species are met, and that current conservation advice for the species in the NT is adhered to.

Data is to be utilised to determine if the population has increased, decreased, or remained unchanged, and be assessed against historical data to indicate trends. This is important to understand if mining operations are having an impact on threatened species populations (and feral animal populations) around the mine site as compared to the broader landscape surrounding the Project.

Triggers and responses are to be determined by predicted 'levels of acceptable change'. The accepted levels of change are determined by known species characteristics and include three scenarios as provided in Table 5-1. With the understanding of species characteristics, levels of acceptable change have been developed for each monitoring and management plan. A summary of acceptable levels of changes are provided in Table 5-2.

**Table 5-1. Scenarios for triggers and responses**

| Scenario | Description |
|---|---|
| Known to Fluctuate | If a species/community is known to fluctuate broadly in numbers or activity patterns, then a higher level of change (as determined through monitoring) is acceptable, because that level of change may simply reflect natural fluctuations. |
| Generally Consistent | If a species/community is known to remain consistent in numbers or activity patterns, then a lower level of change is acceptable, because any change at all may indicate that the Project is having an effect. |
| Unknown | If the populations or activity levels of a species/community are not understood adequately to determine the natural levels of variability, and less is known about the dynamics of a species/community, then smaller levels of change will be accepted until there is a better understanding of the species population variability. |

**Table 5-2. Levels of acceptable change.**

| Acceptable level of change | When to apply |
|---|---|
| No increase | The species/community being investigated is known to have naturally very small variation in population size or activity patterns. Thus, detection of any deleterious change (as found through monitoring) suggests that the Project may be having an effect. |
| Small change | The species/community being investigated is known to have naturally small variation in population size or activity patterns. Thus, detection of small deleterious change (as found through monitoring) suggests that the Project may be having an effect. |
| Moderate change | The species/community being investigated is known to have naturally moderate variation in population size or activity patterns. Thus, small changes (as found through monitoring) may simply reflect natural variation, and more substantial changes would need to be detected to suggest that the Project may be having an effect. |
| Large change | The species/community being investigated is known to have naturally high variation in population size or activity patterns (e.g., boom-bust or irruptive species). Thus, even moderate changes (as found through monitoring) may simply reflect natural variation, and large consistent long-term changes would need to be detected to suggest that the Project may be having an effect. |

## 5.2 Central Australian Rock-wallaby

The monitoring program is based on survey techniques described in the EPBC survey guidelines for threatened mammals (Survey guidelines for Australia's threatened mammals, DSEWPC 2011a). The monitoring program will primarily use daytime searches for scats in areas of suitable habitat. This method is commonly used in central Australia to determine species presence and also species abundance estimates, such as in Newhaven Wildlife Sanctuary. Camera trapping may also be used as part of the monitoring program, which is a relatively new survey technique and methodology is continually evolving. Arafura plan to meet with local experts and Fauna Scientists from DEPWS on an annual basis to discuss monitoring results and methodology.

**Table 5-3 Monitoring Program for the Central Australian Rock Wallaby**

| Program | | Threatened Species Monitoring – Central Australian Rock-wallaby |
|---|---|---|
| **Objectives** | | To estimate the presence and abundance of Central Australian Rock-wallabies within known sites surrounding the Project area. |
| **Survey area** | | Rocky habitat and rocky outcrops within 5km of the mine site and in surrounding rocky areas (landscape context). |
| **Method** | **Survey** | Scat searches along permanent 100 m transects. Scat age categories used so that results can be used to estimate current inhabitation and previous/recent occurrence.<br>The following data will be collected (at a minimum):<br>Scat type / adult or juvenile<br>Scat age:<br>1) Fresh - black, glossy, 95% intact.<br>2) Recent – black, some gloss, 70% intact<br>3) Old – grey or whitish; or black/dark brown with no glossy sheen, <70% intact<br>▪ Number and location of recently occupied refuges<br>▪ Number and location of unused refuges<br>▪ Presence / absence of evidence of grazing by rock-wallaby<br>▪ Presence / absence and type of predator scats (cat, fox, dingo)<br>▪ Presence / absence and type of other herbivore scats or grazing or sighting.<br>▪ Presence / absence and type of other herbivore scats or grazing or sighting.<br>▪ Presence / absence of key food plants (spearbush and fig)<br>▪ Fire history and weed presence. |
| | | Camera traps may be utilised for continuous data collection of wallabies, feral animals, and other native species. |
| | **Timing** | Annually initially, then timing subject to previous surveys results / recommendations. |
| | **Personnel** | Qualified ecologist (suitably qualified expert as per definition in the EPBC approval conditions – refer to Section 2.5) |
| **Trigger Points** | | **Acceptable level of change exceeds moderate, which may include:**<br>▪ Rock-wallabies are not detected in rocky outcrop near the mine site and in the preceding year or if rock-wallabies are killed on the roads in the study area.<br>▪ Predator monitoring shows that numbers of predators in the study area over the preceding 12 months increased (cat and fox) or increased greatly (dingo); or<br>▪ Wildfire in rocky areas during the preceding 12 months and no rock-wallabies are detected in nearby rocky areas. |
| **Corrective Actions** | | Conduct population review by qualified ecologist which will include an assessment of:<br>▪ Incident of direct fauna impact caused by project activities.<br>▪ invasive species population fluctuations.<br>▪ Regional fire regime. |

## 5.3 Great Desert Skink

The monitoring program is based on Commonwealth survey guidelines for the Great Desert Skink (Survey Guidelines for Australia's Threatened Reptiles, DSEWPC 2011b). The most effective survey technique to identify the presence / absence of Great Desert Skink is to locate warrens by walking along transects through suitable habitat, and then check the burrow entrances for recent signs of activity (active latrine site, recently dug soil at entrances, fresh tracks at burrow entrance). Survey timing will occur during the onset of warm spring weather, which is expected to coincide with the emergence of Great Desert Skinks post-hibernation.

**Table 5-4 Monitoring Program for the Great Desert Skink**

| Program | | Threatened species monitoring – Great Desert Skink |
|---|---|---|
| **Objectives** | | ▪ To document the presence/absence within previous identified active burrows<br>▪ To search other areas of suitable habitat for new burrow systems to better understand the size and extent of the current 'population.'<br>It is noted that this monitoring program occurs in addition to pre-clearing surveys conducted as part of Ground Disturbance Permits (for proposed areas to be cleared / disturbed for mining operations). |
| **Survey area** | | ▪ Previously recorded Great Desert Skink burrow systems.<br>▪ Spinifex sandplain habitats surrounding site infrastructure and roads within the borefield. |
| **Method** | **Task 1** | Inspection will be undertaken on known Great Desert Skink burrows. The following data will be collected:<br>▪ Burrow system is active / inactive (based on fresh scat, tracks, fresh spoil, burrow maintenance, sighting, or camera evidence)<br>▪ Number of burrow entrances in use<br>▪ Burrow system size (estimate in $m^2$)<br>▪ Number of latrines<br>▪ Size of latrine<br>▪ Scat size variation within latrine(s) – used to indicate adults and juveniles.<br>▪ Presence of predator signs within and surrounding burrow system.<br>▪ Vegetation and habitat description<br>▪ Fire history<br>▪ If possible, camera traps will be installed to recorded footage of burrow occupants – as additional evidence of presence / absence to sign-based protocols described above. |
| | **Task 2** | Track-plot (sign-based) surveys to detect species presence. Track-plots will be 5 ha (500 m x 100 m). Great Desert Skink burrow systems will be recorded as per data collection protocols described in Task 1. Site selection of track-plots will include areas surrounding known occurrences of Great Desert Skink burrows, as well as other locations within general area that have not been surveyed.<br>All information will be collated into the threatened species monitoring register (Excel and GIS). |
| | **Timing** | Annually initially, then timing subject to previous surveys results.<br>Surveys to be conducted during the summer months when the species is active (latrines and tracks will be clearly visible) so that assessment can be made on current inhabitation. |
| | **Personnel** | Qualified ecologists (suitably qualified expert as per definition in the EPBC approval conditions – refer to Section 2.5). |

| Program | Threatened species monitoring – Great Desert Skink |
|---|---|
| **Trigger Points** | **Acceptable level of change exceeds small, which may include:**<br>Additional mitigation action required if:<br>▪ >20% decrease in numbers of Great Desert Skink; and<br>▪ Predator monitoring shows that numbers of predators in the study area over the preceding 12 months increased (cat and fox) or increased greatly (dingo); or<br>▪ Wildfire in the sandplain habitat during the preceding 12 months and no Great Desert Skink where previously detected. |
| **Corrective Actions** | Conduct population review by qualified ecologist which will include an assessment of:<br>▪ Incident of direct fauna impact caused by project activities.<br>▪ Invasive species population fluctuations.<br>▪ Regional fire regime. |

## 5.4 Predator Species

Predator monitoring to align with relevant EPBC Threat Abatement Plans. To monitor key predator species within and surrounding the Project site to determine if additional control measures are required. The focus species will be cats, foxes, and native dingos.

**Table 5-5 Monitoring Program for Invasive Species**

| Program | | Predator monitoring (focused on Cats, Foxes and Dingos) |
|---|---|---|
| **Objectives** | | Establish baseline and subsequent comparative data on population sizes of feral predators and dingoes to inform control programs. |
| **Method** | **Survey** | Establish baseline data by undertaking a motion-sensing camera surveys.<br>Invasive scat and/or track surveys to be incorporated into Central Australian Rock-wallaby and Great Desert Skink monitoring programs. |
| | **Operation** | Establish baited camera stations that can be repeatedly used including:<br>▪ Sites that are known to be possible attractants to pests / predators (i.e. landfill, water bodies etc.)<br>▪ Sites within 100 m of proposed mine activities (particularly around the landfill). |
| | **Timing** | Regularly through construction and operations. |
| | **Personnel** | Transect surveys will require completion by a suitably qualified expert as per definition in the EPBC approval conditions – refer to Section 2.5)<br>Environmental staff for inspections and camera trap data retrieval. |
| **Trigger Points** | | **Acceptable level of change**: No increase<br>Any increase in population size is likely to be detrimental to biodiversity.<br>Action required if >10% increase in numbers of individuals detected across two surveys. |
| **Corrective Actions** | | Investigate the occurrence with qualified ecologist.<br>Implement or increase predator control program as required.<br>Increase cat/fox control efforts, through trapping, poisoning, shooting.<br>Predator/pest control methods are to be regulated to ensure that there is no unintentional capture or death of threatened fauna species. |

# 6.0 CORRECTIVE ACTIONS

For each monitoring program (see the tables in Section 4.5 above), specific triggers have been assigned as an indication of when corrective actions must be taken. In all events, a suitably qualified expert (as per defined in EPBC Approval Conditions and outlined in Section 2.5) will be engaged to investigate the cause of the trigger and to provide assurance that the proposed corrective actions would be suitable based on the outcomes of the investigations.

# 7.0 BIODIVERSITY GOALS, MEASURES AND CRITERIA AT CLOSURE

## 7.1 Closure Overview

The principle aims of mine closure and rehabilitation for the Nolans project are:

- To establish a safe and stable post-mining land surface which supports vegetation growth over the long-term;
- To return the land, as close is reasonably practical, to its pre-disturbance land use; and
- To make the site suitable for future leaseholders likely uses for the site.

With these principle aims in mind, the following mine closure objectives have been identified:

- **Legal compliance** - to meet all legal obligations and commitments
- **Meet stakeholder expectations** - to meet stakeholder expectations for the closed site
- **Public safety** - to provide a closed site with no unacceptable safety risks or hazards to people and animals
- **Long-term stability** - to achieve physical, chemical and biological stability of rehabilitated areas
- **Minimise impacts to groundwater or surface waters** so that the nominated post-closure land uses are not affected.

## 7.2 Completion Criteria

The completion criteria provide a means of evaluating the successful achievement of the closure objectives.

Ideally these should be SMART (specific, measurable, attainable, relevant and timely) and, once agreed, set the conditions on which the relinquishment of the Project site can take place.

The level of detail of completion criteria should be appropriate to the stage of development. This conceptual closure plan is submitted pre-approval and further detail and definition will be added to the criteria during Project design, construction and during operations.

In agreement with the regulators, the criteria may be reviewed and amended in response to operational and post-closure management and monitoring programmes.

The preliminary Completion Criteria for biological stability of rehabilitated areas are provided in Table 7-1.

**Table 7-1 Closure Objectives and Completion Criteria for Biological Stability of Rehabilitated Areas.**

| OBJECTIVE | CRITERIA | MEASUREMENT |
|---|---|---|
| **Biological Stability of Rehabilitated Areas** | | |
| Rehabilitated ecosystem has equivalent values, functions and resilience as the target ecosystem. | Nolans site recolonised by previously existing fauna communities. | Camera surveys of fauna populations. |
| | Revegetation uses locally sourced seeds at the optimum mix for successful establishment and representativeness of target ecosystem. | Records of seeding trials<br>Audit seed list. |
| | Self-sustaining vegetation cover is successfully re-established on disturbed areas. | Rehabilitation vegetation monitoring and assessment. |
| | Rehabilitated vegetation community species composition and diversity, density and structure are representative of the target ecosystem. | Rehabilitation vegetation monitoring and assessment. |
| | Weed populations do not restrict establishment of target ecosystem. | Weed surveys. |
| The rehabilitated landscape is compatible with the agreed final post-closure use. | As far as possible, post-closure watercourses have geomorphology and riparian communities consistent with those on site prior to development.<br>Post-closure drainage does not lead to flooding of pit or erosion of waste landforms during storm events.<br>Drainage can accommodate a 1 in 1000-year ARI wet year rainfall. | Flood modelling<br>Flow monitoring<br>Audit of approved designs and specifications for drainage pathways and outflows including design flows. |
| | Landforms, including surface covers, designed with drainage pathways and outflows that manage surface drainage, including extreme rainfall events, erosion and sedimentation have been agreed with relevant stakeholders. | Record of consultation with stakeholders representing future land users. |
| | Permanently altered land is limited to the WRDs, TSF, RSF and mine pit footprints and agreed infrastructure. | As built fencing/bunding plans. |
| The landscape and integrity of waste storage landforms is retained through extreme future events such as flooding, bushfires and drought. | Research trials demonstrate the potential of the rehabilitation to regenerate following fire. | Success of post-fire regeneration. |
| | Monitoring has confirmed the rehabilitation can survive one or more seasons of drought. | Qualitative assessment of vegetation health. |
| Disturbed areas will be progressively rehabilitated during operation. | Operational areas on site will be progressively rehabilitated. | Mining programme rehabilitation reports. |

# 8.0 AUDIT AND REVIEW

All referenced company policies, standards, registers, operational procedures, activity specific documents, forms and templates are stored and can be accessed from within the Arafura Environmental and Social Management System (ESMS).

## 8.1 Inspections and Audits

Routine environmental inspections are required to assess adherence to and effectiveness of policies and procedures.

Inspections will cover environmental aspects including:

- Weeds
- Pests
- Waste control checks
- Erosion and sediment control checks and identification of issues that need remediation.

**Table 8-1. Inspections and Audit Schedule**

| Performance assessment | Description | Frequency | Responsibility |
|---|---|---|---|
| Environmental inspections | Daily work area inspections to include animal pest observations (behaviour or population). | Daily | Work area supervisor |
| | Monthly environmental inspections to include animal pest observations (behaviour or population). | Monthly | Environmental Advisor |
| Ground Disturbance Permit (GDP) Procedure | Verification audit of ground disturbance activities and non-conformance. | Annual | Environmental Advisor |
| Induction register checks | Ensure induction records are kept demonstrating what was covered in the induction and who was inducted.<br>Record to be provided in the Monthly Environmental Report. | Monthly | Environmental Manager |

## 8.2 Registers / Data Control

- GDP register (Excel and GIS)
- Pest monitoring and management control register (Excel and GIS)
- Weed monitoring and management control register (Excel and GIS)
- Fuel load monitoring and fire control action register/database (Excel and GIS)
- Fauna sighting and fatality register (Excel and GIS)
- Threatened species monitoring register and spatial data (Excel and GIS)
- Site induction register.

## 8.3 Review of this management plan

This BMP should be reviewed annually (to coincide with the review process of the Project's MMP) and updated accordingly, such that it remains relevant to site conditions. The next review is due in April 2025.

# 9.0 REFERENCES

Read JL and Ward MJ (2011). Bringing back the warru: initiation and implementation of the South Australian Warru Recovery Plan. *Australian Mammalogy* 33, 214-220.

NRETAS (2006). Threatened species of the Northern Territory, Black-footed Rock-wallaby, *Petrogale lateralis*. Compiled by Chris Pavey May 2006. Northern Territory Natural Resources, Environment, The Arts and Sport (NRETAS).

Department of Environment, Parks and Water Security (DEPWS) (2021). *Alice Springs Regional Weeds Strategy 2021-2026*. *https://depws.nt.gov.au/__data/assets/pdf_file/0003/291513/alice-springs-regional-weed-mgt-plan-2021-2026.pdf*

DEPWS (2021), NT Land Clearing Guidelines https://nt.gov.au/__data/assets/pdf_file/0007/236815/land-clearing-guidelines.pdf

GHD (2016a). Appendix M – Flora and Vegetation Report for the Nolans Project. Report prepared by GHD for the Nolans Environmental Impact Statement.

GHD (2016b). Appendix N – Fauna and Threatened Species Repor for the Nolans Project. Report prepared by GHD for the Nolans Environmental Impact Statement.

Low Ecological (2022), Preclearance Survey – Enabling Works, Bill Low, October 2022.

Geelen LJ (1999). A preliminary study of the black-footed rock-wallaby (Petrogale lateralis MacDonnell Ranges raxe) in the Anangu Pitantjatjara lands, South Australia. B.Sc (Honours) Thesis, University of Adelaide.

McAlphin S (2001). A Recovery Plan for the Great Desert Skink (Egernia kintorei) 2001-2011. Prepared by Steve McAlpin on behalf of the Arid Lands Environment Centre, February 2001.

McAlphin S, Duckett P, Stow A (2011). Lizards Cooperatively Tunnel to Construct a Long-Term Home for Family Members. PLoS ONE vol. 6, no 5.

Menkhorst P and Knight F (2011), A Field Guide to the Mammals of Australia. Oxford University Press. 3rd Edition, November 2011.

DSEWPC (2011a), *Survey guidelines for Australia's threatened mammals: Guidelines for detecting mammals listed as threatened under the EPBC Act 1999*, prepared by Commonwealth of Australia.

DSEWPC (2011b), *Survey guidelines for Australia's threatened reptiles: Guidelines for detecting reptiles listed as threatened under the EPBC Act 1999*, prepared by Commonwealth of Australia.

Woinarski J, Pavey C, Kerrigan R, Cowie I and Ward S (2007) *Lost from our Landscape: threatened species of the Northern Territory*. NT Government printer, Darwin.

DoEE (2020). Consultation Document on Listing Eligibility and Conservation Actions – Falco hypoleucos (Grey Falcon) https://www.dcceew.gov.au/sites/default/files/env/consultations/ad34afee-a901-4c94-8e71-654e9f15f29c/files/consultation-document-falco-hypoleucos.pdf

Falkenberg ID (2011). Aspects of the ecology of the Grey Falcon Falco hypoleucos in the South Australian arid zone. *Corella* 35:23-28.

# 10.0 APPENDIX A

# ENVIRONMENTAL CONSULTANTS

EcOz

EcOz Environmental **Consultants** is the Top End's longest established locally-owned environmental consultancy. Formed in 1990 the company provides a broad range of environmental services to a diverse range of local, national and international clients.

We work closely with our clients to provide commercially **focused** rigorous and practical solutions to environmental matters whilst maintaining integrity in environmental practice. Our local team of 20 demonstrates we can deliver professional results in a timely manner whilst maintaining a personalised relationship with our clients.

Our technical expertise, first-rate safety and management systems, and demonstrated experience has us well placed to service your entire projects environmental requirements.

**Our core areas of expertise suited to the Mining, Onshore Oil and Gas, Industrial and Agricultural Development Industries include:**

- Environmental Impact Assessments, Environmental Management Planning, Monitoring and Auditing
- Ecology (Terrestrial and Aquatic) Baseline Studies, **Weed Surveys,** Threatened Species Assessments and Monitoring
- Surface and Ground Water Baseline Studies, **Water Management Plans and Water Quality Monitoring**
- **Land and Soils Investigations, Erosion and Sediment Control, Rehabilitation and Closure Planning and Monitoring Programs**

## APPROVALS

### ENVIRONMENTAL ASSESSMENTS AND MANAGEMENT

EcOz has extensive environmental assessment experience. We can manage the environmental aspects of a project from concept to completion.

We offer our client's relationship based professional support, advice and project management services to guide them through the environmental and regulatory approvals process. We maintain a solid working relationship with all levels of Government and are familiar with their systems and regulation. Our experience and stability of well-respected staff can help you navigate through complex legislative pathways to gain approvals in an efficient and effective manner.

We provide total environmental management, as well as auditing, monitoring and regulatory services to companies, departments and organisations.

### SERVICES

- Project Approvals Strategies/Plans
- Environmental Impact Statement
- Risk assessment and management
- Petroleum and Pipeline Environmental Management Plans
- Construction Environmental Management Plans
- Mining Management Plans
- Land clearing and development applications
- Environment Protection Licences (NT listed waste approvals)
- Air and noise monitoring
- Compliance monitoring and reporting
- Auditing to ISO 14001

## ECOLOGY

### ECOLOGY, BASELINE STUDIES, THREATENED SPECIES ASSESSMENTS AND MONITORING

EcOz has the Northern Territory's largest team of consulting ecologists; all are experienced across a wide range of northern and central Australian bioregions and the corresponding flora and fauna of the region.

Our staff, projects and activities are permitted under the Parks and Wildlife Act and staff are registered animal handlers with ethics approvals under the *Animal Welfare Act*. We are fully equipped for safe and effective remote work and have up-to-date specialist vehicles, equipment, technology and safety and management systems.

### SERVICES

- Project planning and environmental constraints analysis
- Baseline flora and fauna studies
- Threatened species surveys
- Vegetation surveys and mapping
- Land condition assessment
- Land type mapping and land capability assessment (for development applications)
- Weed and pest animal surveys and management plans
- Threatened species management plans and monitoring programs

# CORE INDUSTRIES

**Mining** – from Exploration through to Closure

**Onshore Oil and Gas**

## WATER

### SURFACE AND GROUND WATER

EcOz can manage your water-related requirements, with specialist capabilities in surface and groundwater assessments and sampling in a variety of industries and locations in northern Australia. We have many years of experience in water quality assessment, monitoring and management, including an in-depth knowledge of the specific regulatory requirements.

We have the capability to cover all aspects of water quality for a given project, such as surface and groundwater baseline water quality assessments and routine monitoring, mine water balances, biological monitoring, and investigative monitoring and reporting.

### SERVICES

- Baseline surface water and groundwater assessments
- Aquatic ecology surveys
- Water quality monitoring
- Marine monitoring programs
- Incident response sampling and assessments
- Water Management Plans
- Waste Discharge Licences
- Water Extraction Licences

## LAND & SOILS

### LAND ASSESSMENT, MONITORING AND REHABILITATION

EcOz can manage your site assessment, monitoring, rehabilitation and closure requirements. EcOz prides itself on delivering effective, economical and compliant land remediation and rehabilitation solutions. We have worked closely with a number of mining, commercial and infrastructure clients to deliver successful land remediation plans and rehabilitation outcomes. Our experience incorporates the project planning phases, statutory approvals, implementation and monitoring.
Our technical expertise, first-rate safety and management systems, and demonstrated experience have us well placed to service your land assessment, monitoring and rehabilitation requirements.

### SERVICES

- Site contamination assessments and validation reports
- Baseline soil studies to support mine closure planning
- Land Capability Assessments for wastewater and irrigation
- Acid Sulfate Soils assessments and management plans
- Certified Erosion and Sediment Control Plans
- Rehabilitation Plans
- Mine Closure Plans
- Rehabilitation monitoring

# LOCAL
# CONNECTED
# EXPERIENCED

## OTHER CAPABILITIES

**Other areas of capability include:**

- Land tenure, acquisition advice and due diligence
- Planning and development approval advice
- Air, dust, noise, insects and other general monitoring activities
- Community Consultation (including Indigenous stakeholders)
- Community Benefit Programs and Environmental and other Offsets
- Spatial Information and Mapping (GIS)

EcOz

## PEOPLE AND CONTACTS

EcOz's management team contacts are provided below. Full CVs can be sent on request.


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# Tom Reilly

**MANAGING CONSULTANT – ALICE SPRINGS**

## CAREER OVERVIEW:

Tom has worked as an ecological consultant in Alice Springs and Darwin since 2002. In this time, he has gained ecological expertise from habitats and species extending from the central deserts to the Top End, and as such, is well recognised by government authorities (i.e. DEPWS) in providing high quality reports for impact assessments or biodiversity monitoring projects.

Tom specialises in threatened species surveys and assessments, biodiversity surveys, vegetation / habitat mapping and weed surveys; and is often tasked with leading technical ecological studies required to inform environmental impact assessment (or equivalent environmental approvals). He also has expertise in water and soil sampling and assessment, sediment and erosion control plans, and is highly proficient in GIS mapping.

## AREAS OF EXPERTISE:

Project management I Environmental impact assessment I Flora & fauna surveys I Threatened species assessment I Environmental risk assessment I EPBC referrals I GIS Mapping (ArcMap) I Weed survey I Rehabilitation monitoring

## QUALIFICATIONS:

Bachelor of Science in Natural Resource Management (Hons) – University of Western Australia

## PROFESSIONAL AFFILIATIONS:

Environment Institute of Australia and New Zealand (currently a committee member & Treasurer for the NT Division)

## ECOZ PROJECT EXPERIENCE:

- Targeted surveys for Central Australian Rock-wallaby for proposed gravel, access and magazine tenure associated with the Nolans Rare Earths Project (2024). Arafura Resources Limited
- Biodiversity monitoring for the Nolans Rare Earth Project, including development of methodology and field surveys for Great Desert Skink, Central Australian Rock-wallaby and predator species (cats, dingo and fox) (2023/24). Arafura Resources Limited
- Preparation and advice for the Nolans Rare Earths Project Biodiversity Management Plan (2023). Arafura Resources Limited
- Pre-Clearing surveys for Great Desert Skink (and weeds) for proposed vegetation clearing associated with the Nolans Rare Earths Project (2023). Arafura Resources Limited
- Ecological Survey of the revised alignment of the Zevon Testline, including targeted surveys for Princess Parrot and Grey Falcon (2023). Central Petroleum
- Weed survey for the Dukas 1 (2023). Santos
- Environmental audit and assessment mineral exploration at Hatches Creek, including targeted checks for including Black-footed Rock-wallaby (2023). Tungsten Mining
- Environmental and safety audit of legacy mines in the Alice Springs and Harts Range region (2023). DITT
- Greater Bilby survey and land type mapping of ancillary infrastructure associated with the Australian ASEAN PowerLink Solar Project on Powell Creek Station (2022). SunCable
- Ecological survey and assessment of proposed well pads at Mereenie Oil and Gas Field, including threatened species habitat surveys and likelihood of occurrence assessments, including Black-footed Rock-wallaby (2022). Central Petroleum
- Ecological survey and assessment of the proposed Rover 1 Gold Mine, including targeted Greater Bilby surveys (2021). Castile Resources

- Ecological survey and assessment (and associated Environmental Management Plan) for the proposed Wiso Basin 2D Seismic Exploration Program, including targeted surveys for Greater Bilby, and habitat assessments for Grey Falcon, Purple-crowned Fairywren and Gouldian Finch (2021). Blue Energy
- Ecological survey and assessment of the Zevon seismic project, including land type mapping and threatened species habitat mapping including Black-footed Rock-wallaby (2021). Central Petroleum
- Greater Bilby surveys for sand exploration project on Murranji Station (2021). Territory Sands
- Ecological Survey of the Zevon Testline, including targeted surveys for Princess Parrot (2021). Central Petroleum
- Weed and environmental audit of the Pine Gap Powerline (2021). Yurika
- Ecological assessment of the proposed seismic exploration project on EP134 (2021). Peak Helium
- Great Desert Skink surveys for Tjukarru Road upgrade project (2021). DIPL
- Rehabilitation surveys of seismic exploration on EP105 (2021). Santos
- Ecological reconnaissance survey of the proposed Maurentania Mine, including vegetation and threatened species likelihood of occurrence assessment (with some Greater Bilby targeted survey) (2020). Tennant Creek Consolidated Mining Group
- Targeted surveys for Eremophila prostrata (threatened plant) (2020). DIPL
- Baseline ecological studies and assessment for the Australian ASEAN PowerLink Solar Project on Powell Creek Station, including land type / vegetation mapping and targeted threatened species surveys for Greater Bilby, Gouldian Finch, Grey Falcon, Floodplain Monitor (2020). SunCable
- Groundwater Dependant Vegetation survey on Singleton Station (field work only) (2020). GHD
- Ecological assessment for the proposed Arumbera Industrial Development, including land type / vegetation mapping and targeted survey for Slaters Skink (threatened species) (2020). DIPL
- Ecological assessment for Yulara Hybrid Power Station Development Application (2020), including targeted surveys (fauna tracking) for Brush-tailed Mulgara and Great Desert Skink; and vegetation mapping. Territory Generation
- Ecological assessment for conventional gas exploration, including threatened species surveys and vegetation mapping (2020). Central Petroleum
- Flora and fauna surveys at Alice Springs Airport in 2009, 2014 and 2019. Northern Territory Airports Pty Ltd.
- Flora and fauna surveys at Darwin International Airport in 2008, 2009 and 2014. Northern Territory Airports Pty Ltd.
- Threatened species surveys and vegetation mapping for the Roper Valley Iron Ore EIS, including Ghost Bat and Gouldian Finch (2018). NT Iron Ore
- Rehabilitation assessment of restored seismic line associated with the Southern Amadeus Project (2018). Santos
- Ecological assessment of the Dukas 1 conventional well site (2018). Santos
- Ecological assessment for Ammaroo Phosphate Project – Central Australia, NT (2017), including habitat mapping, targeted threatened species surveys (for Greater Bilby, Brush-tailed Mulgara, Grey Falcon and Great Desert Skink), habitat suitability assessment for Southern Marsupial Mole, weed surveys and sensitive vegetation assessment. Verdant Minerals
- Land condition surveys for Territory Conservation Agreements (Montejinni Station & VRD Station (2017). TNRM
- Rehabilitation assessment of Lethbridge and Andranangoo mine areas on the Tiwi Islands (2017). MZI Resources
- Ecological assessment for the Northern Gas Pipeline (2016), including vegetation, land type mapping and weed surveys, targeted threatened species surveys for Greater Bilby, Brush-tailed Mulgara, Latz's Grass, Tobermorey Melon; and Habitat suitability assessments for Grey Falcon and Plains Death Adder. Jemena
- Biodiversity Assessment, focusing on Threatened Species, RAAF Delamere Range Facility (2015). AECOM
- Baseline ecology surveys for the proposed Esmeralda Gold Project, Pine Creek, NT (2015). NT Mining Operations
- Finniss River Biodiversity Monitoring Project (2015). Territory NRM
- Environmental approvals for the Tiwi Islands Mineral Sands Project (Andranangoo, Lethbridge West, Lethbridge West) (2008 to 2014). MZI Resources

- Flora and fauna surveys for the Noonamah Ridge Sustainable Village Project (2013). Intrapac Property
- Baseline ecological studies for the SupleJack Gold Project, Tanami region, NT (2013). Ord River Resources
- Baseline ecological studies for the Twin Bonanza Gold Project, Tanami region (2012/13). ABM Resources.
- Flora and fauna surveys for road works approvals, Big Horse Creek VRD, NT (2012). Dept of Infrastructure.
- Environmental Assessments for mining exploration activities in the Simpson Desert, NT (2011). Tristar Petroleum
- Baseline Flora and Fauna Studies for Rover 1 Exploration Decline in 2011 – Tennant Creek, NT. Westgold
- Regional Biodiversity Monitoring for Defence Estates NT/K region, including Yampi Sound Training Area (WA), Bradshaw Field Training Area (NT) and Delamere Range Facility (NT) (2010). Spotless
- EIS and Baseline Flora and Fauna Studies for Redbank Copper Mine Expansions 2009. Redbank Copper Ltd.
- Fauna recovery from pipeline construction trench, Bonaparte Gas Pipeline (2008). AJ Lucas Pty Ltd.
- Flora and Fauna Surveys Muirhead Defence Housing Estate in 2008. Connell Wagner

## TRAINING AND PROFESSIONAL DEVELOPMENT:

- Current First Aid Certification
- Side by Side Vehicle Certification
- 4WD Certification
- Animal Ethics Certification
- White card
- Weed certification course
- Snake handling course