# BIODIVERSITY MANAGEMENT PLAN

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Project Name: Nolans Rare Earth Project

NdPr

## REVISION HISTORY

| Date | Description | Prepared | Reviewed | Approved | 3rd Party Approval |
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| July 2022 | Rev 1 | Michael Robinson, ESG Manager | Michael Robinson, ESG Manager | Stewart Watkins, GM Projects | |
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# 1.0 INTRODUCTION

## 1.1 Background

The Nolans Rare Earths Project (the Project) is located approximately 135 km north west of Alice Springs, Northern Territory. The Project targets the Nolans Bore mineral deposit for rare earth elements. Activities will focus on construction, mining, processing, rehabilitation and decommissioning of an open-cut, rare earth mine, and its associated infrastructure.

The Project involves several key activities during construction and operations which have the potential to impact on biodiversity. Biodiversity management refers specifically to flora (vegetation, excluding weeds) and fauna (wildlife, including native and non-native animals). The management of biodiversity at the Project, includes:

- Clearing of vegetation and fauna habitat;
- Collisions between fauna and traffic;
- Storage and use of potentially hazardous substances;
- Introduction and/or spread of weeds (covered in the Weed Management Plan); and
- Increase in population size of native and/or non-native predators.

## 1.2 Purpose

The purpose of the Biodiversity Management Plan (BMP) is to provide a framework for biodiversity management across the Project site as well as providing information which is to be used in decision making and project management, detail planning and methods of work, and provide for a record of performance. The Plan has been developed to outline of the actions and methods required to mitigate likely impacts on biodiversity including:

- Procedures to be adopted during vegetation clearing, including wildlife rescue procedures;
- Weed and feral animal management; and
- Mitigation of potential impacts on rare, threatened species.

This document and its subsequent revisions form an integral part of the Project's Mining Management Plan (MMP). It is a dynamic document, a receptacle for information which is to be reviewed and updated when required, enabling an accurate reflection of the current operational requirements and practices whilst allowing for responsiveness to conditions, input from stakeholders, and enabling flexibility in planning and prioritisation where required.

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 Integrated Management System (ARMS).

## 1.3 Objectives

This management plan aims to reduce the impact of Project activities on biodiversity at and adjacent to the Project and has been designed to achieve this objective through the following process:

- Identifying the key biodiversity issues that require control measures;
- Developing strategies to manage impacts on biodiversity and implementing those strategies;
- Assigning responsibilities for impact monitoring and management;
- Providing sufficient information to assist with auditing the implementation of the BMP; and
- Establishing a biodiversity monitoring program and appropriate management measures.

Responsibilities for the implementation of this plan are outlined in Table 2—3.

## 1.4 Previous Investigations

This management plan has been prepared on the basis of the biodiversity information obtained from the Environmental Impact Statement (EIS) studies (GHD, 2016a/b). A summary of previous investigations is provided in Table 1—1.

**Table 1—1 Summary of Investigations**

| Date | Reference | 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. |
| 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). |
| 8 – 9 December 2011 | GHD | Targeted Black-footed Rock-wallaby (MacDonnell Ranges race) survey of mine site only. |
| 27 April – 3 May 2015 | GHD | Baseline Fauna survey of current study area incl. 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 Black-footed Rock-wallaby in the eastern end of the Reynolds Range, Hann Range, Reaphook Hills and outcrops in between. |

# 2.0 MANAGEMENT AND MITIGATION

The general approach for management of biodiversity before, during and after Project construction and operations is structured below as follows:

- **Key Activities, Impacts and Residual Risks:** A summary of the key activities being undertaken during the management period. The potential environmental impacts and residual risk levels are identified for each environmental aspect.
- **Objective:** The guiding environmental management objective(s) and activities that apply to the element.
- **Mitigation Measures:** The procedures to be employed to ensure that the relevant objectives are met.
- **Trigger, Action, Response Plan (TARP):** The actions to be implemented in the case of non-compliance. This includes strategies of remediation and the person(s) responsible for the actions.

## 2.1 Key Activities and Impacts

The key activities and potential environmental impacts identified through the project risk assessment, referenced in the MMP Section 5.6.2, specifically for biodiversity management are listed in Table 2—1.

**Table 2—1 Key Activities and Potential Impacts**

| ID No | Activity | Potential Environmental Impact and Habitats | |
|---|---|---|---|
| 1 | Clearing of habitat | ▪ Killing/injuring fauna;<br>▪ Displacement of fauna;<br>▪ Disruption to nesting/roosting/ foraging habitats and/or behaviour;<br>▪ Reduction of area of fauna habitat available;<br>▪ Habitat fragmentation and edge effects;<br>▪ Creation of barriers to movement;<br>▪ Creation of corridors and conduits for detrimental species' movement or invasion (e.g. predators accessing new areas);<br>▪ Increase in dust;<br>▪ Erosion and sedimentation resulting from disturbed soils;<br>▪ Degradation of surface water quality due to erosion of soils and landforms;<br>▪ Increased weed establishment; and<br>▪ Increased use of the area by non-native predators (e.g. feral cats and foxes), by creation of access tracks into new areas | **In rocky areas:**<br>Black-footed Rock-wallaby.<br><br>**In sandplain and mulga woodland areas:**<br>▪ Brush-tailed Mulgara;<br>▪ Spectacled Hare-wallaby;<br>▪ Northern Nailtail Wallaby;<br>▪ Emu;<br>▪ Australian Bustard;<br>▪ Flock Bronzewing;<br>▪ Bush Stone-curlew; and<br>▪ Great Desert Skink |

| ID No | Activity | Potential Environmental Impact and Habitats | |
|---|---|---|---|
| 2 | Dust-generating activities<br>(e.g., habitat clearing, drilling, blasting, excavation, haulage and movement of vehicles, handling of materials) | ▪ Dust deposition on vegetation leading to sub-optimal foraging; and<br>▪ Dust deposition/sedimentation in waterways leading to degradation of surface water quality. | Some species in habitats predominantly around the mining area. |
| 3 | Activities generating noise and vibration<br>(e.g., habitat clearing, drilling, blasting, excavation, haulage and movement of vehicles, handling of materials) | ▪ Displacement of fauna; and<br>▪ Disruption to nesting/roosting/foraging habitats and/or behaviour; | Some species in habitats near the mine and processing facilities. |
| 4 | Use of permanent/long-term lighting | Local displacement of fauna (i.e. fauna move away from lit areas);<br>▪ Attraction of and enhanced mortality of insects;<br>▪ Increased susceptibility of fauna to predation;<br>▪ Disruption to nesting/roosting behaviour;<br>▪ Disorientation of nocturnal birds and bats;<br>▪ Attraction, disorientation and altered breeding behaviour of amphibians; and<br>▪ Altered activity rhythms. | Nocturnal fauna, particularly in areas near the mine and processing facilities, in particular:<br>▪ Brush-tailed Mulgara;<br>▪ Black-footed Rock-wallaby;<br>▪ Spectacled Hare-wallaby;<br>▪ Northern Nailtail Wallaby |

| ID No | Activity | Potential Environmental Impact and Habitats | |
|---|---|---|---|
| 5 | Refuse/garbage management and storage – Pest management | Inappropriate/inadequate refuse/garbage management could lead to:<br>Spread of garbage by birds, particularly crows; and<br>Increases in populations of vermin (non-native rats and mice) and consequent increases in the local populations of predators (particularly the native Dingo, as well as the feral fox and cat) leading to increased predation pressure on native fauna and competition with aggressive and dominating vermin (e.g., House Mouse, Black Rat). | Some species in habitats where people congregate and where rubbish bins exist.<br>Landfill management will be limited to industrial refuse. |
| 6 | Construction of roads, hard stands or embankments | ▪ Habitat fragmentation;<br>▪ Creation of barriers to movement;<br>▪ Creation of corridors and conduits for detrimental species' movement or invasion (e.g. predators accessing new areas);<br>▪ Erosion and sedimentation resulting from disturbed soils;<br>▪ Alteration to surface water flows;<br>▪ Degradation of surface water quality due to erosion of soils and landforms; and<br>▪ Increased weed establishment. | All terrestrial species around the Project |
| 7 | Surface water bodies including the RSF decant pond | ▪ Poisoning of fauna from drinking contaminated water, leading to injury or death; and<br>▪ Drowning of fauna. | All species, but particularly birds. Tailings and process residue area will be fenced to limit access. Alternate water sources will be available. |

## 2.2 Mitigation Objectives

The five key biodiversity management objectives have been established and outlined in Table 2—2. A summary of the mitigation measures which will be used to achieve these objectives are outlined in Table 2—3.

**Table 2—2 Mitigation Objectives**

| Objective | Target | KPI |
|---|---|---|
| Establish and maintain awareness and importance of protecting biodiversity across the Project. | All onsite personnel (including Contractors) to undertake site induction which will include a summary of the Project biodiversity. | Percentage of personnel who completed the site induction. |
| Minimise the extents of vegetation clearance and undertake in accordance with the Ground Disturbance Permit system, with particular focus on habitat of listed threatened species. | Zero incidents of clearing outside Project footprint and approved borrow pit locations.<br>Manage D. Blythi (mulgara) habitat by maintaining patches of ground layer and low level vegetation in scattered woodland areas.<br>Manage L. kintorei (Great Desert Skink) habitat by maintaining large hummock grassland with Wilcox Bush (Eremophila leucophylla) close to rocky outcrops. | Number of incidents of clearing outside of approved clearance areas.<br>No change in population size, distribution or density of potential threatened species in the vicinity of the Project. |
| Minimise injury or death to native fauna from Project activities. | All vehicles to adhere to the current scope of the Projects speed limits.<br>Zero incidents of native fauna injury or death from Project activities.<br>Implement system for the management of injured and dead fauna. | Number of incidents involving native fauna injury or death from Project activities.<br>Management of injured and dead wildlife system in place. |
| Implement Pest Monitoring Plan – cat and fox. | No change in the feral cat/fox population. | Percentage increase in population sizes |
| Undertake population monitoring for Black-footed Rock-wallaby and the species in sandplain habitats. | Below moderate change for Black-footed Rock-wallaby and small change for sandplain habitats threatened species. | Percent decrease in population sizes. |

## 2.3 Mitigation Measures

Mitigation measures have been developed to minimise potential impacts to biodiversity in the project area from the key activities identified in Table 2—1. The mitigation measures, timing and responsibilities are provided in Table 2—3.

**Table 2—3 Mitigation Measures**

| Mitigation Measure | Purpose/Objective | Timing | Responsibility |
|---|---|---|---|
| **General – for all key activities (Risk Activity 1 – 8)** | | | |
| Site induction is to include the following components for biodiversity management:<br>▪ Summary of biodiversity at the Project including ecologically sensitive areas and threatened fauna;<br>▪ Identification of potential impacts to biodiversity from the Project activities;<br>▪ Requirement to enter and exit site through recognised vehicle access points, and to travel around site using existing or approved roads and tracks only;<br>▪ Requirement for speed restrictions across the Project; and<br>▪ No work to be undertaken without an approved Ground Disturbance Permit. | Establish and maintain awareness and importance of protecting biodiversity across the Project.<br>– Raise awareness of threats to biodiversity;<br>– Educate personnel on ways to avoid impacts; and<br>– Educate personnel on procedure to follow in the event of vehicle injuring or killing fauna. | Prior to work commencing | Environmental Officer |
| No work undertaken within 200 m of the Great Desert Skink warren recorded within the Borefield. | Minimise injury of death to native fauna from Project activities<br>– Avoid known habitat for EPBC listed reptile. | At all times | All personnel |
| Seal/cover open holes, pits, trenches (e.g. monitoring bores, production wells, exploration bores) when not manned to prevent ground-dwelling fauna from falling in. | Minimise injury of death to native fauna from Project activities | At all times | All personnel |

| Mitigation Measure | Purpose/Objective | Timing | Responsibility |
|---|---|---|---|
| **CLEARING OF VEGETATION / HABITAT (Risk Activity 1)** | | | |
| Prior to clearing a Ground Disturbance Permit is required to be issued by the HSEC Manager. | Obtain authorisation. | Prior to clearing | All personnel |
| Use previously disturbed areas before clearing vegetation from undisturbed areas. | Minimise new clearing of habitat. | At all times | Area Managers |
| Minimise ground disturbance at all locations and specifically at/near riparian zones. | Minimise dust, erosion, sedimentation and habitat loss. | At all times | Area Managers |
| Maximum clearing easements for haul roads and access roads will be complied with. | Minimise habitat loss. | Road construction | Area Managers |
| Qualified ecologist will complete clearing survevs of the Borefield easements where mulgara burrows have been mapped. Where practical infrastructure will detour around or move away from identified locations. | Minimise injury of death to native fauna from Project activities<br>_ | During clearing | HSEC Manager, using qualified ecologists |
| 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. | Minimise habitat loss. | Prior to clearing during all phases of project | Area Managers |
| Plan to clear vegetation progressively and incrementally as needed, rather than through large-scale clearing in advance. | Minimise injury of death to native fauna from Project activities | Design phase, prior to clearing | Area Managers |

| Mitigation Measure | Purpose/Objective | Timing | Responsibility |
|---|---|---|---|
| Rehabilitate/stabilise cleared land progressively as activities are completed (which forms part of the Mine Closure Plan). | Reduce impacts of dust. | As activities are completed | Area Managers |
| **LIGHT (Risk Activity 4)** | | | |
| Implement a light reduction strategy during the detailed design phase including:<br>▪ Limit artificial light to areas where it is essential;<br>▪ Turn off lights when not required;<br>▪ Avoid the flood of light into natural habitats and limit the escape of light into surrounding areas of fauna habitat (i.e. using shields/deflectors);<br>▪ Ensure that artificial lighting is not directed upwards or laterally (i.e. should be directed towards the ground);<br>▪ Use lower (i.e. closer to the ground) rather than higher lighting installations;<br>▪ Use lower wavelengths of light wherever possible i.e. red/yellow lights;<br>▪ Use light intensities that are as low as possible without reducing safety or efficiency; and<br>▪ Avoid painting large structures bright or reflective colours and minimise use of bright or reflective construction materials and finishes for large structures. | Minimise injury or death to native fauna from Project activities and reduce impacts on nocturnal fauna. | At all times | Area Managers |

| Mitigation Measure | Purpose/Objective | Timing | Responsibility |
|---|---|---|---|
| **Pests (Risk Activity 5)** | | | |
| As part of the Waste Management Plan, implement sound waste (rubbish) management to limit invasion/colonisation by pests. | Minimise potential impacts of vermin and pest predators. | At all times | Environmental Officer |
| General site wastes will be managed to prevent/reduce interaction with fauna. Waste management includes:<br>▪ 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; and<br>▪ Putrescible waste will be taken off site to facilities at Alice Springs to limit risk and reduce management at site. | Avoid population increase in pest predators. | At all times | Area Managers |
| Implement a pest monitoring plan to monitor feral cat and fox populations to determine if control measures are required. | Control of feral cats and foxes. | Timing and frequency to be determined by results of pest- animal monitoring | Area Managers |

| Mitigation Measure | Purpose/Objective | Timing | Responsibility |
|---|---|---|---|
| **SURFACE WATER (Risk Activity 7)** | | | |
| 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). | Minimise injury or death to native fauna from drowning or ingestion of chemicals from Project activities. | Design, construction and operational phases | Area Manager |
| Fence off residue storage facilities to prevent ground-based fauna from accessing the water.<br><br>All surface RSF and process water pond liners to be constructed with a rough liner or fauna egress matting will be installed at regular intervals to allow fauna to climb out of poly lined water facilities.<br><br>Utilise bird deterrent devices if bird visitation becomes problematic | | Construction | Area Manager |
| **NOISE AND VIBRATION/HAULAGE AND VEHICLE MOVEMENTS (Risk Activity 3 and 6)** | | | |
| Keep the proposed road network to a minimum. | Minimise injury or death to native fauna from Project activities. | Design, construction and operational phases | Area Managers |
| Implement and enforce speed restriction controls and signage for all roads across the entire Project. | | Construction and operational phases | Area Managers |

| Mitigation Measure | Purpose/Objective | Timing | Responsibility |
|---|---|---|---|
| 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. | | Construction and operational phases | Area Managers |
| Upgrade high-use areas to be safer for vehicles and fauna (e.g. no blind curves, wider shrub-free verges). | | Design and construction phases | Area Managers |
| 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 | | Construction and Operation | All personnel; Environmental Officer |
| If dead animals are found on/beside roads, the Environmental Officer is to be notified immediately to remove the carcass into adjacent land. | | Construction and Operation | All personnel; Environmental Officer |
| **INSPECTION AND MONITORING (Risk Activity 1 – 8)** | | | |
| Threatened species monitoring program including the Black-footed Rock-wallaby Plan and Sandplain Habitats Plan | Undertake population monitoring for Black-footed Rock wallaby and the species in sandplain habitats<br>Determine Projects impact<br>on threatened species. | As required | Environmental Officer |
| Pest Monitoring Plan including monitoring pest species population and determine if additional measures are required. | Implement Pest Monitoring Plan – cat and fox<br>Determine Projects impact on pest species. | As required | Environmental Officer |

| Mitigation Measure | Purpose/Objective | Timing | Responsibility |
|---|---|---|---|
| Pest management is accordance with a pest monitoring plan | Implement a pest monitoring plan – cat and fox<br>Bait, trapping and use of the Felixer feral cat grooming device to remove known pests from around the mine site and broader region. | Continual | Environmental Officer |
| Regular assessment of compliance with Ground Disturbance Permits. | Minimise the extent of vegetation clearance and ensure any undertaken is in accordance with the Ground Disturbance Permit system, with particular focus on habitat of listed threatened species. | As required | Environmental Officer |
| Fauna Sighting and Fatality Register to be maintained (Appendix APPENDIX A). | Undertake population monitoring for Black-footed Rock wallaby and the species in sandplain habitats | As required | Environmental Officer |

## 2.4 Trigger, Action and Response Plan

The Trigger, Action and Response Plan (TARP) outlines remedial actions and responses to the situation. The levels of incidents and TARP are provided in Table 2—4.

**Table 2—4 Trigger Action and Response Plan**

| Trigger | Action | Response |
|---|---|---|
| Areas of vegetation to be cleared will be outside of Project boundary / existing disturbance. | Environmental officer to complete the following:<br>▪ Assess requirement to clear outside of Project boundary.<br>▪ Areas to be cleared outside of existing disturbance will be flagged to prevent over clearing.<br>▪ Ensure topsoil and seed bank are reserved (and protected) to facilitate rehabilitating the area.<br>▪ Survey additional disturbance.<br>▪ Ensure sufficient erosion and sediment control measures are used. | **Area Managers:**<br>Ensure this Biodiversity Management Plan is being implemented by all Site Personnel. |
| Vegetation cleared outside of approved boundary. | Stop work and inform the Environmental Officer of additional disturbance. | **Environmental Officer:**<br>Provide guidance on rehabilitation of additional disturbance.<br>▪ Survey additional disturbance.<br>▪ Ensure sufficient erosion and sediment control measures are used.<br>▪ Undertake investigation into disturbance incident.<br>▪ Ensure this Biodiversity Management Plan is being implemented by all Site Personnel.<br>Assess the ground disturbance incident and undertake relevant corrective measures. |

| Trigger | Action | Response |
|---|---|---|
| | | **Area Managers:**<br>Assess the ground disturbance incident and ensure relevant corrective measures have been taken. |
| Native fauna observed in the area of the landfill, construction and/or operational activities. | **Contractor:**<br>Encourage or wait for native fauna to vacate construction areas.<br>Report sighting to the Environment Officer.<br>**Environmental Officer:**<br>Enter sighting into Fauna Sighting and Fatality Register (APPENDIX A). | **Area Managers:**<br>Review Biodiversity Management Plan implementation with all Site Personnel. |
| Native fauna injured or killed due to Project activities. | **Contractor:**<br>▪ Report to Area Supervisor.<br>▪ If fauna is killed, remove from road into adjacent land.<br>**Environmental Officer:**<br>If fauna is killed, remove from road into adjacent bush land.<br>▪ If fauna is injured, assess the situation and potential requirement to euthanize and/or contact Wild Care Alice Springs for advice:<br>M: 0419 221 128<br>E: wildcareasp@gmail.com<br>▪ If fauna is killed, remove from road into adjacent land.<br>▪ Record incident in Fauna Sighting and Incident Register (APPENDIX A).<br>Determine if species is a threatened species and if the death activates additional contingency measures. Record death within Fauna Sighting and Fatality Register (APPENDIX A) or record as an environmental incident in the case of a threatened species death. | **Area Managers:**<br>Assist the Environmental Officer in addressing potential installation of contingency measures. |

# 3.0 MONITORING AND THREAT ABATEMENT PROGRAMS

Monitoring programs are to be established in ways that allow baseline information to be compared against subsequent repeat surveys. If monitoring indicates that the current mitigation efforts are inadequate, then revised or increased mitigation measures are to be implemented to meet the objectives of the BMP.

## 3.1 Threat Abatement Plans

Under the Environment Protection and Biodiversity Conservation Act 1999 (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; and
- Threat Abatement Plan for Predation by Feral Cats – 2015.

Threatened species considered to be at high risk of predation by feral cats and/or foxes identified for the Project area include the Black-footed Rock-wallaby, Brush-tailed Mulgara and Great Desert Skink. Accordingly, monitoring must focus on these threatened species and the threats posed within the broader landscape of the project.

## 3.2 Assessment Criteria

Monitoring of threatened species and management of pest species population density within the Project area will be undertaken at agreed intervals as detailed in Table 3—2 to Table 3—6. The 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 the Nolans 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 follows:

- 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.

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 and associated definitions are provided in Table 3—1.

**Table 3—1 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. |

## 3.3 Action Plans

Action plans have been established to determine if mitigation measures at the Project are sufficient. The plans include:

- Monitoring – Dingos, Cats and Foxes (Table 3—2);
- Register - Cats and Foxes (Table 3—3);
- Pest Animal Management – Bait and Trapping (Table 3—4);
- Threatened Species Monitoring - Black-footed Rock-wallaby (Table 3—5); and
- Threatened Species monitoring - Sandplain habitats (Table 3—6).

**Table 3—2 Monitoring – Dingoes, Cats and Foxes**

| Program | | MONITORING – Cats and Foxes |
|---|---|---|
| Objective | | Establish baseline and subsequent comparative data on population sizes of feral predators and dingoes to inform control programs. |
| Survey Effort | Survey | Establish baseline data by undertaking a motion-sensing camera surveys. |
| | Operation | Establish baited camera stations that can be repeatedly used including:<br>sites within 100 m of proposed mine activities (particularly around the landfill);<br>sites approximately 1 km from mine activities; and<br>sites more than 5 km from mine activities. |
| | Timing | Regularly through construction and operations. |
| | Personnel | Qualified ecologists or environmental staff. |
| Trigger Points | Dingoes / Cats / Foxes | **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. |
| Contingency | | 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. |

**Table 3—3 Register – Cats, Foxes and Rabbits**

| Program | | REGISTER – cats, foxes, rabbits |
|---|---|---|
| Objective | | Provide additional information on feral predator and pest animal populations, in conjunction with monitoring program. |
| Method | Survey | Predator and pest-animal sightings are to be recorded in the Fauna Sighting and fatality Register (Appendix APPENDIX A) to be established and maintained.<br>Input will be opportunistic, however all personnel will be encouraged to report all sightings of cats (including colour and identifying markings, if possible), foxes and rabbits. |
| | Timing | Continually. |
| | Personnel | All personnel. |
| Trigger Points | Cats / Foxes / Rabbits | **Acceptable level of change:** No increase<br>Any increase in population size is likely to be detrimental to biodiversity.<br>Additional mitigation action required if the Fauna Sighting and fatality Register (Appendix APPENDIX A) indicates an increase in sightings in a particular area (e.g. |

| Program | | REGISTER – cats, foxes, rabbits |
|---|---|---|
| | | more often per week, larger numbers per night, more individuals in an area).<br>Action required if >10% increase in numbers of individuals detected across a six-month period. |
| Contingency | | Implement or increase predator and pest-animal control program as required (e.g. if there is a notable increase in sightings of non-native predators in the study area).<br>Increase cat/fox/rabbit control efforts, through trapping, poisoning, shooting.<br>Make sure predator/pest control method does not result in the unintentional capture or death of threatened fauna species. |

**Table 3—4 Pest Animal Management - Bait and Trapping**

| Program | | Pest Animal Management - Bait and Trapping |
|---|---|---|
| Objective and approach | | Implement a pest eradication/control program targeting foxes, cats and rabbits across the Project and non-native rats and mice at the mine site and accommodation village to minimise potential impacts of vermin and pest predators. |
| Target species | | Non-native rats/mice (e.g., *Rattus rattus, Mus musculus*);<br>European rabbit;<br>Red fox;<br>Feral cat |
| **Rats / Mice** | Methods | Poisoned baits in and under buildings and within the confines (fences) of the landfill facility. |
| | Timing | All year. |
| | Location | Offices and accommodation areas across the Project and around the landfill facility. |
| **Rabbits** | Methods | Warren fumigation and/or ripping.<br>Prior to control methods being used on a suspected rabbit warren, motion-sensing cameras must be deployed at warren entrances for at least 30 days during the warmer months (October to March) to make certain that the burrows aren't used by Mulgaras or Great Desert Skinks, or any other threatened fauna species.<br>If any burrow is found to support a native threatened species, then fumigation and warren ripping are not suitable. Other rabbit-control methods are to be established (e.g., trapping, shooting). |
| | Timing | All year, as required.<br>The need for rabbit control will be informed by the Fauna Sighting and fatality Register (Appendix APPENDIX A), and the results of other fauna monitoring (e.g. use of motion-sensing cameras). |

| Program | | Pest Animal Management - Bait and Trapping |
|---|---|---|
| | Location | Across Study area, particularly in sandplain areas where the impact of rabbits on native threatened species has the potential to be greater. |
| **Cats / Foxes** | Methods | Range of methods to be trialed upon the outset of the program to determine the most effective and efficient method. Possible methods include:<br>Poisoned baiting;<br>Trapping (e.g., cage trapping);<br>Shooting; and<br>Grooming traps (innovative new passive baiting and trapping methods that target cats (https://thylation.com/felixer-faqs/). Grooming Traps may provide a long-term tool to control trap or bait-shy cats and foxes in areas of high conservation value (e.g. in areas of known Black-footed Rock-wallaby habitat). |
| | Timing | Regularly, and as required on the basis of monitoring results. |
| | Location | Mine Site and broader project area.<br>Focus efforts initially in and around the mine site and landfill facility where non-native rats and mice are most expected to attract non-native predators.<br>Expand area of control if any of the fauna monitoring or Fauna Sighting and fatality Register (Appendix APPENDIX A) data suggest that predator numbers have increased in areas away from the Mine Site. |

**Table 3—5 Threatened Species Monitoring - Black-footed Rock-wallaby**

| Program | | Threatened Species Monitoring – Black-footed Rock-wallaby |
|---|---|---|
| Objective | | Assess the potential impact from the Project on Black-footed Rock-wallaby through:<br>Documenting the persistence of the local rock-wallaby population;<br>Understanding changes in habitat use near the mine site;<br>Evaluating the effectiveness of predator control measures; and<br>Evaluating the effectiveness of vehicle movement restrictions. |
| Method | Survey | Aerial and motion camera surveys. |
| | Locations | Marginally rocky habitat, rocky outcrops near the mine site and in surrounding rocky areas (landscape context). |
| | Timing | Annually initially, then timing subject to previous surveys results. |
| | Personnel | Qualified ecologist. |
| Trigger Points | | **Acceptable level of change:** moderate change<br>Additional mitigation action required if:<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. |
| Contingency | | Mitigation measures include:<br>Increase cat/fox control efforts (trapping, poisoning, shooting) if their numbers have increased;<br>Assess the regional and local bushfire regime and consider the need for improved fire management; and<br>Reduce vehicle speeds or access in high-risk areas if roadkill may have been the cause. |

**Table 3—6 Threatened Species Monitoring – Sandplain Habitats**

| Program | | Threatened species monitoring – Sandplain Habitats |
|---|---|---|
| Objective | | To document the persistence of known threatened species in the vicinity of the mine, and to evaluate the effectiveness of predator control measures. |
| Method | Survey | Motion-sensing camera surveys within known threatened species habitat for Brush-tailed Mulgara and Great Desert Skink including placing cameras at known warrens.<br>Transect surveys searching for warrens within known threatened species habitat for Great Desert Skink prior to ground disturbing activities..<br>Camera surveys will be undertaken on known Great Desert Skink burrow during the active season. |
| | Locations | Sandplain Habitats surrounding site infrastructure and roads. |
| | Timing | Annually initially, then timing subject to previous surveys results. |
| | Personnel | Qualified ecologists. |
| **Trigger Points** | | **Acceptable level of change:** small change<br>Additional mitigation action required if:<br>>20% decrease in numbers of Great Desert Skink and/or Mulgara; 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 and/or Mulgara are detected. |
| Contingency | | Mitigation measures include:<br>Increase cat/fox control efforts if predator numbers have increased;<br>Assess the regional and local bushfire regime and consider the need for improved fire management; and<br>Reduce vehicle speeds or access in high-risk areas if roadkill may have been the cause. |

# 4.0 PERFORMANCE REVIEW

An regular review of performance of this management plan is to coincide with the review process of the Project's MMP.

The review process is to assess performance against objectives of this plan and the stated actions within the MMP, with any relevant outcomes, supporting information, reports and/or data, discussed within the relevant section of the MMP, and supporting information/reports provided within the appendices.

Any outcomes of the performance review that will assist in continually improving this management plan, it's objectives, methods or controls, are to be included or reflected in an updated version of this document.

# 5.0 REFERENCES

## 5.1 Third Party Documents


| Ref No. | Title | Document Number |
|---|---|---|
| C1. | Brocklehurst, P. Lewis, D., Napier, D., and Lynch, D. (2007) *Northern Territory Guidelines and Field Methodology for Vegetation Survey and Mapping. Technical Report.* Northern Territory Department of Natural Resources, Environment and the Arts, Palmerston, Northern Territory. | |
| C2. | Department of Sustainability, Environment, Water, Population and Communities (2012). *Threat Abatement Plan to Reduce the Impacts on Northern Australia's Biodiversity by the Five Listed Grasses.* Canberra, ACT. | |
| C3. | Department of Sustainability, Environment, Water, Population and Communities (2011). *Survey Guidelines for Australia's Threatened Reptiles: Guidelines for Detecting Reptiles Listed as Threatened Under the Environment Protection and Biodiversity Conservation Act 1999*. Australian Government | |
| C4. | Department of Sustainability, Environment, Water, Population and Communities (2011). *Survey Guidelines for Australia's Threatened Mammals: Guidelines for Detecting Mammals Listed as Threatened Under the Environment Protection and Biodiversity Conservation Act 1999*. Australian Government | |
| C5. | Department of the Environment (2015). *Threat Abatement Plan for Predation by Feral Cats*. Commonwealth of Australia | |
| C6. | Department of the Environment and Energy (2016). *Threat Abatement Plan for Competition and Land Degradation by Rabbits.* Commonwealth of Australia. | |
| C7. | Department of the Environment, Water, Heritage and the Arts (2008). *Threat Abatement Plan for Predation by the European Red Fox*. DEWHA, Canberra. | |
| C8. | GHD (2016). *Nolans Project Environmental Impact Statement, May 2016*. A report for Arafura Resources Limited. . | |
| C9. | GHD (2016a). *Nolans Project Environmental Impact Statement. Appendix M: Biodiversity - Flora and Vegetation Assessment.* Unpublished report for Arafura Resources Limited | |
| C10. | GHD (2016b). *Nolans Project Environmental Impact Statement. Appendix N: Biodiversity - Fauna and Threatened Species Report.* Unpublished report for Arafura Resources Limited | |
| C11. | GHD (2017). *Nolans Project Environmental Impact Statement - Supplementary Report, October 2017.* A report for Arafura Resources Limited | |
| C12. | McAlpin, S. (2001). *A Recovery Plan for the Great Desert Skink (Egernia kintorei) 2001-2011*. Arid Lands Environment Centre Inc. Alice Springs, NT | |

| Ref No. | Title | Document Number |
|---|---|---|
| C13. | Neave, H., Sparrow, B., and Clifford, M. (2006) *Preliminary Report: Towards a resource assessment of the Burt Plain Bioregion for Conservation Planning.* Biodiversity Conservation Department of Natural Resources, Environment and the Arts. | |
| C14. | Northern Territory. Department of Mines and Energy (1998). *Reducing Impacts of Tailings Storage Facilities on Avian Wildlife in the Northern Territory of Australia: Best Practice Guidelines*. Darwin, N.T.: Dept. of Mines and Energy. | |
| C15. | NRETAS (2005) *Northern Territory Parks and Conservation Masterplan – Northern Territory Bioregions Assessment of Key Biodiversity Values and Threats*, Department of Natural Resources, Environment, the Arts and Sport, Darwin, NT. | |
| C16. | Pavey, C. (2006). National Recovery Plan for the Greater Bilby *Macrotis lagotis*. Northern Territory Department of Natural Resources, Environment and the Arts. | |
| C17. | Pearson, D. J. (2013). Recovery Plan for Five Species of Rock Wallabies: Black-footed Rock Wallaby (*Petrogale lateralis*), Rothschild Rock Wallaby (*Petrogale rothschildi*), Short-eared Rock Wallaby (*Petrogale brachyotis*), Monjon (*Petrogale burbidgei*) and Nabarlek (*Petrogale concinna*) 2012-2022. Department of Parks and Wildlife, Perth, WA | |

# APPENDIX A FAUNA SIGHTING AND FATALITY REGISTER (EXAMPLE)

| Date | Time | Animal (Type / Name) | Number | Condition (Sighting, Injured, Dead) | Conservation Status (Native, Migratory, Feral, Introduced, Threatened, Unknown) | Location (Reference to infrastructure or Haul Road chainage) | Interaction Details (Summary of interaction including how fauna was injured or killed by Project activities and measures taken) |
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# APPENDIX B GROUND DISTURBANCE PERMIT

Instructions for Filling in the Ground Disturbance Permit Form

**Section 1 Application**

The applicant is to complete and submit Section 1 a minimum of 72 hours prior to ground disturbance. No ground disturbance is to be undertaken prior to approval. The applicant is required to complete, sign and submit the form to the HSEC Manager or representative. The form requires the following details:

- Applicant: Contractor or supervisor responsible for the work area.
- Arafura Area Manager/Supervisor: Arafura Resources company representative responsible for the works area.
- Summary of Clearing Request:
  - Contractor(s): Applicant Company and any subcontractors to be used are summarised including roles and contact details.
  - Purpose: Summary of works and its relation to the Project.
  - Related Infrastructure: Detail what infrastructure will be constructed post clearing (i.e. drill pad, ROM Pad, etc).
  - Location: Brief description of the location for ground disturbance in relation to layouts provided in Figure 1 to Figure 6.
  - Tenement / Lease: Detail which lease(s) the disturbance is situated on.
  - Clearing Summary: Equipment to be utilised, process to be followed (i.e. vegetation removal, topsoil strip, etc) and location of stockpiles.
  - Proposed Clearing Dates: Dates for clearance to occur and timings (i.e. day shift 06:00 to 18:00).
  - Area: Details of total area to be cleared as part of this permit.
  - High Risk Locations: Summary of high-risk locations at or adjacent to proposed ground disturbance including Aboriginal Area Protection Authority (AAPA) Restricted Works Area (RWA), heritage locations and/or identified threatened species or sensitive vegetation (see Figure 1 to Figure 6).

**Section 2 - Review**

Section 2 provides a framework for the disturbance to be assessed against to ensure compliance with Project approvals including the Cultural Heritage, Weed and Biodiversity Management Plans.

The application will be assessed by the HSEC Manager or representative. The assessment will determine if the disturbance is approved as part of the existing approvals and if it is compliant with the Cultural Heritage, Biodiversity and Weed Management Plans. Should insufficient detail have been provided within Section 1, the application will be returned to the Applicant with a request for more information.

**Section 3 – Approval**

Section 3 provides approval to an applicant to undertake the disturbance and describes associated approval conditions. The approval will be provided with a unique identification number and will be signed by the HSEC Manager or representative, applicant and Arafura Area Manager / Supervisor.

**Section 4 – Ground Disturbance**

Section 4 will capture the disturbance process including duration and a summary of the works. The summary will include conditions encountered, animals observed or translocated, stockpile locations and weed status.

## GROUND DISTURBANCE PERMIT

| **Section 1 - Application**<br>**This form must be completed before any work commences. Applicant to complete and provide to the HSEC Manager or representative a minimum of 72 hours prior to ground disturbance.** | | | |
|---|---|---|---|
| **Applicant** | | **Arafura Area Manager/Supervisor** | |
| **Name** | | **Name** | |
| **Position** | | **Position** | |
| **Employer** | | **Contact No.** | |
| **Contact No.** | | | |
| **Summary Ground Disturbance Request** | | | |
| Contractor(s) entities | | | |
| Purpose rationale or reason for clearing. | | | |
| Related infrastructure<br>Type of infrastructure to be constructed as covered by this ground disturbance permit. | | | |
| Location<br>Location description and coordinate references (specify GPS georeference used). | | | |
| Tenement / lease<br>Detail lease ID and confirm it is on lease. | | | |
| Clearing summary<br>Equipment, process and stockpile locations (vegetation and soil). | | | |
| Date(s) and time(s) for proposed clearing and work activity<br>Duration of clearing and works. | | | |
| Area (ha) (append map) | | | |
| High risk locations<br>AAPA restricted work areas, creeks/rivers, threatened species (see Figure 1 to Figure 6). | | | |
| High risk control measures<br>Installation of additional flagging tape and / or spotter. | | | |

| | | | |
|---|---|---|---|
| Request Submission | | | |
| **Applicant Signature** | | **Date** | |

| **Section 2 - Review**<br>**HSEC Manager or representative to review ground disturbance request and determine if it is within the lease, approved through the EIS and/or high-risk control measures are sufficient.** | |
|---|---|
| **Area of Disturbance** | |
| Is disturbance authorised under Mining Management Plan? | |
| Is the disturbance within the tenement / lease?<br>If not, provide justification/relevant approvals. | |
| Will the work impact activities off lease? | |
| Detail potential impact on pre- established monitoring locations (boreholes, survey stations or surface water monitoring locations)? | |
| Confirm area to be disturbed will be / has been flagged? | |
| **Cultural Heritage** | |
| Is the disturbance outside of AAPA Restricted Work Areas (RWA)?<br>No works are to occur within RWAs without written approval from AAPA. | |
| Is the disturbance within close proximity (i.e. 50 m) of an RWA?<br>< 50m additional flagging and a spotter are required. | |
| Will the disturbance impact any identified cultural heritage?<br>Assess if cultural heritage can be avoided in unison with Applicant. If not:<br>Complete Heritage Branch 'Application to Carry Out Work on Heritage Plan or Object';<br>Wait for Heritage Branch work approval; and<br>Notify traditional owners of disturbance dates and invite to supervise works. | |

| **Section 2 Continued - Review**<br>**HSEC Manager or representative to review ground disturbance request and determine if it is within the lease, approved through the EIS and/or high-risk control measures are sufficient.** | |
|---|---|
| **Flora and Fauna** | |
| Have flora and fauna surveys been undertaken across the disturbance?<br>No works are to occur without | |

| | |
|---|---|
| fauna survey being undertaken to identify threatened species.<br>Environmental department to schedule Bill Low Ecological to survey all areas for threatened fauna to be cleared within two months prior to submitting this GDP. | |
| Have threatened species been identified in the disturbance footprint?<br>If so, a qualified ecologist is to be present onsite to capture and translocate animals encountered. | |
| Has a site walkover identified any indication of threatened species?<br>If so, a qualified ecologist is to be present onsite to capture and translocate animals encountered.<br>Have weeds been identified within the disturbance footprint?<br>If so, weeds are to be removed prior to vegetation clearance. | |
| Where will vegetation stockpiles from the disturbance be located?<br>Include vegetation stockpile locations within Weed Management Plan and weed infestation monitoring/control programs. | |
| **Excess Material Management** | |
| Where will soil stockpiles from the disturbance be located?<br>Stockpiles to be kept at designated topsoil storage locations to facilitate erosion and sediment control management. | |
| Will stockpile material type and volumes be recorded?<br>Contractor and/or HSEC Manager or representative to record volumes and materials for future reference | |

| | |
|---|---|
| and assist in rehabilitation of site. | |
| **Survey Management** | |
| Has the disturbance been scheduled for survey?<br>Survey data required to facilitate annual closure estimation. Applicant to organise survey of the disturbance. | |

| Section 3 - APPROVAL<br>HSEC Manager or representative to review ground disturbance request and determine if it is within the lease, approved through the EIS and/or high-risk control measures are sufficient. | | | | | |
|---|---|---|---|---|---|
| **Disturbance Approval .** | | | | **GDP No** | |
| Conditions of Approval | | | | | |
| **Clearing Date(s)** | | | | | |
| **HSEC Manager** | | **Signature** | | **Date** | |
| **Arafura Area Manager/Supervisor** | | **Signature** | | **Date** | |
| **Applicant Acceptance** | | | | | |
| **Applicant** | | **Signature** | | **Date** | |

| **Section 4 – WORKS SUMMARY**<br>**Contractor or Arafura Area Manager / Supervisor to provide clearance dates and summary of any issues/recommendations.**<br>**The Ground Disturbance Permit is to be returned to the HSEC Manager or representative when works are complete for inclusion in the Ground Disturbance Database.** | | | |
|---|---|---|---|
| **Ground Disturbance** | | | |
| **Start** | | **Finish** | |
| **Date** | | **Date** | |
| **Time** | | **Time** | |
| Summary of Disturbance<br>Conditions encountered, animals observed or translocated and weed status. | | | |
| Survey Data<br>Extents of disturbance and location. | | | |