



Avoidance and Mitigation



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6 AVOIDANCE AND MITIGATION

6.1 INTRODUCTION

This section describes the environmental management framework that will apply to the Southern Lease Exploration Program (2023-2025) (the exploration program) and the measures that will be adopted to avoid and mitigate the environmental impacts of the exploration program.

6.2 ENVIRONMENTAL MANAGEMENT FRAMEWORK

6.2.1 Environmental Policy and Standards

The proponent places the highest value on being a responsible operator and is committed to minimising the impact of its business on the environment. The proponent adheres to strict internal environmental management standards and has an environmental management system in place that is consistent with the requirements of *ISO 14001 Environmental Management Systems – Requirements with Guidance for Use*.

The proponent has internal documentation which specifies the minimum mandatory environmental standards and performance requirements for its operations. These standards and procedures are relevant to the management of land, biodiversity, water, air, greenhouse gas, hydrocarbons, and waste. Various internal targets and key performance indicators (KPIs) are routinely set by management for site operations and departments. Monitoring and internal reporting of results relative to these KPIs occurs monthly to review the effectiveness of management and mitigation strategies. If a non-compliance or a notifiable incident occurs, the proponent reports these incidents to the Anindilyakwa Land Council (ALC) and to the Northern Territory Department of Industry, Tourism and Trade (DITT) consistent with Section 29 of the *Mining Management Act 2001* (NT).

In addition, South32 has a Sustainability Policy which guides environmental and social management as well as sustainability planning for the business. South32's Sustainability Policy can be accessed via the following hyperlink:

[https://www.south32.net/docs/default-source/corporate-governance/sustainability-policy-\(2\).pdf](https://www.south32.net/docs/default-source/corporate-governance/sustainability-policy-(2).pdf)

The Sustainability Policy is supported by a number of standards which assist to minimise environmental and social impacts, support regulatory compliance and drive continual improvement in regards to environmental performance. The standards include but are not limited to the:

- Environment and Climate Change Standard (and the associated Implementation Guide);
- Health, Safety, Environment, and Community Reporting Standard;
- Social Performance Standard;
- Safety Standard;
- Health Standard;
- Inclusion and Diversity Standard; and
- Closure Standard.

These South32 standards apply to the existing mine and will also apply to the exploration program, as relevant.



6.2.2 Mining Management Plan

Prior to commencing the exploration program, it will be necessary for the proponent to submit a Mining Management Plan (MMP) to DITT in support of an approval for authorisation under the *Mining Management Act 2001*. DITT has published a guideline on the required structure and content of the MMP. The MMP will be prepared in accordance with this guideline. The MMP will include a description of the exploration program and the environmental management measures to be adopted to mitigate and manage potential impacts (consistent with those described in this section).

6.2.3 Environmental Incident Reporting

The proponent has well established procedures in place for reporting and investigating environmental non-conformances and hazards. All environmental incidents are recorded on an internal database, risk ranked, and investigated to determine the cause. Corrective actions are then implemented and monitored. Key learnings from the incidents are noted on the internal database, and the learnings are communicated to the workforce via email and during daily pre-start safety meetings, and are incorporated into training and site induction processes. The Technical Services Team also meets weekly with its senior managers and superintendents where any incidents/events and actions relating to the department (this includes exploration) are discussed.

In accordance with the *Mining Management Act 2001*, environmental incidents must be reported to DITT as soon as possible. The MMP will also detail any environmental incidents from the previous reporting period.

6.2.4 Community Complaints

The proponent encourages community members to submit any complaints or issues so they may be investigated and resolved as appropriate. Where necessary, this may include monitoring or changes to environmental management plans and procedures.

The proponent also liaises closely with the ALC regarding community issues, and undertakes quarterly forums with the ALC to raise, discuss and communicate any environmental concerns.

6.2.5 Review and Auditing

The environmental management framework encourages continual improvement in environmental performance through the review and, if necessary, revision of environmental management plans or procedures. Internal and external compliance audits of the environmental management framework are conducted to ensure compliance with the proponent's mandatory environmental standards and regulatory requirements.

6.2.6 Environmental Training and Education

The proponent is committed to educating all employees about their individual responsibilities regarding health, safety and environmental management, through specific induction, training and education programs. An important component of the existing site induction program covers targeted environmental issues, including:

- Key environmental legislation and other requirements, and the consequences of non-compliance;
- Potential environmental impacts across the site and at each work area, and how the proponent controls these impacts;
- Groote Eylandt's threatened species and the importance of the island's biosecurity (Cane Toads (*Rhinella marina*), weeds etc.);
- Measures to increase energy efficiency and reduce greenhouse gas emissions;



- The importance of water efficiency;
- The importance of managing dust;
- The importance of managing noise;
- Where to dispose of waste appropriately and the proponent's land-based spill response procedure; and
- The importance of, and how to, report environmental incidents/hazards.

All personnel (including contractors) who conduct vegetation clearing and exploration activities are also provided with awareness training in the identification of the threatened species that may be encountered in the area, including specific habitat features of these species (such as spoil heaps or tree hollows). Contamination risk management, including spill response training, is also completed by all personnel as part of their induction and is included as a hazard for consideration as part of the Job Hazard Analysis and Take 5 processes.

In addition, at the start of each drilling campaign all employees and contractors involved in exploration receive a presentation on the environmental procedures, practices and protocols that apply to exploration activities. This includes topics such as weed management, biosecurity and a presentation on the results of the rehabilitation monitoring in exploration areas.

6.3 AVOIDANCE MEASURES

South 32's Environment Standard emphasises the importance of the mitigation hierarchy being followed (i.e. designing activities to avoid impacts where possible, applying mitigation measures to further reduce impacts and only relying on offsets for impacts that remain after avoidance and mitigation measures have been applied). This is consistent with the environmental decision-making hierarchy in the *Environment Protection Act 2019* (NT) (EP Act) which requires that decision makers, proponents and approval holders follow a hierarchy of approaches (in order of priority). This involves ensuring that actions are designed to avoid adverse impacts on the environment, applying management measures to mitigate these impacts to the greatest extent, and providing environmental offsets where these impacts cannot be avoided or mitigated.

The avoidance of impacts is most efficiently achieved during the project planning stage. The proponent has located and designed its activities in the Southern Lease (including the exploration program) to avoid environmental impacts where possible. The process adopted to avoid impacts, as part of the project planning stage, is described in Section 2 – Project Description. In summary, it includes:

- Gathering baseline data on the environmental and cultural values in the Southern Lease to enable the identification of the most sensitive environmental and cultural features. This included:
 - Undertaking terrestrial ecology surveys, including two research programs which were designed by the Department of Environment, Parks and Water Security (DEPWS) to provide data to inform an assessment of impacts of exploration on threatened species.
 - Undertaking aquatic ecology field surveys.
 - Mapping waterways and catchments.
 - Engaging the ALC to undertake a study to define the location of sacred sites and delineate the required buffer zones around them.
- Undertaking an iterative project planning process, informed by this baseline data, to:
 - Locate the exploration program in a broad area that avoids the most sensitive environmental and cultural features in the Southern Lease. The kinds of features that were identified and avoided are large, perennial



rivers and their floodplains, estuarine areas, significant wetlands, and monsoonal vine thicket (this vegetation type is generally considered to be culturally and environmentally sensitive).

- Design the exploration program, at a fine scale, to incorporate the following measures to avoid impacts:
 - Positioning drill holes along previously cleared tracks, where possible;
 - Utilising the track width as part of the drill pad area;
 - Where possible, positioning slightly larger drill pads at the end of an access track to enable the drill rig to turnaround, as opposed to clearing a new access track to connect adjacent tracks;
 - Where possible, geotechnical drill holes and test pits have been sited on previously cleared tracks or on pads used for infill drilling;
 - Limiting clearing at drill holes to the smallest possible area;
 - Utilising existing access tracks where possible; and
 - The disturbance footprint has been designed to avoid watercourses, wetlands and riparian vegetation, as shown on Figure 2-11 of this EP Act Referral.

6.4 MITIGATION MEASURES

6.4.1 Introduction

This section outlines the measures in place to mitigate the potential impacts of the exploration program. The proponent has undertaken exploration on Groote Eylandt for nearly 60 years and consequently has substantial experience with exploration and its potential impacts. Mitigation measures have been developed to address potential impacts, and these measures have been used successfully during previous exploration campaigns in the Southern Lease. The adopted mitigation measures reflect feedback obtained from regulators, specifically the Northern Territory Environment Protection Authority (NT EPA) and DEPWS, during previous approval applications for exploration. In addition, the proponent has made three previous referrals under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act) for exploration in the Eastern Leases. None of these referrals were found to be controlled actions. However, in deciding the applications, the Commonwealth outlined the manner in which exploration should be undertaken (e.g. particular requirements for pre-clearing inspections) in order to avoid significant impacts. These measures have been incorporated as part of the proponent's standard mitigation measures for exploration.

Mitigation measures relevant to the kinds of impacts that may arise from exploration are as follows:

- Measures to avoid and minimise impacts from vegetation clearing (Section 6.4.2);
- Rehabilitation practices for areas disturbed by exploration (Section 6.4.3);
- Measures to prevent the introduction and spread of weeds (Section 6.4.4);
- Measures to prevent the introduction of Cane Toads to Groote Eylandt (Section 6.4.5);
- Waste management practices (Section 6.4.6);
- Practices related to the handling of hazardous materials (Section 6.4.7);
- Erosion and sediment controls (Section 6.4.8); and
- Measures to protect cultural heritage, including the procedure to be adopted if an unexpected archaeological find is discovered (Section 6.4.9).



These measures will apply to the exploration program and Section 6.4.10 lists the procedures, and associated forms/safe work instructions, that describe the measures in detail.

6.4.2 Clearing Procedures

Clearing will be undertaken in accordance with the proponent's Permit to Clear process. This will ensure that clearing is well planned, undertaken in accordance with all necessary regulatory approvals and corporate requirements, and subject to an internal approval process.

The proponent's Permit to Clear Process includes:

- Delineating the area to be cleared;
- Undertaking pre-clearance surveys;
- Consulting with the ALC;
- Approving the Permit to Clear form (including engaging with specialist internal teams within GEMCO to ensure environmental constraints are assessed and applied (e.g. Land Access, Environment, Mine Planning)); and
- Undertaking vegetation clearing in accordance with the Permit to Clear.

These measures are discussed in the following sections and will apply throughout the life of the exploration program.

Delineation of Clearing Area

As part of the Permit to Clear process, the area to be cleared will be delineated using flagging tape. The area to be cleared will be:

- Restricted to the minimum area required to safely complete the drilling program. This will include minimising the width of access tracks and area of drills pads.
- Consistent with commitments made in the proponent's regulatory approval documents, i.e. that:
 - The exploration program will be broadly consistent with that shown in Figure 2-9 of this EP Act Referral, although noting the need to potentially relocate drill pads and tracks to account for cultural and environmental considerations that are identified during the Pre-clearance survey and as part of the Permit to Clear process.
 - The exploration program will be located within the exploration program area shown on Figure 2-2 of this EP Act Referral.
 - There will be no clearing within watercourses, wetlands or riparian vegetation (as shown in Figure 2-11 of this EP Act Referral), and no clearing in sacred sites or restricted work areas.

Pre-clearance Surveys

The area proposed to be cleared (and delineated using flagging tape) will be inspected by an experienced ecologist or an experienced environmental practitioner. The area will be inspected for weeds and for habitat features for threatened fauna species, as follows:

- Weeds. The area proposed to be cleared will be inspected for weeds. In the event weeds are present, the location of these weeds will be GPS recorded, with the information provided to the proponent's Exploration and Environment Departments, as well as the Rehabilitation Mine Services Team. Any weeds that are identified will be sprayed or removed prior to any clearing being undertaken.



- Threatened species. Searches will be undertaken of each clearing area by an experienced ecologist or environmental practitioner to identify key habitat features of threatened fauna species. Key habitat features are defined as large trees (trees that are larger than 50 cm Diameter at Breast Height (DBH)) and all hollow-bearing trees, and all key habitat features will be marked with flagging tape. The following measures will be implemented:
 - Large trees:
 - Access tracks will be realigned to avoid all large trees.
 - Drill pads will be relocated to avoid large trees, where possible. Should a large tree within the drill pad contain a hollow suitable for, or occupied by, the Masked Owl (northern), the required buffers detailed below will apply, in which case the pad will be moved.
 - A 10 m buffer will be created around non-occupied hollow-bearing trees that have hollows that are suitable for the Masked Owl (northern) (i.e. hollows >20 cm in size).
 - A 100 m buffer will be created around hollow-bearing trees assessed as occupied by a Masked Owl (northern), as determined by indirect evidence of occupation (e.g. white wash, prey).
 - Hollow-bearing trees:
 - In addition to the above measures, the pre-clearance survey will involve the flagging of all hollow-bearing trees that are not also large trees (<50 cm DBH). Controlled felling will be undertaken for hollow-bearing trees to minimise the risk of injury to fauna and to enable hollows to continue to be used by other fauna species. This process includes:
 - Trees will be tapped to encourage any animals within the tree to vacate; and
 - Where possible, trees will be felled with any hollows facing upward to enable the continued use of the felled tree as possible habitat.
 - Although the Northern Hopping-mouse is unlikely to occur within the disturbance footprint (based on extensive camera surveys (refer Section 4 – Terrestrial Ecosystems)), the following pre-clearance process will be followed as a precautionary measure:
 - An experienced ecologist or environmental practitioner will search the proposed clearing area for spoil heaps or pop holes.
 - Where two or more suitable¹ spoil heaps or pop holes are found within 200 m², cameras will be installed, as follows, to determine if these features are due to the presence of the Northern Hopping-mouse:
 - Cameras will be set approximately 2 m from the spoil, or if present 2 m from the pop hole. Cameras will be attached to either a tree or wooden stake/metal star picket using an octopus strap, with the top of the camera casing positioned at 35 cm above the ground;
 - Cameras will be focussed on a bait station located 1.5 m from the camera. The bait station will comprise a PVC pipe, with a ventilated cap on each end, and containing a bait mixture of peanut butter, oats and honey; and

¹ Suitable spoil heaps (as defined by Diets, 2016) are piles of soil that are round or oblong, are >50 cm at their longest diameter and have no visible hole from where the spoil emerged. Suitable spoils may also have 2-4 cm wide pop holes (access points to the burrow) located up to 5 m away from the soil.



- For individual spoil heaps or pop holes, one camera will be used per spoil heap. In the case of clusters of spoil (>4 spoil heaps/ha) four cameras will be used per hectare with the cameras spaced at least 50 m apart;
- Cameras will be deployed for a minimum of seven nights.
- If the Northern Hopping-mouse is confirmed as present using the cameras, a 100 m buffer will be established and the access track/drill hole re-aligned to ensure the area is avoided. If cameras do not identify the presence of the Northern Hopping-mouse, the exploration can proceed as planned.
- Where drill pads or access tracks are located within areas identified as having key habitat features that require avoidance (e.g. large trees, confirmed Northern Hopping-mouse spoil), their locations will be moved to beyond the buffer areas and searches undertaken at the new locations.
- A pre-clearing report will be prepared documenting the findings of the ecology inspection described above.

Consultation with the ALC

An assessment of sacred sites has been completed and the Traditional Owners have nominated buffers around sacred sites (refer to Section 5 – Culture and Heritage). Exploration activities will be sited beyond the sacred sites and buffers. In addition, consultation will be undertaken with the ALC as part of the Permit to Clear process and as per the requirements of the Exploration Agreement. As part of this process, a cultural monitor (i.e. a Traditional Owner who speaks for the country) will be invited to visit the exploration area and confirm that it is suitable from a cultural perspective. Once this process has been completed, the proponent obtains the ALC's written endorsement of the proposed clearing.

Approval of Permit to Clear

Following pre-clearance surveys and ALC endorsement, a Permit to Clear form will be completed which describes the proposed works, including the proposed location and timing of clearing. The form includes sections on environmental controls, including those related to threatened species. These sections are completed by the proponent's Environment Specialist. It also includes a section documenting that the ALC's endorsement of the activity has been obtained (this section is completed by the proponent's External Affairs department).

The Permit to Clear form and accompanying spatial data will be submitted for approval to GEMCO's Technical Services Manager. Clearing will only be undertaken once the Permit to Clear has been approved by each of the nominated discipline leads (i.e. Technical Services Rehabilitation Planner, the Environment Department Superintendent, External Affairs – Land Access, and the Technical Services Manager). The originator of the Permit to Clear form is also required to sign off on the form, acknowledging that they understand and are aware of the requirements of the permit and actions prescribed by each technical discipline. The Permit to Clear will designate any specific requirements that must be adopted in undertaking the clearing (e.g. avoidance of key habitat features, specifications about how trees are to be felled).

Vegetation Clearing

The operator undertaking clearing (e.g. dozer operator) will be given the front two pages of the approved Permit to Clear showing that the Permit has been approved as well as conditions the operator must abide by and a map of the area. The Exploration Supervisor is responsible for ensuring that the dozer operator has read the Permit to Clear and completed any actions described in the Permit. The Supervisor and operator must sign-off in the relevant section of the Permit prior to commencing clearing. In addition, the GPS coordinates for clearing from the Permit to Clear are uploaded to the dozer's GPS guidance system. The system has a built-in alarm if the operator is found to stray off course.

A spotter will work with the dozer operator during the clearing of any vegetation. The spotter will ensure compliance with the various restrictions identified during pre-clearance surveys, such as maintaining adopted



buffer distances from flagged trees, as well as ensuring the dozer operator maintains the correct alignment and stays within the approved clearing area.

In undertaking clearing, the disturbance of topsoil will be minimised by undertaking clearing using the blade up method (i.e. the blade of the dozer is lifted so that the soil is not disturbed).

6.4.3 Rehabilitation

Rehabilitation and monitoring methods are discussed in the following sections.

Capping of Holes

Two main aquifers occur in places in the Southern Lease, namely a shallow, unconfined laterite aquifer and a deeper, confined aquifer associated with the Cretaceous sandstone. Bentonite, an inert low permeability clay, will be used to create a seal in any holes where the confined aquifer is intersected. This will prevent any possible connection between the aquifers.

The top of the holes will then be plugged using a hole plug and backfilled with drill cuttings to produce a mound on top of the hole to allow for consolidation.

Rehabilitation of Drill Pads and Access Tracks

Rehabilitation of drill pads and tracks is planned to occur progressively during the three year exploration program and is designed to occur before the onset of the next wet season. Drill pads and access tracks will be rehabilitated using the same methods adopted for previous exploration in the Southern Lease. The tasks involved in rehabilitation of drill pads and access tracks are as follows:

- Removing and disposing of any rubbish.
- Respreading any remaining drill cuttings on drill pads.
- Respreading the windrows of cleared vegetation (e.g. logs, vegetation cover and leaf litter) on the disturbed area. Note that topsoil is not stripped as part of developing the drill pads or access tracks and so it is not necessary to respread topsoil.

The area will then be allowed to naturally revegetate from endemic seeds in the soil seed bank and from adjacent vegetation.

Upon completion of rehabilitation, and prior to the commencement of the wet season, felled timber and logs will be placed across the entrance to access tracks and along a sufficient distance of track to prevent ongoing access. This measure is designed to prevent the access tracks becoming permanent tracks. This will assist with reducing the potential for threatening processes to be introduced. These processes include:

- Access to previously inaccessible areas of the Southern Lease has the potential to increase fire frequency, which may alter the floristic composition and structure within these areas. The closure of access tracks will minimise this risk.
- The potential ongoing use of tracks will impede regeneration and could potentially result in long term habitat fragmentation, therefore reducing the ability of native species to utilise the area. The closure of access tracks will allow the tracks to naturally revegetate without further disturbance.



- As vehicles are common vectors for weed dispersal, there is potential for weeds to be inadvertently spread from other areas of Groote Eylandt into the Southern Lease with the continued use of access tracks. This threatening process will be minimised by the closure of access tracks.
- Cleared areas may provide transport vectors to more remote areas of the Southern Lease by feral fauna species such as the Feral Cat (*Felis catus*) which prey on threatened fauna species. The closure of access tracks and the natural regeneration of these areas will assist to restrict the movement of feral animals.

There may be some instances where tracks may be required to remain open longer than a single dry season. For example, if the exploration drilling program is unable to be fully completed in an area before the onset of the wet season, some cleared tracks may need to remain open to enable access to drill holes in the following dry season. These instances would be considered an exception to the rehabilitation process and would be subject to an internal review and approval process.

Monitoring of Rehabilitation

Rehabilitation Checklist

As each drill pad and track is rehabilitated, an Exploration Field Technician will complete a checklist and take a photograph of the pad or track. The checklist will confirm that the following actions have been undertaken for each pad/track:

- All drill holes have been capped and backfilled;
- Rubbish has been removed;
- Drill cuttings, as well as surface materials such as logs and woody debris, have been spread back over the pad; and
- Logs have been placed where the associated access track intersects a public access track.

This information, including photographic reference, will be recorded in the proponent's geographic information system (GIS) database for the Southern Lease.

Monitoring

As noted above, rehabilitation of drill pads and tracks is planned to occur before the onset of the next wet season. Monitoring of rehabilitated areas will be undertaken one to two wet seasons after rehabilitation has been completed. Monitoring will be undertaken in the dry season by an experienced ecologist or environmental practitioner and will comprise:

- Inspecting access tracks to confirm they are not being used and that the log barriers are effective in preventing access;
- Inspecting drill pads for erosion or for evidence of subsidence in drill holes that have been backfilled;
- Assessing the area to confirm that revegetation is occurring;
- Undertaking a survey to identify the presence of weeds; and
- Taking a photograph of each drill pad.

The ALC will also be provided an opportunity to inspect rehabilitated exploration areas to confirm the rehabilitation has been undertaken to the satisfaction of the Traditional Owners.

Corrective action will be taken in response to issues identified during monitoring. If further remediation is required due to significant subsidence of drill holes, a stable landform will be achieved through sourcing and placing



suitable local backfill materials. If monitoring reveals the presence of weeds, the weeds will be recorded and treated/removed, and further monitoring will be undertaken to confirm the success of weed control/removal work.

6.4.4 Weed Management

The proponent has established a weed management framework to reduce the risk of weeds impacting native plant and animal species within its tenements. To support this framework, a Weed Management Plan, covering all the proponent's tenements (including the Southern Lease), has been prepared in consultation with DEPWS.

The Weed Management Plan includes management activities and controls, communication and reporting procedures, and evaluation and review procedures that will also apply to the exploration program. These are discussed in the following sections.

Management Activities and Controls

Overview

The proponent recognises that the introduction and spread of weeds represents a significant risk to the ecological, cultural and recreational values of Groote Eylandt. Risks posed by weeds are managed via:

- Maintaining a baseline map of the current distribution of weeds across the proponent's tenements on Groote Eylandt, including the Southern Lease;
- Implementing measures to prevent the introduction of weeds and/or prevent their propagation and spread;
- Managing current weed infestations via weed control and treatment activities;
- Monitoring for the presence of weeds; and
- Implementing a weed response program.

These management measures are described in the following sections.

Mapping of Existing Weed Distribution

The proponent maintains a GIS weed mapping database to capture any weed infestation data gathered, either through pre-clearance surveys, monitoring of rehabilitation, or through incidental sighting of weeds. The location of the weeds is GPS recorded and information is forwarded to the proponent's Exploration and Environment Departments, as well as the Rehabilitation Mine Services Team.

The database also includes a record of weed control actions that are required in response to the sighting, a record of the actions that have been undertaken, and details of follow up monitoring.

Measures to Prevent the Introduction or Spread of Weeds

The Weed Management Plan describes the following measures that will be employed to prevent the introduction of weeds and/or prevent their propagation and spread:

- Quarantine inspections. All the proponent's barge freight, including vehicles and equipment, that arrives on Groote Eylandt is inspected at the Alyangula Freight Port for soil, seeds or plant matter. These inspections are also completed by the barge crew prior to the barge departing from Darwin. Any vehicles or equipment found to have noticeable traces of soil/seeds during inspections are detained at the port facility until wash down/weed treatment is completed.
- Vehicle washdown and inspection procedures. Vehicles will be subject to washdown and inspection procedures before entering the Southern Lease. This will apply to all mine and contractor vehicles, including drill rigs, scrub dozers, light vehicles and other support vehicles. The existing vehicle wash bay facility is located at the mine



industrial area adjacent to the Maintenance Workshop and at the Mining Office. The inspection procedure involves checking the entire piece of equipment for noticeable traces of soil/seeds and plant material. This includes checking the deck area, wheel arches, belly plates, front grill and radiator. Plant or equipment that are observed to contain seeds or plant material will be refused access to the Southern Lease until it has been adequately cleaned.

- Vegetation clearing procedures. Clearing procedures include:
 - A Permit to Clear process (facilitated by pre-clearance surveys) is undertaken prior to any areas being cleared (refer to Section 6.4.2). This survey will include identifying any weeds that exist in the area to be cleared. Any weeds that are identified will be sprayed or removed prior to clearing.
 - At the conclusion of clearing activities, if the earthmoving equipment has been operating in an area that contains weeds, the equipment is washed at the designated wash bay facility located at the mine site prior to relocation to ensure that weeds are not spread.
 - Exploration access tracks will be closed following exploration to impede ongoing vehicular access and minimise the potential for vehicles to inadvertently transport weeds into and throughout the Southern Lease.
- Other general preventative measures to avoid weed germination and spread. These include:
 - Personnel working on the Southern Lease will undertake a daily check for weed seeds on work clothes or boots prior to entering the Southern Lease.
 - Established roads and tracks will be used where available.
 - Alyangula residents and the proponent's employees, contractors and visitors are prohibited from importing plants, soil and mulch material from non-approved sources.
 - All the proponent's employees and contractors are educated on weed management and reporting obligations as part of the site induction process. This induction highlights how weeds impact the environment and what employees and contractors should do to help reduce risks associated with weeds.

Weed Control and Treatment Activities

The proponent controls weeds through use of an integrated weed management strategy that uses complementary weed control methods targeted to individual species. Weed control is prioritised in newly established rehabilitation areas, high traffic areas and park up areas.

The control methods used will depend on the weed species, and the location and extent of the weed infestation. The Weed Management Plan includes a Weed Field Guide which lists each weed species, provides details regarding the priority, classification and taxonomy of the species, the physical characteristics of the species, and what treatment methods are suitable for controlling the species (including optimum treatment times). Weed management techniques adopted by the proponent include, but are not limited to, hand weeding and the use of vehicle mounted spray units for the application of selective herbicides. Land management control measures are also utilised at the existing mine, including isolating areas of infestations and preventing access to these areas via road closures and the installation of signage.

Monitoring

The following monitoring will be undertaken in relation to exploration activities:

- As detailed in Section 6.4.2, pre-clearance surveys will be undertaken, which include identifying any weeds that exist in the area to be cleared. The location of these weeds will be GPS recorded and information will be forwarded to the proponent's Exploration and Environment Departments, as well as the Rehabilitation Mine Services Team. Any weeds that are identified will be sprayed or removed prior to clearing.



- Areas of exploration rehabilitation will be monitored for the presence and distribution of weeds. The location of weeds in areas of exploration rehabilitation will be GPS referenced in monitoring reports and recorded as part of the mine site weed management register. Recommended actions that are necessary for controlling weeds will also be recorded and scheduled as part of the work program for the proponent's Rehabilitation and Mine Services Team.

Response Program

The proponent has developed a Trigger, Action and Response Plan which outlines the response required for certain incidents related to weeds. The triggers include:

- Introduction of a new declared weed to Groote Eylandt or spread of a declared weed to a new area;
- Introduction of priority weeds to areas previously weed free;
- Spread of environmental weeds to areas previously weed free; and
- Wildfire or controlled burns on the proponent's tenements.

Actions, responsibilities and timeframes are allocated to each trigger, as detailed in the Trigger, Action and Response Plan. Further detail is provided in the Weed Management Plan.

Communication and Reporting

Reporting and consultation in relation to weeds will include the following:

- The proponent will continue to facilitate ongoing consultation with the ALC on matters relating to weed management.
- The proponent will report on weed management activities as part of the MMP prepared under the *Mining Management Act 2001* (NT).
- The proponent will notify the Weed Management Branch (WMB) of DEPWS within 14 days if a declared weed species is identified by the proponent on land where it has not previously been recorded or is known to have been present.
- The proponent will provide an annual report to the Northern Territory Government that describes the performance of the Weed Management Plan in relation to any weed species that are subject to Statutory Weed Management Plans (note that no such weeds have been detected in the Southern Lease). Site-wide Communication Briefs will be used to alert workers and the Groote Eylandt community of any new weed threats, and to provide weed identification information.
- As part of the site inductions and pre-start safety briefings, all exploration staff and contractors will be made aware of their responsibilities regarding weed management to ensure there is an ongoing and general awareness of the risks of weed incursions.

Evaluation and Review

All weed treatment activities and outcomes are verified (during the monitoring programs described in a preceding section), using the proponent's existing task monitoring and validation systems.

There is also a Groote Eylandt Weed Management Working Group which consists of representatives from GEMCO and other organisations that operate in the Groote Archipelago (such as the ALC, and Groote Eylandt and Bickerton Island Enterprises), with the WMB attending selected Working Group meetings. The Working Group meets biannually and reviews the priorities in the Weed Management Plan and the performance of treatment programs. This information is used to inform subsequent annual treatment and monitoring programs and may trigger the need to update the Weed Management Plan, as required.



The Weed Management Plan is also reviewed every three years in consultation with the WMB, and amendments made to the plan, if required.

6.4.5 Cane Toad Management

The proponent has a Cane Toad Management Plan, Cane Toad Response Plan and associated quarantine procedures in place, which would apply to the exploration program. The Cane Toad Management Plan was prepared in consultation with DEPWS.

The management framework includes activities undertaken to manage the risk of freight and passenger luggage, Cane Toad awareness initiatives, a Cane Toad monitoring program, a Cane Toad response program, and associated reporting, evaluation and review procedures. These elements are discussed in the following sections.

Risk Management of Freight and Passenger Luggage

The following actions are taken to reduce the risks associated with the proponent's operations (freight and airline passengers) transporting stowaway Cane Toads to Groote Eylandt:

- Cane Toad exclusion and containment fencing. Cane Toad exclusion fencing is deployed and maintained at key freight yards in Darwin to minimise the risk of Cane Toads entering the yards and accessing freight destined for Groote Eylandt. Cane Toad containment fencing is also deployed and maintained in key freight yards on Groote Eylandt where freight is unloaded/unpacked. This ensures that even if there are Cane Toads in freight, they will be contained within freight yards. These fencing systems are required to be checked multiple times a week by the operators of the facilities to ensure that the systems are still intact. Exclusion and containment areas are required to be kept in a condition that is not conducive to Cane Toads hiding within or close to the yard.
- Cane Toad trapping. Cane Toad traps are deployed and will continue to be maintained within all exclusion and containment areas in Darwin and on Groote Eylandt. The traps are for the purpose of ensuring that any Cane Toads that have entered these areas are trapped before either accessing freight destined for Groote Eylandt (in the case of mainland areas) or escaping containment areas (in the case of Groote Eylandt areas). A minimum number of traps are required in each area (dependent on the size of the perimeter), and traps are required to be kept in good condition and checked multiple times a week. Forms are submitted to the proponent for the purpose of confirming that these checks have taken place and reporting on whether any Cane Toads have been detected.
- Cane Toad inspections. Inspection of the proponent's freight for the presence of Cane Toads is undertaken at multiple points along the journey from mainland freight facilities to its destination (i.e. locations on Groote Eylandt). Inspections of freight include those undertaken visually by the barge operators, and those undertaken by Cane Toad Detection Dogs and their handlers (Biosecurity Coordinators) on Groote Eylandt.

Awareness Initiatives

Comprehensive awareness initiatives have been put in place to raise public awareness and knowledge of Cane Toads and their potential impacts, as well as provide advice on how this risk can be managed. These include:

- Inductions for the proponent's employees, contractors, visitors, and suppliers, that discuss Cane Toads;
- Awareness sessions that cover relevant biosecurity issues, including Cane Toads;
- Awareness signage, promotional material and information packs providing information on Cane Toads;
- Deployment of Cane Toad Detection Dogs and their handlers (Biosecurity Coordinators) at key freight facilities and the airport on Groote Eylandt, which raises awareness of the importance of Cane Toad biosecurity on the island;



- Issuing pre-flight reminders to all GEMCO charter flight travellers, reminding them to check their boots and baggage for Cane Toads prior to traveling;
- A biosecurity stall, organised annually, to increase public awareness of all biosecurity issues on the island, including Cane Toads; and
- Contracting requirements to ensure that vendors servicing the proponent are made aware of the risk of Cane Toads and their contractual obligations to manage this risk.

Monitoring

A robust monitoring system has been developed and will be implemented to ensure that any Cane Toads that arrive on Groote Eylandt, and escape containment areas, are detected quickly. The monitoring program is risk-based, with higher risk sites being monitored more frequently. The monitoring program is conducted by at least two trained personnel throughout the wet season in accordance with a detailed procedure and includes:

- A comprehensive spotlighting program undertaken at multiple locations across Groote Eylandt;
- A supplementary eDNA monitoring program undertaken at several waterbodies across Groote Eylandt to collect samples for laboratory analysis;
- Surveys for the presence of Cane Toad metamorphs or tadpoles within waterbodies, undertaken at multiple waterbodies across Groote Eylandt.

Cane Toad Incursion Response Program

A response program has been developed to ensure that a quick and effective response can be enacted in the event of a Cane Toad being detected on Groote Eylandt. The response program includes:

- The reporting of Cane Toad sightings through the GEMCO Emergency Services Officer's 24-hour emergency line and associated Cane Toad Report Response Procedures to be conducted by the Emergency Services Officers/ALC Biosecurity Coordinators in the case of a report.
- The enactment of a response program, including five levels of response, based on the location and severity of the incursion. Response methods include spotlighting, deployment of Cane Toad Detection Dogs, placing holds on the movement of freight, manual removal of Cane Toads, eDNA sampling, tadpole trapping and netting, diurnal searches for Cane Toad eggs, and installing temporary fencing around waterbodies.

Reporting, Evaluation and Review

The Cane Toad Management Plan also includes a reporting, evaluation and review framework. All Cane Toad incidents which occur within Darwin freight yards or on Groote Eylandt are recorded by the proponent. Cane Toad incidents include interceptions of Cane Toads during quarantine inspections, reported or suspected toad sightings and eradication of toads. Recording incidents in this way enables quantification of the risk by determining the frequency and type of incident so that future planning can be improved. The proponent also undertakes regular reviews/performance evaluations of quarantine procedures in collaboration with the Anindilyakwa Land & Sea Rangers to confirm their adequacy and make recommendations for their continuous improvement. The Cane Toad Management Plan is also reviewed regularly.

6.4.6 Waste Management

The proponent has a waste management system in place for the existing mine, as described in the proponent's Waste Management Standard. Waste generated by the exploration program will be managed in accordance with this system. The waste management system is based on the regulatory requirements, values and principles of the Northern Territory's *Waste Management and Pollution Control Act 1988* (NT), *Waste Management and Pollution*



Control (Administration) Regulations 1998 (NT), and the Waste Management Strategy for the Northern Territory 2015-2022 (NT EPA, 2015).

The waste management system adopts the principles of the waste management hierarchy as far as practicable. Key features of the system include segregation and secure containment of all wastes for appropriate reuse, recycling or disposal at licensed facilities; employee awareness of waste management practices; environmental auditing; and regular inspections and ongoing monitoring.

The proponent operates several waste management facilities on Groote Eylandt for the reuse, recycling or disposal of the various waste streams. Waste management activities at these facilities are undertaken in accordance with the proponent's Waste Facilities Management Procedure. A proportion of the wastes collected are transported to the mainland for repair, reuse, recycling, or disposal by licensed contractors.

The exploration program is not expected to create a significant volume of wastes. All wastes generated will be managed in accordance with the existing waste management system. All rubbish and consumables used as part of the drilling activities will be collected and returned to the existing mine where it will be appropriately disposed.

6.4.7 Hazardous Materials Management

The only significant hazardous material/substance required for the exploration program is diesel fuel, which will be stored at the fuel storage facilities located at the existing mine. Diesel will be required to refuel drill rigs, dozers, and other vehicles and equipment that remain within the exploration area. As drill rigs will be left in situ, refuelling will be required to be undertaken at the drill pads. Drill rigs are expected to be refuelled approximately every two days.

Diesel will be transported and stored in 5000 L tanks on support trucks which are internally banded to catch any spills. The proponent has refuelling procedures in place to prevent and control any spills that may occur during vehicle refuelling. In addition, the proponent will ensure that:

- Spill clean-up kits are available on support trucks;
- Staff receive appropriate training in the use of spill clean-up kits;
- Any spillages which may result during refuelling activities are contained; and
- Contaminated materials are removed and disposed in accordance with the existing mine procedures.

Should other hazardous substances (or dangerous goods) be required during the exploration program (e.g. hydraulic oils, other hydrocarbons, and spent hydraulic fluids), the transport, use and disposal issues will be planned and managed prior to use on site and appropriate measures implemented in accordance with existing mine procedures and relevant guidelines and legislation.

Any spillage of diesel, hydraulic oils, other hydrocarbons or spent hydraulic fluids will be removed and disposed in accordance with the existing mine procedures. The proponent's Land Based Spill Response Procedure describes the process to be enacted in the unlikely event of spills. In this procedure, spills are categorised into three types, based on the significance of the spill (e.g. the quantity and type of material spilled, and whether the spill has the potential to affect a watercourse) and the level of response required. Response procedures typically include the following:

- The spill type is confirmed (spills are treated as Category 3 (i.e. Dangerous Goods) spills if there is any doubt);
- The spill is contained/controlled using isolation techniques (if safe to do so) such as:
 - Deployment of absorbent pads, booms, pillows, and bags to divert the spill;
 - Use of absorbent particulates to absorb and solidify the spill; and



- The digging of trenches to cut-off/divert the spill.
- The relevant personnel are immediately notified, including the relevant Area Supervisor and the Environment Department;
- Clean-up of the spill is undertaken, by sweeping/raking/pumping into disposal bags or drums, and using degreasers/detergents where necessary and safe to do so;
- The event is reported in the proponent's internal incident database;
- The area is restored to its original condition. This may include the removal of contaminated soil and absorbent material;
- The contaminated material is safely secured and dispatched to the Mine Site Bioremediation Area; and
- External stakeholders are notified, if deemed required.

6.4.8 Erosion and Sediment Control

As the exploration program is located in a tropical setting, erosion has the potential to occur through direct rainfall impact loosening soil particles, as well as overland flow washing soil particles away. However, exploration will be undertaken in the dry season, which limits the potential for issues with erosion and sediment control. In addition, the topography in the exploration program area is relatively flat, which reduces the potential for erosion.

The proponent undertakes the following measures to prevent and limit erosion and sedimentation:

- Erosion is prevented or minimised at the source by protecting any disturbed surfaces from the impact of rain and overland surface water flows. This is achieved by applying the blade up method of clearing, which leaves topsoil undisturbed and promotes the rapid regeneration of pioneer grass species during the first year of rehabilitation. These species are then typically followed by a succession of mid-canopy native tree and shrub species.
- Cleared vegetation is placed along the perimeter of access tracks and pads, ensuring that it can be readily retrieved and placed back over cleared tracks and pads during the rehabilitation program.
- Disturbed areas are revegetated as soon as possible following the completion of the exploration program for that year and before the onset of the wet season.
- Rehabilitated exploration pads and tracks are inspected for signs of erosion during the rehabilitation monitoring process (Section 6.4.3), with remedial action taken in the event of erosion being detected.

6.4.9 Cultural Heritage and Unexpected Archaeological Finds

A number of mitigation measures will be adopted to ensure there are no impacts to culture and heritage values resulting from the exploration program. Mitigation measures include the following:

- Cultural monitors will be provided an opportunity to inspect areas prior to clearing.
- As part of the workforce induction process, there is a module on cultural heritage and cultural awareness training that is mandatory for all employees and contractors.
- In the event that the proponent's employees or contractors suspect that they have uncovered an unexpected archaeological find, the following process will apply:
 - Immediately cease disturbance of any areas surrounding the find;
 - If it is considered that the find is at risk of being inadvertently damaged by exploration activities, a temporary fence/barricade will be erected around the find with GPS coordinates obtained;



- The ALC will be notified of the discovery of areas of potential archaeological significance immediately following the discovery, and prior to any disturbance;
- The ALC, and if necessary, a suitably qualified archaeologist, will be requested to inspect the find and determine its significance; and
- Should the find be of archaeological significance, the Northern Territory Heritage Branch will be notified, and appropriate mitigation strategies will be developed in consultation with the ALC and the Northern Territory Heritage Branch.

6.4.10 Environmental Management Procedures

The management measures outlined in the preceding sections are described in further detail in the internal documents (e.g. procedures and safe work instructions) that form part of the proponent’s environmental management system. These are listed in Table 6-1.

Table 6-1 Environmental Management Procedures Relevant to Exploration

DOCUMENT	OVERVIEW OF CONTENT
Vehicle and Equipment Inspection Checklist (FRM-3872)	A procedure/form which all exploration personnel are to complete as part of a vehicle and equipment inspection process, ensuring that vehicles and equipment are free of weeds and plants seeds, soils and Cane Toads. Vehicles are also checked for holding free water which could be a suitable environment for mosquito larvae.
Weed Management Plan (STA-3091)	A management plan that describes the process for managing and preventing the occurrence and spread of weeds across the proponent’s tenements.
Weed Field Guide (PRO-3094)	A procedure which describes the treatment options for each priority weed species as identified in the Weed Management Plan (STA-3091). This procedure assists in the early identification, reporting and control of priority weed species.
Quarantine Inspection Procedure (PRO-3198)	A procedure for the purpose of preventing new exotic flora and fauna from establishing on Groote Eylandt. The procedure provides guidance on how to correctly inspect barges and their cargo for invasive species such as weeds and Cane Toads.
Permit to Clear and Burn Vegetation (PRO-4149)	A procedure that describes the Permit to Clear process.
Vegetation Clearing Procedure (PRO-4192)	A procedure that provides the standard requirements for vegetation clearing. The procedure ensures that clearing will be conducted in a manner that allows for successful rehabilitation of disturbed areas.
Exploration Pre-Clearance Surveys (PRO-9003)	A procedure that describes the pre-clearance surveys that are undertaken as part of the Permit to Clear process for exploration activities.
Exploration – Marking & Clearing Lines & Drill Pads (SWI-21257)	A procedure which describes the various hazards and controls to be considered as a minimum when marking and clearing drill lines and preparing exploration pads. The procedure describes the standard flagging tape matrix to be employed when delineating buffer zones and the requirements for avoiding potential habitats for various threatened species.



DOCUMENT	OVERVIEW OF CONTENT
Waste Management Standard (STA-3316)	A standard which provides a framework for the responsible management of waste products associated with the proponent's activities and the Groote Eylandt community. This standard describes the measures undertaken to manage waste and its disposal, and minimise waste generated by or received by the proponent.
Waste Facilities Management Procedure (PRO-3050)	A procedure which describes the waste management techniques and processes to be undertaken at the proponent's waste facilities on Groote Eylandt, to ensure waste is managed in the correct manner that reduces risk to health and the environment.
Land Based Spill Response (PRO-3115)	A procedure that describes the safe and effective process to be used in response to spills of materials which have the potential to cause environmental harm.
Exploration – Collar Cutting, Capping & Plugging (SWI-21441)	A procedure that describes the process of grouting exploration drill holes.