

- *Cereus jamacara*
- *Melia azedarach*

There are numerous ways in which invasive species can be introduced deliberately or unintentionally.

5.2.2.9 Heritage Impacts

Although no archaeological sites have been identified yet in the project area, appropriate measures will be undertaken upon discovering any new archaeological sites. All archaeological remains are protected under the National Heritage Act (2004) and will not be destroyed, disturbed or removed. The Act also requires that any archaeological finds be reported to the Heritage Council Windhoek.

Table 10 Impact evaluation for the operational phase of the project

Identified Impact	Significance		Duration	Extent	Intensity	Probability
	NMM	MM				
Air Quality	M	L	LD	L	M	HP
Fire & Explosion Hazard	H	M	SD	O	M	LP
Generation of waste	M	L	LD	O	L	D
Health and Safety	H	M	MD	N	L	P
Fauna	M	L	MD	L	M	D
Vegetation	M	L	MD	L	M	D
Avifauna	M	L	MD	L	M	LP
Alien Invasive Plants	M	L	MD	L	M	P
Heritage	M	L	LD	O	H	LP

6. Environmental Management Plan

6.1 Overview

This Environmental Management Plan is intended to give effect to the recommendations of the Environmental Impact Assessment. To achieve this goal, it is essential that all personnel involved on the mineral exploration are fully aware of the environmental issues and the means to avoid or minimize the potential impacts of activities on site. The proposed mineral exploration activities are summarized in Section 3 of the scoping report above. Legal and policy requirements are well known and understood by the proponent, its employees and contractors and will be strictly enforced by its management team. A general description of the environment is contained in Section 4, and more site-specific information on particularly sensitive areas is contained in Section 4 as well. Issues and concerns identified in the EIA will form a set of environmental specifications that will be implemented on site. It is the intention that these environmental specifications should form the basis for an agreement between the proponent and the Ministry of Environment and Tourism. By virtue of that agreement, these specifications will become binding on the proponent.

Environmental management requires a joint effort on the part of all parties involved. The proponent has assigned certain roles to ensure that all players fulfil their responsibilities in this regard.

6.2 Environmental Management Principles

The proponent will ensure that all parties involved in the project uphold the following broad aims:

1. All persons will be required to conduct all their activities in a manner that is environmentally and socially responsible. This includes all consultants, contractors, and sub-contractors, transport drivers, guests and anyone entering the exploration areas in connection with the mineral exploration project.
2. Health, Safety and Social Well Being

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- Safeguard the health and safety of project personnel and the public against potential impacts of the project. This includes issues of road safety, precautions against natural dangers on site, and radiation hazards; and,
 - Promote good relationships with the local authorities and their staff.

3. Biophysical Environment

- Wise use and conservation of environmental resources, giving due consideration to the use of resources by present and future generations;
- Prevent or minimise environmental impacts;
- Prevent air, water, and soil pollution, Biodiversity conservation and Due respect for the purpose and sanctity of the area.

To achieve these aims, the following principles need to be upheld.

A. Commitment and Accountability:

The proponent's senior executives and line managers will be held responsible and accountable for:

Health and safety of site personnel while on duty, including while travelling to and from site in company vehicles and environmental impacts caused by mineral exploration activities or by personnel engaged in the mineral exploration activities, including any recreational activities carried out by personnel in the area

B. Competence

The proponent will ensure a competent work force through appropriate selection, training, and awareness in all safety, health and environmental matters.

C. Risk Assessment, Prevention and Control

Identify, assess and prioritise potential environmental risks. Prevent or minimize priority risks through careful planning and design, allocation of

financial resources, management and workplace procedures. Intervene promptly in the event of adverse impacts arising.

D. Performance and Evaluation

Set appropriate objectives and performance indicators. Comply with all laws, regulations, policies and the environmental specifications. Implement regular monitoring and reporting of compliance with these requirements.

E. Stakeholder Consultation

Create and maintain opportunities for constructive consultations with employees, authorities, other interested or affected parties. Seek to achieve open exchange of information and mutual understanding in matters of common concern.

F. Continual Improvement

Through continual evaluation, feedbacks, and innovation, seek to improve performance about social health and well-being and environmental management throughout the lifespan of the mineral exploration project.

G. Financial Provisions for Mineral exploration

In line with Namibia's environmental rehabilitation policy, the proponent will make the necessary financial provision for compliance with the EMP.

6.3 Impacts on the Bio-physical Environment

6.3.1 Impacts on Archaeological Sites

The **nature of impact** is outlined below:

- Potential damage to archaeological sites as a result of vehicle tracks, footprints and actions of contractors, employees and visitors of the mineral exploration site.
- As the mitigation measures below are fully enforced, any impact will be significantly reduced compared to with present situation.

Mitigation Measures to be enforced:

- Buffer zones will be created around the sites.
- Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mineral exploration activities.
- All archaeological sites to be identified and protected before further exploration commences.
- Notices/information boards will be placed on sites.
- Training employees regarding the protection of these sites.

Methods for monitoring:

- An archaeologist will inspect any identified archaeological sites before commencing with the mineral exploration activities.

6.3.2 Impacts on Fauna

The **nature of impact** is outlined below:

- Movement of vehicles in and out of the site.
- Noise produced by moving earth-moving equipment.

Mitigation Measures to be enforced:

- Some habitat areas such as trees of the riverbeds and tunnels outcrops will be avoided wherever possible.
- A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise.
- No animals shall be killed, captured or harmed in any way.
- No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict.
- Care will be taken to ensure that no litter is lying around as these may end up being ingested by wild animals
- No animals shall be fed. This allows animals to lose their natural fear of humans, which may result in dangerous encounters.

Methods for monitoring:

- Regular monitoring of any unusual signs of animal habitat.

6.3.3 Impacts on Avifauna

Birds or Nest sites will not be disturbed by any employee, visitor or contractor.

6.3.4 Impact on Vegetation

The **nature of impact** is outlined below:

- Negative impacts on plants from trenching, compacting and removal of plants.
- Negative Impact from movement of vehicles and the movement of people around the site.
- Negative impacts from land-clearing and mineral exploration operations.

Mitigation Measures to be enforced:

- Environmental considerations will always be adhered to before clearing roads, trenching and excavating.
- Paths and roads will be aligned to avoid root zones. Permeable materials will be used wherever possible.
- The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided.
- The movement of vehicles will be restricted to certain tracks only.
- Areas with species of concern will be avoided.
- Ministry of Environment and Tourism will be informed of any protected species which will be transplanted in consultation with MET.

6.3.5 Impacts of Alien invasive Plants

The **nature of impact** is outlined below:

- Plant or seed material may adhere to car tyres or animals

- Seed or plant material may be imported to site in building materials if the source is contaminated.
- Seeds may blow from debris removed at sites.

Mitigation Measures to be enforced:

- The explorer will ensure that debris is properly disposed of.
- Vehicle tyre inspections can be carried out although this may not be a practical mitigation measure.
- Eradicating alien plants by using an Area Management Plan

Methods for monitoring:

- Regular monitoring of any unusual signs of alien species.

6.3.6 Impacts on Socio-Economic

The **nature of impact** is outlined below:

- Impact from loss of grazing for domestic livestock in “exclusive use zone”
- Impacts on cultural and spiritual values.
- Demographic factors: Attraction of additional population that cannot benefit from the project.
- Perception of Health and Safety risks associated with mineral exploration.

Mitigation Measures to be enforced:

- The population change can be mitigated by employing people from the local community and encouraging the contractors to employ local individuals.
- The perception of risks will be mitigated by putting up safety signs wherever possible and ensuring that all employees and visitors to the site undergo a safety induction course.

Methods for monitoring:

- Public meetings will be held by the proponent whenever necessary.
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6.3.7 Visual Impacts

The **nature of impact** is outlined below:

- Tracks and damaged vegetation caused by the mineral exploration vehicles.

Mitigation Measures to be enforced:

- Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating.

Methods for monitoring:

- Employees will be trained on the importance of minimising visual impacts.

6.3.8 Use of Natural Resources

Water and electricity are very scarce in Namibia. During the exploration, best international practices will be considered as a minimum standard for operation. The bulk of the power supply to the exploration site will be sourced from the proponent's own generator. The proponent will maximise water recycling opportunities wherever possible.

6.3.9 Generation of Solid Waste

Correct management of solid waste will involve a commitment to the full waste life cycle by all the employees and contractors of the site. The Proponent's goal is to avoid the generation of solid waste in the first place and if not possible, to minimise the volumes generated by looking at technologies that promote longevity and recycling of products. Ideally, the proponent should transport solid waste to a registered site for disposal. However, it is not certain if such facilities are available in the area or if they have the capacity to handle large increases in volume. Appropriate on-site facilities will be designed to store large volumes of waste.

6.3.10 Noise

The **nature of impact** is outlined below:

- Movement of people, and vehicles.

- Noise may be generated from an airborne geophysical survey which may be carried out at a later stage.

Mitigation Measures to be enforced:

- Disturbance to fauna that roam the area will be minimized by training the employees on ways to minimise noise.

6.3.11 Air Quality

The **nature of impact** is outlined below:

- Dust from movement of people, vehicles and earth-moving machinery. Emissions from vehicles and drill rigs as well.

Mitigation Measures to be enforced:

- All staff on should be equipped with dosimeters that measure exposure levels to radiation.
- All staff must be made aware of the health risk and obliged to wear dust masks.

6.4 Summary of Environmental Management Plan during construction, operation and decommissioning phases

Construction/Initial Phase			
Environmental Impact	Proposed mitigation measures	Responsibility	Monitoring plan
Air pollution	<ul style="list-style-type: none"> • Control speed and operation of construction vehicles. • Prohibit idling of vehicles. • Maintenance of vehicles and equipment. • Sensitize field exploration workers and contractors. • Workers should be provided with dust masks if working in sensitive areas. 	<ul style="list-style-type: none"> • Contractor • Site Manager 	<ul style="list-style-type: none"> • Amount of dust produced. • Level of Landscaping carried out.
Noise pollution	<ul style="list-style-type: none"> • Maintain equipment and vehicles. • Field work should only be carried out only during daytime i.e. 08h00 to 17h00. • Workers should wear earmuffs if working in noisy section. • Management to ensure that noise is kept within reasonable levels. 	<ul style="list-style-type: none"> • Contractor • Management 	Amount of noise

Solid waste	<ul style="list-style-type: none"> Any debris should be collected by a waste collection company If trenches are dug, waste should be re-used or backfilled. The site should have waste receptacles with bulk storage facilities at convenient points to prevent littering during exploration. 	<ul style="list-style-type: none"> Management 	Presence of well-Maintained receptacles and central collection point.
Oil leaks and spills	<ul style="list-style-type: none"> Vehicles and equipment should be well maintained to prevent oil leaks. Contractor should have a designated area where maintenance is carried out and that is protected from rainwater. All oil products should be handled carefully. 	<ul style="list-style-type: none"> Contractor 	No oil spills and leaks on the site
First aid	<ul style="list-style-type: none"> A well-stocked first aid kit shall be maintained by qualified personnel 	<ul style="list-style-type: none"> Management 	Contents of the first aid kit.
Visual	<ul style="list-style-type: none"> Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Employees will be trained on the importance of minimising visual impacts.
Archaeological Sites	<ul style="list-style-type: none"> Buffer zones will be created around the sites. Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mineral exploration activities. All archaeological sites to be identified and protected before further exploration commences. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Register of all archaeological sites identified.
Occupational Health and Safety	<ul style="list-style-type: none"> Provide Personal Protective Equipment Train workers on personal safety and how to handle equipment and machines. A well-stocked first aid kit shall be maintained by qualified personnel. Report any accidents / incidences and treat and Compensate affected workers. Provide sufficient and suitable sanitary conveniences which should be kept clean. 	<ul style="list-style-type: none"> Contractor Management 	<ul style="list-style-type: none"> Workers using Protective Equipment. Presence of Well stocked First Aid Box. Clean sanitary facilities.
Fauna	<ul style="list-style-type: none"> Some habitat areas such as trees of the riverbeds and tunnels outcrops will be avoided wherever possible. A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise. No animals shall be killed, captured or harmed in any way. No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Regular monitoring of any unusual signs of animal habitat.
Alien Invasive Plants	<ul style="list-style-type: none"> The explorer will ensure that debris is properly disposed off. Vehicle tyre inspections can be carried out although this may not be a practical mitigation measure. Eradicating alien plants by using an Area Management Plan 	<ul style="list-style-type: none"> Management Contractor 	<ul style="list-style-type: none"> Regular monitoring of any unusual signs of alien species.
Loss of vegetation	<ul style="list-style-type: none"> Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. Paths and roads will be aligned to avoid root zones. Permeable materials will be used wherever possible. 	<ul style="list-style-type: none"> Contractor Management 	<ul style="list-style-type: none"> Warning signs on site restored vegetation

	<ul style="list-style-type: none"> The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided. The movement of vehicles will be restricted to certain tracks only. 		
Operational Phase			
Environmental/ Social Impact	Proposed mitigation measures	Responsibility	Monitoring plan
Noise pollution	<ul style="list-style-type: none"> Maintain vehicles and drilling equipment. Exploration drilling should be carried out only during daytime. Workers to wear earmuffs if working in noisy section Management to ensure that noise is kept within reasonable levels. 	<ul style="list-style-type: none"> Contractor Management 	<ul style="list-style-type: none"> Amount of noise
Visual	<ul style="list-style-type: none"> Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Employees will be trained on the importance of minimising visual impacts.
Fauna	<ul style="list-style-type: none"> Some habitat areas such as trees of the riverbeds and tunnels outcrops will be avoided wherever possible. A fauna survey will be conducted to determine the effect of fragmented habitat on game species should the need arise. No animals shall be killed, captured or harmed in any way. No foodstuff will be left lying around as these will attract animals which might result in human-animal conflict. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Regular monitoring of any unusual signs of animal habitat.
Alien Invasive Plants	<ul style="list-style-type: none"> The explorer will ensure that debris is properly disposed of. Vehicle tyre inspections can be carried out although this may not be a practical mitigation measure. Eradicating alien plants by using an Area Management Plan 	<ul style="list-style-type: none"> Management Contractor 	<ul style="list-style-type: none"> Regular monitoring of any unusual signs of alien species.
Loss of vegetation	<ul style="list-style-type: none"> Environmental considerations will be adhered to at all times before clearing roads, trenching and excavating. Paths and roads will be aligned to avoid root zones. Permeable materials will be used wherever possible. The movement of vehicles in riverbeds, rocky outcrops and vegetation sensitive areas will be avoided. The movement of vehicles will be restricted to certain tracks only. 	<ul style="list-style-type: none"> Contractor Management 	<ul style="list-style-type: none"> Warning signs on site restored vegetation
Solid waste	<ul style="list-style-type: none"> Minimize solid waste generated on site. Recycle waste especially waste from trenching. Debris should be collected by waste collection company. Excavation waste should be re-used or backfilled. 	<ul style="list-style-type: none"> Contractor Management 	<ul style="list-style-type: none"> Amount of waste on Site Presence of well-Maintained receptacles and central

			collection point.
Oil leaks and spills	<ul style="list-style-type: none"> Machinery should be well maintained to prevent oil leaks. Contractor should have a designated area where maintenance is carried out and that is protected from rainwater. All oil products should be stored in a site store and handled carefully. 	<ul style="list-style-type: none"> Contractor 	<ul style="list-style-type: none"> No oil spills and leaks on the site.
Archaeological Sites	<ul style="list-style-type: none"> Buffer zones will be created around the sites. Adhere to practical guidelines provided by an archaeologist to reduce the archaeological impact of mineral exploration activities. All archaeological sites to be identified and protected before further exploration commences. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Update Register of all archaeological sites identified.
First aid	<ul style="list-style-type: none"> A well-stocked first aid kit shall be maintained by qualified personnel 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Contents of the first aid kit.
Fire preparedness	<ul style="list-style-type: none"> Firefighting drills carried out regularly. Firefighting emergency response plan. Ensure all firefighting equipment are regularly maintained, serviced and inspected. Fire hazard signs and directions to emergency exit, route to follow and assembly point in case of any fire incidence. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Number of fire drills carried. Proof of inspection on firefighting equipment. Fire Signs put up in strategic places. Availability of firefighting equipment.
Environment Health and Safety	<ul style="list-style-type: none"> Train workers on personal safety and disaster preparedness. A well-stocked first aid kit shall be maintained by qualified personnel. Report any accidents / incidences and treat and compensate affected workers. Provide sufficient and suitable sanitary conveniences which should be kept clean. Conduct Annual Health and Safety Audits. 	<ul style="list-style-type: none"> Management 	<ul style="list-style-type: none"> Provide sanitary facilities. Copies of Annual Audit
Decommissioning Phase			
Environmental/Social Impact	Proposed mitigation measures	Responsibility	Monitoring plan/indicator
Noise & Air pollution	<ul style="list-style-type: none"> Maintain plant equipment. Decommissioning works to be carried out only during daytime. Workers working in noisy section to wear earmuffs. Workers should be provided with dust masks. 	<ul style="list-style-type: none"> Contractor Management 	<ul style="list-style-type: none"> Amount of noise
Disturbed Physical environment	<ul style="list-style-type: none"> Undertake a complete environmental restoration programme and introducing appropriate vegetation 	<ul style="list-style-type: none"> Management 	

Solid waste	<ul style="list-style-type: none"> • Solid waste should be collected by a contracted waste collection company • Excavation waste should be re-used or backfilled. 	<ul style="list-style-type: none"> • Contractor • Management 	<ul style="list-style-type: none"> • Amount of waste on Site. • Presence of well-maintained receptacles and central collection point.
Occupational Health and Safety	<ul style="list-style-type: none"> • Provide Personal Protective Equipment. • Train workers on personal safety and how to handle equipment and machines. • A well-stocked first aid kit shall be maintained by qualified personnel. • Demarcate area under decommissioning. 	<ul style="list-style-type: none"> • Contractor 	<ul style="list-style-type: none"> • Workers using Protective Equipment. • Presence of a First Aid Box.

6.5 Monitoring, Auditing and Reporting

6.5.1 Inspections and Audits

During the life of the project, performance against the EMP commitments will need to be monitored, and corrective action taken where necessary, in order to ensure compliance with the EMP and relevant enviro-legal requirements.

6.5.1.1 Internal Inspections/Audits

The following internal compliance monitoring programme will be implemented:

1. Project kick-off and close-out audits will be conducted on all contractors. This applies to all phases, including drilling contract work during operations:
 - Prior to a contractor beginning work, an audit will be conducted by the applicable phase site manager to ensure that the EMP commitments are included in Contractors' standard operating procedures (SOPs) and method statements.
 - Following completion of a Contractors work, a final close-out audit of the contractor's performance against the EMP commitments will be conducted by the applicable phase site manager.
2. Monthly internal EMP performance audits will be conducted during the construction/initial and decommissioning phases.
3. Ad hoc internal inspections can be implemented by the applicable phase exploration manager at his/her discretion, or in follow-up to recommendations from previous inspection/audit findings.

6.5.1.2 External Audits

- At the close of each project phase, and annually during the operational phase, an independently conducted audit of EMP performance will be conducted.
- Specialist monitoring/auditing may be required where specialist expertise are required or in order to respond to grievances or authorities directives.
- Officials from the DEA may at any time conduct a compliance and/or performance inspection of mineral exploration operations. The proponent will be provided with a written report of the findings of the inspection. These audits assist with the continual improvement of the exploration project and the proponent will use such feedback to help improve its overall operations.

6.5.1.3 Documentation

Records of all inspections/audits and monitoring reports will be kept in line with legislation. Actions will be issued on inspection/audit findings. These will be tracked and closed out.

6.5.1.4 Reporting

Environmental compliance reports will be submitted to the Ministry of Environment and Tourism on a bi-annual basis.

6.5.2 Environmental Management System Framework

In order to implement Environmental Management Practices, an Environmental Management System (EMS) will be established and implemented by the proponent and their Contractors. This subchapter establishes the framework for the compilation of a project EMS. The applicable exploration manager will maintain a paper based and/or electronic system of all environmental management documentation. These will be divided into the following main categories:

6.5.2.1 Policy and Performance Standards

A draft environmental policy and associated objective, goals and commitments has been included in the EMP. The mineral explorer may adapt these as necessary.

6.5.2.2 Enviro-Legal Documentation

A copy of the approved environmental assessment and EMP documentation will always be available by the proponent. Copies of the Environment Clearance Certificate and all other associated authorisations and permits will also be kept with the exploration team. In addition, a register of the legislation and regulations applicable to the project will be maintained and updated as necessary.

6.5.2.3 Impact Aspect Register

A register of all project aspects that could impact the environment, including an assessment of these impacts and relevant management measures, is to be maintained. This Draft EMP identifies the foreseeable project aspects and related potential impacts of the proposed project, and as such forms the basis for the Aspect-Impact Register; with the Project Activity. It is however noted that during the life of the project additional project aspects and related impacts may arise which would need to be captured in the Aspect-Impact Register. In this regard, the impact identification principles set forth in the scoping report can be used to update the Register. This method can be modified as required by the applicable exploration manager as necessary during the life of the project.

6.5.2.3 Procedures and Method Statements

In order to affect the commitments contained in this EMP, procedures and method statements will be drafted by the relevant responsible mineral exploration staff and Contractors. These include, but may not be limited:

- Standard operating procedures for environmental action plan and management programme execution.
- Incident and emergency response procedures.
- Auditing, monitoring and reporting procedures, and
- Method statements for EMP compliance for ad hoc activities not directly addressed in the EMP action plans.

All procedures are to be version controlled and signed off by the applicable exploration manager. In addition, knowledge of procedures by relevant staff

responsible for the execution thereof must be demonstrable and training records maintained.

6.5.2.4 Register of Roles and Responsibilities

During project planning and risk assessments, relevant roles and responsibilities will be determined. These must be documented in a register of all environmental commitment roles and responsibilities. The register is to include relevant contact details and must be updated as required.

6.5.2.5 Site Map

An up to date map of the exploration site indicating all project activities is to be maintained. In addition to the project layout, the following detail must be depicted:

- Materials handling and storage;
- Waste management areas (collection, storage, transfer, etc.);
- Sensitive areas;
- Incident and emergency equipment locations; and Location of responsible parties.

6.5.2.6 Environmental Management Schedule

A schedule of environmental management actions is to be maintained by the applicable phase site managers and/or relevant Contractors. A master schedule of all such activities is to be kept up to date by the exploration manager. Scheduled environmental actions can include, but are not limited to:

- Environmental risk assessment;
- Environmental management meetings;
- Soil handling, management and rehabilitation;
- Waste collection
- Incident and emergency response equipment evaluations and maintenance
- Environmental training;