

**THE PROPOSED EXPLORATION FOR
BASE AND RARE METALS, DIMENSION STONES,
INDUSTRIAL MINERALS, AND PRECIOUS METALS ON EPL 8634
IN KUNENE REGION**

JANUARY 2023

ENVIRONMENTAL MANAGEMENT PLAN



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1. INTRODUCTION and BACKGROUND

This Environmental Management Plan (EMP) serves as a managing tool for the exploration drilling for mineral exploration, on EPL8643. The EMP is developed to outline measures to be implemented in order to minimise adverse environmental degradation associated with this development.

The EMP serves as a guiding tool for the drilling workforce on their roles and responsibilities concerning environmental management on site, and also provides an environmental monitoring framework for the whole exploration phase. This environmental management plan aims to take a pro-active route by addressing potential problems before they occur. The EMP acts as a stand-alone document, which can be used during the various phases of the development.

In this report, the *Contractor* refers to Horn Metals (Pty) Ltd and its sub-contractors.

The purpose of the EMP is to:

- ✓ Train employees and contractors with regard to environmental obligations.
- ✓ Promote and encourage good environmental management practices.
- ✓ Outline responsibilities and roles of Horn Metals (Pty) Ltd and the contractor in managing the surrounding environment.
- ✓ Describe all monitoring procedures required to identify environmental impacts.
- ✓ Minimise disturbance of the natural environment.
- ✓ Develop waste management practices.
- ✓ Prevent all forms of pollution.
- ✓ Protect the natural environment.
- ✓ Prevent soil and water erosion.
- ✓ Comply with all applicable laws, regulations and standards for environmental protection.

The proposed exploration drilling entails:

- ✓ Transporting of all relevant drilling materials to site.
- ✓ Erection of associated temporary offices (e.g. Caravan) and other infrastructure.
- ✓ Installation of temporary long drop toilets
- ✓ Installation of associated electrical supply or generator.
- ✓ Delivery of fuel with road transport tankers.
- ✓ Handling and storage of the chemical products (e.g. grease).

2. LEGISLATIVE FRAMEWORK

National Legislative Requirements

The EIA process is undertaken in terms of Namibia's Environmental Management act no. 7 of 2007 and the Environmental Assessment Policy of 1995, which stipulates activities that may have significant impacts on the environment. Listed activities require the authorisation from the Ministry of Environment and Tourism (DEA). Section 32 of the Environmental Management Act requires that an application for an environmental clearance certificate be made for the listed activities. The following environmental legislations are relevant to this project:

➤ *The Namibian Constitution*

The Namibian Constitution has a section on principles of state policy. These principles cannot be enforced by the courts in the same way as other sections of the Constitution. But they are intended to guide the Government in making laws which can be enforced.

The Constitution clearly indicates that the state shall actively promote and maintain the welfare of the people by adopting policies aimed at management of ecosystems, essential ecological processes and biological diversity of Namibia for the benefit of all Namibians, both present and future.

➤ *Environmental Management Act No.7 of 2007*

This Act provides a list of projects requiring an Environmental Assessment. It aims to promote the sustainable management of the environment and the use of natural resources and to provide for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters.

The Act defines the term "*environment*" as an interconnected system of natural and human-made elements such as land, water and air; all living organisms and matter arising from nature, cultural, historical, artistic, economic and social heritage and values.

The Environmental Management Act has three main purposes:

- (a) to make sure that people consider the impact of activities on the environment carefully and in good time.
- (b) to make sure that all interested or affected people have a chance to participate in environmental assessments
- (c) to make sure that the findings of environmental assessments are considered before any decisions are made about activities which might affect the environment

The rezoning of land from open space to any other land use is a *'listed activity'* as per the *List of Activities requiring Environmental Clearance* (Government Notice 29 of 6 February 2012) and accordingly requires an Environmental Impact Assessment (EIA) to be conducted.

Line Ministry: Ministry of Environment and Tourism

➤ ***Atmosphere Pollution Prevention Ordinance (1976)***

This Ordinance generally provides for the prevention of the pollution of the atmosphere. Part IV of this ordinance deals with dust control. The Ordinance is clear in requiring that any person carrying out an industrial process which is liable to cause a nuisance to persons residing in the vicinity or to cause dust pollution to the atmosphere, shall take the prescribed steps or, where no steps have been prescribed, to adopt the best practicable means for preventing such dust from becoming dispersed and causing a nuisance.

Line Ministry: Ministry of Environment and Tourism

➤ ***Water Resources Management Act of Namibia (2004)***

This act repealed the existing South African Water Act No.54 of 1956 which was used by Namibia. This Act ensures that Namibia's water resources are managed, developed, protected, conserved and used in ways which are consistent with fundamental principles depicted in section 3 of this Act. Part IX regulates the control and protection of groundwater resources. Part XI, titled Water Pollution Control, regulates discharge of effluent by permit. Thus developers are required to efficiently plan for sewage disposal.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

➤ ***Water Act No.54 of 1956***

This Act provides for Constitutional demands including pollution prevention, ecological and resource conservation and sustainable utilisation. In terms of this Act, all water resources are the property of the State and the EIA process is used as a fundamental management tool.

A water resource includes a watercourse, surface water, estuary or aquifer, and, where relevant, its bed and banks. A watercourse means a river or spring; a natural channel in which water flows regularly or intermittently; a wetland lake or dam, into which or from which water flows; and any collection of water that the Minister may declare to be a watercourse. Permits are required in terms of the Act for the undertaking of the following activities relevant to the proposed project:

- ✓ Discharge of waste or water containing waste into a water resource through a pipe, canal, sewer, sea outfall or other conduit in terms of Section 21 (f); and

- ✓ Disposal of waste in a manner that may detrimentally impact on a water resource in terms of Section 21 (g).

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

➤ ***The Draft Wetland Policy (1993)***

Requires that any wetlands and its associated hydrological functions form a part, to be managed in such a way that their biodiversity, vital ecological functions and life support systems are protected for the benefit of present and future generations.

Line Ministry: Ministry of Environment and Tourism

➤ ***Soil Conservation Act (No.76 of 1969).***

The Act advocates for the prevention and combating of soil erosion, conservation, improvement and manner of use of soil and vegetation, and protection of water resources.

➤ ***Draft Pollution Control and Waste Management Bill***

The proposed exploration drilling in EPL 8643, only applies to Parts 2 and 7 of the Bill.

Part 2 stipulates that no person shall discharge or cause to be discharged any pollutant to the air from a process except under and in accordance with the provisions of an air pollution licence issued under section 23. It further provides for procedures to be followed in licence application, fees to be paid and required terms of conditions for air pollution licences.

Part 7 states that any person who sells, stores, transports or uses any hazardous substances or products containing hazardous substances shall notify the competent authority, in accordance with sub-section (2), of the presence and quantity of those substances.

➤ ***National Monuments Act of Namibia (No. 28 of 1969) as Amended until 1979***

“No person shall destroy, damage, excavate, alter, remove from its original site or export from Namibia:

a) any meteorite or fossil; or

b) any drawing or painting on stone or a petroglyph known or commonly believed to have been executed by any people who inhabited or visited Namibia before the year 1900 AD; or

c) any implement, ornament or structure known or commonly believed to have been used as a mace, used or erected by people referred to in paragraph (b); or

d) the anthropological or archaeological contents of graves, caves, rock shelters, middens, shell mounds or other sites used by such people; or

e) any other archaeological or palaeontological finds, material or object; except under the authority of and in accordance with a permit issued under this section.

➤ ***Forestry Act (No.12 of 2001)***

This Act makes provision for the protection various plant species. Harvesting permits are required from the Directorate of Forestry to clear certain protected vegetation species from the site.

Line Ministry: Ministry of Agriculture, Water Affairs and Forestry

➤ ***Hazardous Substances Ordinance No. 14 of 1974***

The Ordinance applies to the manufacture, sale, use, disposal and dumping of hazardous substances, as well as their import and export and is administered by the Minister of Health and Social Welfare. Its primary purpose is to prevent hazardous substances from causing injury, ill-health or the death of human beings.

Line Ministry: Ministry of Health and Social Services

➤ ***Public Health Act 36 of 1919 and Subsequent Amendments***

The Act, with emphasis to Section 119 prohibits the presence of nuisance on any land occupied. The term nuisance for the purpose of this EIA is specifically relevant specified, where relevant in Section 122 as follows:

- ✓ any dwelling or premises which is or are of such construction as to be injurious or dangerous to health or which is or are liable to favour the spread of any infectious disease;
- ✓ any area of land kept or permitted to remain in such a state as to be offensive, or liable to cause any infectious, communicable or preventable disease or injury or danger to health; or
- ✓ any other condition whatever which is offensive, injurious or dangerous to health.

Potential impacts associated with the mineral exploration project are expected to include dust, air quality impacts, groundwater impacts, noise nuisance and smoke emissions.

Line Ministry: Ministry of Health and Social Services

➤ ***Minerals Prospecting and Mining Act 33 of 1992***

The Act provides for EIAs in mining activities, and includes requirements for rehabilitation of prospecting and mining areas and for minimising or preventing pollution.

Line Ministry: Ministry of Mines and Energy

➤ ***National Heritage Act (No.76 of 1969).***

The Act calls for the protection and conservation of heritage resources and artefacts. Should any archaeological material, e.g. old weapons, coins, bones found during the construction, work should stop immediately and the National Heritage Council of Namibia must be informed as soon as possible. The Heritage Council will then decide to clear the area or decide to conserve the site or material.

➤ **Environmental Assessment Policy of Namibia (1995)**

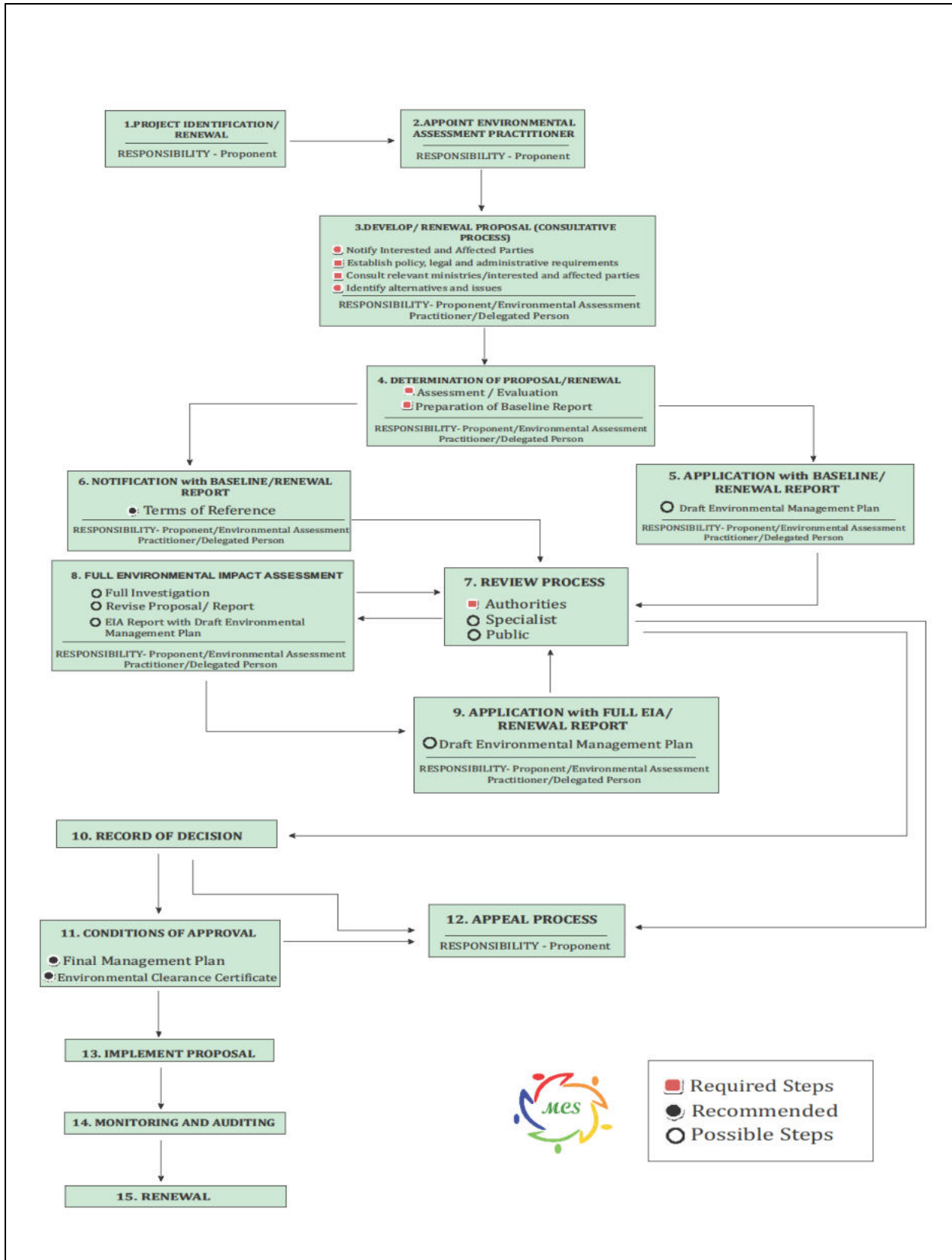


Figure 1. Environmental Assessment Procedure of Namibia (Adapted from the Environmental Assessment Policy of 1995)

Environmental Assessments (EA's) seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and that the term ENVIRONMENT (in the context of IEM and EA's) is broadly interpreted to include biophysical, social, economic, cultural, historical and political components.

All listed policies, programmes and projects, whether initiated by the government or the private sector, should be subjected to the established EA procedure as set out in Figure 2.

Line Ministry: Ministry of Environment and Tourism

➤ ***International Conventions and Regulations***

Article 144 of the Namibian Constitution states that “the general rules of public international law and international agreements binding upon Namibia form part of the law of Namibia.” This means that all the international agreements that Namibia signed become part of the law of our country. These laws and/or agreements are:

- ✓ Convention on Biological Diversity, 1992;
- ✓ United Nations Framework Convention on Climate Change, 1992;
- ✓ Kyoto Protocol on the Framework Convention on Climate Change, 1998;
- ✓ Stockholm Convention of Persistent Organic Pollutants, 2001.

3. ENVIRONMENTAL MANAGEMENT PLAN

3.1 Responsibilities for Environmental Management

Horn Metals (Pty) Ltd will be responsible for environmental control on site during the exploration drilling phase. It is important that a briefing meeting be held before drilling commences, to reach an agreement on specific roles of various parties and penalties for non-compliance.

3.2 Environmental Training and Induction

Horn Metals (Pty) Ltd is bound to be responsible for ensuring that environmental awareness education of all employees and contractors is done satisfactorily. Horn Metals (Pty) Ltd should ensure that employees and contractors are made aware of the environmental requirements of the project.

The EMP should form part of the Terms of Reference for all contractors, sub-contractors and suppliers. All contractors, sub-contractors and suppliers will have to sign an agreement to assure that they understood the EMP and that they will comply. All senior staff should familiarise themselves with the full contents of the EMP and its implications. Senior staff is expected to train and assist the rest of the employees on the contents of the EMP.

The environmental awareness training programme will include:

- environmental induction of new employees;
- code of conduct signed by all inducted employees;
- identification of environmental risks associated with each job, and
- training on the implementation of emergency procedures.

3.3 Environmental Incident Reporting

All environmental incidents occurring at the project location will be recorded. The incident report will have to include time, date, location, and nature of the incident, extent of the incident, actions taken, and personnel involved.

All complaints received from the neighbouring properties and communities should be directed to the manager of Horn Metals (Pty) Ltd. Management should be able to respond to the complainant within a week (even if pending further investigation). It is important that the issues raised are considered and that the complainant feels that their concerns have been addressed to and wherever possible actions taken to address these. All complaints should be entered in the environmental register and all responses and actions taken to address these should be recorded.

3.3.1 Environmental Register

An environmental register should be kept on site in which incidents related to actual impacts are recorded. This will include information related to incidents as spillages, dust generation and complaints from adjacent neighbours. It should also contain information relating to actions taken. Any party on site may complete the register,

however, it is envisaged that the Technical Manager, the contractor and the ECO officer will be the main contributors, and who will also be the main parties involved in suggesting mitigation measures.

3.4 Environmental Monitoring

Periodic environmental monitoring must be taken on a regular basis. Monitoring should be done in order to ensure compliance with all aspects of the EMP. Findings should be liaised with to all responsible officers as chain command. The following monitoring and performance assessment programme will be put in place for the EPL 8643 exploration project.

Monitoring Periods	Type of assessment	Reporting requirements	Responsible person
Daily	Visual inspections against EMP compliance	Reporting of environmental incident through a structure reporting procedure	Site Supervisor/Manager
Weekly	Weekly audit of EMP compliance	EMP non-compliance reporting	Site Supervisor/Manager
Every 2 Months	Monthly external EMP compliance audit	External EMP compliance report	External Environmental Assessment Practitioner

3.5 EMP Administration

Copies of this EMP shall be kept at the site office and should be distributed to all senior staff members, including those of the contractors.

3.6 EMP Amendments

The EMP amendments can only be made with the approval of the DEA. Amendments to the EMP should be liaised to all employees and contractors.

3.7 Non Compliance of the EMP

Problems may occur in carrying out mitigation measures or monitoring procedures that could result in non-compliance of the EMP. The responsible personnel should encourage staff to comply with the EMP, and address acts of non-compliance and penalties.

Horn Metals (Pty) Ltd is responsible for reporting non-conformance with the EMP, to the ECO officer. The management of Horn Metals (Pty) Ltd, in consultation with the ECO officer must, thereafter, undertake the following activities:

- ✓ Investigate and identify the cause of non-conformance.
- ✓ Report matters of non-conformance to Horn Metals (Pty) Ltd Environmental Department Manager and/or MET (depending on the severity of the incident).
- ✓ Implement suitable corrective action as well as prevent recurrence of the incident.
- ✓ Assign responsibility for corrective and preventative action.
- ✓ Any corrective action taken to eliminate the causes of non-conformance shall be appropriate to the magnitude of the problems and commensurate with the environmental impact encountered.

3.8 Environmental Control Officer

The Environmental Control Officer for the site can be an independent environmental consultant (e.g. Matrix Consulting Services) appointed by Horn Metals (Pty) Ltd to monitor and review the on-site environmental management and implementation of this EMP.

Duties of the ECO officer:

- ✓ The identification of potential environmental impacts, prior to the onset of decommissioning. A site visit may also be required prior to site development. This would be carried out in consultation with the Technical Manager.
- ✓ Providing of an environmental register at the site to be filled in by any person reporting an environmental incident, issue or concern and inspected by the ECO officer on a regular basis to check for issues raised and actions taken.
- ✓ Ensuring that the EMP conditions are adhered to at all times and taking action.
- ✓ Ensuring that environmental impacts are kept to a minimum.
- ✓ Reviewing and approving method statements in consultation with the Technical Manager.
- ✓ Reporting to Horn Metals (Pty) Ltd on a regular basis and advising of any major environmental impacts. Attending the site meetings (when necessary)
- ✓ Inspecting the site and surrounding areas regularly, and monitoring an ongoing environmental awareness program in conjunction with the Technical Manager.
- ✓ Requesting the removal of people and/or equipment not complying with the specifications of EMP.
- ✓ Keeping both a written and photographic record of progress on site from an environmental perspective, and an ad hoc record of all environmental incidents
- ✓ Undertaking continual review of the EMP and submitting a report to the relevant stakeholders.
- ✓ The ECO officer will submit all written instructions and verbal requests to contractors via the Technical Manager and Project Engineer.

3.9 Exploration Site Management

Areas outside this designated working zone shall be considered “no go” areas. The offloading zones must be clearly demarcated when offloading goods to enhance safety around the proposed development.

3.9.1 Access routes and work sites

Drilling and associated vehicles to be used during exploration will access the proposed site via the existing C39 and D2761 road and the existing tracks. No new tracks/roads shall be established and only existing roads may be used. Work sites shall be clearly demarcated and road signs erected where needed. The general public should not have access to the work sites during the exploration activities.

3.9.2 Fire and Safety Management

The Contractor shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence or spread of fire; and shall ensure that there is sufficient fire-fighting equipment on site at all times. This equipment shall include fire extinguishers and fire beaters. The making of fires for cooking, warmth or any other purposes, except in the demarcated cooking area, is to be prohibited. The Contractor should be prepared for such events and have all emergency contacts and those of the local authorities.

Horn Metals (Pty) Ltd management together with contractors shall take all reasonable measures to avoid increasing the risk of fire and shall ensure that there is sufficient fire-fighting equipment on site at all times.

No uncontrolled fire, whether for cooking or any other purpose, is to be made at the project location during both the exploration phase. The Contractor shall take all reasonable measures and active steps to avoid increasing the risk of fire through activities on site and prevent the accidental occurrence or spread of fire.

3.9.3 Staff Management

The Contractor must ensure that their employees have suitable personal protective equipment and properly trained in fire fighting and first aid.

3.9.4 Waste Management

The developer shall remove all waste off-site to designated waste disposal sites. Sufficient bins or containers on-site to store any solid or liquid waste produced should be provided by Horn Metals (Pty) Ltd. The bins and containers should be weatherproof and scavenger-proof.

The oil leakages, lubricants and grease must be addressed. Contaminated soil must be removed and disposed off at the hazardous waste cell at an appropriate landfill. The contractor must provide containers on-site, to store any hazardous waste produced.

Regular inspection and housekeeping procedure monitoring should be maintained by the contractor.

3.9.5 Cement and Concrete Batching

Should boreholes be closed up with cement, concrete mixing directly on the ground shall not be allowed and shall take place on an impermeable surface. All run-off from batching areas shall be strictly controlled, and cement contaminated water shall be collected, stored and disposed of at a suitable waste disposal facility.

3.9.6 Chemicals Management

If any spillage occurs, contaminated soil shall be collected in a holding tray or drum and which will then be disposed at a suitable hazardous waste site. The Contractor may treat hydrocarbon contaminated soil with commercially available absorbents e.g. peat sorbs before it can be disposed in the environment.

The Contractor shall take all reasonable measures to prevent surface or groundwater pollution from the release of any hazardous chemicals. Oil and other chemicals should be stored on an impermeable layer. No hazardous chemicals may be stored directly on the ground.

3.9.7 Flood Management

Prevention of flood will be part of the initial planning phase of. A proper storm water management plan should be created before drilling commences.

3.9.8 Information board

The Contractor will be responsible for erecting information boards on site. The number and locations of these boards shall be agreed upon by the ECO officer.

The contents of the information board shall be provided by the Technical Manager and will essentially be to advise the public of the construction activity and the prohibition on entering certain areas. The information board shall also provide the contact number of the ECO, to ensure that the public can access relevant information and lodge any complaints during the construction phase of the township development.

3.9.9 Progressive Rehabilitation

Rehabilitation must commence as soon as possible on areas where exploration (drilling, sampling etc) has taken place or no further development is to take place, i.e. on completed excavations, soil/rock cutting hips, slopes etc.

3.9.8 Management of environmental aspects during the exploration activities

Groundwater

Drilling phase	
Description	<p>Groundwater contamination can be caused by leakages and spills of fuel from machinery and heavy-duty vehicles during exploration. Care must be taken to avoid contamination of soil and groundwater.</p> <p>Cross-contamination of aquifers due to borehole construction may also occur during drilling.</p>
Proposed Mitigation Measures	<p>Prevent spillages of any fuel and oils. Use drip trays when doing maintenance on machinery. Maintenance should be done on dedicated areas with linings or concrete floor. All spills must be cleaned up immediately.</p> <p>The borehole should be backfilled with cement and/or bentonite and sealed if it is not to be used further.</p> <p>The risk can be lowered further through proper training of staff.</p>
Proposed Monitoring	Regular visual inspection. Groundwater sampling, if there is evidence of pollution in the borehole.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Mobilization and Inter-Movement to and from site	
Description	Hydrocarbon and oil leakages might occur from heavy-duty drilling machinery and associated fleet along the access routes.
Proposed Mitigation Measures	Drip trays and/or plastic sheeting should be used to contain any leaks emanating from the drilling machinery and fleet. The risk can be lowered further through proper training of staff. All spills must be cleaned up immediately.
Proposed Monitoring	Regular visual inspection.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Surface Water

Drilling phase	
Description	Leakage from machinery during exploration drilling. Oil Spills may form a film on water surfaces causing physical damage to water-borne organisms. Improper management of general and human waste may also occur.
Proposed Mitigation Measures	Machinery should not be serviced at the drill site to avoid spills. All spills should be cleaned up as soon as possible. Hydrocarbon contaminated clothing or equipments should not be washed within 25m of any surface water body.
Proposed Monitoring	Regular visual inspection. Surface water quality monitoring in cases of evident pollution.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Mobilization and Inter-Movement to and from site	
Description	Spillages might occur from vehicle during movement to and from the project location. Contaminated soil might pose a risk to surface water.
Proposed Mitigation Measures	All spills should be cleaned up as soon as possible. An emergency plan should be in place on how to deal with spills. Drip trays and/or plastic sheeting should be used to contain any leaks emanating from the drilling machinery and fleet.
Proposed Monitoring	Regular visual inspection. Surface water quality monitoring in cases of evident pollution.
Responsible Party	Horn Metals (Pty) Ltd

Air quality (including dust)

Drilling phase	
Description	Dust will be produced during the drilling phase; and might be worsened when strong winds occur. These are expected to be site specific and could potentially pose a nuisance to the drilling staff. The drilling project is expected to have minimal impact on the surrounding air quality. Uncontrolled release of fumes and dust may have detrimental impacts on the surrounding environment.
Proposed Mitigation Measures	Drilling must be avoided under high wind conditions. During high winds, dust suppression measures may be required (e.g. dampening with water). No unnecessary revving of engines or operation of vehicles is allowed. Exploration borehole should be capped and sealed when no drilling is taking place, to prevent emissions immediately after drilling has stopped
Proposed Monitoring	Regular visual inspection.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Mobilization and Inter-Movement to and from site	
Description	Dust will be generated during the movement of drilling machineries and vehicles to and from the site. Exhaust fumes will be released from vehicles during movement.
Proposed Mitigation Measures	Restricted speed limits along access routes in order to sufficiently reduce dust. Regular dust suppression should be included along access routes, when dust becomes an issue. No unnecessary revving of engines or operation of vehicles is allowed. Vehicle idling time should be minimised.
Proposed Monitoring	A complaints register regarding emissions/smell should be kept and acted on if it becomes a regular complaint.
Responsible Body	Horn Metals (Pty) Ltd

Safety and Security

Drilling phase	
Description	During the drilling phase, drilling equipment will be used on site. This increases the possibility of injuries. Presence of equipment lying around on site may encourage criminal activities (theft).
Proposed Mitigation Measures	<p>Sensitize operators to switch off engines of vehicles or machinery not being used. The contractor is advised to ensure that the team is equipped with first aid kits and that they are available on site, at all times. Workers should be equipped with adequate personal protective gear and properly trained in first aid and safety awareness.</p> <p>Signs such as 'NO SMOKING' must be prominently displayed in parts where inflammable materials are stored on the premises. Fencing around the drill site should be erected to avoid entrance of animals and unauthorized persons. Safety regulatory signs should be placed at strategic locations to ensure awareness. Adequate lighting within and around the drilling location should be erected.</p>
Proposed Monitoring	Safety procedures evaluation. Health and safety incident monitoring.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Mobilization and Inter-Movement to and from site	
Description	Safety issues while driving to and from site.
Proposed Mitigation Measures	The contractor is advised to ensure that all vehicles are equipped with first aid kits and that they are available, at all times. Workers should be equipped with adequate personal protective gear and properly trained in first aid and safety awareness.
Proposed Monitoring	Regular inspection and incident monitoring report evaluation.
Responsible Body	Horn Metals (Pty) Ltd

Noise Pollution

Drilling phase	
Description	Noise pollution due to heavy-duty equipment and machinery on site.
Proposed Mitigation Measures	Sensitize vehicle drivers and machinery operators to switch off engines of vehicles or machinery not being used. Ensure engines are fitted with mufflers. Equipment and machinery operators should be equipped with ear protection equipment.
Proposed Monitoring	Observation of on-site noise levels by the Manager or Supervisor.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Mobilization and Inter-Movement to and from site	
Description	Noise pollution along the access routes is expected due to movement of heavy-duty drilling vehicles and the rest of the fleet.
Proposed Mitigation Measures	Movement of heavy-duty trucks should be limited. Loud music from operational vehicles should be restricted. Target noise levels should be <85dB.
Proposed Monitoring	Observation of on-site noise levels by the Manager or Supervisor.
Responsible Body	Horn Metals (Pty) Ltd

Waste Generation

Drilling phase	
Description	This can be in a form of contaminated soil, drill chips and domestic waste.
Proposed Mitigation Measures	All waste must be collected, contained and disposed of at an appropriate waste disposal site. General domestic waste, contaminated soil, oil leaks, drill cuttings etc must be addressed. Drill cuttings must be collected and placed back into the drill holes, or removed from site. The drilling contractor must provide sufficient bins and/or containers on-site, to store any solid waste produced.
Proposed Monitoring	Regular inspection and housekeeping procedure monitoring. Observation of site appearance by the manager.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Mobilization and Inter-Movement to and from site	
Description	Waste in the form of contaminated soil due to spillage might be generated, but should be prevented. Litter may also be produced during mobilization.
Proposed Mitigation Measures	Waste minimization policy should be formulated by Horn Metals (Pty) Ltd. Bioremediation of contaminated soil. Rubbish must be collected and disposed at a disposal site.
Proposed Monitoring	Regular visual inspection.
Responsible Body	Horn Metals (Pty) Ltd

Traffic

Drilling phase	
Description	Exploration drilling activities are expected to have a minor impact on the movement of traffic along the C39 and D2761 road , and other access tracks. No diversion of traffic or closure of roads is expected.
Proposed Mitigation Measures	Speed limit warning signs must be erected to minimise accidents. Drilling vehicles and machinery must be tagged with reflective signs or tapes to maximise visibility and avoid accidents.
Proposed Monitoring	Observations of the traffic flow on site.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Mobilization and Inter-Movement to and from site	
Description	Traffic around the proposed site.
Proposed Mitigation Measures	Speed limit warning signs must be erected to minimise accidents. Drilling vehicles and machinery must be tagged with reflective signs or tapes to maximise visibility and avoid accidents.
Proposed Monitoring	Observations of the traffic flow and speed on site.
Responsible Body	Horn Metals (Pty) Ltd

Ecological impacts

Drilling phase	
Description	The location of the proposed drilling project is free of any conservation worthy terrestrial vegetation and fauna. Impacts on fauna and flora are expected to be low and less significant. However, small patches Welwitschia Plants could occur randomly in these areas. Welwitschia plants are protected species, and disturbances of these plants should avoided a
Proposed Mitigation Measures	The site has been previously disturbed by road contractors. Prevent surface water contamination and disturbance of areas outside the designated working zone.
Proposed Monitoring	Regular site inspection.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Mobilization and Inter-Movement to and from site	
Description	Disturbance or impacts on fauna and flora. Very little impacts are expected as the area already has existing roads/tracks that lead to the project location.
Proposed Mitigation Measures	The creation of new roads and tracks should be avoided. Minimise the area of disturbance by restricting movement to the designated access routes.
Proposed Monitoring	Regular access route inspection.
Responsible Body	Horn Metals (Pty) Ltd

Nuisance Pollution

Drilling phase	
Description	Aesthetics and inconvenience caused to person trying to access/exit the site and surrounding areas.
Proposed Mitigation Measures	The supervisor should maintain tidiness on site at all times. Take cognition when parking vehicles and placing equipment.
Proposed Monitoring	Regular visual site inspection.
Responsible Party	Horn Metals (Pty) Ltd / Contractors.

Fire and explosion hazard

Drilling phase	
Description	Fires and explosions at the site.
Proposed Mitigation Measures	There should be sufficient water available for fire fighting purposes. Ensure that all fire-fighting devices are in good working order and they are serviced. All personnel have to be trained about responsible fire protection measures and good housekeeping such as the removal of flammable materials on site.
Proposed Monitoring	Regular inspections should be carried out to inspect and test fire fighting equipment.
Responsible Body	Horn Metals (Pty) Ltd

Cultural and Archaeological Impacts

Drilling phase	
Description	Damage or disturbance to cultural and archaeological
Proposed Mitigation Measures	A grave site and an old farm building were identified as sensitive heritage resources. A 100m buffer zone should be created and maintained around the burial sites and old farm house building found within the EPL. Should any archaeological remains or objects with cultural values (e.g. military shells, arterially, weapons, ancient clothing, ancient cutlery, graves etc) are uncovered along the access routes or surrounding, it should be barricaded off and the relevant authorities should be contacted immediately.
Proposed Monitoring	Regular visual inspection.
Responsible Body	Horn Metals (Pty) Ltd

Mobilization and Inter-Movement to and from site	
Description	Damage or disturbance to cultural and archaeological
Proposed Mitigation Measures	A grave site and an old farm building were identified as sensitive heritage resources. A 100m buffer zone should be created and maintained around the burial sites and old farm house building found within the EPL. Should any archaeological remains or objects with cultural values (e.g. military shells, arterially, weapons, ancient clothing, ancient cutlery, graves etc) are uncovered along the access routes or surrounding, it should be barricaded off and the relevant authorities should be contacted immediately.
Proposed Monitoring	Monitoring and evaluation inspection as the NHC Consent terms
Responsible Body	Horn Metals (Pty) Ltd

4. CONCLUSIONS

If the above-mentioned management recommendations are properly implemented, it is anticipated that most of the adverse impacts on the environment can be mitigated. An appointed environmental officer/consultant will need to monitor or audit the site throughout exploration to ensure that the EMP is fully implemented and complied with. The EMP caters for all activities of the project, but will need to be reviewed when necessary, especially when revisions are made to the project plans.

The Environmental Management Plan should be used as an on-site tool during all phases of the proposed project. Parties responsible for contravention of the EMP should be held responsible for any rehabilitation that may need to be undertaken.

Clearance certificates issued on EMPs are only valid for 3 years and will need to be reviewed and submitted to the Department of Environmental Affairs again for approval.

Matrix Consulting Services

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