



## mineral resources

Department:  
Mineral Resources  
REPUBLIC OF SOUTH AFRICA



**MYEZO ENVIRONMENTAL  
MANAGEMENT SERVICES**

*Environmental Stewardship*

### **BASIC ASSESSMENT REPORT**

**And**

### **ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT**

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED) FOR THE PROPOSED PROSPECTING IRON ORE AND MANGANESE ORE ON THE FARMS THORNS 407, DUINE 437, RECORD 411, LOSKOP 414, OATLANDS 406, AND TOWTON 415, LOCATED APPROXIMATELY 50 KM NORTH WEST OF KATHU TOWN, IN THE MAGISTERIAL DISTRICT OF KURUMAN, WITHIN TSANTSABANE LOCAL MUNICIPALITY, NORTHERN CAPE PROVINCE

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## **ABBREVIATIONS**

**BAR:** Basic Assessment Report

**CV:** Curriculum Vitae

**COVID-19:** Corona Virus Disease of 2019

**DFFE:** Department of Forestry, Fisheries and Environment

**DMRE:** Department of Mineral Resources and Energy

**EA:** Environmental Authorisation

**EAP:** Environmental Assessment Practitioner

**GA:** General Authorisation

**GN:** Government Notice

**GPS:** Global Positioning System

**HIV:** Human Immunodeficiency Virus

**I&APs:** Interested and Affected Parties

**MPRDA:** Mineral and Petroleum Resources Development Act (Act No. 28 of 2002) as amended

**Myezo:** Myezo Environmental Management Services (Pty) Ltd

**NEMA:** National Environmental Management Act (Act 107 of 1998)

**NEM:BA:** National Environmental Management: Biodiversity Act (No. 10 of 2004)

**NEM:PAA:** National Environmental Management: Protected Areas Act (No. 57 of 2003)

**NEM:AQA:** National Environmental Management: Air Quality Act (No. 39 of 2004)

**NEM:WA:** National Environmental Management: Waste Act (No. 59 of 2008)

**NHRA:** National Heritage Resources Act (Act No. 25 of 1999)

**SAHRA:** South African Heritage Resources Agency

**SDF:** Spatial Development Framework

**SANBI:** South African National Biodiversity Institute

**TB:** Tuberculosis

**TLM:** Tsantsabane Local Municipality

**Zastrocode (Pty) Ltd - Zastrocode**

## PART B

### ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT

#### 1) Environmental Management Programme.

- a) Details of the EAP,** (Confirm that the requirement for the provision of the details and expertise are already included in Part 1, Section (a) herein as required).

Please refer to Part A (BAR), Section 1. For ease of reference this information is described in this section as well.

#### i) Details of the EAP

The following are the details of the Environmental Assessment Practitioner responsible for the Zastrocode environmental authorisation application for the proposed prospecting of iron ore and manganese within Tsantsabane Local Municipality, Northern Cape Province:

Name of The Practitioner: Ms. Babalwa Fatyi

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#### ii) Expertise of the EAP

##### 1. The qualifications of the EAP

Ms. Babalwa Fatyi is a SACNASP registered Professional Scientist (1993) and a holder of a Master of Science (cum laude) from the Witwatersrand University. She is a registered Environmental Assessment Practitioner (EAP) and an accredited Environmental Auditor with the Institute of Environmental Management and Assessment, Lincoln, UK (0025153). She has several certificates in environmental management including ISO 14001 and Waste Management and Auditing. For copy of qualifications, please refer to Appendix 1.1-1 of the Basic Assessment Report.

##### 2. Summary of the EAP's past experience.

Ms. Babalwa Fatyi's mining environmental impact assessment and management experience is extensive both in the private and government sectors including working with the Council for Scientific and Industrial Research (CSIR) and the DME to develop best practice rehabilitation guidelines for derelict, abandoned and operational mines. Some of Babalwa's vast mining environmental consulting experience include working for SRK Consulting from 1999 to 2002. From 2002 to 2005 she worked for a mining company Trans Hex (Pty) Ltd where she successfully administered the company's compliance with both internal and legislative environmental obligations and was active in stimulating environmental consciousness through all the different mining development phases. Driven to impart environmental stewardship at personal,

societal and corporate levels, her consulting experience gave her an insight with respect to sector-specific environmental requirements ranging from authorizations, implementation and monitoring. A proud and recognised South African female business owner and entrepreneur, she continues to be a voice of consciousness and a team player for change with regards to how development and environmental matters are handled.

She has a way of teasing environmental and social commitments into manageable components and elements. This also stems from her capability to enable understanding risks, legal framework, biophysical and social risks, and monitoring to ensure that co-operative agreements are established for each development she is supporting, thus creating opportunities for transformation and innovative change.

Focusing on the environmental aspects, she developed a sustainability report for the Wesizwe Platinum. Working with a task team from the Department of Environmental Affairs, she played a key role in the fruitful development of the fourth National Country Report in the implementation of the United Nation Convention to Combat Desertification.

Babalwa has resourcefully led, project-managed and participated in over 40 mining environmental impact assessment studies (EIAs) and Environmental Management Plans programmes (EMPrs) including compiling more than 20 Basic Assessment Reports (BARs) within the various sectors and industries. She was also part of industry experts who were selected to partake in the executive preparation programme, a collaboration between Mining Qualification Authority and academia. Cumulatively, she has developed over 50 strategic/management programmes, closure plans, sustainability reports and monitoring protocols for the mining industry. A hardworking researcher, she is an established co-author of several publications in scientific journals since 1999. On her own, she has written and published poetry books and performed poetry presentations, both which promote sustainable means of unlocking the natural resource capital whilst upholding coexistence principles.

Through various roles and innovations, she is well versed with mining activities, marine legislation and coastal environmental management. As a Trans-Hex Operations representative in the provincial coastal committee, from 2003 to 2011 she assisted in tackling impacts related to industrial activities along the coast. The major aim was to promote protection and sustainable utilisation of coastal resources. As part of this committee, she assisted in the spearheading of the integration of coastal management principles and objectives into the plans, programs and policies of other organ of state with jurisdiction over aspects of the coastal environment. Guided by marine legislation, she was involved in the implementation of concession EMPs for mining operations. She developed the monitoring protocol for the deep-sea operations and reviewed the monthly monitoring sheets that the contractors were trained to fill during the sea mining activities. She also represented a company on The Benguela Current Large Marine Ecosystem (BCLME) programme.



She has diverse sector experience and insight with sector specific environmental requirements ranging from EA applications, implementation and monitoring, acquired while working for the mining industry and later while a serving the same mining industry as a consultant. Babalwa is fluent in partnering with both large blue-chip companies and smaller companies, which require her expertise ensuring collaborative design of strategies and methodologies. Subsequently, this kindles sustainable development and enable successful execution of various projects which she directs and participates in. The tenacity and authenticity of a project leader determines its success and Babalwa has personified these traits in the way she applies her experience in dealing with stakeholders, adapting to change, dealing with unexpected parameters and having competence in budget and cost control.

- b) Description of the Aspects of the Activity** (confirm that the requirement to describe the aspects of the activity that are covered by the environmental programme is already included in Part A, Section 1(h) herein as required.

Prospecting activities will include non-invasive techniques and invasive (drilling) techniques to be done in two phases. Geological surface mapping will be done to evaluate the potential of the ore deposit within the prospecting area. This will entail surface geological mapping, structural mapping and subsurface interpretations of the structural trends.

Mapping will be performed in conjunction with geophysical surveys, which entails ground magnetics and ground gravity geophysical procedures on a pre-determined grid of 100 m x 100 m, in order to delineate ore formations. Minimal vegetation clearance will be required during the geophysical surveys to provide freedom of movement to the geo-technicians that are traversing the grids.

In-situ ore material across the area will also be analysed to determine the subsurface ore grade variation throughout the prospecting area. The samples will be selected based on the availability of fresh subsurface ore material.

For the drilling programme, a total of 40 drill holes are planned to depths ranging from 50 m to 100 m. The locations of these holes will be based on results obtained from the geological interpretations during the non-invasive phase. Prospecting activities will make use of existing roads and track as far as possible. However, additional tracks estimated at 5 km in length as well as 40 drill-pads will be created

Ultimately, all prospecting data will be validated and captured in order to generate geological models and resource estimates.

**Non-Invasive activities:**

These are project activities which do not disturb or alter anything in the terrestrial environment. Project activities that are noninvasive include Desktop Study and Pre-feasibility Studies.

- **Desktop Study**

These activities will include:

- (i) Data gathering
  - (ii) Remote Sensing
  - (iii) Geological Mapping
  - (iv) Geochemistry
- i. Data Gathering - Detailed geological and structural mapping will also be carried out. Information concerning the project area and applicable spheres of interest will be sought from reliable and reputable sources such as government publications and academic institutions. This will include geological data, environmental baseline information and the socio-economic status. The information will be used not only for mining and environmental applications but for effective decision making. This will involve analysis of data where exploration records of all previous work in the area will be re-examined, and the following studies will be carried out:
- Literature review
  - Detailed aerial photograph and satellite image interpretation
  - Regional airborne geophysics with main emphasis on magnetic
  - Historical drilling review and interpretation
- ii. Remote sensing this involves acquiring information from the project area making use of aerial photographs, satellite imagery, and regional airborne geophysical data.
- Information from satellite such as the Landsat Thematic Mapper Satellite can detect geological faults and fractures that indicate manganese and iron ore deposits.
  - Existing aerial photography – this information can help photogeologists in determining important information such as lithologies and other geological features.
  - Satellite imagery – satellite imagery helps gather important information such as soil type, water content and drainage without having to disturb the land. The information is important for geological assessments, environmental management and decision-making.
  - Regional airborne geophysical data- this is information describing the region's electromagnetic properties, magnetic field and resistivity (USGS, 2020). Resistivity can help determine the soil's mineral properties due to its conductivity relative to water content.
- iii. Geological mapping – this is field data collection whereby the geologist will record surface features such as outcrops and rock types. Geological mapping will also be applied to identify the manganese and iron ore bearing geological units with their local complexities and variations.

- iv. Geochemistry – reviews of historical drilling will be done. This is analysis of existing data for the chemical composition of the earth's crust in the project area.

These noninvasive activities will be undertaken during the period that the prospecting permit application is being assessed and, presumably, approved. A period of 12 months is estimated for this.

- **Pre-feasibility studies**

- The will be the final stage of the prospecting programme and would involve the following activities:
- Initial conceptual Mine Planning.
- Planning the infrastructure requirements
- Environmental management planning
- Financial modelling
- Market analysis
- Analysis of transport logistics to markets
- Assessment of personal and training requirements
- Assessment of socio-economic factors

**Invasive activities:**

These are project activities that result in the disturbance of the land and this will involve drilling activities and resource generation. Activities to be undertaken include:

**1. Initial Drilling**

These activities will be undertaken after the issuance of a licence, identified prospective targets will require further subsurface investigation. Thus, drilling will be undertaken and about 10 drill-holes will be drilled initially. Drill holes could vary in depth from 50 to 100m, with an average depth in the order of 50 meters since from the available data for the area the manganese/iron outcrops. The total amount of drilling to be budgeted for at this stage will be 1000 meters and it is assumed that every meter of the manganese and iron intersections will be analysed. Types of drilling being considered include Diamond, Air Core, Rotary Air Blast (RAB) or Reverse circulation (RC). Drill waste includes non-hazardous muds and fluids. Drilling of the prospective areas will commence to establish presence of mineralization. Geological borehole logging, down the hole logging and sampling will also be carried out this may involve the use of special drills to get cylindrical core samples for continuous data and geological mapping of iron and manganese ore seams.

The geological information generated will be used to model and estimate resource. The resources will at least be expected to be in the Measured and Indicated Category according to the appropriate reporting standard (SAMREC, JORC, or NI43 -101).

**2. Resource Drilling**

Depending on the the results of the initial drilling, further 30 drill-holes totaling about 2000 meters may be required. The activities will include:

- Resource drilling
- Geological Modelling
- Resource Calculation

### **3. Prefeasibility Studies**

These activities are non-invasive and will include the following:

- Geological modeling and resources evaluation
- Mine planning
- Plant design
- Financial modeling
- Market analysis

#### **c) Composite Map**

Provide a map (Attached as an Appendix) at an appropriate scale which superimposes the proposed activity, its associated structures, and infrastructure on the environmental sensitivities of the preferred site, indicating any areas that any areas that should be avoided, including buffers.

The site locality Plan (composite map) is included as Appendix C1-1.

#### **d) Description of Impact management objectives including management statements**

- i) Determination of closure objectives.** (ensure that the closure objectives are informed by the type of the environment described)

The main objectives of the rehabilitation are outlined below:

- To ensure the availability of sufficient finances to attain the set environmental measures to be executed at the planning stage and during implementation of the EMP report.
- To ensure maintenance of the biodiversity on site
- To ensure re-establishment and sustainability of vegetation in the rehabilitated land, and thereby avoiding loss of any species habitat
- To Ensure that the rehabilitated land is in the state that is suitable for its agreed upon post-closure uses
- To develop good remediation methods and proper closure plans, so as to minimize degradation of the environment
- Rehabilitatè disturbed land and drill deposits to a state that:

- facilitates compliance with applicable environmental quality objectives (air quality and water quality guidelines);
  - reduces visual impact of the disturbed land;
  - limits post closure management.
- To ensure that the infrastructure is safe after rehabilitation
  - To keep relevant authorities informed of the progress of the decommissioning phase.
  - Submit monitoring data to the relevant authorities as required.
  - Maintain required pollution control facilities and rehabilitated land until closure

The rehabilitation of the site will involve:

#### **(1) Water sumps management**

After the completion of the construction of the drill site, all the proposed water management structures will be removed, as they are all temporary. The water sumps will be designed in a way that will not cause any spillages of wastewater.

#### **(2) Flora and fauna rehabilitation plan**

Disturbance of critical biodiversity areas will be avoided. Activities related to clearing vegetation will be limited to the area where the boreholes and site camps. Rehabilitation and vegetation will be done for all cleared areas. Should there be a need to alter a listed species, a permit will be sought from the relevant authority first, before commencement.

#### **(3) Haul Roads**

Haul roads will be remediated through vegetation, and the applicant will ensure that the revegetation is done using the original type of vegetation as before.

#### **(4) Mobile offices and workshops**

As part of recycling, the hired mobile offices will be returned to the suppliers. Re-vegetation will be done through preparing soil and levelling to ensure growth of the Impacted vegetation.

#### **(5) Waste bins and chemical toilets**

A collection of waste bins and chemical toilets that have been emptied will be done. These will be cleaned by a chosen waste collection company.

#### **(6) Topsoil**

Landscaping, replacement of topsoil and vegetation establishment will be done to rehabilitate disturbed areas.

Closure objectives and measures will be done according to the type of environment in question.

## **(7) General Management Objectives**

- To assign time frames for achieving those set objectives.
- To have a system of ensuring that environmental requirements are updated as modifications occur in activities and structures.
- To ensure that responsible parties to be involved in environmental management planning process have set time frames, and these are agreed with the environmental impact generating divisions
- Environmental Management System (EMS) to include designation of responsibility for achieving objectives at each function
- Targets to be developed in line with EMPr commitments and acceptable standards for:
  - Solid, liquid waste and gaseous emissions
  - Waste reduction, reuse and recycling
  - Rehabilitation KPAs
  - Biodiversity management
  - Eco-efficiency such as electricity consumption

### **(7.1) Resources, Structure and Responsibility objectives**

To ensure that:

- There is allocation of sufficient personnel and other resources to meet objectives and targets.
- EMS procedures to stipulate equipment requirements and personnel requirements to ensure that there is clearly defined roles and responsibilities
- Compliance roles and responsibilities of environmental protection personnel to be clearly defined and incorporated into key performance areas as a comprehensive part of the performance management system
- Accountability for achieving and maintaining compliance is set through formal appointments for any delegated environmental roles
- Accountability of general impact generating personnel is formally controlled through key performances areas (KPAs)

#### ***(7.1)1. Guidelines for attaining the objectives***

- Develop a procedure for ensuring that the company identifies and allocates human, technical and financial resources necessary to meet its environmental objectives and targets

- Develop a procedure for tracking costs and benefits of environmental activities
- Review environmental management system procedures and ensure that human resources are allocated to set environmental management objectives
- Define roles and responsibilities
- Describe how environmental performance and compliance information will be communicated to employees, on-site service providers and contractors
- Review complaints registers or other procedures to ensure that concerns concerning environmental performance and compliance raised by personnel are received and addressed
- Develop procedures to ensure that responsibilities and accountability of personnel who manage, perform, verify work affecting environment are defined and documented
- Key performance areas of identified environmental responsible personnel to include environmental obligations
- All EMP commitments to be included in contractor's contracts

#### **(7.2) Emergency preparedness and Response objectives**

Zastrocode's environmental emergency procedures will ensure appropriate responses to unexpected / accidental actions/incidents that could cause environmental impacts. Such incidents may include:

- Accidental discharges to water (i.e. into the watercourse) and land;
- Accidental spillage of hazardous substances (typically oil, petrol, and diesel);
- Accidental toxic emissions into the air; and
- Specific environmental and ecosystem effects from accidental releases or incidents.

It is intended that all environmental emergency situations are identified and are linked to the identified significant risks, made known to employees and surrounding communities that proper response action are in place and are communicated to those who might encounter such emergency situations.

##### **(7.2)1 Guidelines for attaining the objectives**

- Develop emergency preparedness and response procedure with respect to environmental management to:
- Identify potential for accidents and emergency situations

- Respond to accidents and emergency situations
- Prevent and mitigate environmental impacts
- Review emergency procedures (particularly after emergency situations) and periodical test such procedures where practicable.
- Identify and draw term of reference for the rescue team
- Significant environmental aspects and their associated environmental impacts will be identified for all operational areas.
- In formulating the emergency plan the following factors should be taken into consideration:
  - All significant environmental aspects likely to result to emergency conditions;
  - Historic emergency events of activities, products and services on/off the site;
  - Chemicals, oils and other materials used on site;
  - Activities of contractors;
  - Concerns of communities and authorities were submitted;
  - Proximity to sensitive area such as residential areas, schools, wetlands, rivers Availability of local emergency services;
  - Availability of local emergency services;
  - Availability of trained, on-site personnel for emergency situations.
- Potential emergency situations identified should include petrochemical/chemical spillages, hazardous material spillages, fires, storage failures, untreated effluent spillages, explosions and natural disasters, and electrical failure.
- A risk assessment should be undertaken to identify such potential emergency risk situations.
- Emergency plans should be documented for each of these stipulated emergencies, which include responsibilities in emergency situations, corrective and preventative actions and the reporting of such emergencies.
- Identification of evacuation routes;
- Identification of safety showers and eye-wash stations;
- Identification of fire extinguishers;
- Identification of spill containment equipment;



- Effluent drains, storm water channels, and other water systems;
- Site infra-structure such as bulk storage facilities;
- Prevailing wind direction and neighbouring communities and facilities; and
- Emergency generators.

### **(7.3) Biodiversity objectives**

#### **(7.3)1 Vegetation**

- To ensure long-term survival of the ecosystem where the mining activity will be conducted
- To prevent loss of vegetation due to unnecessary clearing during construction activities.
- To limit and prevent the establishment of invasive and/or alien vegetation.
- To limit the impact on the flora within the stipulated footprints of the infrastructural areas.

#### **(7.3)2 Animals**

- To prevent loss of biodiversity.
- To limit the impact on the fauna in the area of the mine complex and related infrastructure sites over which the applicant has control.
- To prevent the incidents of snaring, poaching and accidental killings of wildlife and livestock within the area over which the applicant has control.

### **(7.4) Soils, land capability and land use objectives**

#### **(7.4)1 Soils**

- To preserve as much soil as possible from areas to be disturbed to ensure that the maximum amount of soil is available for future use during rehabilitation.
- To preserve soil horizons and group similar soil units together in stockpiles.
- To encourage re-growth and biological activity within the soils, while they are stockpiled.
- To maintain the fertility of the soils so as to ensure good re-vegetation of the rehabilitated areas.
- Prevent soil loss through wind and water erosion.
- Prevent reduction of soil quality through contamination
- To encourage re-growth and biological activity within the soils, while they are stockpiled.

- To ensure the correct rehabilitation of contaminated soils.
- To ensure the correct placement, sequence and depths of soils during rehabilitation.
- To encourage re-growth and biological activity within the replaced soils and to minimise the loss of soil.

#### **(7.4)2 Land capability**

- To minimise the area to be disturbed during construction and operational activities.
- To manage and rehabilitate the disturbed areas to an appropriate level.
- To minimise soil erosion.

#### **(7.4)3 Land use**

- To limit the impact of the mining operations to as small a footprint as is possible.
- To manage and rehabilitate the disturbed areas to an appropriate level.

### **(7.5) Cultural Heritage**

#### **(7.5)1 Objectives**

- To ensure the preservation of identified sites of cultural importance (such as graves, should there be any of such encounters)
- To ensure that any necessary, destruction of identified cultural sites that fall within the mine foot print is done in accordance with the NHRA and under the guidance of SAHRA.

#### **(7.5)2 Guiding principles to achieve the objectives**

- Any earthmoving activities, establishment of roads and areas for setting up processing plants in areas immediately behind beaches and bays hold the possibility of impacting some of the many shell middens and other archaeological sites that exist close to the shoreline, in particular, estuaries, rocky headlands and sheltered bays tend to be very archaeologically rich. Pro-active measures will involve contracting an archaeologist to survey and mitigate the coastal zone adjacent to beach mining operations, as well as any proposed roads and infrastructure. This work may happen on a periodic basis to coincide with mining schedule.
- Relevant construction staff will receive training in basic archaeological identification and the communication routes to follow in the case of a discovery since additional heritage resources may be unearthed during construction, should this occur, work in that area should be halted until such

time as an appropriately qualified person can make an expert decision on the mitigation measures required. A responsible archaeologist will be identified for this commission.

- The expert would notify SAHRA (in line with the provisions of Schedule 35 of the NHRA and carry out an emergency recovery.
- Identified archaeological sites and stone cairns will be monitored. In such cases where the archaeologist spots, investigate and report fossil material, a separate monitoring by a palaeontologist would not be necessary. According the specialist report (Volume 4 of the EIAR) most areas have relatively low potential for fossil bone material and it is expensive and impractical to have excavations constantly monitored by a professional during the construction phase. Notwithstanding, the sporadic fossil occurrences are then particularly important. In order to spot the rare occurrences, would be crucial to have the co-operation of the personnel responsible for mining activities such as excavations.
- Awareness training would be conducted and guidelines for potential finds and a reporting/action protocol would be in place when finds are uncovered.
- Zastrocode will contribute towards research by fostering a relationship with a paleontologist and where necessary (as per results of the monitoring exercise) a paleontologist will inspect pits and profiles before they are rehabilitated, since deep excavation contains some form of paleontology that is exposed in the stratigraphy.
- Should destruction of the cultural sites, necessary permits should be in place from SAHRA prior to construction activities commencing at or near the relevant identified sites. Through induction training, staff on site will be mindful of artefacts that may appear in the project area. Such material can include lumps of iron, ballast stones or ingots, pieces of rope, wood, leather as well as ceramics and porcelain. In the event of a find, an archaeologist will be consulted.

## **(7.6) Contamination control – cleanup of machine fluid spills**

### **(7.6)1 Objectives**

To ensure that:

- Ensure that polluted soil is removed from the spillage site to an approved treatment site where it will be rehabilitated.

### **(7.6)1 Guiding principles to attain the objectives**

- It is the responsibility of the person (s) causing or involved in the spilling of the machine fluids to report it to the supervisor responsible for the area in which the spill happened. The responsibility is however not limited to the persons involved in the incident, but also transferred to each person

observing a polluted area to investigate whether the incident has been reported.

- Any spill incidents will be reported internally, as soon as possible (within 24 hours) by completion the Accident / Incident Report.
- NEM:WA and associated regulations and standards must be followed with respect soil decontamination site.

#### **(7.7) Waste management (Natural resource use and eco-efficiency)**

Waste sources identified as part of the mining activities will include:

- Filter cloths.
- Contaminated process water.
- Steel balls.
- Scrap metal.
- Dirty water.
- Used oils and grease.
- Paint and paint tins.
- Aerosol cans.
- Batteries.
- Hazardous material packaging.
- Office waste and domestic waste.
- Recyclable, including
  - Paper
  - Glass
  - Metals
  - Plastic

Volumes of produced materials should be recorded in a waste register

##### **(7.7)1 Solid Waste**

- Records of waste produced and volumes disposed of will be kept
- Targets for waste reduction at source will be determined and thus waste production targets will be set for each month
- Recyclable waste should be recycled at an appropriate recycling facility.
- A temporary transfer station or collection point will be demarcated and fenced off

- Skip bins will be provided for collection of domestic waste from various sources around the mine

#### **(7.7)2 Sewage Effluent**

- Portable toilets will be used for the project. These will be transported and disposed of in approved treatment and disposal sites by a registered service provider.

#### **(7.7)3 Hazardous Waste**

- All hazardous waste should be collected on site at a temporary storage facility
- Streams of hazardous substances stored on site should be recorded and Materials Safety Data Sheets kept for all of these. The hazardous substances waste streams (type of waste, volumes, where generated, current disposal strategy) should form part of the overall waste register for the mine. Ensure that safety disposal certificates are obtained from the supplier.
- Materials safety data sheets will be kept for all materials stored on site and shall be displayed at the stores and well as at points of use.
- The hazardous waste should be collected by a registered hazardous waste carrier and disposed of at a registered H:H site. A certificate for the safe disposal of hazardous waste will be supplied to the mine.

### **(7.8) Surface water management (Natural resource use and eco-efficiency)**

#### **(7.8)1 Objectives**

- To reduce the area of the catchment not contributing to runoff to minimise the impact on the catchment yield.
- To keep clean and dirty water separate.
- To minimise water consumption from external sources and recycle as much water as possible.
- To prevent contamination of the watercourses.
- To ensure compliance with all legal obligations.
- All plant and surface infrastructure (including the TSF and Overburden dumps) to be designed and constructed according to national standards and applicable legislative requirements, to prevent surface water contamination.
- To maximise the re-use of water during the operational phase in order to minimise the use of clean water. To recycle water from points such as return water dams to avoid water wastage

- To minimise the risk of polluted water leaving each site and to prevent the contamination of local watercourses.
- To ensure that water in sumps is recycled and not contaminated
- To keep clean and dirty water separate.
- At closure, to ensure that the existing surface water flow is returned to as close as is possible to the original flows through contouring of the site during rehabilitation.

#### **(7.8)2 Guiding principles**

- All applicable water uses to be licensed.
- Temporary storm water diversion berms to be constructed around all construction sites to divert clean water around and away from the sites.
- Water consumption to be managed by setting key performance indicators to achieve water reduction based on the current water balance and the implementation of annual water audits.
- All chemicals, bulk fuels, oils and grease and any other hazardous substance, to be stored and handled as per all applicable legislation and national standards.
- All vehicle transfer of hazardous materials must be done within bunded areas to minimise potential effects of spills.
- All surface water management measures to be implemented in accordance with the Integrated Water and Waste Management Plan (IWWMP) and IWUL.
- The pollution control facilities (pollution control dams and return water dam) to be placed on planned maintenance, routine inspections to be implemented and they to be de-silted periodically to ensure effective performance.
- Recycled water from sumps to be used for road watering when it can no longer be recycled.
- Drill fluid, fuel, chemical and hydrocarbon spillages from trucks, conveyors and pipelines to be cleaned up timeously to prevent contamination.

#### **(7.9) Ground water**

##### **(7.9)1 Objectives**

- To minimize impacts on the volume of ground water available for use.
- To prevent pollution of groundwater.

- To minimize the impact of dewatering along preferential pathways.
- To gather sufficient information to allow future interpretations and to guide planning for closure.

#### **(7.9)2 Guiding principles**

- All plant and surface infrastructure (such as water sumps) to be constructed in accordance with national standards and applicable legislative requirements, to prevent ingress of surface water into the groundwater regime.
- All groundwater management measures to be implemented in accordance with the Integrated Water and Waste Management Plan (IWWMP) and IWUL.
- Clean and dirty water to be separated.
- Groundwater quality and level monitoring to be conducted monthly as per the water management plan. Internal quarterly reporting to be undertaken and an annual report to be submitted.
- All hydrocarbon spills should be cleaned up, as soon as possible, to prevent seepage of pollutants into the ground water regime.
- Surface water quality needs to be monitored until any impacts attributable to mining have been eliminated and are acceptable to the receiving water environment.

#### **(7.91) Visual**

##### **(7.91)1 Objectives**

- To limit the perception of visual intrusion of the mining activities, where reasonably possible.

##### **(7.91)2 Guiding principles**

- Mining infrastructure is generally designed as per functional engineering requirements. Efforts will be made, where possible, to design structures with a more aesthetic appeal.
- The final design will be concluded prior to the commencement of the construction phase and will be signed off by a professional engineer.
- The design will include both visual and noise design criteria.
- Designs will be optimised to try to decrease visual exposure of mining infrastructure.
- Exclusive use of lay down areas will be enforced and the uncontrolled dumping of waste or construction material will be prohibited.

- This will be undertaken where the visual impact on sensitive receptors is considered high.
- Uncontrolled, open fires will be prohibited on site.
- Dust will be controlled using appropriate dust suppression measures.
- The mine and plant will operate on a 24-hour basis. Lighting is thus required for safe operating conditions. As far as is possible, without compromising safety of mine personnel and operating processes, all light sources will be directed downwards and away from the public roads and surrounding communities.
- All light sources will be directed downwards and away from the public roads and surrounding communities.
- Rehabilitated areas will be maintained and monitored.

The process for managing any environmental damage, pollution, pumping and treatment of extraneous water or ecological degradation as a result of undertaking a listed activity.

The environmental management measures developed for all the identified impacts will be implemented and incorporated into the plant daily activities. The effectiveness of management measures in mitigating the impacts will be monitored. Compliance with environmental conditions of approval will be assessed through undertaking of performance audits.

Throughout the life of the operating, it will be checked that closure objectives are clearly defined and that monitoring data collected will be meaningful at closure and that management measure are monitored timeously to minimize environmental liabilities at closure.

### **(7.91)3 General Management**

The activities will be managed and operated:

- In accordance with EMPr that inter alia identifies and minimizes risk pollution, including those arising from operations, maintenance, accidents, incidents and non-conformances and those drawn to the attention of the developer as a result of stakeholder complaints.
- In accordance with the requirements of the issued licenses and associated conditions of those licenses such as water use license or waste license.
- In accordance with conditions of this license
- By sufficient persons, who are competent in respect of the responsibilities to be undertaken by them, in connection with the operation of the activities.



- Any persons having duties that are or may be affected by the matters set out in the EMPr will have convenient access to a copy of it, kept at or near the place where those duties are carried out.

The EMPr specifies the minimum requirements to be implemented, according to the scope of work and the scope of the environmental authorisation. This is done to reduce and manage the potential environmental impacts for sustainable environmental management practices. The EMPr is binding to any party which responsibility for the mining activities has been delegated to, until such time that the competent authority has been formally released Zastrocode from its responsibilities in terms of this EMPr.

It is essential that the EMPr requirements be carefully studied, understood, implemented, and adhered to at all times. The key environmental elements which are necessary for the implementation of the EMPr requirements are outlined below.

#### **(7.92) Environmental Policy**

Zastrocode recognizes that concern for the environmental impact of our operations is an integral part of best practice and is committed to meeting the challenges this represents.

Where practicable Zastrocode will contribute to sustainable development by integrating environmental consideration into the design and management of our procurement of goods and services and the development, operation and maintenance of sites and facilities.

The Environmental Policy assigns responsibility for environmental implementation to all appointed personnel who perform activities with environmental potential impacts. The overall responsibility for ensuring implementation lies with the company Chief Executive Officer.

The policy which is the cornerstone for ensuring environmental consciousness and responsibility, is thus provided below.

Zastrocode will:

- Adopt a systematic approach to environmental management in order to achieve continual improvement of our contribution to the protection and enhancement of both the local and global environment;
- Commit to the reduction and prevention of pollution and waste and take positive action to conserve water, energy and other resources (particularly where non-renewable); and ensure waste disposal is dealt with in a responsible manner;
- Promote environmental awareness and appreciation through our research and through our interactions with all other stakeholders;

- Ensure compliance with all applicable environmental legislation and other environmental requirements to which the company subscribes and which relate to the company environmental aspects.
- Co-operate with environmental regulatory bodies;
- Provide information and training necessary for employee involvement in meeting the objectives of this policy;
- Maintain contingency plans to minimize the impact of foreseeable environmental incidents;
- Assess and monitor the environmental impacts of our activities and develop ways of minimizing these impacts;
- Establish programs for achieving environmental objectives and progress these through management review.
- Individual, employees or individuals who are working for or on behalf of Zastrocode are required to co-operate with the company in the implementation of this policy by:
  - Ensuring that waste is correctly handled, stored and disposed-off;
  - Promptly reporting all accidents or incidents which could lead to pollution;
  - Feeding back any suggestions for pollution prevention, waste reduction or energy conservation.

### **(7.93) Organisational Structure and responsibility**

This section also indicates the party responsible for implementing the environmental measures and action plans laid out in the EMPr. Responsible personnel with respect to the roles highlighted under the management commitments in Section 2, Table 1 (d) – 1 are outlined in Table 1 (e) - 1.

Figure d)1-1 provides a guideline for the team structure that plays a role in the successful implementation of the EMPr. It is aimed to indicate the intended plans and commitment by Zastrocode to execute the management commitments within an organised structure, to ensure accountability as well as responsibility of the successful compliance with the conditions of authorisation. Therefore, this chart structure is going to just be utilised as a reminder that the implementation of the EMPr does not solely rest with a single party within the organisation as well as a guide to determine specific role players. It will be updated continuously as part of reporting procedures as per the actual operational activities on site and as new role key players are identified.

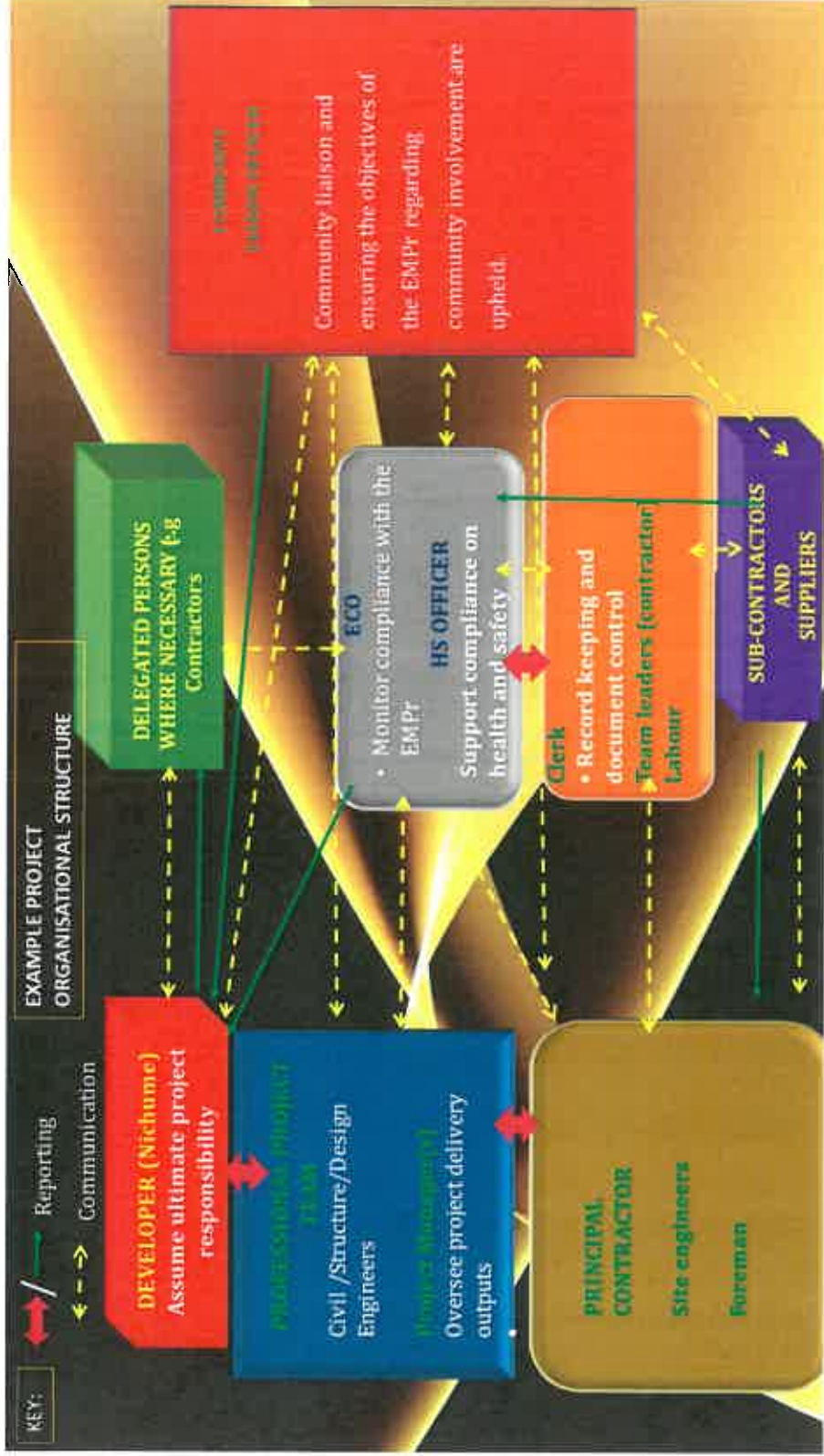


Figure d1-2: Example of a Project Organisational Structure

### **(7.93)1 Appointment of contractor**

- Zastrocode will ensure that this EMPr forms part of any contractual agreements with a Contractor(s) and sub-contractors for the execution of the proposed project. The contractor must make adequate provision in their budgets for the implementation of the EMPr.
- The principal contractor (including sub-contractors and suppliers) will comply with the relevant provisions of the EMPr, applicable environmental legislation, by-laws and associated regulations promulgated in terms of these laws. Tender documents should include statements to include the use of local communities or local community organisation where possible in supplying services and labour to the construction activities.
- Tender documents for any procured services regarding implementation of the EMPr, should include statements to include the use of local communities or local community organisation where possible in supplying services and labour to the construction activities.

### **(7.93)2 Preparation of Method Statements and procedures**

- Method Statements will be submitted by the contractor to the SHE Officer and will be adhered to by the Contractor and project engineers. These relate to water and storm water management requirements, traffic requirements, solid waste management requirements, fuel storage and filling and dispensing of fuel (diesel and petrol), hydrocarbon spills, contaminated soil disposal, the storage of hazardous materials, standard emergency procedures, amongst others.
- The ECO will monitor the implementation of the statements and as such all copies of the statements and plans will be submitted to the appointed ECO;
- The recommendations of the specialists regarding sensitive site features will be upheld and recommendation of a site ecologist will be sought, when necessary, prior to vegetation clearing.

### **(7.93)3 Appointment of ECO**

- ECO will be appointed to monitor the implementation of the EMPr;
- The monitoring of the success of the implementation in the form of internal audits and progress reports will be the role of the ECO

### **(7.93)4 The developer / Zastrocode**

The developer is ultimately responsible for ensuring compliance with the environmental specification and upholding the team to environmental commitment to compliance with all national, provincial and local legislation that relates to management of this environment.

- May on the recommendation of the engineer and/or ECO and Community Liaison Officer (CLO) order the contractor to suspend any or all works on site if the contractor or his sub-contractor/supplier fails to comply with the said environmental specifications;

- More specifically Zastrocode shall:
  - Ensure that it complies with the requirements of this operational EMPr
  - Designate a staff member as ECO, who will assess compliance with the office of EMPr;
  - Maintain a record of all environmental management activities relating to the site (including all environmental reports, complaints made by the public, etc.)
  - Appoint an independent Environmental Auditor to undertake operational phase environmental audits every two years, to determine compliance with the operational EMPr.
  - Implement the recommendations made by the EA timeously

**(7.93)5 The engineer and professional project team**

The engineer will:

- Enforce the environmental specification on site;
- Monitor compliance with the requirements of the specification;
- Assess the contractor's environmental performance in consultation with the ECO, from which a brief monthly statement of environmental performance is drawn up for record purposes and to be reported to project meetings; and
- Ensure the documentation, in conjunction with the contractor, the state of the site prior to construction activities commencing. This documentation will be in the form of photographs or video record.

**(7.93)6 The contractor (including sub-contractors)**

The contractor is required to:

- Be fully conversant with the EMPr and all conditions of the EA;
- Provide information on previous environmental management experience and company environmental policy in terms of the relevant forms contained in the contract document;
- Supply method statements timeously for all activities requiring special attention as specified and/or requested by the developer, ECO and/or engineer during the duration of the contract;
- Be conversant with the requirements of this environmental specification/EMPr. Brief all his/her staff about the requirements of the environmental specification;
- Comply with requirements of the ECO in terms of this specification and the project specification, as applicable, within the time period specified;
- Ensure any sub-contractors/suppliers who are utilised within the context of the contract comply with the environmental requirements of the project, in terms of the specifications. The contractor will be held responsible for non-compliance on their behalf;
- Bear the cost of any delays, with no extension of time granted, should he or his sub-contractors/suppliers contravene the said specifications such that the engineer

orders a suspension of work. The suspension will be enforced until such time, as the offending party(ies), procedure, or equipment is corrected;

- Be conversant with the requirements of this environmental specification/ EMPr. Brief all his/her staff about the requirements of the environmental specification.

#### **(7.93)7 Environmental Control Officer**

The ECO shall be a Zastrocode or a qualified environmental professional or professional firm with the relevant environmental expertise and shall be responsible for:

- Informing key, on-site staff through initial environmental awareness training of their roles and responsibilities in terms of the EMP and ensuring that such roles are included in their key performance areas
- Undertaking site inspections to determine compliance with the EMP;
- Identifying areas of non-compliance, and recommending measures to rectify them;
- Compiling a checklist of areas of non-compliance;
- Ensuring follow-up and resolution of all non-compliance;
- Acting as a community liaison officer to receive and respond to complaints raised by the public.
- Monitor that the principal contractor, sub-contractors, construction teams and the developer are in compliance with the EMPr, at all times during the construction and rehabilitation phases of the project;
- Monitor all site activities monthly for compliance;
- Conduct monthly audits of the site according to the EMPr, and report findings to the developer/contractor;
- Attend monthly site meetings;
- Recommend corrective action for any environmental non-compliance at the site;
- Compile a monthly report highlighting any non-compliance issues as well as progress and compliance with the EMPr prescriptions.
- Conduct training with the contractor on the EMPr and general environmental awareness.
- It must be noted that the responsibility of the ECO is to monitor compliance and give advice on the implementation of the EMPr and not to enforce compliance. Ensuring compliance is the responsibility of Zastrocode.
- Be fully conversant with all relevant environmental legislation applicable to the project, and ensure compliance with them;
- Compilation of method *statements* together with the principal contractor that will specify how potential environmental impacts in line with the requirements of the

EMPr will be managed, and, where relevant environmental best practice and how they will practically ensure that the objectives of the EMPr are achieved;

- Convey the contents of this EMPr to the construction site staff and discuss the contents in detail with the contractor;
- Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMPr;
- Take appropriate action if the specifications contained in the EMPr are not followed;
- Monitor and verify that environmental impacts are kept to a minimum, as far as possible;
- Order the removal from the construction site of any person(s) and/or equipment in contravention of the specifications of the EMPr;
- Report any non-compliance or remedial measures that need to be applied to the appropriate environmental authorities, in line with the requirements of the EMPr;
- Submitting a report at each site meeting which will document all incidents that have occurred during the period before the site meeting;
- Ensuring that the list of transgressions is available on request; and
- Maintain an environmental register which keeps a record of all incidents which occur on the site during construction. These incidents include:
  - Public involvement/complaints.
  - Health and safety incidents.
  - Incidents involving hazardous materials stored on site.
  - Non-compliance incidents.

#### ***(7.93)8 Occupational Health and Safety Officer***

The Occupational Health and Safety (OHS) Officer will be responsible for undertaking of the following:

- Compilation of a comprehensive project Health and Safety Risk Assessment (HSRA);
- Compilation of health and safety specifications based on risks identified;
- Reviewing and approval of health and safety plan(s) submitted by appointed principal contractor(s);
- Conducting monthly health and safety inspections and compiling monthly OHS reports;
- Conducting monthly health and safety audits with audit reports;
- Assisting the developer/contractor in the investigation of major accident/incidents;
- Monitoring of site activities for compliance to the Occupational Health and Safety Act, (Act No. 85 of 1993) (OHSA) and Regulations;
- Establishment and monitoring of project health and safety file;

- Monitoring the principal contractor(s)' health and safety performance; and
- Preparation of project close-out reports and submission of project health and safety files to the Client.

**(7.94) Legal Compliance**

**(7.94)1. Compliance with Environmental Development**

The EMPr will form part of the contract documentation for any contractors who will be responsible for environmental responsibilities, and this EMPr will be a legally binding document. As such, contractors will be held liable for failure to implement environmental responsibilities. Evidence of contravention of clauses within the boundaries of the site, site extensions and haul/access roads will be subjected to internally agreed penalties. There will be enforced dedication to comply with corrective or other instructions issued by the developer, Environmental Control Officer (ECO) or engineer within a specified time by all contractors

Zastrocode will ensure that the provisions of the NEMA Section 28 are also upheld in that a responsibility to avoid environmental damage, the preventative measures to reduce or prevent additional pollution and/or environmental damage from occurring will be developed and implemented.

**ii. Volumes and rate of water use required for the operation.**

An expected volume of 7500 litres/borehole may be used per day.

**iii. Has a water use licence has been applied for?**

The water will be sourced from the local municipality. Another alternative supply would be to purchase water from suppliers who would bring it to site via mobile water bowser tanks. There will be no application for water use licence for the prospecting phase of this development since there is no triggered water use in terms of Section 21 of the NWA. It is not anticipated that more than 1000 l per hole will be used. The RC drilling method uses compressed air and does not utilise water. Only when Diamond Core drilling is used, will water be required.



iv. Impacts to be mitigated in their respective phases

Table div1-1: Measures to rehabilitate the environment affected by the undertaking of any listed activity

ACTIVITIES (listed only)	POTENTIAL IMPACT	SIZE AND SCALE (of disturbance)	MITIGATION MEASURES  how each recommendation will remedy the cause of pollution or degradation and migration of pollutants	COMPLIANCE WITH STANDARDS  how recommendations will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities	TIME PERIOD FOR IMPLEMENTATION  at the earliest opportunity
<b>PLANNING AND SETUP PHASE</b>					
Selection of routes for access roads as listed in GN. R 985 or R 324 as amended in April 2017 (Listing Notice 3) The clearance of an area of 300 square metres or more of indigenous vegetation except where such clearance of indigenous vegetation is required for maintenance purposes undertaken in accordance with a maintenance management plan. Prospecting activities will make use of existing roads and track as far as possible. However, additional tracks estimated	Access roads may disturb sensitive areas such as wildlife breeding grounds.  Since the proposed project area is close to communities, access roads may tamper with and damage existing infrastructure and community properties.	Prospecting activities will make use of existing roads and track as far as possible.  Proposed project area is 14 573,11 hectares but to some extent, sphere of influence may go within a 2 km radius of its boundaries	Access roads will avoid sensitive areas. An environmental specialist will be involved in the selection of an access road. However, about 300 square metres of vegetation will be cleared, since it is determined that minimal vegetation clearance be undertaken just to allow for access during the geophysical survey.  The local community and local municipality will be informed of the project before any work is done. They will also be involved in the planning, selection and construction of the access road.	Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector (2013) encourages minimising activities that result in vegetation clearing and disturbance  Critical Infrastructure Act, 2019 prohibits the intentional damage to public infrastructure. The project will avoid such damage	During the planning phase, before any setting up of equipment is done.  During the planning phase. However, this will be a continuous process throughout the entire project

ACTIVITIES (listed only)	POTENTIAL IMPACT	SIZE AND SCALE (of disturbance)	MITIGATION MEASURES  how each recommendation will remedy the cause of pollution or degradation and migration of pollutants	COMPLIANCE WITH STANDARDS  how recommendations will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities	TIME PERIOD FOR IMPLEMENTATION  at the earliest opportunity
<p>at 5 km in length as well as 30 drill-pads will be created.</p> <p>Any development within a watercourse, or within 500 meters as listed in GA in terms of NWA, will be sought during next stages of the development, where necessary.</p>	<p>Soil erosion can result from removal of vegetation during preparation of land for the contractor camp. Eroded soil can be carried by water into rivers and results in aquatic resources deterioration.</p>	<p>Development will be done more than 500 metres from any identified rivers.</p>	<p>Rivers will be avoided at all costs. Mechanically stabilised earth walls and other best practice methods will be used to control erosion and stop eroded soil from reaching the rivers or streams.</p>	<p>NEMA prescribes a general duty of care not to cause significant pollution or degradation of the environment (including wetlands). Such will thus be avoided as a measure to conform to this legislation.</p>	<p>During the setup phase, erosion control mechanisms and buffer zones will be established</p>
<b>OPERATIONAL / CONSTRUCTION PHASE</b>					
<p>Drilling and Exploration activities as listed in Government Notice R.983,</p>	<p>Drill workers can cause deforestation and / or conflicts with local</p>	<p>Each drill site will cover about 40 square metres.</p>	<p>No trees or shrubs will be felled for the purpose of obtaining firewood, unless</p>	<p>No trees or shrubs will be felled for firewood in accordance with</p>	<p>Measures will be put in place prior to setting up.</p>

ACTIVITIES (listed only)	POTENTIAL IMPACT	SIZE AND SCALE (of disturbance)	MITIGATION MEASURES	COMPLIANCE WITH STANDARDS	TIME PERIOD FOR IMPLEMENTATION
Activity 20: Any activity, including the operation of that activity which requires a prospecting right in terms of Section 16 of the MPRDA including associated infrastructure, structures and earthworks, directly related to prospecting a mineral resource, including activities for which an exemption has been issued in terms of Section 106 of MPRDA.	<p>communities by cutting down trees for firewood.</p> <p>Soil erosion may result from the movement of workers and vehicles into and out of the drill site. Eroded soil can cause sedimentation of water bodies.</p> <p>There is risk of veld fires which can damage properties and result in injuries or loss of life. Fires disturb and reduce biodiversity.</p>	<p>There will be a total of 30 drill locations</p> <p>There will be clearance of an area of 300 square metres or more for access road maintenance. Total project drill sites will take 40 square metres X 30 sites giving 1200 square metres.</p> <p>The selected project area covers 3 314 hectares but wild fires can spread further than that.</p>	<p>agreed to by the landowner/tenant.</p> <p>Where soil clearing is done, it will be done in stages; top soil removed first and stored carefully to preserve its functions as a seed bank, the soil after top soil and stones will be stored separately for use in filling dongas. Riparian ecosystem will not be disturbed since it buffers rivers and wetlands from being silted by eroded soil. Where necessary, drainage systems will be made to reduce erosion</p> <p>Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break will be cleared around the perimeter of the camp and office sites.</p>	<p>National Forests Act No. 30 of 1998</p> <p>In accordance with the Soil Conservation Act 76 of 1969, soil conservation and erosion prevention mechanisms will be put in place.</p> <p>The National Veld and Forest Fire Act 101 of 1998 has the provision for veld fire prevention and fighting such as fire breaks. These will be put in place prior to starting the project.</p>	<p>at the earliest opportunity</p> <p>The measures will be implemented during the setup phase whilst clearing is being done.</p> <p>Fire equipment and firebreaks must be installed before any work commences.</p>

ACTIVITIES (listed only)	POTENTIAL IMPACT	SIZE AND SCALE (of disturbance)	MITIGATION MEASURES  how each recommendation will remedy the cause of pollution or degradation and migration of pollutants	COMPLIANCE WITH STANDARDS  how recommendations will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities	TIME PERIOD FOR IMPLEMENTATION  at the earliest opportunity
	Water can be wasted during drilling activities that have high water consumption for purposes such as cooling and lubrication	Each borehole will use an estimate of 7500 litres per day	Water used for drilling purposes or to dilute drill fluid will be recycled in open pits to increase water use efficiency. Water will be sourced from the local municipality.		Water purchase and acquisition planning will be done before the project begins.
	During drilling and movement of vehicles, dust is produced. Dust can fall on vegetation reducing the surface for photosynthesis. It also poses a risk to the health of workers by causing eye damage and irritation to the respiratory system.	This is expected not to go beyond 2 metres from both sides of the road. Water will be sprinkled on the dust roads whenever it is windy	Drilling activities will make use of water to reduce dust. Water will be sprayed where there is constant movement of traffic, especially on windy days. Traffic will move in the project area below 40 kilometres per hour to reduce dust.	NWA promotes the sustainable conservation of water. This will be done through recycling.	This will be implemented once the exploration has started and where there will be movement of vehicles frequent enough to generate dust
Drill rigs run on diesel and continuously produce fumes that have potent greenhouse gases such	Transboundary. Fumes will be immediately		Drill rigs with better emission technology will be used. Catalytic converters and emissions trapping mechanisms	Air Quality Act No 39 of 2004 requires that reasonable measures	Drill rigs with higher emissions will be fitted with catalytic converters and

ACTIVITIES (listed only)	POTENTIAL IMPACT	SIZE AND SCALE (of disturbance)	MITIGATION MEASURES  how each recommendation will remedy the cause of pollution or degradation and migration of pollutants	COMPLIANCE WITH STANDARDS  how recommendations will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities	TIME PERIOD FOR IMPLEMENTATION  at the earliest opportunity
	as carbon dioxide and nitrous oxide. These cause global warming.	dispersed by wind upon release.	will be used. Machinery will be serviced regularly so that they emit less.	be put in place to control, reduce and mitigate against air pollution	serviced before they are brought to the project site.
	Drill rigs are made up of several heavy equipment. Noise is produced by the equipment during drilling activities	Sound Pressure Levels Decrease with 6dB – with the Doubling of Distance from the drill rig	Drill rigs will make use of silencers. Machinery will be well serviced therefore will make less noise.	Noise Control Regulations PN 627 of 1998 prohibits outdoor noise due to drilling from exceeding 65 dB.	Silencers will be installed on noisy drill rigs prior to use.
	Vibration is produced by the drill rigs and can disturb underground animals. Workers exposed to vibration over a long period can develop 'shaking syndrome'. Vibration affect underground animals.	Within 100 metres of the drill rig, vibrations may not exceed 5mm/s <sup>2</sup>	Machinery will be serviced regularly so that they vibrate less. Vibration monitoring will be carried out on all machinery on a regular basis to ensure workers' exposure is below recommended duration and levels.	Occupational Injuries and Diseases Act No 130 of 1993 regards vibration as an occupational hazard.	Vibration monitoring can be done following feedback from nearby communities and drill workers.
Surface water contamination can occur due to spill of drill fluid or effluent water.	Any rivers and streams in the vicinity	Drilling will make use of biodegradable drill fluid and additives such as Black-Bear & Bentonite, respectively. Water samples will be taken on a	NWA requires the prevention and remediation of water pollution.	Water samples can be collected on a monthly basis to test for contamination.	

ACTIVITIES (listed only)	POTENTIAL IMPACT	SIZE AND SCALE (of disturbance)	MITIGATION MEASURES  how each recommendation will remedy the cause of pollution or degradation and migration of pollutants	COMPLIANCE WITH STANDARDS  how recommendations will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities	TIME PERIOD FOR IMPLEMENTATION  at the earliest opportunity
Waste generation from contractor camps	Sewage waste is generated from the contractor camps on a daily basis. This can pose	1200 square metres. However, contaminants in water can spread over larger areas.	monthly basis from nearby water bodies to test for contamination. All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 metres, from any stream, river, pan, dam or borehole. Any spills must be immediately to the satisfaction of the ECO by removing the spillage together with the polluted soil and by disposing of them at a suitable, licensed facility.  Contractor camps can make use of mobile toilets whose waste must be collected and disposed of into the nearest sewer system or other appropriate methods	NWA requires the prevention and remediation of water pollution.	Waste storage, collection and disposal mechanisms will be

ACTIVITIES (listed only)	POTENTIAL IMPACT	SIZE AND SCALE (of disturbance)	MITIGATION MEASURES  how each recommendation will remedy the cause of pollution or degradation and migration of pollutants	COMPLIANCE WITH STANDARDS  how recommendations will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities	TIME PERIOD FOR IMPLEMENTATION  at the earliest opportunity
	a health risk if not disposed of properly.		approved by law. Use of 'bush toilets' must be prohibited. Chemical toilet facilities will be used and sited on the camp site in such a way that they do not cause water or soil pollution. All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 metres, from any stream, river, pan, dam or borehole. Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, for appropriate disposal at a licensed facility.		in place prior to setting up.
	Solid waste will be generated daily from the contractor camps. This	1200 square metres	Drill contractor will put in place measures to reduce waste, for example workers will be	NWA requires the prevention and remediation of water	Waste storage, collection and disposal

ACTIVITIES (listed only)	POTENTIAL IMPACT	SIZE AND SCALE (of disturbance)	MITIGATION MEASURES  how each recommendation will remedy the cause of pollution or degradation and migration of pollutants	COMPLIANCE WITH STANDARDS  how recommendations will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities	TIME PERIOD FOR IMPLEMENTATION  at the earliest opportunity
	can distort the environment and pollute water resources.		provided with metal cutlery and not use disposables. Use of Styrofoam will be avoided at all cost. Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., will be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognised disposal facility. Specific precautions will be taken to prevent refuse from being dumped on or in the vicinity of the camp site.	pollution. MEN:WA promotes the principles of reduce, re-use, recover, recycle.	mechanisms will be in place prior to setting up.
<b>REHABILITATION PHASE</b>					
Rehabilitation of access roads as related to GN. R 985 or R 324 as amended	Unrehabilitated access roads can promote soil erosion and can distort the natural look of the	5 km in length	Roads will be ripped or ploughed, and if necessary, appropriately fertilised (based on a soil analysis) to ensure the	NEMA promotes ecologically sustainable development and rehabilitation of	This will commence as soon as the project construction phase has ended.



ACTIVITIES (listed only)	POTENTIAL IMPACT	SIZE AND SCALE (of disturbance)	MITIGATION MEASURES  how each recommendation will remedy the cause of pollution or degradation and migration of pollutants	COMPLIANCE WITH STANDARDS  how recommendations will comply with any prescribed environmental management standards or practices that have been identified by Competent Authorities	TIME PERIOD FOR IMPLEMENTATION  at the earliest opportunity
in April 2017 (Listing Notice 3)	environment. This can also make future cultivation difficult where an access road passes through arable land or a crop field.		regrowth of vegetation. Imported road construction materials which may hamper regrowth of vegetation will be removed and disposed of in an approved manner prior to rehabilitation.	environmental impacts from such.	
Any development within a watercourse, or within 500 meters as listed in GA in terms of NWA, will be sought during next stages of the development, where necessary.	Water resources can be contaminated by leftover oil or drill fluid during the decommissioning of the campsite.	Depending on concentration or volume, contaminants such as oil can travel up to over 2 kilometres.	Care will be taken to avoid spills and leakages when camp site is being closed. Oil storage should have at least 120% bunding. Water samples will be taken close to where the site was after site closure.	By implementing 120% or more self bunding, the project complies with SANS 310:2011	As soon as the operational phase ends. This will be done within 60 working days.

e) Impact Management Outcomes

Table e1-1: Impact management outcomes

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Selection of exploration technology	Selected exploration technologies (i.e., RC drilling & RAB) will have minimal and manageable impacts on the environmental.	This will have an effect on the whole prospecting operation and how impacts will be managed or mitigated	Controlled through selection of exploration alternatives such as RC drilling which have less impacts on soil and ground water.	Major impacts will be minimised or avoided. For example, air emissions will be reduced significantly, noise will be cancelled through use of silencers, etc.
Selection of routes for access roads	Access roads may disturb sensitive areas such as wildlife breeding grounds.	Soil, Biodiversity	Avoid through avoidance of sensitive areas such as rivers. An environmental specialist will be involved in the selection of an access road.	Impact will be avoided. Rivers or streams must not be disturbed or passed through.
	Since the proposed project area is close to communities, access roads may tamper with and damage existing infrastructure and community properties.	Social. economic	Control through preparing local communities and authorities for the disturbances by informing them of the project before any work is done. They must also be involved in the planning, selection and construction of the access road.	Impact controlled and minimised
Selection of exploration drilling contractor	Contractors, depending on their institutional capability and resources, may have different abilities to avoid or manage adverse environmental impacts. Selecting the wrong contractor may result in worsening of impacts.	All aspects: social, economic, biodiversity, soil, water resources	A contractor with a good record of environmental management will be engaged. They also be selected based on the presence of an internal environmental policy which they use for their drilling activities. Tracing and consulting their referees, previous	Impact controlled and minimised through good operating practices and procedures and institutional capability.

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Selection of site for contractor camps	There is possibility of conflicts with locals when planning to work close to community buildings. Drill workers may encroach into homesteads and undermining privacy.	Social	Control through employee movement management. Since there will be work close to houses, owners have informed and consulted. Drill workers will not be allowed to be within 50 metres of local homesteads without approval from the supervisor.	Impact avoided through respecting community privacy and communicating. Good relations must be maintained between community and developer.
	Disturbance of farming land will occur due to drilling activities taking up some of the land being used for cultivation	Social	Controlled through avoidance of sensitive areas. Since mining land is being used, the owner will be compensated and assisted to restore their livelihoods where necessary.	Impact will be managed. At the end, affected parties must maintain their level of benefit or better, which they used to experience from use of their field.
	Areas of cultural and religious importance may be disturbed by movement of traffic and people to and from the exploration sites.	Cultural heritage	Control through avoidance of any identified areas. Even though no sites of significance were identified, local traditional leaders will be consulted and informed of the project as a precautionary step.	Impact avoided. There will be no areas of cultural and religious significance disturbed by the project activities or workers.
	Water resources conflicts can arise when exploration activities start to use scarce or sensitive resources being used by the community.	Water resources, social	The local municipality and village heads will be consulted before choosing a water source for drilling purposes. If a homestead water source is to be used, an agreed payment should be done.	Impact avoided. There will be no use of scarce community resources. Even when abundant, use of community resources will result in a significant benefit of some sort to the whole community.
Clearing of land for camp	Soil erosion can result from removal of vegetation during preparation of land for the contractor camp. Eroded soil can be carried by water into	Soil, aquatic resources	Controlled through management and monitoring. Impact spatial scale will be greatly limited through erosion control mechanisms such as mechanically	Impact managed and minimised. Rivers will not be disturbed. Its quality will be maintained.

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
and drill site preparation	streams resulting in quality deterioration.		stabilised earth walls and other best practice methods to control erosion and stop eroded soil from reaching rivers.	
Clearance of vegetation for the establishment of a camp site will result in vegetation / biodiversity loss.		Soil, vegetation	Controlled through minimisation of impact spatial scale. The area chosen for the establishment of the camp site will be the minimum reasonably required and will involve the least disturbance to vegetation i.e., minimum clearance of vegetation.	Impact minimised through control of vegetation clearing.
There will be generation of dust due of vehicular movement and vegetation clearing		Occupational safety	Controlled through water spraying and/or other dust-alloying agents. The speed of haul trucks and other vehicles will be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.	Impact minimised. There will be low levels of dust enough to allow for visibility and good working environment.
Spread of alien invasive species can occur during land preparation for contractor camp. This results in a threat to biodiversity.		Biodiversity	Controlled through appropriate measures. If any alien invasive species are encountered, they must be removed and burnt or sprayed with approved herbicides.	Impact minimised. Alien invasive species will not be spread.
Temporary ablation facilities can result in pollution of groundwater.		Water resources	Avoided through adoption of best practice methods. Proper temporary ablation facilities will be used with approved ferrying and dumping.	Impact will be avoided. Approved temporary ablation facilities and disposal will be used.
Movement of drill rig	Drill workers can cause deforestation and / or conflicts with local	Biodiversity, Social	Controlled through management, collaboration and monitoring. No trees	Impact will be avoided. No trees will be felled for firewood.

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
workers and vehicles	communities by cutting down trees for firewood.		or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner / tenant.	
	Soil erosion may result from the movement of workers and vehicles into and out of the drill site. Eroded soil can cause sedimentation of water bodies.	Soil, water resources	Controlled and remedied through erosion control and rehabilitation, respectively. Where soil clearing is done, it will be done in stages; top soil removed first and stored carefully to preserve its functions as a seed bank, the soil after top soil and stones will be stored separately for use in filling dongas. Riparian ecosystem will not be disturbed since it buffers rivers and wetlands from being silted by eroded soil. Where necessary, drainage systems will be made to reduce erosion.	Impact will be minimised. Rehabilitation will restore the environment to its original state or better.
	There is risk of veld fires which can damage properties and result in injuries or loss of life. Fires disturb and reduce biodiversity.	Social, biodiversity	Controlled and avoided through strict control of fire use. Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break will be cleared around the perimeter of the camp and office sites.	Impact will be avoided. There will be designated fire-use stations.
Water Sump use	Water can be wasted during drilling activities that have high water consumption for purposes such as cooling and lubrication	Water resources	Control through conservative practices. Water used for drilling purposes or to dilute drill fluid will be recycled in open pits to increase water use efficiency.	Impact will be reduced through limiting volumes of water used daily.
Drilling and exploration	During drilling and movement of vehicles, dust is produced. Dust can fall on vegetation reducing the surface for photosynthesis. It also poses a risk to the health of workers	Biodiversity, Occupational safety	Controlled through dust management measures. Drilling activities will make use of water to reduce dust. Water will	Impact will be minimised. Dust levels will not be so intense that it affects visibility or make breathing difficult.

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	by causing eye damage and irritation to the respiratory system.		be sprayed where there is constant movement of traffic.	
	Drill rigs run on diesel and continuously produce fumes that have potent greenhouse gases such as carbon dioxide and nitrous oxide. These cause global warming.	Air quality	Minimised through selection of drill rigs with better emission technology. Catalytic converters and emissions trapping mechanisms will be used. Machinery will be serviced regularly so that they emit less.	GHG emissions will not exceed stipulated quantities per day.
	Drill rigs are made up of several heavy equipment. Noise is produced by the equipment during drilling activities	Social, occupational safety	Avoided through use of silencers. Machinery will be well serviced therefore will make less noise.	Impact will be minimised or avoided. Ambient noise levels must not exceed 65 dB
	Vibration is produced by the drill rigs and can disturb underground animals. Workers exposed to vibration over a long period can develop 'shaking syndrome'. Vibration affect underground animals.	Biodiversity, occupational safety	Machinery will be serviced regularly so that they vibrate less. Vibration monitoring will be carried out on all machinery on a regular basis to ensure workers' exposure is below recommended duration and levels.	Impact will be minimised or avoided. Vibration levels must not exceed 5mm/s <sup>2</sup>
	Drill rigs normally operate around the clock and make use of lighting for security and making work easier. Photo-pollution can result from the lighting. Light and noise can disturb the local community.	Biodiversity, social	The use of the drill rig will be limited to day time operational hours. Lighting used will be within the workspace and outside of the drill camp. Low frequency lighting will be used. Lighting and noise disturbance that may have an effect on the landowner / tenant / persons lawfully living in the vicinity shall be kept to a minimum.	Impact will be minimised or avoided.

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	Risk of occupational injuries is high from the drill rig which makes use of moving parts.	Occupational health and safety, community safety	Workers at drill sites must be trained on proper safety practices and potential occupation safety hazards. Drilling must be done in accordance with the contractor's relevant internal standards.	The project will strive to end without injuries and without death. If any injuries occur, emergency care will be immediately administered whilst waiting for an ambulance.
	Drainage Surface disturbance can occur during drilling.	Water resources	Appropriate technologies that have been selected for the proposed project have less chances of disturbing the drainage surface.	No drilling will be done in a wetland, close to a river or in proximity to a water body.
	Fly rock can be produced during drilling and can result in injuries to the workers or local communities.	Occupational safety, community safety	Drilling will make use of water for lubrication and reduction of fly rock. Drill rig will have a safety enclosure to prevent fly rock from hitting workers or locals.	Drill site enclosures will stop fly rock from travelling beyond 4 metres from the drill.
	Surface water contamination can occur due to spill of drill fluid or effluent water.	Aquatic resources	Drilling will make use of biodegradable drill fluid and additives such as Black-Bear & Bentonite, respectively. Water samples will be taken on a monthly basis from nearby water bodies to test for contamination. All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 metres, from any stream, river, pan, dam or borehole. Any spills must be immediately to the satisfaction of the ECO by removing the spillage together with the polluted soil and by disposing of them at a suitable, licensed facility.	Water and soil near the drill sites will remain uncontaminated.

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
	Undiscovered artefacts can be unintentionally disturbed by drilling activities.	Cultural heritage	Any artefacts found must result in cessation of works and report the findings to SAHRA. The Environmental Control Officer must familiarise him or herself with the formation present and its fossils.	Any identified artefacts will be preserved.
Fuel and lubricant storage on site	Due to use of high volumes of oil and lubricants by the rig, there is a high possibility of oil leaks and spills which results in water and soil contamination.	Soil and water resources	No oil or lubricant storage site will be located closer than 100 metres from a stream, river, spring, dam or pan. Machinery will be checked daily and serviced regularly to reduce the chances of oil leaks. Oil trays will be used during servicing and refuelling, which will be done on impermeable surfaces. Oils residues will be disposed to approved oil recyclers. Storage of fuels and oils will be done in proper containment which has 150% bunds. There will be a soil decontaminant or hydrocarbon absorbent (e.g., Peat Sorb) on site to ensure that any oil spillages resulting in soil contamination are treated. The treated soil will be removed and disposed separately from domestic waste. Oil spills from machinery, will be collected and stored in waste collection bins and transported to the nearest licensed landfill site. The hydrocarbon fluids will be transported to site on drums. Only amounts which will be	Impact will be avoided through the use of bunding, proper storage and spill cleaning kits. Where spills occur, the soil must be remediated to its original state.



ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
			<p>utilised during the drilling operation will be available on site at any one time. Therefore, there will not be any storage facilities on site. Suitable personal protective equipment (PPE) and protective clothing will be provided.</p>	
	<p>Fuel and oil storage present a fire hazard. Fire can result in loss of biodiversity, injuries or loss of life.</p>	<p>Biodiversity, occupational safety, community safety</p>	<p>All vehicles and heavy machinery that use combustion engines will have approved fire extinguishers. The ECO / SHE officer will carry out a fire hazard assessment. Burning of waste will be avoided. Use of fire for cooking must be done in a safe zone that is far or buffered from fuel &amp; cleared of dry combustible vegetation</p>	<p>Impact will be avoided at all costs. At project end, no fires uncontrolled would have been experienced.</p>
<p>Waste generation from contractor camps</p>	<p>Sewage waste is generated from the contractor camps on a daily basis. This can pose a health risk if not disposed of properly.</p>	<p>Occupational safety, community health</p>	<p>Contractor camps can make use of mobile toilets whose waste must be collected and disposed of into the nearest sewer system or other appropriate methods approved by law. Use of 'bush toilets' must be prohibited. Chemical toilet facilities will be used and sited on the camp site in such a way that they do not cause water or soil pollution. All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 metres, from any stream, river, pan, dam or borehole. Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable</p>	<p>Impact will be avoided. No sewage will be released into the environment, treated or not. All sewage waste will be collected and disposed of in an approved manner.</p>

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
			receptacle and removed from the site, for appropriate disposal at a licensed facility.	
	Solid waste will be generated daily from the contractor camps. This can distort the environment and pollute water resources.	Biodiversity, water resources	Drill contractor will put in place measures to reduce waste, for example workers will be provided with metal cutlery and not use disposables. Use of Styrofoam will be avoided at all cost. Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., will be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognised disposal facility. Specific precautions will be taken to prevent refuse from being dumped on or in the vicinity of the camp site.	Impact on the environment will be avoided through proper storage, transport, recycling and disposal.
<b>REHABILITATION</b>				
Rehabilitation of drill holes	Drill holes must not be left uncovered. They must be rehabilitated. Uncovered drill boreholes can result in aquifer contamination.	Soil, groundwater resources	Drill holes will be plugged if they must be used again or filled there is no further use for them.	Impact will be minimised through rehabilitation that will eventually result in no contamination occurring.
Rehabilitation of access roads	Unrehabilitated access roads can promote soil erosion and can distort the natural look of the environment. This can also make future cultivation	Soil, biodiversity	Roads will be ripped or ploughed, and if necessary, appropriately fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction materials which may	Rehabilitation will achieve soil and vegetation quality equal to or better than before.

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Rehabilitation of camp sites	<p>difficult where an access road passes through arable land or a crop field.</p> <p>Soil erosion can worsen after the contractor camps have been removed as soil previously covered by structures will be left bare.</p>	Soil, aquatic resources	<p>hamper regrowth of vegetation will be removed and disposed of in an approved manner prior to rehabilitation.</p> <p>Once the contractor camp has been removed, vegetation will be planted to control soil erosion. The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora</p>	Impact of soil erosion on aquatic resources will be avoided. Rehabilitation of cleared and already eroded soil will restore the land vegetation to its original state or better.
Rehabilitation of water abstraction sites and water sumps	<p>Contractor camp must be disbanded properly after exploration. If not done properly, non-degradable waste can pollute or distort the environment whilst soil compaction can occur.</p> <p>Water sumps and water abstraction sites must be rehabilitated. Water abstraction sites can result in siltation if not rehabilitated whilst uncovered water sumps can pose a risk to humans and livestock.</p>	Soil, biodiversity	<p>Metal components can be stored away for reuse or recycling. Any gate or fence erected by the applicant which is not required by the landowner/tenant, shall be removed and the area restored to the pre prospecting condition. Where office/camp sites have been rendered devoid of vegetation / grass or where soils have been compacted owing to traffic, the surface will be scarified or ripped. All infrastructure, equipment, plant, temporary housing and associated infrastructure used during the prospecting period will be removed from the site</p> <p>Pits will be filled after exploration has been finished since people and animals may fall resulting in injuries or loss of life or livestock. Areas containing French drains will be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.</p>	<p>Rehabilitation will ensure that the effects of the impact are totally reversed through the removal of all camp components from the environment.</p> <p>Impact will be totally reversed to its original state or better through rehabilitation.</p>

ACTIVITY (listed or not)	POTENTIAL IMPACT	ASPECTS AFFECTED	MITIGATION TYPE	STANDARD TO BE ACHIEVED
Collection and transportation of drill and camp site waste	Campsite waste can pollute land, water and soil resources	Soil, water resources	Campsite waste will be recycled or sent to a landfill where not possible. All waste material of any nature, including receptacles, scrap, rubble and tyres, will be removed entirely from the prospecting area and disposed of at a licenced landfill facility. No waste will be permitted to be buried or burned on site.	Impact on the environment will be avoided through proper storage, transport, recycling and disposal.
	Water resources can be contaminated by leftover oil or drill fluid during the decommissioning of the campsite.	Water resources	Care will be taken to avoid spills and leakages when camp site is being closed. Water samples will be taken close to where the site was after site closure.	Impact will be avoided through the use of proper storage, transport, spill cleaning kits and disposal. Where spills would have occurred, the soil must be remediated to its original state.

**f) Impact Management Actions**

(A description of impact management actions, identifying the manner in which the impact management objectives and outcomes contemplated in paragraphs (c) and (d) will be achieved).

**Table f1-1: Impact management actions**

<b>ACTIVITIES</b>	<b>POTENTIAL IMPACT</b>	<b>MITIGATION TYPE</b>	<b>TIME PERIOD FOR IMPLEMENTATION</b>	<b>COMPLIANCE WITH STANDARDS</b>
<b>PLANNING AND SETUP PHASE</b>				
Selection of exploration technology	Selected exploration technologies (i.e., RC drilling & RAB) will have minimal and manageable impacts on the environmental.	The selected alternatives for exploration technology such as RC drilling all have less impacts on soil and ground water.	Before commencement of drilling activities	ISO 18758-2:2018 gives the standards for the best and recommended exploration drilling technologies.
Selection of routes for access roads	Access roads may disturb sensitive areas such as wildlife breeding grounds.	Access roads will avoid sensitive areas such as the identified and undisturbed wetland to the west. An environmental specialist will be involved in the selection of an access road.	Before commencement of drilling activities	Mining and Biodiversity Guideline: Mainstreaming biodiversity into the mining sector (2013) encourages minimising activities that result in vegetation clearing and disturbance
	Since the proposed project area is close to communities, access roads may tamper with and damage existing infrastructure and community properties.	The local community and local municipality must be informed of the project before any work is done. They must also be involved in the planning, selection and construction of the access road.	This will take a few days and will be done before exploration. This will also be a continuous process till project ends.	Critical Infrastructure Act, 2019 prohibits the intentional damage to public infrastructure. The project will avoid such damage

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Selection of exploration drilling contractor	Contractors, depending on their institutional capability and resources, may have different abilities to avoid or manage adverse environmental impacts. Selecting the wrong contractor may result in worsening of impacts.	A contractor with a good record of environmental management will be engaged. They also be selected based on the presence of an internal environmental policy which they use for their drilling activities. Tracing and consulting their referees, previous clients and previous works will also be done.	This will be done throughout the planning stage and before anything is set up.	Even though the project is not following it, the IFC's Environmental & Social Performance Standards are some of the best in the world and require that environmental management capability be part of the criteria for contractor selection.
Selection of site for contractor camps	There is possibility of conflicts with locals when planning to work close to community buildings. Drill workers may encroach into homesteads and undermining privacy.	Since there will be work close to houses, owners have informed and consulted. Drill workers will not be allowed to be within 50 metres of local homesteads without approval from the supervisor.	This will be done before anything is setup. Communication with local communities will be a continuous process.	Constitution of the Republic of South Africa No. 108 of 1996: Bill of Rights recognises the right to privacy for individuals. The community's privacy will be respected and upheld.
	Disturbance of farming land will occur due to drilling activities taking up some of the land being used for cultivation	Sensitive areas will be avoided. Since farming land is being used, the owner will be compensated and assisted to restore their livelihoods where necessary.	Sensitive areas have already been identified and have been avoided in the planning. Landowners have been engaged.	NEMA: EIA Regulations requires consultation of interested and affected parties before development is done. Landowners are affected parties
	Areas of cultural and religious importance may be disturbed by movement of traffic and people to and from the exploration sites.	Even though no sites of significance were identified, local traditional leaders will be consulted and informed of the project as a precautionary step.	Local leaders will be consulted during the planning phase.	The NHRA provides for the protection and management of conservation-worthy places.

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Water resources conflicts can arise when exploration activities start to use scarce or sensitive resources being used by the community.	The local municipality and village heads will be consulted before choosing a water source for drilling purposes. If a homestead water source is to be used, an agreed payment should be done.	Local leaders will be consulted during the planning phase. Alternatively, water may be purchased from nearby suppliers who will bring it to site using bowsers.	NEMA: EIA Regulations requires consultation of interested and affected parties before development is done. Communities are affected and interested parties.
Clearing of land for camp and drill site preparation	Soil erosion can result from removal of vegetation during preparation of land for the contractor camp. Eroded soil can be carried by water into the wetland to the west and results in wetland quality deterioration. The Digital Elevation Model by Prism EMS (2020) shows that the project site slopes to the west towards the wetland thereby eroded soil can easily be carried from project site to the wetland.	Mechanically stabilised earth walls and other best practice methods will be used to control erosion and stop eroded soil from reaching the wetland. The area has existing erosion which must be rehabilitated prior to any project activity.	Mechanically stabilised earth walls or other control mechanisms will be installed during the setup phase and before any drilling begins.	NEMA prescribes a general duty of care not to cause significant pollution or degradation of the environment (including wetlands). The wetland will thus be avoided as a measure to conform to this legislation.
Clearance of vegetation for the establishment of a camp site will result in vegetation / biodiversity loss.	Clearance of vegetation for the establishment of a camp site will result in vegetation / biodiversity loss.	The area chosen for the establishment of the camp site will be the minimum reasonably required and will involve the least disturbance to vegetation i.e., minimum clearance of vegetation.	This will take a few days and impact mitigation and avoidance measures will be put in place at the beginning of the setup phase.	No trees or shrubs will be felled for firewood in accordance with National Forests Act No. 30 of 1998

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	There will be generation of dust due of vehicular movement and vegetation clearing	Control through water spraying and/or other dust-allaying agents. The speed of haul trucks and other vehicles will be strictly controlled to avoid dangerous conditions, excessive dust or excessive deterioration of the road being used.	This will be implemented as soon as the activity starts during the setup phase.	Air Quality Act No 39 of 2004 requires that reasonable measures be put in place to control, reduce and mitigate against dust.
	Spread of alien invasive species can occur during land preparation for contractor camp. This results in a threat to biodiversity.	If any alien invasive species are encountered, they must be removed and burnt or sprayed with approved herbicides.	The removing and burning of alien invasive species will be done as soon as they are encountered regardless of the project phase.	National Environmental Management: Biodiversity Act (10/2004): Alien and Invasive Species Regulations, 2014 gives a list of alien and invasive species and the regulations prohibiting spread or transport of such.
	Temporary ablation facilities can result in pollution of groundwater.	Proper temporary ablation facilities will be used with approved ferrying and dumping.	Ablution facilities will be among the first infrastructure to be setup.	Occupational Health and Safety Act 1993 Act 85 of 1993 has provisions for proper ablation facilities for employees
<b>CONSTRUCTION PHASE</b>				
Movement of drill rig workers	Drill workers can cause deforestation and / or conflicts with local communities by cutting down trees for firewood.	No trees or shrubs will be felled or damaged for the purpose of obtaining firewood, unless agreed to by the landowner/tenant.	No trees will be cut during all project phases.	No trees or shrubs will be felled for firewood in accordance with National Forests Act No. 30 of 1998
	Soil erosion may result from the movement of workers	Where soil clearing is done, it will be done in stages; top soil removed first	Erosion control mechanisms will be	In accordance with the Soil Conservation Act 76 of 1969,



ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	<p>and vehicles into and out of the drill site. Eroded soil can cause sedimentation of water bodies.</p>	<p>and stored carefully to preserve its functions as a seed bank, the soil after top soil and stones will be stored separately for use in filling dongas. Riparian ecosystem will not be disturbed since it buffers rivers and wetlands from being silted by eroded soil. Where necessary, drainage systems will be made to reduce erosion</p>	<p>implemented just before the setup phase. They will be maintained throughout all the project phases.</p>	<p>soil conservation and erosion prevention mechanisms will be put in place.</p>
	<p>There is risk of veld fires which can damage properties and result in injuries or loss of life. Fires disturb and reduce biodiversity.</p>	<p>Fires will only be allowed in facilities or equipment specially constructed for this purpose. If required by applicable legislation, a fire-break will be cleared around the perimeter of the camp and office sites.</p>	<p>Fire control mechanisms will be installed and implemented during the setup phase and maintained throughout the entire project.</p>	<p>The National Veld and Forest Fire Act 101 of 1998 has the provision for veld fire prevention and fighting such as fire breaks. These will be put in place prior to starting the project.</p>
<p>Water Sump use</p>	<p>Water can be wasted during drilling activities that have high water consumption for purposes such as cooling and lubrication</p>	<p>Water used for drilling purposes or to dilute drill fluid will be recycled in open pits to increase water use efficiency.</p>	<p>Water recycling in the sumps will be done whenever the sumps are in use and this starts as soon as they become operational.</p>	<p>NWA promotes the sustainable conservation of water. This will be done through recycling.</p>
<p>Drilling and exploration</p>	<p>During drilling and movement of vehicles, dust is produced. Dust can fall on vegetation reducing the surface for photosynthesis. It also poses a risk to the health of workers by causing eye damage and irritation to the respiratory system.</p>	<p>Drilling activities will make use of water to reduce dust. Water will be sprayed where there is constant movement of traffic. Generally, there is expected to be little movement of traffic during this project phase.</p>	<p>Dust control mechanisms will be implemented and intensified during dry and windy days, especially when an increase in traffic movement is anticipated.</p>	<p>Air Quality Act No 39 of 2004 requires that reasonable measures be put in place to control, reduce and mitigate against dust.</p>

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	<p>Drill rigs run on diesel and continuously produce fumes that have potent greenhouse gases such as carbon dioxide and nitrous oxide. These cause global warming.</p>	<p>Drill rigs with better emission technology will be used. Catalytic converters and emissions trapping mechanisms will be used. Machinery will be serviced regularly so that they emit less.</p>	<p>Drill rigs will be fitted with catalytic converters and serviced before they are brought to the project site.</p>	<p>Air Quality Act No 39 of 2004 requires that reasonable measures be put in place to control, reduce and mitigate air pollution.</p>
	<p>Drill rigs are made up of several heavy equipment. Noise is produced by the equipment during drilling activities</p>	<p>Drill rigs will make use of silencers. Machinery will be well serviced therefore will make less noise.</p>	<p>Where there is need, drill rigs will be fitted with silencers and serviced before they are brought to the project site.</p>	<p>Noise Control Regulations PN 627 of 1998 prohibits outdoor noise due to drilling from exceeding 65 dB.</p>
	<p>Vibration is produced by the drill rigs and can disturb underground animals. Workers exposed to vibration over a long period can develop 'shaking syndrome'. Vibration affect underground animals.</p>	<p>Machinery will be serviced regularly so that they vibrate less. Vibration monitoring will be carried out on all machinery on a regular basis to ensure workers' exposure is below recommended duration and levels.</p>	<p>Vibration monitoring on the drill rigs will be done on the first day of drilling and once every 2 months after that.</p>	<p>Occupational Injuries and Diseases Act No 130 of 1993 regards vibration as an occupational hazard.</p>
	<p>Drill rigs normally operate around the clock and make use of lighting for security and making work easier. Photo-pollution can result from the lighting. Light and</p>	<p>The use of the drill rig will be limited to day time operational hours. Lighting used will be within the workspace and outside of the drill camp. Low frequency lighting will be used. Lighting and noise disturbance or any other form of disturbance that may have an effect on the landowner</p>	<p>For this particular project, drill rigs are highly likely to operate during the day only. However, if there is need to operate at night, additional measures will be put in</p>	<p>No standard exists locally for this. Recommendations based on the EAP's ability to give best practice based on intended outcome.</p>

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	noise can disturb the local community.	/ tenant / persons lawfully living in the vicinity shall be kept to a minimum.	place in time. These measures include use of low lighting and advising nearby community in time.	
	Risk of occupational injuries is high from the drill rig which makes use of moving parts.	Workers at drill sites must be trained on proper safety practices and potential occupation safety hazards. Drilling must be done in accordance with the contractor's relevant internal standards.	The measures will be implemented for a day before drilling commences. Safety briefings will also be done at least twice weekly and at the discretion of the ECO or drill supervisor.	Occupational Health and Safety Act 1993 Act 85 of 1993 states that an employer must make reasonable steps to eliminate or mitigate against occupational hazards and risks. Such steps include training employees and use of PPE.
	Drainage Surface disturbance can occur during drilling.	Appropriate technologies that have been selected for the proposed project have less chances of disturbing the drainage surface.	Measures have already been implemented through the selection of best drill technology alternatives.	<i>No standards were identified locally for this. Recommendations based on the EAP's ability to give best practice based on intended outcome.</i>
	Fly rock can be produced during drilling and can result in injuries to the workers or local communities.	Drilling will make use of water for lubrication and reduction of fly rock. Drill rig will have a safety enclosure to prevent fly rock from hitting workers or locals.	Water for drilling and safety enclosures will be in place before drill rigs start operating.	Occupational Health and Safety Act 1993 Act 85 of 1993 states that an employer must make reasonable steps to eliminate or mitigate against occupational hazards and risks. Such steps include training employees and use of PPE.
	Surface water contamination can occur due to spill of drill fluid or effluent water.	Drilling will make use of biodegradable drill fluid and additives such as Black-Bear & Bentonite, respectively. Water samples will be	Biodegradable drill fluids and additives use will be part of the selection criteria when	NWA requires the prevention and remediation of water pollution.

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<p>taken on a monthly basis from nearby water bodies to test for contamination. All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 metres, from any stream, river, pan, dam or borehole. Any spills must be immediately to the satisfaction of the ECO by removing the spillage together with the polluted soil and by disposing of them at a suitable, licensed facility.</p>	<p>choosing a drilling contractor.</p>	
	<p>Undiscovered artefacts can be unintentionally disturbed by drilling activities.</p>	<p>Any artefacts found must result in cessation of works and report the findings to SAHRA. According to Fourie (2020), The Environmental Control Officer must familiarise himself or herself with the formation present and its fossils.</p>	<p>Any findings will be reported immediately as drilling would have been temporarily stopped whilst awaiting response from SAHRA.</p>	<p>The NHRA provides for the protection and management of conservation-worthy places and artefacts.</p>
<p>Fuel and lubricant storage on site</p>	<p>Due to use of high volumes of oil and lubricants by the rig, there is a high possibility of oil leaks and spills which results in water and soil contamination.</p>	<p>No oil or lubricant storage site will be located closer than 100 metres from a stream, river, spring, dam or pan. Machinery will be checked daily and serviced regularly to reduce the chances of oil leaks. Oil trays will be used during servicing and refuelling, which will be done on impermeable</p>	<p>Measures will be implemented as and when necessary and also at the discretion of a qualified ECO.</p>	<p>NWA requires the prevention and remediation of water pollution. NEMA prohibits Measures will be put in place to reduce this.</p>

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<p>surfaces. Oils residues will be disposed to approved oil recyclers. Storage of fuels and oils will be done in proper containment which has 150% bunds. There will be a soil decontaminant or hydrocarbon absorbent (e.g. Peat Sorb) on site to ensure that any oil spillages resulting in soil contamination are treated. The treated soil will be removed and disposed separately from domestic waste. Oil spills from machinery, will be collected and stored in waste collection bins and transported to the nearest licensed landfill site. The hydrocarbon fluids will be transported to site on drums. Only amounts which will be utilised during the drilling operation will be available on site at any one time. Therefore, there will not be any storage facilities on site.</p>		
<p>Fuel and oil storage present a fire hazard. Fire can result in loss of biodiversity, injuries or loss of life.</p>		<p>All vehicles and heavy machinery that use combustion engines will have approved fire extinguishers. The ECO / SHE officer will carry out a fire hazard assessment. Burning of waste will be avoided. Use of fire for cooking must be done in a safe zone that is far or buffered from fuel &amp; cleared of dry combustible vegetation</p>	<p>Fire extinguishers will be installed on drill rigs before they are brought to the project site. Cooking and smoking zones will be designated during the planning phase.</p>	<p>The National Veld and Forest Fire Act 101 of 1998 has the provision for veld fire prevention and fighting such as fire breaks and fire extinguishers. These will be put in place prior to starting the project.</p>

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
Waste generation from contractor camps	Sewage waste is generated from the contractor camps on a daily basis. This can pose a health risk if not disposed of properly.	Contractor camps can make use of mobile toilets whose waste must be collected and disposed of into the nearest sewer system or other appropriate methods approved by law. Use of 'bush toilets' must be prohibited. Chemical toilet facilities will be used and sited on the camp site in such a way that they do not cause water or soil pollution. All effluent water from the camp washing facility shall be disposed of in a properly constructed French drain, situated as far as possible, but not less than 200 metres, from any stream, river, pan, dam or borehole. Only domestic type wash water shall be allowed to enter this drain and any effluents containing oil, grease or other industrial substances must be collected in a suitable receptacle and removed from the site, for appropriate disposal at a licensed facility.	Mobile toilet providers will be contracted during the planning phase.	NWA requires the prevention and remediation of water pollution. NEMA prohibits pollution of water and soil.
	Solid waste will be generated daily from the contractor camps. This can distort the environment and pollute water resources.	Drill contractor will put in place measures to reduce waste, for example workers will be provided with metal cutlery and not use disposables. Use of Styrofoam will be	Waste bins sites will be designated during the planning phase.	NWA requires the prevention and remediation of water pollution. NEM: WA promotes the principles of reduce, re-use, recover, recycle.

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		avoided at all cost. Non-biodegradable refuse such as glass bottles, plastic bags, metal scrap, etc., will be stored in a container at a collecting point and collected on a regular basis and disposed of at a recognised disposal facility. Specific precautions will be taken to prevent refuse from being dumped on or in the vicinity of the camp site.		
<b>REHABILITATION PHASE</b>				
Rehabilitation of drill holes	Drill holes must not be left uncovered. They must be rehabilitated. Uncovered drill boreholes can result in aquifer contamination.	Drill holes will be plugged if they must be used again or filled there is no further use for them.	Upon cessation of drilling.	NEMA promotes ecologically sustainable development and rehabilitation of environmental impacts from such.
Rehabilitation of access roads	Unrehabilitated access roads can promote soil erosion and can distort the natural look of the environment. This can also make future cultivation difficult where an access road passes through arable land or a crop field.	Roads will be ripped or ploughed, and if necessary, appropriately fertilised (based on a soil analysis) to ensure the regrowth of vegetation. Imported road construction materials which may hamper regrowth of vegetation will be removed and disposed of in an approved manner prior to rehabilitation.	Upon cessation of drilling and removing of all infrastructure or equipment from the project site	NEEMA promotes ecologically sustainable development and rehabilitation of environmental impacts from such.
Rehabilitation of camp sites	Soil erosion can worsen after the contractor camps have been removed as soil previously covered by structures will be left bare.	Once the contractor camp has been removed, vegetation will be planted to control soil erosion. The site shall be seeded with a vegetation seed mix adapted to reflect the local indigenous flora	Upon cessation of drilling and the removal of drill rigs / infrastructure from the project site.	NEMA promotes ecologically sustainable development and rehabilitation of environmental impacts from such.

ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
	Contractor camp must be disbanded properly after exploration. If not done properly, non-degradable waste can pollute or distort the environment whilst soil compaction can occur.	Metal components can be stowed away for reuse or recycling. Any gate or fence erected by the applicant which is not required by the landowner/tenant, shall be removed and the area restored to the pre prospecting condition. Where office/camp sites have been rendered devoid of vegetation / grass or where soils have been compacted owing to traffic, the surface will be scarified or ripped. All infrastructure, equipment, plant, temporary housing and associated infrastructure used during the prospecting period will be removed from the site	Upon cessation of drilling activity.	NWA requires the prevention and remediation of water pollution. NEM:WA promotes the principles of reduce, re-use, recover, recycle.
Rehabilitation of water abstraction sites and water sumps	Water sumps and water abstraction sites must be rehabilitated. Water abstraction sites can result in siltation if not rehabilitated whilst uncovered water sumps can pose a risk to humans and livestock.	Pits will be filled after exploration has been finished since people and animals may fall resulting in injuries or loss of life or livestock. Areas containing French drains will be compacted and covered with a final layer of topsoil to a height of 10cm above the surrounding ground surface.	Upon cessation of the exploration activities.	NEMA promotes ecologically sustainable development and rehabilitation of environmental impacts from such
Collection and transportation of drill and camp site waste	Campsite waste can pollute land, water and soil resources	Campsite waste will be recycled or send to a landfill where not possible. All waste material of any nature.	Upon cessation of drilling activities.	NWA requires the prevention and remediation of water pollution. NEM:WA promotes the



ACTIVITIES	POTENTIAL IMPACT	MITIGATION TYPE	TIME PERIOD FOR IMPLEMENTATION	COMPLIANCE WITH STANDARDS
		<p>including receptacles, scrap, rubble and tyres, will be removed entirely from the prospecting area. and disposed of at a licenced landfill facility. No waste will be permitted to be buried or burned on site.</p>		<p>principles of reduce, re-use, recover, recycle.</p>
	<p>Water resources can be contaminated by leftover oil or drill fluid during the decommissioning of the campsite.</p>	<p>Care will be taken to avoid spills and leakages when camp site is being closed. Water samples will be taken close to where the site was after site closure.</p>	<p>Upon cessation of exploration activities.</p>	<p>NWA requires the prevention and remediation of water pollution.</p>

**g) Financial Provision**

**(1) Determination of the amount of Financial Provision.**

- a) Describe the closure objectives and the extent to which they have been aligned to the baseline environment described under the Regulation.**

The closure objectives are outlined in Section m) and Section (d) (i).

- b) Confirm specifically that the environmental objectives in relation to closure have been consulted with landowner and interested and affected parties.**

The closure objectives were communicated to the the landowners and other stakeholders during the notification and public review period in the form of a Draft BAR that was made available for public review.

- c) Provide a rehabilitation plan that describes and shows the scale and aerial extent of the main mining activities, including the anticipated mining area at the time of closure.**

See d) i) and f) of this EMPr and Section j) of the BAR

- d) Explain why it can be confirmed that the rehabilitation plan is compatible with the closure objectives.**

See d) i) and f) of this EMPr.

- A summary of the results of the environmental risk report and details of identified residual and latent impacts were incorporated into the costing;
- A summary of the results of progressive rehabilitation undertaken were considered;
- A description of the methods to decommission each prospecting component and the mitigation or management strategy proposed to avoid, minimize and manage residual or latent impacts influenced the overall calculation;
- Details of any long-term management and maintenance expected were considered;
- Details of a proposed closure cost and financial provision for monitoring, maintenance and post closure management;
- A final and future land use proposal and arrangements for the site was an input into the calculations;
- A record of interested and affected persons consulted was considered.

- e) Calculate and state the quantum of the financial provision required to manage and rehabilitate the environment in accordance with the applicable guideline.**

A surveyed plan of the areas on the site was provided as input into the Quantum Calculation. All the disturbances were categorised using the DMR guideline document for finance calculation. The machinery requirements and volumes of materials to be moved were determined, and rates for such rehabilitation was determined. Requirements for aftercare and maintenance was understood, and allocations of rates and fees for such was provided. In addition, closure objectives and how these relate to the mine operation, and its environmental and social setting also form the basis of the closure calculation. The estimated cost for rehabilitation is **R 140 921.00**.

- f) Confirm that the financial provision will be provided as determined.**

The financial provision will be provided by Zastrocode as per the quantum calculation included in Section s) of the BAR

**Mechanisms for monitoring compliance with and performance assessment against the environmental management programme and reporting thereon, including**

**g) Monitoring of Impact Management Actions**

This section indicates when the actions for that specific aspect must be implemented and/or monitored and all these are captured under Table I1-1.

**h) Monitoring and reporting frequency**

**1. Reporting Documentation**

The following documentation must be kept on site in order to record compliance with the EMP:

- An environmental file which includes:
  - Copy of the EMP;
  - Copy of the Environmental Authorisation;
  - All necessary authorisations, permits and licences must be obtained by the Developer prior to the commencement of construction
  - Copy of all rehabilitation plans;
  - Copy of the rehabilitation interventions
  - Copy of relevant legislation;
  - Environmental Policy
  - Environmental method statements compiled by the contractor;
  - Non-conformance reports;

**2. Environmental register, which shall include:**

- Communications Register—including records of complaints, and, minutes and attendance registers of all environmental meetings;
- Monitoring Results – including environmental monitoring reports, register of audits, Non-Conformance Reports (NCR);
- Incident book – including copies of notification of Emergencies and Incidents, this must be accompanied by a photographic record
- Waste Documentation
- Material Safety Data Sheets for all hazardous substances;
- Dust suppression register;
- Water Quality Monitoring reports (if necessary);
- Written Corrective Action Instructions; and

- Notification of Emergencies and Incidents.

### **3. Environmental Register**

Zastrocode as the developer will put in place an environmental register. Zastrocode will ensure that the following information is recorded for all complaints/incidents:

- Nature of complaint/incident;
- Causes of complaint/incident;
- Party/parties responsible for causing complaint/incident;
- Immediate actions undertaken to stop/reduce/contain the causes of the complaint/incident;
- Additional corrective or remedial action taken and/or to be taken to address and to prevent reoccurrence of the complaint/incident;
- Timeframes and the parties responsible for the implementation of the corrective or remedial actions;
- Procedures to be undertaken and/or penalties to be applied if corrective or remedial actions are not implemented;
- Copies of all correspondence received regarding complaints/incidents.

The above records will form an integral part of the contractors' records. These records will be kept with the EMPr, and will be made available for scrutiny if so requested by the developer.

### **4. Non-Conformance Report**

A NCR will be issued to the contractor as a final step towards rectifying a failure in complying with a requirement of the EMPr. This will be issued by the ECO to the contractor in writing. Preceding the issuing of an NCR, the contractor must be given an opportunity to rectify the issue.

Should the ECO assess an incident or issue and find it to be significant (e.g. non-repairable damage to the environment), it will be reported to the relevant authorities and immediately escalated to the level of a NCR.

The following information should be recorded in the NCR:

- Details of non-conformance;
- Any plant or equipment involved;
- Any chemicals or hazardous substances involved;
- Work procedures not followed;
- Any other physical aspects.
- Nature of the risk.

- Actions agreed to by all parties following consultation to adequately address the non-conformance in terms of specific control measures and should take the hierarchy of controls into account.
- Agreed timeframe by which the actions documented in the NCR must be carried out.
- ECO should verify that the agreed actions have taken place by the agreed completion date, when completed satisfactorily; the ECO and contractor should sign the close-out portion of the Non-Conformance Form (NCF) and file it with the contract documentation.

The performance Assessment Report will be submitted every two years.

The WRC will within 24 hours notify the relevant Government Department of the occurrence or detection of an incident on the site, or incidental to the operation of the site, which has the potential to cause, or has caused pollution of the environment, health risks, nuisance conditions or water pollution.

Zastrocode will within 14 days, from detection of any incident mentioned in the above sentence, submit an action plan, which will include a detailed time schedule, and resource allocation providing measures.

- a) Correct the impact resulting from the incident;
- b) Prevent the incident from causing any further impact; and
- c) Prevent a recurrence of a similar incident.

Zastrocode will keep an incident report and complaints register, which must be made available to external auditor, Departmental auditors for the purpose of audit.

The relevant departments with jurisdiction over the incident or environmental components affected by the incident must be notified without delay in the case of the following:

- Any malfunction, breakdown or failure of equipment or techniques, accident or fugitive emission which caused, is causing or may cause significant pollution;
- The breach of this license and
- Any significant adverse environmental and health effects.

**i) Responsible persons**

**(1) Objectives**

To ensure that:

- There is allocation of sufficient personnel and other resources to meet objectives and targets.
- The budget should provide a clear indication of the capital and annual maintenance costs associated with dust control measures and dust monitoring plans. It may be necessary to make assumptions about the duration of aftercare prior to obtaining closure. This assumption must be made explicit so that the financial plan can be assessed within this framework. Costs related to inspections, audits, environmental reporting and I&AP liaison should also be indicated where applicable. Provision should also be made for capital and running costs associated with dust control contingency measures and for security measures and other monitoring requirements.
- EMS procedures to stipulate equipment requirements and personnel requirements to ensure that there is clearly defined roles and responsibilities
- Compliance roles and responsibilities of environmental protection personnel to be clearly defined and incorporated into key performance areas as a comprehensive part of the performance management system
- Accountability for achieving and maintaining compliance is set through formal appointments for any delegated environmental roles
- Accountability of general impact generating personnel is formally controlled through KPAs.

**j) Time period for implementing impact management actions**

This is provided in Table f)1-1 for both listed and non-listed activities.

**k) Mechanism for monitoring compliance**

This is provided in Table k)1-1.

**a. Monitoring Objectives**

Monitoring objectives will be to ensure that:

- There is assessment of compliance with dust fall limits within the main impact zone of the operation.
- There is facilitation of the measurement of progress against environmental targets within the main impact zone of the operation.
- There is temporal trend analysis to determine the potential for nuisance impacts within the main impact zone of the operation.
- There is tracking of progress due to pollution control measure implementation within the main impact zone of the operation
- There is information of the public of the extent of localized dust nuisance impacts occurring in the vicinity of the proposed operations.

**(1.1) Objectives**

- Measure environmental performance by conducting regular audits and assessment of compliance with company and legal requirements
- Develop corrective and preventative actions to allow for continual improvement

**(1.2) Guidelines**

- Conduct annual external and quarterly internal environmental performance assessment of the EMPr
- Define roles and responsibilities and link these to key performance areas to ensure that (Key performance areas of identified environmental responsible personnel to include environmental obligations);
- Describe how environmental performance and compliance information will be communicated to employees, on-site service providers and contractors;
- Review complaints registers or other procedures to ensure that concerns concerning environmental performance and compliance raised by personnel are received and addressed;
- Develop procedures to ensure that responsibilities and accountability of personnel who manage, perform, verify work affecting environment are defined and documented;
- Document findings reached during audits and provide corrective actions
- Design a formal process of ensuring that corrective actions are implemented
- Design systematic follow-up to ensure effectiveness of the implemented actions
- Develop a monitoring plan with a detail of items to be monitored, parameters to be monitored, frequency of monitoring and reporting schedule
- Monitoring plan to include all set targets listed under objectives and targets
- Keep records of inspections, calibration and maintenance activity
- Ensure that test results to be distributed to relevant personnel for analysis and action



- Install sufficient flow meters to develop adequate water balance and for adequate water management
- Monitor use of natural resources such as electricity and water
- Monitor rehabilitation
- Keep all monitoring records
- Report annually or according to set time frames stipulated in the monitoring plan

### **(1.3) Performance assessment**

An internal Environmental Auditor will be appointed by Zastrocode. The environmental auditor shall be commissioned to undertake an environmental audit on a yearly basis. The yearly audits shall include:

- Undertaking site inspections to determine whether compliance with this operational EMPr;
- Compilation of annual audit reports;
- Identifying areas of non-compliance, and recommending measures to rectify.

Zastrocode will conduct these internal audits, to check compliance of project activities with the approved EMP. The site will be visited and any non-compliance will be addressed through development of corrective actions. The corrective actions will be assigned to responsible personnel who will then implement them. EMP performance will be part of weekly project meetings.

Internal audits will be conducted six monthly and on each audit occasion an official report will be compiled by the relevant auditor to report the findings of the audits, which must be made available to the external auditor.

Zastrocode will appoint an independent external auditor to audit the site bi-annually and this auditor will compile an audit report documenting the findings of his audit, which will then be submitted by DMR and any other regulatory authorities affected by the activities covered in the audit, if necessary.

All site personnel will be given a copy of the management measures committed to in this EMPr, to keep with them during the duration of the construction activities. Internal audits will be conducted on a weekly and monthly basis to check compliance with the approved EMP. During the internal audits, the site will be visited and any non-compliance identified will be addressed through development of corrective actions. The corrective actions will be assigned to site safety representative on site, who will then implement them. The project/site engineer will follow-up on the corrective actions on a weekly basis and sign them off once satisfied that they have been implemented.

In addition to the above-mentioned performance and monitoring commitments, Zastrocode shall adopt the following strategies to ensure that the commitments stipulated in this EMP are adhered to:

- Develop a procedure for ensuring that the company identifies and allocates human, technical and financial resources necessary to meet its environmental objectives and targets;
- Review EMS procedures and ensure that human resources are allocated to set environmental management objectives;
- Define roles and responsibilities and link these two key performance areas to ensure that key performance areas of identified environmental responsible personnel to include environmental obligations;
- Review complaints registers or other procedures to ensure that concerns concerning environmental performance and compliance raised by personnel are received and addressed;
- Update environmental awareness plan annually and implement;
- Focus training on means on enhancing ability of personnel to ensure compliance with environmental requirements;
- Conduct environmental inductions for contractors and subcontractors; and
- Conduct environmental inductions for employees.

In addition, the following initiatives will be adhered to:

- New opportunities to be communicated to relevant affected parties through an agreed formal communication channel and concerns to be incorporated into feasibility decisions;
- Complaints registers to be utilised and reviewed and corrective actions done;
- Interested and affected parties (I&APs) concern to be incorporated into project implementation;
- Internal communication to be strengthened to support continual improvement.

**Table k1 - 1: Mechanisms for monitoring compliance**

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Drilling and exploration activities	Potential contamination of surface water due to oil / fuel / lubricant / drill fluid spill	<p>Chemical water tests at designated points. Build up database and graph the results. Compare with limits and take action on non-conformances.</p> <p>It is proposed to regularly sample for those constituents found in the potential contaminants and parameters affected by such i.e. Total Petroleum Hydrocarbon, Electrical Conductivity, pH, TDS, SS, Cl, SO4, Na, F, Fe, Al, Mn, Zn, Total Alkalinity, turbidity</p>	ECO and designated project managers	<p>All the data will be in a data base from Zastrcode will be compiled in accordance with legal requirements and the requirements of the Water Monitoring and Measurement Guideline.</p> <p>Trend analysis will be conducted to assess possible trends and/or changes with regard to water quality by tracking the contaminants of concern as indicators of pollution.</p> <p>Reporting on the surface water quality will be done by means of monthly, quarterly and annual reports. frequency of reporting will be as follows: Monthly -Internal Data Report Quarterly-Data Report to Authorities</p>

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
				Annually -Annual Status / Audit Report
		<p>The objective of the groundwater monitoring system is the following:</p> <ul style="list-style-type: none"> <li>Assess possible trends and/or changes with regard to groundwater quality by tracking contaminants of concern as indicators of pollution;</li> <li>To monitor the water quality of the groundwater monitoring boreholes, in order to gather more data to inform the calibration and updating of the</li> </ul>	ECO	<p>The quarterly reports will be guided by the authority requirements and might contain brief compliance assessment description, brief description of monitoring actions performed and flow characteristics as well as geographic presentations of monitoring points.</p> <p>The annual reports will also be guided by the applicable statutory requirements and relevant resource quality objectives and</p>

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		<p>numerical groundwater model; and</p> <p>To monitor the water quantity of the groundwater in order to assess compliance with water quantity requirements stipulated by regulatory authorities.</p> <p>A groundwater monitoring programme has been developed for implementation and the locations of the sampling points.</p> <p>In addition, the recommendations contained in the DW&amp;S's Best Practice Guideline: 'Water Monitoring Systems', dated July 2007, will be taken into consideration when groundwater monitoring is conducted in mining operation.</p> <p>Samples will be analysed for chemical and physical</p>		<p>SANS 241 and other applicable standards.</p>

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		constituents normally associated with expected contaminants.		
		If in the opinion of the ECO, environmental pollution nuisance or health risks maybe or are occurring on site, Zastrocode will initiate an investigation into the cause of the problem or suspected problem. Such investigation will include monitoring of the relevant environmental pollution, nuisance and health risk variables, at those monitoring points and such frequency to be determined in consultation with the ECO. Should the investigation reveal any unacceptable levels of pollution, the Zastrocode will prepare	ECO	Quarterly monitoring reports

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Water abstraction points and water reticulation outlet points	Water conservation	<p>mitigatory measures and rectify the pollution concern.</p> <p>All information obtained during the sampling and analyses of the water samples will be entered into an electronic database. This will allow for structured data storage, and also facilitate optimal information generation. Record total water use Ensure compliance with DW&amp;S standards</p>	ECO	Impact management actions to be implemented on a daily basis. Monitoring reports will be produced quarterly and supported by daily records or checklists.
Natural revegetated areas	Vegetation clearing and dust generation	<p>Map all rehabilitated areas</p> <p>Determine extent of the treated areas</p> <p>Foot inspection</p> <p>Photographs every two weeks for the first month and thereafter every month</p> <p>Keep photographs with detailed record of vegetation establishment</p>	ECO	Monitoring reports will be produced quarterly.

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Camps site All cleared areas	Erosion	Visual inspection Walk over landscaped areas. Check pipelines and pumps; Record and Photograph.	ECO	Quarterly, until closure
Whole site.	Alien infestation	Visual inspection on foot patrol. Map presence of invasive plants. Plan removal, remove and document area covered on monthly basis. Verify. Photographs.	ECO	On-going until under control – then every 6 months.
Monitoring of maintenance of general waste disposal	All loads of waste to be recorded and quantity also recorded	Running total of loads of waste taken.	Until closure	Waste inventory and records to be done weekly with monitoring reports produced quarterly
Fly rock enclosure	Safety and security	Visual inspection	ECO and drilling supervisor	Daily inspection with weekly inspection reports



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Drill borehole rehabilitated areas Old roads	Scarring of the landscape Drainage disturbance	Determine use of borehole plugs or backfill Disturbed areas should be monitored for at least 12 months after the rehabilitation is initiated to check on progress of vegetation rehabilitation and any alien invasion. Visual inspection	ECO and Geologist	At project end
Biodiversity monitoring should be undertaken. This program	Disturbed areas and loss of vegetation	Will include, but is not limited to: Monitoring of the condition of habitats, ecosystems, topsoil stockpiles, species inventory and alien vegetation control.	ECO and designated ecological specialist	Quarterly audit of condition of vegetation around drill sites and submit report at the end of project.
Monitoring of erosion Roads Rehabilitated drilling sites Any other areas	Every 2 months and following any heavy rainfall	Visual inspection Walk over rehabilitated areas Drive along roads Photographic records	DMR and DW&S	
Monitoring of disposal of metal scrap, drill fluids / additives, old oil, oil filters, old oil drums, oily cloths,	Pollution of surrounding environment	Record: each load sent off the site	ECO and Designated engineer	Monthly report and submit quarterly

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batteries, tyres and contaminated soil. (Hazardous waste site)		Ensure safe disposal certificates are obtained from suppliers if the material are given back to them		
General waste disposal	Odours and pollution of the surrounding environment	Running total of loads of waste taken. Record of waste taken to waste disposal site Keeping records of waste taken to disposal site All loads of waste to be recorded and quantity extrapolated. Covering of waste segregation bins	ECO and Support Services Managers	Monthly
Sewage facilities / portable toilets	Condition and overflow	Visual inspection. Record condition.	ECO and drilling site supervisor	Every 2 months and end of project report

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Bunded areas around diesel / fuel tanks, refueling area, old oil tank; and petrol tanks	Risk of failure and leak and contamination of soils	Visual inspection	ECO and drilling site supervisor	Monthly
Observations of any excavation or ground breaking activities during the construction phase in accordance with the Heritage impact assessment report.	Disturbance of heritage resources	Survey to identify the status of existing heritage sites during operation	Drilling site supervisor and ECO and Commissioned Heritage Specialist	End of project report
Waste manage sections	Storage and disposal of general waste	Quantities, glass, paper, tins, plastic recycled	ECO and drilling site supervisor	Monthly
Waste management and recycling stations	Storage and disposal of paper waste	Quantities shredded for packaging	ECO and drilling site supervisor	Monthly
Recycling or transfer stations	Generation storage of cardboard boxes	Quantities recycled	ECO and drilling site supervisor	Monthly
Potential release of ozone depleting substance	Potential release of ozone depleting substance	Amount of equipment using this substance	ECO and drilling site supervisor	Annual

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Waste drum generation and storage areas	Storage and disposal of empty drums	Amount back for reuse by supplier	ECO and drilling site supervisor	3 Monthly
Storage and disposal of hazardous(hazardous) waste areas	Storage and disposal of hazardous(hazardous) waste	Amount generated for disposal	ECO and drilling site supervisor	Ad hoc
Storage and use of hazardous substances and raw material areas	Storage and use of hazardous substances and raw material	Number of spillages reported	ECO and drilling site supervisor	Ad hoc
EMPr	Objectives and targets achieved exceeding target dates and those that are overdue	Numbers	ECO and drilling site supervisor	Monthly
Awareness training plan	Awareness training and effectiveness Conducted training Training schedule	Perceptions and number of trained, aware and competent and numbers scheduled.	ECO and drilling site supervisor	Report at the end of the project
Complaint registers	Complaint received	Numbers	ECO and drilling site supervisor	Monthly

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
Communication plan	Communiqués sent out	Numbers	ECO and drilling site supervisor	2 Monthly
Emergency response plans	Emergency plans tested	Numbers	ECO and drilling site supervisor	2 Monthly
Internal Audits	Internal Audits done and scheduled	Numbers	ECO and drilling site supervisor	2 Monthly
Management review	Management Review done and scheduled	Numbers	ECO and drilling site supervisor	2 Monthly
Management commitment	Management commitment	Perceptions	ECO and drilling site supervisor	Ad hoc
Management commitment	Management commitment	Resources allocated	ECO and drilling site supervisor	2 Monthly
Dust sources Attenuating fall-out dust relates to all mining and site development activities and relies on pre-establishment consideration of dust risk in terms of location relative to downwind uses, planned disturbance of vegetation exposing the surface to	Dust fall out	Monitoring of fall-out dust would best be achieved by using the DustWatch™ equipment or similar equipment Assess dust source, wind-path and affected receiving environment.	ECO and air quality specialist	Regular periods preferably once per month, collect the dust cups and weigh the dried dust content To be done until project end

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<p>wind generated dust, trafficking of roads and areas where soils are pulverised to significantly increase dust generation potential and to processing activities which may be related to the specific project and present as high dust generating sources.</p>				
<p>Dust sources</p>	<p>Dust plume extent and intensity</p>	<p>As measurement of sand mass in drifts is extremely difficult, the monitoring of dust plumes is to be based on:  Visual observation and photographic recordal of plumes within the categorisation of low, medium and high (To be expanded on by the E.C.O.</p>	<ul style="list-style-type: none"> <li>ECO and air quality specialist</li> </ul>	<p>Regular periods preferably once per month, collect the dust cups and weigh the dried dust content  To be done until project end</p>

SOURCE ACTIVITY	IMPACTS REQUIRING MONITORING PROGRAMMES	FUNCTIONAL REQUIREMENTS FOR MONITORING	ROLES AND RESPONSIBILITIES (FOR THE EXECUTION OF THE MONITORING PROGRAMMES)	MONITORING AND REPORTING FREQUENCY and TIME PERIODS FOR IMPLEMENTING IMPACT MANAGEMENT ACTIONS
		<p>based on further observations and categorisation definition).</p> <p>Aerial photo record of plume extent/ advance and intensity.</p> <p>Capture of the plume extent and intensity by .shp polygon overlays and hectareage measurement expressed in a tabled record of measurement plume mapping .shp files as the current baseline data.</p>		
Dust fall out	Intervention success and failures	By DustWatch™ result recordal in spreadsheets and graph generation of the data over the period when attenuations have been applied, the success of intervention can be assessed in terms of reduction of dust expressed in grams/ m <sup>2</sup> / day.	ECO and air quality specialist	Over the period when attenuations have been applied

**l) Indicate the frequency of the submission of the performance assessment/  
environmental audit report.**

A performance assessment or environmental audit report will be submitted on a quarterly report. However, for internal purposes, there will be a monthly audit report.

**m) Environmental Awareness Plan**

**(1) Manner in which the applicant intends to inform his or her employees of any  
environmental risk which may result from their work.**

It is important to ensure that the employees have the appropriate level of environmental awareness and competence to ensure continued environmental due diligence and ongoing minimisation of environmental harm. Training needs will be identified based on the available and existing capacity of site personnel (including the contractors and sub-contractors) to undertake the required EMP management actions and monitoring activities. It is vital that all personnel are adequately trained to perform their designated tasks to an acceptable standard. The environmental training is aimed at:

- Promoting environmental awareness;
- Informing the contractor of all environmental procedures, policies and programmes applicable;
- Providing generic training on the implementation of environmental management specifications; and
- Providing job-specific environmental training in order to understand the key environmental features of the construction site and the surrounding environment.

**(1.1) Objectives**

- To ensure the ongoing involvement of representatives in the planning, development and management of the rehabilitation interventions.
- To ensure that there is sufficient training of on-site service providers/contractors whose job responsibilities affect the ability to achieve EMS objectives
- To ensure that training objectives to be set in line with the EMP requirements
- To ensure that personnel performing tasks, which can cause significant environmental impacts, are competent in terms of appropriate education, training and /or experience
- To develop a change from a paper system to an effective system of implementing provided training (training translated into observable skill)

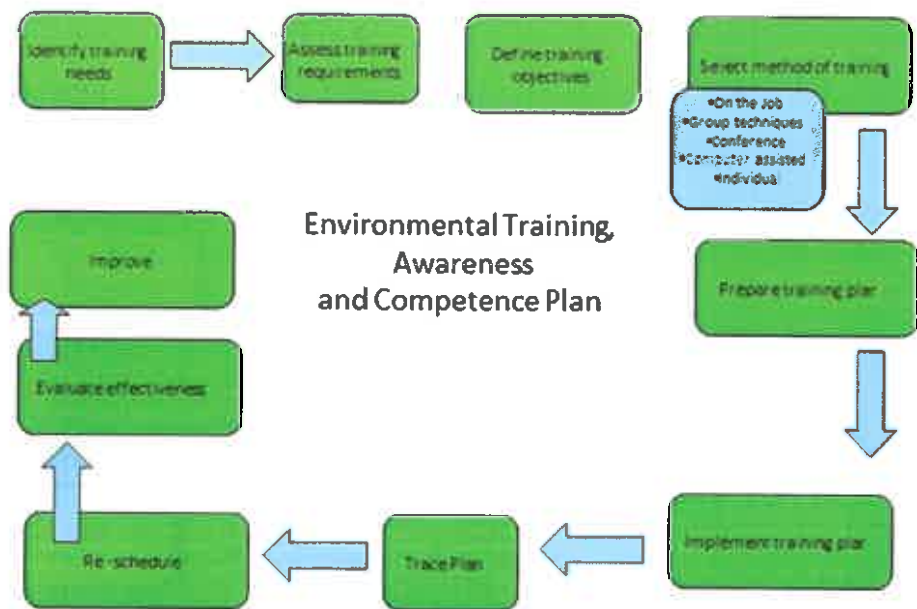


### **(1.2) Guiding principles to achieve the objectives**

- Develop environmental awareness implementation plan in line with approved EMPR
- Develop procedure to facilitate training of employees, on-site service providers and contractors
- Training to focus on means on enhancing ability of personnel to ensure compliance with environmental requirements
- Procedures to be established and maintained to make appropriate employees aware of:
  - The significant environmental impacts, actual or potential, of their work activities and environmental benefits of improved personal performance;
  - Their roles and responsibilities in achieving conformance with environmental policy, procedures and any implementation measures
  - The potential consequences of departure from specified operating procedures;
- Identify training and development needs through analysis of role descriptions. The role description is used to confirm the category of occupation as per Zastrocode's structure templates.
- Source descriptions of activities, aspects and impacts from the Environmental Implementation Plan Section/department and use this information to derive a training and development needs matrix
- Compile a training and development needs matrix displaying the environmental responsibility/role, required knowledge and outputs, intervention required and interval of intervention.
- Evaluate training received
- Top management to build awareness and motivate and reward employees
- Environmental policies to be available to contractors
- Conduct environmental inductions for contractors
- Conduct environmental inductions for employees
- Employees will adequately be educated, as to the provisions included in the EMPr and general environmentally friendly practice;
- The training will, as a minimum, include the following:
  - The importance of conformance with all environmental policies;
  - The environmental impacts, actual or potential, of their work activities;

- The environmental benefits of being accountable and improved personal performance;
- Their roles and responsibilities in achieving conformance with the environmental policy and procedures and with the requirement of the consultant's environmental management systems, including emergency preparedness and response requirements; and
- The mitigation measures required to be implemented when carrying out their work activities.

The matrix below provides a guideline of the sequential process that will be followed to attach the stipulated goals and objectives.



**Chart 2: Training matrix**

### **(1.3) Shareholders involvement during all stages of the project**

#### **(1.3)1 Objectives**

- To ensure the ongoing involvement of representatives in the planning, development and management of the rehabilitation interventions.
- To ensure that the adjacent landowners are informed and updated throughout the development phases.

#### **(1.3)2 Mitigation Measures**

- Develop and implement effective mechanisms for ongoing communications with local stakeholders and neighbouring communities.

- Actively participate in local and regional conservation and socio-economic development initiative that may affect or benefit the project during all development phases developmental stages.
- Identify and enable access to employment empowerment and capacity building opportunities for the local community.

**(2) Manner in which risks will be dealt with in order to avoid pollution or the degradation of the environment.**

**(2.1) Risk Documents**

This section provides details of the supporting documentation that has been and will be used to identify risks and as such will be utilized during the EMPr implementation process, to ensure management of environmental damage. These are the documents used to identify, track and control risks to the project up to the decommissioning and closure phases. This section will support during the implementation process to ensure that the risks associated with activities, especially closure related risks are captured and addressed promptly.

The numbering is aligned with the title called Risk and as such tables will commence with R for Risk, RR is Risk Register, RG is General Risks, RL is Legislation Related Risks, RM is Management Related Risks, RC is Closure Related Risks.

**n) Specific information required by the Competent Authority**

**(Among others, confirm that the financial provision will be reviewed annually).**

The financial provision presented herein will be reviewed annually.

**2) UNDERTAKING**

The EAP herewith confirms

- a. the correctness of the information provided in the reports;
- b. the inclusion of comments and inputs from stakeholders and I&As;
- c. the inclusion of inputs and recommendations from the specialist reports where relevant; and
- d. that the information provided by the EAP to interested and affected parties and any responses by the EAP to comments or inputs made by interested and affected parties are correctly reflected herein .

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Signature of the environmental assessment practitioner:

**Myezo Environmental Management Services**

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Name of company:

**22 May 2021**

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Date: