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DOCUMENT INFORMATION

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PROJECT TITLE	Environmental Impact Assessment for the Proposed Exploration Activities of Base & Rare & Precious Metal, Industrial Minerals On Exclusive Prospecting Licenses 6877 at Opuwo Area in Kunene Region
CLIENT	Epangelo Mining Pty Ltd
PROJECT CONSULTANT	Mr. Ipeinge Mundjulu
LOCATION	Opuwo Areas, Kunene Region
DATE	May 2021

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ACRONYMS

DEA	Department of Environmental Affairs
EA	Environmental Assessment
EAP	Environmental Assessment Practitioner
EC	Environmental Commissioner
ECC	Environmental Clearance Certificate
ECO	Environmental Compliance Officer
EIA	Environmental Impact Assessment
EM	Epangelo Mining
EMA	Environmental Management Act (No. 7 of 2007)
EMP	Environmental Management Plan
EPL	Exclusive Prospecting License
I&APs	Interested and Affected Parties
MET	Ministry of Environment and Tourism
PPE	Personal Protective Equipment
RC	Reverse Circulation
RD	Red-Dune Consulting CC
TORs	Terms of Reference

Executive Summary

Mineral exploration existed for many centuries. With improving technology, mineral exploration has become environmentally friendly, in a way that it is more non-evasive, with negligible impact on the bio-physical environment. The proponent, Epangelo Mining Pty Ltd intent to carry out exploration activities of Base & Rare & Precious Metal, and Industrial Minerals on the Exclusive Prospecting License (EPL) 6877. The EPL is located at Opuwo area of Omukurukaze in Kunene Region and measures 15773.9728 hectares (ha) of communal / state land where land use is predominantly livestock farming.

The proposed exploration activities shall comprise of non-invasive methods such as geological field mapping and geophysical ground mapping to generate target point where geochemical soil sampling will take place. Generated targets will be sampled using traditional methods of shallow pitting and trenching, while deeper targets would be sampled through Reverse Circulation drilling. All drilled holes shall be covered completely after sampling unless otherwise they are beneficial to the community (i.e. water borehole), a casing may be left.

In conclusion, exploration activities are not known to cause harm to the environment. Line cutting will be made in a way that it avoids mature and protected trees. Should this exploration yield into a potential establishment of a mine, a comprehensive EIA must be undertaken which will include all necessary specialist studies. Henceforth, it is recommended to the approving authority that this project is approved and be issued with an Environmental Clearance Certificate.

1. Overview

This Environmental Management Plan (EMP) is developed following an Environmental Impact Assessment (EIA) for the EPL 6877. A comprehensive project description and impact assessment are contained in the EIA report.

2. Purpose of the EMP

This Environmental Management Plan (EMP) is a risk strategy that contains logical framework, monitoring programme, mitigation measures, and management control strategies to minimize environmental impacts. It further stipulates the roles and responsibility of persons involved in the project. These strategies are developed to reduce the levels of impacts for the projects

3. Compliance to the EMP

This EMP is a legally binding document as given under the provisions of the Environmental Management Act, 2007 (Act No. 7 of 2007). Epangelo Mining and its contractors must adhere to the framework of this document

4. Roles and Responsibility

4.1. Proponent

The proponent. Epangelo Mining Pty Ltd shall take overall responsibility for proper implementation of the EMP. It remains the responsibility of the proponent to appoint key personnel for the implementation of the EMP such as Site Manager and ensure that all employees and contractors are conversant with the EMP.

4.2. Site Manager

The Site Manager (SM) represents the proponent on site. He/she shall be responsible for daily activities in ensuring environmental protection. All communication with regard to the implementation of EMP must be channelled through the SM

4.3. Employees

It shall be responsibility of employees to adhere to the provision of EMP at all times when on site

4.4. Environmental Compliance Officer

Compliance to EMP is enforced by the environmental inspector as provided for under Environmental Management Act (No. 7 of 2007) (EMA)

5. Disciplinary Action

This EMP is a legally binding document, non-compliance to the EMP is punishable in accordance to the provision of EMA

6. Policy, Legal and Administrative Framework

Table 1. Regulatory framework applicable to the project

Legislation	Summary	Applicability to Assessment
The Namibian Constitution	The State shall actively promote and maintain the welfare of the people by adopting policies aimed at ... The maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilization of living natural resources on a sustainable basis for the benefit of all Namibians, both present and future	Protection of the environment and biodiversity. Ensures that these principles are enshrined in the EIA documentation
Environmental Management Act No. 7 of 2007	To promote sustainable management of the environment and the use of natural resources and to provides for a process of assessment and control of activities which may have significant effects on the environment; and to provide for incidental matters	The Act provides a list of activities that may not be undertake without an environmental clearance certificate to prevent environmental damages.
Mineral Resource Act, Act 1992.	Prospecting and Mining of Mineral in Namibia and Issuance of all Permits.	Issuance of Mining permits
Draft Pollution Control and Waste Management Bill	This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management.	To protect the Environment from possible hydrocarbons and oil leaks from the machinery, trucks and vehicles.

Legislation	Summary	Applicability to Assessment
Environmental Policy framework (1995)	This policy subjects all developments and project to environmental assessment and provides guideline for the Environmental Assessment.	Consideration of all possible impacts and incorporate them in the development stages
Regulations Related to the Health and Safety of Employees at Work. Reg No. 156	Promotes the Safety and Health of employees at the work place	To ensure employees health and safety at work
Public Health Act No. 36 of 1919	To Protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health.	To ensure that the project is not a nuisance to land owners and the public at large
Labour Act No. 11 of 2007	This Act outlines the labour laws which encompass protection and safety of employees at work.	Fair labour practises to be observed with regard to this act
Water Act No, 54 of 1956	All water resources belong to the State. It prevents pollution and promotes the sustainable utilization of the resource	Prevention of discharging contaminated water at unauthorised places
Soil Conservation Act No. 76 of 1969	To promotes the conservation and compacting of soil erosion	Uncontrolled movement of heavy vehicles and truck at areas surrounding the site may cause land degradation

Legislation	Summary	Applicability to Assessment
Water Resource Management Act No.11 of 2011	The Act stipulates the prevention of pollution for Surface and Ground water sources.	Oil spillage coming from machinery requires proper monitoring.
Public Health Act no. 36 of 1919	The Act gives provision for the protection for the health of all people.	The noise and dust level emanating from the project could affect the surrounding community and vegetation in the vicinity.
National Heritage Act No.27 of 2004	The Act gives provision of the protection and conservation of places and objects with heritage significance.	The chance find of Human Remains due to colonial history or crime, Artefacts, and or heritage materials within the EPL
Minerals (Prospecting and Mining) Act No 33 of 1992	Section 50 (i) requires “an environmental impact assessment indicating the extent of any pollution of the environment before any prospecting operations or mining operations are being carried out and an estimate of any pollution, if any, likely to be caused by such prospecting operations or mining operations”	The proposed activity is prospecting for minerals, hence it requires an EIA to be carried out and adhere to the act’s provisions.

7. The EMP table

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
<p>Access</p> <p>Access to site must be communicated to the Village chiefs to avoid conflict</p>	<p>To avoid conflict between Epangelo Mining local people</p>	<ol style="list-style-type: none"> 1. Inform Chiefs well in advance before your planned activities 2. All COVID-19 measures must be implemented (wearing of mask and hand sanitizers) 	<p>Recorded conflict</p> <p>Health certificates records</p> <p>Identification documents</p>	<p>Site Manager</p>
<p>Induction</p>	<p>To ensure that all employees are familiar with the requirements of the EMP</p>	<ol style="list-style-type: none"> 1. All employees must go through an induction course for the provision of the EMP. 2. Staff operating specialised equipment and heavy vehicle must be properly trained 	<p>Induction Minutes, report and Attendance Register</p>	<p>Site Manager</p>
<p>Employment</p>	<p>Although significant employment is not expected, the proponent must abide to the relevant labour laws</p>	<ol style="list-style-type: none"> 1. Ensure that all general work is reserved for local people unless in circumstances where specialized skills are required. 2. Fair compensation and labour practise as per Namibian Labour Laws must be followed 3. Ensure skill transfer to the locals 	<p>Employees records and their nationalities</p> <p>Labour unrest over unfair compensation</p>	<p>Site Manager</p>

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
HIV/AIDS, Alcohol and Drug abuse	To sensitise employees about the danger of alcohol, drugs and HIV/AIDS	<ol style="list-style-type: none"> 1. Provide awareness to the employees on danger of alcohol, (HIV/AIDS) and drug abuse 2. Provide Condoms to workers 	Awareness meeting minutes	Site Manager
General Safety	To ensure good health and safety for the employees and public	<ol style="list-style-type: none"> 1. Abide by the Occupational Health and Safety and Labour Act of Namibia and other statutory requirement such as International Labour Practise (ILO) 2. Develop a health and safety plan / policy 3. Ensure that every employee went through an induction course about safety; 4. Employees must be equipped with all necessary Personal Protective Equipment (PPE). These includes, Helmet, Overall, Safety Shoes, Safety Glasses, Gloves, Earmuff etc; 5. During operation, minor accidents are eminent, hence there must be a first aid kit; 6. Only qualified and licenced personnel must be allowed to operate machinery and vehicles; 	Induction Minutes Valid driver licenses for heavy vehicles Complain of health issues by employees PPE for all employees	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
		<ul style="list-style-type: none"> 7. No employee must be allowed to be onsite without PPE; 8. Adequate safety signs must be displayed on site; 9. Unauthorised fire shall not be permitted on site 		
Health	To ensure good health for the employees	<ul style="list-style-type: none"> 1. Implement COVID-19 preventative measures 2. Employees must NOT be exposed to noise levels above the required -85dB (A) limit over a period of 8 hours. 3. Adhere to the Labour act, non-toxic human dust exposure levels may not exceed 5mg/m³ for respiratory dust and 15mg/m³ for total dust. 4. Supply clean drinking water to the site, such as portable water tank; 5. Used mobile toilets 6. Ensure that supervisor has gone through occupational health and first aid course, 7. Train employee on hazard and risk avoidance 8. Provide insect repellent, mosquito nets and if necessary immunization to prevent deadly diseases such as malaria, 	Complain from farmers Health complaints from employee and employees fitness certificate	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Visual Impact	To prevent litter / waste scattered all over and preserve aesthetic value	<ol style="list-style-type: none"> 1. Maintain good house keeping 2. Trenches, access roads , camping places must be rehabilitated 	Scattered Litter, Visual inspection	Site Manager
Impact on Flora	To ensure sustainable conservation the vegetation	<ol style="list-style-type: none"> 1. Mature trees must be avoided to be cut down 2. Do not plant alien trees 3. Don not harvest firewood 	Complain and records	Site Manager
Impact on Fauna	To ensure protection of animals especially wild animals	<ol style="list-style-type: none"> 1. Do not kill animals if found on site (unless it is an eminent danger to human life) 2. There must be ZERO tolerance to poaching 	Complaints from farmers and record of poaching	Site Manager
Conservation of Ground Water Resource	To prevent exposure of ground water	<ol style="list-style-type: none"> 1. Ensure that drilled holes are properly closed to prevent ground water exposure unless otherwise as agreed with the locals 	Rehabilitated drilled sites	Site Manager
Surface and Ground water pollution	To prevent water pollution	<ol style="list-style-type: none"> 1. Fueling of heavy vehicle on site must be well coordinated at designated places 2. Stationary vehicles must be provided with drip tray to capture oil, lubricants and hydraulic fluids leakages 3. All vehicle and machinery must be well service to avoid leakages 4. Provide and train on oil spill emergency response 	Physical inspection	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
		5. Servicing of vehicles and machinery must take place at designated sites		
Land Degradation	To prevent soil erosion	<ol style="list-style-type: none"> 1. Movement of heavy vehicles must be coordinated and restricted to be on access roads 2. Normally, gravel roads are meant for light vehicles, exploration vehicles have the potential to damage the farm access roads. Hence proper road maintenance must be implemented to ensure that the roads are left on good state 	Physical inspection	Site Manager
Waste Generation	To ensure good housekeeping and prevent littering	<ol style="list-style-type: none"> 1. Provide Skip bins to collect waste and be disposed of at an approved disposal site 2. Do not burry waste on site 3. Excavate a small biodegradable waste site that would be dump filled at the end of the project alternatively, provide mobile toilets that will be disposed at an approved municipal site 4. Used oil, grease and lubricants cans must be collected in appropriate drums and disposed of at an approved site. 	Waste bins on site Physical inspection	Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Noise Impacts	To prevent noise pollution from flying aircraft	<ol style="list-style-type: none"> 1. The aircraft must fly at heights which may not cause noise nuisance to animals 2. A fixed wing aircraft is recommended than a helicopter 	Complaints from farmers and members of public	Site Manager
Traffic	To ensure coordinated movement of heavy vehicles	<ol style="list-style-type: none"> 1. Trucks must be installed with a rotating headlight beam lights 2. Truck must maintain a low speed to prevent excessive dust and accident 3. The roads must be maintained by scrapping and compacting 4. Install warning signs where necessary 	Records of public complain Visible warning signs	Site Manager
Oil Leakages	Manage fuels, oils and lubricants leakages from Vehicles and Machinery to prevent pollution	<ol style="list-style-type: none"> 1. Ensure all vehicle are well service and leak inspection are done; 2. Provide drip trays to stationary vehicle 3. Servicing of vehicle must be done at an approved site or at areas agreed with the farm owner. 4. Re-fuelling, oil replacement must be done on approved sites; 	Physical verification and routine monitoring	Management or Site Manager

Environmental / Social Impact	Objectives	Proposed Mitigation Measures	Monitoring Indicator	Party Responsible
Archaeology / Heritage Resources / Artefacts	Preserve Heritage	<ol style="list-style-type: none"> 1. Employee must be trained on the possible find of heritage and archaeological material in the area; 2. Implement a chance find and steps to be taken for heritage or archaeological material finding (Heritage (rock painting and drawings), human remains or artefacts) are unearthed Stopping the activity immediately <ol style="list-style-type: none"> i. Informing the operational manager or supervisor ii. Cordoned of the area with a danger tape and manager to take appropriated pictures. iii. Manager/supervisor must report the finding to the competent authorities National Heritage Council of Namibia (061 244 375) National Museum (+264 61 276800) or the National Forensic Laboratory (+264 61 240461). 	Sighting report/s of heritage resources / artefacts	Management or Site Manager

8. Closure / Decommissioning Plan

During exploration, evasive processes includes trenching and drilling. Trenching is normally done by hand, they are not deep and they are immediately rehabilitated after sampling. Drilling may necessitate the establishment of access roads to targets site, hence these must be rehabilitated immediately. After geochemical sampling with the drill, the casing must be removed and the drill hole must be properly covered, unless otherwise agreed with the locals to leave the casing for purpose of making water borehole (Figure 1).



Figure 1 RC drill hole are after rehabilitation (Photo for illustration purpose)

9. Conclusions and Recommendations

9.1. Conclusion

Exploration activities are not known to cause harm to the environment due to their non-physical nature. In Namibia, farms are heavily encroached with thick bushes, hence access roads to generated targets are in a way advantageous to the farmers as long as the line cutting avoids mature and protected trees. It is important for the proponent to establish good relation with farm owner to ensure environmental protection. Should this exploration yield into the potential of establishing a mine, a comprehensive EIA must be undertaken which shall include all necessary specialist studies.

9.2. Recommendations

It is recommended to the approving authority that this project is approved and be issued with an Environmental Clearance Certificate with following conditions;

- Bi-annual report for environmental monitoring must undertaken

10. References

- A.L.E. Simmonds and T.J. Smalley 2000., Kalahari aquifers in the Gam area of north-eastern Namibia, *Communs geol. Surv. Namibia*, 12 (2000), 469-474
- D.B.Nascimento A.Ribeiro R.A.J.Trouw R.S.Schmitt C.W.Passchier C Stratigraphy Of The Neoproterozoic Damara Sequence In Northwest Namibia: Slope To Basin Sub-Marine Mass-Transport Deposits And Olistolith Fields, *Precambrian Research*, Volume 278, June 2016, P 108-125
- Dr. Martin Pickford and Dr Brigitte Denut 2010., *Memoir 21 Karst Geology and Palaeobiology of Northern Namibia*, Ministry of Mines and Energy Geological Survey of Namibia
- Enviro Dynamics 2014., *Environmental Assessment for the exploration of base metals on exclusive prospecting licenses 5606, 4934, 5712 & 5713*, Kavango East Region, Namibia.
- Greg Christelis and Wilhelm Struckmeier 2011., *Groundwater in Namibia; An Explanation to the Hydrogeological Map*, Ministry of Agriculture Water and Forestry
- Mannheimer, C.A, & Curtis, B.A. (eds) 2009. *Le Roux and Muller's Field Guide to the Trees and Shrubs of Namibia*. Windhoek: Macmillan Education Namibia.
- Mendelsohn, J., Jarvis, A., Roberts, C. & Robertson, T., 2009. *Atlas of Namibia*. 3rd ed. Cape Town: Sunbird Publishers.
- Ministry of Agriculture Water and Forestry 2000 ., *Strategic Water Resources Assessment: Theme Report*
- Okitsu, S. (2005). Factors controlling geographical distribution in savanna vegetation in Namibia. *African Study Monographs, Suppl. 30*(March), 135–151.
- Population Demography for the Kunene Region for 2001 and 2011 (Namibia Population and Census Report of (2011).*
- R. Brandt *Preliminary Report On The Stratigraphy Of The Damara Sequence And The Geology And Geochemistry Of Damaran Granites In An Area Between Walvis Bay And Karibib*
- S Hapugoda and J R Manuel., *A Comparison of Drilling and Sampling Techniques as They Relate to Base and Precious Metal Exploration in the Mt Isa Inlier of North West Queensland and the Southern Lachlan Fold Belt in New South Wales*