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Scoping Report (including impact assessment) Assessment Report for Epangelo Mining Company's Proposed Exploration Activities on EPLs 4817 & 4833

Project No.: 734.05041.00001

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EXECUTIVE SUMMARY

1. General Introduction

Epangelo Mining Company (Pty) Ltd (Epangelo) is a state owned enterprise responsible for the acquisition and development of the country's natural resources. One way of fulfilling this mandate is by acquiring prospecting and mining licenses with the aim of contributing to the country's sustainable development.

Epangelo holds exclusive prospecting license (EPL) 4817 in the Erongo Region and EPL 4833 on the boundary between the Erongo and Otjozondjupa Regions. EPL 4817 measures in at 31,000.70 ha in size and covers fourteen (14) commercial farms. EPL 4833 measures in at 99,934.40 ha in size and covers thirty six (36) commercial farms.

2. Motivation for the exploration activities

The Ministry of Mines and Energy (MME), Directorate of Mines undertakes to exploit the country's mineral resources in a manner which integrates mining into the various economic sectors for the socio-economic development of the country. In order to achieve this, MME issues EPLs to various entities for the exploration of minerals within the country. Epangelo intends to discover whether or not for base and rare metals, industrial minerals and precious metals occur in the above mentioned EPLs.

Should a feasible resource be located, it could provide social and economic development within the region and the country, subject to a Mining Licence (ML) being issued by MME and a separate, comprehensive (full) environmental impact assessment (EIA) process.

3. Activities relating to the exploration programme

The exploration activities will be conducted concurrently across the EPLs and is expected to be conducted throughout the EPLs. Target sites will be identified during the exploration process and will be "refined" or "focussed", depending the outcome of the exploration results.

Epangelo Mining Company plans to commence with activities as soon as the clearance certificates have been issued.

The licenses are valid for three years and during that time period the following activities may be undertaken:

- Geological mapping: Review of geological maps of the area and on-site ground traverses and observations. The maps will be updated where relevant information been obtained.
- Lithology and Soil geochemical surveys: Samples of rock or soil are collected and sent for geochemical trace element analysis to determine if sufficient quantities of base & rare or precious

metal or industrial minerals are present. These analyses are conducted by an analytical chemical laboratory. Trenches or pits may be dug to investigate the mineral potential. The length and depth of the trenches or pits, as well as the method on how to dig them, e.g., manual or excavator, needs to be discussed with the landowner. In order to minimise the risks associated with excavations, all excavations will either be opened and closed on the same day or fenced off until closed to ensure that no livestock or wildlife could be harmed.

- Geophysical surveys: The collection of information of the substrata, by air or ground, through sensors such as radar, magnetic and electromagnetic to detect any mineralization in the area.
- Drilling: Should analyses by an analytical laboratory be positive, holes are drilled and drill samples collected for further analysis. This will determine the depth of the potential mineralization. If necessary new access tracks to the drill sites will be created and drill pads will be cleared in which to set the rig.

4. Identification of environmental aspects

The exploration activities listed above have the potential to impact on the environment. Environmental aspects and potential impacts were identified during the screening and scoping phases of the EIA, in consultation with authorities, Interested and Affected Parties and the environmental team. As requested from the Ministry of Environment and Tourism, a Scoping Report with assessment and Environmental Management Plan have been prepared for the exploration activities.

The following issues were qualitatively assessed in this process and the findings are presented in this Scoping Report:

- Air quality
- Biodiversity
- Socio-economic
- Land-use
- Noise
- Surface water and Groundwater
- Waste management

5. Assessment findings

Air quality: This assessment was conducted in terms of dust generated from drilling and vehicle entrainment on gravel roads, in close proximity to residents. In the unmitigated scenario there is the potential for nuisance impacts relating to people residing in the surrounding area. However, with appropriate mitigation and management the potential impacts are greatly reduced and the significance rating is reduced to low.

Biodiversity: Both EPLs are located on the central-western Plains within the tree-and-shrub Savanna biome and the dominant vegetation type is thornbush shrubland. Numerous protected trees are found on the EPLs. A high animal diversity can be found in the area and furthermore the EPLs fall within an area of high endemism of mammal, birds and reptiles.

Epangelo Mining Company's personnel/contractors performing exploration activities could have an impact on the surrounding fauna and vegetation. Specifically, the impacts associated with illegal hunting and poaching and the collection of firewood. In the unmitigated scenario the severity and the probability of the impacts were found to be medium, however, with mitigation and management measures both were reduced to a rating of low.

Air surveys (i.e. low flying airplanes) could cause wildlife to run away, which in turn would result in wild stock loss. Spooked wildlife and livestock could breach fences causing property damaged in addition to the loss of stock. Airplanes are expected to fly as low as 50 meters from the ground. Should they fly over wildlife enclosures then it is very likely that wildlife and livestock will be spooked. In the unmitigated scenario the significance of this impact was found to be medium, however, with mitigation and management measures it can be reduced to low.

Socio-Economic: The potential socio-economic impacts relate to the inconvenience the exploration activities could have on the landowners. Specifically, the need for access, leaving farm gates open/unlocked and the increased risk of criminal activities. In the unmitigated scenario the significance rating is medium, however, with appropriate mitigation and management the potential impacts are greatly reduced and the significance rating falls to low.

The low flying airplanes would also create a direct noise-related disturbance for local residences and tourist facilities. Pre-scheduled flight paths and times would reduce this impact from medium in the unmitigated scenario to low.

Heritage: It is possible that there are heritage resources present in the proposed exploration area, especially as it is located within the rock art area. It is important that these sites not be disturbed by the proposed exploration activities. In the unmitigated scenario, the possibility of heritage impact occurring results in a medium impact significance rating. This can however be reduced to low through the avoidance of obvious heritage resources and the implementation of a chance find procedure.

Noise: The assessment of noise impacts specifically relate to exploration activities taking place near a residence and resulting in a nuisance impact, and the severity of the impact is rated medium. In the mitigated scenario, the severity of the impact is reduced and is rated low.

Land-use: The assessment for land use refers predominantly to the impact the exploration activities have on farming and hunting activities.

Exploration could lead to a possible loss of grazing and agricultural land. The rehabilitation of the site will allow for the continued use for grazing and agricultural activities

Exploration activities may impact hunting activities in the area, thereby impacting the livelihoods of land owners. Careful scheduling/planning around the hunting season and compensation agreements for financial losses reduce the significance of this impact.

Surface water/ Groundwater: The assessment relates to the impacts associated with the spillage of hydrocarbons within the exploration area, with specific regard to water resources. Given the relatively localised nature of the activities, as well as the introduction of hydrocarbon spill management measures, the significance rating for both the unmitigated and mitigated scenario remain low.

There is a possibility that groundwater abstraction could result in a decrease in groundwater availability. Careful monitoring of groundwater levels during abstraction would prevent this from occurring. The significant of this impact is medium in the unmitigated scenario but can be reduced to low through continuous groundwater level monitoring during abstraction.

Waste management: Given the remote location and the land-use, the dumping of domestic waste within the exploration area could prove hazardous to wildlife and livestock, as well as impede agricultural production. However, given the small scale of the activities, a large amount of waste will not be generated. With mitigation and management measures in place the rating remains low.

6. Way forward

The way forward for the EIA scoping phase is as follows:

- Submit the final Scoping Report (with comments) and EMP to MET.
- MET review the Scoping Report and EMP and provide record of decision.

SCOPING ASSESSMENT REPORT FOR EPANGELO MINING COMPANY' PROPOSED EXPLORATION ACTIVITIES ON EPLS 4817 & 4833

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ACRONYMS AND ABBREVIATIONS

Below a list of acronyms and abbreviations used in this report.

Acronyms / Abbreviations	**Definition**
EAPAN	Environmental Assessment Professionals' Association of Namibia
EPL	Exclusive Prospecting License
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
MET	Ministry of Environment and Tourism
MET: DEA	Ministry of Environment and Tourism: Department of Environmental Affairs
ML	Mining License
Target area	The area of the EPL intended for exploration activities
TLB	Tractor-Loader-Backhoe

SCOPING ASSESSMENT REPORT FOR EPANGELO MINING COMPANY' PROPOSED EXPLORATION ACTIVITIES ON EPLS 4817 & 4833

1 INTRODUCTION

1.1 INTRODUCTION TO THE PROPOSED EXPLORATION ACTIVITIES

Epangelo Mining Company (Pty) Ltd (Epangelo) is a state owned enterprise responsible for the acquisition and development of some of the country's natural resources. One way of fulfilling this mandate is by acquiring prospecting and mining licenses with the aim of contributing to the country's sustainable development.

Epangelo holds exclusive prospecting license (EPL) 4817 in the Erongo Region and EPL 4833 on the boundary between the Erongo and Otjozondjupa Regions. (Refer to Figure 1-1). EPL 4817 measures in at 31,000.70 ha in size and covers fourteen (14) commercial farms (refer to Figure 1-2 for an indication of the farms within EPL 4817). EPL 4833 measures in at 99,934.40 ha in size and covers thirty six (36) commercial farms (refer to Figure 1-3 for an indication of the farms within EPL 4833).

1.2 MOTIVATION FOR THE EXPLORATION ACTIVITIES

The Ministry of Mines and Energy (MME): Directorate of Mines undertakes to exploit the country's mineral resources in a manner which integrates mining into the various economic sectors for the socio-economic development of the country. In order to achieve this, MME issues EPLs to various entities for the exploration of minerals within the country. Epangelo intends to discover whether or not base and rare metals, industrial minerals and precious metals occur in the above mentioned EPLs.

Should a feasible resource be located, it could provide social and economic development within the region and the country, subject to a Mining Licence (ML) being issued by MME and a separate, comprehensive (full) environmental impact assessment (EIA) process.

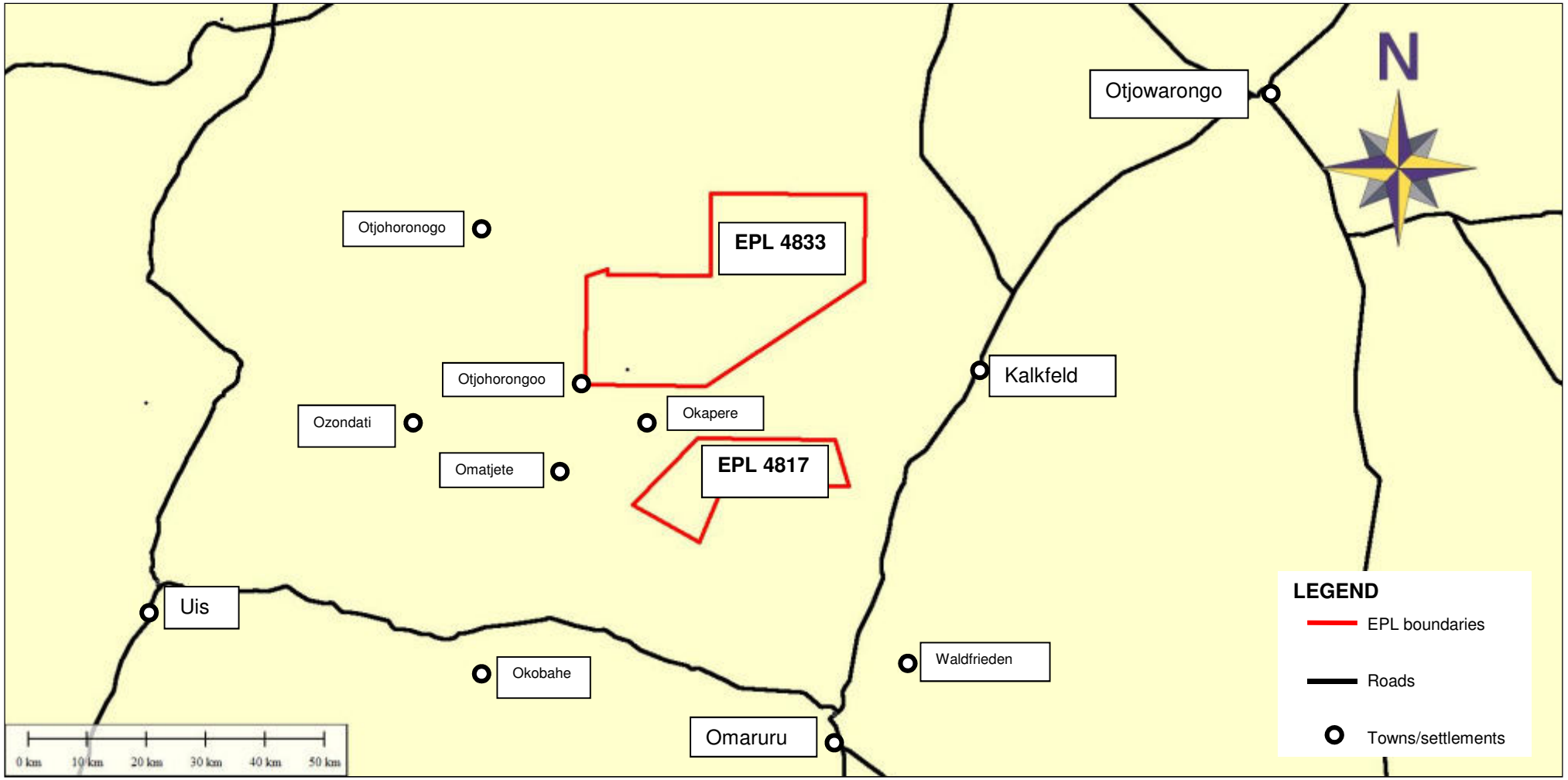

FIGURE 1-1: LOCALITY MAP

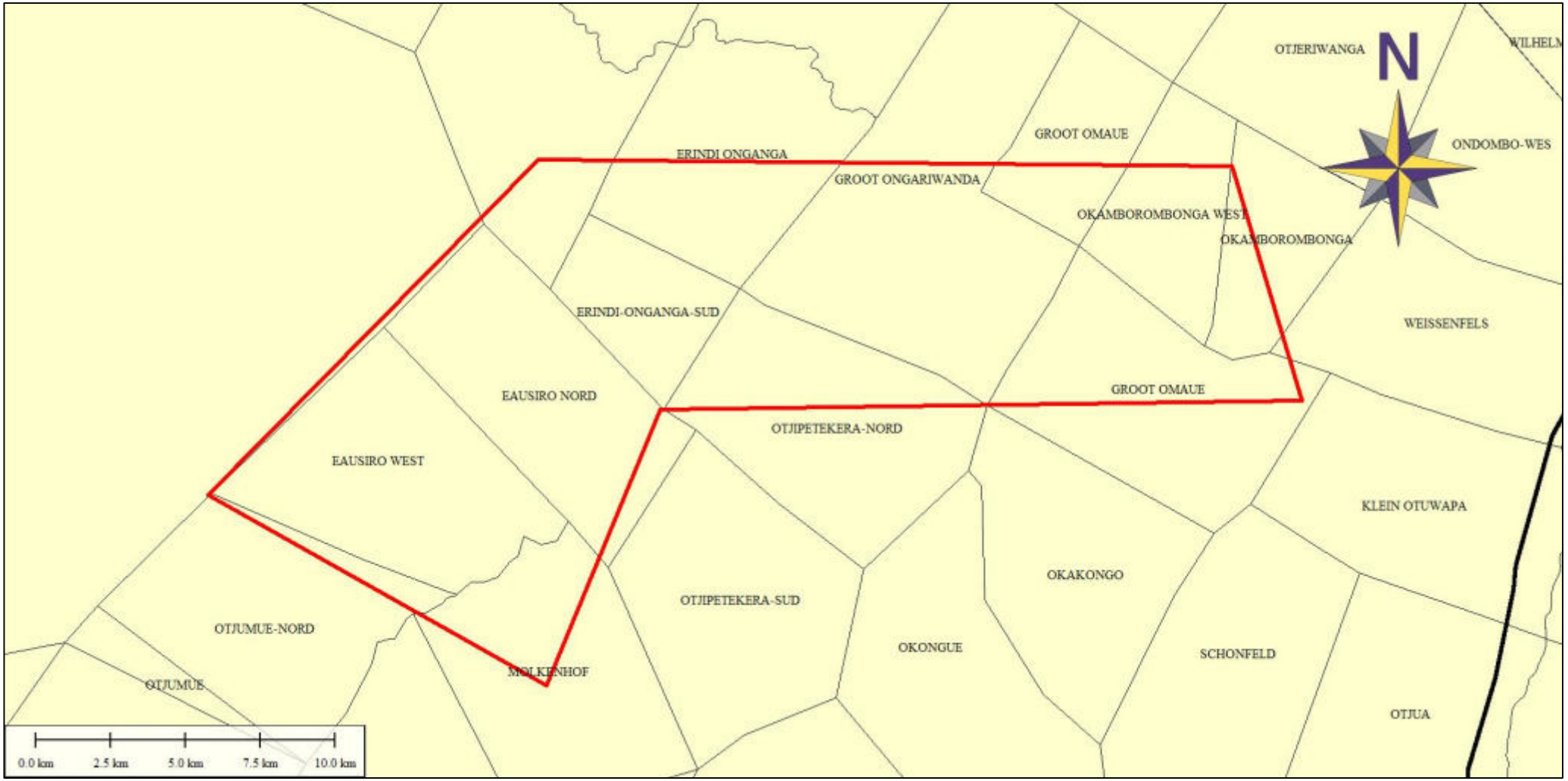

FIGURE 1-2: EPL 4817 - AFFECTED FARMS

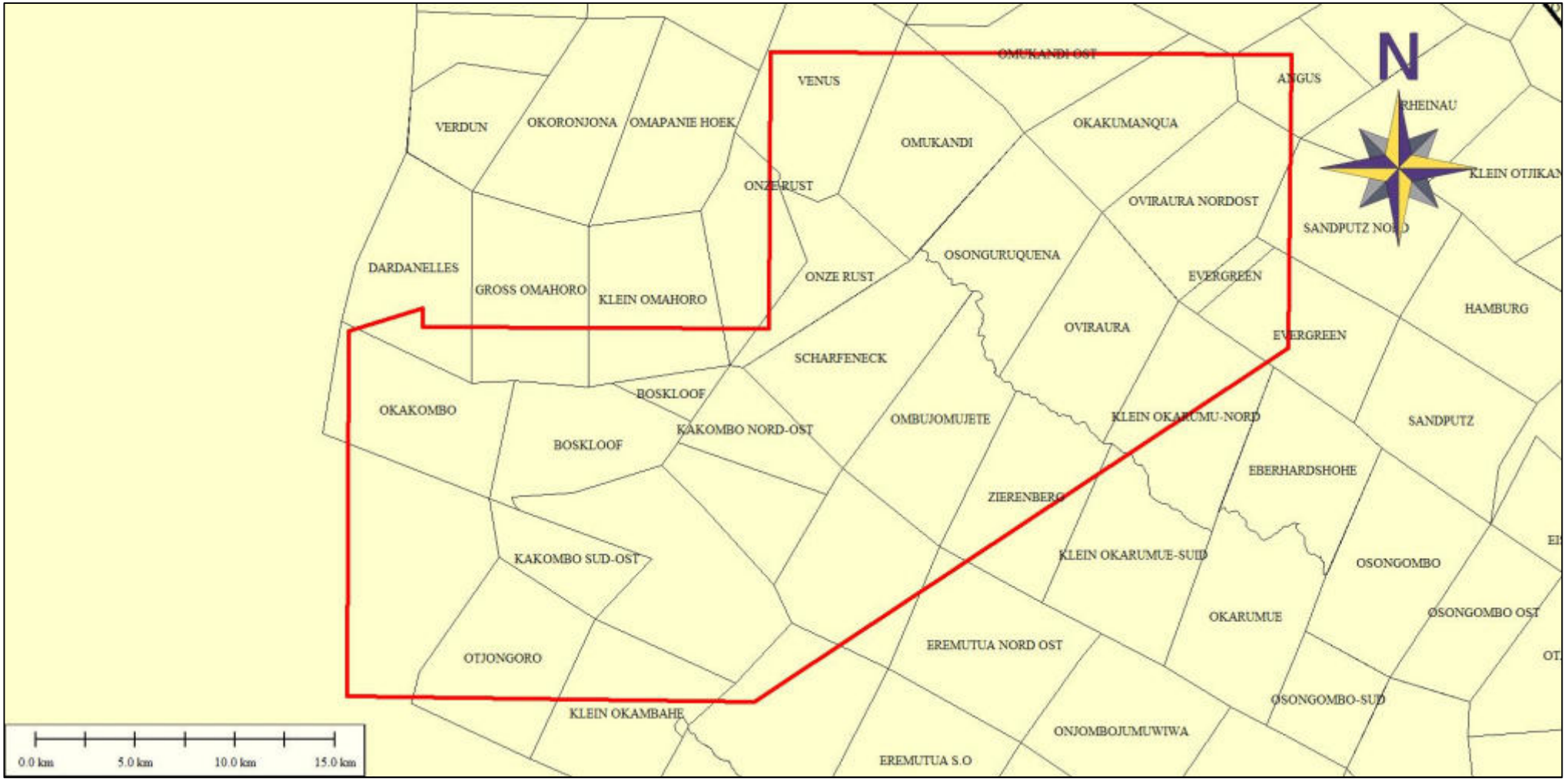

FIGURE 1-3: EPL 4833 - AFFECTED FARMS

1.3 INTRODUCTION TO THE ENVIRONMENTAL IMPACT ASSESSMENT FOR THE PROPOSED EXPLORATION ACTIVITIES

Environmental Impact Assessments are regulated by the Ministry of Environment and Tourism (MET) in terms of the Environmental Management Act, 7 of 2007. This Act was gazetted on 27 December 2007 (Government Gazette No. 3966). The List of Activities that may not be undertaken without an Environmental Clearance Certificate and the Environmental Impact Assessment Regulations: Environmental Management Act, 2007 (Government Gazette No. 4878) were promulgated on 6 February 2012.

The following listed activities are relevant to the exploration activities:

Mining and Quarrying Activities

3.1 The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.

3.2 Other forms of mining or extraction of any natural resources whether regulated by law or not.

3.3 Resource extraction, manipulation, conservation and related activities.

1.3.1 EIA PROCESS FOR THE PROPOSED EXPLORATION ACTIVITIES

An application will be submitted to the Ministry of Environment and Tourism (MET): Department Environmental Affairs (DEA) for the activities relating to the EPLs. An EIA process was conducted in terms of the Environmental Management Act, 7 of 2007. This process included: a screening phase and a scoping phase, which included an impact assessment (qualitative) and the production of an Environmental Management Plan (EMP) (section 8 of this report).

The main purpose of this report is to provide information relating to Epangelo's proposed exploration activities and to indicate which environmental aspects and potential impacts have been identified during the Screening and Scoping phases. This Scoping Report was developed through site observations and consultation with relevant stakeholders, specifically the relevant landowners. An Environmental Management Plan (EMP) is also included as part of this report (Section 8).

With reference to the EIA regulations and a workshop held between the MET and the Environmental Assessment Professionals' Association of Namibia (EAPAN) in May 2013, MET spelt out the requirements for the EIA process relating to mineral exploration activities as follows:

- Conduct a Scoping process (including public participation)
- Prepare a Scoping Report and environmental management plan (EMP)
- Submit the final report to MET for a decision and environmental clearance (Environmental Clearance Certificate).

This report is the Scoping Report and EMP. Taking the above mentioned into consideration, this report will provide sufficient information for the MET to make an informed decision regarding the proposed exploration activities, and whether an environmental clearance certificate can be issued or not.

More detailed information on the Scoping Report and EMP is provided in Section 2.2.

1.3.2 EIA SCOPING PROCESS

The EIA Scoping process and corresponding activities are outlined in Table 1-1 below.

Table 1-1: EIA Scoping process

Objectives	Corresponding activities
Project initiation/screening phase (July 2014)	
• Identify environmental aspects and potential impacts internally • Notify the decision making authority of the proposed exploration activities • Initiate the EIA Scoping process.	• Project initiation discussions with the project proponent (Epangelo). • Identify environmental and social issues and determine legal requirements.
Scoping phase (including assessment of impacts) (July – October 2014)	
• Identify interested and/or affected parties (IAPs) (specifically relevant landowners) and involve them in the scoping process through information sharing. • Further identify potential environmental issues associated with the proposed project. • Consider alternatives. • Provide a description of the potentially affected environment. • Assessment of potential environmental impacts associated with the proposed project. • Develop management and mitigation measures.	• Identify government authorities and IAPs and notify them of the project and EIA process. • IAP registration and initial comments period. • Site visit and Focus Group meeting with landowners. • Compilation of Scoping Report and EMP. • Distribute Scoping Report and EMP to relevant authorities and IAPs for review • Submission of Application form to MET. • Forward finalised Scoping Report and EMP with IAPs comments to MET for decision making.

More details regarding the public participation process are provided in Section 2.3.

1.3.3 EIA TEAM

SLR Environmental Consulting (Namibia) (Pty) Ltd (SLR) is an independent firm of consultants who were appointed to undertake the environmental impact assessment processes. Simon Charter, the EIA project manager, has 8 years of experience of EIA preparation, compilation of EMPs, conducting audits and reviewing relevant reports. Werner Petrick is the reviewer and has more than sixteen years of relevant experience in conducting / managing EIAs, compiling EMPs and implementing EMPs and Environmental Management Systems. Both Werner and Simon are certified as lead environmental practitioners and reviewers under the Environmental Assessment Professionals Association of Namibia (EAPAN). The relevant curriculum vitae documentation is attached in Appendix G. The environmental project team is outlined in Table 1-2 below.

Table 1-2: The environmental project team

Team	Name	Designation	Tasks and roles	Company
Epangelo Mining Company's Project Team	Vilho Hanghome	General Manager: Mineral Resources Development	Responsible for the interface between Epangelo and the environmental team, and for ensuring implementation of the EIA/EMP outcomes.	Epangelo Mining Company (Pty) Ltd
Project management	Simon Charter	Project Manager	Management of the process. Report compilation.	SLR Environmental Consulting (Pty) Ltd
	Werner Petrick	Project review	Review the process and relevant reports and provide assistance.	
	Nadine Soutschka	Project Assistant	Project administration, etc.	

2 SCOPING METHODOLOGY

2.1 INFORMATION COLLECTION

SLR used various sources to identify the environmental issues associated with the exploration activities. The main sources of information for the preparation of this Scoping Report include:

- Project information provided by Epangelo Mining Company.
- Site visit by SLR (with Epangelo Mining Company) to the EPL areas - the entire area was not covered, as some areas are inaccessible at this stage.
- Literature research.
- Consultation with Interested and Affected Parties (IAPs) (i.e. relevant landowners).
- Consultation with relevant local authorities.

2.2 SCOPING REPORT

The main purpose of this Scoping Report is to indicate which environmental aspects relating to the exploration activities might have an impact on the environment, to assess them and to provide management and mitigation measures to avoid or reduce these impacts. The scope of this EIA process therefore only includes the impacts associated with the exploration activities. Table 2-1 outlines the Scoping Report requirements contained in Section 8 of the Environmental Impact Assessment Regulations promulgated in February 2012 under the Environmental Management Act, 7 of 2007. The table includes reference to the relevant sections in the report.

Table 2-1: Scoping report requirements stipulated in the EIA regulation

Requirements for a Scoping Report in terms of the February 2012 regulations	Reference in report
(a) the curriculum vitae of the EAP who prepared the report;	Appendix G
(b) a description of the proposed activity;	Sections 1 & 4
(c) a description of the site on which the activity is to be undertaken and the location of the activity on the site	Section 5
(d) a description of the environment that may be affected by the proposed activity and the manner in which the geographical, physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed listed activity;	Sections 5 & 7
(e) an identification of laws and guidelines that have been considered in the preparation of the Scoping Report;	Section 3
(f) details of the public consultation process conducted in terms of regulation 7(1) in connection with the application, including -	Section 2, Appendices

Requirements for a Scoping Report in terms of the February 2012 regulations	Reference in report
(i) the steps that were taken to notify potentially interested and affected parties of the proposed application; (ii) proof that notice boards, advertisements and notices notifying potentially interested and affected parties of the proposed application have been displayed, placed or given; (iii) a list of all persons, organisations and organs of state that were registered in terms of regulation 22 as interested and affected parties in relation to the application; and (iv) a summary of the issues raised by interested and affected parties, the date of receipt of and the response of the EAP to those issues;	A,B,C,D
(g) a description of the need and desirability of the proposed listed activity and any identified alternatives to the proposed activity that are feasible and reasonable, including the advantages and disadvantages that the proposed activity or alternatives have on the environment and on the community that may be affected by the activity;	Sections 1.2
(h) a description and assessment of the significance of any significant effects, including cumulative effects, that may occur as a result of the undertaking of the activity or identified alternatives or as a result of any construction, erection or decommissioning associated with the undertaking of the proposed listed activity;	Section 7
(i) terms of reference for the detailed assessment; and	
(j) a draft management plan, which includes - (i) information on any proposed management, mitigation, protection or remedial measures to be undertaken to address the effects on the environment that have been identified including objectives in respect of the rehabilitation of the environment and closure; (ii) as far as is reasonably practicable, measures to rehabilitate the environment affected by the undertaking of the activity or specified activity to its natural or predetermined state or to a land use which conforms to the generally accepted principle of sustainable development; and (iii) a description of the manner in which the applicant intends to modify, remedy, control or stop any action, activity or process which causes pollution or environmental degradation remedy the cause of pollution or degradation and migration of pollutants.	Section 8

2.3 PUBLIC PARTICIPATION PROCESS

The public participation process for the exploration activities aimed to ensure that all persons (i.e. relevant landowners) and/or organisations that may be affected by, or interested in, the proposed activities were informed of the project and could register their views and concerns. By consulting with IAPs the range of environmental issues to be considered in the Scoping Report (including the assessment of impacts) has been given specific context and focus.

Included below is a summary of the people consulted, the process that was followed, and the issues that were identified.

2.3.1 EPANGELO MINING COMPANY STAKEHOLDERS

The following table (Table 2-2) provides a broad list of stakeholders that are relevant to the proposed project. They were informed about the exploration activities and the public consultation process.

Table 2-2: Stakeholders

Stakeholder Grouping	Organisation
Government Ministries	• Ministry of Environment and Tourism (MET) ○ Department of Environmental Affairs • Ministry of Mines and Energy
Local authorities	• Regional authorities.
Affected landowners	• Farm owners
Other interested and affected parties	• Any other people with an interest in, or who may be affected by, the proposed project.

The full stakeholder database for this project is included in Appendix B of the report.

2.3.2 STEPS IN THE CONSULTATION PROCESS

Table 2-3 sets out the steps in the consultation process that were conducted during the EIA Scoping process:

Table 2-3: Consultation process with IAPs

TASK	DESCRIPTION	DATE
Notification - regulatory authorities and IAPs		
IAP identification	The stakeholder database was created and has been updated throughout the EIA Scoping process, where required. A copy of the IAP database is attached in Appendix B. The majority of the land owners in the area were contacted through direct phone calls, via email, through local famers' associations and through word-of-mouth	July 2014
Distribution of Background Information Document (BID)	SLR contacted (telephonically and via email) most of the affected farm owners to further explain the project and the EIA process, etc. SLR also contacted the regional Farmer's Associations to share the same information.	July 2014

TASK	DESCRIPTION	DATE
and telephone calls	BIDs were emailed to I&APs on the 22 and 23 July 2014. Hard copies of the BID were also made available during the Scoping Focus Group (farmers) meeting on 30 July 2014. The purpose of the BID was to inform IAPs about the exploration activities, the EIA (Scoping) process being followed, possible environmental impacts and means of providing input into the EIA (Scoping) process. Attached to the BID was a registration and response form, which provided IAPs with an opportunity to submit their names, contact details and comments on the project. A copy of the BID is attached in Appendix A.	
Site notices	Site notices were placed at the following locations: • Omaruru Spar • Kalkfeld General Dealer Due to the extremely large scale of the project, identifying appropriate sites for notices was problematic. Site notices were therefore identified as a poor method and therefore not the primary form of IAP notification. Photos of the site notices are attached in Appendix D.	30 July 2014
Newspaper Advertisements	Block advertisements were placed as follows: • The Republikein (23 & 29 July 2014) • The Namibian (22 & 28 July 2014) Copies of the advertisements are attached in Appendix C.	23 & 29 July 2014 22 & 28 July 2014
Focus Group Meeting and submission of comments		
Focus group meeting.	A meeting with local land owners was held on 30 July 2014. The information shared is attached in Appendix E.	30 July 2014
Comments and Responses	All comments received by email, fax, telephone conversations and through the meetings (minutes) are attached in Appendix E. A Summary Issues and Response Report is attached in Appendix F.	July 2014
Review of draft Scoping Report		
IAPs and authorities (excluding MET)	The Scoping Report was distributed to all IAPs that are registered on the IAP database via e-mail. An electronic copy (CD format) was made available to certain	4 September 2014 - 3 October 2014

TASK	DESCRIPTION	DATE
review of Scoping Report and EMP	IAPs, on request. Authorities and IAPs have 21 working days to review the Scoping Report and submit comments in writing to SLR. The closing date for comments is 25 September 2014.	
Comments on the Scoping Report	All comments received are attached in Appendix E. The Issues and Response Report (Appendix F) was also updated to include the additional comments.	End of the comment period
MET review of Scoping Report and EMP	A copy of the final Scoping Report, including authority and IAP review comments, was delivered to MET on completion of the public review process, for their review and decision.	Early October 2014

2.3.3 SUMMARY OF ISSUES RAISED

All issues that have been raised to date by IAPs are provided in Appendix E of the Scoping Report. Issues raised pertain to:

- Impact on water resources (water use);
- Fires;
- Road use;
- Illegal hunting activities;
- Land access agreements;
- Loss of income, particularly in relation to exploration on hunting farms;
- Socio-economic issues relating to the granting of access, disturbance and land use impacts;
- Rehabilitation requirements;

An Issues & Responses Report is attached in Appendix F.

3 LEGAL FRAMEWORK

The Republic of Namibia has five tiers of law and a number of policies relevant to environmental assessment and protection, which includes:

- The Constitution.
- Statutory law.
- Common law.
- Customary law.
- International law.

Key policies currently in force include:

- The EIA Policy (1995).
- Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation (1994).

As the main source of legislation, the Constitution of the Republic of Namibia (1990) makes provision for the creation and enforcement of applicable legislation. In this context and in accordance with its constitution, Namibia has passed numerous laws intended to protect the natural environment and mitigate against adverse environmental impacts.

3.1 APPLICABLE LAWS AND POLICIES

In the context of the proposed exploration activities, there are several laws and policies currently applicable. They are reflected in Table 3-1.

Further legislative details can be found in Appendix H.

TABLE 3-1: RELEVANT LEGISLATION AND POLICIES FOR THE EXPLORATION ACTIVITIES

YEAR	NAME	Natural Resource Use (energy & water)	Emissions to air (fumes, dust & odours)	Emissions to land (non-hazardous & hazardous	Emissions to water (industrial & domestic)	Noise (remote only)	Visual	Vibrations	Impact on Land use	Impact on biodiversity	Impact on Archaeology	Emergency situations	Socio-economic	Safety & Health
1990	The Constitution of the Republic of Namibia of 1990	X	X	X	X	X	X	X	X	X	X	X	X	X
1997	Namibian Water Corporation Act, 12 of 1997	X											X	
1992	The Minerals (Prospecting and Mining) Act 33 of 1992	X	X	X	X					X				
2001	The Forestry Act 12 of 2001	X							X	X				
2013	Water Resources Management Act 11 of 2013 (not yet enforced)	X			X								X	
2004	National Heritage Act 27 of 2004										X			X
2007	Environmental Management, Act 7 of 2007	X	X	X	X	X	X	X	X	X	X		X	X
2012	Regulations promulgated in terms of the Environmental													

YEAR	NAME	Natural Resource Use (energy & water)	Emissions to air (fumes, dust & odours)	Emissions to land (non-hazardous & hazardous	Emissions to water (industrial & domestic)	Noise (remote only)	Visual	Vibrations	Impact on Land use	Impact on biodiversity	Impact on Archaeology	Emergency situations	Socio-economic	Safety & Health
	Management, Act 7 of 2007													
1975	Nature Conservation Ordinance 14 of 1975	X			X					X	X			
1976	Atmospheric Pollution Prevention Ordinance 11 of 1976		X											
1995	Namibia's Environmental Assessment Policy for Sustainable Development and Environmental Conservation	X	X	X	X	X	X	X	X	X	X	X		X

4 DESCRIPTION OF THE EXPLORATION ACTIVITIES

Epangelo wish to conduct exploration programs on EPLs 4817 and 4833 for base and rare metals, industrial minerals and precious metals. During that time period the following activities will be undertaken:

- Geological studies and field mapping
- Soil surveys
- Geophysical surveys
- Drilling

4.1.1 GEOLOGICAL MAPPING

This includes the review of geological maps of the area and on-site ground traverses and observations. The maps will be updated where relevant information has been obtained.

4.1.2 LITHOLOGY AND SOIL SAMPLING SURVEYS

With guidance from the geological mapping, samples of rocks and soil are collected and sent for geochemical major and trace element analysis to determine if sufficient quantities of base & rare or precious metal or industrial minerals are present. These analyses are conducted by analytical chemistry laboratories.

Small pits (±20cm X 20cm X 30cm) will be dug where 1 kg samples can be extracted and sieved to collect 50 g of material. Pits are filled back in upon completion of sampling.

Depending on the commodity, trenches or pits might be dug to investigate the mineral potential. The length and depth of the trenches or pits, as well as the method on how to dig them, e.g., manual or excavator, needs to be discussed with the landowner. In order to minimise the risks associated with excavations, all excavations will either be opened and closed on the same day or fenced off until closed to ensure that no life stock or wildlife could be harmed.

4.1.3 GEOPHYSICAL SURVEYS

Geophysical surveys are conducted in order to ascertain the mineralisation of a given area and entails the collection of information of the substrata, by air or ground, through sensors such as radar, magnetic and electromagnetic to detect any mineralisation in the area.

Ground geophysical surveys would be carried out using sensors mounted on vehicles or carried by staff.

When air surveys are conducted, sensors will be mounted to an aircraft, which flies over the target area. These surveys are contracted out to companies specialising in aerogeophysical surveys.

4.1.4 DRILLING

Drilling would only be undertaken upon satisfactory results of lithological and soil surveys.

Exploration drilling is the process of collecting rock samples beneath the surface from an area, where the previous surveys (mapping and geophysics) showed that there is mineralisation potential. Holes will be drilled and drill samples collected for analysis of major and trace elements. There are various drilling methods available and the applicant will utilise either open percussion drilling; reverse circulation drilling; and/or diamond-core drilling.

A typical drilling pad/area will consist of a drill-rig, an area where the drill core and geological samples can be stored and a storage area for drill equipment, fuel and lubricants. This area is cordoned off and off-limits to those not part of the exploration team. The drilling pad/area is usually cleared and levelled and is approximately 10 m x 10 m. All drill-water during diamond-core drilling will be collected in drill-sumps, which will be managed to prevent overflows.

Reverse Circulation (RC) Drilling/Open percussion drilling:

The drilling mechanism is a pneumatic reciprocating piston known as a "hammer" driving a tungsten-steel drill bit. RC drilling utilises much larger rigs and machinery and depths of up to 500m are routinely achieved. RC drilling ideally produces dry rock chips, as large air compressors dry the rock out ahead of the advancing drill bit. RC drilling is slower and costlier but achieves better penetration; however it is less costly than diamond coring.

Open percussion drilling differs in that air is blown directly down the drill-hole in order to return rock samples to the surface.

Diamond-core Drilling:

Diamond core drilling uses an annular diamond-impregnated drill bit attached to the end of hollow drill rods to cut a cylindrical core of solid rock. Holes within the bit allow water to be delivered to the cutting face. This provides three essential functions — lubrication, cooling, and removal of drill cuttings from the hole. Diamond drilling is much slower than reverse circulation (RC) drilling due to the hardness of the ground being drilled. Drilling of 100 to 1800 metres is common and at these depths, ground is mainly hard rock.

Diamond rigs can also be part of a multi-combination rig. Multi-combination rigs are a dual setup rig capable of operating in either a reverse circulation (RC) and diamond drilling role (though not at the same time). This is a common scenario where exploration drilling is being performed in a very isolated location. The rig is first set up to drill as an RC rig and once the desired metres are drilled, the rig is set up for diamond drilling. This way the deeper metres of the hole can be drilled without moving the rig and waiting for a diamond rig to set up on the pad.

Samples taken during drilling and soil surveys will be sent away for analysis, specifically to determine the mineral composition and the level of base metals, namely copper, zinc and lead within the samples. Samples are taken during drilling by either the geologists or geological assistants and can be in either rock, soil or drill core form.

4.2 PERSONNEL AND MACHINERY / VEHICLES

The Table below provides a summary of the anticipated personnel and machinery/vehicles required to accomplish the above mentioned exploration activities.

TABLE 4-1: ANTICIPATED PERSONNEL AND MACHINERY AND VEHICLES TO CARRY OUT THE EXPLORATION ACTIVITIES

Activity	Anticipated personnel	Machinery/vehicles (approximate)
Field mapping	1 Geologist and 1 Field Assistant	1-2 light vehicles (i.e. 4x4)
Lithology and soil surveys	Up to 6 personnel (i.e. Geologists, Geo-technician and un-skilled workers)	2-3 light vehicles
Geophysical surveys	1 Geologist 1-3 Field Assistants	1 light vehicle
Drilling	• 1 Geologists • 1-2 Geo-Technician • 3 Semi-skilled/un-skilled workers • 6 Drill Crew	• 1 Drill rig • 2 Support Trucks • 2-3 light vehicles

Where possible, the exploration and drilling teams will be housed in a nearby lodge. In remote areas, if agreed upon with the landowner, a camp site will be established to accommodate the team. The camp site will consist of tents, caravans and/or make-shift buildings and temporary ablution facilities.

The predominant type of waste that will be generated during the exploration activities, in small volumes, is domestic waste (non-hazardous).

Domestic waste will be stored in a manner that there can be no discharge of contamination to the environment and disposed of correctly (refer to EMP commitments).

Potential hydrocarbon spills from vehicles and drilling equipment might lead to soil contamination and needs to be treated as a hazardous waste if not bio-remediated.

4.3 SANITATION

In areas where ablution facilities are located in close proximity, and with consent from the landowner, personnel will use the existing facilities. Should activities be conducted in remote locations, an appropriate toilet facility will be made available for the use of personnel. Due to health and safety concerns, personnel may not relieve themselves in the surrounding bush.

4.4 WATER SUPPLY

Water will be required for diamond-core drilling and for dust suppression. Water can be supplied through existing farm boreholes (with the permission of the land owners); new boreholes created by Epangelo specifically for exploration activities (permits required);or trucked in from the nearest municipality. While it would be more efficient to utilise existing boreholes on the property, this would depend on the agreement reached with each landowner.

4.5 POWER SUPPLY

The various machinery and equipment required for drilling have their own power supplies and or generators attached. Fuel (diesel) will be stored in small mobile bowser. The drill rigs will either be re-fuelled with Jerry cans or directly from the bowser.

4.6 ACCESS ROUTES

As far as is practicable, no new roads or tracks will be developed. Motorised access will be limited to existing tracks during geological mapping, sampling and geophysical surveys. New access routes to the drill sites will be identified and demarcated prior to the commencement of drilling. The final alignment of new access tracks will be discussed and agreed upon with the land owners prior to the commencement of exploration activities.

4.7 REHABILITATION

Once the proposed exploration has been concluded, the impacted sites will be rehabilitated in accordance with the requirements of the EMP.

5 DESCRIPTION OF THE CURRENT ENVIRONMENT

The information presented in the section below was derived from the following sources:

- Visual observations during a site visit by SLR to the relevant EPL areas
- Discussions with Epangelo Mining Company employees
- Atlas of Namibia
- Google Earth

5.1 TOPOGRAPHY

Both EPLs are located on the central-western Plains. Stretching from the coast to about 450 km inland this big area of plains was largely formed by erosion cutting eastwards into the higher ground. This formed the catchment area of several major ephemeral rivers. Much of the area lies between 500m and 1000m above sea level and consists of metamorphic rock.

5.2 LAND USE

The entire area within which the EPLs lie is categorised as “agriculture and tourism on freehold (privately owned) land”. The majority of land in the north-eastern Erongo Region is used for agriculture, livestock farming and tourism (e.g. lodges, B&Bs, game farms, hunting etc.).

5.3 AIR QUALITY

There is some dust generated from vehicles on the gravel roads in the area, however, there is very little traffic on these smaller farm access roads. The impacted area is expected to be limited in extent due to limited emission generating activities.

No dust monitoring is currently taking place and the emissions listed above cannot be quantified.

5.4 NOISE

Major sources of noise in the area where the EPLs are located, include the following:.

- Traffic on other secondary and farm roads.
- Agricultural activities

As a result of the predominance of agricultural activities over most parts of the EPL areas, ambient noise levels are low.

5.5 ARCHAEOLOGY

Due to the large spatial scale of the EPLs, it was not possible to carry out a full archaeological reconnaissance.

As, the EPLs cover a large area and it is likely that archaeological resources are present within their boundaries. Especially as the EPLs are located within the rock art area. For this reason, it is important that the chance find procedures outlined in the EMP be implemented.

5.6 BIODIVERSITY

The EPLs fall within the Tree-and-Shrub Savanna Biome (Mendelsohn, 2009). The vegetation in the study area can broadly be classified as the western highlands thurnbush shrubland. Dominant tree species in the area include *Acacia mellifera* (Swarthaak), *Acacia reficiens* (Rooihak) and *Acacia fleckii* (Sand-veld Acacia).

There are a number of protected tree species that are known to occur in the area. These include:

- *Acacia erioloba*
- *Albizia anthelmintica*
- *Boscia albitrunca*
- *Colophospermum mopane*
- *Combretum imberbe*
- *Elaeodendron transvaalensis*
- *Erythrina decora*
- *Euclea pseudebenus*
- *Kirkia accuminata*
- *Maerua schinzii*
- *Parkinsonia africana*
- *Rhus lancea*
- *Sterculia africana var africana*

It is expected that 61-75 mammal species and over 140 bird species may occur in the area. Furthermore, the EPLs fall within an area of high endemism of mammals, birds and reptiles (Simmons *et al.* 1998).

5.7 WATER

The EPLs fall in the Brandberg- Waterberg hydrological area and within the geology of the Swakop Group. The groundwater potential of fractured aquifers in the Swakop Group of the Damara Sequence is generally low.

Very few perennial rivers occur in Namibia, all of which are located along international boundaries. Watercourses in Namibia are typically ephemeral, only flowing after rainfall events. In such systems the surface water normally only flows over a short distance before disappearing underground where it contributes to the recharge of the underlying aquifer. The EPLs are located in the Ugab watershed, which is the second largest ephemeral catchment area of the country.

6 ALTERNATIVES

6.1 ACCESS ROUTE ALTERNATIVES

All the access routes to the explorations sites (or target areas) have not yet been determined, however, the shortest route is usually the preferred option. However, in most instances, these access routes will create new tracks across the area, which might cause additional impacts to the environment (I.e. dust, general disturbance to biodiversity, visual impacts, etc.). Instead of this approach, in order to limit the clearing of vegetation and other potential impacts, existing tracks can be utilized. The landowners are often aware of existing tracks on their properties and could provide details regarding the locations of existing tracks.

6.2 DRILLING OPTIONS

As explained in section **Error! Reference source not found.** of this report, various drilling options exist. Diamond core drilling can achieve greater depths, delivers core samples to the surface, provides an idea of the hard rock and rock conditions that can be expected below ground and is a form of wet drilling. Wet drilling is favourable as it minimises the nuisance dust impact, from both an occupational health and an environmental point of view. However, considering the difficulty associated with obtaining water in certain areas, this may be a more difficult form of drilling to achieve.

Percussion drilling is cheaper and faster to perform, however there is less accuracy, as rock samples are returned to the surface as powder or small cuttings and the below ground rock condition cannot be ascertained. It can, however, give an indication of the mineralisation (within specific limits/range).

6.3 NO-GO OPTION

This option entails that no further activities are undertaken on the EPL areas and upon expiration it will revert back to the Ministry of Mines and Energy. Should this happen, the economic and social growth associated with the potential resource will not reach fruition, and Namibian economy will fail to benefit from a potential mineral resource. The advantage of this option would be that no exploration activities would take place on private and/or public land and will not negatively impact on the environment and/or the landowners.

However, it must be noted that exploration within Namibia has been identified as a national priority. Should no exploration activities be carried out by Epangelo and the EPLs reverted back to the Ministry

then it is highly probable that they will be allocated to another exploration company who will be expected to carry out the required prospecting.

7 IDENTIFICATION OF ENVIRONMENTAL ASPECTS AND IMPACTS AND IMPACT ASSESSMENT

The exploration activities have the potential to impact on the environment. Environmental aspects and potential impacts were identified during the screening and scoping phases, in consultation with authorities, IAPs and the environmental team. Given the relatively limited nature of the proposed activities and taking the existing environment into consideration, the potential impacts were also qualitatively assessed by SLR.

Table 7-2 below provides a summary of the activities associated with the exploration programme, the associated environmental aspects and potential impacts on the environment and also a qualitative assessment of these impacts (before and after mitigation). The aspect identification and impact assessment is based on the "worst case scenario" – taking into consideration that the activities might in future be extended into other areas on the EPLs (refer to section 4.1).

Table 7-1 shows the methodology used to conduct the qualitative assessment.

TABLE 7-1: CRITERIA FOR ASSESSING IMPACTS

PART A: DEFINITION AND CRITERIA		
Definition of SIGNIFICANCE		**Significance = consequence x probability**
Definition of CONSEQUENCE		**Consequence is a function of severity, spatial extent and duration**
Criteria for ranking of the SEVERITY/NATURE of environmental impacts	**H**	Substantial deterioration (death, illness or injury). Recommended level will often be violated. Vigorous community action. Irreplaceable loss of resources.
	M	Moderate/ measurable deterioration (discomfort). Recommended level will occasionally be violated. Widespread complaints. Noticeable loss of resources.
	L	Minor deterioration (nuisance or minor deterioration). Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints. Limited loss of resources.
	L+	Minor improvement. Change not measurable/ will remain in the current range. Recommended level will never be violated. Sporadic complaints.
	M+	Moderate improvement. Will be within or better than the recommended level. No observed reaction.
	H+	Substantial improvement. Will be within or better than the recommended level. Favourable publicity.
Criteria for ranking the DURATION of impacts	**L**	Quickly reversible. Less than the project life. Short term
	M	Reversible over time. Life of the project. Medium term
	H	Permanent. Beyond closure. Long term.
Criteria for ranking the SPATIAL SCALE of impacts	**L**	Localised - Within the site boundary.
	M	Fairly widespread – Beyond the site boundary. Local
	H	Widespread – Far beyond site boundary. Regional/ national

PART B: DETERMINING CONSEQUENCE					
SEVERITY = L					
DURATION	Long term	**H**	**Medium**	**Medium**	**Medium**
	Medium term	**M**	**Low**	**Low**	**Medium**
	Short term	**L**	**Low**	**Low**	**Medium**
SEVERITY = M					
DURATION	Long term	**H**	**Medium**	**High**	**High**
	Medium term	**M**	**Medium**	**Medium**	**High**
	Short term	**L**	**Low**	**Medium**	**Medium**
SEVERITY = H					
DURATION	Long term	**H**	**High**	**High**	**High**
	Medium term	**M**	**Medium**	**Medium**	**High**
	Short term	**L**	**Medium**	**Medium**	**High**
			L	**M**	**H**
			Localised Within site boundary Site	Fairly widespread Beyond site boundary Local	Widespread Far beyond site boundary Regional/ national
			SPATIAL SCALE		
PART C: DETERMINING SIGNIFICANCE					
PROBABILITY (of exposure to impacts)	Definite/ Continuous	**H**	**Medium**	**Medium**	**High**
	Possible/ frequent	**M**	**Medium**	**Medium**	**High**
	Unlikely/ seldom	**L**	**Low**	**Low**	**Medium**
			L	**M**	**H**
			CONSEQUENCE		

PART D: INTERPRETATION OF SIGNIFICANCE	
Significance	**Decision guideline**
High	It would influence the decision regardless of any possible mitigation.
Medium	It should have an influence on the decision unless it is mitigated.
Low	It will not have an influence on the decision.

Table 7-2: Environmental aspects and potential impacts associated with the exploration activities

ACTIVITY	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	SIGNIFICANCE DISCUSSION	MITIGATION (with & without)	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	REFERENCE
Field mapping and geophysical surveys											
Air surveys	Noise	Noise generated by the low flying airplanes could disturb local fauna.	Low flying airplanes could cause wildlife to run away, which in turn would result in wild stock loss. Spooked wildlife and livestock could breach fences causing property damaged in addition to the loss of stock. Airplanes are expected to fly as low as 50 meters from the ground. Should they fly over wildlife enclosures then it is very likely that wildlife and livestock will be spooked.	Without	M	L	M	M	M	**M**	1
				With	L	L	L	L	L	**L**	
		Inconvenience to landowners	The low flying airplanes would create a direct noise-related disturbance for local residences and tourist facilities.	Without	L	L	L	L	M	**M**	2
				With	L	L	L	L	L	**L**	
Field mapping and ground surveys	Socio-economic	Inconvenience to landowners	In the case of the exploration team being allowed unsupervised access, there is the potential that gates may be left open, resulting in the movement of wildlife and livestock, as well as an increased risk of criminal activities. The potential impacts on cultivated / agricultural/horticultural land is regarded as insignificant as the field mapping and surveying	Without	H	M	L	M	M	**M**	3
				With	L	L	L	L	L	**L**	

ACTIVITY	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	SIGNIFICANCE DISCUSSION	MITIGATION (with & without)	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	REFERENCE
			activities will not damage any land.								
	Biodiversity	Potential impact on fauna and flora (General disturbance and clearing of vegetation)	Some clearing of natural vegetation may occur as vehicles may have to drive off-track to access certain areas. However, it is very small scale, involving a limited number of vehicles. Access routes for staff on foot would also have to be developed in some instances due to the dense nature of the vegetation in certain areas.	Without	M	M	L	M	M	**M**	4
				With	L	L	L	L	L	**L**	
	Air quality	Increase in dust levels (nuisance & health impacts)	Dust generation through the establishment of an access track (if necessary). Air pollution through vehicle entrainment is expected to be negligible due to the small scale of the project. However, where vehicles travel close to residences, the dust from the roads might be a nuisance to the residents. Air pollution through vehicle emissions (i.e. exhaust fumes) is expected to be negligible due to the small scale of the project.	Without	L	L	M	L	M	**L**	5
				With	L	L	L	L	L	**L**	
	Heritage	Activities could result in possible damage to/destruction of heritage resources.	Heritage sites will have to be avoided during exploration. A chance find procedure has also been included in the EMP.	Without	L	H	L	M	M	**M**	6
				With	L	H	L	M	L	**L**	

ACTIVITY	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	SIGNIFICANCE DISCUSSION	MITIGATION (with & without)	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	REFERENCE
Sampling											
Soil sampling	Socio-economic	Inconvenience to landowners	Impact reference: 3	Without	M	L	M	M	M	**M**	3
				With	M	L	M	L	L	**L**	
	Biodiversity	Potential impact on fauna and flora (General disturbance and clearing of vegetation)	Impact reference: 4	Without	L	M	L	L	M	**M**	4
				With	L	L	L	L	L	**L**	
				With	L	L	L	L	L	**L**	
Drilling											
Drill site establishment: Access the drill site using a new	Noise	Noise generated by the establishment of access tracks and site clearing/ establishment activities.	Should the activities take place in close proximity to a residence, the noise from these activities might be a nuisance impact.	Without	M	L	M	M	M	**M**	7
				With	L	L	M	L	M	**L**	
	Biodiversity	Potential impact on fauna and flora.	Due to the fact that the activities are relatively	Without	L	M	L	L	M	**M**	8

ACTIVITY	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	SIGNIFICANCE DISCUSSION	MITIGATION (with & without)	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	REFERENCE
access track Set-up drilling machine with drip trays and groundsheets Establish temporary safety fencing around the drill site Set-up ablution facilities Set-up fuel and lubricants storage area Waste management		(General disturbance and clearing of vegetation) Drilling contractors and employees that are not well managed can impact on the biodiversity through illegal collection of firewood, poaching, road kills etc. Loss of economic function of disturbed area during exploration activities and potential loss of land capability	small and the fact that the exploration team will not be very big, potential poaching and collection of firewood impacts can easily be managed through appropriate management and mitigation measures outlined in the EMP. Could result in possible loss of land available for livestock farming.	With	L	L	L	L	L	**L**	
		Site clearance may allow for the establishment of invasive plants in the area.	The area is to be rehabilitated upon closure. Certain areas are currently characterised by severe bush encroachment. However, management measures relating to the control of bush encroachment have been included in the EMP.	Without	L	M	M	M	M	**M**	9
				With	L	L	L	L	L	**L**	
	Land use	Loss off land capability due site clearance.	Possible loss of grazing and agricultural land. The rehabilitation of the site will allow for the continued use for grazing and agricultural activities Exploration activities may impact hunting activities in the area, thereby impacting the livelihoods of land owners. Careful scheduling/planning around the hunting season and compensation agreements for financial losses reduce the	Without	H	M to H	M	M to H	H	**M to H**	10
				With	M	L	M	M	L	**L**	

ACTIVITY	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	SIGNIFICANCE DISCUSSION	MITIGATION (with & without)	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	REFERENCE
			significance of this impact.								
	Heritage	Exploration activities could result in possible damage to/destruction of heritage resources.	Impact reference: 6								6
Drilling	Spillages of hydrocarbons, lubricants, or possible spills from ablution facilities	Soil pollution	Soil loss and contamination could have an impact on grazing animals. However, the area to be disturbed is very localise and on a small-scale, and impacts can be easily mitigated.	Without	H	M	L	M	M	**M**	11
				With	L	L	L	L	L	**L**	
		Surface water contamination	Given the small area to be impacted per hole and the lack of surface water resources, this impact is likely to be insignificant. Mitigation measures can be found in the EMP.	Without	L	L	L	L	L	**L**	12
				With	L	L	L	L	L	**L**	
		Groundwater could become polluted due to pollutants entering aquifers via surface water infiltration.	Given the small area to affected, per hole, this impact is likely to be insignificant.	Without	L	L	L	L	L	**L**	13
				With	L	L	L	L	L	**L**	
	Dust generation through using the access track. Air pollution	Air quality deterioration. Increase in dust levels (nuisance & health impacts)	Dust generation through the establishment of an access track (if necessary). Air pollution through vehicle entrainment is expected to be negligible due to the small scale of the project. However, where vehicles travel close to residences, the dust from the roads might be a	Without	M	L	M	M	M	**M**	5

ACTIVITY	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	SIGNIFICANCE DISCUSSION	MITIGATION (with & without)	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	REFERENCE
	from exhaust fumes. Dust generation through drilling activities		nuisance to the residents. Air pollution through vehicle emissions (i.e. exhaust fumes) is expected to be negligible due to the small scale of the project.	With	L	L	L	L	L	**L**	
	Noise generation	Noise generated by the drill could disturb nearby residences (nuisance).	Impact reference: 7								7
	Land use	Loss off land capability due site clearance.	Impact reference: 10								10
Groundwater abstraction (if required)	Groundwater	Reduction in availability of groundwater	The reduction in the availability of groundwater could impact land use in the area. It is unlikely that the quantities required will impact groundwater levels. Nevertheless, impacts on groundwater in an arid area such as this could have a high severity.	Without	H	M	M	M	M	**M**	14
				With	L	L	L	L	L	**L**	
Relevant to all activities											
All exploration activities	Socio-economic and community safety	The proposed activities may have the potential to result in an increase in crime and/or poaching on the farms. Given that access to explorations/drill sites	Given the location of the exploration area and need for a close working relationship with the landowners, these potential impacts can be mitigated through the implementation of the EMP.	Without	M	L	M	M	M	**M**	15
				With	M	L	M	L	L	**L**	

ACTIVITY	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	SIGNIFICANCE DISCUSSION	MITIGATION (with & without)	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	REFERENCE
		may be gained through the use of community access roads, this could pose a threat to community safety.									
	Waste Management	The dumping of general waste within the exploration area and drilling sites could prove hazardous to wildlife and livestock, as well as impede agricultural production. This could also lead to general environmental degradation.	Waste generation is likely to be limited on site and will primarily be domestic waste. This material will be removed daily and disposed of properly off-site. Through the effective implementation of the management and mitigation measures, as described in the EMP (Section 8) the potential impacts relating to waste management can be avoided/mitigated.	Without	M	L	M	M	M	**M**	16
				With	M	L	M	L	L	**L**	
	Social – provision of toilet facilities	Health & safety issues	If suitable toilet facilities are not provided for the exploration team, they will relieve themselves in the environment which could lead to potential health and safety issues to 3rd parties	Without	L	L	M	L	M	**M**	17
				With	L	L	L	L	L	**L**	
Closure and rehabilitation of drill site											
Remove all waste and equipment from site. Rip compacted areas (including access roads	Biodiversity and land use	Positive environmental impact as a result of rehabilitation.	The impacted sites will be rehabilitated in accordance with the EMP requirements.	Without	N/A						18
				With	M	H	L	M	H	M +	

ACTIVITY	ASPECT	POTENTIAL ENVIRONMENTAL IMPACT	SIGNIFICANCE DISCUSSION	MITIGATION (with & without)	SEVERITY	DURATION	SPATIAL SCALE	CONSEQUENCE	PROBABILITY	SIGNIFICANCE	REFERENCE
and paths).											

With reference to Table 7.1, it can be seen that the activities and facilities associated with the exploration programme is unlikely to have high significant impacts on the environment if mitigation measures are implemented.

8 ENVIRONMENTAL MANAGEMENT PLAN

8.1 AIMS

The aim of the Environmental Management Plan (EMP) is to detail the actions required to effectively implement mitigation and management measures. These actions are required to minimise negative impacts and enhance positive impacts associated with the operations.

The EMP gives the commitments, which form the environmental contract between Epangelo and the Government of the Republic of Namibia; represented by the Ministry of Environment and Tourism (MET).

It is important to note that an EMP is a living document in that it will be updated and amended as new information (e.g. environmental data), policies, authority guidelines, technologies and proposed activities develop. The conceptual management measures proposed to mitigate the potential impacts are detailed in the action plans below.

8.2 ACTION PLANS TO ACHIEVE OBJECTIVES

Action plans to achieve the objectives are listed in tabular format together, separated by activities. The action plans also includes the frequency for implementing the mitigation measures as well as identifying the responsible party.

TABLE 8-1: ENVIRONMENTAL MITIGATION MEASURES AND COMMITMENTS – FIELD MAPPING, GEOPHYSICAL SURVEYS AND SOIL SAMPLING

Activity	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	Responsible Parties
Air survey	Noise	- Discuss flight plans and schedule with land owners prior to air surveys. - Avoid residences, game and livestock enclosures where possible. - Where possible, avoid air surveys during hunting season (1 February until 30 November). Where not possible, schedule exploration activities in such a way that disturbances to hunting operations are minimised.	Prior to air surveys	Project Manager Pilots
Ground survey, mapping, soil sampling and trenching/pitting	Socio-economic	- Honour agreements set out in the site-access contracts - Schedule exploration activities in such a way that disturbances to hunting operations are minimised. No new access tracks are created during mapping and soil sampling if not otherwise agreed with the landowner during the land access agreement. - Consult landowner if dangerous animals are on the farm - No firearms are allowed on the farm - Consult and provide feedback regarding activities on the individual properties - Provide contact details of a designated Epangelo person, who will serve as liaison between landowners and the exploration teams - Poaching and plant theft will not be tolerated and staff found in possession will be prosecuted - Land owners to be provided with a list of all people working on site along with a photographic key for easy identification. - Staff will be provided with visible identification. - All staff operating on site will be provided with identification and proof that they are working for the applicant - Ensure gates are closed after entry and exit. - Scheduling/planning along with residents - Notify landowner in advance of planned exploration activities - Include in landowner agreement that no smoking is permitted in the veld	Duration of mapping and surveying	Project Manager Site supervisor
	Biodiversity	- The footprint of the area to be disturbed for surveying/mapping and for providing access to survey sites will be minimised as far as is practically possible. - Epangelo will implement a zero tolerance policy with regards to the killing or collecting of any biodiversity. This applies to people directly employed by	Duration of mapping and surveying	Project Manager Site supervisor

Activity	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	**Responsible Parties**
		Epangelo as well as any contractors working on their behalf. - Employees and contractors will be shown the value of biodiversity and the need to conserve the species and systems that occur within the project area. - Inform Epangelo of botanical sensitive areas, include no-go areas in the landowner agreement - No open fires will be permitted on site. - Speed limits will be enforced so as to prevent road kills. - Permits will be required for the removal of protected tree species. - Pits and trenches will either be opened and closed on the same day or will be fenced off until such time as they can be closed. - Ensure that trenches and pits allow for smaller animals to exit the pits/trenches if they fall into them. - No excavations will be left open overnight unless fenced off. - Consult farmers to help ID important sites and species. - A floral survey of all pit/trench sites need to be conducted prior to establishment.		
	Air quality	- Vehicle speeds will be limited to 40km/h on access routes to limit dust.	Duration of mapping and surveying	Project Manager Site supervisor
	Heritage	- Consult with landowner to identify known archaeological sites on the farm - In the event that archaeological resources are discovered, a chance find emergency procedure will be implemented which includes the following: o All work at the find will be stopped to prevent damage; o An appropriate heritage specialist will be appointed to assess the find and related impacts; and o Permitting applications will be made to the necessary authorities, if required. - In the event that any graves are discovered during the exploration activities, these will be avoided and preserved as a first priority. If damage is unavoidable, prior to damaging or destroying any identified graves, permission for the exhumation and relocation of graves must be obtained from the relevant descendants (if known) and the relevant local and provincial authorities.	Duration of mapping and surveying	Project Manager Site supervisor

TABLE 8-2: ENVIRONMENTAL MITIGATION MEASURES AND COMMITMENTS – DRILL SITE ESTABLISHMENT

Activities	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	Responsible Parties
- Access the drill site using a new access track where necessary - Set-up drilling machine with drip trays and groundsheets - Strip vegetation and topsoil (up to 300mm where available) - Temporarily store topsoil adjacent to drill site - Set-up ablution facilities - Set-up fuel and lubricants storage area - Waste management	Air quality – dust and gaseous emissions	- The movement of drilling related vehicles on the unpaved access track will be on a small scale - Vehicle speeds will be limited to 30km/h on site - Vehicles and the drilling rig will be maintained in good working order - Minimise new access route development (routes to be approved by land owners prior to development)	On-going	Project Manager Site supervisor
	Noise	- Vehicles will travel maximum 30km/hour near houses/settlements	Ongoing	Project Manager Site supervisor
	Biodiversity	- Refer to biodiversity management measures relating to ground surveying, mapping and sampling (Table 8-1). - A floral survey of all drill sites need to be conducted prior to establishment to ensure that no protected (under the Ministry of Environment and CITES) species are destroyed. - Honour agreements set out in the site-access contracts, specifically relating to the areas utilised for game and livestock farming. Special consideration should be given to the sensitive hunting season. - Provide appropriate toilet facilities for the exploration workers on the site or agree with landowner to use certain facilities on the farm.	Ongoing	Project Manager Site supervisor
	Land use	- Access agreements to be prepared and approved prior to drill site establishment. - The footprint of the area to be disturbed will be minimised as far as is practically possible. The drill site should be fenced in with tape to ensure that all scheduled activities stay within the demarcated area. All tape must be removed from the site upon completion. - Agree on relevant compensation with land-owners where land uses are impacted	Ongoing	Project Manager Site supervisor
	Soil Erosion	To minimise erosion access tracks should be created as follow: • Follow as much as possible contour lines • Erect berms to minimise soil erosion during rain events • Don't create furrows, channels etc, which could lead to soil erosion during rain events. Contour lines or perpendicular to the slopes.		

Activities	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	Responsible Parties
	Heritage	- Refer to heritage management measures relating to ground surveying, mapping and sampling (Table 8-1)	Ongoing	Project Manager Site supervisor
	Socio-economic	- Refer to socio-economic management measures relating to ground surveying, mapping and sampling (Table 8-1) - Discuss water use with landowner in case of diamond drilling	Ongoing	Project Manager Site supervisor

TABLE 8-3: ENVIRONMENTAL MITIGATION MEASURES AND COMMITMENTS – DRILLING

Activities	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	**Responsible Parties**
- Drill borehole - Contain all drilling water in the sump and allow to settle - Log the drill core and place on core trays - Maintain ablution facilities	Contamination of soil/Hydrocarbon spillages	- In all areas where there is storage of hazardous substances (i.e. hydrocarbons), there will be containment of spillages on impermeable floors and bunded trays that can contain 110% of the volume of the hazardous substances. - All refuelling and any maintenance of vehicles will take place on impermeable surfaces. - Pollution will be prevented through basic infrastructure design and through maintenance of equipment. - Spill kits will be readily available on site. Employees and/or contractors will be shown to use the spill kits to enable containment and remediation of pollution incidents. - Environmental awareness training of contractor - Epangelo will establish environmental awareness in employees and contractors - A PVC lined sump will be used for collection of oils and silt contained in the drilling water - Any spills will be contained and cleaned up immediately - Non-toxic and biodegradable drilling lubricant will be used - No drilling activities to take place in close proximity (within 500 m) of any farm dam.	On-going for all drilling activities	Project Manager Site supervisor
	Groundwater contamination	- Refer to management measures relating to contamination of soils. - Licenses in terms of the Water Resource Management Act (Act No. 11 of 2013) will be obtained for all drilled holes (not just boreholes). Provide appropriate toilet facilities for the exploration workers on the site or agree with landowner to use certain facilities on the farm. - If chemical toilets are provided, these need to be serviced by an authorised company	On-going for all drilling activities	Project Manager Site supervisor

Activities	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	**Responsible Parties**
	Air quality deterioration	- Vehicle speeds will be limited to 40km/h on access routes to limit dust. - The movement of drilling related vehicles on unpaved access track will be on a small scale. - Water sprays can be used around the lay-down area when a drill-site is located near settlements (or sensitive land-use areas, i.e. horticultural areas).	On-going for all drilling activities	Project Manager Site supervisor
	Noise generation	- Drilling will only be conducted during the day when drill sites are located close to inhabited homesteads. - Drilling plans and schedules will be discussed and agreed upon with land owners prior to initiation. - Vehicles will travel maximum 30 km/hour near houses/settlements.	On-going for all drilling activities	Project Manager Site supervisor
	Land use	- Refer to land use management measures relating to drill site establishment (Table 8-2)	On-going for all drilling activities	Project Manager Site supervisor
Water abstraction	Groundwater quantity	- An agreement to abstract water from existing boreholes must be included in the land access agreement. - Water use licenses in terms of the Water Resource Management Act (Act No. 11 of 2013) will be obtained for all boreholes. - Water levels will be measured prior to abstraction, during abstraction (daily) and after completion. Levels will be reported to land owners. - Should water be reached during drilling the landowners will be informed. Should the landowners wish it; the holes will be cased and left for use by the farmers (liability relating to the boreholes will then be transferred to the landowners).	On-going for all drilling activities	Project Manager Site supervisor

TABLE 8-4: ENVIRONMENTAL MITIGATION MEASURES AND COMMITMENTS – RELEVANT TO ALL EXPLORATION ACTIVITIES

Activities	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	Responsible Parties
- All exploration activities	Social – provision of toilet facilities	- Provide appropriate toilet facilities for the exploration workers on the site or agree with landowner to use certain facilities on the farm.	On-going for all exploration activities	Project Manager Site supervisor
	Waste Management	- Waste generated will be handled in accordance with the contract signed with the landowner. - Suitable receptacles for waste disposal will be provided at appropriate locations on site. These receptacles will be clearly marked for different waste types.		Project Manager Site supervisor

Activities	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	Responsible Parties
		- Employees and contractors will be shown the importance of correct waste disposal as well as waste minimisation and recycling. - Waste will be removed from site and disposed of at a suitable licensed waste disposal facility. - Hazardous waste (including hydrocarbon contaminated material/soil) will be disposed of at a licenced hazardous waste disposal facility (Kupferberg).		

TABLE 8-5: ENVIRONMENTAL MITIGATION MEASURES AND COMMITMENTS – CLOSURE AND REHABILITATION

Activities	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	**Responsible Parties**
General closure activities: - Close drill holes (unless otherwise agreed with farmers) - Remove water from the sump and drip trays - Remove oils and silt from drip trays and store until disposal to permitted hazardous landfill site - Backfill the sump once it has dried out (dome to allow for subsidence) and plug borehole (unless an agreement is in place with landowner for alternative uses) - Move drill core trays, ablution facilities, water bowser, stores and drill rig from the site - Dispose of any general waste to a permitted landfill site	Groundwater and surface water contamination	- In all areas where there is storage of hazardous substances (i.e. hydrocarbons), there will be containment of spillages on impermeable floors and bunded trays that can contain 110% of the volume of the hazardous substances. - All refuelling and any maintenance of vehicles will take place on impermeable surfaces. - Pollution will be prevented through basic infrastructure design and through maintenance of equipment. - Spill kits will be readily available on site. Employees and/or contractors will be shown how to use the spill kits to enable containment and remediation of pollution incidents. - Any spills will be contained and cleaned up immediately	Once- Closure of drill site	Project Manager Site supervisor
	Noise pollution	- Vehicles will travel maximum 30 km/hour near houses/settlements.	On-going	Project Manager Site supervisor
	Contamination of soils	- Refer to management measures relating to contamination of water	On-going and closure	Project Manager Site supervisor
	Air quality deterioration	- Vehicle speeds will be limited to 40km/h on access routes to limit dust. - The movement of drilling related vehicles on unpaved access track will be on a small scale.	On-going	Project Manager Site supervisor
	Soil erosion	- Impacted footprints are to be raked and/or ploughed to encourage re-vegetation - Access routes and drill pads will be ripped unless the land owners wish for them to remain. - A monitoring program will be implemented to establish re-vegetation progress - Agree on relevant compensation with land-owners where land used for hunting	Starts at closure, continues for a pre-determined time (as stated in agreements)	Project Manager Site supervisor

Activities	Potential Impact	Management and Mitigation Measures	Action Plan	
			Frequency	**Responsible Parties**
- Remove temporary fencing - Rip and plough compacted areas - Replace topsoil over disturbed area - Rehabilitate access track by ripping - GPS marker to identify drill site		purposes is impacted		
	Waste management	- Decommission ablution facilities - Ensure that all waste generated during activities is removed from the site and disposed of appropriately	Once off	Project Manager Site supervisor
	Land use	- Land owners will be invited to carry out site inspections following rehabilitation in order to ensure that it has been carried out suitably.	Post-closure	Project Manager Site supervisor

9 WAY FORWARD

9.1 WAY FORWARD FOR THE SCOPING REPORT

The way forward for the EIA scoping phase is as follows:

- Submit the final Scoping Report (with comments) and EMP to MET.
- MET review the Scoping Report and EMP and provide record of decision.

10 ENVIRONMENTAL IMPACT STATEMENT AND CONCLUSIONS

The environmental aspects associated with the exploration activities have been successfully identified and assessed as part of this EIA Scoping process. Relevant mitigation measures have been provided and are included in the EMP that accompanies this scoping report.

SLR believes that a thorough assessment of the proposed project has been achieved and that an environmental clearance certificate could be issued on condition that the management and mitigation measure in the EMP be adhered to.

Simon Charter
(Project Manager)

Werner Petrick
(Project Reviewer)

11 REFERENCES

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APPENDIX A: BACKGROUND INFORMATION DOCUMENT

APPENDIX B: INTERESTED AND AFFECTED PARTIES DATABASE

APPENDIX C: NEWSPAPER ADVERTISEMENTS

APPENDIX D: PICTURE OF SITE NOTICE

APPENDIX E: PRESENTATION TO FARM OWNERS AND COMMENTS RECEIVED

APPENDIX F: ISSUES AND RESPONSE REPORT

APPENDIX G: CURRICULUM VITAE

APPENDIX H: DETAILED LEGAL INFORMATION

RECORD OF REPORT DISTRIBUTION

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Mr Theo Nghitila	MET (Environmental Commissioner)	Hard Copy	September 2014	SC

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