Johannes Christiaan Kake
(The Proponent)

Environmental Management Plan (EMP) to support the Application for Environmental Clearance Certificate (ECC) for the Proposed Exploration Activities in the Exclusive Prospecting License (EPL) (EPL 8300), **Sesfontein District, Kunene Region**

September 2022

Johannes Christiaan Kake
P.O Box 504
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PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

TYPE OF AUTHORISATIONS REQUIRING ECC

Exclusive Prospecting License (EPL) No. 8300

NAME OF THE PROPONENT

Johannes Christiaan Kake

COMPETENT AUTHORITY

Ministry of Mines and Energy (MME)

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PROPOSED PROJECT

Proposed Minerals Exploration / Prospecting activities
in the Exclusive Prospecting License (EPL)
No. 8300, Sesfontein District, Kunene Region

PROJECT LOCATION

Sesfontein District, Kunene Region
(-19.588611, 14.249444)

ENVIRONMENTAL CONSULTANTS

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NON-TECHNICAL SUMMARY

Johannes Christiaan Kake (the "Proponent") has applied for mineral rights under the Exclusive Prospecting License (EPL) 8300 Base and Rare Metals, Dimension Stones, Industrial Minerals and Precious Metals (http://portals.flexicadastre. com/Namibia). The physical license of the EPL 8300 will only be granted by the Mining Commissioner in the Ministry of Mines and Energy (MME) once the Proponent has obtained an Environmental Clearance Certificate (ECC) from the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT).

The proposed exploration / prospecting activities covers the following phases:

(i) Initial desktop exploration activities (no fieldwork undertaken).

(ii) Regional reconnaissance field-based mapping and sampling activities (Subject to the positive results of (i).

(iii) Initial local field-based mapping and sampling activities (Subject to the positive results of (ii) above).

(iv) Detailed local field-based activities such as local geological mapping, geochemical mapping, and sampling, trenching, and drilling of closely spaced boreholes and bulk sampling (Subject to the positive results of (iii) above), and.

(v) Prefeasibility and feasibility studies (Subject to the positive results of (iv) above.

The scope of the field-based support and logistical activities will be dependent on the scale of proposed exploration activities to be undertaken at any given phase / stage. The proposed / ongoing exploration activities will be supported by existing tracks and campsites / farmstead as well as existing accommodation in the local area as may be applicable. In the absences of existing tracks and depending on the scale of exploration activities being undertaken, the field team will create such new tracks with the permission of the landowner/s and in compliance with the provisions of the EMP and all applicable regulations and standards. In the absences of existing suitable campsite / farmstead, a temporary camp site will be setup at suitable location with the permission of the landowner and in line with the provisions of the EMP. The size of the exploration camp will be of very limited footprint during the initial and detailed field-based exploration phases. In an event of a discovery of economic minerals resources, the exploration campsite may be expanded for the subsequent exploration phases such as prefeasibility and feasibility studies.

The proposed exploration activities are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and cannot be undertaken without an Environmental Clearance Certificate (ECC). An application for ECC together with the supporting updated Environmental Scoping and Impact assessment and Environmental Management Plan (EMP) Report was prepared by the Risk-Based Solutions (RBS) CC on behalf of the Proponent and submitted to the Environmental Commissioner in the Ministry of Environment, Forestry and Tourism (MEFT).

The EPL 8300 is located in the Sesfontein district, Kunene Region, approximately 150 kilometres from the regional capital Opuwo and approximately 52km from Kamanjab. The EPL has a total area of 1683.815 Ha. The land use of the EPL area is surrounded by villages/settlements Palmfontein Pos, Palmfontein, and Keiserfontein which are small-scale agricultural areas on communal land. On the eastern side of the EPL are Community Forests and the Sesfontein Conservancy on eastern border of the EPL.

The area of the EPL falls within the largely semi-desert and sparse savannah. The landscape is a mixture of hills, plains, and wooded river valleys. Compared to the rest of Namibia, the region has a typically low diversity of mammals and reptiles, but it also has several significant species that should be protected.

The environmental consequence that the proposed exploration and associated infrastructure such as access and campsite would have on the receiving environment will depend on the extent of the proposed activities over the development area, management of the area and how the Proponent eventually implements the proposed mitigation measures. Avoiding sensitive habitats such as Ephemeral River channels, rock heads, mountainous terrains, granite features that might hold archaeological resources as well as track discipline (including no killing/poaching of fauna and unnecessarily cutting down of trees) must be adhered to and/or always enforced. The following is the assessment summary of the likely environmental impacts that the proposed exploration prospecting activities will have on the receiving environment (physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses) without mitigations:

(i) Initial desktop exploration activities: Overall likely negative impact on the receiving environment will be negligible with extremely unlikely probability of occurrence without mitigations. Overall significant impacts will be negligible, and no field work will take place.

(ii) Regional reconnaissance field-based activities: Overall likely negative impact on the receiving environment will be negligible with extremely unlikely probability of occurrence without mitigations. Overall significant impacts will be negligible. Some field-based activities will have localised low impacts with low probability of occurrence without mitigations and negligible with mitigations. Overall significant impacts will be negligible.

(iii) Initial local field-based activities: Initial field-based activities will have localised low impacts with low probability of occurrence without mitigations and negligible with mitigations**.** Overall significant impacts will be negligible**.** All desktop related activities and laboratory assessments will have negligible impacts with extremely unlikely probability of occurrence without mitigations. Overall significant impacts will be negligible.

(iv) Detailed local field-based activities: Overall likely negative impact on the receiving environment will be high and localised impacts without mitigations and localised low impacts with mitigations. Overall significant impacts will be medium without mitigations and low with mitigations, and.

(v) Prefeasibility and feasibility studies to be implemented on a site-specific area if the local field-based studies prove positive: Overall likely negative impact on the receiving environment will be high and localised impacts without mitigations and localised medium impacts with mitigations. Overall significant impacts will be high without mitigations and low with mitigations for bulk sampling, and field coordination including exploration camp.

The overall severity of potential environmental impacts of the proposed / ongoing project activities on the receiving environment (physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses) will be of low magnitude, temporally duration, localised extent, and low probability of occurrence. Mitigation measures as detailed in Section 6 of the Updated Scoping and EMP Report attached to this application must be implemented and monitored by the Proponent. The proponent shall obtain permission / consent from landowners (surface rights holders) before exercising their subsurface rights for all areas covered by the EPL 8300.

Based on the findings of this updated Scoping and EMP Report, it is hereby recommended that the proposed / ongoing exploration activities by the Proponent be issued with a Environmental Clearance Certificate (ECC) with the following key conditions:

(i) The Proponent shall negotiate Access Agreements with the landowners as may be applicable.

(ii) In consultation with the landowners and where possible and if key and core conservation, tourism or archaeological resources areas are identified within the EPL area, such areas shall be excluded from the proposed minerals exploration activities.

(iii) The Proponent shall adhere to all the provisions of the EMP and conditions of the Access Agreement to be entered between the Proponent and the landowner/s in line with all applicable national legislations and regulations.

(iv) Before entering any private property such as private farms or communal areas, the Proponent shall give advance notices to the surface land rights holders and always obtain permission to access the land to undertake prospecting activities in any given area.

(v) Mitigation measures shall be implemented as detailed in Section 6 (EMP) of this updated Scoping and EMP report, and.

(vi) Where possible, and if good quality freshwater is found during the detailed exploration borehole drilling operations, the Proponent shall support other land users in the area in terms of access to good quality freshwater resources for both human consumption, wildlife management and agricultural uses as may be requested by the local community / landowner/s. With permission from the Department of Water Affairs in the Ministry of Agriculture, Water and Land Reform (MAWLR), the abstraction of the groundwater resources shall include water levels monitoring, sampling and quality testing on a bi-annual basis, and that the affected landowner/s must have access to the results of the water monitoring analyses as part of the ongoing stakeholder disclosure requirements on shared water resources as may be applicable.

Once economic resources are discovered for possible mining operations, a separate field-based and site-specific Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) shall be undertaken as part of the prefeasibility and feasibility studies. The site-specific EIA and EMP shall cover the area/s identified to have potential economic minerals resources and the assessment shall include the entire planned mine layout areas such as local land uses, pit / shaft, waste rock, tailings dump, access, office blocks, mechanical workshop, water, and energy infrastructure support areas (water, energy, and road / access).

In addition to the site-specific possible mining EIA and EMP Terms of Reference (ToR) to be developed during the prefeasibility study phase, the following field-based and site-specific specialist studies shall be undertaken in an event of a discovery of economic minerals resources that can support the development of a mining project within the EPL No. 8300 area:

(i) Groundwater studies including modelling as may be applicable.

(ii) Field-based flora and fauna assessments.

(iii) Dusts, noise and sound assessments and modelling linked to engineering studies.

(iv) Socioeconomic assessment, and.

(v) Others as may be identified / recommended by the stakeholders/ landowners/ Environmental Commissioner or specialists during the prefeasibility and feasibility phases.

2. Summary of the Proposed Mitigation Measures

Avoiding sensitive habitats such as Ephemeral River channels, rock heads and mountainous terrains as well as track discipline (including not killing/poaching of fauna and unnecessarily cutting down of trees) must be adhered to and/or enforced at all times. Mitigation measures shall be implemented as detailed in this EMP report and includes the following:

1. Project planning and implementation.

2. Implementation of the EMP.

3. Public and stakeholders relations.

4. Measures to enhance positive socioeconomic impacts.

5. Environmental awareness briefing and training.

6. Erection of supporting exploration infrastructure.

7. Use of existing access roads, tracks and general vehicle movements.

8. Mitigation measures for preventing flora destruction.

9. Mitigation measures for preventing faunal destruction.

10. Mitigation measures to be implemented with respect to the exploration camps and exploration sites.

11. Mitigation measures for surface and groundwater protection as well as general water usage.

12. Mitigation measures to minimise negative socioeconomic impacts.

13. Mitigation measures to minimise health and safety impacts.

14. Mitigation measures to minimise visual impacts.

15. Mitigation measures to minimise vibration, noise and air quality.

16. Mitigation measures for waste (solid and liquid) management.

17. Rehabilitation plan, and.

18. Environmental data collection.

3. Conclusions and Recommendations of the EMP

Based on the findings of the EIA and the mitigation measures provided in this EMP Report, it is hereby recommended that the proposed exploration activities be issued with an Environmental Clearance Certificate (ECC). The following is the summary of the key conditions that shall be implemented by the Proponent for the proposed project activities:

(i) The Proponent will undertake to implement the conditions of the land lease agreements to be concluded with the owners of the land as may be required to support the proposed exploration activities.

(ii) The proponent shall implement and adhere to all the provisions of this EMP report.

(iii) Mitigation measures shall be implemented as detailed in this EMP report.

(iv) Rehabilitation must be undertaken at all times.

(v) The Proponent shall adhere to all the applicable national regulations and standards as well as Good International Industry Practice (GIIP) that defines leading industry best practices as provided for in the Equator Principles and International Finance Corporation (IFC) environmental management guidelines and frameworks, and.

(vi) The Proponent shall adopt the precautionary approach / principles in instances where baseline information, national or international guidelines or mitigation measures have not been provided or do not sufficiently address the site-specific project impact.

The following are the recommended actions (roles and responsibility) to be implemented by the Proponent as a part of the management of the impacts through implementations of this EMP Report:

(i) Appoint an Environmental Control Officer to lead and further develop, implement and promote environmental culture through awareness raising of the workforce, contractors and sub-contractors in the field during the whole duration of the proposed project.

(ii) Provide with other support, human and financial resources, for the implementation of the proposed mitigations, rehabilitation plans and effective environmental management during the planned mine project life cycle.

(iii) Develop a simplified environmental induction and awareness programme for all the workforce, contractors and sub-contractors.

(iv) Where contracted service providers are likely to cause environmental impacts, these will need to identify and contract agreements need to be developed with costing provisions for environmental liabilities.

(v) Implement internal and external monitoring of the actions and management strategies developed during the project duration and a final Environmental Monitoring report to be prepared by the Environmental Control Officer and to be submitted to the regulators, and.

(vi) Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA related to the expansion of the current delineated resources or development of completely new mine site within the EPL area.

All the responsibilities to ensure that the recommendations and provisions of this EMP Report are executed accordingly, rest with the Proponent. The Proponent shall provide all appropriate resource requirements for the implementation of this EMP as well as an independently managed (not directly controlled by the company) funding instrument for rehabilitation and associated environmental liabilities.

It is the responsibility of the Proponent to make sure that all members of the workforce including contractors and subcontractors are aware of the provisions of this EMP and its objectives. It is hereby recommended that the Proponent take all the necessary steps to implement all the recommendations of this EMP for the successful execution of the proposed exploration programme.

1. BACKGROUND

1.1. Introduction

Johannes Christiaan Kake, the Proponent, holds mineral rights under Exclusive Prospecting License (EPL) No. 8300, and intend to undertake exploration activities covering desktop studies, followed by field-based regional and detailed site-specific explorations activities using techniques such as desktop studies, geophysical surveys, geological mapping, trenching, drilling and bulk sampling. The summary of the EPL is as follows:

- **Type of License:** Exclusive Prospecting License (EPL) No.8300
- **EPL Holder and Proponent:** Johannes Christiaan Kake
- **Application Date:** 05/08/2020
- **Commodities:** Base and Rare Metals, Dimension Stone, Industrial Minerals, and Precious Stones.
- **Size of the EPL:** 16831.815 Ha

1.2. Proposed Scope of Work

The Proponent intends undertake exploration activities covering desktop studies: the purchase and interpretation of the existing Government high resolution airborne geophysical data sets, regional reconnaissance assessment covering field-based activities such as regional mapping and sampling to identify and verify potential targeted areas as delineated during the desktop stage, geological mapping, sampling, surveying and possible widely spaced trenching and drilling to test the viability of any delineated local target based on the regional data collected under localised site-specific detailed geological mapping, trenching, bulk sampling, surveying, and detailed drilling to determine the feasibility of the delineated local targets. If the detailed exploration activities lead to positive results, the exploration data collected will then be put together into a prefeasibility report and if the prefeasibility results prove positive, a detailed feasibility study supported by detailed site-specific drilling, bulk sampling and laboratory testing / test mining will be undertaken on the identified site-specific area.

1.3. Regulatory Requirements

The proposed prospecting activities are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and the EIA Regulations, 2012 and cannot be undertaken without an Environmental Clearance Certificate (ECC). The Proponent is required to have undertaken Environmental Assessment comprising this Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports for the proposed minerals prospecting activities.

Risk – Based Solutions cc was appointed by the Proponent to prepare the EIA and EMP Reports in order to support the application for an Environmental Clearance Certificate (ECC) for the EPL No. 8300 with respect to the proposed exploration activities.

1.4. Location, Land Use, Infrastructure and Services

The EPL 8300 is located in the Sesfontein district, Kunene Region, about 150 kilometres from the regional capital Opuwo and appoximately 50km from the Kamanjab (Fig 1.1 - 1.2). The EPL has a total area of 1683.815 Ha and covers the following commercial privately owned farmlands including (Figs. 1.1-1.2). The land use of the EPL area is surrounded by villages/settlements Palmfontein Pos, Palmfontein, and Keiserfontein which are small-scale agricultural areas on communal land. On the eastern side of the EPL are Community Forests and the *Khoadi-//Hõas- Conservancy on the eastern border of the EPL (Figs. 1.1 - 1.2).

The land uses of the EPL area and surrounding general area is mainly centred on commercial agriculture and tourism freehold land including small stock, intensive agricultural operations (Figs. 1.1 - 1.2).

1.5. Supporting Infrastructure and Services

The EPL area is accessible via the M26 road and D2650 (Figs. 1.1 - 1.2). Private minor roads may require high clearance 4 x 4 vehicles and may only be used with permission from the landowners (Fig. 1.1-1.2).

The following supporting infrastructures and services will be required if detailed field-based studies suchas geological mapping, trenching, or drilling need to be conducted following the delineation of potentialtargets requiring field verifications and / or investigations:

(i) External and internal roads network: The Proponent will use the already existing external and internal road networks during the exploration phase (Fig 1.1 and 1.2).

(ii) Water supply: Raw water will be sourced from local groundwater resources (Fig. 2.5). The Proponent will utilise the existing boreholes with permission from the landowners. The exploration activities such as drilling operations will require limited water resources which could also be supplied by a tanker truck.

(iii) Energy: The proposed exploration operations will use diesels and solar energy as may be required for exploration equipment and lighting, respectively, and.

(iv) Accommodation and other supporting facilities and services: The exploration team will utilise the exiting accommodation facilities and services in the area. In absence of such facilities and services, the Proponent will provide onsite camping accommodation and supporting portable infrastructures such as chemical toilets as well as other requirements as may be applicable. The establishment of an exploration camp will only be done with thepermission of the landowner.

If, required, field-based exploration activities will only be conducted once an Access Agreement has been concluded with the affected landowner/s.

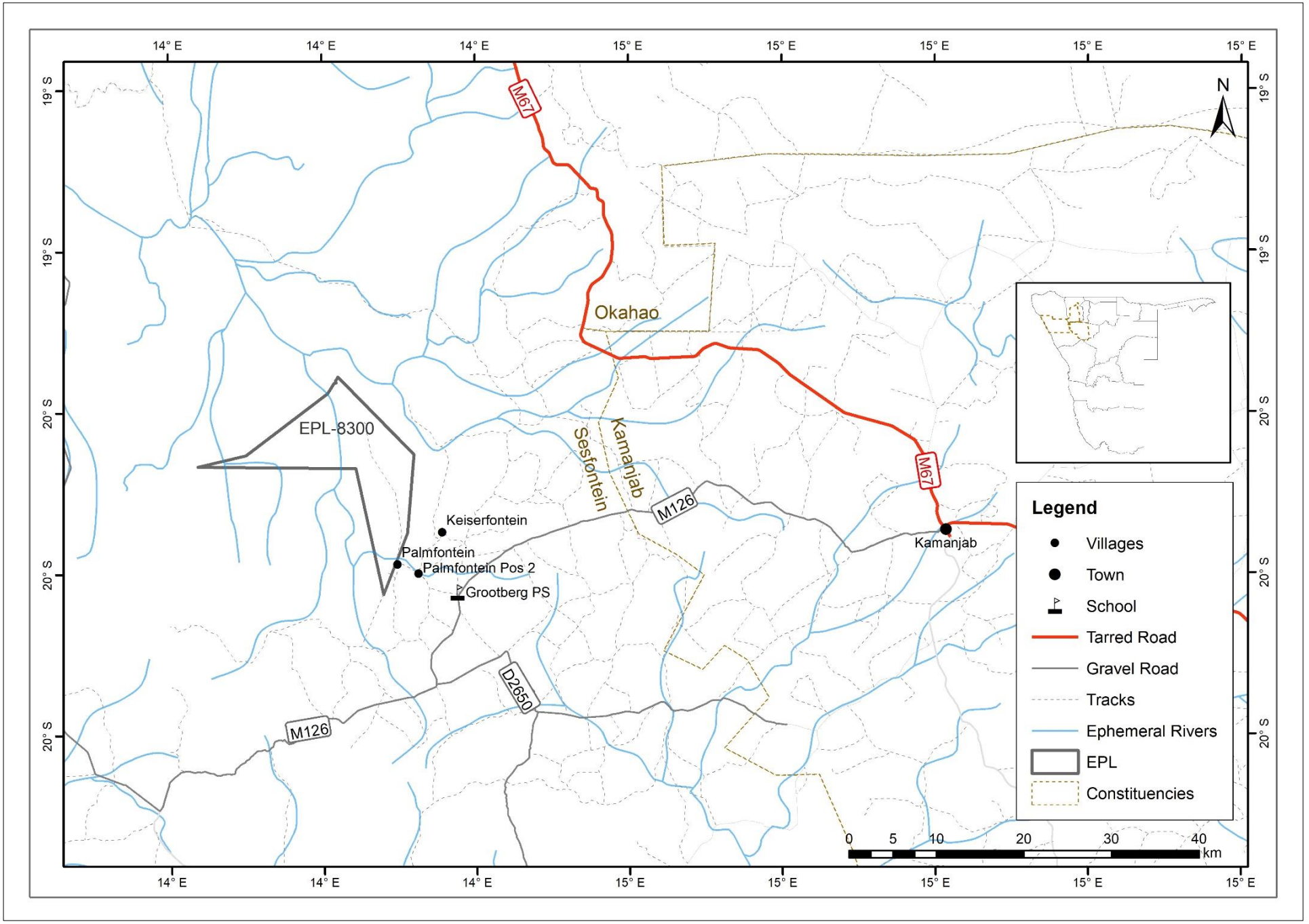

Figure 1.1: Detailed regional location of the EPL 8300 and related infrastructure.

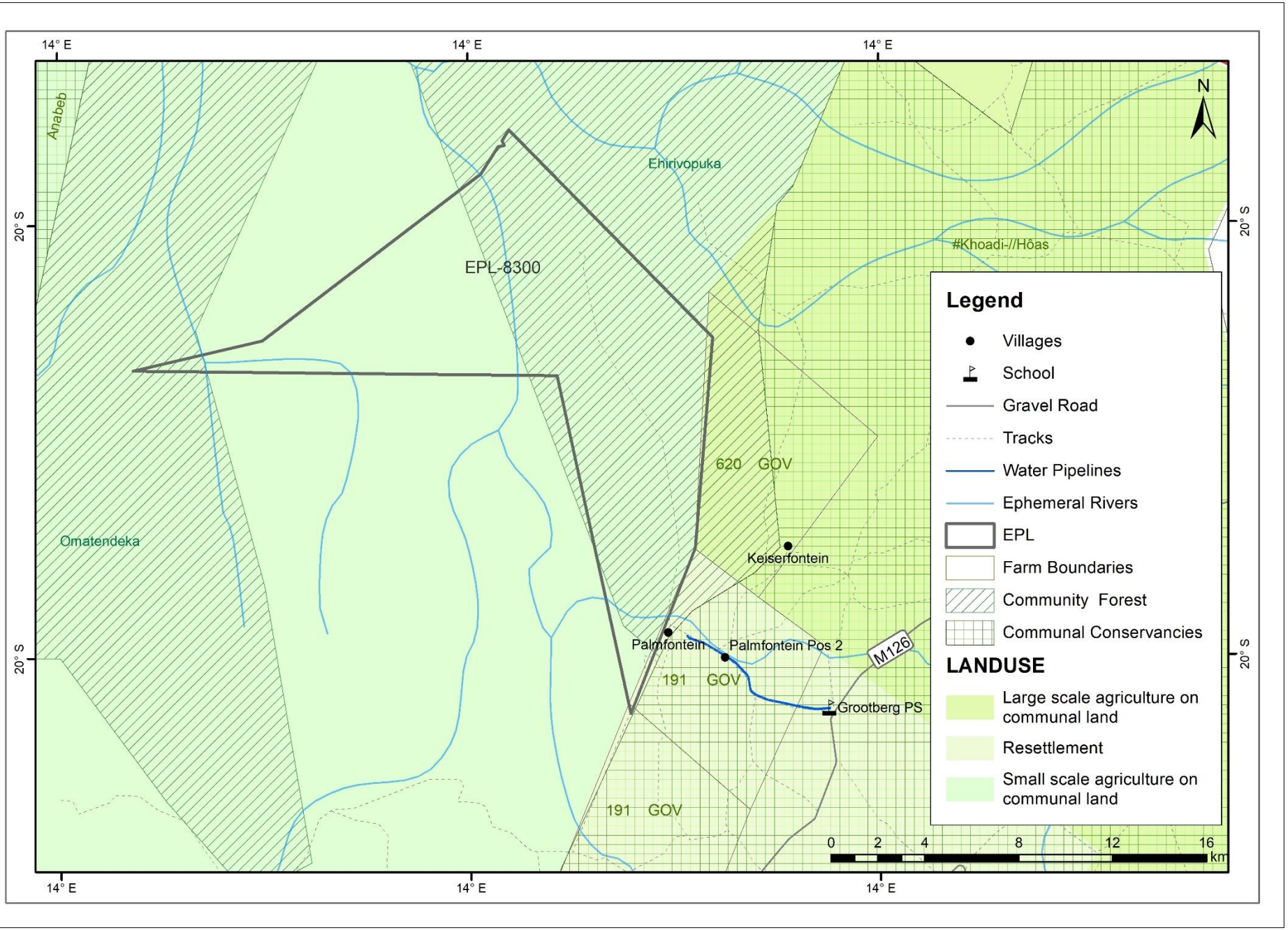

Figure 1.2: Detailed regional location and overlaying commercial farms and land use surrounding EPL 8300

2. SUMMARY OF THE RECEIVING ENVIRONMENT

2.1. Climate

Kunene Region lies in the arid and semi-arid northern Namib Desert. The district's yearly temperature is approximately 27.79ºC. Sesfontein typically receives 150 mm average annual rainfall. Temperatures are high and precipitation falls between the months of December to March (Fig 2.1). The month with the most daily hours of sunshine is November with an average of 11.49 hours of sunshine.

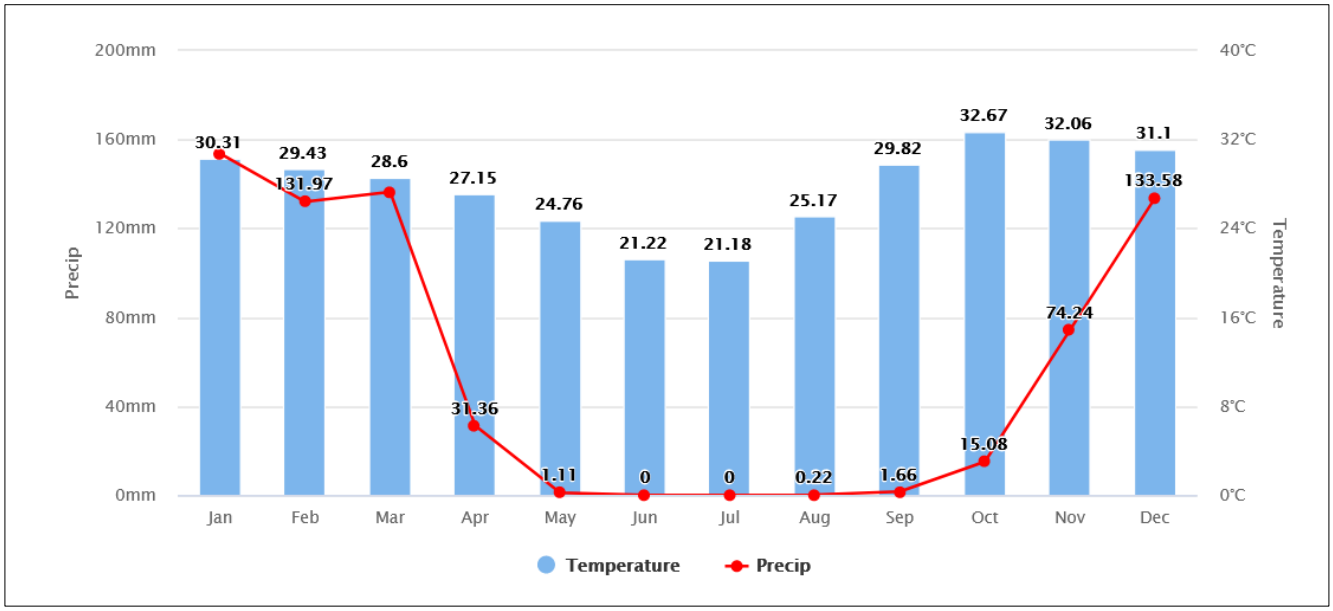

Figure 2.1: Temperature and precipitation map for Sesfontein and surrounding areas.

2.2. Flora and Fauna Diversity

2.2.1. Overview

The area of the EPL falls within the largely semi-desert and sparse savannah. The landscape is a mixture of hills, plains, and wooded river valleys. Compared to the rest of Namibia, the region has a typically low diversity of mammals and reptiles, but it also has several significant species that should be protected. The majority of the farming in the region is practiced with cattle and small stock. Sesfontein valley has one of the largest densities of cattle and small animals, which leads to overgrazing and associated erosion.

2.2.2. Reptile Diversity

Approximately 261 species of reptiles are known or expected to occur in Namibia thus supporting approximately 30% of the continent's species diversity (Griffin 1998a). At least 22% or 55 species of Namibian lizards are classified as endemic. The occurrence of reptiles of "conservation concern" includes about 67% of Namibian reptiles (Griffin 1998a). The reptile diversity of the area is estimated to be 71 - 80 species.

2.2.3. Amphibian Diversity

Amphibians are declining throughout the world due to various factors of which much has been ascribed to habitat destruction. Basic species lists for various habitats are not always available with Namibia being no exception in this regard while the basic ecology of most species is also unknown. Approximately 4,000 species of amphibians are known worldwide with just over 200 species known from southern Africa and at least 57 species expected to occur in Namibia. 6 Griffin (1998b) puts this figure at 50 recorded species and a final species richness of approximately 65 species, 6 of which are endemic to Namibia. This "low" number of amphibians from Namibia is not only as a result of the

generally marginal desert habitat, but also due to Namibia being under studied and under collected. Most amphibians require water to breed and are therefore associated with the permanent water bodies, mainly in northeast Namibia. There is no permanent surface water in the study area. Any frog species present would be adapted to opportunistic breeding in ephemeral pools after rains. Approximately 8-11 species are likely to be found in the area.

2.2.4. Mammal Diversity

Namibia is well endowed with mammal diversity with at least 250 species occurring in the country. These include the well-known big and hairy as well as a legion of smaller and lesser-known species. Currently 14 mammal species are considered endemic to Namibia of which 11 species are rodents and small carnivores of which very little is known. Most endemic mammals are associated with the Namib and escarpment with 60% of these rock dwelling (Griffin 1998c). About 76-90 species of mammals likely occurs in the study area. Sesfontein itself is home to a diversity of large game, including elephant, giraffe, black rhino, Hartmann's Mountain zebra, kudu, gemsbok, springbok, duiker, steenbok, klipspringer, and ostrich. Large carnivores include lion, leopard, cheetah, and caracal, spotted and brown hyaena and jackal.

2.2.5. Bird Diversity

Although Namibia's avifauna is comparatively sparse compared to the high rainfall equatorial areas elsewhere in Africa, approximately 658 species have already been recorded with a diverse and unique group of arid endemics (Brown et al. 1998, Maclean 1985). Fourteen species of birds are endemic or near endemic to Namibia with the majority of Namibian endemics occurring in the savannas (30%) of which ten species occur in a north-south belt of dry savannah in central Namibia (Brown et al. 1998). The area has relatively low bird diversity with only about 81-110 species of likely occurrence.

2.2.6. Summary of Flora Diversity

2.2.6.1. Trees /shrub species

Mopane savannah dominates some of the eastern parts of the conservancy, interspersed with stands of acacias. The rugged mountains covering much of the conservancy support a diversity of interesting plants, including *Commiphora* and *Euphorbia species*, as well as the distinctive kobas. The Hoanib River is lined by extensive salvadora thickets and huge camel thorn and ana trees. It has been estimated that well over 4,000 ana trees grow along the river. The seed pods are an important source of food for livestock and wildlife, with elephants being particularly fond of them.

The vegetation has adapted to both the intense heat of the sun and the lack of water. *Sterculia quinqueloba*, more commonly called "talcum tree," is recognizable by its white bark. It grows in the slightest crack in the rocks. The land is often covered with golden herbs and dotted with large bushes such as the *Euphorbia Damarana*, a plant endemic to the region. It is sometimes the only hint of green in the landscape. The plant consists of *slender and greys stems* growing up to 8 feet tall. The shrub's thin silvery stems contain milky, toxic latex capable of killing animals and humans except for rhinos, kudu, and Oryx, which eat them with impunity. The Bushmen apply the potent poison of the *Euphorbia Damarana* at the tip of their arrows for hunting.

2.3. Soils and Geology

The surficial geology is dominated by lithosols, a group of shallow azonal soils consisting of imperfectly weathered rock fragments as shown in Fig. 4.5. The local geology of EPL 8300 generally comprises units of the Otavi Group, the EPL is part of Damara super group and gariep complex consisting of limestone and dolomite. The main rock types of this area are Schists, Dolomites, phyllite, quartzite, conglomerate, and limestone. The different geological group formations associated with the EPL are illustrated in Figure 4.4.

2.4. Water

The EPL 8300 falls within an area with moderately productive aquifer (Mendelsohn, Jarvis, Roberts & Roberston, 2002). The EPL 8300 falls within the Kunene North groundwater Basin, with several boreholes. The area is underlain by dolomites, which show a high potential of groundwater with an increased potential where fractures and faults occur on a local scale. The aquifer is also reliable, as it is frequently recharged and water quality is generally of a high standard (Mendelsohn *et al*., 2002). Figure 4.6 shows groundwater and water supply schemes found within and around the EPL 8300 area. The water supply scheme of Sesfontein (93) owes its origin and name to the six fountains along the contactzone between dolomites of the Tsumeb Subgroup dolomite aquifers and the underlying less permeable phyllites of the Mulden Group (both Damara Sequence).

The source of water supply for the proposed exploration and in particular the proposed drilling of exploration boreholes if need arises to drill, will be from existing groundwater resources. The proponent must obtain permission from the landowner before using water from any existing local boreholes and infrastructures. If there is a need to drilling a water borehole to support the proposed / exploration programme, the proponent must obtain permission from the landowner and Department of Water Affairs in the Ministry of Agriculture, Water and Forestry (MAWF).

2.5. Socioeconomic

2.5.1. Overview

Kunene Region is geographically located in the Northwestern part of Namibia and covers a range of biomass or landscapes; this region is very mountainous. The name Kunene is derived from the Kunene River that boarders Namibia and Angola. The region's administrative capital is Opuwo. The region covers an approximate area of 115,293km^2 of the total Namibian land. After //Kharas region, Kunene is the second largest region which is home to roughly 86,856 residents (43 234 females and 43 603 males (Census 2011) which signifies 4% of the Namibian population.

2.5.2. Regional Socioeconomic Setting

- The region has constituencies which are Kamanjab, Outjo, Khorixas, Epupa, Opuwo and Sesfontein (Census, 2011).

- According to Census (2011), the most spoken languages at home in Kunene region are Otjiherero (42% of households) and Nama/Damara (36%).

- Literacy rate is 65% for those who are 15 years and older, literacy rate is low in rural Opuwo due to a high number of indigenous residents who are not exposed to any education. However, in the urban part of the town, literacy rate increases to 75% (females 72,5%, males 76,4%).

- People living with disability is 4%. Main sources of income in households are farming 32%, wages and salaries 41%, cash remittance 5%, business (non-farming) 8% and pension.

- Many households in this region also highly rely on drought relief assistance (15%) (NSA, 2017). A few communities also rely on incomes from conservancies they formed, through good wildlife management that attracts tourists and other activities such as trophy hunting.

- About 67% of households have safe drinking water, 63% have no toilet facilities and 32% use wood/charcoal for cooking (Census, 2011).

2.5.3. Locally Socioeconomic Setting

- Sesfontein lies in the Kunene Region, were Otjiherero and Khoekhoegowab are spoken by around 42 and 36 percent of the population, respectively. The two language groups together make up about 20 percent of the national population.

- ❖ Sesfontein is one of the areas which is frequently visited by tourists, and it owes its name to six springs that surface at the base of the hills, creating an oasis in the barren wastes of the Kunene Region. Prominent areas include the Fort Sesfontein lodge, which was once a military outpost, back in 1901.

- ❖ There is also the Sesfontein conservancy which was registered in 2003 and covers 30 2465km2. The landscape is a mix of hills, plains, and wooded river valleys with the scenic Hoanib Valley and fountains.

- ❖ Sesfontein is the largest settlement in the conservancy yet provides a limited range of facilities and services. A few small shops offer a basic selection of goods, and a combined school provides some access to education.

- ❖ Sesfontein has a police station, as well as the northernmost petrol station in the north-west.

- ❖ A clinic offers basic health services, while the nearest hospital is in the regional capital of Opuwo, around 135 kilometres to the north.

- ❖ People in Sesfontein have reasonable access to water, but beyond the settlement water availability is a limiting factor. Boreholes supply groundwater to most residents, but often yield only limited supplies and are costly to drill and maintain.

2.5.4. Archaeology, Historical and Cultural Resources

2.5.4.1. Regional Archaeological Setting

Modern humans and their ancestors have lived in Namibia for more than one million years, and there are fossil remains of lineal hominin ancestors as early as the Miocene Epoch (Kinahan, 2017). Namibia has a relatively complete sequence covering the mid-Pleistocene to Recent Holocene period, represented by thousands of archaeological sites mainly concentrated in the central highlands, escarpment, and Namib Desert. According to Kinahan, (2017), the Recent Holocene archaeological sequence in Namibia, i.e., the last 5 000 years, is of particular importance because it provides the background evidence for the development and recent history of the indigenous peoples of Namibia before the advent of written historical records during the colonial era. Many archaeological sites from this period are of great significance to the understanding of Namibian history, and some are of global importance.

2.5.4.2. *Local Archaeological Setting and Recommendation*

In the absence of field-based assessment being undertaken, it is likely that the general area around the EPL area may have archaeological resources that are protected by the National Heritage Act, 2004 (Act No. 27 of 2004) under the National Heritage Council of Namibia. The EPL area is likely to have evidence from the early colonial period related to a combination of mining, trade, missionary, and indigenous tribes' activities. The expectation is therefore:

(i) A high likelihood of Holocene age archaeological sites, including rock art, associated with outcropping granite in the EPL area, and.

(ii) A high likelihood of late precolonial and colonial settlement sites.

The following are the key recommended actions related to archaeology in the EPL Area:

(i) The exploration team should be made aware that under the National Heritage Act, 2004 (Act No. 27 of 2004) any items protected under the definition of heritage found in the course of the prospecting process should be reported to the National Heritage Council.

(ii) The chance finds procedure as outlined in the EMP must be always implemented, and.

(iii) Detailed field survey should be carried out if suspected archaeological resources or major natural cavities / shelters have been unearthed during the prospecting process.

The Proponent must not disturb major natural shelters or cavities that may be unearthed because they could hold some highly significant historical or cultural sites that would require detailed documentation and possibly mitigation measures to be adopted in the event of encroachment by the proposed exploration activities.

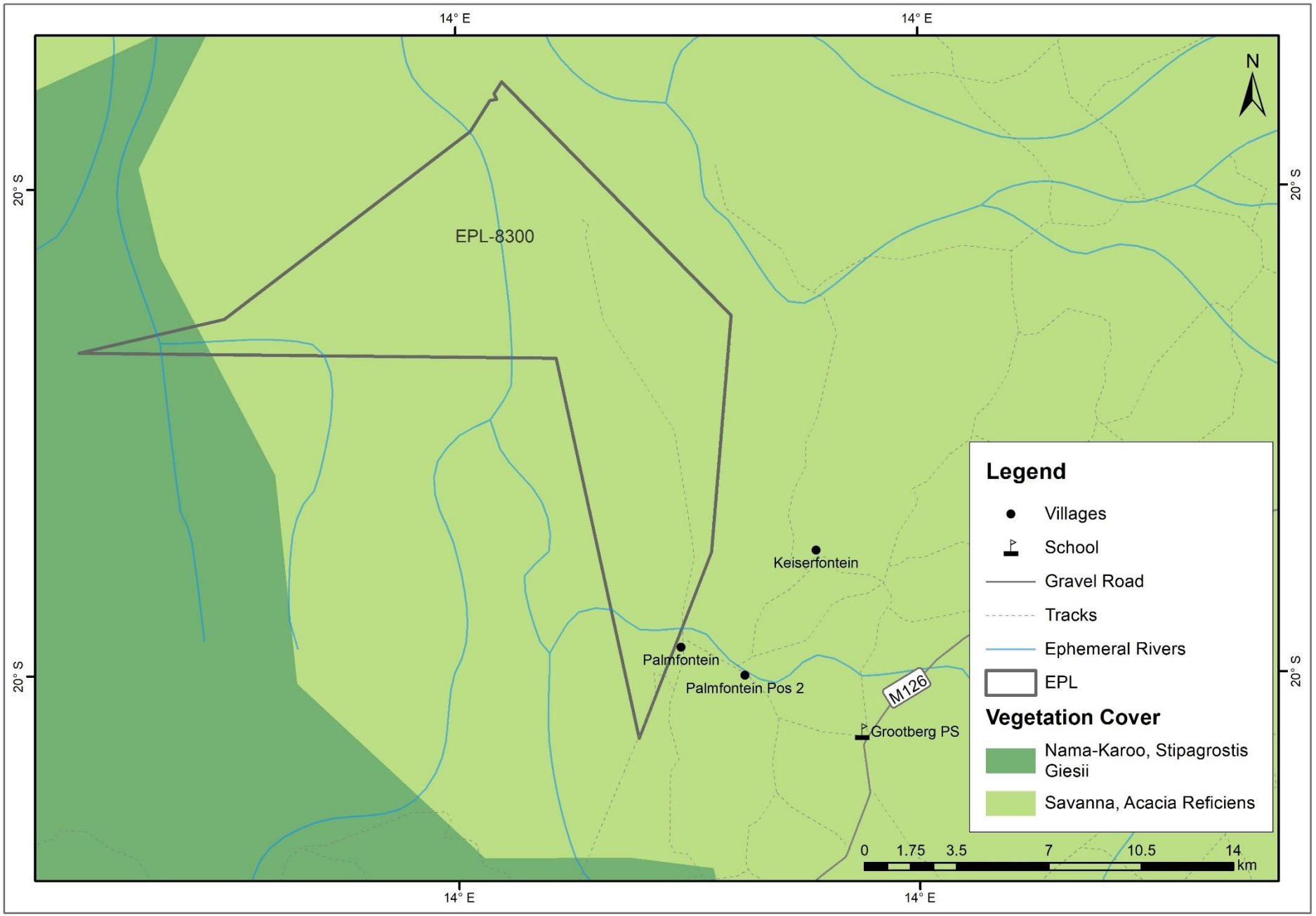

Figure 2.2: Vegetation diversity found within and around the EPL No. 8300 area

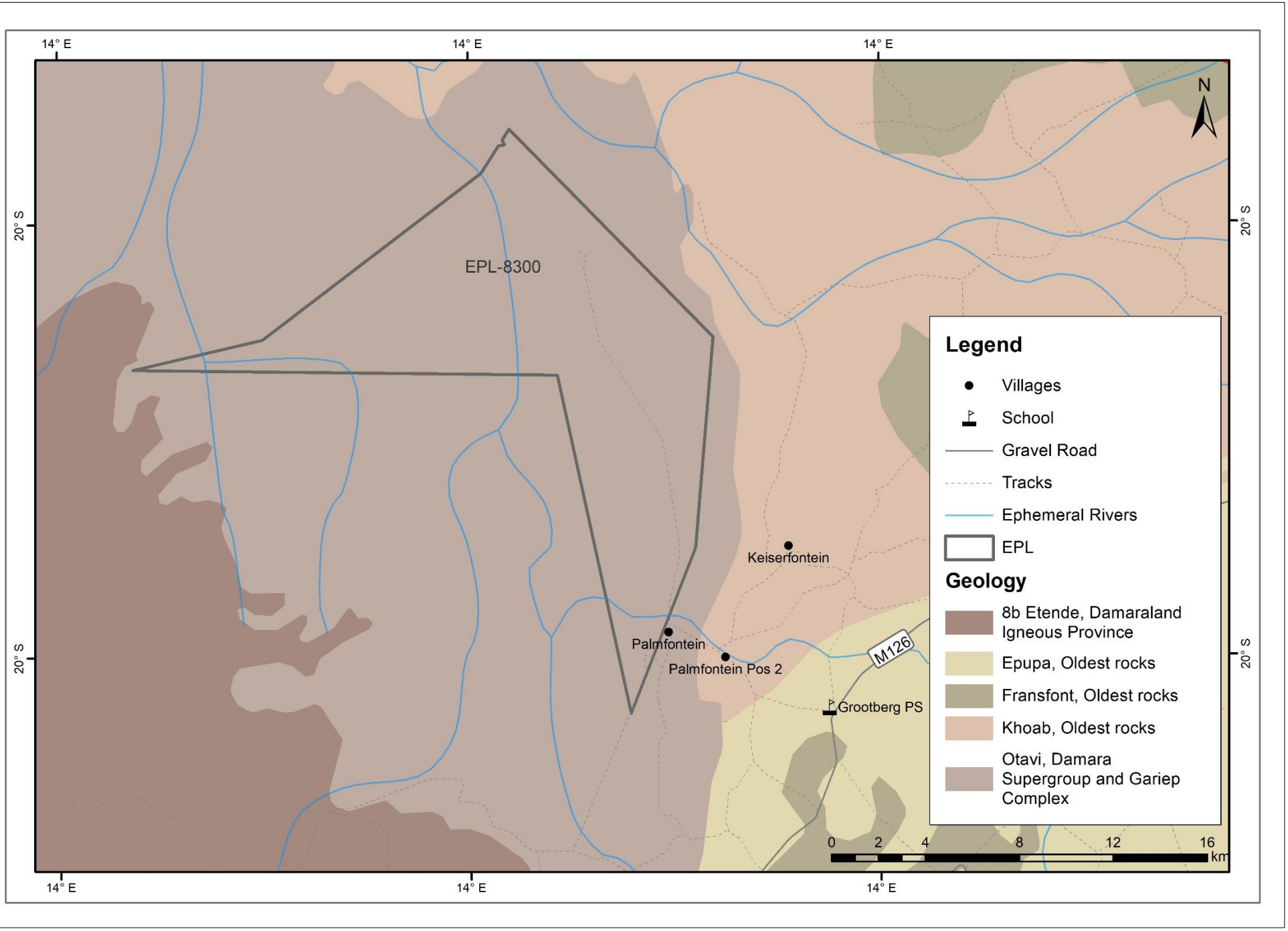

Figure 2.3: Rock types / solid geology found within and around the EPL No. 8300

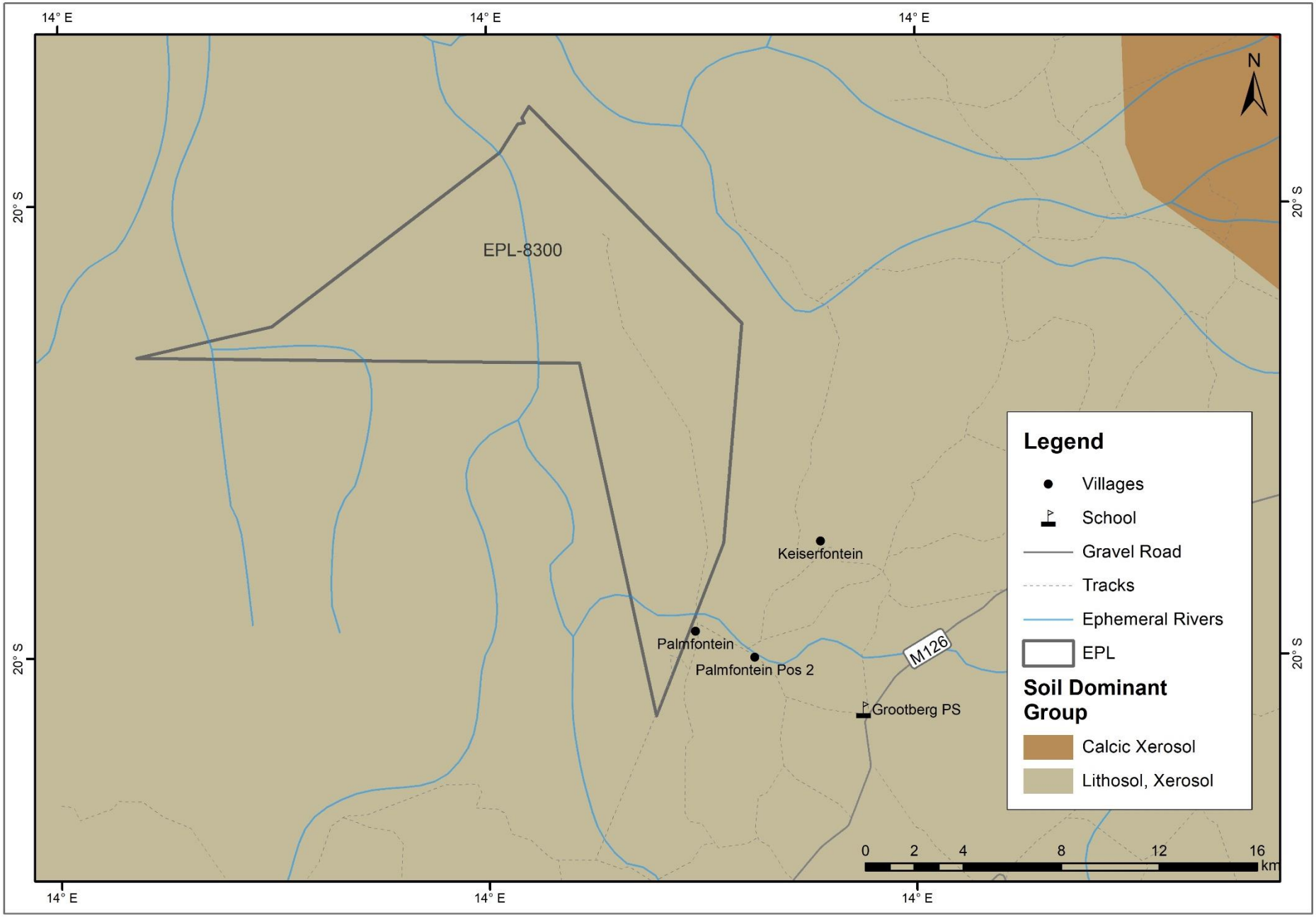

Figure 2.4: Soil types / surficial geology found within and around the EPL No. 8300 area

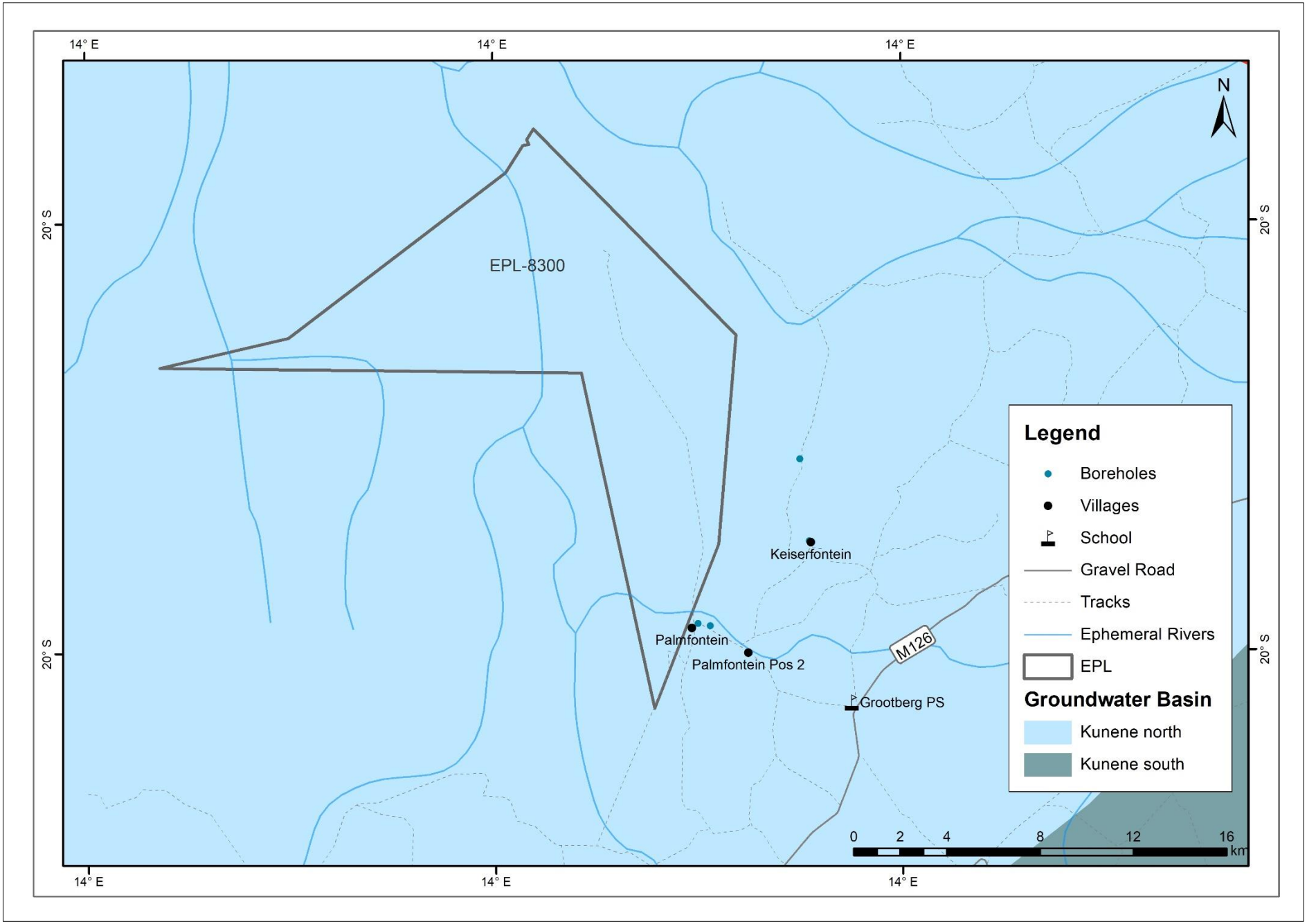

Figure 2.5: Groundwater basin and boreholes found within and around the EPL No. 8300 area

3. OBJECTIVES OF THE EMP

3.1. Summary Objectives

This EMP provides a detailed plan of actions required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively. The EMP also provides the management actions with roles and responsibilities requirements for the successful implementation of environmental management strategies by Proponent.

3.2. EMP Management Linkages

The mitigation measures described in this EMP report are based on the impacts assessment results detailed in the EIA Report. The EMP must be continuously updated during the implementation of the proposed project activities and throughout the project lifecycle. This EMP Reports incorporates the provisions of the Namibian Environmental regulations and policies as well as international environmental best practices in mining development, operational, rehabilitation, and closure and aftercare activities.

3.3. Summary of Impact Assessment Results

3.3.1. Summary of Impacts Assessment Methodology

The EIA and EMP process used for this project took into considerations the provisions of the Environmental Impact Assessment (EIA) Regulations, 2012 and the Environmental Management Act (EMA), 2007, (Act No. 7 of 2007) as outlined in Fig 3.1.

The Proponent intends undertake exploration activities covering desktop studies, followed by site-specific activities on targets that may be delineated and using exploration techniques/ methods such as geophysical surveys, geological mapping, trenching, drilling, bulk sampling, and test mining. The detailed outline of all the activities associated with each of the exploration stages as sources of potential environmental impacts are outlined in Table 3.1. The impact assessment methodology adopted a two-dimensional matrix approach in predicting the potential impacts of the proposed project on the receiving environment. The two-dimensional matrix consisted of the following cross-referencing (Table 3.3 - Table 3.4):

- The activities linked to the project that could have an impact on the receiving environment, and.
- The existing environmental and social conditions that could possibly be affected by the project.

The impact assessment considerations included land disturbance/land use impacts. potential impacts to specially designated areas. impacts to soil, water and air resources. impacts to vegetation, wildlife, wildlife habitat, and sensitive species. Visual, cultural, paleontological, socioeconomic and potential impacts from hazardous materials are provided in the EIA Report.

3.3.2. Summary of Impact Assessment Results

In order to determine the likely environmental impacts as well as the overall significant impacts of individual sources associated with the proposed exploration activities within the EPL area (Table 3.6), an impact identification and assessment process was undertaken as detailed in this report. Details of

the impact assessment results, definitions, methodology as well as the baseline \ receiving environment are provided in the EIA Report.

As detailed in the EIA Report, the significant impact identification and assessment processes focused on the evaluation of the influences of the proposed project activities pathways and the likely targets or receptor (receiving environment). In this process, components of the project activities that are likely to impact the natural environment (physical, biological, and socioeconomic) were broken down into individual development stages and activities.

The summary of the overall impact and significant impact assessment results as detailed in the EIA Report associated with the proposed activities / sources of potential impacts with respect to the receiving environment that could potentially be affected are presented in Table 3.2 -Table 3.5.

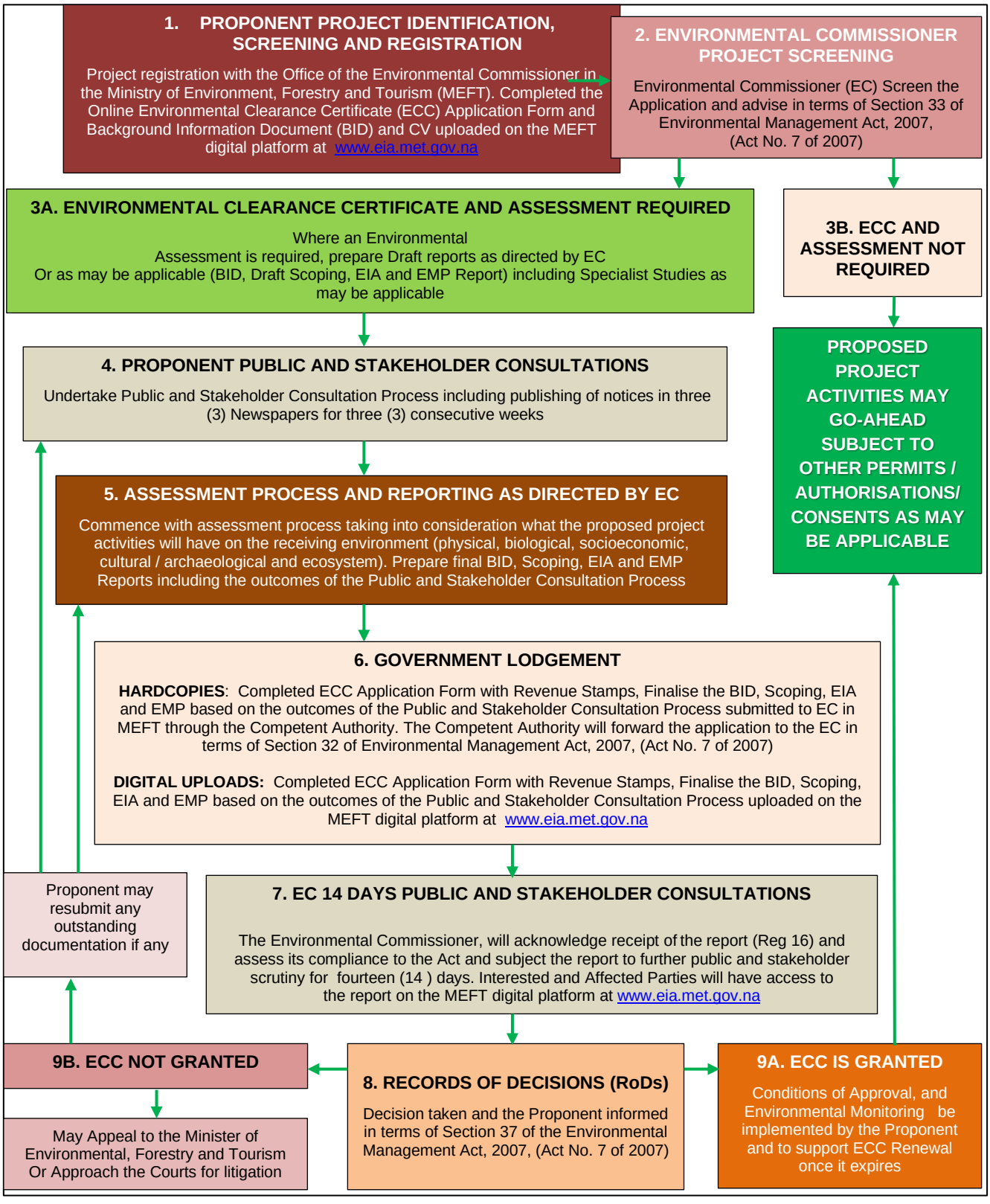

Figure 3.1: RBS Schematic presentation of Namibia's Environmental Assessment Procedure.

Table 3.1: Summary of the proposed activities, alternatives and key issues considered during the Environmental Assessment (EA) process covering Scoping, EIA and EMP Processes.

<table>
<tr><th colspan="2">PROJECT ACTIVITIES</th><th>ALTERNATIVES CONSIDERED</th><th colspan="2">Key Issues to be Evaluated and Assessed with Environmental Management Plan (EMP) / Mitigation Measures Developed</th></tr>
<tr><td>1. Project Implementation and Initial Desktop Exploration Activities</td><td>Review of existing information and all previous activities in order identify any potential target/s in within the EPL Area</td><td rowspan="6">(i) Location for Minerals Occurrence: A number of economic deposits are known to exist in different parts of Namibia and some have been explored by different companies over the years. The proponent intends to explore / prospect for possible economic minerals occurrence in the EPL area as licensed. Minerals occurrence is linked to the geology or local rock outcrops and site-specific.

(ii) Other Alternative Land Uses: Game farming, tourism and agriculture

(iii) Ecosystem Function (What the Ecosystem Does.

(iv) Ecosystem Services.

(v) Use Values.

(vi) Non-Use, or Passive Use.

(vii) The No-Action Alternative

(viii) Others to be identified during the public consultation process and preparation of the EIA and EMP Reports</td><td colspan="2">Potential land use conflicts / opportunities for coexistence between proposed exploration and other existing land uses such as conservation, tourism and agriculture</td></tr>
<tr><td>2. Regional Reconnaissance Field-Based</td><td>Reginal mapping and sampling to identify and verify potential targeted areas based on the recommendations of the desktop work undertaken under (1) above</td><td rowspan="2">PHYSICAL ENVIRONMENT</td><td rowspan="2">• Water Quality
• Physical infrastructure and Resources
• Air quality,
• Noise and dust
• Landscape and topography value
• Soil quality
• Climate Change Influences</td></tr>
<tr><td>3. Initial Local Field-Based Activities</td><td>May include: Widely spaced geological mapping, sampling, surveying and possible trenching and drilling in order to determine the viability of any delineated local target/s</td></tr>
<tr><td>4. Detailed Local Field-Based Activities on Delineated Targets If Any</td><td>Following the delineation of potential target/s, conduct detailed mapping, trenching, sampling, surveying and drilling in order to determine the viability of the project.</td><td>BIOLOGICAL ENVIRONMENT</td><td>• Habitat Protected Areas
• Flora
• Fauna
• Ecosystem functions, services, use values and non-Use or passive use</td></tr>
<tr><td>5. Prefeasibility and Feasibility Studies</td><td>Assess the viability of any delineated local target/s and more detailed mapping, trenching, bulk sampling, drilling and test mining activities where applicable. If the project proves viable, a feasibility report and application for Mining License will be undertaken.</td><td>SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT</td><td>• Local, regional and national socioeconomic settings
• Commercial Agriculture
• Community Protected Areas
• Tourism and Recreation
• Cultural, Biological and Archaeological Resources</td></tr>
</table>

Table 3.2: Results of the sensitivity assessment of the receptors (Physical, Socioeconomic and Biological environments) with respect to the proposed exploration / prospecting activities.

RECEPTOR SENSITIVITY		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
Initial Desktop Exploration Activities	General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Purchase and analysis of existing Government high resolution magnetics and radiometric geophysical data	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Purchase and analysis of existing Government aerial hyperspectral	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Regional Reconnaissance Field-Based Activities	Regional geological, geochemical, topographical and remote sensing mapping and data analysis	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

SENSITIVITY RATING		CRITERIA
1	Negligible	The receptor or resource is resistant to change or is of little environmental value.
2	Low	The receptor or resource is tolerant of change without detriment to its character, is of low environmental or social value, or is of local importance.
3	Medium	The receptor or resource has low capacity to absorb change without fundamentally altering its present character, is of high environmental or social value, or is of national importance
4	High	The receptor or resource has moderate capacity to absorb change without significantly altering its present character, has some environmental or social value, or is of district/regional importance.
5	Very High	The receptor or resource has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental or social value, or is of international importance.

RECEPTOR SENSITIVITY		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
Initial Local Field-Based Activities	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Ground geophysical survey (Subject to the positive outcomes of i and ii above)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Possible Trenching (Subject to the outcomes of i - iii above)	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Detailed Local Field-Based Activities	Access preparation and related logistics to support activities	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
Prefeasibility and Feasibility Studies	Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Detailed drilling and bulk sampling and testing for ore reserve calculations	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
	Geotechnical studies for mine design	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3

SENSITIVITY RATING		CRITERIA
1	Negligible	The receptor or resource is resistant to change or is of little environmental value.
2	Low	The receptor or resource is tolerant of change without detriment to its character, is of low environmental or social value, or is of local importance.
3	Medium	The receptor or resource has low capacity to absorb change without fundamentally altering its present character, is of high environmental or social value, or is of national importance
4	High	The receptor or resource has moderate capacity to absorb change without significantly altering its present character, has some environmental or social value, or is of district/regional importance.
5	Very High	The receptor or resource has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental or social value, or is of international importance.

RECEPTOR SENSITIVITY		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
	Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	EIA and EMP to support the ECC for mining operations	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Preparation of feasibility report and application for Mining License	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

SENSITIVITY RATING		CRITERIA
1	Negligible	The receptor or resource is resistant to change or is of little environmental value.
2	Low	The receptor or resource is tolerant of change without detriment to its character, is of low environmental or social value, or is of local importance.
3	Medium	The receptor or resource has low capacity to absorb change without fundamentally altering its present character, is of high environmental or social value, or is of national importance
4	High	The receptor or resource has moderate capacity to absorb change without significantly altering its present character, has some environmental or social value, or is of district/regional importance.
5	Very High	The receptor or resource has little or no capacity to absorb change without fundamentally altering its present character, is of very high environmental or social value, or is of international importance.

Table 3.3: Results of the scored time period (duration) over which the impact is expected to last.

RECEPTOR SENSITIVITY		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
SCALE	DESCRIPTION	Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
T	Temporary																
P	Permanent																
Initial Desktop Exploration Activities	General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Purchase and analysis of existing Government high resolution magnetics and radiometric geophysical data	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Purchase and analysis of existing Government aerial hyperspectral	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
Regional Reconnaissance Field-Based Activities	Regional geological, geochemical, topographical and remote sensing mapping and data analysis	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

RECEPTOR SENSITIVITY		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
SCALE	DESCRIPTION	Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
T	Temporary																
P	Permanent																
Initial Local Field-Based Activities	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Ground geophysical survey (Subject to the positive outcomes of i and ii above)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Possible Trenching (Subject to the outcomes of i - iii above)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
Detailed Local Field-Based Activities	Access preparation and related logistics to support activities	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
Prefeasibility and Feasibility Studies	Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Detailed drilling and bulk sampling and testing for ore reserve calculations	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Geotechnical studies for mine design	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

RECEPTOR SENSITIVITY		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
SCALE	DESCRIPTION	Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
T	Temporary																
P	Permanent																
	Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	EIA and EMP to support the ECC for mining operations	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	Preparation of feasibility report and application for Mining License	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T

Table 3.4: Results of the scored geographical extent of the induced change.

GEOGRAPHICAL EXTENT OF IMPACT		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
Initial Desktop Exploration Activities	General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Purchase and analysis of existing Government high resolution magnetics and radiometric geophysical data	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Purchase and analysis of existing Government aerial hyperspectral	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Regional Reconnaissance Field-Based Activities	Regional geological, geochemical, topographical and remote sensing mapping and data analysis	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

SCALE		DESCRIPTION
L		limited impact on location
O		impact of importance for municipality
R		impact of regional character
N		impact of national character
M		impact of cross-border character

GEOGRAPHICAL EXTENT OF IMPACT		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
Initial Local Field-Based Activities	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Ground geophysical survey (Subject to the positive outcomes of i and ii above)	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Possible Trenching (Subject to the outcomes of i - iii above)	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Detailed Local Field-Based Activities	Access preparation and related logistics to support activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Detailed Local Field-Based Activities	Access preparation and related logistics to support activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

SCALE		DESCRIPTION
L		limited impact on location
O		impact of importance for municipality
R		impact of regional character
N		impact of national character
M		impact of cross-border character

GEOGRAPHICAL EXTENT OF IMPACT		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
	Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
Prefeasibility and Feasibility Studies	Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Detailed drilling and bulk sampling and testing for ore reserve calculations	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Geotechnical studies for mine design	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	EIA and EMP to support the ECC for mining operations	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	Preparation of feasibility report and application for Mining License	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L

SCALE		DESCRIPTION
L		limited impact on location
O		impact of importance for municipality
R		impact of regional character
N		impact of national character
M		impact of cross-border character

Table 3.5: Results of the qualitative scale of probability occurrence.

IMPACT PROBABILITY OCCURRENCE		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
Initial Desktop Exploration Activities	General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Purchase and analysis of existing Government high resolution magnetics and radiometric geophysical data	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Purchase and analysis of existing Government aerial hyperspectral	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Regional Reconnaissance Field-Based Activities	Regional geological, geochemical, topographical and remote sensing mapping and data analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

SCALE		DESCRIPTION
A		Extremely unlikely (e.g. never heard of in the industry)
B		Unlikely (e.g. heard of in the industry but considered unlikely)
C		Low likelihood (egg such incidents/impacts have occurred but are uncommon)
D		Medium likelihood (e.g. such incidents/impacts occur several times per year within the industry)
E		High likelihood (e.g. such incidents/impacts occurs several times per year at each location where such works are undertaken)

IMPACT PROBABILITY OCCURRENCE		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
	site-specific exploration if the results are positive and supports further exploration of the delineated targets																
Initial Local Field-Based Activities	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	Ground geophysical survey (Subject to the positive outcomes of i and ii above)	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	Possible Trenching (Subject to the outcomes of i - iii above)	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B
	Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
Detailed Local Field-Based Activities	Access preparation and related logistics to support activities	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Prefeasibility and Feasibility Studies	Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	Detailed drilling and bulk sampling and testing for ore reserve calculations	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C

SCALE		DESCRIPTION
A		Extremely unlikely (e.g. never heard of in the industry)
B		Unlikely (e.g. heard of in the industry but considered unlikely)
C		Low likelihood (egg such incidents/impacts have occurred but are uncommon)
D		Medium likelihood (e.g. such incidents/impacts occur several times per year within the industry)
E		High likelihood (e.g. such incidents/impacts occurs several times per year at each location where such works are undertaken)

IMPACT PROBABILITY OCCURRENCE		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
	Geotechnical studies for mine design	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
	EIA and EMP to support the ECC for mining operations	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
	Preparation of feasibility report and application for Mining License	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A

SCALE		DESCRIPTION
A		Extremely unlikely (e.g. never heard of in the industry)
B		Unlikely (e.g. heard of in the industry but considered unlikely)
C		Low likelihood (egg such incidents/impacts have occurred but are uncommon)
D		Medium likelihood (e.g. such incidents/impacts occur several times per year within the industry)
E		High likelihood (e.g. such incidents/impacts occurs several times per year at each location where such works are undertaken)

Table 3.6: Significant impact assessment matrix for the proposed exploration activities.

SIGNIFICANT IMPACT		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
1. Initial Desktop Exploration Activities	(i) General evaluation of satellite, topographic, land tenure, accessibility, supporting infrastructures and socioeconomic environment data	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(ii) Purchase and analysis of existing Government high resolution magnetics and radiometric geophysical data	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(iii) Purchase and analysis of existing Government aerial hyperspectral	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(iv) Data interpretation and delineating of potential targets for future reconnaissance regional field-based activities for delineated targets	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
2. Regional Reconnaissance Field-Based Activities	(i) Regional geological, geochemical, topographical and remote sensing mapping and data analysis	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(ii) Regional geochemical sampling aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(iii) Regional geological mapping aimed at identifying possible targeted based on the results of the initial exploration and regional geological, topographical and remote sensing mapping and analysis undertaken	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(iv) Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

IMPACT SEVERITY (Magnitude, Duration, Extent, Probability)	RECEPTOR CHARACTERISTICS (SENSITIVITY)				
	Very High (5)	High(4)	Medium (3)	Low (2)	Negligible (1)
Very High (5)	Major [5/5]	Major [4/5[	Moderate [3/5]	Moderate [2 /5]	Minor 1/5
High (4)	Major [5/4]	Major [4/4]	Moderate [3/4]	Moderate [2/4]	Minor[1/4]
Medium (3)	Major [5/3]	Moderate[4/3]	Moderate[3/3]	Minor[2/3]	None[1/3]
Low (2)	Moderate [5/2]	Moderate[4/2]	Minor[3/2]	None[2/2]	None[1/2]
Negligible (1)	Minor [5/1]	Minor [4/1]	None [3/1]	None [2/1]	None [1/1]

SIGNIFICANT IMPACT		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
IMPACT SEVERITY (Magnitude, Duration, Extent, Probability)	RECEPTOR CHARACTERISTICS (SENSITIVITY)	Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
Very High (5)	Major [5/5] Major [4/5[Moderate [3/5] Moderate [2 /5] Minor 1/5																
High (4)	Major [5/4] Major [4/4] Moderate [3/4] Moderate [2/4] Minor[1/4]																
Medium (3)	Major [5/3] Moderate[4/3] Moderate[3/3] Minor[2/3] None[1/3]																
Low (2)	Moderate [5/2] Moderate[4/2] Minor[3/2] None[2/2] None[1/2]																
Negligible (1)	Minor [5/1] Minor [4/1] None [3/1] None [2/1] None [1/1]																
	(v) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets for future detailed site-specific exploration if the results are positive and supports further exploration of the delineated targets	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
3. Initial Local Field-Based Activities	(i) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during regional reconnaissance field activities	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(ii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(iii) Ground geophysical survey (Subject to the positive outcomes of i and ii above)	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2
	(iv) Possible Trenching (Subject to the outcomes of i - iii above)	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2
	(v) Field-based support and logistical activities will be very limited focus on a site-specific area for a very short time (maximum five (5) days)	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2
	(vi) Laboratory analysis of the samples collected and interpretation of the results and delineating of potential targets	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(i) Access preparation and related logistics to support activities	2\2	2\2	2\2	2\2	2\2	2\2	3/2	1/1	3/2	3/2	3/2	2\2	2\2	2\2	2\2	2\2
	(ii) Local geochemical sampling aimed at verifying the prospectivity of the target/s delineated during the initial field-based activities	2\2	2\2	2\2	2\2	2\2	2\2	3/2	1/1	3/2	3/2	3/2	2\2	2\2	2\2	2\2	2\2

SIGNIFICANT IMPACT		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL AND ARCHAEOLOGICAL ENVIRONMENT				
		Water Quality	Physical infrastructure and Resources	Air Quality, Noise and Dust	Landscape Topography	Soil Quality	Climate Change Influences	Habitat	Protected Areas	Flora	Fauna	Ecosystem functions, services, use values and non-Use or passive use	Local, regional and national socioeconomic settings	Commercial Agriculture	Community Protected Areas	Tourism and Recreation	Cultural, Biological and Archaeological Resources
4. Detailed Local Field-Based Activities	(iii) Local geological mapping aimed at identifying possible targeted based on the results of the regional geological and analysis undertaken	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2
	(iv) Ground geophysical survey, trenching, drilling and sampling (Subject to the positive outcomes of i and ii above).	2\2	2\2	2\2	2\2	2\2	2\2	3/2	3/2	3/2	3/2	3/2	2\2	2\2	2\2	3\2	3\2
5. Prefeasibility and Feasibility Studies	(i) Detailed site-specific field-based support and logistical activities, surveys, detailed geological mapping	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2
	(ii) Detailed drilling and bulk sampling and testing for ore reserve calculations	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3
	(iii) Geotechnical studies for mine design	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2	2\2
	(iv) Mine planning and designs including all supporting infrastructures (water, energy and access) and test mining activities	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3	3/3
	(v) EIA and EMP to support the ECC for mining operations	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1
	(vi) Preparation of feasibility report and application for Mining License	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1	1/1

IMPACT SEVERITY (Magnitude, Duration, Extent, Probability)	RECEPTOR CHARACTERISTICS (SENSITIVITY)				
	Very High (5)	High(4)	Medium (3)	Low (2)	Negligible (1)
Very High (5)	Major [5/5]	Major [4/5[	Moderate [3/5]	Moderate [2 /5]	Minor 1/5
High (4)	Major [5/4]	Major [4/4]	Moderate [3/4]	Moderate [2/4]	Minor[1/4]
Medium (3)	Major [5/3]	Moderate[4/3]	Moderate[3/3]	Minor[2/3]	None[1/3]
Low (2)	Moderate [5/2]	Moderate[4/2]	Minor[3/2]	None[2/2]	None[1/2]
Negligible (1)	Minor [5/1]	Minor [4/1]	None [3/1]	None [2/1]	None [1/1]

3.4. Implementation of the EMP

3.4.1. Roles and Responsibilities

Management of the environmental elements that may be affected by the different activities of the proposed / ongoing exploration is an important element of the proposed / ongoing exploration activities. The EMP also identifies the activity groups / environmental elements, the aspects / targets, the indicators, the schedule for implementation and who should be responsible for the management to prevent major impacts that the different exploration activities may have on the receiving environment (physical and biological environments).

3.4.2. Proponent's Representative (PR) / Project Manager (PM)

The Proponent is to appoint a **Proponent's Representative (PR) / Project Manager (PM)** with the following responsibilities with respect to the EMP implementation:

- Act as the site project manager and implementing agent.
- Ensure that the Proponent's responsibilities are executed in compliance with the relevant legislation.
- Ensure that all the necessary environmental authorizations and permits have been obtained.
- Assist the exploration contractor/s in finding environmentally responsible solutions to challenges that may arise.
- Should the PR be of the opinion that a serious threat to, or impact on the environment may be caused by the exploration activities, he/she may stop work. the Proponent must be informed of the reasons for the stoppage as soon as possible.
- The PR has the authority to conduct disciplinary proceedings in accordance with the company policies and national legislation requirements and provisions for transgressions of basic conduct rules and/or contravention of the EMP.
- Should the Contractor or his/her employees fail to show adequate consideration for the environmental aspects related to the EMP, the PR can have person(s) and/or equipment removed from the site or work suspended until the matter is remedied.
- Maintain open and direct lines of communication between the landowners and Proponent, as well as any other identified Interested and Affected Parties (I&APs) with regards to environmental matters, and.
- Attend regular site meetings and inspections as may be required for the proposed / ongoing exploration programme.

3.4.3. Project Health, Safety and Environment (Project HSE)

The Proponent is to appoint a Project Health, Safety and Environment (Project HSE) with the following responsibilities with respect to the EMP implementation:

- ❖ Assist the PR in ensuring that the necessary environmental authorizations and permits have been obtained.

- ❖ Assist the PR and Contractor in finding environmentally responsible solutions to challenges that may arise.

- ❖ Conduct environmental monitoring as per EMP requirements.

- ❖ Carry out regular site inspections (on average once per week) of all exploration areas with regards to compliance with the EMP. report any non-compliance(s) to the PR as soon as possible.

- ❖ Organize for an independent internal audit on the implementation of and compliance to the EMP to be carried out half way through each field-based exploration activity. audit reports to be submitted to the PR.

- ❖ Continuously review the EMP and recommend additions and/or changes to the EMP document.

- ❖ Monitor the Contractor's environmental awareness training.

- ❖ Keep records of all activities related to environmental control and monitoring. the latter to include a photographic record of the exploration activities, rehabilitation process, and a register of all major incidents, and.

- ❖ Attend regular site meetings.

3.4.4. Contractors and Subcontractors

The responsibilities of the **Contractors and Subcontractors** that may be appointed by the Proponent to undertake certain field-based activities of the proposed / ongoing exploration programme include:

- ❖ Comply with the relevant legislation and the EMP provision.

- ❖ Preparation and submission to the Proponent through the Project HSE of the following Management Plans:

    - o Environmental awareness training and inductions.

    - o Emergency preparedness and response.

    - o Waste management, and.

    - o Health and safety.

- ❖ Ensure adequate environmental awareness training for senior site personnel.

- ❖ Environmental awareness presentations (inductions) to be given to all site personnel prior to work commencement. the Project HSE is to provide the course content and the following topics, at least but not limited to, should be covered:

    - o The importance of complying with the EMP provisions.

- Roles and responsibilities, including emergency preparedness.
- Basic rules of conduct (do's and don'ts).
- EMP: aspects, impacts and mitigation.
- Conduct disciplinary proceedings in accordance with the company policies and national legislation requirements and provisions for transgressions for failure to adhere to the EMP, and.
- Health and safety requirements.

❖ Record keeping of all environmental awareness training and induction presentations, and.

❖ Attend regular site meetings and environmental inspections.

4. EMP MITIGATION MEASURES

4.1. Hierarchy of Mitigation Measures Implementation

A hierarchy of methods for mitigating significant adverse effects has been adopted in order of preference and as follows:

(i) Enhancement, e.g. provision of new habitats.

(ii) Avoidance, e.g. sensitive design to avoid effects on ecological receptors.

(iii) Reduction, e.g. limitation of effects on receptors through design changes, and.

(iv) Compensation, e.g. community benefits.

4.2. Mitigation Measures Implementation

The Environmental Management Plan (EMP) provides a detailed plan of action required in the implementation of the mitigation measures for minimising and maximising the identified negative and positive impacts respectively.

The EMP also provides the management actions with roles and responsibilities requirements for implementation of environmental management strategies by the Proponent through the Contractors and Subcontractors who will be undertaking the exploration activities.

The EMP gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities during and after the implementation of the proposed / ongoing exploration programme.

Based on the findings of the EIA, key mitigation measures as detailed in 4.1 have been prepared to be implemented by the Proponent with respect to the proposed / ongoing exploration programme activities

and in particular for the field-based exploration activities. The following is the summary of the key areas of the migration measures provided in Table 4.1:

1. Project planning and implementation.
2. Implementation of the EMP.
3. Public and stakeholders' relations.
4. Measures to enhance positive socioeconomic impacts.
5. Environmental awareness briefing and training.
6. Erection of supporting exploration infrastructure.
7. Use of existing access roads, tracks and general vehicle movements.
8. Mitigation measures for preventing flora destruction.
9. Mitigation measures for preventing faunal destruction.
10. Mitigation measures to be implemented with respect to the exploration camps and exploration sites.
11. Mitigation measures for surface and groundwater protection as well as general water usage.
12. Mitigation measures to minimise negative socioeconomic impacts.
13. Mitigation measures to minimise health and safety impacts.
14. Mitigation measures to minimise visual impacts.
15. Mitigation measures to minimise vibration, noise and air quality.
16. Mitigation measures for waste (solid and liquid) management.
17. Rehabilitation plan, and.
18. Environmental data collection.

Table 4.1: Key areas of the migration measures

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
Project planning and implementation			
Establish a strong environmental awareness protocol from project implementation to final closure in order to ensure the least possible impact to the environment.	1. Resources (Human and Financial) are provided for the Environmental Awareness and Training, Regular Safety, Health and Environment meetings and for internal and external Environmental Monitoring Costs as well as for any rehabilitation costs that may arise. 2. Appointment of senior and experienced persons as Proponent's Representative (PR), Project Manager (PM) and Project HSE to assume responsibility for environmental issues. 3. All individuals including sub-contractors who work on, or visit, the sites are aware of the contents of the Environmental Policy and the EMP. 4. The EMP and Environmental Policy will be included in Tender Documents. 5. Field visit will take place during which main access tracks will be discussed in cooperation with the land owner/s	1. Regional reconnaissance field-based mapping and sampling activities. 2. Initial local field-based mapping and sampling activities. 3. Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. 4. Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor Subcontractors
Implementation of the EMP			
1. Define roles and responsibilities in terms of the EMP. To make all personnel, contractors and subcontractors aware of these roles and responsibilities to ensure compliance with the EMP provisions. 2. Implement environmental management that is preventative and proactive. Establish the resources, skills, etc. required for effective environmental management.	1. Senior staff and senior contractors are aware of, and practice the EMP requirements. These persons shall be expected to know and understand the objectives of the EMP and will, by example, encourage suitable environmentally friendly behaviour to be adopted during the exploration 2. Recognition will be given to appropriate environmentally acceptable behaviour. 3. Inappropriate behaviour will be corrected. An explanation to why the behaviour is unacceptable must be given, and, if necessary, the person will be disciplined. e.g. fees set out for non-compliance	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
Public and stakeholders relations.			
Maintain sound relationships with the Other land users/ land owner/s and another stakeholders / public	1. No littering or any other activity prohibited 2. Permission to utilise water as well as all applicable permits are obtained.	1. Regional reconnaissance field-based mapping and sampling activities. 2. Initial local field-based mapping and sampling activities. 3. Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. 4. Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor Subcontractors
Measures to enhance positive socioeconomic impacts.			
Measures to enhance positive socioeconomic impacts in order to: 1. Avoid exacerbating the influx of unemployed people to the area. 2. Develop a standardised recruitment method for sub-contractor and field workers.	1. Stipulate a preference for local contractors in its tender policy. Preference to local contractors should still be based on competitive business principles and salaries and payment to local service providers should still be competitive. 2. Develop a database of local businesses that qualify as potential service providers and invite them to the tender process. 3. Scrutinise tender proposals to ensure that minimum wages were included in the costing. 4. Stipulate that local residents should be employed for temporary unskilled/skilled and where possible in permanent unskilled/skilled positions as they would reinvest in the local economy. 5. Must ensure that potential employees are from the area, they need submit proof of having lived in the area for a minimum of 5 years. 6. Must ensure that contractors adhere to Namibian Affirmative Action, Labour and Social Security, Health and Safety laws. This could be accomplished with a contractual requirement stipulating that monthly proof should be submitted indicating payment of minimum wages to workers, against their ID numbers,	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
	payment of social security and submission of affirmative action data. Encouraged to cater for the needs of employees to increase the spending of wages locally.		
Environmental awareness briefing and training.			
Implement environmental awareness briefing / training for individuals who visit, or work, on site.	1. Every senior/supervisory member of the team shall familiarise themselves with the contents of the EMP. They shall understand their roles and responsibilities with regard to personnel and project compliance with the EMP. 2. Subject to agreement of the parties, the Environmental Coordinator will hold an Environmental Awareness Briefing meeting, which shall be attended by all contractors before the start of the mineral exploration activities. 3. Briefings on the EMP and Environmental Policy shall discuss the potential dangers to the environment of the following activities: public relations, littering, off-road driving, waste management, poaching and plant theft etc. The need to preserve soil, conserve water and implement water saving measures shall be presented. Individuals can be questioned on the Environmental Philosophy and EMP and can recall contents.	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor Subcontractors
Erection of supporting exploration infrastructure.			
1. Get Environmental Clearance before implementation 2. Establishment of the supporting exploration infrastructure done on an area with the least disturbance to the environment and within the non-sensitive areas	1. Documented Environmental Clearance from MET. 2. All on site exploration infrastructure (e.g. water tanks, sewage tanks, waste disposal) are not situated on environmental sensitive area and have disturbed as less as possible. No littering.	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
		(iv) Prefeasibility and feasibility studies.	
Use of existing access roads, tracks and general vehicle movements.			
1. Plan a road/track network that considers the environmental sensitivity of the area and a long-term tourism potential, and which is constructed in a technically and environmentally sound manner. 2. Stick to the recommended track and sensitivity management zones.	1. Avoid unnecessary affecting areas viewed as important habitat – i.e. Ephemeral River and its network of tributaries of ephemeral rivers. rocky outcrops. clumps of protected tree species. 2. Make use of existing tracks/roads as much as possible throughout the area. 3. Do not drive randomly throughout the area (could cause mortalities to vertebrate fauna and unique flora. accidental fires. erosion related problems, etc.). 4. Avoid off-road driving at night as this increases mortality of nocturnal species. 5. Implement and maintain off-road track discipline with maximum speed limits (e.g.30km/h) as this would result in fewer faunal mortalities and limit dust pollution. 6. Use of "3-point-turns" rather than "U-turns". 7. Where tracks have to be made to potential exploration sites off the main routes, the routes should be selected causing minimal damage to the environment – e.g. use the same tracks. cross drainage lines at right angles. avoid placing tracks within drainage lines. avoid collateral damage (i.e. select routes that do not require the unnecessary removal of trees/shrubs, especially protected species). 8. Leave vehicles on tracks and walk to point of interest, when possible. Rehabilitate all new tracks created.	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors
Mitigation measures for preventing flora and ecosystem destruction and promotion of conservation.			
	1. Limit the development and avoid rocky outcrops throughout the entire area. 2. Avoid development and associated infrastructure in sensitive areas – e.g. Ephemeral River, in/close to drainage lines, cliffs, boulder and rocky outcrops in the area, etc. This would minimise the negative effect on	(i) Regional reconnaissance field-based mapping and sampling activities.	

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
Prevent flora and ecosystem destruction and promote conservation	the local environment especially unique features serving as habitat to various species. 3. Avoid placing access routes (roads and tracks) trough sensitive areas – e.g. over rocky outcrops/ridges and along drainage lines. This would minimise the effect on localised potentially sensitive habitats in the area. 4. Avoid driving randomly through the area (i.e. "track discipline"), but rather stick to permanently placed roads/tracks – especially during the detailed field-based exploration phase. This would minimise the effect on localised potentially sensitive habitats in the area. 5. Stick to speed limits of maximum 30km/h as this would result in less dust pollution which could affect certain flora – e.g. lichen species. Speed humps could also be used to ensure the speed limit. 6. Remove unique and sensitive flora (e.g. all Aloe sp.) before commencing with the development activities and relocate to a less sensitive/disturbed site if possible. 7. Prevent and discourage the collecting of firewood as dead wood has an important ecological role – especially during the development phase(s). Such collecting of firewood, especially for economic reasons, often leads to abuses – e.g. chopping down of live and/or protected tree species such as *Acacia erioloba* which is a good quality wood. 8. Attempt to avoid the removal of bigger trees during the development phase(s) – especially with the development of access routes – as these serve as habitat for a myriad of fauna. 9. Prevent and discourage fires – especially during the development phase(s) – as this could easily cause runaway veld fires causing problems (e.g. loss of grazing and domestic stock mortalities, etc.) for the neighbouring farmers. 10. Rehabilitation of the disturbed areas – i.e. initial development access route "scars" and	(ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
	associated tracks as well as temporary accommodation sites. Preferably workers should be transported in/out to the EPL area on a daily basis to avoid excess damage to the local environment (e.g. fires, wood collection, poaching, etc.). Such rehabilitation would not only confirm the company's environmental integrity, but also show true local commitment to the environment. 11. Implement erosion control. The area(s) towards and adjacent the drainage line(s) are easily eroded and further development may exacerbate this problem. Avoid undertaking any exploration activities including supporting activities such as camping within 20m of the main drainage line(s) to minimise erosion problems as well as preserving the riparian associated fauna. 12. Conduct a thorough investigation on the flora associated with the proposed exploration site(s). 13. Prevent the introduction of potentially invasive alien plant species (e.g. *Tecoma stans, Pennisetum setaceum*, etc.) for ornamental purposes as part of the landscaping should mining activities eventually commence. Alien species often "escape" and become invasive causing further ecological damage. A thorough investigation of water use and ground water extraction should take place before actual mining activities commence as this would affect the local flora, especially the ephemeral riparian vegetation, not only locally, but downstream as well.		
Mitigation measures for preventing faunal and ecosystem destruction and promotion of conservation			
	1. Limit the development and avoid rocky outcrops throughout the entire area. 2. Avoid development & associated infrastructure in sensitive areas – e.g. in/close to drainage lines, cliffs, boulder and rocky outcrops in the area, etc. This would minimise the negative effect on the local environment especially		

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
Prevent faunal and ecosystem destruction and promote conservation	unique features serving as habitat to various species. 3. Avoid placing access routes (roads & tracks) trough sensitive areas – e.g. over rocky outcrops/ridges and along drainage lines. This would minimise the effect on localised potentially sensitive habitats in the area. 4. Avoid driving randomly through the area (i.e. "track discipline"), but rather stick to permanently placed roads/tracks – especially during the detailed field-based exploration phase. This would minimise the effect on localised potentially sensitive habitats in the area. 5. Stick to speed limits of maximum 30km/h as this would result in fewer faunal road mortalities. Speed humps could also be used to ensure the speed limit. 6. Remove (e.g. capture) unique fauna and sensitive fauna before commencing with the development activities and relocate to a less sensitive/disturbed site if possible. 7. Prevent and discourage the setting of snares (poaching), illegal collecting of veld foods (e.g. tortoises, etc.), indiscriminate killing of perceived dangerous species (e.g. snakes, etc.) and collecting of wood as this would diminish and negatively affect the local fauna – especially during the development phase(s). 8. Attempt to avoid the removal of bigger trees during the development phase(s) – especially with the development of access routes – as these serve as habitat for a myriad of fauna. 9. Prevent and discourage fires – especially during the development phase(s) – as this could easily cause runaway veld fires affecting the local fauna, but also causing problems (e.g. loss of grazing & domestic stock mortalities, etc.) for the neighbouring farmers. 10. Rehabilitation of the disturbed areas – i.e. initial development access route "scars" and associated tracks as well as temporary accommodation sites. Preferably workers	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
	should be transported in/out to the EPL area on a daily basis to avoid excess damage to the local environment (e.g. fires, wood collection, poaching, etc.). Such rehabilitation would not only confirm the company's environmental integrity, but also show true local commitment to the environment. 11. Implement erosion control. The area(s) towards & adjacent the drainage line(s) are easily eroded and further development may exacerbate this problem. Avoid undertaking exploration activities including supporting activities such as camping within 20m of the main drainage line(s) to minimise erosion problems as well as preserving the riparian associated fauna. 12. Conduct a thorough investigation on the fauna associated with the proposed exploration site(s). 13. Prevent the number of domestic pets – e.g. cats & dogs – accompanying the workers during the field-based exploration activities as cats decimate the local fauna and interbreed & transmit diseases to the indigenous African Wildcat found in the area. Dogs often cause problems when bonding on hunting expeditions thus negatively affecting the local fauna. The indiscriminate and wanton killing of the local fauna by such pets should be avoided at all costs.		
Mitigation measures to be implemented with respect to the exploration camps and exploration sites.			
Promotion of conservation through preservation of flora, fauna and	1. Select camp sites and other temporary lay over sites with care – i.e. avoid important habitats. 2. Use portable toilets to avoid faecal pollution around camp and exploration sites. 3. Initiate a suitable and appropriate refuse removal policy as littering could result in certain animals becoming accustomed to humans and associated activity and result in typical problem animal scenarios – e.g. baboon, black-backed jackal, etc..	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities.	

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
ecosystem around the exploration camps and exploration sites	4. Avoid and/or limit the use of lights during nocturnal exploration activities as this could influence and/or affect various nocturnal species – e.g. bats and owls, etc. Use focused lighting for least effect. 5. Prevent the killing of species viewed as dangerous – e.g. various snakes – when on site. 6. Prevent the setting of snares for ungulates (i.e. poaching) or collection of veld foods (e.g. tortoises) and unique plants (e.g. various Aloe and Lithop) or any form of illegal hunting activities. 7. Avoid introducing dogs and cats as pets to camp sites as these can cause significant mortalities to local fauna (cats) and even stock losses (dogs). 8. Remove and relocate slow moving vertebrate fauna (e.g. tortoises, chameleon, snakes, etc.) to suitable habitat elsewhere on property. 9. Avoid the removal and/or damaging of protected flora potentially occurring in the general area – e.g. various Aloe, Commiphora and Lithop species. 10. Avoid introducing ornamental plants, especially potential invasive alien species, as part of the landscaping of the camp site, etc., but rather use localised indigenous species, should landscaping be attempted, which would also require less maintenance (e.g. water). 11. Remove all invasive alien species on site, especially Prosopis sp., which is already becoming a major ecological problem along various water courses throughout Central Namibia. This would not only indicate environmental commitment, but actively contribute to a better landscape. 12. Inform contractors/workers regarding the above-mentioned issues prior to exploration activities and monitor for compliance thereof throughout.	(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
	13. Rehabilitate all areas disturbed by the exploration activities – i.e. camp sites, exploration sites, etc.. 14. Implement a policy of replacing 2 tree species (preferably the same species) for every 1 protected tree species having to be removed (if necessary). 15. Although fires are not expected to be a major issue in the general area due to the overall lack of grass cover, some years it may be necessary to consider fire prevention. Ensure that adequate firefighting equipment (e.g. fire beaters. extinguishers, etc.) is available at camp sites and clear kitchen areas to avoid accidental fires. 16. Employ an independent environmental auditor to ensure compliance, especially of the rehabilitation of all the affected areas.		
Mitigation measures to minimise negative socioeconomic impacts.			
Effective management of socioeconomic benefits of the proposed / ongoing project activities	1. The employment of local residents and local companies should be a priority. To ensure that potential employees are from the area, they need submit proof of having lived in the area for a minimum of 5 years. 2. Providing information such as the number and types of jobs available, availability of accommodation facilities and rental costs and living expenses, could make potential job seekers wary of moving to the area. 3. Addressing unrealistic expectations about large numbers of jobs would be created. 4. Exploration camp if required should be established in close consultation with the land owners. 5. Exploration camp should consider provision of basic services. 6. When the contracts an employee is terminated or not renewed, contractors should transport the employee out of the area to their hometowns within two days of their contracts coming to an end.	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
	7. Tender documents could stipulate that contractors have HIV/Aids workplace policies and programmes in place and proof of implementation should be submitted with invoicing. 8. Develop strategies in coordination with local health officers and NGO's to protect the local communities, especially young girls. 9. Contract companies could submit a code of conduct, stipulating disciplinary actions where employees are guilty of criminal activities in and around the vicinity of the EPL. Disciplinary actions should be in accordance with Namibian legislation. 10. Contract companies could implement a no-tolerance policy regarding the use of alcohol and workers should submit to a breathalyser test upon reporting for duty daily. 11. Request that the Roads Authority erect warning signs of heavy exploration vehicles on affected public roads. 12. Ensure that drivers adhere to speed limits and that speed limits are strictly enforced. 13. Ensure that vehicles are road worthy and drivers are qualified. 14. Train drivers in potential safety issues.		
Mitigation measures to minimise health and safety impacts			
Promotion of health and safe working environment in line with national Labour Laws	1. Physical hazards: Follow national and international regulatory and guidelines provisions, use of correct Personal Proactive Clothing at all times, training programme, as well as the implementation of a fall protection program in accordance with the Labour Act. 2. Some of the public access management measures that may be considered in an event of vandalism occurring are: • All exploration equipment must be in good working condition and services accordingly.	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities.	(i) Proponent's Representative (PR)

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
	• Control access to the exploration site through using gates on the access road(s) if required. • The entire site, must be fenced off. the type of fencing to be used would, however, be dependent on the impact on the visual resources and/or cost. and. • Notice or information boards relating to public safety hazards and emergency contact details to be put up at the gate(s) to the exploration area. 3. There is a comprehensive First Aid Kit on site and that suitable anti-histamine for bee stings / snake bites should be available. 4. Rubber gloves are used in case of an accident to reduce the risk of contracting HIV/AIDS. 5. All individuals have received instructions concerning the dangers of dehydration or hyperthermia. Encourage all to drink plenty of clean water not directly from the surface water bodies. 6. No person under the influence of alcohol or drugs is allowed to work on site. 7. The Exploration Manager ensures compliance with the requirements of the relevant Namibian Labour, Mining and Health and Safety Regulations. 8. Dangerous or protected / sensitive areas are clearly marked and access to these areas is controlled or restricted. 9. Due care must be taken when driving any vehicles on any roads particularly the gravel roads. ALL Drivers must drive with their headlights switched on when travelling on the gravel roads (day and night). 10. Persons driving a vehicle must be in possession of a valid driver's license 11. Awareness on HIV/AIDS among workers is raised	(iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors
Mitigation measures to minimise visual impacts.			

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
Preserve the landscape character in the development of supporting infrastructure and choice of visual screening	1. Consider the landscape character and the visual impacts of the exploration area including camp site from all relevant viewing angles, particularly from public roads. 2. Use vegetation screening where applicable. Do not cut down vegetation unnecessary around the site and use it for site screening. 3. Avoid the use of very high fencing. 4. Minimise access roads and no off-road that could result in land scarring is allowed. 5. Minimise the presence of secondary structures: remove inoperative support structures. 6. Remove all infrastructure and reclaim, or rehabilitate the project site after exploration activities are completed.	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors
Mitigation measures to minimise vibration, noise and air quality.			
Promote of effective management of vehicle movement, drilling and blasting operations and use of Personal Protective Equipment (PPE) in mitigating air quality and vibrations impacts in line with national laws	1. Limit vehicle movements and adhere to the speed of 60 km/h. 2. Vehicles and all equipment must be properly serviced to minimise noise pollution. 3. Use of Personal Protective Equipment (PPE) to minimise Occupational Health Safety impacts dues to noise pollution around the site. 4. National or international acoustic design standards must be followed. 5. Drilling and blasting operations can major sources of vibration, noise and dust and where required the following mitigation measure shall be implemented. • Drilling and blasting operations shall only be done by a qualified person who must at all times adhere to the required blasting protocol. • Prior warning shall be given to all persons, neighbour and visitors before the blasting takes place.	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
	• Careful planning and timing of the blast program to minimise the size of the charge. • Where practicable, use of explosive products with lower detonation velocities, but noting that this would require more explosives to achieve the same blast result. • Use of detonating caps with built-in time delays, as this effectively reduces each detonation into a series of small explosions. • Use of a procedure ("decking the charge") which subdivides the charge in one blast hole into a series of smaller explosions, with drill patterns restricted to a minimum separation from any other loaded hole. • Over-drilling the holes to ensure fracturing of the rock. • Staggering the detonation for each blast hole in order to spread the explosive's total overpressure over time. Matching, to the extent possible, the energy needed in the "work effort" of the borehole to the rock mass to minimise excess energy vented into the receiving environment.		
Mitigation measures for waste (solid and liquid) management.			
Promotion of effective waste (solid and liquid) management through the adoption of sound and hierarchical approach to waste management, which would include waste minimisation, re-use, recovery, recycling, treatment, and proper disposal.	1. Burial of waste on anywhere within the EPL area is not allowed and all generated solid waste must be disposed at the at an approved municipal waste disposal site. 2. Toilet and ablution facilities must be provided on site and should not be located close to Ephemeral Rivers or visible discontinuities (fractures, joints or faults). 3. Provide site information on the difference between the two main types of waste, namely: • General Waste. and • Hazardous Waste. 4. Sealed containers, bins, drums or bags for the different types of wastes must be provided. Never dispose of hazardous waste in the bins or skips intended for general waste. 5. All solid and liquid wastes generated from the proposed / ongoing project activities shall be	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
	reduced, reused, or recycled to the maximum extent practicable. 6. Trash may not be burned or buried, except at approved sites under controlled conditions in accordance with the municipal regulations. 7. Never overfill any waste container, drum, bin or bag. Inform your Contractor or the Environmental Control Officer / Site Manager if the containers, drums, bins or skips are nearly full. 8. Never litter or throwaway any waste on the site, in the field or along any road. No illegal dumping. 9. Littering is prohibited. 10. Latrines and French drains built >100m from watercourses or pans to avoid pollution of primary and secondary aquifers. 11. Chemical toilets or suitable waste water management system shall be provided on site and around the camp as may be required.	of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	
Rehabilitation plan			
Contributions toward environmental preservation and sustainability through rehabilitation of disturbed areas such as exploration sites and remove all unwanted part of the fixtures and restore the sites to close an approximation of the pristine state as is technically, financially and reasonably possible.	1. The following rehabilitation actions are practiced: • Small samples are preferably removed from site to avoid additional scars in the landscape. • Litter from the site has been taken to the appropriate disposal site. • Debris, scrap metal, etc is removed before moving to a new site or closure of the mine. • Water tanks are dismantled and removed if not need for after use. • Tracks on site and the access road are rehabilitated by smoothing the 'middle mannetjie'(middle ridge between the tracks) and raking the surface. 2. The following should be undertaken at all disturbed areas that require further	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
	rehabilitation: • if applicable the stockpiled subsoil to be replaced (spread) and/or the site is neatly contoured to establish effective wind supported landscape patterns. • Replace the stored topsoil seed bank layer. Five (5) years after rehabilitation the sites are not visible from 500 m away.		
Environmental data collection			
1. Collect data that will add value to environmental monitoring and reporting to the regulators 2. Collect data that will add to the general scientific and geographic knowledge of the environment in which the exploration process takes place. 3. Acknowledged that the required skills and knowledge to collect all the suggested data may not be available within the mine /exploration team, however, as much data as is practical should be collected.	1. Environmental Monitoring Report Compiled and submitted by the Environmental Coordinator to the regulators 2. The following types of information should be gathered: • Fauna. What tracks or signs of animal activity have been seen? (photographs and GPS recording) What animals, birds etc were identified? Alternatively provide a description and/ or photo if unidentified. • Unusual weather conditions, e.g. records of the prevailing wind direction and the direction from which storm events come. Was there fog or rain, frost overnight or intense heat? Preferably have a thermometer and rain gauge on site. • Vegetation. Record trees, shrubs, grass, etc. that are found in the vicinity along each of the profiles. Some plants do only occur after rainfall and might not have been seen for decades. • Any archaeological, cultural or historical sites that may be found. GPS coordinates, photograph and plot the position on a 1: 50 000 maps. • other including surface water, spring, large scale geological features etc	(i) Regional reconnaissance field-based mapping and sampling activities. (ii) Initial local field-based mapping and sampling activities. (iii) Detailed local field-based activities such as local geological mapping, geochemical mapping and sampling, trenching and drilling of closely spaced boreholes and bulk sampling. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

5. REHABILITATION COMMITMENTS

5.1. Rehabilitation Process

The following is the summary of key rehabilitation process to be implemented by the proponent:

- **Step 1: Backfilling excavated or disturbed areas:**
  - Transporting all stockpiled overburden back to the excavated voids.
  - Backfilling the trenches, pits and quarries using original excavated and stockpiled materials.
  - If applicable, backfill the various layers of overburden in the reverse order in which they were removed, i.e. Last out should be first in as far as possible, and.
  - When backfilling, bear in mind that some space must be left for the backfilling of the soil on top of the overburden.
- **Step 2: Remove all waste and unwanted materials:**
  - Once the drilling slimes ponds have dried sufficiently, scrape out the slimes and transporting back to an exploration excavated voids during the overburden backfilling stage.
  - Allow the pollution control dam to evaporate completely, scrape all waste that has collected in the pond and dispose of these and the pond lining at a suitable site.
  - Bulldoze the walls of the pollution control pond over and contour.
  - Collect remaining domestic waste on site and transport to an approved municipal waste disposal site.
  - Clean out the oil traps, collect the waste material in drums and transport to a suitable site for disposal, and.
  - Manually remove all weedy species that are present at the site (the entire plant can easily be removed because the plants tend not to root deeply).
- **Step 3: Remove all structures:**
  - Remove all building materials from the exploration / test mining site and either:
    - Transporting to a new site if it is to be used or stored elsewhere. or
    - Disposing at a suitable approved municipal waste disposal site. or
    - Making them available to the farmer or local persons, or,
    - Selling at an auction.

- Remove all machinery from the site and transport to a new site where it is to be used or stored or sell at an auction.

- Remove all fences that have been constructed and either make the material available to the local persons/farmer, dispose at a suitable site or sell at an auction.

- Remove the generators from the sites from site and either transport to a new site for storage or sell it to the farmer or an Auction.

- Seal all petrol, diesel, oil and grease containers and remove from the site to a storage facility or make it available to the farmer.

- Collect all scrap metal and dispose at a suitable site or sell at an auction, and.

- Break up all concrete slabs and structures on-site and transport the fragments to a suitable site for disposal.

❖ **Step 4: Rehabilitate the excavated voids:**

- Replace the subsoil layer by backfilling the soil on top of the overburden and contour cap the subsoil with a topsoil layer about 10cm deep, and.

- Cap the topsoil containing the seed bank with a layer of gravel by manually spreading the fragments across the surface using a rake.

❖ **Step 5: Rehabilitate site-specific storm-water channel:**

- Remove all the site structures created.

- Dispose of the plastic/wire and use the fill material to backfill the storm-water channel.

- Cap with a layer of topsoil to a depth of about 10cm, and.

- Cap the topsoil containing the seedbank with a gravel layer by manually spreading the fragments across the surface using a rake.

❖ **Step 6: Rehabilitate all adjacent exploration / test mining sites affected:**

- Rip the surfaces to a depth of 40 cm to 50 cm using a multi-toothed ripper and tractor.

- Cover with a layer of topsoil to a depth of about 10 cm, and.

- Cap the topsoil containing the seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake.

❖ **Step 7: Rehabilitate all unwanted access roads created:**

- Rip the road surface to a depth of at least 50 cm using a multi-toothed ripper and tractor.

- Disk the ripped surface to break up the clods.

- Cover with a layer of topsoil to a depth of about 10 cm, and.

- Cap the topsoil containing the seed bank with a gravel layer by manually spreading the fragments across the surface using a rake.

5.2. Monitoring of the Environmental Performance

5.2.1. Rehabilitation Evaluation and Performance Monitoring

The following is the summary of key rehabilitation evaluation and performance monitoring to be implemented by the proponent:

- Monitoring: A monitoring program is instituted to ensure that the requirements of the mining site rehabilitation program are met. A rehabilitation program may be subjected to various natural or man-made forces that can hinder progress and lead to problems or failure of the rehabilitation program. Regular monitoring will ensure that these factors are identified early so they may be resolved through appropriate recommendations.

- Frequency: All rehabilitated areas should be monitored over a three (3) years period from the onset of the rehabilitation procedures. The frequency of monitoring suggested above is dependent on satisfactory performance. If, however, the requirements are not being met, the frequency of monitoring can be increased. It is suggested that the monitoring be conducted once a year around September when the grasses and forbs are flowering.

- Methods: The rehabilitated areas might be monitored by the sampling randomly located $1m^2$ quadrates. Approximately 10 quadrates per hectare (or a minimum of 3) should be sampled per plant community. The factors that will be examined in each quadrate include:

    - Percentage basal cover.

    - Percentage aerial cover.

    - Species composition and diversity.

    - Vigor and health of plants.

    - Presence of and evidence of fauna, and.

    - Nature of the substrate.

- Controls: To enable a comparison, control plots located within the surrounding un-mining areas should also be monitored. This will give an indication of the progress of rehabilitated areas versus the natural vegetation and will set the goals, which ultimately should be achieved. By monitoring the natural vegetation annually, it will also be possible to assess the natural changes that are taking place. These findings can then be applied to the rehabilitated areas so as to account for the changes, which may have resulted from natural events. Approximately 5 to 10 quadrates of $1m^2$ should be sampled per community type to set the controls.

- Maintenance: Maintenance requirements may include seeding (if there is poor germination of the seedbank), fertiliser applications, correcting erosion problems, removing weeds, etc.

Maintenance of the rehabilitated areas will be necessary periodically. The need for and extent of maintenance activities will be determined during the regular monitoring of the site, and.

- ❖ Qualified Personnel: The rehabilitation procedures from implementation to monitoring should be overseen by qualified personnel. Any persons involved in the rehabilitation of the mining site should be trained in the techniques involved.

5.2.2. Overall Environmental Performance Monitoring and Reporting

The monitoring of the environmental performances for the proposed / ongoing exploration project can be divided into two (2) parts and these are:

(i) Routine / ongoing daily monitoring activities to be undertaken by the Project HSE Officer with the support of the external specialist consultants as maybe required, and.

(ii) Preparation of annual Environmental Monitoring Report and Environmental Closure covering all activities related to the Environmental Management Plan during exploration / prospecting stages and at the closure of the proposed / ongoing exploration to be undertaken by the Project HSE Officer with the support of the external specialist consultants as may be required.

The proponent will be required to report regularly (twice a year or as the case may be) to the Environmental Commissioner in the Ministry of Environment, Forestry, and Tourism (MEFT), the environmental performances as part of the ongoing environmental monitoring programme. An environmental monitoring programme is part of the EMP performance assessments and will need to be compiled and submitted as determined by the Environmental Commissioner. The process of undertaking appropriate monitoring as per specific topics (such as fauna and flora) and tracking performances against the objectives and documenting all environmental activities is part of internal and external auditing to be coordinated by the Project HSE Officer.

The second part of the monitoring of the EMP performance will require a report outlining all the activities related to the effectiveness of the EMP at the end of the planned mineral exploration to be undertaken by the Project HSE Officer with the support of the external specialist consultants as may be required. The objective will be to ensure that corrective actions are reviewed, and steps are taken to ensure compliance for future EIA and EMP implementation.

The report shall outline the status of the environment and any likely environmental liability after the completion of the proposed / ongoing project activities. The report shall be submitted to the Environmental Commissioner in the Ministry of Environment and Tourism and will represent the final closure and fulfillment of the conditions of the Environmental Clearance Certificate (ECC) issued by the Environmental Commissioner and the conditions of the Pro-Forma Environmental Contract signed by the Proponent, Environmental Commissioner and the Mining Commissioner.

6. CONCLUSION AND RECOMMENDATION

6.1. Conclusions

Johannes Christiaan Kake (the “Proponent”) has applied for mineral rights under the Exclusive Prospecting License (EPL) 8300 Base and Rare Metals, Dimension Stones, Industrial Minerals and

Precious Metals. The exploration activities to be undertaken as assessed in this environmental assessment are as follows:

(i) Initial desktop exploration activities.

(ii) Regional reconnaissance field-based activities.

(iii) Initial local field-based activities including detailed mapping, sampling and drilling operations.

(iv) Detailed local field-based activities including detailed mapping, sampling and drilling operations, and.

(v) Prefeasibility and feasibility studies including possible test mining.

The overall severity of potential environmental impacts of the proposed / ongoing project activities on the receiving environment (physical, biological, socioeconomic environments and ecosystem functions, services, use and non-use values or passive uses) will be of low magnitude, temporally duration, localised extent and low probability of occurrence.

6.2. Recommendations

Based on the findings of the EIA, it's hereby recommended that the proposed / ongoing exploration activities be issued with an Environmental Clearance Certificate (ECC). It's hereby recommended that the proposed / ongoing exploration activities be issued with an Environmental Clearance Certificate (ECC). The Proponent shall implement precautionary measures / approach to environmental management.

The Proponent shall take into consideration the following key requirements for implementing the proposed exploration programme:

(i) Mitigation measures must be implemented as detailed in this EMP report.

(ii) Based on the findings of the EIA, it's hereby recommended that the proposed / ongoing exploration activities be issued with an Environmental Clearance Certificate (ECC). It's hereby recommended that the proposed / ongoing exploration activities be issued with an Environmental Clearance Certificate (ECC). The Proponent shall implement precautionary measures / approach to environmental management.

(iii) The Proponent shall negotiate Access Agreements with the land owner/s as may be applicable.

(iv) The Proponent shall adhere to all the provisions of the EMP and conditions of the Access Agreement to be entered between the Proponent and the land owner/s in line with all applicable national regulations.

(v) Before entering any private or protected property/ area such as a private farm, the Proponent must give advance notices and obtain permission to access the EPL area at all times, and.

(vi) Where possible, and if water is found during the detailed exploration boreholes drilling operations, the Proponent shall support other land uses in the area in terms of access to freshwater supply for both human consumption, wildlife, and agricultural support as may be requested by the local community / landowners/s. The abstraction of the groundwater resources shall include water levels monitoring, sampling, and quality testing on a bi-annual basis, and the affected landowners must have access to the results of the water monitoring analyses as part of the ongoing stakeholder disclosure requirements on shared water resources as may be applicable.

The Proponent must take all the necessary steps to implement all the recommendations of the EMP for the successful implementation and completion of the proposed / ongoing exploration programme covering the EPL 8300. Recommended actions to be implemented by the Proponent through implementations of the EMP are:

(i) The Proponent must implement precautionary measures / approach to environmental management. Once a viable and potential economic resource have been identified, the Proponent must develop and implement a separate EIA and EMP inclusive of the specialist studies such as fauna and flora to be undertaken by specialist consultants as part of the feasibility study stage.

(ii) Before detailed site-specific exploration activities such as extensive drilling operations and access routes are selected, the Project HSE Officer with the support of the external specialist consultants as may be required, should consider the flora, fauna and archaeological sensitivity of the area and commission a field survey in advance of any site development as may be required based on the assessment undertaken.

(iii) The Project HSE Officer shall lead, implement, and promote environmental culture through awareness-raising of the workforce, contractors and sub-contractors in the field during the whole duration of the proposed / ongoing exploration period.

(iv) The Proponent to provide all the necessary support including human and financial resources, for the implementation of the proposed / ongoing mitigations and effective environmental management during the planned exploration activities for the EPL 8300.

(v) Project HSE Officer with the support of the external specialist consultants as may be required to develop a simplified environmental induction and awareness programme for all the workforce, contractors, and sub-contractors.

(vi) Where contracted service providers are likely to cause environmental impacts, these will need to be identified and contract agreements need to be developed with costing provisions for environmental liabilities.

(vii) Implement monitoring of the actions and management strategies developed during the mineral exploration process. Final Environmental Monitoring report shall be prepared by the Project HSE Officer with the support of the external specialist consultants as maybe required to be submitted to the regulators and to mark the closure of the proposed / ongoing mineral exploration, and.

(viii) Develop and implement a monitoring programme that will fit into the overall company's Environmental Management Systems (EMS) as well as for any future EIA for possible mining projects.

6.3. Summary ToR for Test Mining and Mining Stages

In an even that economic minerals resources are discovered within the EPL 8300 area and could lead to the development of mining project, a new Environmental Clearance Certificate (ECC) for mining will be required. The ECC being supported by this EMP report only covers the exploration phase. A separate field-based and site-specific Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) reports supported by specialist studies as maybe applicable must be prepared in order to support the application for the new ECC for mining operations. The EIA and EMP studies shall form part of the prefeasibility and feasibility study with respect to the test mining or possible mining operations.

The site-specific EIA and EMP shall cover the area identified to have potential economic minerals resources as well as all areas to be used for infrastructural support areas such as pit / shaft area/s, waste rock, tailings dump, access, office blocks, water, and energy infrastructure support areas (water, energy and road / access). In addition to the Terms of Reference (ToR) to be developed during the Environmental Scoping study phase for the test mining / mining stages, the following field-based and site-specific specialist studies shall be undertaken as part of the EIA and EMP for possible test mining or mining operations in an event of a discovery of economic minerals resources and possible development of a mining project:

(i) Groundwater studies including modeling as may be applicable.

(ii) Field-based flora and fauna diversity.

(iii) Archaeology.

(iv) Noise and Sound modellng linked to engineering studies.

(v) Socioeconomic assessment, and.

(vi) Others as may be identified/recommended by the stakeholders/ landowners/ Environmental Commissioner or specialists.

The aims and objectives of the Environmental Assessment (EA) covering EIA and EMP to be implemented as part of the feasibility study if a variable resource is discovered are:

(i) To assess all the likely positive and negative short- and long-term impacts on the receiving environment (physical, biological, and socioeconomic environments) at local (EPL Area), regional, national (Namibia), and Global levels using appropriate assessment guidelines, methods and techniques covering the complete project lifecycle. The EIA and EMP to be undertaken shall be performed with reasonable skill, care, and diligence in accordance with professional standards and practices existing at the date of performance of the assessment and the guidelines, methods, and techniques shall conform to the national regulatory requirements, process, and specifications in Namibia and in particular as required by the Ministry of Mines and Energy, Ministry of Environment and Tourism and Ministry of Agriculture, Water Affairs and Forestry, and.

(ii) The development of appropriate mitigation measures that will enhance the positive impacts and reduce the likely negative influences of the negative impacts identified or anticipated. Such mitigation measures shall be contained in a detailed EMP report covering the entire project lifecycle.

7. REFERENCES

1 FURTHER GENERAL READING

Department of Water Affairs and Forestry, 2001. Groundwater in Namibia: An explanation to the hydrogeological map. *MAWRD*, Windhoek, 1, 128 pp.

Geological Survey of Namibia, 1999. Regional geological map of Namibia. Ministry of Mines and Energy, Windhoek, Namibia.

Miller, R.McG. 2008. The geology of Namibia. Geological Survey, Ministry of Mines and Energy, Windhoek, Vol. 3.

Lycia L. Stigall, D. I.-K. (2014). Evidence For A Dioecious Mating System In Early Jurassic Hardapestheria Maxwelli Gen.Et Sp. Nov. (*Crustacea, Branchiopoda,Spinicaudata*) From The Kalkrand Formation Of Namibia. Paleontology, 127–140.

Miller, R. McG., 1992. Stratigraphy. *The mineral resource of Namibia*, *Geological Survey of Namibia, MME*, Windhoek, 1.2 .1 -1.2.13.

Miller, R. McG., 1983a. The Pan – African Damara Orogen of S.W.A. / Namibia, Special Publication of the Geological Society of South Africa, **11**, 431 - 515.

Miller, R. McG., 1983b. Economic implications of plate tectonic models of the Damara Orogen, Special Publication of the Geological Society of South Africa, **11**, 115 -138.

Ministry of Environment, Forestry, and Tourism (MEFT), 2002. Atlas of Namibia. Comp. J. Mendelsohn, A. Jarvis, T. Roberts and C. Roberts, David Phillip Publishers, Cape Town.

Müller, M.A.N. 1984. Grasses of Southwest Africa/Namibia. John Meinert Publishers (Pty) Ltd, Windhoek, Namibia.

National Statistics Agency (NSA) 2011. Kunene Region Census Regional Profiles: 2011 Population and Housing Census, Kunene Region Basic Analysis with Highlights, National Statistics Agency, Windhoek.

Steven, N. M., 1993. A study of epigenetic mineralization in the Central Zone of the Damara Orogen, Namibia, with special reference to gold, tungsten, tin, and rare earth element. *Geological Survey of Namibia, Memoir* 16,166 pp.

South African National Standards (SANS), 2005**.** South African National Standard, Ambient Air Quality – Limits for Common Pollutants. SANS 1929:2005. Standards South Africa, Pretoria.

2. REFERENCES AND FURTHER READING ON FAUNA AND FLORA

Alexander, G. and Marais, J. 2007. A guide to the reptiles of southern Africa. Struik Publishers, Cape Town, RSA.

Barnard, P. 1998. Underprotected habitats. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Bester, B. 1996. Bush encroachment – A thorny problem. *Namibia Environment* 1: 175-177.

Branch, B. 1998. Field guide to snakes and other reptiles of southern Africa. Struik Publishers, Cape Town, RSA.

Branch, B. 2008. Tortoises, terrapins and turtles of Africa. Struik Publishers, Cape Town, RSA.

Boycott, R.C. and Bourquin, O. 2000. The Southern African Tortoise Book. O Bourquin, Hilton, RSA.

Broadley, D.G. 1983. Fitzsimons' Snakes of southern Africa. Jonathan Ball and AD. Donker Publishers, Parklands, RSA.

Brown, C.J., Jarvis, A., Robertson, T. and Simmons, R. 1998. Bird diversity. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Brown, I, Cunningham, P.L. and De Klerk, M. 2006. A comparative study of wetland birds at two dams in central Namibia. *Lanioturdus* 39(1): 2-9.

Buys, P.J. and Buys, P.J.C. 1983. Snakes of Namibia. Gamsberg Macmillan Publishers, Windhoek, Namibia.

Carruthers, V.C. 2001. Frogs and frogging in southern Africa. Struik Publishers, Cape Town, RSA.

Channing, A. 2001. Amphibians of Central and Southern Africa. Protea Bookhouse, Pretoria, RSA.

Channing, A. and Griffin, M. 1993. An annotated checklist of the frogs of Namibia. *Madoqua* 18(2): 101-116.

Coats Palgrave, K. 1983. Trees of Southern Africa. Struik Publishers, Cape Town, RSA.

Cole, D.T. and Cole, N.A. 2005. Lithops Flowering Stones. Cactus and Co. Libri

Craven, P. 1998. Lichen diversity in Namibia. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Craven, P. (ed.). 1999. A checklist of Namibian plant species. Southern African Botanical Diversity Network Report No. 7, SABONET, Windhoek.

Crouch, N.R., Klopper, R.R., Burrows, J.E. and Burrows, S. M. 2011. Ferns of southern Africa – a comprehensive guide. Struik Nature, Cape Town, RSA.

Cunningham, P.L. 1998. Potential wood biomass suitable for charcoal production in Namibia. *Agri-Info* 4(5): 4-8.

Cunningham, P.L. 2006. A guide to the tortoises of Namibia. Polytechnic of Namibia, Windhoek, Namibia.

Curtis, B. and Barnard, P. 1998. Sites and species of biological, economic or archaeological importance. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Curtis, B. and Mannheimer, C. 2005. Tree Atlas of Namibia. National Botanical Research Institute, Windhoek, Namibia.

De Graaff, G. 1981. The rodents of southern Africa. Buterworths, RSA.

Du Preez, L. and Carruthers, V. 2009. A complete guide to the frogs of southern Africa. Struik Publishers, Cape Town, RSA.

Estes, R.D. 1995. The behaviour guide to African mammals. Russel Friedman Books, Halfway House, RSA.

Giess, W. 1971. A preliminary vegetation map of South West Africa. *Dinteria* 4: 1 – 114.

Griffin, M. 1998a. Reptile diversity. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Griffin, M. 1998b. Amphibian diversity. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Griffin, M. 1998c. Mammal diversity. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Griffin, M. 2003. Annotated checklist and provisional national conservation status of Namibian reptiles. Ministry of Environment, Forestry and Tourism (MEFT), Windhoek.

Griffin, M. and Coetzee, C.G. 2005. Annotated checklist and provisional national conservation status of Namibian mammals. Ministry of Environment, Forestry and Tourism (MEFT), Windhoek.

Hardap Regional Council . (2018). Strategic plan 2018/19-2022-23.

Hebbard, S. n.d. A close-up view of the Namib and some of its fascinating reptiles. ST Promotions, Swakopmund, Namibia.

Hockey, P.A.R., Dean, W.R.J. and Ryan, P.G. 2006. Roberts Birds of Southern Africa VII Edition. John Voelcker Bird Book Fund.

IUCN, 2015. IUCN red list of threatened animals, IUCN, Gland, Switserland.

Joubert, E. and Mostert, P.M.K. 1975. Distribution patterns and status of some mammals in South West Africa. *Madoqua* 9(1): 5-44.

Komen, L. n.d. The Owls of Namibia – Identification and General Information. NARREC, Windhoek.

Maclean, G.L. 1985. Robert's birds of southern Africa. John Voelcker Bird Book Fund.

Maggs, G. 1998. Plant diversity in Namibia. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Mannheimer, C. and Curtis, B. (eds) 2009. Le Roux and Müller's field guide to the trees and shrubs of N amibia. Macmillan Education Namibia, Windhoek.

Marais, J. 1992. A complete guide to the snakes of southern Africa. Southern Book Publishers, Witwatersrand University Press, Johannesburg, RSA.

Mendelsohn, J., Jarvis, A., Roberts, A. and Robertson, T. 2002. Atlas of Namibia. A portrait of the land and its people. David Philip Publishers, Cape Town, RSA.

Monadjem, A., Taylor, P.J., F.P.D. Cotterill and M.C. Schoeman. 2010. Bats of southern and central Africa. Wits University press, Johannesburg, RSA.

Müller, M.A.N. 1984. Grasses of South West Africa/Namibia. John Meinert Publishers (Pty) Ltd, Windhoek, Namibia.

Müller, M.A.N. 2007. Grasses of Namibia. John Meinert Publishers (Pty) Ltd, Windhoek, Namibia.

NACSO, 2010. Namibia's communal conservancies: a review of progress and challenges in 2009. NACSO, Windhoek.

Passmore, N.I. and Carruthers, V.C. 1995. South African Frogs - A complete guide. Southern Book Publishers, Witwatersrand University Press, Johannesburg, RSA.

Rothmann, S. 2004. Aloes, aristocrats of Namibian flora. ST promotions, Swakopmund.

SARDB, 2004. CBSG Southern Africa. In: Griffin, M. 2005. Annotated checklist and provisional national conservation status of Namibian mammals. Ministry of Environment, Forestry and Tourism (MEFT), Windhoek.

Schultz, M. and Rambold, G. 2007. Diversity shifts and ecology of soil lichens in central Namibia. Talk, Ecological Society of Germany, Austria and Switzerland (GfÖ), 37th Annual Meeting, Marburg: 12/9/2007 to 15/9/2007.

Schultz, M., Zedda, L. and Rambold, G. 2009. New records of lichen taxa from Namibia and South Africa. *Bibliotheca Lichenologica* 99: 315-354.

Simmons, R.E. 1998a. Important Bird Areas (IBA's) in Namibia. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Simmons, R.E. 1998b. Areas of high species endemism. In: Barnard, P. (ed.). Biological diversity in Namibia: a country study. Windhoek: Namibian National Biodiversity Task Force.

Simmons R.E., Brown C.J. and Kemper J. 2015. Birds to watch in Namibia: red, rare and endemic species. Ministry of Environment, Forestry and Tourism (MEFT) and Namibia Nature Foundation, Windhoek.

Skinner, J.D. and Smithers, R.H.N. 1990. The mammals of the southern African subregion. University of Pretoria, RSA.

Skinner, J.D. and Chimimba, C.T. 2005. The mammals of the southern African subregion. Cambridge University Press, Cape Town, RSA.

Stander, P. and Hanssen, L. 2003. Namibia large carnivore atlas. Unpublished Report, Ministry of Environment, Forestry and Tourism (MEFT), Windhoek.

Steyn, M. 2003. Southern African Commiphora. United Litho, Arcadia.

Tarboton, W. 2001. A guide to the nests and eggs of southern African birds. Struik Publishers, Cape Town, RSA.

Taylor, P.J. 2000. Bats of southern Africa. University of Natal Press, RSA.

Tolley, K. and Burger, M. 2007. Chameleons of southern Africa. Struik Nature, Cape Town, RSA.

Van Oudtshoorn, F. 1999. Guide to grasses of southern Africa. Briza Publications, Pretoria, South Africa.

Van Wyk, B. and Van Wyk, P. 1997. Field guide to trees of Southern Africa. Cape Town: Struik Publishers.