On-Road Investments (Pty) Ltd

Final Environmental Scoping and Environmental Management Plan (EMP) Report to Support the Application for Renewal of Environmental Clearance Certificate (ECC) for Ongoing / Proposed Exploration / Prospecting Activities in the Exclusive Prospecting License (EPL) No. 4232,
Okahandja District, Otjozondjupa Region

May 2023

P. O Box 26826
6 Amasoniet Street, Eros
WINDHOEK NAMIBIA

PROPONENT, LISTED ACTIVITIES AND RELATED INFORMATION SUMMARY

NAME OF THE PROPONENT

On-Road Investments (Pty) Ltd

MEFT REFERENCE APPLICATION No.

APP-001474

COMPETENT AUTHORITY

Ministry of Mines and Energy (MME)

ADDRESS OF THE PROPONENT AND CONTACT PERSON

P. O Box 26826
6 Amasoniet Street, Eros
WINDHOEK NAMIBIA

Contact Person:
Ms. Maggie Shi
Email:maggieming2012@hotmail.com

PROJECT TITLE

Application for Renewal of Environmental Clearance Certificate (ECC) for the Proposed Exploration / Prospecting Activities in the Exclusive Prospecting License (EPL) No. 4232, Okahandja District, Otjozondjupa Region, Namibia

PROJECT LOCATION

Windhoek District, Khomas Region, Central Namibia
(Latitude: -22.225198, Longitude: 17.430349)
Latitude: 22°13'30.7"S, Longitude: 17°25'49.3"E

ENVIRONMENTAL / PERMITTING DE-RISKING CONSULTANTS

Risk-Based Solutions (RBS) CC
10 Schützen Street, Sivieda House,
Windhoek Central Business District (CBD)
P. O. Box 1839, **WINDHOEK**, **NAMIBIA**
Tel: +264 - 61- 306058/224780/236598. Fax: +264-61-245001
Mobile: +264-811413229. **Email**: smwiya@rbs.com.na
Global Office / **URL**: www.rbs.com.na

ENVIRONMENTAL ASSESSMENT PRACTITIONER (EAP)

Dr Sindila Mwiya
PhD, PG Cert, MPhil, BEng (Hons), Pr Eng

Content List

List of Figures

List of Tables

List of Plates

NON-TECHNICAL SUMMARY

On-Road Investments (Pty) Ltd (the Proponent) holds mineral rights for base and rare metals, and precious stone under the Exclusive Prospecting Licence (EPL) No. 4232 granted on the 03/06/2014 and will expire on the 08/05/2023. The Exclusive Prospecting Licence (EPL) No. 4232 is located in the Okahandja District, Otjozondjupa Region, central Namibia. The EPL 4232 area totalling 11014.6539 Ha cover parts of the following five (5) commercial farmland: Ozombanda 21, Elbe 10, Ombujongupa 292, Ongombombera 20, and Rudenau Nord 6.

The EPL 4232 area is located at an elevation of between 1350 and 1450 mamsl (meters above mean sea level). The local landscape is characterised by general flat topography with minor valleys created by tributaries of the Swakop Ephemeral River Channel. The general land use of the area is mainly dominated by agriculture (cattle and small stock framing) and privately owned Safari Game Farms / Game Hunting Farms and some farms have lodges facilities and services that support tourism operations in the region.

The proponent intends to continue with the ongoing exploration or prospecting for base and rare metals, and precious stones likely to be associated with the various Damara Rocks found within the EPL area. These Damara Rocks hosts economic minerals resources in different parts of Namibia such as copper, lead, zinc, gold, lithium, uranium as well as marble and granite dimension stones.

This Scoping and Environmental Management Plan (EMP) report has been prepared based on the previous Scoping and EMP Report that was completed in 2019 as well as the Environmental Monitoring activities that have been undertaken since 2019 in order to support the application for the renewal of the ECC that was issued on the 18th September 2019.

It is estimated that at least 78 reptile, 9 amphibian, 83 mammal and 209 bird species (breeding residents) are known to or expected to occur in the general/immediate Elbe area of which a large proportion are endemics. Endemics include at least 36% of the reptiles, 33% of the amphibians, 8% of the mammals and 71% (10 of the 14 Namibian endemics) of all the breeding and/or resident birds known and/or expected to occur in the general area. Faunal disturbance with respect to the proposed exploration activities would be localised.

The effect that the proposed exploration and associated infrastructure would have on the fauna and flora would depend on the extent of the development, area of development, management of the area and how the proposed mitigations are eventually implemented by the proponent (On-Road Investments). Access and maintenance routes would have the most impact on the surroundings although these would also be negligible if new accesses are constructed properly, avoided sensitive habitats such as Swakop Ephemeral River channel and associated tributaries and track discipline (including no killing/poaching fauna along these routes) is adhered to and/or enforced.

The following is the summary of the likely environmental impacts of the proposed exploration / prospecting activities on the receiving environment (physical, biological and socioeconomic environments) without and with 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 as no field-based activities will be undertaken.

(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, and.

(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.

Current proposed main mineral exploration field-based activities covering mapping, geochemical sampling and drilling operations will have low localised impacts on the local receiving environment with low significant impacts. Based on the findings of this Environmental Assessment study covering Environmental Scoping and Environmental Management Plan (EMP), it is hereby recommended that the proposed exploration activities be issued with an Environmental Clearance Certificate (ECC) with key conditions of adhering to all the provisions of the EMP, requirement and conditions of the Access Agreement and all applicable national regulations. Mitigation measures must be implemented as detailed in Section 6 (EMP) of this report. The proponent (On-Road Investments (Pty) Ltd) must obtain permission of the land owners (surface rights holders) before exercising their subsurface rights in all the farms covered by the EPL 4232.

If additional and more detailed boreholes drilling activities need to be undertaken, extensive environmental monitoring including groundwater monitoring must be undertaken. The groundwater monitoring should include water levels monitoring and sampling on a bi-annual basis, and that the affected landowners / farmers must have access to the results of the water monitoring analyses as part of the stakeholder disclosure requirements.

Once a viable project has been identified (economic resources are discovered) and separate field-based and site-specific Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) must be implemented as 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. The following specialist studies shall be undertaken as prat of the EIA and EMP for possible test mining or mining operations: Groundwater studies, flora, fauna, socioeconomic and others as may be identified / recommended by the stakeholders/ land owners/ Environmental Commissioner or specialists.

1. BACKGROUND

1.1 Introduction

On-Road Investments (Pty) Ltd (the Proponent) hold minerals rights under the Exclusive Prospecting License (EPL) No. 4232. The following is the summary of the EPL 4232:

- Type of License: Exclusive Prospecting License (EPL) No. 4232.
- EPL Holder: On-Road Investments (Pty) Ltd.
- EPL Granted Date: 03/06/2014.
- EPL Expiry Date: 08/05/2023.
- Commodities: Base and rare metals and precious metals.
- Size of the EPL: 11014.6539 Ha, and.
- Environmental Clearance Certificate (ECC) granted on the 18th September 2019 and.
- ECC expired on the 18th September 2022.

On-Road Investments (Pty) Ltd intend to continue with the ongoing exploration activities covering desktop studies, followed by site-specific activities using techniques such as geophysical surveys, geological mapping, trenching, drilling and bulk sampling.

1.2 Regulatory Requirements

The proposed prospecting activities are listed in the Environmental Impact Assessment (EIA) Regulations, 2012 and the Environmental Management Act, 2007, (Act No. 7 of 2007) and cannot be undertaken without an Environmental Clearance Certificate (ECC).

The Proponent is required to have a valid ECC for the ongoing and proposed exploration activities. In fulfilment of the environmental requirements, the Proponent appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant and led by Dr Sindila Mwiya as the Environmental Assessment Practitioner (EAP).

This Scoping and EMP report has been prepared based on the previous Scoping and EMP Report that was completed in 2019 as well as the Environmental Monitoring activities that have been undertaken from September 2019 to May 2023 in order to support the application for the renewal of the ECC that was issued on the 18th September 2019 (Fig. 1.1).

1.3 Location, Infrastructure and Services

1.3.1 Location

The Exclusive Prospecting Licence (EPL) No. 4232 is located in the Okahandja District, Otjozondjupa Region, central Namibia (Figs. 2.1 - 1.7). The EPL 4232 area totalling 11014.6539 Ha cover parts of the following five (5) privately owned commercial farms (Fig. 1.5):

1. Ozombanda 21.
2. Elbe 10.
3. Ombujongupa 292.

4. Ongombombera 20, and.

5. Rudenau Nord 6.

The EPL 4232 area is located at an elevation of between 1350 and 1450 mamsl (meters above mean sea level) (Fig. 1.6). The local landscape is characterised by general flat topography with minor valleys created by tributaries of the Swakop Ephemeral River Channel (Figs. 1.4 and 1.6).

The general land use of the area is mainly dominated by agriculture (cattle and small stock framing) and privately owned Safari Game Farms / Game Hunting Farms and some farms have lodges facilities and services that support tourism in the region (Figs. 1.5 and 1.7).

Game farms are also important conservation areas for endemic and protected flora and act as sanctuaries for endangered faunal species. Game farms offers visitors the opportunity to be close to nature with a variety of tailor-made tourism products such game viewing, trails and hunting activities.

The summary of other land uses activities found in the general area but not necessary covered by the EPL area includes: Tourism, recreational and hospitality faciality at Gross Barmen Resort, conservation, minerals prospecting and mining operations (Fig. 1.7).

1.3.2 Infrastructure and Services

The following is the summary of the supporting infrastructure and services:

- **Road** – Access to the EPL area is through the B1 Road to Swakopmund for about 35 km from Okahandja, followed by a left turn-off into the gravel road D2192. The left side main gate to the old mine access road leading to the western boundary Farm Elbe 10 and situated about 12 km south from the B1 turnoff along the gravel road D2192 (Figs. 1.2-1.7).

  Alternatively, the EPL area can also be accessed via the M87 Road leading to Gross Barmen Hot Springs linking into the D1972 connecting to the D2192 (Figs. 1.2-1.7). The main gate leading to the old mine along the 2192 road can be reached via a 12 km north bound trail at Klein Barmen.

- **Rail** - Rail service is available at a 1.067 m gauge line, is located some 21.0 km away at the Francois siding. This siding is located some 31 km west of Okahandja.

- **Energy** –Fuel and other related products are available in Okahandja situated about 35 km to the east of the project area. The total power requirements for exploration will utilise generators and solar as may be applicable. There is a 220 kV powerline line that cut across the EPL area over the Farm Elbe 10 towards a NamPower Substation location about 20 km to south of the EPL area, and.

- **Water** – Water for exploration and in particular drilling program could be obtained from existing borehole or a new borehole drilled on the licence. Large volumes of water, for mining purposes would likely require a pipeline from the Sneyrevier Dam, located 20 km to the south-southwest of the EPL area (Fig. 1.4).

ECC – 00117 Serial No:V6lZg8117

REPUBLIC OF NAMIBIA

MINISTRY OF ENVIRONMENT AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental Management Act (Act No. 7 of 2007)

TO

On-Road Investments (Pty) Ltd
P O Box 26826, Windhoek Namibia, 6 Amasoniet Street, Eros.

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

Proposed Minerals Exploration in The Exclusive Prospecting License (EPL) No. 4232, Situated in Okahandja Area, Otjozondjupa Region.

MINISTRY OF ENVIRONMENT AND TOURISM P/Bag 13306 Windhoek, Namibia 2019 -09- 18 Office of the Deputy Environmental Commissioner

DEPUTY ENVIRONMENTAL COMMISSIONER

Issued on the date: 2019-09-18

Expires on this date: 2022-09-18

(See conditions printed over leaf)

This certificate is printed without erasures or alterations

Reduce Reuse Recycle NAMIBIA TRASH BIN

Figure 1.1: Copy of the ECC granted on the 18th September 2019 and expired on the 18th September 2022 and need to be renewed.

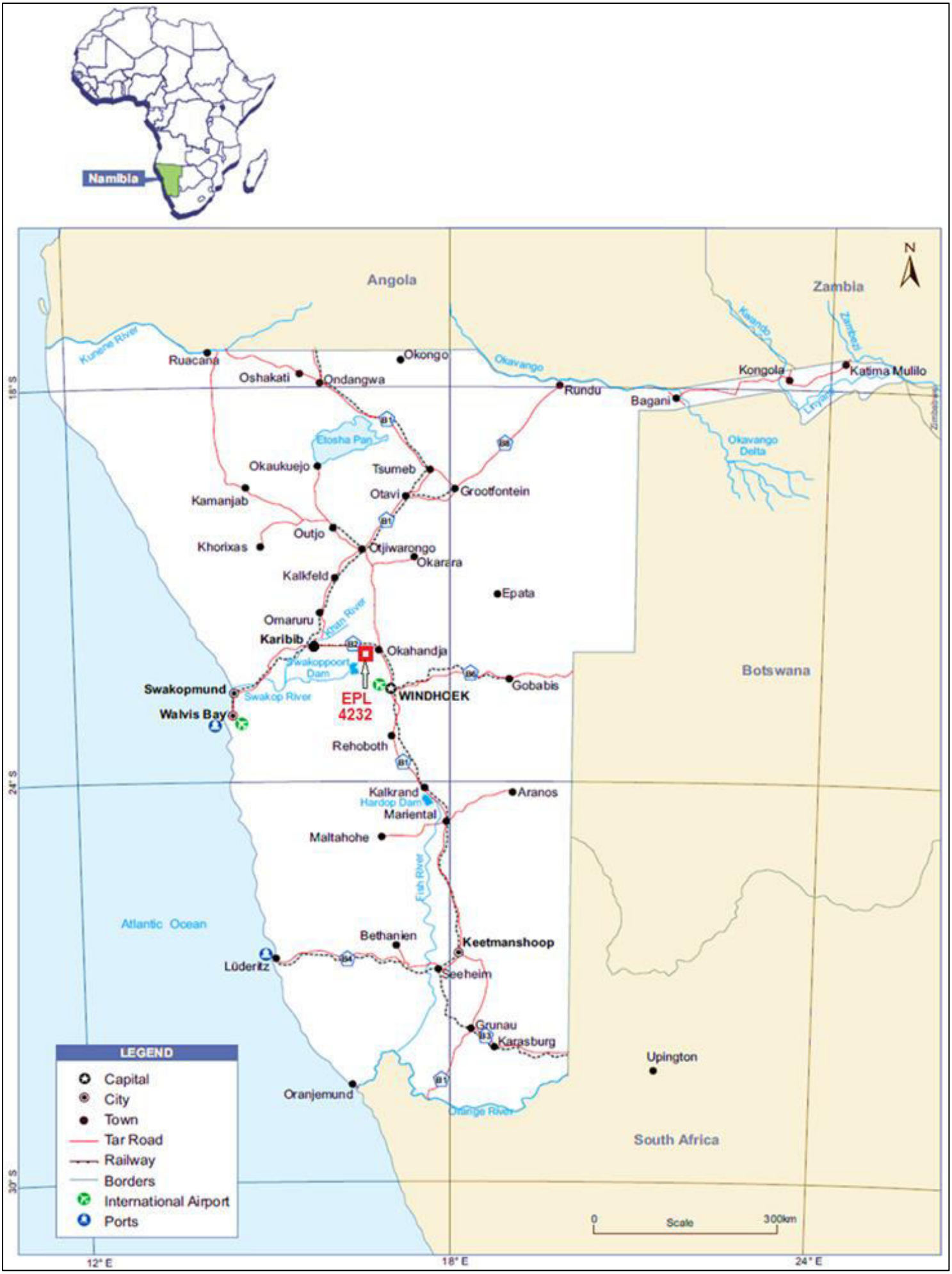
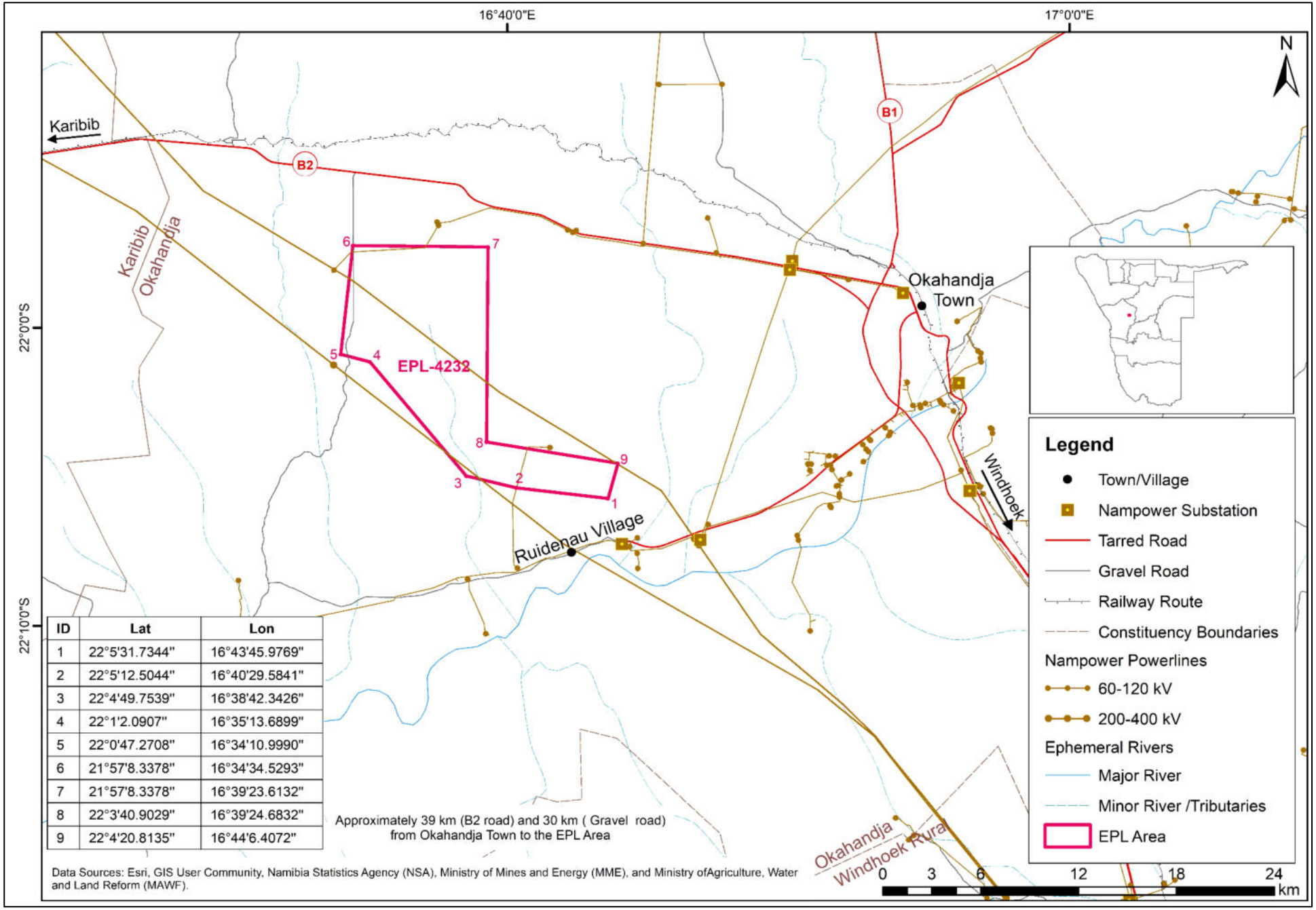


Figure 1.2: Regional location of the EPL 4232.



ID	Lat	Lon
1	22°5'31.7344"	16°43'45.9769"
2	22°5'12.5044"	16°40'29.5841"
3	22°4'49.7539"	16°38'42.3426"
4	22°1'2.0907"	16°35'13.6899"
5	22°0'47.2708"	16°34'10.9990"
6	21°57'8.3378"	16°34'34.5293"
7	21°57'8.3378"	16°39'23.6132"
8	22°3'40.9029"	16°39'24.6832"
9	22°4'20.8135"	16°44'6.4072"

Figure 1.3: Detailed regional location of the EPL 4232 showing the license comer coordinates.

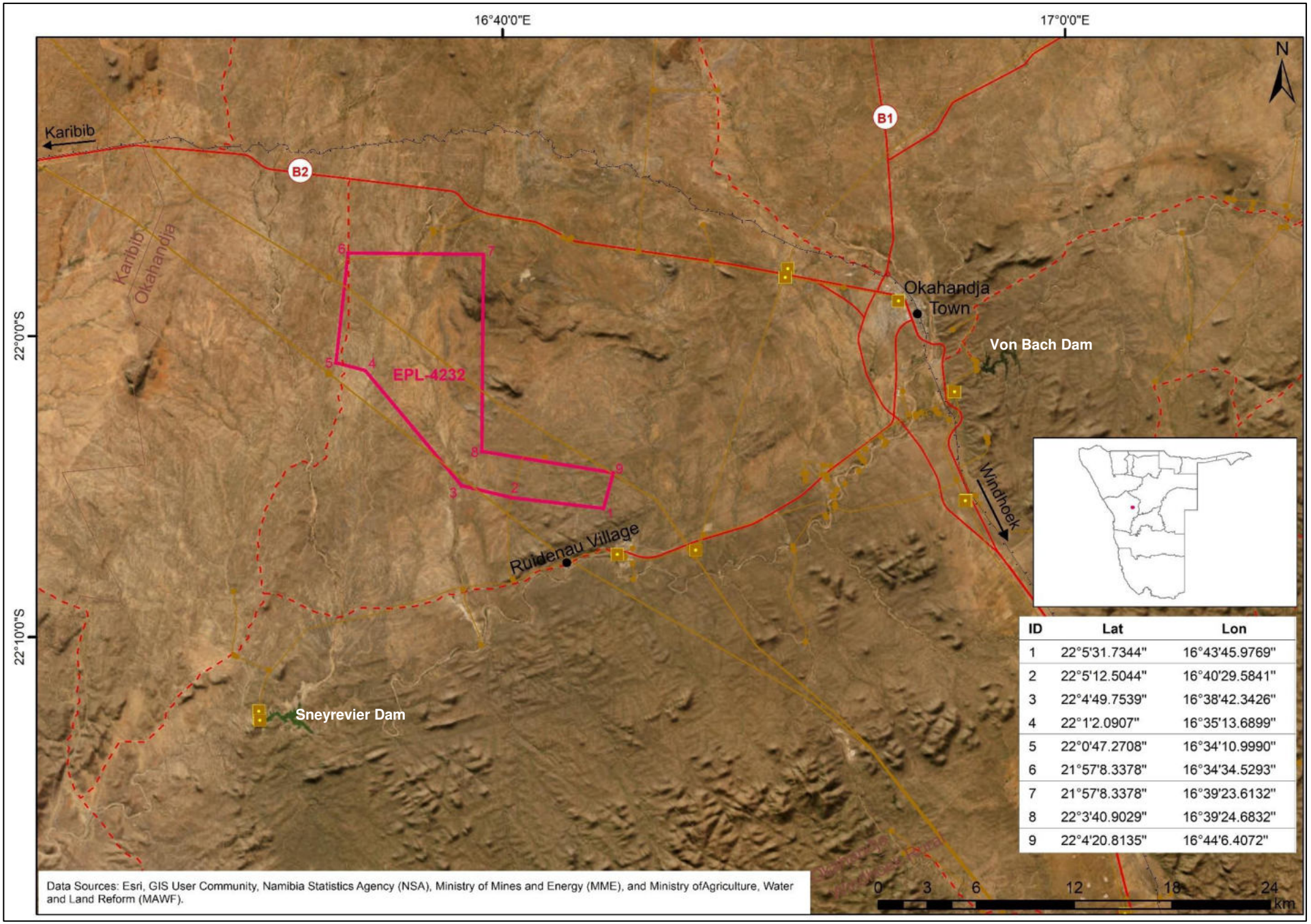


Figure 1.4: Detailed regional satellite image location of the EPL 4232 showing the EPL corner coordinates.

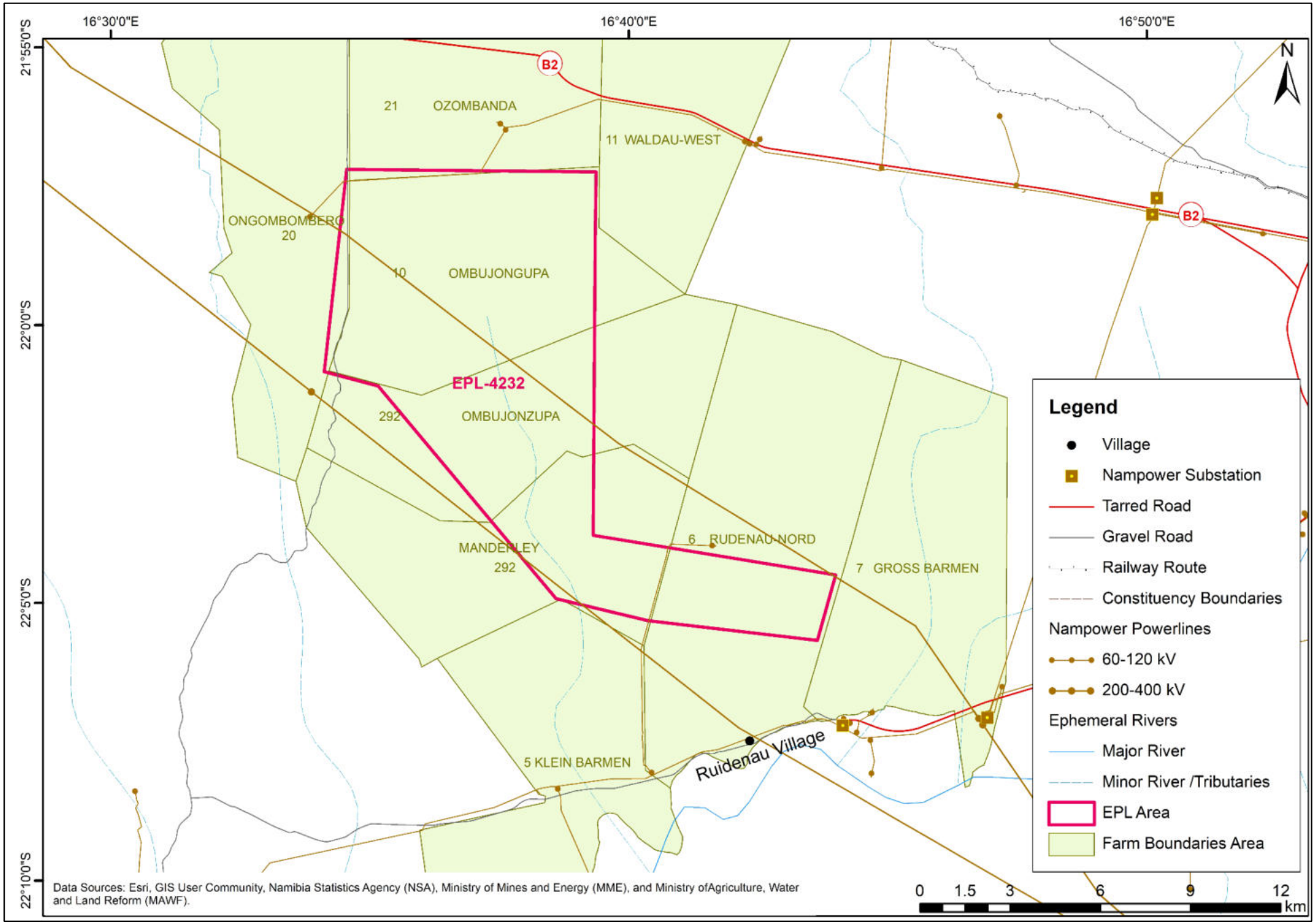


Figure 1.5: Farmlands covered by the EPL 4232 Area.

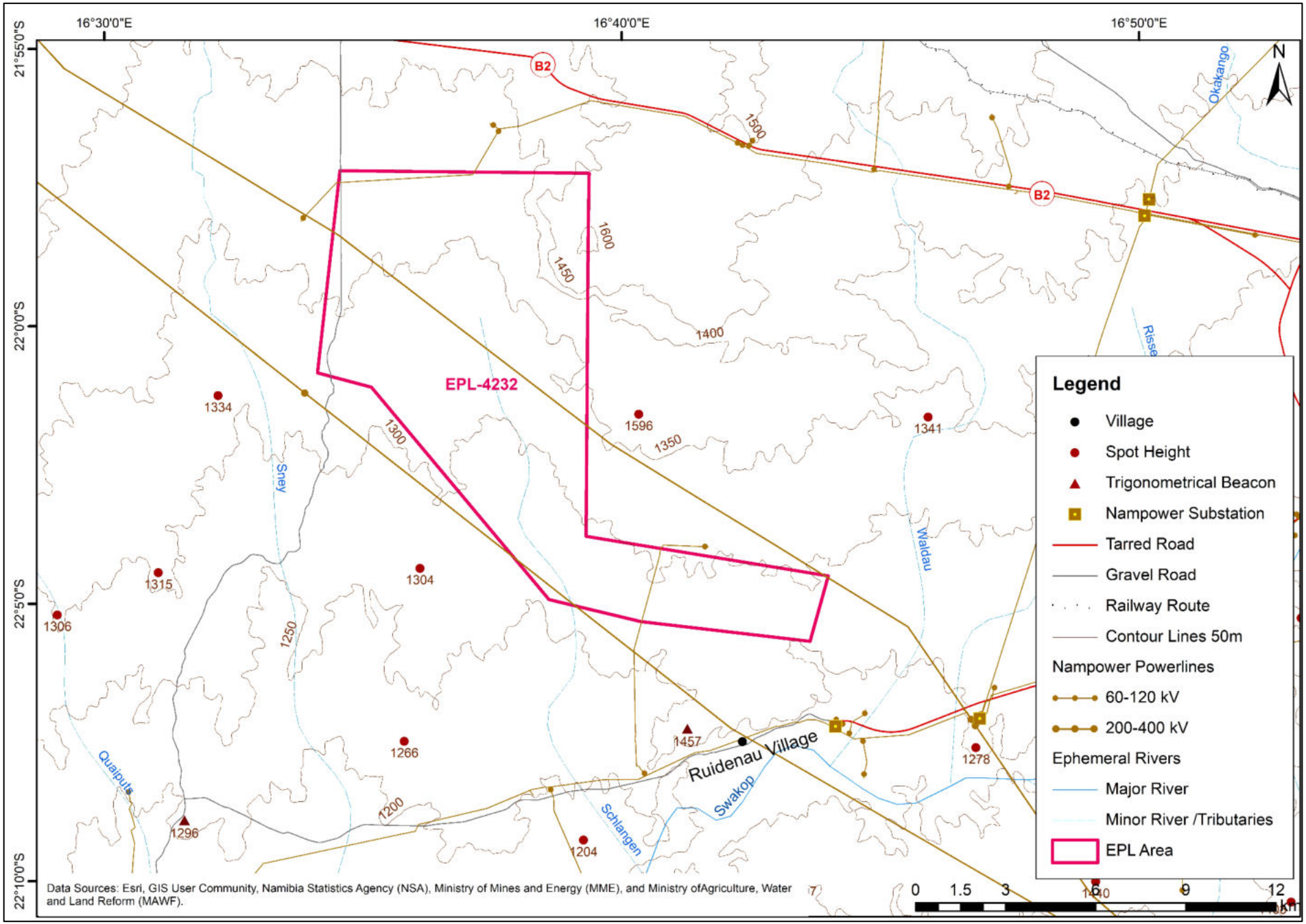


Figure 1.6: Detailed topographic setting of the EPL 4232 and local supporting infrastructure.

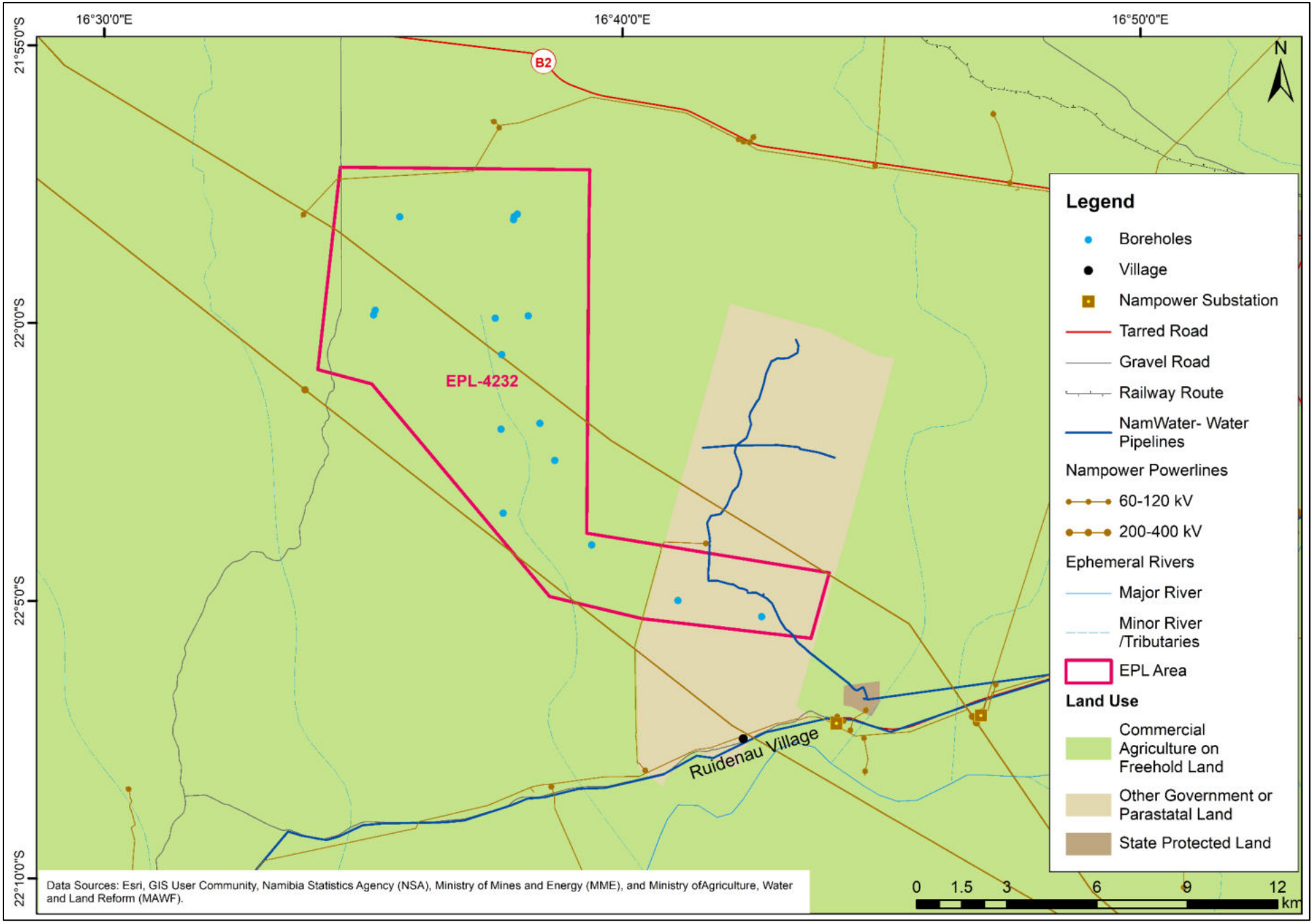


Figure 1.7: Overview of the land use around the EPL 4262 and surrounding areas.

1.4 Project Motivation

The EPL 4232 falls within the central Damara Belt which is regarded one of the highly prospective areas for base and rare metals and precious metals in Namibia. These Damara Rocks hosts economic minerals resources in different parts of Namibia such as copper, lead, zinc, gold, lithium, uranium as well as marble and granite dimension stones. The EPL area covers one of the historical well-known copper deposits called the Elbe Copper Project.

The proposed / ongoing exploration activities has some limited socioeconomic benefits which are mainly centred around the payment of the annual license rental fees to the Central Government through the Ministry of Mines and Energy (MME) and value addition to the potential underground mineral resources in the area which otherwise would not have been known if the exploration in the EPL 4232 did not take place.

The potential discovery of additional economic minerals resources and the development of new copper or gold mining project in the area will have much greater and positive socioeconomic benefits to the local and regional communities as well as Namibia as a whole.

Additional socioeconomic benefits will also be realised at regional and national levels in terms of capital investments, value addition opportunities, license rental fees, royalty taxes payable to Government, direct and indirect contracts and employment opportunities, export earnings, foreign direct investments and various taxes payable to the Government.

1.5 Approach, Alternatives, Key Issues and Methodology

1.5.1 Terms of Reference (ToR) and Approach

Risk-Based Solutions (RBS) was appointed by the Proponent to prepare this Scoping and Environmental Management Plan (EMP) based on the approved screening by the Environmental Commissioner in order to support the application for renewal of the Environmental Clearance Certificate (ECC) for the EPL No. 4232 with respect to the ongoing and proposed exploration activities.

The environmental assessment and management process reviewed the key components of the receiving environmental settings (physical, biological, socioeconomic and ecosystem services, function, use values and non-use) with respect to the ongoing and proposed exploration activities, identified the impacts and then assessed the likely impacts (positive and negative) on the receiving environment (Table 1.1).

The key deliverable comprises this Scoping and EMP Report as per the provisions of the confirmation of screening notice send to the Proponent by the Environmental Commissioner through email in terms of the assessment procedures (Section 35 (1)(a)(b) of the Environmental Management Act, No 7 of 2007) (Fig. 1.8).

The updated environmental report and the completed Application for Environmental Clearance Certificate (ECC) will be submitted to the client (Proponent) and the Office of the Environmental Commissioner, Department of Environmental Affairs and Forestry (DEAF), Ministry of Environment, Forestry and Tourism (MEFT) through the Mining Commissioner in Ministry of Mines and Energy (the Competent Authority) for review and issue of the Record of Decision (RD).

The environmental assessment processes has been performed with reasonable skill, care and diligence in accordance with professional standards and practices existing at the date of performance of the assessment and that the guidelines, methods and techniques that have been applied are all in conformity to the national regulatory requirements, process and specifications in Namibia as required by Ministry of Mines and Energy (MME), Ministry of Environment, Forestry and Tourism (MEFT) and the client (Proponent). This Scoping and EMP Report has been prepared in line with the January 2015 MEFT Environmental Assessment Reporting Guideline.

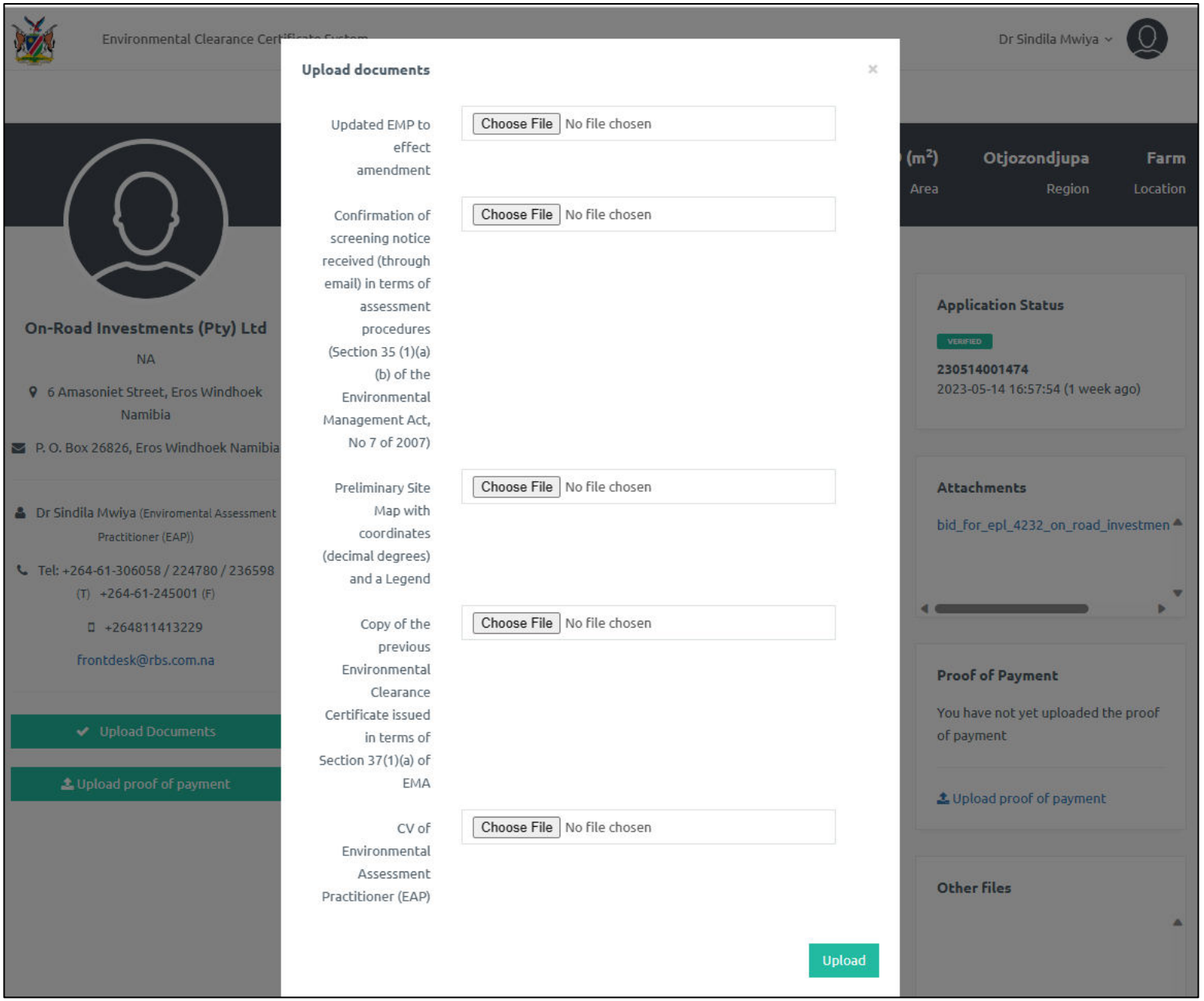


Figure 1.8: Screenshot of the Environmental Commissioner screening results in terms of the provisions of Section 35 (1)(a)(b) of the Environmental Management Act, No. 7 of 2007) with respect to the documents that the Proponent is required to submit as provided for in the confirmation of screening notice send to the Proponent by email but not received due technical issues.

Table 1.1: Summary of the proposed / ongoing activities, alternatives and key issues considered during the Environmental Assessment (EA) process covering Scoping, EIA and EMP Processes.

<table>
<tr><th>PROPOSED / ONGOING PROJECT ACTIVITIES</th><th>ALTERNATIVES TO BE CONSIDERED</th><th colspan="2">KEY ISSUES EVALUATED AND ASSESSED WITH ENVIRONMENTAL MANAGEMENT PLAN (EMP) / MITIGATION MEASURES DEVELOPED</th></tr>
<tr><td rowspan="6">(i) Initial desktop exploration activities (review of existing information and all previous activities in order identify any potential target/s)
(ii) Regional reconnaissance field-based activities such mapping and sampling to identify areas with potential targets
(iii) Initial local field-based activities such as widely spaced mapping, sampling, surveying and possible drilling in order to determine the viability of any delineated targets
(iv) Detailed local field-based activities such very detailed mapping, sampling, surveying and possible drilling in order to determine the feasibility of any delineated local target
(v) Prefeasibility and feasibility studies to be implemented on a site-specific area if the local field-based studies prove positive</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.
(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</td><td colspan="2">Potential land use conflicts / opportunities for coexistence between proposed / ongoing exploration and other existing land uses such as conservation, tourism and agriculture</td></tr>
<tr><td rowspan="3">Impacts on the Physical Environment</td><td>Natural Environment such as air, noise, water, dust etc.</td></tr>
<tr><td>Built Environment such as existing houses, roads, transport systems, Buildings, energy and water and other supporting infrastructure</td></tr>
<tr><td>Socioeconomic, archaeological and Cultural impacts on the local societies and communities</td></tr>
<tr><td rowspan="3">Impacts on the Biological Environment</td><td>Flora
Fauna
Habitat</td></tr>
<tr><td>Ecosystem functions, services, use values and non-Use or passive use</td></tr>
</table>

1.5.2 Environmental Assessment Process and Steps

The environmental assessment process adopted 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. 1.9.

1.5.3 Assumptions and Limitations

The following assumptions and limitations underpin the approach adopted, overall outcomes and recommendations for this study:

- The proposed exploration activities as well as all the plans, maps, EPL Boundary / coordinates and appropriate data sets received from the Proponent, project partners, regulators, Competent Authorities and specialist assessments are assumed to be current and valid at the time of conducting the studies and compilation of this environmental report.

- The impact assessment outcomes, mitigation measures and recommendations provided in this report are valid for the entire duration of the proposed exploration / prospecting activities.

- A precautionary approach has been adopted in instances where baseline information was insufficient or unavailable or site-specific locations of the proposed project activities is not yet available, and.

- Mandatory timeframes as provided for in the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 and the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) have been observed and will apply to the review and decision of this report by the Competent Authority and the Environmental Commissioner.

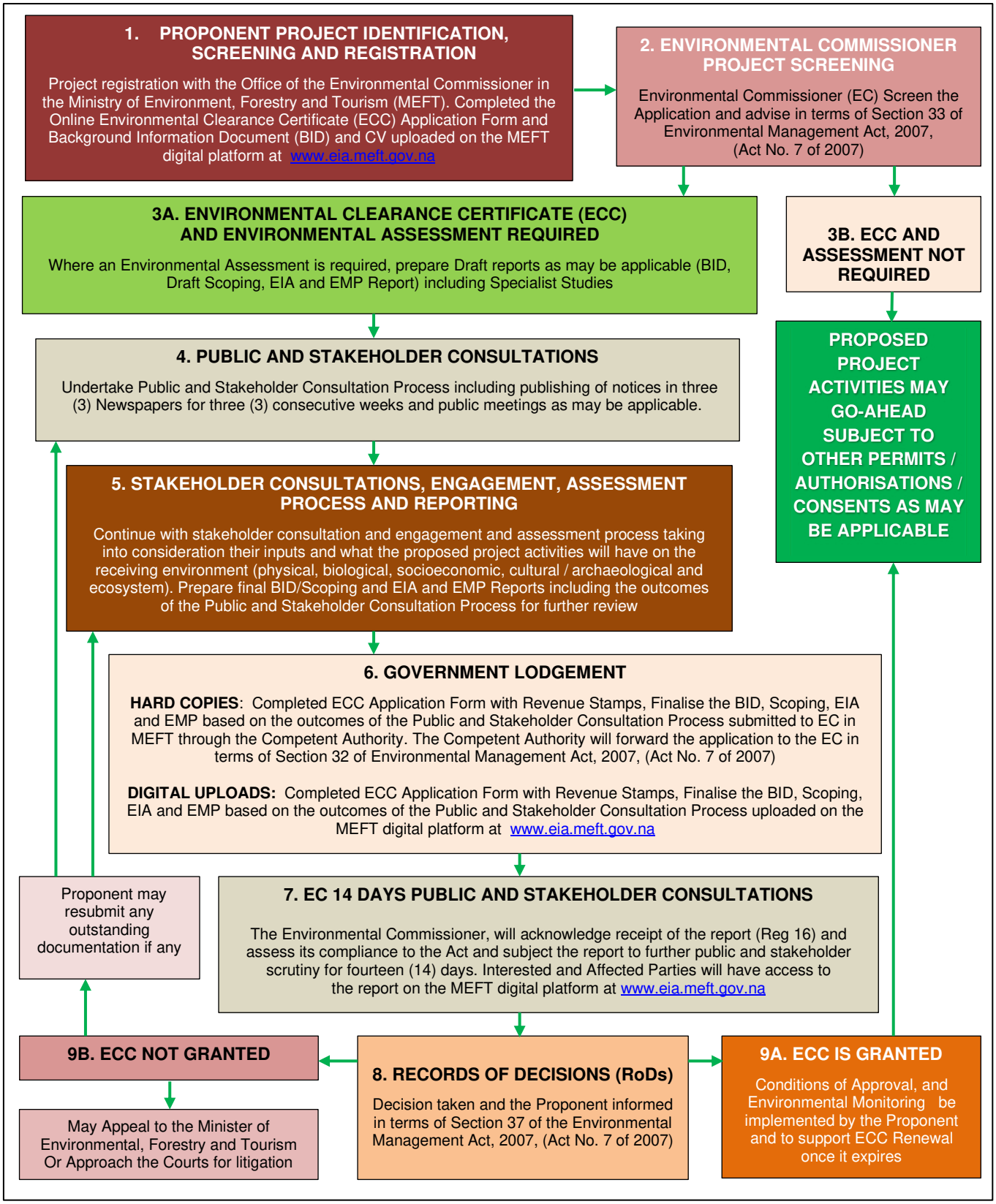


Figure 1.9: RBS Schematic presentation of Namibia's Environmental Assessment Procedure.

1.6 Structure of the Report

The following is the summary structure outline of this scoping and EMP report.

- **Section 1: Background** covering the proposed project location with available infrastructure and services.
- **Section 2: Project Description** covering the summary of the proposed project exploration activities.
- **Section 3: Regulatory Framework** covering the proposed exploration with respect to relevant legislation, regulations and permitting requirements.
- **Section 4: Receiving Environment** covering physical, biological and socioeconomic environments of the proposed project area.
- **Section 5: Impact Assessment** covering the likely positive and negative impacts the proposed project activities are likely to have on the receiving environment.
- **Section 6: Environmental Management Plan (EMP)** describing the detailed mitigation measures with respect to the identified likely impacts.
- **Section 7: Conclusions and Recommendations**- Summary of the findings and way forward.
- **SECTION 8: Annexes**

2. DESCRIPTION OF THE EXPLORATION

2.1 General Overview

The overall aim of the proposed / ongoing project activities (exploration / prospecting programme) is to search for potential economic minerals resources within the EPL area. The exploration activities to be undertaken as assessed in this environmental assessment are as follows:

(i) Initial desktop exploration activities (no field-work 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 (i) and (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 (i) - (iii) above), and.

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

The scope of the required field-based support and logistical activities will depend on the scale of proposed exploration activities to be undertaken. The proposed exploration activities will be supported by existing tracks and campsites / farmstead as well as existing accommodation in in the area. In the absences of existing tracks, the field team will create such new tracks with the permission of the land owner/s and depending on the scale of exploration.

In the absences of existing suitable campsite / farmstead, temporary camp will be setup at suitable locations within the EPL area in line with the EMP provisions.

The size of the exploration camp will be of very limited footprints during the exploration phase but may be expanded for the test mining and mine development phases in an event of a discovery of economic minerals resources.

2.2 Proposed Detailed Local Field-Based Activities

A number of regional reconnaissance field-based mapping and sampling activities as well as initial local field-based mapping and sampling activities have already been undertaken within the EPL area but will still be extended to other parts of the EPL Area where potential minerals occurrences are expected.

Other activities to be undertaken as part of the detailed local field-based activities include the following:

(i) Surface and subsurface geological mapping including boreholes drilling and logging, sampling and laboratory analyses / assessments.

(ii) Trenching, logging, sampling and laboratory analyses of shallow targets.

(iii) Baseline studies such as fauna and flora diversity spanning across the seasons in twelve (12) months and hydrogeological assessments including boreholes drilling and possible groundwater modelling, and.

(iv) Logistical support such as access preparation, exploration and camp sites management.

2.3 Prefeasibility and Feasibility Studies

Prefeasibility and feasibility studies will be implemented on site-specific area and is subject to the positive outcomes of the detailed local field-based exploration activities. The activities to be undertaken as part of the prefeasibility and feasibility will include the following:

(i) Detailed site-specific surveys.

(ii) Detailed geological mapping.

(iii) Bulk sampling and testing.

(iv) Ore reserve calculations.

(v) Geotechnical studies for mine design.

(vi) Detailing technical viability studies including forecasts of estimated expenditure and financial.

(vii) Mine planning and designs including all supporting infrastructures (water, energy and access).

(viii) Environmental Impact Assessment for mining.

(ix) Environmental Management Plan for mining.

(x) Test mining activities, and.

(xi) Preparation of feasibility report and application for Mining License.

Field-based support and logistical activities will be very extensive because the local field-based activities will be undertaken on a specific area for a very long time (up to one year or more in some instances). The activities will be supported by existing tracks and campsites / lodging facilities available in the area.

3. LEGISLATIVE FRAMEWORK

3.1 Overview

There are four sources of law in Namibia: (1) statutes (2) common law (3) customary law and (4) international law. These four kinds of law are explained in more detail in the other factsheets in this series. The constitution is the supreme law of Namibia. All other laws must be in line with it. The most important legislative instruments and associated permits\licenses\authorisations\concerts\ compliances applicable to the proposed exploration activities include: Minerals exploration and mining, environmental management, land rights, water, atmospheric pollution prevention and labour as well as other indirect laws linked to the accessory services of exploration and possible test mining operations.

3.2 Key Applicable Legislation

3.2.1 Minerals Exploration and Mining Legislation

The national legislation governing minerals prospecting and mining activities in Namibia fall within the authority of the Ministry of Mines and Energy (MME) as the Competent Authority (CA) responsible for granting authorisations. The Minerals (Prospecting and Mining) Act (No 33 of 1992) is the most important legal instrument governing minerals prospecting and mining activities in Namibia. A new Bill, to replace the Minerals (Prospecting and Mining) Act (No 33 of 1992) is being prepared and puts more emphasis on good environmental management practices, local participation in the mining industry and promotes value addition as prescribed in the Minerals Policy of 2003. The Minerals (Prospecting and Mining) Act (No 33 of 1992) regulates reconnaissance, prospecting (exploration) and mining activities. The Mining Commissioner, appointed by the Minister, is responsible for implementing the provisions of this Act including reporting requirements, environmental obligations as well as the associated regulations such as the Health and Safety Regulations.

3.2.2 Environmental Management Legislation

The Environmental Assessment (EA) process in Namibia is governed by the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) in the Ministry of Environment, Forestry and Tourism (MEFT). The objectives of the Act and the Regulations are, among others, to promote the sustainable management of the environment and the use of natural resources to provide for a process of assessment and control of activities which may have significant effects on the environment. The Minister of Environment, Forestry and Tourism (is authorised to list activities which may only be undertaken if an environmental clearance certificate has been issued by the environmental commissioner, which activities include those relating to exploration and mining operations. In addition to the requirements for undertaking Environmental Assessment prior to the project implementation, the Environmental Management Act and the EIA Regulations also provide for obligations of a license holder to provide for project rehabilitation and closure plan. In the regulations, the definition of “rehabilitation and closure plan” is a plan which describes the process of rehabilitation of an activity at any stage of that activity up to and including closure stage.

3.2.3 Water Legislation

Water Act 54 of 1956 under the Minister of Agriculture, Water and Land Reform (MAWLR) provides for the control, conservation and use of water for domestic, agricultural, urban and industrial purposes. In terms of Section 6, there is no right of ownership in public water and its control and use is regulated and provided for in the Act. In accordance with the Act, the proposed exploration must ensure that mechanisms are implemented to prevent water pollution. Certain permits will also be required to abstract groundwater as well as for “water works”. The broad definition of water works will include the reservoir on site (as this is greater than 20,000m^3), water treatment facilities and pipelines. Due to the water scarcity of the area, all water will be recycled (including domestic wastewater). The Act requires the license holder to have a wastewater discharge permit for discharge of effluent. The Water Act 54 of 1956 is due to be replaced by the Water Resources Management Act 24 of 2004 which is currently

being revised. The Water Resource Management Act 2004 *provides for the management, development, protection, conservation and use of water resources.*

3.2.4 Forest Regulations and Permit Requirements

All forms of trees and wood harvesting anywhere in Namibia, is governed by the Forest Act, 2001, (Act No. 12 of 2001). and its Regulations, 2015. The Act also governs activities which take place in classified forests, namely State Forests, Forestry Management Areas and Community Forests as well as non-classified forest areas. This Act is administered by the Directorate of Forestry (DoF) in the Ministry of Environment, Forestry and Tourism (MEFT).

3.2.5 Atmospheric Pollution Prevention Legislation

The Atmospheric Pollution Prevention Ordinance, 11 of 1976 falling under the Ministry of Health and Social Services (MHSS) provide for the prevention of the pollution of the atmosphere, and for matters incidental thereto. Part III of the Act sets out regulations pertaining to atmospheric pollution by smoke. While preventative measures for dust atmospheric pollution are outlined in Part IV and Part V outlines provisions for Atmospheric pollution by gases emitted by vehicles.

3.2.6 Labour, Health and Safety Legislations

The Labour Act, 1992, Act No. 6 of 1992 as amended in the Labour Act, 2007 (Act No. 11 of 2007), falling under the Ministry of Labour, Industrial Relations and Employment Creation (MLIREC) refers to severance allowances for employees on termination of a contract of employment in certain circumstances and health, safety, and welfare of employees. In terms of the Health Safety and Environment (HSE), the Labour Act, 2007 protects employees and every employer shall, among other things: provide a working environment that is safe, without risk to the health of employees, and that has adequate facilities and arrangements for the welfare of employees, provide and maintain plant, machinery and systems of work, and work processes, that are safe and without risk to the health of employees, and ensure that the use, handling, storage or transportation of hazardous materials or substances is safe and without risk to the health of employees. All hazardous substances shall have clear exposure limits and the employer shall provide medical surveillance, first-aid and emergency arrangements as fit for the operation.

3.2.7 Other Applicable National Legislations

Other Important legislative instruments applicable to the proposed exploration operations include the following (Table 3.1):

- Explosives Act 26 of 1956 (as amended in SA to April 1978) – Ministry of Home Affairs, Immigration, Safety and Security (MHAISS).
- National Heritage Act 27 of 2004 – Ministry of Education, Arts and Culture (MEAC).
- Petroleum Products and Energy Act 13 of 1990 – Ministry of Mines and Energy (MME).
- Nature Conservation Ordinance, No. 4 of 1975 – Ministry of Environment, Forestry and Tourism (MEFT).
- Forest Act 12 of 2001 – Ministry of Environment, Forestry and Tourism (MEFT).
- Hazardous Substances Ordinance 14 of 1974 – Ministry of Health and Social Services (MHSS), and.
- Public Health Act 36 of 1919 – Ministry of Health and Social Services (MHSS).

Table 3.1 summarises the key selected legislations relevant applicable to the proposed exploration.

Table 3.1: Legislation relevant to the proposed exploration operations.

LAW	SUMMARY DESCRIPTION
Constitution of the Republic of Namibia, 1990	The Constitution is the supreme law in Namibia, providing for the establishment of the main organs of state (the Executive, the Legislature, and the Judiciary) as well as guaranteeing various fundamental rights and freedoms. Provisions relating to the environment are contained in Chapter 11, article 95, which is entitled "promotion of the Welfare of the People". This article states that the Republic of Namibia shall – "actively promote and maintain the welfare of the people by adopting, inter alia, policies aimed at … maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of living natural resources on a sustainable basis for all Namibians, both present and future. The Government shall provide measures against the dumping or recycling of foreign nuclear waste on Namibian territory."
Minerals (Prospecting and Mining) Act, 1992 ***Ministry of Mines and Energy (MME)***	The Minerals Act governs minerals prospecting and mining. The Act *provides for the reconnaissance, prospecting, and mining for, and disposal of, and the exercise of control over minerals in Namibia. and to provide for matters incidental thereto. A new Minerals Bills is currently under preparation.*
Environmental Management Act (2007) - ***Ministry of Environment, Forestry and Tourism*** **(MEFT)**	The purpose of the Act is *to give effect to Article 95(l) and 91(c) of the Namibian Constitution by establishing general principles for the management of the environment and natural resources. to promote the co-ordinated and integrated management of the environment. to give statutory effect to Namibia's Environmental Assessment Policy. to enable the Minister of Environment and Tourism to give effect to Namibia's obligations under international conventions*. In terms of the legislation it will be possible to exercise control over certain listed development activities and activities within defined sensitive areas. The listed activities in sensitive areas require an Environmental Assessment to be completed before a decision to permit development can be taken. The legislation describes the circumstances requiring Environmental Assessments. Activities listed as per the provisions of the Act will require Environmental Assessment unless the Ministry of Environment, Forestry and Tourism, in consultation with the relevant Competent Authority, determines otherwise and approves the exception.
Water Act 54 of 1956 **Minister of Agriculture, Water and Land reform (MAWLR)**	This Act provides for the control, conservation and use of water for domestic, agricultural, urban, and industrial purposes. In terms of Section 6, there is no right of ownership in public water and its control and use is regulated and provided for in the Act. In accordance with the Act, the proposed project must ensure that mechanisms are implemented to prevent water pollution. Certain permits will also be required to abstract groundwater (already obtained) as well as for "water works". The broad definition of water works will include the reservoir on Site (as this is greater than 20,000m^3), water treatment facilities and pipelines. Due to the water scarcity of the area, all water will be recycled (including domestic wastewater) and the Mine will be operated on a zero-discharge philosophy. It will, therefore, not be necessary to obtain permits for discharge of effluent. Section 23 of the Act requires environment rehabilitation after closure of the Mine, particularly, in this instance to obviate groundwater pollution and potential pollution resulting from run-off. This Act is due to be replaced by the Water Resources Management Act 24 of 2004.
Forest Act 12 of 2001 - **Minister of Environment, Forestry and Tourism (MEFT)**	The Act provide for the establishment of a Forestry Council and the appointment of certain officials. to consolidate the laws relating to the management and use of forests and forest produce. to provide for the protection of the environment and the control and management of forest fires. Under Part IV Protection of the environment, Section 22(1) of the Act, it is unlawful for any person to: cut, destroy, or remove: (a) any vegetation which is on a sand dune or drifting sand or in a gully unless the cutting, destruction or removal is done for the purpose of stabilising the sand or gully or (b) any living tree, bush or shrub growing within 100m of a river, stream, or watercourse. Should either of the above be unavoidable, it will be necessary to obtain a permit from the Ministry. Protected tree species as listed in the Regulations shall not be cut, destroyed, or removed.
Hazardous Substance Ordinance 14 of 1974 ***Ministry of Health and Social Services***	Provisions for hazardous waste are amended in this act as it provides "*for the control of substances which may cause injury or ill-health to or death of human beings by reason of their toxic, corrosive, irritant, strongly sensitizing or flammable nature or the generation of pressure thereby in certain circumstances. to provide for the prohibition and control of the importation, sale, use, operation, application, modification, disposal or dumping of such substance. and to provide for matters connected therewith"*

Table 3.1: *Cont.*

Agricultural (Commercial) Land Reform Act, 1995, Act No.6 of 1995 ***Ministry of Agriculture, Water and Land Reform*** **(MAWLR)**	This Act provide for the acquisition of agricultural land by the State for the purposes of land reform and for the allocation of such land to Namibian citizens who do not own or otherwise have the use of any or of adequate agricultural land, and foremost to those Namibian citizens who have been socially, economically or educationally disadvantaged by past discriminatory laws or practices. to vest in the State a preferent right to purchase agricultural land for the purposes of the Act. to provide for the compulsory acquisition of certain agricultural land by the State for the purposes of the Act. to regulate the acquisition of agricultural land by foreign nationals. to establish a Lands Tribunal and determine its jurisdiction. and to provide for matters connected therewith.
Explosives Act 26 of 1956 (as amended in SA to April 1978) - ***Ministry Home Affairs, Immigration, Safety and Security (MHAISS)***	All explosive magazines are to be registered with the Ministry of Mines and Energy as accessory works. In addition, the magazines must be licensed as required by Section 22. The quantity of explosives and the way it is stored must be approved by an inspector. The inspector has powers to enter the premises at any time to conduct inspections regarding the nature of explosive, quantity and the way it is stored. At closure, all explosives are to be disposed of accordingly.
Atmospheric Pollution Prevention Ordinance 11 of 1976. ***Ministry of Health and Social Services (MHSS)***	This regulation sets out principles for *the prevention of the pollution of the atmosphere and for matters incidental thereto.* Part III of the Act sets out regulations pertaining to atmospheric pollution by smoke. While preventative measures for dust atmospheric pollution are outlined in Part IV and Part V outlines provisions for Atmospheric pollution by gases emitted by vehicles.
The Nature Conservation Ordinance, Ordinance 4 of 1975, ***Ministry of Environment, Forestry and Tourism*** **(MEFT)**	During the Mine's activities, care must be taken to ensure that protected plant species and the eggs of protected and game bird species are not disturbed or destroyed. If such destruction or disturbance is inevitable, a permit must be obtained in this regard from the Minister of Environment, Forestry and Tourism. Should the Proponent operate a nursery to propagate indigenous plant species for rehabilitation purposes, a permit will be required. At this stage, however, it is envisaged that this type of activity will be contracted out to encourage small business development.
Labour Act, 1992, Act No. 6 of 1992 as amended in the Labour Act, 2007 (Act No. 11 of 2007 **Ministry of Labour, Industrial Relations and Employment Creation (MLIREC)**	The labour Act gives effect to the constitutional commitment of Article 95 (11), to promote and maintain the welfare of the people. This Act is aimed at establishing *a comprehensive labour law for all employees. to entrench fundamental labour rights and protections. to regulate basic terms and conditions of employment. to ensure the health, safety and welfare of employees* under which provisions are made in chapter 4. *Chapter* 5 of the act improvises on the *protection of employees from unfair labour practice.*
Petroleum Products and Energy Act 13 of 1990 ***Ministry of Mines and Energy (MME)***	Any consumer installation as envisaged in this Act must be licensed. Appropriate consumer installation certificate will need to be obtained from the Ministry for each fuel installation. The construction of the installation must be designed in such a manner as to prevent environmental contamination. Any certificate holder or other person in control of activities related to any petroleum product is obliged to report any major petroleum product spill (defined as a spill of more than 200ℓ per spill) to the Minister. Such person is also obliged to take all steps as may be necessary in accordance with good petroleum industry practices to clean up the spill. Should this obligation not be met, the Minister is empowered to take steps to clean up the spill and to recover the costs thereof from the person. General conditions apply to all certificates issued. These include conditions relating to petroleum spills and the abandonment of the Site. The regulation further provides that the Minister may impose special conditions relating to the preparation and assessment of environmental assessments and the safe disposal of petroleum products.
National Heritage Act 27 of 2004 ***Ministry of Education, Arts and Culture (MEAC)***	This Act provides provisions for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. The proposed activities will ensure that if any archaeological or paleontological objects, as described in the Act, are found during the implementation of the activities, such a find shall be reported to the Ministry immediately. If necessary, the relevant permits must be obtained before disturbing or destroying any heritage

3.3 Key Regulators / Competent Authorities

Government agencies with permits responsibilities over the proposed project activities are shown in Tables 3.2 and 3.3. Table 3.3 shows the relevant permits / licenses required with respect to the proposed minerals exploration activities.

Table 3.2: Government agencies regulating environmental protection in Namibia.

AUTHORITY	TYPE OF AUTHORISATION
Office of the Environmental Commissioner (OEC), Ministry of Environment, Forestry and Tourism	Issue of Environmental Clearance Certificate (ECC) based on the review of the Environmental Assessments (EA) Reports prepared in accordance with the Environmental Management Act (2007) and the Environmental Impact Assessment Regulations, 2012
Directorate of Forestry Ministry of Environment, Forestry and Tourism	Issues the following permits under the Forest Act (Act 12 of 2001) and the Regulations, 2015: ❖ A Harvesting Permit is required for any tree cutting and/or harvesting of wood in an area greater than 15 hectares per annum as stated under Section 22 (1), 23 (1), 24 (2and3) and 33 (1and2) of the Forest Act (Act 12 of 2001). The permit is issued by a Licensing officer, and stipulates conditions of the harvesting on the reverse side of the permit. Inspection of an area to be harvested is done before the permit is issued, and when an application for renewal is made every 3 months. ❖ A Transport Permit is required to convey any wood or wood products (e.g., droppers, planks, charcoal, and firewood). It is obtainable from any Forestry ❖ Office, and is valid for 7 days. ❖ An Export Permit is required to send any wood or wood products outside Namibia. It is obtainable from any Forestry Office, and is valid for 7 days. ❖ A Marketing permit is required to enable the producer to sell his/her products to any other party. The permit is valid for 3 months in commercial areas while in communal areas the permit is valid for 1 month only. The National Botanical Research Institute's (NBRI) mandate is to study the flora and vegetation of Namibia, to promote the understanding, conservation and sustainable use of Namibia's plants for the benefit of all.
Ministry of Mines and Energy (MME)	Competent Authority overseeing all matters related to petroleum exploration and production activities in Namibia. MME is responsible for issuing of all types of Minerals Licenses / Authorisations.
Ministry of Agriculture, Water and Land Reform	The Directorate of Resource Management within the Department of Water Affairs (DWA) at the MAWLR is currently the lead agency responsible for management of surface and groundwater utilisation through the issuing of abstraction permits and waste water disposal permits. DWA is also the Government agency responsible for water quality monitoring and reporting.

Table 3.3: Summary of the permit register applicable to the proposed minerals exploration activities.

ACTIVITY	APPLICABLE LEGISLATION	PERMITTING AUTHORITY	ASSESSMENT RESULTS
Exclusive Prospecting License (EPL)	Petroleum (Exploration and Production) Act 1991 (Act 2 of 1991) As Amended	Ministry of Mines and Energy (MME)	Issued by MME
Environmental Clearance Certificate (ECC)	Environmental Management Act (2007) and the Environmental Impact Assessment Regulations, 2012	Ministry of Environment, Forestry and Tourism (MEFT)	Proponent to Apply for ECC for mineral exploration activities
Land rights covering the proposed project location	Agricultural (Commercial) Land Reform Act, Act 6 of 1995	Private Commercial Farmland	Proposed exploration does not require any Lease Agreement. Access Agreements and Consents shall always be concluded with individual land owners as applicable
Abstraction of water	Water Resources Management Act, 2004 (No. 284 of 2004).	Ministry of Agriculture, Water and Land Reform (MAWLR)	Freshwater Abstraction and Waste Water Discharge Permits to be Applied for once required.
Discharge of effluents or construction of effluent facility			
Removal, disturbances, or destruction of bird eggs	Nature Conservation Ordinance 4, 1975.	Ministry of Environment, Forestry and Tourism (MEFT)	No removals of protected species or mature trees anticipated during the early stages of exploration. Land clearance might be required during the trenching and drilling operation that might form part of the prefeasibility and feasibility stages and if economic resources are discovered and the Proponent decide to apply for a Mining License. The creation of new access shall be undertaken with the consent of the land owners and the physical land clearance must always be done in line with the provisions of the Forest Act, 2001, Act No. 12 of 2001 and the Regulations 2015
Removal, disturbance of protected plants.			
Removal, harvesting, destruction of indigenous trees, bushes, or plants	Forest Act, 2001, Act No. 12 of 2001 and Regulations (2015)		

3.4 International and Regional Treaties and Protocols

Article 144 of the Namibian Constitution provides for the enabling mechanism to ensure that all international treaties and protocols are ratified. All ratified treaties and protocols are enforceable within Namibia by the Namibian courts and these include the following:

- The Paris Agreement, 2016.
- Convention on Biological Diversity, 1992.
- Vienna Convention for the Protection of the Ozone Layer, 1985.
- Montreal Protocol on Substances that Deplete the Ozone Layer, 1987.

- United Nations Framework Convention on Climate Change, 1992.
- Kyoto Protocol on the Framework Convention on Climate Change, 1998.
- Basel Convention on the Control of Transboundary Movement of Hazardous Wastes and Their Disposal, 1989.
- World Heritage Convention, 1972.
- Convention to Combat Desertification, 1994. and
- Stockholm Convention of Persistent Organic Pollutants, 2001.
- Southern Africa Development Community (SADC) Protocol on Mining, and.
- Southern Africa Development Community (SADC) Protocol on Energy.

3.5 Standards and Guidelines

Industrial effluent likely to be generated by the proposed activities must comply with provisions of the Government Gazette No 217 dated 5 April 1962 (Table 3.4) while the drinking water quality comparative guideline values are shown in Table 3.5. The only key missing components to the regulatory frameworks in Namibia are the standards, and guidelines with respect to gaseous, liquid, and solid emissions. However, in the absence of national gaseous, liquid, and solid emission limits for Namibia, the proposed project shall target the Multilateral Investment Guarantee Agency (MIGA) gaseous effluent emission level and liquid effluent emission levels (Table 3.6). Noise abatement measures must target to achieve either the levels shown in Table 3.7 or a maximum increase in background levels of 3 dB (A) at the nearest receptor location off-site (MIGA guidelines).

Table 3.4: R553 Regional Standards for Industrial Effluent, in Government Gazette No 217 dated 5 April 1962.

Colour, odour and taste	The effluent shall contain no substance in concentrations capable of producing colour, odour or taste	
pH	Between 5.5 and 9.5	
Dissolved oxygen	At least 75% saturation	
Typical faecal coli	No typical faecal coli per 100 ml	
Temperature	Not to exceed 35 °C	
Chemical demand oxygen	Not to exceed 75 mg/l after applying a correction for chloride in the method	
Oxygen absorbed	Not to exceed 10 mg/l	
Total dissolved solids (TDS)	The TDS shall not have been increased by more than 500 mg/l above that of the intake water	
Suspended solids	Not to exceed 25 mg/l	
Sodium (Na)	The Na level shall not have been increased by more than 50 mg/l above that of the intake water	
Soap, oil and grease	Not to exceed 2.5 mg/l	
Other constituents	Residual chlorine	0,1 mg/l as Cl
	Free and saline ammonia	10 mg/l as N
	Arsenic	0,5 mg/l as As
	Boron	1,0 mg/l as B
	Hexavalent Cr	0,05 mg/l as Cr
	Total chromium	0,5 mg/l as Cr
	Copper	1,0 mg/l as Cu
	Phenolic compounds	0,1 mg/l as phenol
	Lead	1,0 mg/l as Pb
	Cyanide and related compounds	0,5 mg/l as CN
	Sulphides	1,0 mg/l as S
	Fluorine	1,0 mg/l as F
	Zinc	5,0 mg/l as Zn

Table 3.5: Comparison of selected guideline values for drinking water quality (after Department of Water Affairs, 2001).

Parameter and Expression of the results			WHO Guidelines for Drinking-Water Quality 2nd edition 1993		Proposed Council Directive of 28 April 1995 (95/C/13-1/03) EEC	Council Directive of 15 July 1980 relating to the quality intended for human consumption 80/778/EEC		U.S. EPA Drinking water Standards and Health Advisories Table December 1995		Namibia, Department of Water Affairs Guidelines for the evaluation of drinking-water for human consumption with reference to chemical, physical and bacteriological quality July 1991			
			Guideline Value (GV)		Proposed Parameter Value	Guide Level (GL)	Maximum Admissible Concentration (MAC)	Maximum Contaminant Level (MCL)		Group A Excellent Quality	Group B Good Quality	Group C Low Health Risk	Group D Unsuitable
Temperature	t	°C		-	-	12	25		-	-	-	-	-
Hydrogen ion concentration	pH, 25° C	-	R	<8.0	6.5 to 9.5	6.5 to 8.5	10		-	6.0 to 9.0	5.5 to 9.5	4.0 to 11.0	<4.0 to >11.0
Electronic conductivity	EC, 25° C	mS/m		-	280	45	-		-	150	300	400	>400
Total dissolved solids	TDS	mg/l	R	1000	-	-	1500		-	-	-	-	-
Total Hardness	$CaCO_3$	mg/l		-	-	-	-		-	300	650	1300	>1300
Aluminium	Al	µ g/l	R	200	200	50	200	S	50-200	150	500	1000	>1000
Ammonia	NH_4^+	mg/l	R	1.5	0.5	0.05	0.5		-	1.5	2.5	5.0	>5.0
	N	mg/l		1.0		0.04	0.4		-	1.0	2.0	4.0	>4.0
Antimony	Sb	µ g/l	P	5	3	-	10	C	6	50	100	200	>200
Arsenic	As	µ g/l		10	10	-	50	C	50	100	300	600	>600
Barium	Ba	µ g/l	P	700	-	100	-	C	2000	500	1000	2000	>2000
Berylium	Be	µ g/l		-	-	-	-	C	4	2	5	10	>10
Bismuth	Bi	µ g/l		-	-	-	-		-	250	500	1000	>1000
Boron	B	µ g/l		300	300	1000	-		-	500	2000	4000	>4000
Bromate	BrO_3^-	µ g/l		-	10	-	-	P	10	-	-	-	-
Bromine	Br	µ g/l		-	-	-	-		-	1000	3000	6000	>6000
Cadmium	Cd	µ g/l		3	5	-	5	C	5	10	20	40	>40
Calcium	Ca	mg/l		-	-	100	-		-	150	200	400	>400
	$CaCO_3$	mg/l		-	-	250	-		-	375	500	1000	>1000
Cerium	Ce	µ g/l		-	-	-	-		-	1000	2000	4000	>4000
Chloride	Cl^-	mg/l	R	250	-	25	-	S	250	250	600	1200	>1200
Chromium	Cr	µ g/l	P	50	50	-	50	C	100	100	200	400	>400
Cobalt		µ g/l		-	-	-	-		-	250	500	1000	>1000
Copper after 12 hours in pipe	Cu	µ g/l	P	2000	2	100	-	C	TT##	500	1000	2000	>2000
		µ g/l		-	-	3000[1]	-	S	1000	-	-	-	-
Cyanide	CN^-	µ g/l		70	50	-	50	C	200	200	300	600	>600
Fluoride	F^-	mg/l		1.5	1.5	-	at 8 to 12 °C: 1.5	C	4	1.5	2.0	3.0	>3.0
		mg/l		-	-	-	at 25 to 30 °C: 0.7	P,S	2	-	-	-	-
Gold	Au	µ g/l		-	-	-	-		-	2	5	10	>10
Hydrogen sulphide	H_2S	µ g/l	R	50	-	-	undetectable		-	100	300	600	>600
Iodine	I	µ g/l		-	-	-	-		-	500	1000	2000	>2000
Iron	Fe	µ g/l	R	300	200	50	200	S	300	100	1000	2000	>2000
Lead	Pb	µ g/l		10	10	-	50	C	TT#	50	100	200	>200
Lithium	Li	µ g/l		-	-	-	-		-	2500	5000	10000	>10000
Magnesium	Mg	mg/l		-	-	30	50		-	70	100	200	>200
	$CaCO_3$	mg/l		-	-	7	12		-	290	420	840	>840
Manganese	Mn	µ g/l	P	500	50	20	50	S	50	50	1000	2000	>2000
Mercury	Hg	µ g/l		1	1	-	1	C	2	5	10	20	>20
Molybdenum	Mo	µ g/l		70	-	-	-		-	50	100	200	>200
Nickel	Ni	µ g/l		20	20	-	50		-	250	500	1000	>1000
Nitrate*	NO_3^-	mg/l	P	50	50	25	50		45	45	90	180	>180
	N	mg/l		-	-	5	11	C	10	10	20	40	>40
Nitrite*	NO_2^-	mg/l		3	0.1	-	0.1		3	-	-	-	-
	N	mg/l		-	-	-		C	1	-	-	-	-
Oxygen, dissolved	O_2	% sat.		-	50	-	-		-	-	-	-	-
Phosphorus	P_2O_5	µ g/l		-	-	400	5000		-	-	-	-	-
	PO_4^{3-}	µ g/l		-	-	300	3350		-	-	-	-	-
Potassium	K	mg/l		-	-	10	12		-	200	400	800	>800
Selenium	Se	µ g/l		10	10	-	10	C	50	20	50	100	>100
Silver	Ag	µ g/l		-	-	-	10	S	100	20	50	100	>100
Sodium	Na	mg/l	R	200	-	20	175		-	100	400	800	>800
Sulphate	SO_4^{2-}	mg/l	R	250	250	25	250	S	250	200	600	1200	>1200
Tellurium	Te	µ g/l		-	-	-	-		-	2	5	10	>10
Thallium	Tl	µ g/l		-	-	-	-	C	2	5	10	20	>20
Tin	Sn	µ g/l		-	-	-	-		-	100	200	400	>400
Titanum	Ti	µ g/l		-	-	-	-		-	100	500	1000	>1000
Tungsten	W	µ g/l		-	-	-	-		-	100	500	1000	>1000
Uranium	U	µ g/l		-	-	-	-	P	20	1000	4000	8000	>8000
Vanadium	V	µ g/l		-	-	-	-		-	250	500	1000	>1000
Zinc after 12 hours in pipe	Zn	µ g/l	R	3000	-	100	-	S	5000	1000	5000	10000	>10000
		µ g/l		-	-	5000	-		-	-	-	-	-
			P: Provisional R: May give reason to complaints from consumers					C: Current. P: Proposed. S: Secondary. T#: Treatment technique in lieu of numeric MCL. TT##: treatment technique triggered at action level of 1300 µ g/l					

Table 3.6: Liquid effluent emission levels (MIGA /IFC).

Pollutant	**Max. Value**
pH	6-9
Total suspended solids	50 mg/l
Total metals	10 mg/l
Phosphorous (P)	5 mg/l
Fluoride (F)	20 mg/l
Cadmium (Cd)	0.1 mg/l

Table 3.7: Noise emission levels (MIGA /IFC).

	Maximum Allowable Leq (hourly), in dB(A)	
Receptor	Day time (07:00 – 22:00)	Night time (22:00 – 07:00)
Residential, institutional, educational	55	45
Industrial, commercial	70	70

3.6 Recommendations on Permitting Requirements

It is hereby recommended that the Proponent must follow the provisions of all relevant national regulatory throughout the proposed project lifecycle and must obtain the following permits/ authorisations as maybe applicable / required as the proposed project develops:

(i) Valid EPL as may be applicable from Department of Mines in the MME.

(ii) Valid ECC from the Department of Environmental Affairs in the MEFT.

(iii) The Proponent shall apply for a fresh water abstraction and waste water discharge permits from the Department of Water Affairs (DWA) in the MAWLR before drilling a water borehole and discharge wastewater into the environment respectively, and.

(iv) All other permits as may be applicable for the proposed exploration operations.

4. RECEIVING ENVIRONMENT

4.1 Climatic Settings

The EPL area receives summer rainfall which is brought by northeast winds, generally from October to April. The average annual rainfall varies considerably and ranges between 400 mm and 500 mm (Fig. 4.1). Regional mean annual gross evaporation around the EPL 4232 area is about 3200 mm (Fig. 4.1).

The numbers of rainfall events expressed as an annual average in days as determined from the regional data is 10-30 days. The sun shines for an annual average of 10 hours a day.

The annual mean temperature for is around 24°C with the mean monthly temperatures ranging between 23°C to 14°C throughout the year (Fig. 4.2).

Seasonal variations in the wind fields are presented by the average wind data for January, April, July and October. An increase in the north to north-easterly winds during summer (January) and autumn (April) is likely (Fig. 4.2).

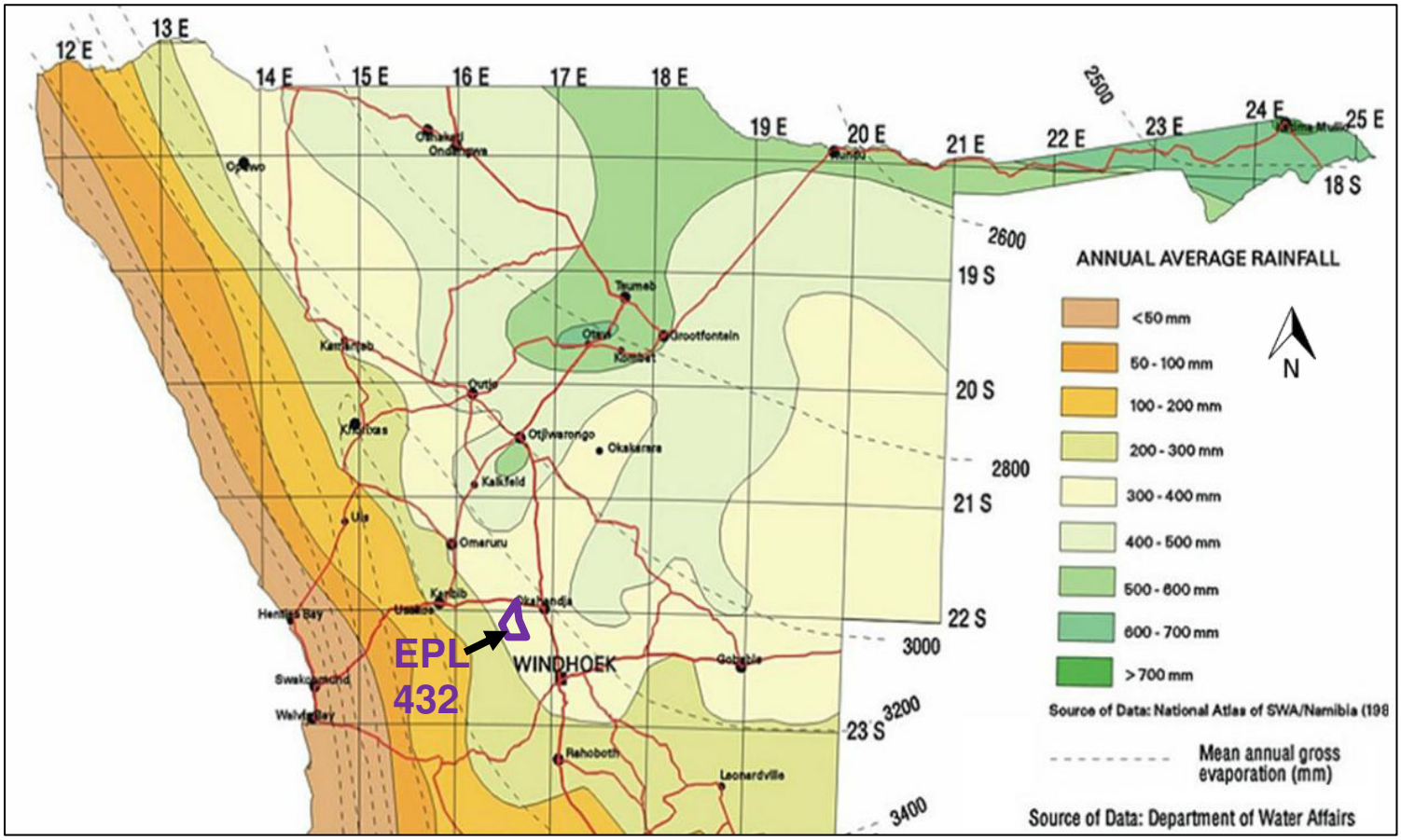


Figure 4.1: Regional climatic settings of central and northern Namibia showing variations in annual rainfall, and mean annual gross evaporation (Source: Department of Water Affairs, Ministry of Agriculture, Water and Land Reform).

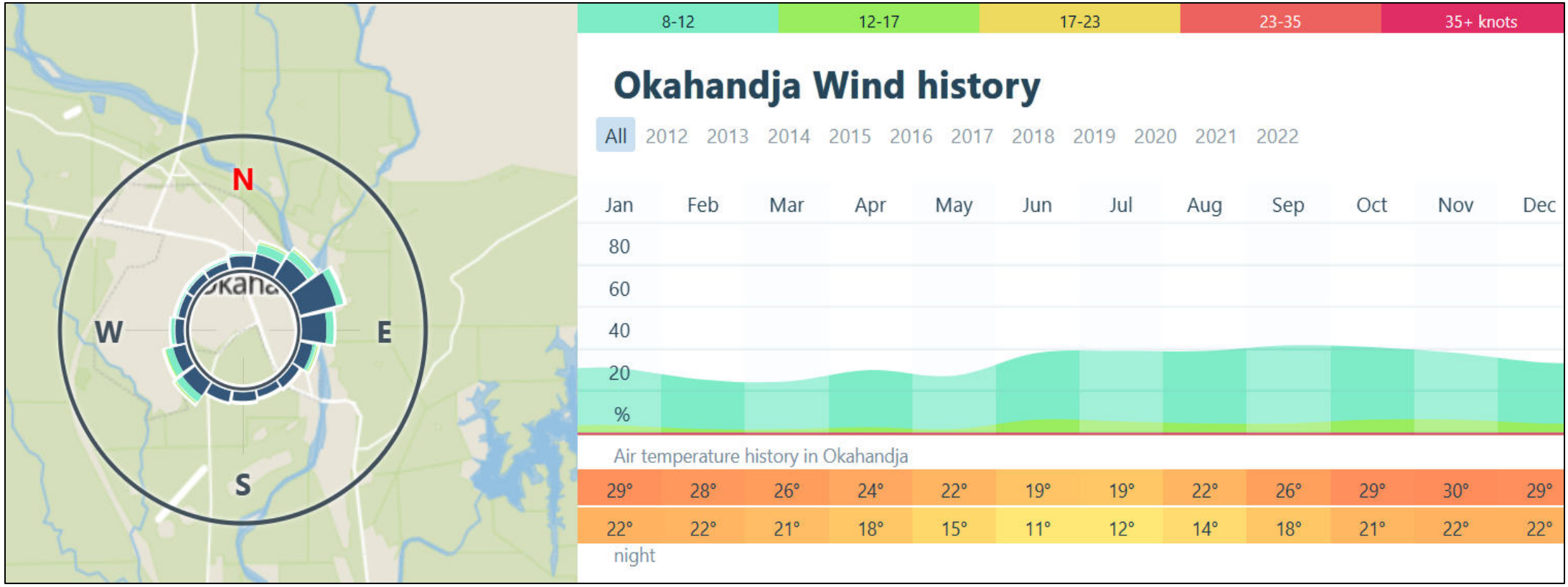


Figure 4.2: Prevailing wind direction, average wind speed and air temperature around Okahandja situated to the southwest of the EPL 8155 (Source: https://windy.app).

4.2 Fauna, Flora and Habitats

4.2.1 Vertebrate Fauna Diversity

It is estimated that at least 78 reptile, 9 amphibian, 83 mammal and 209 bird species (breeding residents) are known to or expected to occur in the general/immediate Elbe area of which a large proportion are endemics. Endemics include at least 36% of the reptiles, 33% of the amphibians, 8% of the mammals and 71% (10 of the 14 Namibian endemics) of all the breeding and/or resident birds known and/or expected to occur in the general area.

4.2.2 Trees, Shrubs and Grasses and Others

The most important tree/shrub species occurring in the general area are *Cyphostemma bainesii* (endemic, NC), *Cyphostemma currorii* (NC), *Cyphostemma juttae* (endemic, NC), *Erythrina decora* (Forestry*, endemic), *Heteromorpha papillosa* (endemic) and *Manuleopsis dinteri* (endemic) and the most important grass expected in the area is the endemic *Setaria finite* associated with ephemeral drainage lines. Other important flora includes protected tree species (*Acacia erioloba*, *Albizia anthelmintica*, *Boscia albitrunca* & *Ziziphus mucronata*); various *Aloe* species (all protected); *Harpagophytum procumbens* and *Citrullus lanatus* (potential economic benefit) and the little-known lichen species associated mainly with rocky outcrops in the general area. Species most likely to be adversely affected by this mining/exploration development would be the protected and unique flora associated mainly with the rocky outcrops and ephemeral drainage lines.

4.2.3 Important Habitats

4.2.3.1 Sensitive Areas

The general area is typical undulating *Acacia* thornbush dominated terrain with rocky outcrops, *Acacia* plains and ephemeral drainage lines (Fig. 4.3).

4.2.3.2 Rocky outcrops

Rocky ridges and outcrops are generally viewed as unique habitat with diverse biodiversity for vertebrate fauna and flora not necessarily associated with the surrounding areas (Plate 4.1). The following seven (7) rocky outcrops were located within the EPL area:

1. 22°00’38.3”S; 16°36’42.8”E
2. 22°00’41.2”S; 16°36’31.7”E
3. 22°00’50.9”S; 16°36’31.6”E
4. 22°00’41.9”S; 16°36’45.8”E
5. 22°00’41.7”S; 16°37’04.5”E
6. 22°00’40.8”S; 16°37’06.0”E
7. 22°00’37.5”S; 16°37’04.4”E

4.2.3.3 Mountains

The larger mountains – e.g. Höhlenberg [NE of EPL] & Löwenberg [SE of EPL] (Plate 4.2) – located to the east parts of the EPL area are also viewed as important habitat for vertebrate fauna and flora. These mountains are however located on the periphery of the EPL 4232 and not expected to be directly adversely affected by the proposed developments.

4.2.3.4 Ephemeral Drainage Lines

Ephemeral drainage lines are virtual lifelines to a variety of vertebrate fauna associated with the dense riparian vegetation and larger trees – e.g. nesting sites for larger raptors, etc. Temporary pools are also habitat to amphibians and terrapins in an otherwise dry environment. The larger ephemeral drainage lines located to the immediate west – Ombuyangupa – and east – Löwenrivier – of the EPL area (Plate 4.3) are viewed as important habitat to a variety of vertebrate fauna and flora associated with these features.

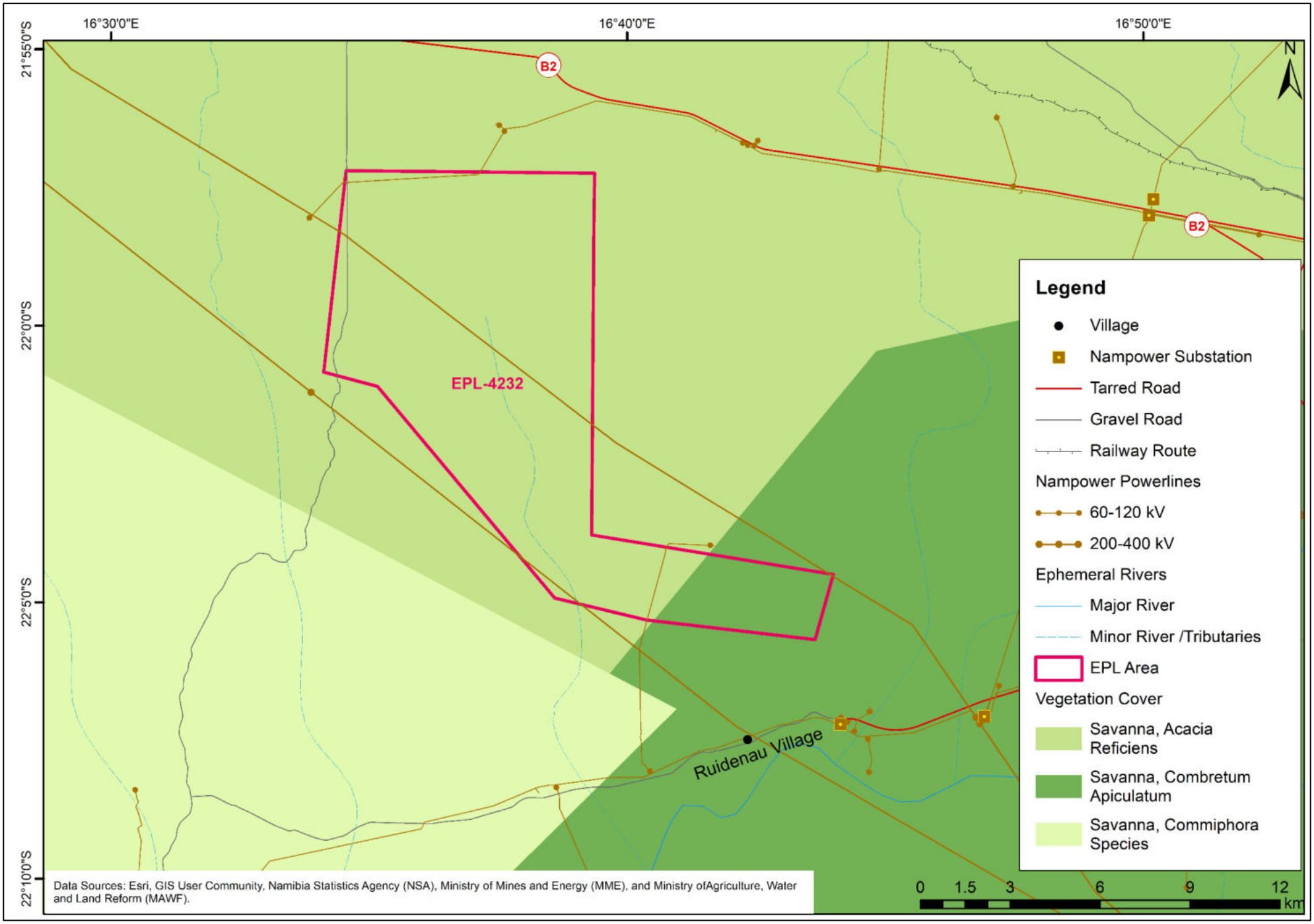


Figure 4.3: General vegetation cover around the EPL 4232 and surrounding areas.

Plate 4.1: Rocky outcrops located within the proposed development area are viewed as important habitat to a variety of vertebrate fauna and flora around the EPL 4232 and surrounding areas.

Plate 4.2: Löwenberg (See arrow) located southeast of the proposed development area is viewed as important habitat to a variety of vertebrate fauna and flora around the EPL 4232 and surrounding areas.

Plate 4.3: Larger trees and dense riparian vegetation associated with the ephemeral drainage lines in the EPL area are viewed as important habitat to a variety of vertebrate fauna and flora around the EPL 4232 and surrounding areas.

4.3 Health and Safety Considerations

The EPL 4232 especially within the Elbe Farm 10, has been subject to different land uses including previous incomplete mine development, drilling and exploration activities, that has left two (2) inclined shafts, open trenches, gullies, scrap metals and uneven excavated areas as well as old infrastructures (Plates 4.4 and 4.5). These may pose localised potential impacts to the safety of workers.

Plate 4.4: Old scrap metals from previous mine construction that was never completed scattered around Farm Elbe No. 10.

Plate 4.5: Old unstable structures, old fences / gates, mineral processing and services all found around Farm Elbe No. 10.

4.4 Socioeconomic

4.4.1 Overview

Okahandja is the main and closest town to the EPL 4232. Okahandja is the Otjozondjupa region's second largest and southern-most town is strategically located at the junction to the north (B1) and the east (B2) and is surrounded by farm land. It consists of the town proper and a number of informal settlements: 5 Rand Kamp, Oshetu 1, Oshetu 2, Oshetu 3 and Saamstaan. According to the 2011 Census data the population of the constituency increased from 12.56% (18,071) of the total Otjozondjupa population to 16.99% (24,451). The density of the population is 4.2 persons for every square kilometre, making the Okahandja constituency the second highest densely populated area in the region. Of the 24,451 residents in the constituency, 22,639 people live in Okahandja (NSA, 2014b).

4.4.2 Summary of the Demographic Information

The demographic information provided indicates the following:

- There has been a proportional decline in the Otjozondjupa Region's population as only 6.8% of the country's population live in the region and the region's population is growing at a slower rate (0.6%) than the national growth rate (1.4%);
- There is a large urban population (54% compared to 43% nationally) and 92.6% of the residents in the Okahandja constituency live in the town;
- Okahandja is the second largest town in the region with a large informal settlement population and the populaion increased by 35% since the previous Census in 2011
- In Okahandja there are close to equal numbers of male and females;
- Workers migrate mostly from the domestic neighbours to the Otjozondjupa Region, as well as Caprivi/Zambezi Region;
- A high proportion (61%) of the population is of working age (between 15 and 59 years);
- The main source of income in the Okahandja constituency is wages and salaries (68%) and the agriculture, hunting and forestry industries are the largest employers, and;
- There is a high labour force participation rate of 73% for the Okahandja constituency.

4.4.3 Summary of the Socioeconomic Information

The socio-economic information is summarised as follows (Annex 5):

- There is a shortage of skills which hampers development projects;
- Infrastructure and facilities are available in the region, but are not sufficient;
- Educational and health facilities are available but with an influx of people, may not be able to meet the demand;
- A high level of inequality exists in Okahandja with 31.3% of residents living in shacks and 31.5% have no toilet facilities;
- The main health concerns for the region is HIV/Aids, TB, malaria, orphans and domestic violence. The prevalence rates of HIV among pregnant women between the ages of 15 and 49 are higher than the national average;
- Mobility and migration increase vulnerability to HIV infection. Both Kunene and Caprivi/Zambezi Region have high prevalence rates of HIV/Aids;

- Alcohol use increases with the increase in income and is a contributing factor to the HIV/Aids epidemic;
- High poverty rates exist in the Otjozondjupa Region (33.7%) with the Khoisan the most impoverished language group (68% of the population live in poverty);
- Crime is on the increase and in rural areas poaching and stock theft is a concern and high levels of unemployment, alcohol abuse and population density contributes to higher crime rates, and;
- The economy of Okahandja is dependent on agriculture, hunting and tourism.

4.4.4 Summary of Socioeconomic Conclusions

The development would have the following socio-economic effects on Okahandja:

- Alternative employment opportunities would be created as currently employment opportunities are limited and dependent on the tourism and agriculture industries as well as commercial activities in Okahandja;
- The urban locality is highly dependent on wages and salaries as the main source of income for the majority of residents and the employment of local residents would contribute to their livelihoods;
- Potential employees may obtain the opportunities to improve or develop employable skills;
- The local economy would be boosted and diversified with the increased availability of money and the utilization of local services and products;
- Large construction developments could cause sudden in-flux of jobseekers, increasing the already large informal populations with resultant higher HIV/Aids risks, crime rates, poaching incidences, demands on state health services;
- An increase in workforce will result in an increase in the need for housing, school placements, infrastructure and health services;
- Increase demand for power and alternative sources of power would need to be investigated and utilized, especially when developing new housing units;
- Increased demand for water and the wise use of water needs to be promoted;
- Increased traffic, especially heavy vehicles using public roads and road safety concerns;
- Potential of community upliftment projects once the mine becomes operational and profitable as part of the mine's social responsibility programme, and;
- Contribution to Namibia's Development Goals and Vision 2030 through the provision of employment and the improvement of the quality of life

The development could have the following potential impacts on the conservancy and the Farms Elbe No. 10 and Ombujongupa 292:

- Disturbance of sense of place and tranquillity due to light pollution, noise pollution, increased traffic, earth tremors caused by blasting;
- Disturbance of visual views impacting negatively on the attractiveness of the area for hunters, tourists and the enjoyment of nature. This could contribute to a potential loss of income by surrounding lodges and hunting farms;

- Loss of income due to change of land use from grazing to mining;
- Dust dispersion from the operations at the mine as well as transport of ore along dirt roads and dust deposition on surrounding grazing land may render the land less suitable for livestock farming and cause loss of income;
- Potential increase in poaching and stock theft could contribute to loss of income, and;
- Potential increase of trespassing and increase in crime.

4.5 Ground Components

4.5.1 Regional and Local Geology

The local geology of the Elbe Project comprises the metasedimentary rocks of the Kuiseb Formation. A suite of syn to post tectonic granitoid rocks cuts the deformed metasedimentary succession. A series of generally narrow dolerite dykes and sills of the Karoo Supergroup have intruded the complete sequence. The metasedimentary succession and certain members of the granitoid intrusive suite have been variably deformed and sheared. Petzel (1989) and Bryan, (2007) summarized the following sequence of events (Fig. 4.4):

- Deposition of pelitic to semi-pelitic Kuiseb Formation sediments into a graben, or half graben;
- Deposition of syngenetic copper – zinc – silver mineralization in the more quartzitic members due either to re-working of Nosib metasedimentary rocks, or exhalative processes;
- Development of tight isoclinal folding (F1) and the development of a strong schistosity (S1). The F1 folding resulted in the near vertical nature of the North limb;
- Emplacement of granitoid rocks with their associated heat generation. Subsequent movement of hydrothermal fluids, particularly in the vicinity of the sulphide rich psammitic members led to a re-concentration of sulphide mineralization.
- Minor, intense, shearing results in cataclasis of narrow zones within the psammite and granitoid rocks. Hydrothermal fluids moving along these conduits altered the host rocks and redistributed the mineralization. Gold mineralization was possibly introduced at this time. (Petzel, 1989) suggests the source to the gold mineralization may be the mafic volcanic rocks of the Omusema Formation, which outcrops in the area.
- The development of an F2 fold pattern, characterized by open folds with a weak S2 cleavage schistosity primarily affected the Platform Zone of the larger A Zone. The linear North Limb remained relatively unaffected, particularly between L 1000 E and L1350 E where S1 and S2 are sub-parallel (Bryan, 2007);
- The development of an F3 fold pattern and the resultant of very minor crenulations and undulations, particularly in the Platform Zone, and to a lesser extent, in the North Limb. The intersection of the S1 / S2 and the weakly developed S3 cleavage results in a steep southwest plunging lineation. This may indicate rodding of the sulphide zone along this orientation, particularly in the North Limb;
- Emplacement of post deformation granites, in particular pegmatite and micro granite dykes and sills, and;
- The emplacement of Late Karoo aged dolerites as dykes and sills.

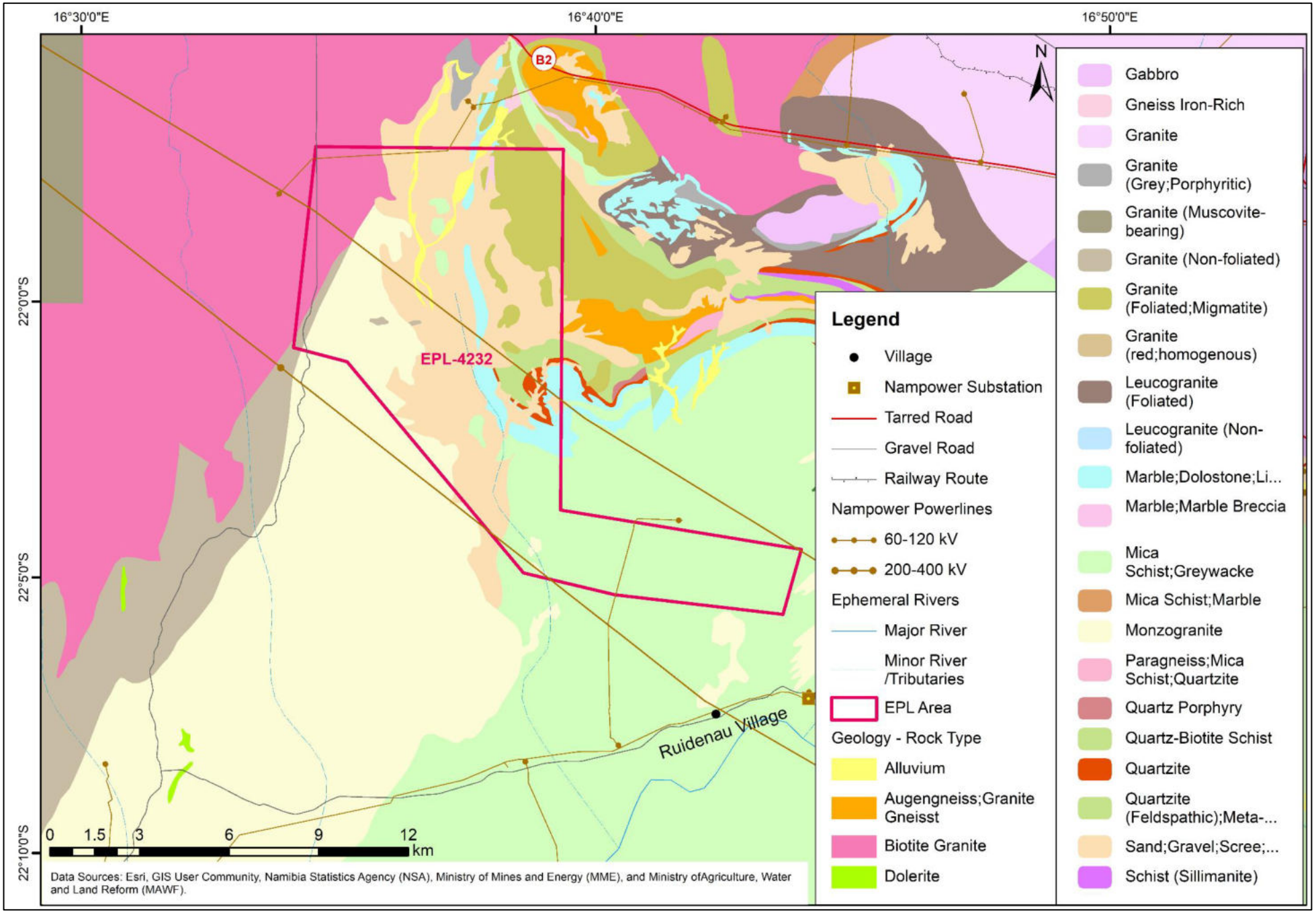


Figure 4.4: General geology of the EPL 4232 and surrounding areas.

4.5.2 Water Supply and Groundwater Resources

Ground water resources are closely interlinked with rock types that vary and are unevenly distributed across the country. The EPL 4232 lies at 1300 meter above mean sea level (masl), with maximum drainage varying considerably in the south-easterly direction due to the sloping of the area. This site is generally considered to be have moderate to low water holding rock bodies with much dependence on boreholes as water source (Fig. 1.5). There are about twenty-one (21) water boreholes in the EPL area. Ephemeral river channels run through the EPL 4232 on the western and eastern parts of the Elbe farm, these include the Ongujombu and Orombanda rivers. On the Southern- west about 20 km of the Elbe farm is the Sneyrevier dam. The Sneyrevier dam will be the key source of water supply for any mining operation as may be required.

The following are key hydrogeological characteristics:

- The Elbe 10 area is indicated on the Hydrogeological Map of Namibia to be of moderately low groundwater potential;
- The proposed mine location does not fall within a declared groundwater control area in terms of the Water Act of 1956 (Act No. 54 of 1956);
- Surface drainage of the study area is southward, to the Swakop River, via the ephemeral Ozombanda and Ombuyongupa Rivers;
- The average rainfall of the area is estimated at about 480 mm/a;
- Vegetation of the study area comprises mainly thornbush savanna and highland savanna, within the eastern reaches of the Swakop River Basin;
- The farm Elbe 10 is dominated by syn- to post-tectonic Damaran granite (Salem granite, £gs) in its western and eastern parts, which is intrusive in mica schist, quartzite and marble bands of the Damara Orogen, located in the central part of the property;
- The Etusis Formation (Nosib Group) forms the basal unit of the Damara Supergroup in the sCZ of the area;
- The Swakop Group, consisting of the Karibib, Tinkas and Kuiseb Formations in the area, lies above the Nosib Group;
- The Elbe mineralisation lies within the quatrtzite and schist of the Kuiseb Formation;
- Strata associated with the Elbe copper deposit and the deposit itself has been folded about northeasterly-striking axes, which plunge steeply to the south-west;
- From a groundwater point of view, the occurrence of faults and fracture zones in the area are important, especially where they dissect carbonate beds or competent layers of quartzite;
- Granite and schist outcrops at Elbe 10 present areas of low to negligible aquifer pollution vulnerability (APV), which would be ideal for waste disposal sites;
- Generally, the carbonate rocks (in the Tinkas Formation) and the quartzite layers (in the Kuiseb Formation) have no primary porosity to store groundwater in any significant quantities;
- A secondary porosity is often developed in the carbonate and quartzite beds by faulting and fracturing, creating the possibility for them to act as ideal conduits for groundwater recharge during flood runoff when cutting across the Ozombanda River;
- Elbe 10 is located within the upper parts of the headbasin of the Ozombanda River, implying that surface runoff in the river may be limited to recharge the existing aquifers in any significant way;

- ❖ Existing borehole data on Elbe are insufficient and outdated to make any conclusive assessment of the groundwater potential of the area;
- ❖ It appears that only three boreholes (WW29194, WW24499 and WW29193) are currently in operation, whilst no information on them could be traced;
- ❖ The original yields of 5 boreholes, not currently in use, appear to have varied between 5 and 1.4 m^3/h, whilst their groundwater level below surface varied between 30 and 56 m;
- ❖ Generally, the groundwater quality of the boreholes reveals an excellent grouping (A), on account of the higher concentrations of total alkalinity, higher concentrations of sodium, strontium and bromine, the groundwater classified as group B quality water, which is regarded as good for human consumption;
- ❖ Two of the boreholes have a classification between group C and D on account of the higher concentrations of calcium and nitrate;
- ❖ Over abstraction of groundwater for mining purposes could present a social environmental impact on account of a decline in the regional groundwater levels, thus causing boreholes that are being used for stock watering to dry up;
- ❖ Indiscriminate mine waste disposal could cause a threat to the grazing vegetation and also cause groundwater pollution, which possibly will have an impact on the social environment, and;
- ❖ Proper groundwater abstraction management and monitoring are necessary to avoid a decline in the groundwater levels, which could have an impact on the natural environment.

4.5.3 Assessment of Groundwater and Environment

Based on the impact assessment results summarised in Table 4.1, it's concluded that a generally small localised environmental impact on the groundwater of the study area is perceived during the exploration phase, provided that sound control measures are applied as detailed in the EMP report (Fig. 4.6).

Table 4.1: Summary screening for environmental groundwater impact.

	Item	Description	Value
Social Environment	**Economic Activities**	Loss of production base (land, etc.) and change in economic structure	**B**
	Public Health Condition	Health and sanitary conditions deteriorate on account of increased waste generation and infestation of harmful insects	**C**
	Waste	Generation of mining and construction waste, surplus soils, sludge, domestic waste, etc.	**B**
Natural Environment	**Groundwater**	Lowering of the groundwater table due to over abstraction and turbid water caused by construction work	**B**
	Fauna and Flora	Interruption of reproduction or extinction of species due to change of habitat conditions	**C**
Pollution	**Water Pollution**	Deterioration of the groundwater quality of the aquifers	**B**
	Off-road Tracks	Unsightly tracks that cause damage to sensitive flora	**B**
Values: A – Serious Impact, **B** – Small Impact, **C** – Very Small Impact, **D** – No Impact			

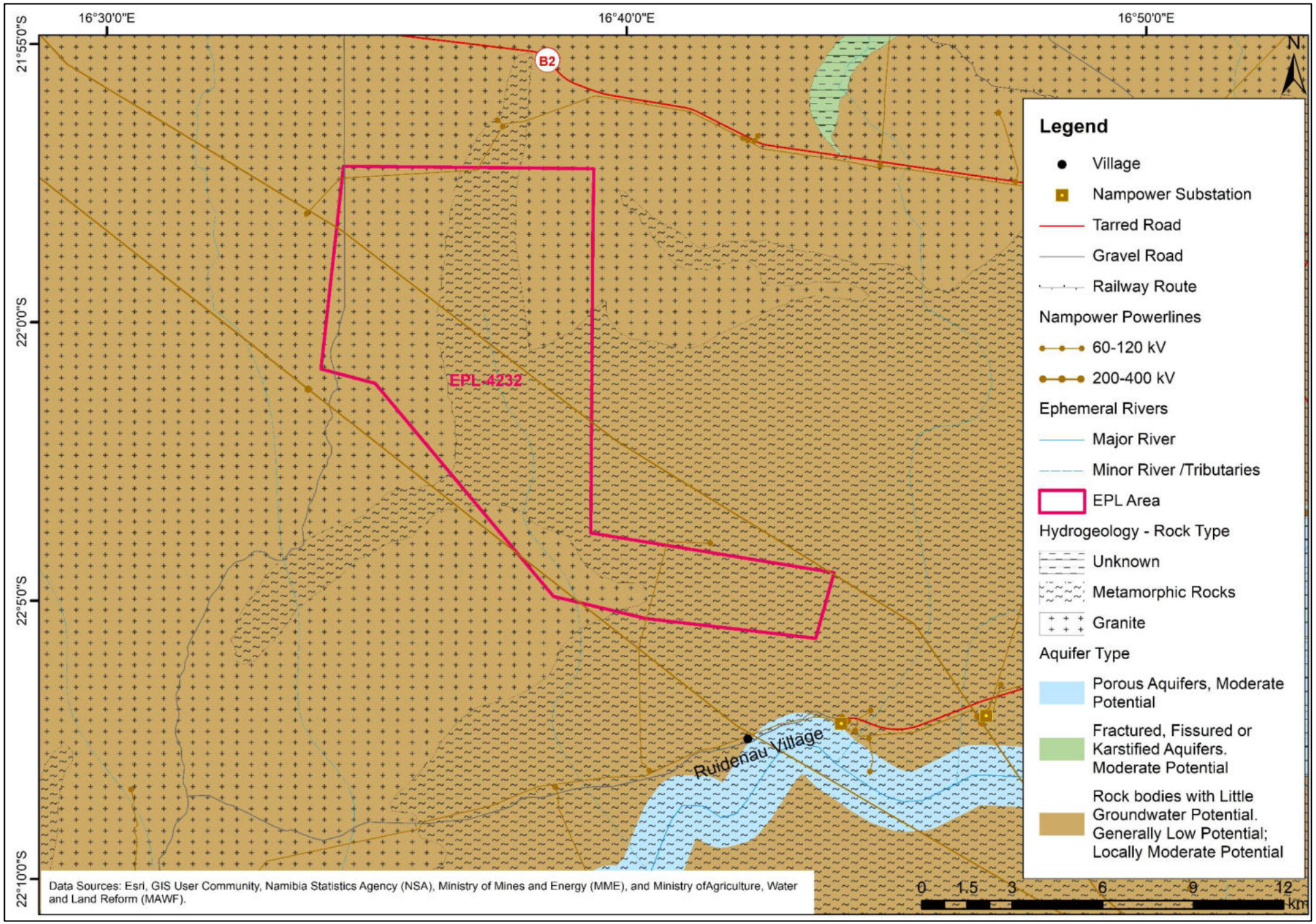


Figure 4.5: Hydrogeological settings of the EPL 4232 and surrounding areas.

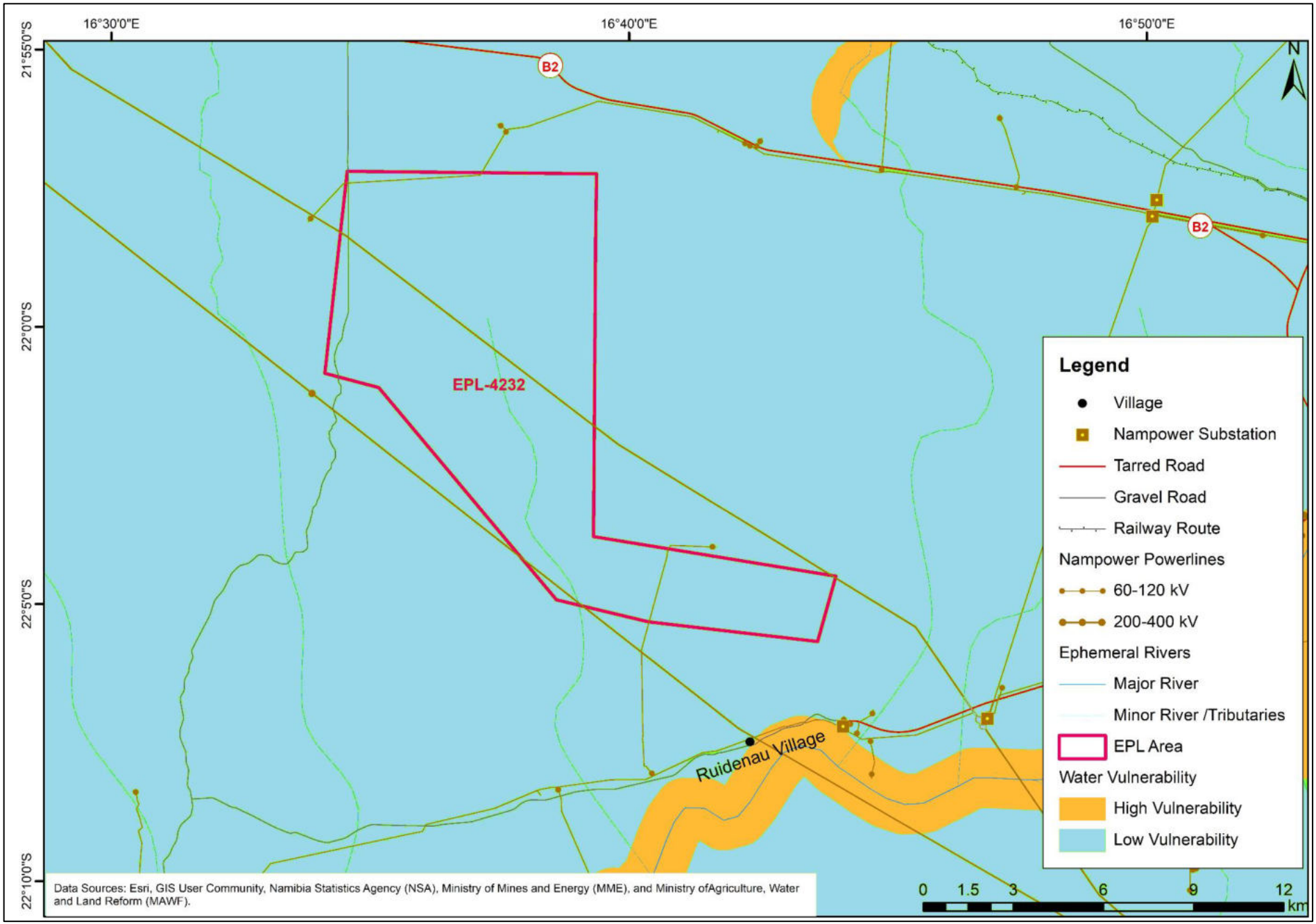


Figure 4.6: Groundwater vulnerability map of the EPL 4232 and surrounding areas.

4.6 Public Consultations Process

4.6.1 Overview

According to the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 and the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007), a person conducting a public consultation process must give notice to all Interested and Affected Patties (I&AP) of the application which is subjected to public consultation.

The EIA Regulations clearly state that potential interested and affected parties must be provided with a reasonable opportunity (21 days) to comment on the application under Section 21(6) of the EIA Regulations.

4.6.2 Public and Stakeholder Consultation Process Undertaken

Public and stakeholder consultation process was provided for in the initial environmental assessment process undertaken for the EPL 4232 in 2019 (Figs. 4.7 - 4.9).

Pubic consultation process was undertaken during the months of February and March 2019 (Figs. 4.7 - 4.9). Public notices were published in the Confidente Weekly Newspaper dated 28th March – 3rd April 2019, Windhoek Observer Weekly Newspaper dated Friday, 26th April 2019 and the Namibian Daily Newspaper dated Tuesday 7th May 2019. The closing date for submission of written inputs/comments/objection was extended from Friday 26th April 2019 to Friday 10th May 2019 (Figs. 4.7 - 4.9).

During the public / stakeholder consultation process, no registration or written submissions with comments / objections / inputs with respect to the proposed minerals prospecting activities in the EPL No. 4232 were received.

The ECC renewal process does not require the Proponent to undertaken any additional public or stakeholder consultation process.

Schlettwein tables N$66.5b budget

From page 1

> "This year's national budget increases the allocation to the development budget by 42 percent, with greater emphasis on economic growth, enhancing infrastructure investment and crowding in private sector participation.

To resuscitate growth and jobs, the development budget is notably increased to N$7.9 billion, up from N$5.5 billion last year. It also deploys project financing amounting to N$1.1 billion under the African Development Bank arrangement, with own budget funding of N$831.9 million for logistics infrastructure, mainly rail and road, agricultural mechanisation, and school infrastructure renovation.

A total allocation of N$290 million is allocated to the crop and horticulture programme under the Ministry of Agriculture, Water and Forestry, of which N$96 million is targeted for the Green Scheme Programme. N$469 million is allocated for water generation and infrastructure refurbishment programme.

"This is for the purpose of increased productive capacity, increased efficiency and job creation in partnership with the private sector and to enhance water security in the country," Schlettwein added.

An allocation of N$15 million is allocated for youth entrepreneurship projects on top of N$9.5 million to support youth employment and self-employment under the National Youth Council.

This is in addition to youth-related projects under the Ministry of Sports, Youth and National Service, as well as the support facilities at the Development Bank of Namibia and the Ministry of Industrialisation, Trade and SME Development.

The FY2019/20 Appropriation Bill

Social Sectors

The share of social sector allocation is maintained at 49.3 percent of the budget and over the MTEF. This is N$29.6 billion in FY2019/20 or N$88.9 billion over the MTEF.

Basic Education receives N$13.8 billion, and N$ 41.4 billion over the MTEF. Higher Education, Training and Innovation receives N$3.1 billion and about N$9.4 billion over the MTEF of which N$911.9 million is for UNAM, N$500 million for NUST and N$1.1 billion for NSFAF in this budget year, and N$3.4 billion over the MTEF.

Health and Social Services is allocated N$6.9 billion, 2.3 percent more than the previous year and about N$20.6 billion over the MTEF. Incremental increases in the allocation to the health sector aim to support procurement of pharmaceuticals, recruitment of additional health personnel, combating public health outbreaks and maintain health infrastructure.

The members' contribution to PSEMAS, which has been stagnant from now, will be doubled to bring the total contribution from the current N$410 million to N$820 million, effective April 2019.

The medical aid scheme, which covers 95% of medical expenses for public servants, received an allocation of 2.8 billion for 2019/20 to covers 130,000 members and 155,000 dependents totalling to 285,000 persons. Poverty Eradication and Social Welfare is allocated N$3.6 billion, 4.5 percent more than the previous year and approximately N$10.8 billion over the MTEF to maintain and improve the coverage of existing programmes.

Given the high dependence ratio and the challenging effects of the cost of living at household level, the Old Age Pension is increased by N$50 per month.

Economic and infrastructure sectors

N$12.8 billion is allocated to the Economic and Infrastructure Sectors in FY2019/20, summing to about N$39.6 billion over the MTEF. This is further supported by investment outlay of the public enterprises in their areas of mandate.

Transport receives N$3.4 billion, and N$10.2 billion over the MTEF, for the completion of ongoing phases of road capital projects with contractual awards. This allocation is supported by N$1.4 billion from the Road Fund in FY2019/20 or about N$7.0 billion over the MTEF as well as N$644.94 million for road project financing under the AfDB loan arrangement during the budget year, with remainder of N$1.69 billion to be disbursed over the next two years for transport road and rail infrastructure financing under the AfDB-funded Economic Governance and Competitiveness Programme. The Ministry of Agriculture, Water and Forestry receives N$1.9 billion, of which N$469 million is earmarked for commencement of the water infrastructure refurbishment and development programme. Over the MTEF, the sectoral allocation amounts to about N$6.1 billion.

The Ministry of Finance is allocated N$4.4 billion and about N$13.2 billion over the MTEF. Of this amount, N$2.4 billion or 58 percent is allocated for PSEMAS. N$73.5 million is allocated to AgriBank, totalling N$241.4 million to support investment in horticulture and AgriBank's loan book. Similarly, a total of N$50.9 million is allocated to DBN for SME support facilities with the MTEF allocation totalling N$165.9 million. A total of N$150 million is earmarked for the transitional arrangements for the establishment of NAMRA in the budget year, to be scaled up over the MTEF on top of the allocations made for the Departments of Inland Revenue and Customs and Excise, while N$2 million is allocated annually for the Financial Literacy Initiative.

Industrialisation, Trade and SME Development is allocated N$295 million and about N$926.3 million over the MTEF.

Public Safety and Order

In FY2019/20, the Public Safety Sector take up the second largest share of the budget allocations, totalling N$13.1 billion and about N$39.1 billion over the MTEF, representing investment in maintenance of law and order, peace and stability.

Defence is allocated N$5.9 billion, and N$17.9 billion over the MTEF. Safety and Security receives N$5.6 billion, 6.3 percent more than the previous year for basic goods and services and recruitment of core personnel needs. Over the MTEF, the allocation stands at N$16.7 billion.

The Ministry of Home Affairs and Immigration is allocated N$677.1 million, 11.2 percent more than the previous year to, among others, complete its head office building and its regional office in Kunene Region. Over the MTEF, the allocations amount to about N$1.7 billion.

The Judiciary receives N$368.4 million, and a total of about N$1.31 billion over the MTEF, the Anti-Corruption Commission receives N$61.6 million, 1.4 percent more than the previous year and totalling about N$184.8 million over the MTEF to support activities to fight against corruption.

Administrative Sectors

The Administrative Sector receives the lowest share of the budget allocations, averaging 7.6 percent over the MTEF. For the budget, a total allocation of N$4.6 billion is made and approximately N$13.7 billion over the MTEF.

Urban and Rural Development receives N$1.98 billion, 6.5 percent more than the previous year and a total of about N$5.8 billion over the MTEF, to support increasing provision of sanitation, serviced urban land and bulk services for water, sewage and electricity. International Relations and Cooperation is allocated N$941.3 million in and totalling about N$2.89 billion over the MTEF.

The National Assembly receives N$126.8 million, 14.4 percent better than the previous year for increased outreach activity and a total of about N$360.5 million over the MTEF while the National Council is allocated N$94.8 million and N$284.3 million over the MTEF.

An amount of N$204 million is allocated to the Contingency Fund in the budget year and about some N$616.77 million for the MTEF to cater for unforeseen emergencies. For this year, N$317 million was also allocated to the Contingency Fund.

REPUBLIC OF NAMIBIA

MINISTRY OF AGRICULTURE, WATER AND FORESTRY

PROCUREMENT MANAGEMENT UNIT

ADVERTISEMENT
BIDS ARE INVITED FOR THE FOLLOWING:

Bid Number: W/ONB/DVS/20-15/2019
Description: Supply, Delivery, Installation, Testing and Commissioning and Maintenance of a Complete Fire Detection System for the New Ongwediva Meat Processing Plant for the Ministry of Agriculture, Water and Forestry.

Bid Number: W/ONB/DVS/20-16/2019
Description: Supply, Delivery, Installation of a Standby Power Generator for the Ongwediva Meat Processing Plant for the Ministry of Agriculture, Water and Forestry.

Closing Date: Tuesday, 30 April 2019
Closing Time: 10:00
Opening of bids: 11:00

Site visit for contractors and will be held on 02 April 2019 at Ongwediva Abattoir 09H00.

Bid documents to be collected from:
The Secretary: Procurement Committee, Ministry Of Agriculture, Water & Forestry, Procurement Management Unit, Northern Industrial Area, C/o of Etienne Rousseau & Tienie Louw Street, Windhoek, Namibia. The bid document will be available as from 25 March 2019

A non-refundable levy of N$300 (Including VAT) per Bid is payable in advance at Ministry of Agriculture, Water & Forestry, Government Office Park, 1st floor, Room no. 123, Attention: Ms. M.M Mukaya at 061-2087405. NO CHEQUES

BID DOCUMENTS TO BE HAND DELIVERED IN THE CORRECT BID BOX AT THE ABOVE ADDRESS

Enquiries: Ms K. David/ Ms J. Shimboyo **Tel:** 061 284008/0811458682

PUBLIC NOTICE BY ON-ROAD INVESTMENTS (Pty) Ltd
APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC), EXCLUSIVE PROSPECTING LICENSE (EPL) No. 4232, OKAHANDJA DISTRICT OTJOZONDJUPA REGION

On Road Investments (Pty) Ltd (the Proponent) hold mineral rights under the Exclusive Prospecting License (EPL) No. 4232 for base and rare metals, and precious metals. The EPL 4232 was granted on the 03/06/2014 and the initial period expired on the 02/06/2018. A renewal application has been submitted and currently pending. The EPL 4232 area (totaling 19791.5649 Ha cover parts of Farms Ozombanda 21, Elbe 10, Ombujongupa 292, Ongambombera 20 and Rudanau Nord 6. The proponent intend to continue with exploration activities on this EPL covering regional and site-specific field-based activities such as ground and aerial geophysical surveys, geological mapping, trenching, drilling and sampling. The proposed prospecting activities are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and the EIA Regulations 30 of 2012 and cannot be undertaken without an Environmental Clearance Certificate (ECC). In fulfilment of the environmental requirements, the Proponent has appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant and led by Dr Sindila Mwiya as the Environmental Assessment Practitioner (EAP) to prepare the Scoping and Environmental Management Plan (EMP) Report in order to support the application for ECC. All interested and affected Parties are hereby invited to register and submit written comments / objections / inputs with respect to the proposed prospecting activities in the EPL 4232. A Background Information Document (BID) is available upon registration.

REGISTER BY EMAIL: frontdesk@rbs.com.na or Contact Dr. Sindila Mwiya for more information: smwiya@rbs.com.na Mobile: 0811413229
DEADLINE FOR WRITTEN SUBMISSIONS IS:
FRIDAY 19th APRIL 2019

Risk-Based Solutions (RBS) CC (URL: www.rbs.com.na)
Resources (Oil, Gas, Minerals & Energy Exploration, Production & Mining) and Environmental Assessments (SEA, EIA, EMP, EMS) Specialist Consultants

Figure 4.7: Copy of the 1st Public Notice that was published in the Confidente Weekly newspaper dated 28th March-3rd April 2019.

CAREERS

How to rock the informational interview

You might not get the job you want immediately, but these kind of interviews are key to building a killer career network.

DANIEL BORTZ, MONSTER CONTRIBUTOR

When you're fresh out of college or still paving your career path, you're probably doing *everything* in your power to get your first job. (aside from putting a "hire me" tattoo on your forehead). But there's one often-overlooked means of networking that you should be taking advantage of: the informational interview.

Hmm...what, *exactly*, is an informational interview? For starters, "It's not a job interview," says Carole Martin, a job interview coach and author of *Boost Your Interview IQ*. "It's an information gathering session."

In an informational interview, your primary goal is to meet workers in your prospective field—people who can offer valuable insight into their job, their company, and the industry as a whole.

Take these steps to set up informational interviews, ask meaningful questions, and build relationships that can help jumpstart your career.

Target the right people

Many executives are too busy to do informational interviews—and less experienced employees at a company can be a tad green when it comes to offering career advice. So, try to arrange informational interviews with mid-level managers (employees who have five to 15 years of experience).

Ideally, you meet these people through mutual connections. However, if you don't know someone who can introduce you, find mid-level workers through your alumni database, social media, or professional associations, says Jeff Neil, a New York City career coach and author of *Informational Interview Handbook: Essential Strategies To Find The Right Career and A Great New Job*.

Be clear about your intentions

When you request an informational interview by email, briefly explain who you are, how you found the person, and why you want to meet. Transparency is crucial, Neil says. Consider saying something like this: "I want to make it very clear that I'm not going to ask you for a job. I would just love a few minutes of your time to learn about how you've succeeded in this industry." By being direct you'll take pressure off the person and establish trust, Neil says.

Do some detective work

You need to do your homework on the company and the person that you're meeting so you have something to talk about other than you. When researching the organization, dig deeper than the company's website.

"Look at their latest press releases, media coverage, and social media," says Pamela Skillings, co-founder of New York-based Big Interview, an online job interview training platform.

Also look at the company's job postings to see what skills they look for in new hires. Even if you're not going to ask them for a job, it's good to know what they look for in case your skill set matches up. And you never know—there might be an open job you'd be perfect for! And of course, you'll want to know about the person you're meeting so, check out their social media pages to see their career path and find fodder for questions you're going to ask.

Solidify the relationship

Bring a copy of your resume with you to the interview, but only present it if the person asks for it, Neil says. Remember: Your goal is to make a valuable connection—*not* get a job offer. (Granted, you wouldn't turn one down!)

Ask your new connection to recommend a couple more people for you to speak with. ("Is there anyone else you know that can give me insight into how I can break into this field?") Also, leave the door open for future communication. ("Would it be OK if I touch base with you in a few weeks?") Remember, "it's your responsibility to stay in touch," says Skillings.

Whether you use old-fashioned snail mail or email, definitely follow up with a thank-you note the next day. If you email, you might even want to share something of value, like an interesting article. You could send an email with a message like: "I read this great story that reminded me of our conversation."

Speaking of resume, that is usually an employer's first point of contact with you, so it should be clean and professional. Even though you don't have lots of work experience, your resume needs to highlight your skills and the value you'd bring to a company. Could you use some help with that?

Get a free resume evaluation today from the experts at Monster's Resume Writing Service. You'll get detailed feedback in two business days, including a review of your resume's appearance and content, and a prediction of a recruiter's first impression. It's a quick and easy way you can stay ahead of the competition. **–www.monster.com**

Figure 4.8: Copy of the 2nd Public Notice that was published in Windhoek Observer Weekly Newspaper dated Friday, 26th April 2019.

Beifang Mining Services

VACANCIES

Blasting Superintendent	Mechanic	Commercial Blaster
Qualification Requirements: • B.Sc. Engineering Degree or Similar Qualification in Mining • Government Class IV Blasting Certificate • Nosa Safety Training Certificate • Computer and software analogies (Microsoft Software, Word, Excel and Power Point) • Mine Planning Experience (added advantage) • 10 years Mining Experience of which 5 years should have been in a Blasting Supervisory position. • [illegible] • Must be a Namibian Citizen **Skills:** • Supervisory • Communication & report writing • Technical problem solving capability • Judgement and decision making in considering viable costs and benefits of potential actions to choose the most appropriate • Interpersonal and human relation skills for the development, recognition and utilization of team members • Understanding of cost structures, budgeting systems, and financial reports.	**Qualification Requirements:** • N3 Certificate 5 years experience in relevant field • Earth moving equipment experience. Experience on equipment such as Atlas Dirk, CAT excavator • EC Code 8 Driver's License, C5 License will be an advantage. **Skills:** • Team Work • Planning • Organising	**Qualification Requirements:** • Grade 12 Senior Certificate with 26 points • Commercial Blasting Certificate • Code C8 Drivers licence • 3 Years Commercial Blasting Experience **Skills:** • Underpin Blasting Patterns • Team Work • Planning • Organising

If interested and you meet the requirements please hand/ mail your CV with certified documents to:
[illegible]@beifangmining.com
Closing date: 17/05/2019 @ 17:00
Previously disadvantage Namibians are encourage to apply.
No documents will be returned.

EPUPA
INVESTMENT TECHNOLOGY (PTY) LTD

Epupa Investment Technology (Pty) Ltd is a dynamic Namibian financial services management and technology solutions provider. As a people based and technologically enabled organization, we strive to achieve sustainable growth, with a sole objective of providing solutions that not only meet but exceeds the needs of our clients. If you are passionate, motivated and have the desire to learn and grow together with us, kindly read through and act on the vacancy below!

Applications are herewith invited from suitably qualified and experienced candidates who are interested in the following vacancy existing at our Head Office in Windhoek.

FUND MANAGER

The main duties will include but not limited to; funds withdrawal and re-bank planning, funds reconciliations and recovery, micro credit due diligence, approval and credit advances, collections, credit profile management, credit risk management and stakeholder engagement amongst others.

REQUIREMENTS

The ideal candidate must have at least 7 years extensive experience in cash and credit management, a degree in finance or related field and a valid driver's license.

DUTY STATION

Windhoek

Interested candidates must hand deliver a CV and supporting documents at Epupa Head Office,
132 Dr Kuaima Riruako Street Windhoek West or email to hengarij@epupainvestech.com

For further information contact Joyce Hengari at 061 - 414807

Closing date for applications is Friday, 15 May 2019.

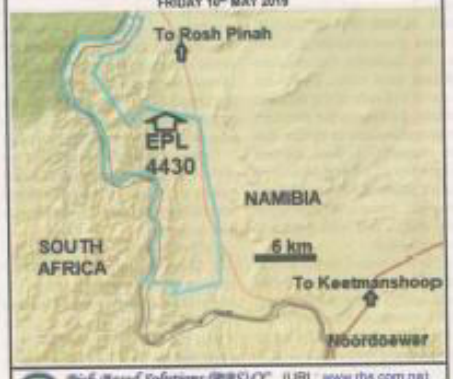
Phone: +264 61 414 800 / Fax: +264 61 222 155 / P O Box 8499, 132 Bach Street, Dorado Valley, Windhoek
Directors: Mrs. M Hoveka, Ms. ET Taapopi, Mr. AMB Auala, Mr. B Hoveka, Mr. NS Shimwino, Mr. N Tjirimuje

Company Registration number: 2004/493

PUBLIC NOTICE BY RHINO MINING AND EXPLORATION CC APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC) FOR THE EPL No. 4430, KARASBURG DISTRICT, //KARAS REGION

RHINO MINING AND EXPLORATION CC (the Proponent) hold Precious Stones mineral rights under the Exclusive Prospecting License (EPL) No. 4430 granted on 14/06/2010 and will expire on the 13/06/2019. The EPL No. 4430 area totalling 17716 Ha is situated along the Orange River bordering Namibia and South Africa. The proponent intend to undertake exploration for diamonds and small-scale test mining activities over very limited Areas of Interest that may be found along the Orange River. The proponent intend to undertake prospecting using techniques such as topographic and geological mapping, trenching, bulk sampling and processing for small-scale test mining for feasibility study. The proposed prospecting and small-scale test mining activities are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and the Environmental Impact Assessment (EIA) Regulations 30 of 2012 and cannot be undertaken without an Environmental Clearance Certificate (ECC). In fulfilment of the environmental requirements, the Proponent has appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant and led by Dr. Sindila Mwiya as the Environmental Assessment Practitioner (EAP) to undertake the scoping and EMP in order to support the application for ECC. All interested and Affected Parties (I&AP) are hereby invited to register and submit written comments / objections / inputs with respect to the proposed prospecting and small-scale test mining activities in the EPL No. 4430. Background Information Document (BID) is available upon registration and on request.

REGISTER BY EMAIL: frontdesk@rbs.com.na or Contact Dr. Sindila Mwiya for more information: smwiya@rbs.com.na, Mobile: 0811413229
DEADLINE FOR WRITTEN SUBMISSIONS IS:
FRIDAY 10th MAY 2019



Risk-Based Solutions (RBS) CC (URL: www.rbs.com.na)
Resources (Oil, Gas, Minerals & Energy Exploration, Production & Mining) and Environmental Assessments (SEA, EIA, EMP, EMS) Specialist Consultants

PUBLIC NOTICE BY ON-ROAD INVESTMENTS (Pty) Ltd APPLICATION FOR ENVIRONMENTAL CLEARANCE CERTIFICATE (ECC), EXCLUSIVE PROSPECTING LICENSE (EPL) No. 4232, OKAHANDJA DISTRICT OTJOZONDJUPA REGION

On-Road Investments (Pty) Ltd (the Proponent) hold mineral rights under the Exclusive Prospecting License (EPL) No. 4232 for base and rare metals, and precious metals. The EPL 4232 was granted on the 03/06/2014 and the initial period expired on the 02/06/2018. A renewal application has been submitted and currently pending. The EPL 4232 area totalling 19791.5549 Ha cover parts of Farms Ozombanda 21, Elbe 10, Otmbujongupa 292, Ongombombera 20 and Rudenau Nord 6. The proponent intend to continue with exploration activities on this EPL covering regional and site-specific field-based activities such as ground and aerial geophysical surveys, geological mapping, trenching, drilling and sampling. The proposed prospecting activities are listed in the Environmental Management Act, 2007, (Act No. 7 of 2007) and the EIA Regulations 30 of 2012 and cannot be undertaken without an Environmental Clearance Certificate (ECC). In fulfilment of the environmental requirements, the Proponent has appointed Risk-Based Solutions (RBS) CC as the Environmental Consultant and led by Dr Sindila Mwiya as the Environmental Assessment Practitioner (EAP) to prepare the Scoping and Environmental Management Plan (EMP) Report in order to support the application for ECC. All Interested and Affected Parties are hereby invited to register and submit written comments / objections / inputs with respect to the proposed prospecting activities in the EPL 4232. A Background Information Document (BID) is available upon registration.

REGISTER BY EMAIL: frontdesk@rbs.com.na or Contact Dr. Sindila Mwiya for more information: smwiya@rbs.com.na, Mobile: 0811413229
DEADLINE FOR WRITTEN SUBMISSIONS IS:
FRIDAY 10th MAY 2019

Risk-Based Solutions (RBS) CC (URL: www.rbs.com.na)
Resources (Oil, Gas, Minerals & Energy Exploration, Production & Mining) and Environmental Assessments (SEA, EIA, EMP, EMS) Specialist Consultants

Figure 4.9: Copy of the 3rd Public Notice that was published in the Namibian Daily Newspaper dated Tuesday, 7th May 2019.

5. IMPACT ASSESSMENT AND RESULTS

5.1 Impact Assessment Procedure

The Environmental Assessment process that has been undertaken with respect to the proposed exploration programme for the EPL No. 4232 has been conducted in accordance with the provisions of the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 gazetted under the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007).

5.2 Alternatives and Ecosystem Assessments

The following alternatives have been considered:

(i) **EPL Location:** A number of potential economic minerals deposits are known to exist in the general area and linked to the regional geology of the EPL area. The Proponent intend to explore / prospect for all the licensed minerals groups likely to be associated with the regional and local geology. The minerals occurrences are site-specific and related to the regional and local geology of a specific area to which there are no alternatives sites to consider with respect to the license location. The only other alternative is the no-action option (no exploration activities are implemented in a specific area).

(ii) **The No-Action Alternative** - A comparative assessment of the environmental impacts of the 'no-action' alternative (a future in which the proposed exploration activities do not take place) has been undertake. An assessment of the environmental impacts of a future, in which the proposed exploration and possible discovery of economic minerals resources does not take place, may be good for the receiving environment because there will be no negative environmental impacts due to the proposed minerals exploration or possible mining operation that may take place in the EPL area.

The environmental benefits will include:

- ❖ No negative impacts as a result of no mineral exploration taking place, and.
- ❖ Potential future mining related negative environmental impact on the receiving environment.

However, it is important to understand that even if the proposed exploration activities do not take place, to which the likely negative environmental impacts are likely to be low and localised, the other current and future land uses such as agriculture and tourism will still have some negative impacts on the receiving environment. The likely negative environmental impacts of the other current and future land use that may still happen in the absence of the proposed minerals exploration activities includes:

- ❖ Land degradation due to drought and Climate Change.
- ❖ Overgrazing / over stocking beyond the land carrying capacity.
- ❖ Poor land management practices,
- ❖ Wildfires, and.
- ❖ Erosion and overgrazing.

Furthermore, it is important to understand what benefits might be lost if the proposed exploration activities do not take place. Key loses that may never be realised if the proposed project activities do not go-ahead include: Loss of potential added value to the unknown underground minerals resources that maybe found within the EPL No. 4232, socioeconomic

benefits derived from current and future exploration, direct and indirect contracts and employment opportunities, export earnings, foreign direct investments, license rental fees, royalties, and various other taxes payable to the Government.

(iii) **Other Alternative Land Uses:** The EPL area fall within the well-known commercial agricultural land uses area dominated by cattle, game, and small stock farming activities. The growing game farming is also making tourism a vital socioeconomic opportunity in the general area. Minerals exploration and mining activities are well known land use options in Namibia and the surrounding EPL area. Due to the limited scope of the proposed exploration and the implementation of the EMP, it is likely that the proposed exploration can coexist with the current and potential future land uses within the general area.

(iv) **Potential Land Use Conflicts:** Considering the current land use practices (agriculture and tourism) as well as potential other land uses including minerals exploration, it is likely that potential economic derivatives from any positive exploration outcomes leading to the development of a mine in the general area can still co-exist with the existing and potential future land use options of the general area. However, much more detailed assessments of any likely visual and other socioeconomic impacts will need to be included in the EIA that must be undertaken as part of the prefeasibility and feasibility studies if economic minerals resources are discovered. The use of thematic mapping and delineation of various land use zones for specific uses such as agriculture, conservation, mining, or tourism etc, within the EPL area will greatly improve the multiple land use practices and promote coexistence for all the possible land use options.

(v) **Ecosystem Function** (**What the Ecosystem Does**)**:** Ecosystem functions such as wildlife habitats, carbon cycling or the trapping of nutrients and characterised by the physical, chemical, and biological processes or attributes that contribute to the self-maintenance of an ecosystem in this area are vital components of the receiving environment. However, the proposed exploration activities will not affect the ecosystem function due to the limited scope of the proposed activities because the ecosystem of this EPL area is part of the larger local and regional ecosystems which are all interlinked.

(vi) **Ecosystem Services:** Food chain, harvesting of animals or plants, and the provision of clean water or scenic views are some of the local ecosystem services associated with the EPL area. However, the proposed exploration activities will not affect the ecosystem services due to the limited scope and area of coverage of the proposed activities because the ecosystem of this EPL area is part of the larger local and regional ecosystems which are all interlinked.

(vii) **Use Values**: The EPL area has direct values for other land uses such as agriculture, conservation and tourism as well as indirect values which includes: Watching a television show about the general area and its wildlife, food chain linkages that sustains the complex life within this area and bequest value for future generations to enjoy. The proposed exploration activities will not destroy the current use values due to the limited scope of the proposed activities as well as the adherence to the provisions of the EMP as detailed in the EMP report, and.

(viii) **Non-Use or Passive Use**: The EPL area has an existence value that is not linked to the direct use / benefits to current or future generations. The proposed exploration activities will not affect the ecosystem current or future none or passive uses due to the limited scope of the proposed activities that will leave much of the EPL area untouched because the ecosystem of this EPL area is part of the larger local and regional ecosystems which are all interlinked.

5.3 Key Issues Considered in the Assessment Process

5.3.1 Sources of Impacts (Proposed Project Activities)

The proposed exploration activities covering initial desktop exploration activities (no field-work undertaken, regional reconnaissance, initial local field-based activities, detailed local field-based

activities, prefeasibility and feasibility studies related activities are the key sources both negative and positive impacts on the receiving environment.

5.3.2 Summary of Receptors Likely to be Negative Impacted

Based on the findings of this report, the following is the summary of the key environmental receptors that are may be negatively impacted by the proposed activities:

- **Physical environment:** Water quality, physical infrastructure and resources, air quality, noise and dust, landscape and topography, soil quality and, Climate change influences.

- **Biological environment:** Habitat, protected areas and resources, flora, fauna, and ecosystem functions, services, use values and non-use or passive use, and.

- **Socioeconomic, cultural and archaeological environment:** Local, regional and national socioeconomic settings, commercial and subsistence agriculture, community protection areas tourism and recreation cultural, biological and archaeological resources.

5.4 Impact Assessment Methodology

5.4.1 Impact Definition

In this report, a natural and/or human environmental impact is defined as: “Change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation’s environmental aspects.” (ISO 14001).

All proposed project activities (routine and non-routine) were considered during the Scoping, EIA and EMP Phases in terms of their potential to:

- Interact with the existing environment (physical, biological and social elements), and.

- Breach relevant national legislation, relevant international legislation, standards and guidelines, and corporate environmental policy and management systems.

Where a project activity and receptor were considered to have the potential to interact, the impact has been defined and ranked according to its significance. Table 5.1 provides the definition of different categories of impacts identified and used in this report.

This report has assessed the potential impacts resulting from routine Project activities, assuming that the Project activities that may cause an impact that will occur but the impact itself will be dependent on the likelihood (Probability) (Table 5.1).

Correct control measures through the implementation of the EMP and monitoring thereof, often reduce any negative significant impacts on the receiving environment as the results of the project activities. The assessment therefore, has focussed on the measures aimed at preventing the occurrence of an impact as well as mitigation measures that may be employed.

Table 5.1: Definition of impact categories used in this report.

Nature of Impact	Adverse	Considered to represent an adverse change from the baseline, or to introduce a new undesirable factor.
	Beneficial	Considered to represent an improvement to the baseline or to introduce a new desirable factor.
Type of Impact	Direct	Results from a direct interaction between a planned or unplanned Project activity and the receiving environment.
	Indirect	Results from the Project but at a later time or at a removed distance or which may occur as a secondary effect of a direct impact.
	Cumulative	Results from (i) interactions between separate Project-related residual impacts. and (ii) interactions between Project-related residual impacts in combination with impacts from other projects and their associated activities. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
Duration of Impact	Short-term	Predicted to last only for a limited period but will cease on completion of the activity, or as a result of mitigation/reinstatement measures and natural recovery typically within a year of the project completion.
	Medium-	Predicted to last only for a medium period after the Project finishing, typically one to five years.
	Long-term	Continues over an extended period, typically more than five years after the Project's completion.
	Permanent	Occurs during the development of the Project and causes a permanent change in the affected receptor or resource that endures substantially beyond the Project lifetime.
Scale of Impact	Local	Affects locally important environmental resources or is restricted to a single habitat/biotope, a single community.
	Regional	Affects nationally important environmental resources, or an area that is nationally important/protected or has macro-economic consequences.
	National	Affects nationally important environmental resources, or an area that is nationally important/protected or has macro-economic consequences.
	International	Affects internationally important resources such as areas protected by international Conventions
	Transboundary	Impacts experienced in one country as a result of activities in another.
Probability	Negligible	Possibility negligible
	Improbable	Possibility very low
	Probable	Distinct possibility
	Highly Probable	Most likely
	Definite	Impact will occur regardless of preventive measures

5.4.2 Knowledge-Based Impact Assessment Process

5.4.2.1 Characterisation of the Impact Assessment Inputs Variables

The impact assessment process for the proposed minerals exploration took into consideration the interactions of the proposed activities with respect to the Knowledge-Based System Model Methodology (KBSMM) characterised climatic, environmental, and ground model datasets of the receiving environment (physical, biological, socioeconomic and ecosystem services and functions).

The influence assessment of the characterised components of the environment has been based on a Knowledge-Based System Model Methodology (KBSMM), a PhD research-based and industry tested / validated Artificial Intelligent (AI) framework developed by Dr Sindila Mwiya.

The KBSMM model inputs variables covered characterised climatic, environmental, and ground model datasets. Source-Pathway-Receptor risk assessment approach was used to determine or validate the influence (impact assessment), and ultimate likely harm that may be linked to the various phased activities of each of the various stages of the proposed minerals exploration implementation process (Fig. 5.1).

5.4.2.2 Climatic Data Sets/Components Inputs

The climatic data sets that have been used in the regional and local site-specific assessment process comprised precipitation, temperature, evapotranspiration and wind data sets. The following is summary explanation of the roles that climatic data sets may have on the proposed minerals exploration implementation process (Fig. 5.1):

- Temperature: Temperature had a direct influence on the fluids that may influence the operation of the site by supporting evapotranspiration. It also has an influence on the planning, operation and implementation of the various project activities.

- Rainfall: Rainfall is one of the data sets used in the water balance assessments with respect to potential fluid production and flash flood occurrences. The data sets had some influence on mobilisation pollutants that may be associated with the proposed project activities.

- Evapotranspiration: This combined effect of evaporation and transpiration is important in water balance assessments with direct influences on the implementation of the various project activities, and.

- Wind Direction and Speed: The direction and speed of the prevailing winds may be critical to the site operations and determination of the optimum operational requirements. The data had a direct influence on the site operations including dust and noise management.

5.4.2.3 Environmental Data Sets/Components Inputs

The regional or local environmental data sets used in this project comprise:

- Economic activities (Proposed minerals exploration) and coordination support available in the area or area.

- Types and amounts of waste likely to be generated.

- Likely contaminants from the activities.

- Ecological, habitats and ecosystems including fauna and flora.

- Community considerations such, land ownership, social, health and safety, and.

- Archaeological, cultural and political issues.

The following is summary explanation of the role of the environmental data sets may have on the proposed minerals exploration implementation process (Fig. 5.2):

- Economic activities and logistic support: The types of economic activities and logistical support services and infrastructure for the proposed activities are a key source of impact component of the environmental data sets in the determination of the likely impacts on the receptors, and.

- The likely Types and amount of waste: Understanding the characteristics of the liquid and solid waste streams be handled is vital in the evaluation of the hazard exposure in terms of the overall risk assessment to the receptors.

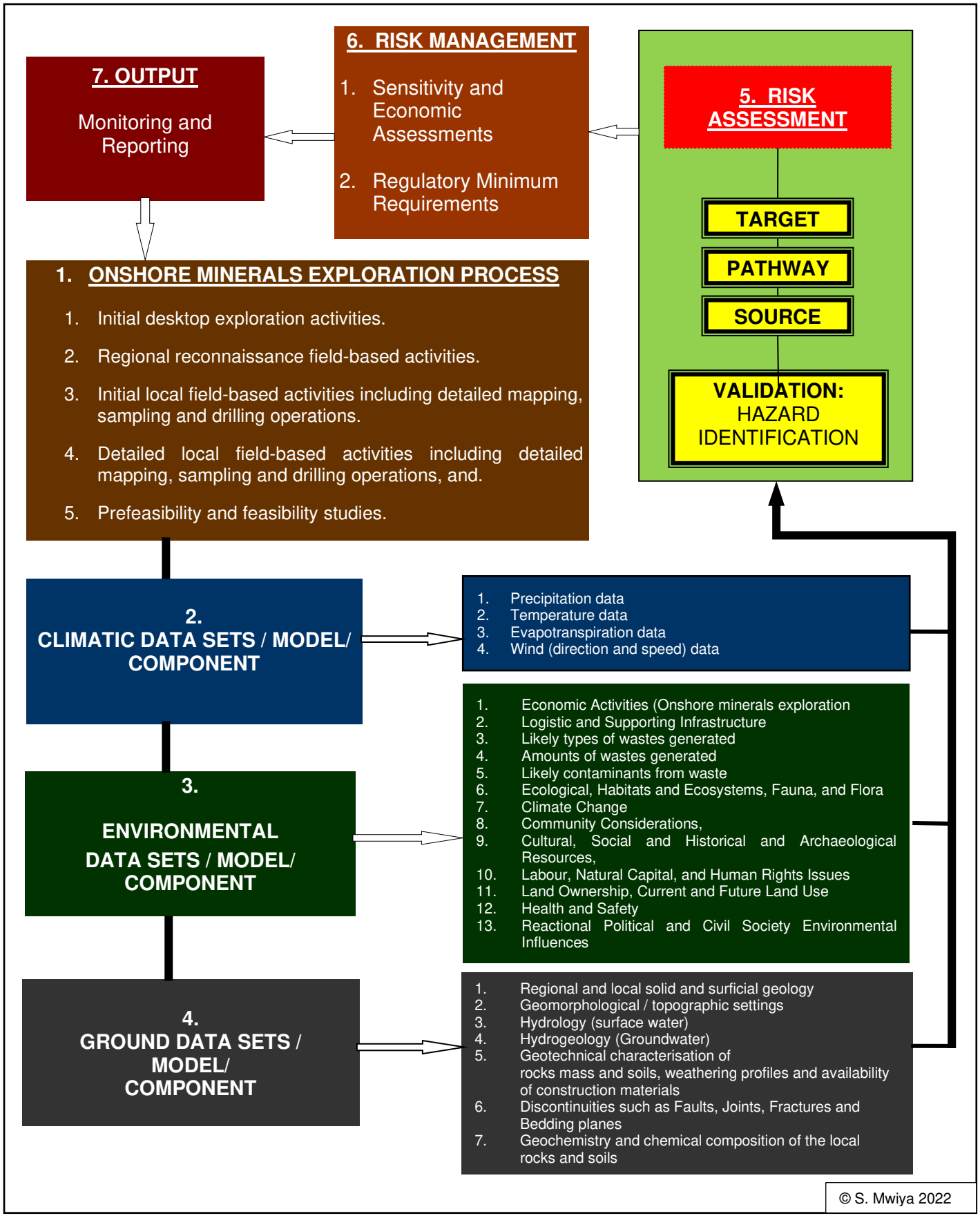


Figure 5.1: Detailed outline of the technical methodology based on a complete looped Knowledge-Based System Model Methodology (KBSMM) used in the impact assessment, risk assessment and determination of the monitoring and reporting strategy. The system model methodology has a built-in looping that allows for the evaluation of a phased onshore minerals exploration process project lifecycle.

- ❖ Likely contaminants: The state (solid, gas, liquid, or vapour) of any likely contaminants that may associated with the proposed phased onshore minerals exploration activities play a major role in the determination of the likely harm, mitigation, monitoring and reporting strategies.

- ❖ Ecological, habitats, ecosystems, fauna, flora, and local, regional or global Climate Change influences: At national, regional and local levels, there are a number of unique and protected habitats, ecosystems, fauna and flora and highly vital as they support other sectors of the national economy such as tourism, agriculture, food security and services. Understanding the likely level of sensitivity of the regional or local areas is highly important to the successful determination of the likely impacts and harm, development mitigation measures, monitoring and reporting strategy to be implemented for the proposed phased onshore minerals exploration process, and.

- ❖ Community considerations: Local community issues and acceptability of the proposed activities by the local community is of vital importance. Other key components of the community considerations include: Land ownership (State land / Communal or Private), land use, local social settings, labour, natural capital, human rights, public and workers health and safety, archaeological, cultural, political, and civil society influences.

As part of the data collection, evaluation, influence and risk assessment process of the proposed phased onshore minerals exploration, determination of the mitigation measures, monitoring and reporting strategies, specialist assessments conducted as part of the EIA process provided vital recommendations incorporated in this report.

5.4.2.4 Ground Data Sets/Components Inputs

The ground data sets covered regional/local solid and surficial geology, geomorphological / topographic settings, hydrology (surface water), hydrogeology groundwater), geotechnical and geochemical characterisation of rocks and soils, weathering profiles and availability of construction materials, and discontinuities such as faults, joints, fractures, and bedding planes of the drilled sites (Fig. 5.1). The geology (solid and superficial) and water (surface and groundwater resources are all targets that may be influenced (impacted) by the various activities of the proposed phased minerals exploration process implementation. Other ground components which include the local terrain (geomorphology and topographic features), discontinuities, geotechnical as well as geochemical /mineralogy will aid the influence of sources in causing or minimising the impacts to be controlled through mitigations (Fig. 5.1). Regional/local solid and surficial geology, geomorphological and topographic settings also linked directly to the availability of local construction and operational materials in support of the proposed phased minerals exploration process project implementation lifecycle (Fig. 5.1).

5.4.2.5 Source-Pathway-Receptor Risk Assessment, Harm and Monitoring

To evaluate the level of influence (impact), risk, and harm that the proposed onshore phased minerals exploration process implementation, the assessment process was focused on the sources, pathways, and targets / receptor chains (Fig. 5.2). It is important to note that in the absence of any of the interlinked three (3) components (sources, pathways, or targets/ receptor) there is no harm or risk to mitigate, monitor or manage (Figs. 5.2 and 5.3).

The risk source/s refers to knowledge - based identified potential hazards that may be present and can cause harm to the exposed target/s / receptors (Fig. 5.3). The risk pathway refers to the route direct or indirect though which the risk source/s may be transferred and exposed to a target/s of concern.

The risk target/s or receptor/s refers to the destination (area point of exposure) at which the source/s may cause harm. The characterisation of source/s, pathway/s and target/s chain has been undertaken for climatic, environmental and ground model data components with respect to the proposed phased onshore minerals exploration process.

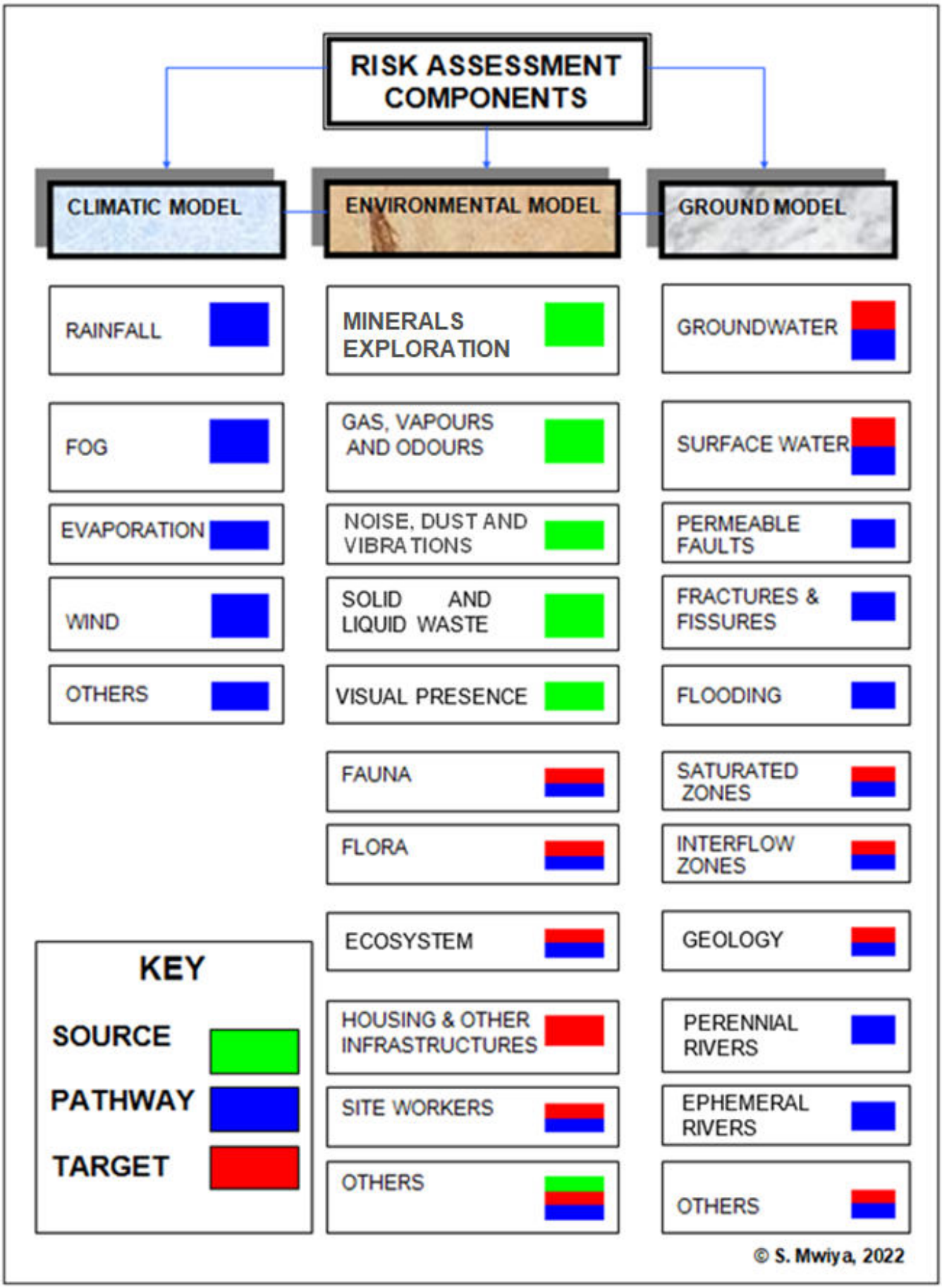


Figure 5.2: A Knowledge-Based System Model Methodology (KBSMM) characterised interactive risk assessment system output field-based and tested / validated Artificial Intelligent (AI) framework windows for onshore phased minerals exploration process implementation project lifecycle.

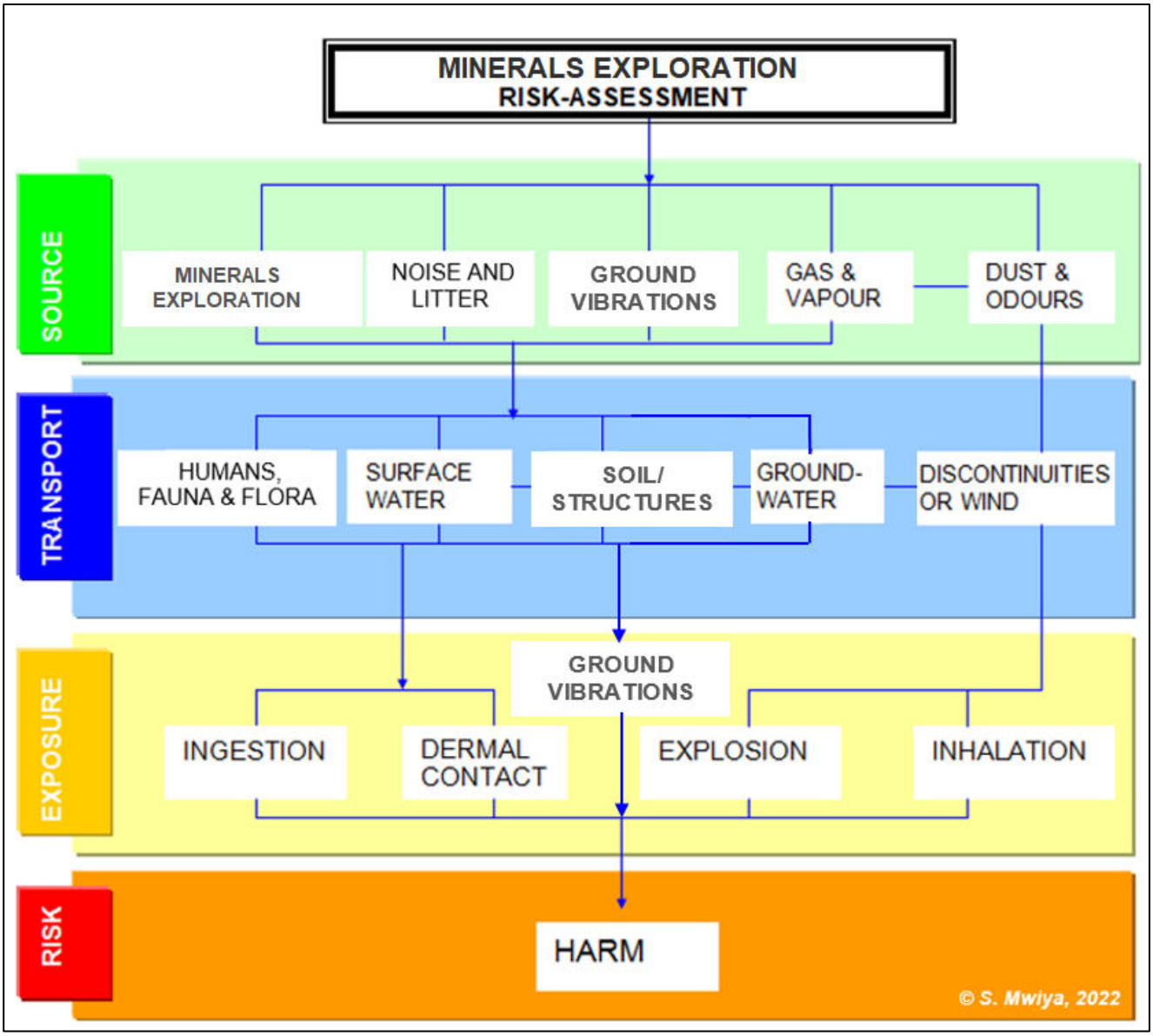


Figure 5.3: A Knowledge-Based System Model Methodology (KBSMM) characterised system output research-based and tested / validated Artificial Intelligent (AI) framework risk consequences (harm) pathways to the receiving target/receptors windows for onshore phased minerals exploration process project implementation lifecycle.

5.4.2.6 Individual Components Impact Assessment Criteria

Based on the Terms of Reference and individual components impact assessment outputs of the KBSMM for the proposed phased minerals exploration process and the lessons learned (created knowledge-base) from the previous phased minerals exploration processes operations undertaken and tested since 1999 when the KBSMM was developed, all key components of the receiving environment were identified and assessed with respect to the overall proposed activities and likely significant impacts on the receiving environment with the aim of developing appropriate mitigation measures as detailed in the EMP Report.

5.4.3 Overall Component and Significant Impact Assessment

5.4.3.1 Overall Component Impact Assessment

The overall component impact assessment and evaluation process has been undertaken by considering the activities of the proposed phased minerals exploration process operations as the overall source of impact (Figs. 5.1-5.3). As illustrated in Figs. 5.1-5.3, the receiving environment has

been considered as the receptor / target that may be impacted positively or negatively by the activities of the proposed phased minerals exploration process.

The characterised components of the receiving environment encompassed the following:

- Physical Conditions / Natural Environment – Air, noise, water, green space, climate change, built environment – houses, roads, transport systems, buildings, infrastructure, etc.
- Biological Conditions: fauna, flora, habitats, and ecosystem - services, function, use values and non-use etc., and.
- Socioeconomic Conditions: Social, economic, labour, gender, human rights, natural and social capital, archaeological, cultural resources, and cultural issues

In evaluating the individual degree of potential negative impacts, the following factors have been taken into consideration:

- Impact Severity: The severity of an impact is a function of a range of consideration, and.
- Likelihood of Occurrence (Probability): How likely is the impact to occur?

In evaluating the severity of potential negative environmental impacts, the following factors have been taken into consideration:

- Receptor/ Resource Characteristics: The nature, importance, and sensitivity to change of the receptors / target or resources that could be affected.
- Impact Magnitude: The magnitude of the change that is induced.
- Impact Duration: The time period over which the impact is expected to last.
- Impact Extent: The geographical extent of the induced change, and.
- Regulations, Standards and Guidelines: The status of the impact in relation to regulations (eg. discharge limits), standards (eg. environmental quality criteria) and guidelines.

The overall impact severity has been categorised using a subjective scale as shown in Table 5.2 for magnitude, Table 5.3 for duration and Table 5.4 for extent.

Table 5.2: Scored on a scale from 0 to 5 for impact magnitude.

SCALE (-) or (+)		DESCRIPTION
0		no observable effect
1		low effect
2		tolerable effect
3		medium high effect
4		high effect
5		very high effect (devastation)

Table 5.3: Scored time over which the impact is expected to last.

SCALE (-) or (+)		DESCRIPTION
T		Temporary
P		Permanent

Table 5.4: Scored geographical extent of the induced change.

SCALE (-) or (+)		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

The likelihood (probability) of the pre-identified events occurring has been ascribed using a qualitative scale of probability categories (in increasing order of likelihood) as shown in Table 5.5. Likelihood of an impact occurring is estimated on the basis of experience (existing knowledge-base) and/ or evidence that such an outcome has previously occurred. Impacts resulting from routine/planned events are classified under category (E).

Table 5.5: Summary of the qualitative scale of probability categories (in increasing order of likelihood).

SCALE (-) or (+)		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 (e.g.,, 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 occur several times per year at each location where such works are undertaken)

The overall individual components impact assessment with respect to the impact duration, geographical extent and probability of occurrence have been categorised using a semi quantitative approach as shown in Table 5.6 and the results are presented under Subsection 5.4.4.

5.4.3.2 Overall Significant Impact Assessment

The determination of the significance of the negative impacts / key issues caused by the proposed phase minerals exploration activities as key sources of such impact has been based on the environmental baseline results such as the intensity and duration of the likely negative impact as assessed under individual components likely to be impacted. The assessment focused on the existence of potential pathways, and the degree to which the proposed project activities are likely to result in unwanted consequences on the receptor, covering the receiving environment (natural, built, socioeconomic, flora, fauna, habitat, and ecosystem).

5.4.4 Proposed Project Activities Summary of Impacts Results

The results of the impacts assessment and evaluation has adopted a matrix assessment framework linked to the KBSMM framework. Assessment results of the magnitude, duration, extent, and probability of the potential impacts due to the proposed project activities interacting with the receiving environment are presented in form of a matrix table as shown in Tables 5.6-5.9.

The overall severity of potential environmental impacts of the proposed project activities on the receiving environment will be of low magnitude (Table 5.6), temporally duration (Table 5.7), localised extent (Table 5.8) and low probability of occurrence (Table 5.9) due to the limited scope of the proposed activities and the use of step progression approach in advancing exploration. The step progressional approach will allow the Proponent to evaluate the results of exploration success and the implementation of the next stage of exploration will be subject to the positive outcomes of previous activities as graded (Tables 5.6-5.9). It is important to note that the assessment of the likely impacts as shown in Tables 5.6 - 5.9, have been considered without the implementation of mitigation measures as detailed in EMP Report. The need for implementation of the appropriate mitigation measures as presented in the EMP Report has been determined based on the results of the impact assessment (Tables 5.6 - 5.9) and the significant impacts as detailed in Tables 5.10 and 5.11.

Table 5.6: 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
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
	(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
	(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
	(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
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	3	3	4
	(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	3	3	4
	(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	3	3	4
	(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	3	3	4
	(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	3	3	4

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 5.6: Cont.

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
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	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4
	(ii)	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	3	3	4
	(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	3	3	4
	(iv)	Possible Trenching (Subject to the outcomes of i - iii above)	2	2	2	2	2	2	2	2	2	2	2	2	2	3	3	4
	(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	3	3	4
	(vi)	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	3	3	4
4. Detailed Local Field-Based Activities	(i)	Access preparation and related logistics to support activities	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
	(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	2	3	3	4
	(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	3	3	4
	(iv)	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	4
5. Prefeasibility and Feasibility Studies	(i)	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	4
	(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	4
	(iii)	Geotechnical studies for mine design	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
	(iv)	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	3	3	4
	(v)	EIA and EMP to support the ECC for mining operations	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4
	(vi)	Preparation of feasibility report and application for Mining License	1	1	1	1	1	1	1	1	1	1	1	1	1	3	3	4

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 5.7: 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: T = Temporary; P = Permanent		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	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	(ii) 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
	(iii) Purchase and analysis of existing Government aerial hyperspectral	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T
	(iv) 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
2. Regional Reconnaissance Field-Based Activities	(i) 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	P
	(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	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	P
	(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	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	P
	(iv) 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	P
	(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	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	P

Table 5.7: *Cont.*

DURATION OF IMPACT		PHYSICAL ENVIRONMENT						BIOLOGICAL ENVIRONMENT					SOCIOECONOMIC, CULTURAL, AND ARCHAEOLOGICAL ENVIRONMENT				
SCALE / DESCRIPTION: T = Temporary; P = Permanent		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
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	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	P
	(ii) 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	P
	(iii) 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	P
	(iv) 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	P
	(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)	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	P
	(vi) 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	P
4. Detailed Local Field-Based Activities	(i) Access preparation and related logistics to support activities	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	P
	(ii) 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	P
	(iii) 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	P
	(iv) 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	P
5. Prefeasibility and Feasibility Studies	(i) 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	P
	(ii) 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	P
	(iii) Geotechnical studies for mine design	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	P
	(iv) 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	P
	(v) 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	P
	(vi) Preparation of feasibility report and application for Mining License	T	T	T	T	T	T	T	T	T	T	T	T	T	T	T	P

Table 5.8: Results of the scored geographical extent of the induced change.

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
1. Initial Desktop Exploration Activities	(i) 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
	(ii) 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
	(iii) Purchase and analysis of existing Government aerial hyperspectral	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L
	(iv) 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
2. Regional Reconnaissance Field-Based Activities	(i) 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	N
	(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	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	N
	(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	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	N
	(iv) 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	N
	(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	L	L	L	L	L	L	L	L	L	L	L	L	L	L	L	N

Table 5.8: *Conti.*

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
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	L	L	L	L	L	L	L	L	L	L	L	L	L	O	R	N
	(ii) 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	O	R	N
	(iii) 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	O	R	N
	(iv) Possible Trenching (Subject to the outcomes of i - iii above)	L	L	L	L	L	L	L	L	L	L	L	L	L	O	R	N
	(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)	L	L	L	L	L	L	L	L	L	L	L	L	L	O	R	N
	(vi) 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	O	R	N
4. Detailed Local Field-Based Activities	(i) Access preparation and related logistics to support activities	L	L	L	L	L	L	L	L	L	L	L	L	L	O	R	N
	(ii) 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	O	R	N
	(iii) 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	O	R	N
	(iv) 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	O	R	N
5. Prefeasibility and Feasibility Studies	(i) 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	O	R	N
	(ii) Detailed drilling and bulk sampling and testing for ore reserve calculations	L	L	L	L	L	L	L	L	L	L	L	L	L	O	R	N
	(iii) Geotechnical studies for mine design	L	L	L	L	L	L	L	L	L	L	L	L	L	O	R	N
	(iv) 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	O	R	N
	(v) EIA and EMP to support the ECC for mining operations	L	L	L	L	L	L	L	L	L	L	L	L	L	O	R	N
	(vi) Preparation of feasibility report and application for Mining License	L	L	L	L	L	L	L	L	L	L	L	L	L	O	R	N

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 5.9: 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
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)																	
1. Initial Desktop Exploration Activities	(i)	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	E
	(ii)	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	E
	(iii)	Purchase and analysis of existing Government aerial hyperspectral	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	E
	(iv)	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	E
2. Regional Reconnaissance Field-Based Activities	(i)	Regional geological, geochemical, topographical and remote sensing mapping and data analysis	A	A	A	A	A	A	A	A	A	A	A	A	A	D	D	E
	(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	A	A	A	A	A	A	A	A	A	A	A	A	A	D	D	E
	(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	A	A	A	A	A	A	A	A	A	A	A	A	A	D	D	E
	(iv)	Limited field-based support and logistical activities including exploration camp site lasting between one (1) to two (2) days	A	A	A	A	A	A	A	A	A	A	A	A	A	D	D	E
	(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	A	A	A	A	A	A	A	A	A	A	A	A	A	D	D	E

Table 5.9: *Cont.*

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
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	A	A	A	A	A	A	A	A	A	A	A	A	A	D	D	E
	(ii) 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	D	D	E
	(iii) 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	D	D	E
	(iv) Possible Trenching (Subject to the outcomes of i - iii above)	B	B	B	B	B	B	B	B	B	B	B	B	B	D	D	E
	(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)	B	B	B	B	B	B	B	B	B	B	B	B	B	D	D	E
	(vi) 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	D	D	E
4. Detailed Local Field-Based Activities	(i) Access preparation and related logistics to support activities	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	E
	(ii) 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	D	D	E
	(iii) 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	D	D	E
	(iv) 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	D	D	E
5. Prefeasibility and Feasibility Studies	(i) 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	D	D	E
	(ii) Detailed drilling and bulk sampling and testing for ore reserve calculations	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	E
	(iii) Geotechnical studies for mine design	C	C	C	C	C	C	C	C	C	C	C	C	C	D	D	E
	(iv) 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	D	D	E
	(v) EIA and EMP to support the ECC for mining operations	A	A	A	A	A	A	A	A	A	A	A	A	A	D	D	E
	(vi) Preparation of feasibility report and application for Mining License	A	A	A	A	A	A	A	A	A	A	A	A	A	D	D	E

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)

5.5 Evaluation of Significant Impacts

5.5.1 Overview

The significance of each impact has been determined by assessing the impact severity against the likelihood (probability) of the impact occurring as summarised in the impact significance assessment matrix provided in Table 5.10.

5.5.2 Significance Criteria

Significance criteria for negative/adverse impacts (i.e., relative ranking of importance) are defined in Table 5.10. It is important to note that impacts have been considered without the implementation of mitigation measures. The need for appropriate mitigation measures as presented in the EMP report has been determined based on the basis of the impact assessment presented in this report.

Table 5.10: Scored impact significance criteria.

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]

5.5.3 Assessment Likely Significant Impacts

The assessment of significant impacts depended upon the degree to which the proposed project activities are likely to results in unwanted consequences on the receptor covering physical and biological environments (Table 5.11). Overall, the assessment of significant impacts has focused on the ecosystem-based approach that considers potential impacts to the ecosystem. The main key sources of impacts that have been used in the determination of significant impacts posed by the proposed minerals exploration comprised activities. Each of the main areas of impact have been identified and assessed as follows:

- Positive Impacts are classified under a single category. they are then evaluated qualitatively with a view to their enhancement, if practical.
- Negligible or Low Impacts will require little or no additional management or mitigation measures (on the basis that the magnitude of the impact is sufficiently small, or that the receptor is of low sensitivity).
- Medium or High Impacts require the adoption of management or mitigation measures.
- High Impacts always require further management or mitigation measures to limit or reduce the impact to an acceptable level.

Overall, the results of the significant impact assessment matrix for the proposed minerals exploration activities on the physical and biological environments are shown in Tables 5.11.

Table 5.11: 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	4/4
	(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	4/4
	(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	4/4
	(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	4/4
	(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	4/4

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]

Table 5.11: *Cont.*

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
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	4/4
	(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	4/4
	(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	4/4
	(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	4/4
	(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	4/4
	(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	4/4
4. Detailed Local Field-Based Activities	(i) Access preparation and related logistics to support activities	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	3\3	3\3	4/4
	(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	3/2	3/2	3/2	3/2	2\2	2\2	3\3	3\3	4/4
	(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	3\3	3\3	4/4
	(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	3\3	3\3	4/4
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	3\3	3\3	4/4
	(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	4/4
	(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	3\3	3\3	4/4
	(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	4/4
	(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	3\3	3\3	4/4
	(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	3\3	3\3	4/4

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]

5.6 Assessment of Overall Impacts

5.6.1 Summary of the Results of the Impact Assessment

In accordance with Tables 5.6 - 5.11, the following is the summary of the overall likely negative and significant impacts of the proposed exploration activities on the receiving environment (physical, biological and socioeconomic environments) without:

(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 **[1/1]** (Table 5.11). Except for the socioeconomic components which carry a **(+)**, the rest of the likely impacts are negative **(-)**.

(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 **[1/1]**. 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 **[1/1]** (Table 5.11). Except for the socioeconomic components which carry a **(+)**, all the other likely impacts are negative **(-)**.

(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 **[2/2]**. 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 **[2/2]** (Table 5.11). Except for the socioeconomic components which carry a **(+)**, all the other likely impacts are negative **(-)**. Cultural, biological, and archaeological resources will have high significant negative impacts **[4/4]**.

(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 **[2/2]** without mitigations and low with mitigations (Table 5.11). Except for the socioeconomic components which carry a **(+)**, all the other likely impacts are negative **(-)**. Tourism and recreation will have medium significant negative impacts **[3\3]**, and cultural, biological, and archaeological resources will have high significant negative impacts **[4/4]**. 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 medium **[3/3]** without mitigations and low with mitigations for bulk sampling, test mining and field logistics (Table 5.11). Except for the socioeconomic components which carry a **(+)**, all the other likely impacts are negative **(-)**. Tourism and recreation will have medium significant negative impacts **[3\3]**, and cultural, biological, and archaeological resources will have high significant negative impacts **[4/4]**.

6. THE EMP

6.1 Summary of the EMP Objectives

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 gives commitments including financial and human resources provisions for effective management of the likely environmental liabilities during and after the exploration.

Regular assessments and evaluation of the environmental liabilities during the exploration will need to be undertaken and will ensure adequate provision of the necessary resources towards good environmental management at various stages of the project development.

6.2 Implementation of EMP

6.2.1 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).

6.2.2 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 issue fines 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.

6.2.3 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 for all new personnel coming onto site.
- ❖ 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.

6.2.4 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.
    - o Roles and Responsibilities, including emergency preparedness.
    - o Basic Rules of Conduct (Do's and Don'ts).
    - o EMP: aspects, impacts and mitigation.
    - o Fines for Failure to Adhere to the EMP, and.
    - o Health and Safety Requirements.
- ❖ Record keeping of all environmental awareness training and induction presentations, and.
- ❖ Attend regular site meetings and environmental inspections.

6.3 Specific Mitigation Measures

6.3.1 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.

6.3.2 Specific 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 assessment phase, Tables 6.1 – 6.18 provides the detailed specific mitigations measures 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 Tables 6.1-6.18:

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 6.1: Project planning and implementation.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
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 a 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 (v) Subcontractors

Table 6.2: Implementation of the EMP.

OBJECTIVES	INDICATOR	SCHEDULE	RESPONSIBILITY
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. 3. 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 (v) Subcontractors

Table 6.3: Public and stakeholders relations.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Maintain sound relationships with the other land users/ land owner/s and other 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 (v) Subcontractors

Table 6.4: Measures to enhance positive socioeconomic impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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 resident 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, payment of social security and submission of affirmative action data. 7. Encouraged to cater for the needs of employees to increase the spending of wages locally.	(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

Table 6.5: Environmental awareness briefing and training.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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. 4. 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 (v) Subcontractors

Table 6.6: Erection of supporting exploration infrastructure.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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. 3. 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. (iv) Prefeasibility and feasibility studies.	(i) Proponent's Representative (PR) (ii) Project Manager (PM) (iii) Project HSE (iv) Contractor (v) Subcontractors

Table 6.7: Use of existing access roads, tracks and general vehicle movements.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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 these increases mortalities 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. 9. 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

Table 6.8: Mitigation measures for preventing flora and ecosystem destruction and promotion of conservation.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Prevent flora and ecosystem destruction and promote 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 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 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. 14. 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.	(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

Table 6.9: Mitigation measures for preventing faunal and ecosystem destruction and promotion of conservation.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Prevent faunal and ecosystem destruction and promote 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 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 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.	(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

Table 6.10: Mitigation measures to be implemented with respect to the exploration camps and exploration sites.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Promotion of conservation through preservation of flora, fauna and ecosystem around the exploration camps and exploration sites	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.. 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. 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.	(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

Table 6.11: Mitigation measures for surface and groundwater protection as well as general water usage.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
Effective management / protection of surface and groundwater resources and general water resources usage	1. Always use as little water as possible. Reduce, reuse and re-cycle water where possible. 2. All leaking pipes / taps must be repaired immediately they are noticed. 3. Never leave taps running. Close taps after you have finished using them. 4. Never allow any hazardous substance to soak into the soil. 5. Immediately tell your Contractor or Environmental Control Officer / Site Manager when you spill, or notice any hazardous substance being spilled during the field-based exploration activities or around the camp site. 6. Report to your Contractor or Environmental Control Officer / Site Manager when you notice any container, which may hold a hazardous substance, overflow, leak or drip. 7. Immediately report to your Contractor or Environmental Control Officer / Site Manager when you notice overflowing problems or unhygienic conditions at the ablution facilities. 8. No washing of vehicles, equipment and machinery, containers and other surfaces. 9. Limit the operation to a specific site and avoid sensitive areas and in particular the Ephemeral River Channel. This would sacrifice the actual area for other adjacent Ephemeral River areas and thus minimise any likely negative effect on water resources. 10. Disposal of wastewater into any public stream is prohibited. 11. The Proponent must obtain permission of the land owners before utilising any water resources or any associated infrastructure. 12. If there is a need to drilling a water borehole to support the exploration programme the proponent must obtain permission form the land owner and Department of Water Affairs in the Ministry of Agriculture and Forestry. In an event of discovery of economic minerals resources, the sources of water supply for the mining related operations will be supplied by NamWater. 13. If there are any further (larger scale) exploration/drilling activities and/or mining activities to follow from the initial planned drill holes, groundwater monitoring must be implemented to include water level monitoring and also water sampling on a bi-annual basis. In order to have greater transparency on the water monitoring activities, the affected landowners / farmers must be given full access to the results of the water monitoring analyses.	(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

Table 6.12: Mitigation measures to minimise negative socioeconomic impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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 employees contracts are terminated or not renewed, contractors should transport the employees out of the area to their hometowns within two days of their contracts coming to an end. 7. Tender documents could stipulate that contractor 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.	(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

Table 6.13: Mitigation measures to minimise health and safety impacts.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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. • 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	(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

Table 6.14: Mitigation measures to minimise visual impacts.

OBJECTIVES	MITIGATION MEASURES	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

Table 6.15: Mitigation measures to minimise vibration, noise and air quality.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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. • 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.	(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

Table 6.16: Mitigation measures for waste (solid and liquid) management.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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 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.	(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

Table 6.17: Rehabilitation plan.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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 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.	(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

Table 6.18: Environmental data collection.

OBJECTIVES	MITIGATION MEASURES	SCHEDULE	RESPONSIBILITY
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 map. • 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

7. REHABILITATION AND MONITORING

7.1 Rehabilitation Process

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

- **Step 1: Backfilling the mining void:**
  - Transporting all stockpiled overburden, whether being stockpiled or used as berms, back to the excavated voids.
  - Backfilling the trenches, pits and quarries using this material.
  - 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 slimes ponds have dried sufficiently, scrape out the slimes and transporting back to the excavated voids during the overburden backfilling stage.
  - Bulldoze the slimes pond walls over and contour.
  - 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:**
  - If permanent structures such as houses were created, hand them to the local farmer or another private person for effective use such as a tourist camp or shade etc.
  - Disassemble all building structures including the any plant structures and pre-fabricated buildings.
  - Remove all building materials from the site and either:
    - Transporting to a new site if it is to be used or stored elsewhere. or
    - Disposing at a suitable 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.

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

- The concrete reservoirs can probably remain intact provided that the farmer wishes to utilise them at some stage - this will need to be negotiated.

- The future of the water pipeline can be negotiated with the farmer or a new owner/lender of the site, because if he chooses to use the pipeline it will not be necessary to remove it and rehabilitate the route, and.

- If the pipeline is to be removed, disassemble and transport the component parts to a storage site or sell at an Auction.

❖ **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 seedbank with a layer of gravel by manually spreading the fragments across the surface using a rake.

❖ **Step 5: Rehabilitate the storm-water channel:**

- Remove the Hyson cells or gabions.

- 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 of disturbed grounds:**

- Compaction of the substrate will result from utilization of these areas or the pressure of overlying structures.

- 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 the roads:**
    - Compaction of the road will result from the continuous passage of heavy vehicles so it will be necessary to break up the road surface.
    - 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 seedbank with a gravel layer by manually spreading the fragments across the surface using a rake.

7.2 Monitoring of the Environmental Performance

7.2.1 Rehabilitation Evaluation and Performance Monitoring

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

- Monitoring: Monitoring program is instituted to ensure that the requirements of the mining site rehabilitation program are met. Rehabilitation program may be subjected to various natural or man-made forces that can hinder the progress and lead to problems or failure or 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 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.

7.2.2 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 closure of the proposed / ongoing exploration to be undertaken by the Project HSE Officer with the support of the external specialist consultants as maybe required.

The proponent will be required to report regularly (twice in a year or as the case maybe) to the Environmental Commissioner in the Ministry of Environment and Tourism (MET), the environmental performances as part of the ongoing environmental monitoring programme. Environmental monitoring programme is part of the EMP performances assessments and will need to be compiled and submitted as determined by the Environmental Commissioner. The process of undertaking appropriate monitoring as per specific topic (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 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 maybe 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 fulfilment 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.

8. CONCLUSION AND RECOMMENDATION

8.1 Conclusions

Current proposed main mineral exploration field-based activities covering mapping, geochemical sampling and drilling of four (4) boreholes will have low localised impacts on the local receiving environment with low significant impacts. Mitigation measures must be implemented as detailed in Section 6 (EMP) of this report. The proponent (On-Road Investments (Pty) Ltd) must obtain permission of the land owners (surface rights holders) before exercising their subsurface rights in all the farms covered by the EPL 4232.

8.2 Recommendations

It's hereby recommended that the proposed exploration activities be issued with an Environmental Clearance Certificate with key conditions of adhering to the provisions of the EMP, Access Agreement as well as all other related regulations governing, mineral exploration, water resources management, health and safety and labour. The proponent (On-Road Investments (Pty) Ltd) must take all the necessary steps to implement all the recommendations of the EMP for the successful implementation and completion of the proposed exploration programme covering the EPL 4232. Recommended actions to be implemented by On-Road Investments (Pty) Ltd as part of the management of the likely impacts through implementations of the EMP are:

(i) The proponent must obtain permission from the land owners to enter the EPL area in order to undertake field-based exploration / prospecting activities.

(ii) The proponent must implement precautionary measures / approach to environmental management. Once a viable and potentially economic resources 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.

(iii) Before detailed site-specific exploration activities such as extensive drilling operations and access routes are selected, the project environmental officer 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.

(iv) Contract an Environmental Control Officer/ Consultant / suitable in-house resources person 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 exploration period.

(v) Provide with other support, human and financial resources, for the implementation of the proposed mitigations and effective environmental management during the planned exploration activities for the EPL 4232.

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

(vii) 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.

(viii) Implement internal and external monitoring of the actions and management strategies developed during the mineral exploration process. Final Environmental Monitoring report be prepared by the Environmental Coordinator / Consultant / Suitable in-house resource person and to be submitted to the regulators and to end the proposed mineral exploration, and.

(ix) 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.

8.3 Summary Terms of Reference for Full EIA

Once potential economic resources are discovered within this EPL area, a separate field-based and site-specific Environmental Impact Assessment (EIA) and the development of an Environmental Management Plan (EMP) MUST be implemented as part of the prefeasibility and or feasibility study stage. The aims and objectives of the Environmental Assessment (EA) covering Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) to be implemented as part of the feasibility study if variable resources are discovered are:

- 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 (Khomas Region), 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 that 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, Forestry and Tourism and Ministry of Agriculture, Water Affairs and Forestry, and.

- 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.

9. BIBLIOGRAPHY / REFERENCES

1. FURTHER GENERAL READING

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

Directorate of Environmental Affairs, 2002. Atlas of Namibia Project. Ministry of Environment, Forestry and Tourism, Windhoek, http://www.met.gov.na

Geological Survey of Namibia, 1999. The Simplified Geological Map of Namibia, Windhoek.

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

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 od 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.

Mwiya, S., 2004. A Knowledge-Based System Model Methodology (KBSMM) for Development and Management of Mine Waste sites in Arid and Semiarid Environments of Southern Africa, *Geosciences Africa 2004*, *University of Witwatersrand, Johannesburg*, South Africa, pp 486.

Risk-Based Solutions, 2014. Final Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) Report for the Proposed Minerals Exploration Activities in the Exclusive Prospecting License (EPL) No. 4742, Hallie Investment Number 411 CC, Windhoek District, Khomas Region, CENTRAL NAMIBIA.

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. 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.

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.

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. & 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, Windhoek.

Griffin, M. 2005. Annotated checklist and provisional national conservation status of Namibian mammals. Ministry of Environment, Forestry and Tourism, Windhoek.

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 2012. IUCN Red List of Threatened Species. Version 2012.2, www.iucnredlist.org

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. & 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., Cotterill, F.P.D. & Schoeman, M.C. 2010. Bats of southern and central Africa – A biogeographic and taxonomic synthesis. Wits University Press, Johannesburg, South Africa.

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, 2006. Namibia's communal conservancies: a review of progress and challenges in 2005. NACSO, Windhoek.

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, 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.

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

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.