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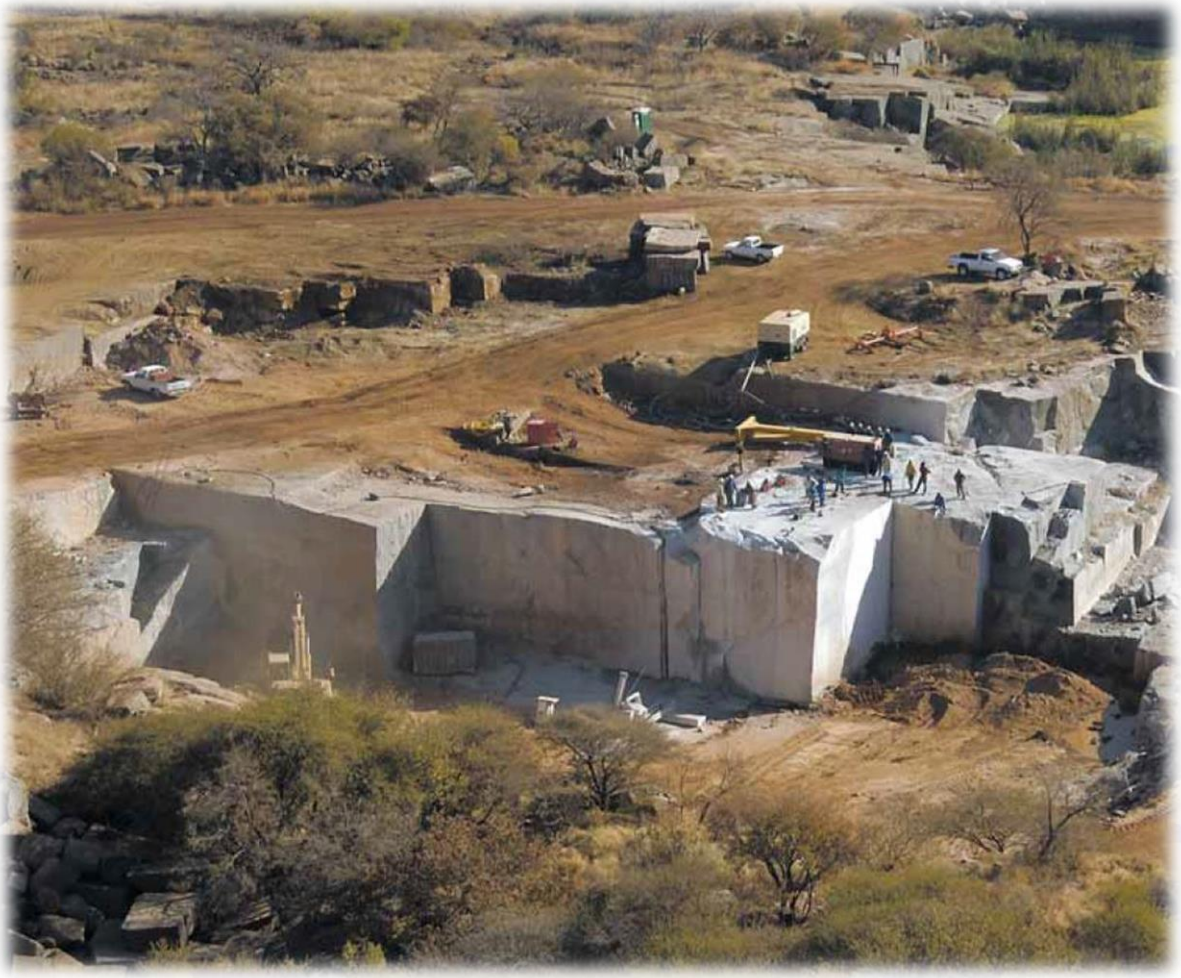

**Environmental Assessment and Environmental Management Plan (EMP) for proposed exploration of dimension stone on EPL 5161, Erongo Region, Namibia**

**Date:** 04 June 2020

**Prepared for:** Best Cheer Investments Namibia (Pty) Ltd

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## EXECUTIVE SUMMARY

Best Cheer Investments Namibia (Pty) Ltd (*the client or Best Cheer hereafter*) intends to carry out exploration activities to investigate the potential of granites and granitoid bodies on Exclusive Prospecting License (EPL) no. 5161, for use as dimension stones. The EPL is located about 25 km northeast of Arandis and covers an area of about 5059 ha. The area falls under the Karibib Constituency jurisdiction and extends across three (3) commercial farms namely Vergenoeg (no. 92), Valencia (no. 122), Namibplaas (no. 93) and one (1) communal farm Trekkopje (no. 120), however work will focus on Farm Trekkopje, particularly the middle and western parts. In order to undertake these exploration activities, an environmental clearance certificate (ECC) is required in terms of the Environmental management Act (Act No.7 of 2007) and its 2012 EIA regulations. As such, Best Cheer appointed OMAVI Geotechnical and Geo-environmental Consultants CC to conduct the necessary assessments including public participation.

Best Cheer intends to adopt a systematic prospecting approach starting with desktop study, which will mostly be office based, focusing on historical data, followed by field evaluation and mapping, whereby a qualified geologist will walk the area and map it to produce a geological map with rocks of interest. Rock mass properties such as colour, texture, discontinuities will be noted to allow rating of rocks. Focus will then be narrowed down to areas yielding a good rating, which will then be drilled to further establish these rock properties at depth during detailed exploration. If the outcome of this evaluation is positive, selected areas will be subjected to test mining, whereby blocks will be extracted and transported to the factories for testing. These results will then determine whether or not the resource is worth pursuing, in which case a Mining Licence will be required.

The proposed project has the potential to improve the sustainability of existing dimension stone factories and to provide employment opportunities to the local people, which in turn contributes to the region's economy. Additionally, the exploration programme will allow acquisition of skills through on the job training. However the project also has the potential to negatively impact the receiving environment. Impacts identified were assessed by considering the potential risk areas associated with the receiving biophysical and social environment and the issues raised during the public consultation process. The key impacts resulting from this process are as follows:

- **Impact on Soils** – was divided into soil pollution and soil disturbance. Potential sources of soil pollution include petrochemical spills from vehicles (bakkies), water trucks, the drill rig, diesel operated generator as well as the trailer mounted diesel tank for fuel storage. In terms of soil disturbance, most of it is anticipated during the early stages of the project, whereby roads will need to be created, exploration camp to be erected and clearing of selected areas for detailed mapping traverses.
- **Impact on air quality** - The possible source of air pollution would be the dust and fumes generated by project vehicles and trucks, diesel powered machinery, as well as dust from drilling and cutting.
- **Impact on biodiversity and habitat destruction** – could potentially result from the removal of vegetation to create access roads and erect temporary exploration camps onsite during field exploration. However, this is likely to be minimal, given that the vegetation is scattered. The scrapping of overburden to expose rocks for drilling and cutting might result in habitat disturbance.
- **Impact on surface and groundwater resources** – it was established that there is no surface water in the area as it seldom receives rainfall, and communities rely on groundwater. Therefore, to avoid putting pressure on this scares resource, the project will source water offsite and transport it in water tankers on a weekly basis. This takes away possible lowering of the groundwater table as a result of abstraction. In terms of water quality, potential sources of pollution can be spills of petrochemicals from vehicles (bakkies), water trucks, the drill rig as well as the trailer mounted diesel tank for fuel storage.
- **Visual impact** – this is a potential impact during the feasibility stage where blocks of rock will be taken or cut from selected areas for testing. However, the significance of this impact is lowered by the fact that test mining will only cover selected areas, which reduces the spatial extent of impact. Additionally, if test mining does not yield positive results, such that there will be a need to apply for a mining licence, the testing blocks will be put back and the area will be rehabilitated.
- **Noise impact**: There is an inconvenient impact of noise to neighbouring locals associated with exploration vehicles, trucks and equipment. The noise from machinery may also pose a health risk to workers that operate them or the ones working directly in noisy areas.
- **Impact on vehicular traffic safety** - having water trucks, heavy trucks on the road for drill rigs as well as those transporting mined blocks from site to the factories for testing may impact traffic safety.

- **Impact on archaeology -** Destruction of archaeological sites might occur during excavation and test mining using a butterfly cutter. However, the likelihood or probability of this happening is minimal as there are no other known archaeological sites or sites of heritage importance known in the project area, except the ones considered in this assessment.
- **Impacts the health and safety of workers** – from the handling of equipment and use of machinery as well as potentially contracting diseases.

The significance of these impacts has been assessed in terms of the scale, duration, intensity or magnitude as well as probability of occurrence. All impacts were assessed in Section 6.3, and they had medium to low significance. Mitigation measures were recommended in the scoping report and outlined in the EMP for implementation by respective parties. Based on this assessment and the information provided in this report, OMAVI is confident the identified risks associated with the project can be reduced to acceptable levels, if the measures recommended in the EMP are implemented and monitored. It is therefore recommended that the project receive Environmental Clearance, provided that the EMP be implemented.

## CONTENTS PAGE

## LIST OF FIGURES



## LIST OF TABLES

**ABBREVIATIONS**

| | |
|---|---|
| DEA | Department of Environmental Affairs |
| DSMGMR | Dimension Stone Mining Global Market Report |
| EA | Environmental Assessment |
| EIA | Environmental Impact Assessment |
| ECC | Environmental Clearance Certificate |
| EMP | Environmental Management Plan |
| EMA | Environmental Management Act |
| EPL | Exclusive Prospecting Licence |
| ESA | Environmental Scoping Assessment |
| I&APs | Interested and Affected Parties |
| MEAC | Ministry of Education, Arts and Culture |
| MAWLR | Ministry of Agriculture, Water & Land Reform |
| MEFT | Ministry of Environment, Forestry and Tourism |
| MLIEC | Ministry of Labour, Industrial Relations and Employment Creation |
| MME | Ministry of Mines and Energy |
| MoHSS | Ministry of Health and Social Services |
| MURD | Ministry of Urban and Rural Development |
| NBG | National Botanical Gardens |
| OGGC | OMAVI Geotechnical and Geo-environmental Consultants cc |
| TA | Traditional Authority(s) |

# 1 INTRODUCTION

## 1.1 Project background

Best Cheer Investments Namibia (Pty) Ltd (*the client or Best Cheer hereafter*) intends to carry out exploration activities to investigate the potential of granites and granitoid bodies on Exclusive Prospecting License (EPL) no. 5161, for use as dimension stones. The EPL is located approximately between coordinates 22.284568°S/ 15.059525°E and 22.319516°S/ 15.295920°E, about 25 km northeast of Arandis and covers an area of about 5059 ha. The area falls under the Karibib Constituency jurisdiction and extends across three (3) commercial farms namely Vergenoeg (no. 92), Valencia (no. 122), Namibplaas (no. 93) and one (1) communal farm Trekkopje (no. 120) as seen in **Figure 1** and **Figure 2** (attached A3 inserts). Although this is the case, works on this EPL will focus on Farm Trekkopje.

Figure 1: Locality map indicating the location of EPL 5161 on a regional scale
Figure 2: Close up locality map indicating the location of EPL 5161 as well as nearby infrastructures

## 1.2 Project justification

The consumption of dimension stones is growing at a rate significantly higher than most mineral products, with a compounded annual growth rate of about 0.8% anticipated in 2020 and an expected global value of nearly US$5.22 billion by 2022 according to the 2020 Dimension Stone Mining Global Market Report. This growth is largely driven by increasing demand for high value natural stones in the construction and real estate sectors in China, India and Eastern Europe. It is partly on these grounds that Best Cheer Investments Namibia (Pty) Ltd decided to pursue the project under review. Additionally, there are existing quarries in the region that have been operating for some time and their reserves are depleting. Therefore, this project will provide business to local processing factories, so that the quarrying and processing industry remains sustainable. This will not only contribute to the Namibian economy but it will also help to empower the local communities of Arandis, Karibib and nearby settlements through job opportunities. Additionally, exploration work will equip the locals with technical skills, which in turn can sustain or improve the socio-economic standing of the region. Furthermore, the EPL has existing transport infrastructure including the B2 national road and the Trans-Kalahari rail passing through it, which provides good connection to the target market via the Walvis Bay Port, thereby reducing the project footprint.

The extraction of mineral resources is a listed activity that must not be undertaken without an Environmental Clearance Certificate (ECC) from the Ministry of Environment, Forestry and Tourism (MEFT). In order to inform the ECC decision, an Environmental Scoping or Impact Assessment (ESA/EIA) must be conducted, as per the requirements of the Environmental

Management Act (Act No. 7 of 2007) (EMA) and its 2012 EIA Regulations. It was in line with this requirement that Best Cheer appointed an Environmental Assessment Practitioner (EAP) to carry out this assessment.

### 1.3 Appointed Environmental Assessment Practitioner

Best Cheer Investments Namibia (Pty) Ltd (*the proponent*) appointed OMAVI Geotechnical & Geo-environmental Consultants CC (*OMAVI hereafter*) as an independent environmental consultant, to investigate the potential biophysical and socio-economic environmental impacts that would arise from the planned exploration activities. The findings of the scoping assessment are aimed at assisting the Ministry of Environment, Forestry and Tourism's (MEFT) Department of Environmental Affairs (DEA) with sufficient factual information to make an informed decision on the granting of an ECC for the proposed activities. Linda Uulenga an Environmental Assessment Practitioner for OMAVI conducted this EA process under the supervision of Mr. Etuna Kanime. Refer to **Appendix A** for the Environmental Practitioner's CV.

### 1.4 Purpose of Environmental Scoping Assessment

The environmental scoping assessment document herein investigated the significant potential positive and negative impacts of the proposed exploration activities on the biophysical and socio-economic environment that would be affected by the proposed activities; taking into account all phases of the project from temporary site establishment through actual exploration to decommissioning of the exploration camps. In addition. This scoping assessment is only for exploration phase. However, should a promising resource be found, an application will be launched with the Ministry of Mines and Energy (MME) for a mining licence, which will be accompanied by a separate environmental impact assessment for mining. The current scoping assessment scope of work is summarized in **Error! Reference s ource not found..**

## 2 PROJECT DESCRIPTION

As part of exploration, Best Cheer Investment (Pty) Ltd intends to adopt a systematic prospecting approach starting with desktop study, field evaluation and mapping, and ultimately, drilling and possibly test quarrying in selected areas where the outcomes of field evaluation are positive.

### 2.1 Proposed exploration technologies

#### *2.1.1 Desktop Study*

The exploration program will commence with a review of geological maps and historical drilling and / or quarrying data for the area.

### *2.1.2 Field evaluation*

Field evaluation will be carried out by a competent and qualified geologist, aimed at locating suitable outcrops in the field and subsequently delineating potential granite intrusions. Granite bodies identified will be ranked in order of priority for follow up exploration based on various factors such as:

- Size (both lateral & vertical thickness) of the granite intrusion
- Colour, texture, pattern and frequency / intensity of the granite intrusion rock mass
- Discontinuities by mapping presence of joints and veins, and evaluating their spacing

At this stage, small hand samples (about 30 $cm^3$ in dimension) will be taken for cutting and polishing to provide insight on hardness of the stone and whether or not the stone can be polished to an acceptable finish. As an end product, a geological map of the area will be produced to assist in target generation for subsequent detailed exploration such as drilling and possibly test mining.

### *2.1.3 Detailed exploration*

Vertical and inclined core drilling with a DTH (down the hole) drill rig will be carried out in selected areas, to provide information on the vertical extent of the formation, as well as the colours, textures and joint spacing or possible defects at depth. Where cleaning of the rock units is required, a bulldozer will be used to scrap off overburden, after which an air compressor will be used to further expose the rocks for mapping. This will aid delineation of major geological structures such as fault and shear zones, the extent of veins, frequencies of fracture/ discontinuity, thereby refining the produced geological map. The refined map will then be used to define targets for feasibility or test quarrying.

### *2.1.4 Feasibility study*

Where drilling yields positive results, test quarrying by means of butterfly cutting will be conducted to fully evaluate the recovery of saleable blocks, and better optimize the extraction methods, production rates and operational costs. This will be carried out in selected areas only and shall be performed on as small an area as possible to minimize environmental impacts. Project feasibility will also be measured in terms of accessibility from site of occurrence to nearby relevant infrastructure such as roads, railway, etc.

Areas found to comprise good quality rocks in economic volumes will then be delineated for possible mining, subject to the granting of a valid mining license by the Ministry of Mines and Energy (MME). Therefore it should be noted that this scoping report is only for the different exploration phase or activities**. Figure 3** shows some of the technologies and equipment to

be used in this study. Although the pictures are showing the use of such technologies in mining, for this study they will be used for exploration purposes.

Overburden Removal (applied in mining)

Down-the-Hole drilling (applied in mining)

*Figure 3: An example of technologies and equipment to be used during exploration*.

## 2.2 Project requirements and Associated infrastructure

### *2.2.1 Power Requirements*

It is anticipated that onsite machinery will be diesel powered. It will mainly be used in powering the compressors for surface cleaning, drilling and cutting machinery. The amount of diesel to be used has not been determined, however it will be delivered to site as required and stored in a trailer mounted bowser. This eradicates the need to connect to the national power grid.

### *2.2.2 Water supply*

About 2000 litres of water will be required for operations per day. Therefore, to avoid putting pressure on surface and groundwater resources in the area, water for exploration activities will be sourced either from Karibib or from the proponent's warehouse water supply line in Swakopmund. The water will then be transported to site by truck and kept onsite in water tankers. It will primarily be used to cool and lubricate cutting and drilling machinery and will be recycled to make maximum use of available water.

### *2.2.3 Roads*

The project will utilise existing farm roads and where necessary, temporary informal access routes will be created to gain access to the actual targeted sites for the drilling rig, air compressor and water trucks.

### *2.2.4 Waste production and sanitation*

Movable ablution facilities with septic tanks will be put up for sanitation purposes for the exploration team. General solid waste will be collected and sent to the Arandis Landfill.

### *2.2.5 Temporary shelter / accommodation*

A temporary camp will be set up to accommodate the exploration team. It will primarily be an erection of tents and other temporary structures such as pre-fabricated structures that

will be used as office and storage space. All this will take place subject to approval by the farm owners.

#### *2.2.6 Personnel and site safety*

A total of about seven (7) people will be employed during exploration and all workers will be equipped with adequate and appropriate personal protective equipment (PPE), that will be replaced or repaired to ensure workers' occupational health and safety. For safety and security reasons, the localized high-risk working sites will be temporarily fenced off. Exploration vehicles will also be equipped with fire extinguisher as well as at the drilling site in cases of fire outbreaks while carrying out exploration activities.

## 2.3 Project Alternatives

Project alternatives can be defined as a possible course of action, in place of another, that would meet the same purpose and need. The role of alternatives is to find the most effective way of meeting the need and purpose of the proposal, either through enhancing the environmental benefits of the proposed activity, and/ or through reducing or avoiding potentially significant negative impacts. In this section alternatives to the proposed project are evaluated with respect to:

- Supporting infrastructure during different stages of the project, and;
- The "No-go" alternative option

#### *2.3.1 Alternative supporting infrastructure*

Alternatives were considered for the different envisaged supporting infrastructures, to ensure that the most feasible options were selected. Due consideration was given to technological, economic and environmental limitations in selecting the most feasible option.

**Table 2-1: Alternative infrastructure.**

| Category of Infrastructure | Alternatives Considered | Justification for selected option |
|---|---|---|
| Ablution facilities | Install fixed facility with septic tank | To avoid long-term visual impacts & minimize rehabilitation costs, portable facilities were selected as the best option |
| | Portable facilities with septic tank | |
| | | |
| Shade Structure for working areas | Shade structure made from blue/ red corrugated sheets | Shade structure made from corrugated sheets deemed most suitable due to robustness, & resistance to wind destruction |
| | Shade structure made with shade net | |
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| Water supply | Use existing farm boreholes | To avoid putting pressure on existing water resources, the option to bring in water from elsewhere was chosen. |
| | Drill own new borehole | |
| | Bring water from elsewhere | |
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| Diesel storage | Install fixed above-ground diesel tank on site | The use of a trailer mounted diesel tank for fuel storage was chosen due to great mobility requirements during exploration |
| | Trailer mounted diesel tank | |
| | | |
| Power supply | Diesel generator set | Most practical & economically viable for exploration and test mining phase |
| | Install photovoltaic panels | Option likely to be considered for long-term operations if economic deposit with high life of mine is found |
| | | |
| Offices, accommodation | Erect dis-mantable prefabricated units | Favoured during field exploration phase due to:<br>- Ease of installation<br>- Low installation costs<br>- Ease of dismantling & moving |
| | Erect Permanent buildings | Lease favoured & unlikely |
| | No office, accommodation structures on site | Option likely to be considered in future, should the project proceed to quarrying/ mining phase. This will minimize risk of veld fires, bush hunting, visual impact from such structures, security risk, & minimize number of people on site. |

### *2.3.2 No-go alternative*

The "No-Go" alternative is the option of not proceeding with the proposed activity, which typically implies a continuation of the status quo. Should the proposed project be discontinued, none of the potential impacts identified in **Subsection 7** will occur. On the other hand, if the project is to be discontinued, the potential economic benefits of the project will not come to fruition. These include:

- Loss of foreign direct investment
- Jobs for community members will not be realized
- Loss of potential income to local and national government through land lease fees, license lease fees and various tax structures
- Socio-economic benefits such as skills acquisition to local community members

- Compromise towards ensuring sustainability of dimension stone processing factories in Karibib and Walvis Bay, with potential job losses and compromise on livelihoods in future.

In light of the above losses, the 'no-go' option is not considered a preferred alternative.

# 3 LEGAL REQUIREMENTS

## 3.1 Applicable Legislations and Compliance Status

In Namibia all mineral rights, related to small to medium-scale mining, are vested in the state and are regulated by the Ministry of Mines and Energy (MME), with the Minerals Prospecting and Mining Act (Act no. 33) of 1992 as the principal act governing exploration and mining of mineral resources in the Republic of Namibia. From an environmental management standpoint this Act stipulates the undertaking of an environmental impact assessment during prospecting or mining operations, coupled with the development of a thorough and implementable environmental plan (EMP) where any pollution is anticipated. The Ministry of Mines and Energy is the custodian agency for the administration of the mining act.

Meanwhile, the Ministry of Environment, Forestry and Tourism (MEFT) regulates sustainable exploitation of natural resources and management of the environment and use is regulated by the under the Environmental Management Act (EMA) of 2007 and its Environmental Impact Assessment (EIA) Regulations of 2012. This administration and enforcement is specifically entrusted with the Department of Environmental Affairs within MEFT. This Act stipulates that possession of an Environmental Clearance Certificate (ECC) is a pre-requisite for issuing any license or permit by any authority for any activities related to the ones listed under the Environmental Impact Assessment Regulations of 2012. The Act further sets out under Section 58 and in the Government Notice No. 29 of 2012 a detailed framework and schedule for conducting Environmental Impact Assessments for mining companies.

In addition to these two acts, there are host of legal and policy documents and guidelines to consider when undertaking an ESA or EIA for mining projects as indicated **in Table 3-1**.

Table 3-1. Summary of relevant Acts and their applicability thereof

| LEGISLATION CONSIDERED | CUSTODIAN ORGAN OF STATE | ASPECT OF PROJECT |
|---|---|---|
| **Relevant Acts** | | |
| The Constitution of the Republic | Government of the Republic of Namibia | The Namibian government has adopted a number of policies that promote sustainable development. Most of |

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| of Namibia (1990) | | these originate in clauses of the Constitution of the Republic of Namibia. In Article 95 (i), the State undertakes to actively promote and maintain the welfare of the people by adopting policies aimed at the utilisation of natural resources on a sustainable basis for the benefit of all Namibians. Articles 91(c) and 95(l) are also of relevance to sound environmental management practice. In summary, these refer to:<br>• Guarding against over-utilisation of biological natural resources.<br>• Pursuing sustainable natural resource use<br>• Limiting over-exploitation of non-renewable resources.<br>• Maintaining biological diversity<br>• Ensuring ecosystem functionality.<br>• Protecting Namibia's sense of place and character.<br>The above therefore commits the State to actively promote and sustain environmental welfare of the nation by formulating and institutionalising policies to accomplish the abovementioned sustainable development objectives.<br><br>Through implementation of the mitigation measures set out in this Scoping Report (ESA) and the Environmental Management Plan (EMP), the owner of the ECC shall be advocating for sound environmental management as set out in the Constitution. |
| EMA | MEFT: DEA | Part 2 of the Act sets out 12 principles of environmental management, as follows:<br><br>• Community involvement in natural resources management and the sharing of benefits arising from the use of the resources, must be promoted, and facilitated.<br>• The participation of all I&APs must be promoted and decisions must consider the interest, needs and values of I&APs.<br>• Equitable access to environmental resources must be promoted and the functional integrity of ecological systems must be considered to ensure |

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| | | the sustainability of the systems and to prevent and/ or minimize harmful effects.<br>• Assessments must be undertaken for activities which may have significant effects on the environment or the use of natural resources<br>• Sustainable development must be promoted in all aspects relating to the environment.<br>• Namibia's cultural and natural heritage including, its biological diversity, must be protected and respected for the benefit of present and future generations.<br>• The option that provides the most benefit or causes the least damage to the environment as a whole, at a cost acceptable to society, in the long term as well as in the short term, must be adopted to reduce the generation of waste and polluting substances at source.<br>• The reduction, re-use and recycling of waste must be promoted.<br>• A person who causes damage to the environment must pay the costs associated with rehabilitation of damage to the environment and to human health caused by pollution, including costs for measures as are reasonably required to be implemented to prevent further environmental damage.<br>• Where there is sufficient evidence which establishes that there are threats of serious or irreversible damage to the environment, lack of full scientific certainty may not be used as a reason for postponing cost-effective measures to prevent environmental degradation; and<br>• Damage to the environment must be prevented and activities which cause such damage must be reduced, limited, or controlled.<br><br>The proponent has the responsibility to ensure that the proposed activity, as well as the ESA process undertaken, conforms to the principles of this Act. In developing the ESA process, OGGC has been cognisant of these requirements, and accordingly the ESA process has been undertaken in conformance with this Act and the EIA |

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| | | Regulations (2012). Several listed activities in terms of the Act, are triggered by the proposed activities as indicated in **Table 3.** |
| Mineral Prospecting & Mining Act (Act no. 33 of 1992) | MME | Sections 50, 52, 54, 57 and 130 of this Act sets out provisions for environmental management for activities arising from mineral exploration, as follows:<br>• That the mineral license holder is required to prepare an ESA or EIA and an EMP and make revision of such EMP from time to time<br>• That the mining license holder is liable to pay compensation where in course of the mining operations; any damage is done to the surface of land, water source, cultivation, building or any other structure<br>• That the holder of a mineral license cannot exercise any rights on a private land until the holder has entered into an agreement with the owner regarding payment of compensation<br>• That the license holder shall take all necessary remedial steps to reasonable satisfaction of the minister for any damage caused by any mining operations on closure of mines<br>• That the minister is empowered to direct the mineral license holder for carrying out good reconnaissance, mining and prospecting practices for the protection of the environment, and conservation of natural resources payment of liability fees and royalty and remedial steps for any damages and<br>• That the mineral or mining license holder shall report pollution in course of any mining or prospecting operations and make remedial measures for such.<br>The abovementioned provisions are all relevant to the proposed activities and were thus considered in the ESA process and drafting of the EMP. |
| Pollution Control & Waste Management Bill | MEFT and others | This Bill serves to regulate and prevent the discharge of pollutants to air and water as well as providing for general waste management. The Bill repeals the Atmospheric Pollution Prevention Ordinance (11 of 1976). In terms of water pollution, it will be illegal to discharge of, or dispose of, pollutants into any watercourse without a Water |

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| | | Pollution Licence (apart from certain accepted discharges). Similarly, an Air Quality Licence will be required for any pollution discharged to air above a certain threshold. The Bill also provides for noise, dust or odour control that may be considered a nuisance. The Bill advocates for duty of care with respect to waste management affecting humans and the environment and calls for a waste management licence for any activity relating to waste or hazardous waste management.<br><br>The proposed exploration of dimension stone would not entail the discharge of large quantities of gaseous pollutants into air but might result in the generation of noise and dust during site establishment and drilling/ butterfly cutting operations. |
| Water Resources Management Act (Act no. 11 of 2013) | MAWLR: Department of Water Affairs | This Act provides a framework for managing water resources based on the principles of integrated water resources management. It provides for the management, development, protection, conservation, and use of water resources. Should the proponent wish to undertake activities involving water abstraction and/or effluent discharge, the relevant permits will have to be applied for.<br><br>Furthermore, any watercourse on/or near the site and associated ecosystems should be protected in alignment with the principles above. Mitigations measures were included in the EMP to reduce impacts on watercourses that could not be avoided |
| Nature Conservation Ordinance (Act no. of 1996) | MEFT | The Nature Conservation Amendment of 1996 provides for an economically based system of sustainable management and utilization of game in communal areas; to delete references to representative authorities; and to provide for matters incidental hereto.<br><br>Section 73. 1 of this act reads: "No person other than the lawful holder of a permit granted by the local authority shall at any time pick ("pick", as defined in Section 1 (xxxviii), includes to cut off, chop off, pick off, take, gather, uproot, damage or destroy) or transport any protected plant provided." This Ordinance will be |

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| | | replaced by the Parks and Wildlife Bill which will regulate protected areas and all indigenous flora and fauna in Namibia. It also includes provisions for protection against alien species.<br><br>Although the proposed sites for development are not located within protected areas, there is indigenous vegetation on the sites and therefore this Ordinance is relevant. A permit is required should any species onsite, with a protected or endangered status, be damaged or removed. If required, the proponent will apply for such a permit prior to commencing with the proposed activities. |
| Forestry Act (Act no. 12 of 2001) | MEFT | The Act provides for the management and use of forests and forest products. It offers protection to any living tree, bush or shrub growing within 100 m of a river, stream or watercourse on land that is not a surveyed erven of a local authority area and a licence would be required to cut and remove any such vegetation.<br><br>Section 22. (1) provides: "Unless otherwise authorised by this Act, or by a licence issued under subsection (3), no person shall on any land which is not part of a surveyed erven of a local authority area as defined in section 1 of the Local Authorities Act, 1992 (Act No. 23 of 1992) cut, destroy or remove - (a) vegetation which is on a sand dune or drifting sand or on 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 100 m of a river, stream or watercourse."<br><br>This may be applicable to the project since the site is located outside the jurisdiction of a local authority and shrubs might be impacted if site establishment activities encroach within 100 m of any river. The proponent will apply for the relevant permit under this Act if it becomes necessary, however, such a permit is unlikely to be needed as the proponents intends not to encroach within 500m of any major river/ stream |
| Soil Conservation Act (Act no. 76 | MAWLR | The Act makes provision for the prevention and control of soil erosion and the protection, improvement and conservation of soil, vegetation and water supply sources |

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| of 1969) | | and resources, through directives declared by the Minister.<br><br>This Act is applicable since stripping of topsoil will take place to expose the targeted rock units. Mitigations measures were included in the EMP to preserve topsoil and reduce impacts on topsoil that could not be avoided |
| Regional Councils Act (Act no. 22 of 1992) | MURD | The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development.<br>The main objective of this Act is to initiate, supervise, manage, and evaluate development in the regions.<br><br>The relevant Regional Council for this project is the Erongo Regional Council which is considered to be an I&AP and was thus provided with an opportunity to comment on the proposed project. |
| Agricultural (commercial) Land Reform Act, 1995 | MAWLR: Land Reform | This act makes provision on which compensation is provided to the owner of private farmland. This act is deemed applicable as a significant portion of the EPL lies on three (3) commercial farms, the owners of which may have to be engaged by the proponent for compensation should it become economically viable to quarry on his/ her farm |
| Traditional Authority Act (Act no. 25 of 2000) | MURD | Namibian legislation recognises both statutory and customary forms of governance. The Traditional Authorities Act recognises Traditional Authorities (TAs), as the customary leadership of traditional communities as legal entities. Currently, 46 authorities in Namibia are officially recognised by the Ministry of Urban and Rural Development, in terms of the aforementioned Act.<br>The primary functions of these authorities are to promote peace and welfare amongst the community members, as well as to supervise and ensure the observance of the customary law of that community by its members.<br>The Act also stipulates that TAs should ensure that natural resources are used on a sustainable basis that conserves the ecosystem. The implications of this Act are that TAs must be fully involved in the planning of land use and development for their area. It is the responsibility of the TA's customary leaderships, the Chiefs, to exercise control on behalf of the state and the residents in their |

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| | | designated area.<br><br>The EPL considered under this project partly lies on farm Trekkopje (no. 120), which is a communal farm under the !Oe#Gan Traditional Authority. As such this TA is considered to be a key I&AP and was therefore provided with an opportunity to comment on the proposed project. |
| National Heritage Act (Act no. 27 of 2004) | MEAC | The Act makes provision for the protection and conservation of places and objects of heritage significance and the registration of such places and objects. Part V Section 46 of the Act prohibits removal, damage, alteration or excavation of heritage sites or remains, while Section 48 (ff) sets out the procedure for application and granting of permits such as might be required in the event of damage to a protected site occurring as an inevitable result of development. Part VI Section 55 Paragraphs 3 and 4 require that any person who discovers an archaeological site should notify the National Heritage Council. The National Heritage Council has been established to identify, conserve, manage and protect places and objects of heritage significance.<br><br>Section 51 (3) sets out the requirements for impact assessment. It is important to note that no regulations have been formulated for the implementation of the National Heritage Act provisions concerning impact assessment. However, archaeological impact assessment of *large-scale* projects has become accepted practice in Namibia.<br><br>**No objects of heritage concern were noted onsite**. However, should any objects of heritage significance be identified during construction or operation phase the work must cease immediately in the affected sites and the necessary steps taken to seek authorisation from the Council. |
| Public Health Act (Act no. 36 of 1919) | MoHSS: Occupational Health | The Act serves to protect the public from nuisance and states that no person shall cause a nuisance or shall suffer to exist on any land or premises owned or occupied by him or of which he is in charge any nuisance or other condition liable to be injurious or dangerous to health. |

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| | | In line with this Act the project proponent is required to ensure that the facility is designed and operated in a way that is not unsafe, or injurious or dangerous to public health and that the noise and dust emissions which could be considered a nuisance remain at acceptable levels.<br><br>This Act will be highly applicable during site set up and ongoing exploration, particularly to the employees but maybe not so much to landowners as farmhouses and settlements are located away from where quarrying exploratаion will be taking place. |
| Labour Act, 2007 | MLIEC | Sections 3, 4, 5, 11, 16, 23-27, 44 and 135 make provision for the following:<br>• That a person may not employ a child under the age of 14years<br>• That children are prohibited for employment in a mine and other dangerous circumstances<br>• That forced employment of persons is prohibited<br>• That an employee is entitled to monetary remuneration daily, weekly, fortnightly or monthly in cash, cheque and direct deposit into a bank account<br>• That the work hours of an employee are 45 hours in a week, over and above which an employee is entitled to additional payment overtime wage<br>• That employees are entitled to (a) annual leave on the basis of the average number of days worked over the year, (b) a day's sick leave for every 26days worked, (c) compassionate leave for a period of 5days in 12 months which is fully paid, and (d) leave on public holidays,<br>• That female employees that have completed 6 months of employment are entitled to 12 weeks of maternity leave, which can be extended for a further period of one month<br>• That the minister is empowered to make regulations in relation to safety, health, hygiene, sanitation and welfare of persons employed in or about mines, including sea-bed operations<br><br>The proponent is expected to be compliant with the |

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| | | above provisions and as such the above provisions were accounted for in the ESA report and EMP. |
| **Relevant Policies and Regulations** | | |
| Environmental Assessment Policy (1994) | MEFT: DEA | This policy aims to promote sustainable development and economic growth while protecting the environment in the long term by requiring environmental assessment prior to undertaking of certain activities. Annexure B of the policy contains a schedule of activities that may have significant detrimental effects on the environment, and which require authorisation prior to undertaking. Please see **Table 3** for a summary of the activities that would require authorisation for the proposed exploration of dimension stone. |
| National Land Policy (1998) | MAWLR: Land Reform | This policy advocates for the use of land and its resources in an environmentally sustainable manner and outlines the various forms of land rights/ permitting required for various land uses including mineral prospecting and mining. |
| Mine Health & Safety Regulations (under section 138A of the Mining Act, 1992) | MME: Mine Safety & Services Division<br><br>MoHSS: Occupational Health Division | These set of regulations are aimed at ensuring that mines are operated in a safe manner to prevent fatalities, injuries and long-term health hazards. The regulations make provision for:<br>• Employee's right to leave unsafe working places<br>• Obligation of a mine manager to provide for all safety measures in a mine or quarry<br>• Reporting of accidents to the chief inspector and keeping a record of such accidents<br>• Requirements for the mine manager to provide occupational health services at area of mining activity<br>• Requirements for stability of excavations; provision of waiting areas; provision of fencing and gates; schemes for working in vicinity of water body.<br>• Provision for mine dump or mine tailings facility<br>• Ensuring that all parts of a mine are well ventilated with minimum standards of air quality<br>• The mine manager's responsibility to formulate a scheme for safe movement of vehicles being use in the mine/ quarry<br>• The mine manager's responsibility to formulate a |

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| | | scheme for identifying hazards at the area of mining activity and provision of appropriate protective equipment<br>• Ensure that the mine manager provides first aid and firefighting equipment and procedures where exploration/ quarrying activities are being conducted<br>All the above-mentioned provisions are relevant to this project and were thus considered in the ESA process and EMP. |
| **Relevant Guidelines** | | |
| Draft Procedures & Guidelines for conducting EIAs and compiling EMPs (2018) | MEFT: DEA | These guidelines outline the procedures and principles that are to be followed for conducting EIA's and compiling EMP's in the Republic of Namibia.<br><br>This scoping assessment was informed by these national guidelines to ensure compliance to national and international best practice. |
| Namibia: Environmental Impact Assessment Guidelines for Mining Sector | MEFT: DEA | This guideline was developed as a sector-specific EIA guideline for the mining sector to:<br>• Assist the regulatory Authority and EIA practitioners in understanding the main areas of concern and employ these to enhance the quality of the EIA study and report<br>• Inform the regulatory authority and EIA practitioners about the best environmental management practices related to mining projects<br>• Inform the regulatory authority, EIA practitioners and stakeholders about the Acts and regulations applicable to mineral prospecting and mining projects<br>• Inform the regulatory authority, EIA practitioners and stakeholders on generic potential impacts and mitigation measures arising from all stages of mineral prospecting and mining activities<br>• Assist the relevant authorities in assessing the EIA reports in an effective manner and arrive at a sound judgement<br><br>This scoping assessment was informed by these national |

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| | | guidelines to ensure compliance to national and international best practice |

## 3.2 Relevant Listed Activities in terms of EMA

The EMA identifies and lists activities that require environmental clearance prior to commencement. The proposed project would trigger a number of listed activities as indicated in **Table 3-2.**

**Table 3-2: .** ***Applicable listed activities in terms of the EMA EIA Regulations of 2012***

| ACTIVITY | DESCRIPTION OF ACTIVITY | RELEVANCE OF LISTED ACTIVITY |
|---|---|---|
| Activity no. 2.1 | The construction of facilities for waste sites, treatment of waste and disposal of waste | The proposed activity will require development of stockpiles for waste rock on a small scale during test mining, as well as stockpiling of topsoil stripped off to expose the targeted rock unit. These are both preserved for rehabilitation purposes |
| Activity no. 3.1 | The construction of facilities for any process or activities which requires a license, right or other form of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (Prospecting & Mining Act), 1992 | The proposed project will entail exploration activities, which require environmental clearance and prospecting licence prior to commencement |
| Activity no. 3.2 | Other forms of mining or extraction of any natural resources whether regulated by law or not | The proposed project would require cleaning over the footprint of the targeted rock units, with possibility of butterfly cutting for test mining and block sampling. |
| Activity no. 3.3 | Resource extraction, manipulation, conservation & related activities | |
| Activity no. 5.1(c & d) | Change in land use from agricultural use to industrial (mining & marginal beneficiation) use | The proposed project would require the establishment of portable temporary housing/ office units and small quarries at the targeted sites, thus changing the land use for the duration of the exploration activities |
| Activity no. 9.4 | The storage and handling of a dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin, in containers with a combined capacity of more than 30 $m^3$ (30 | It is anticipated that a portable diesel generator will initially be used for power generation for both domestic and industrial use |

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| | 000L) at any one location | at the site. |
| Activity no. 10.1 (b) | The construction of – public roads | The proposed project may include the construction of access roads for access to the sites |

# 4 THE RECEIVING ENVIRONMENT

An understanding of the existing environment can inform the management of potential impacts. Therefore the environmental practitioner undertook a site visit on the 18th July 2020, to confirm and collect baseline information. The subsequent section discusses the existing environment both from literature as well as from field observation and verbal communication with the residents who gave the site tour.

Located approximately 90 km inland from the west coast of Namibia, its climate is moderated by the cold Benguela current and the regular fog bank. This section describes the main climatic parameters within the licence area and surrounding, the resulting living environment as well as its current socio-economic standing.

## 4.1 Biophysical environment

### *4.1.1 Climatic Conditions*

The area generally has a desert climate, with warm temperatures occurring in the inland areas during the day, and cooling at night due to outgoing solar radiation under typically clear skies (MME, 2010). Limpitlaw and Hoadley (2009) described it as a hyper arid desert climate. Maximum and minimum temperatures at the coast are moderated by the effects of the cold Benguela current and the regular fog bank. Given that Arandis is the closest town to the site, reference was made to the Arandis weather information. The town experiences an average annual temperature of 19°C, with maximum temperatures ranging between 17 and 27°C and minimum temperatures ranging between 12 and 21°C over the past 10 years (World Weather online, 2020) ( **Figure 4**).

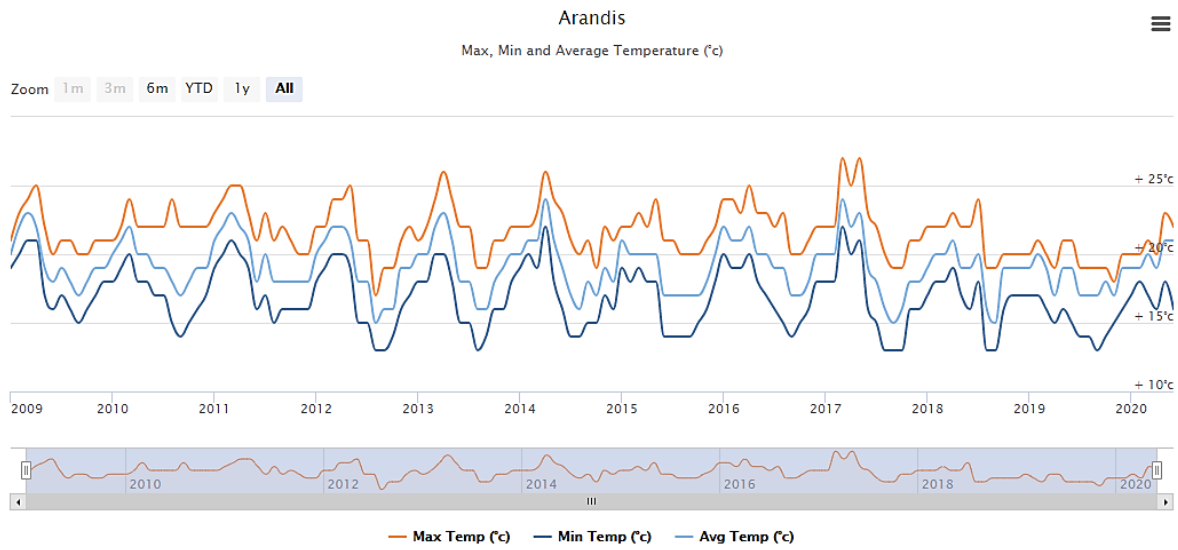


*Figure 4: The maximum, minimum and average temperature for the Arandis area (World Weather Online, 2020)*

In terms of rainfall, it is noted that annual rainfall in the Erongo Region generally increases with distance from the coast. The project site is situated in a belt that receives an average of less than 100mm of rain per annum, with rainfalls of less than 10mm received in 2020 as shown in **Figure 5**. The recorded rainfall data for Arandis indicates that rainfall events are uncommon, wiith the chance of rain on any given day being calculated at less than 5%, with an annual rainfall of approximately 44mm (ClimateData.org).

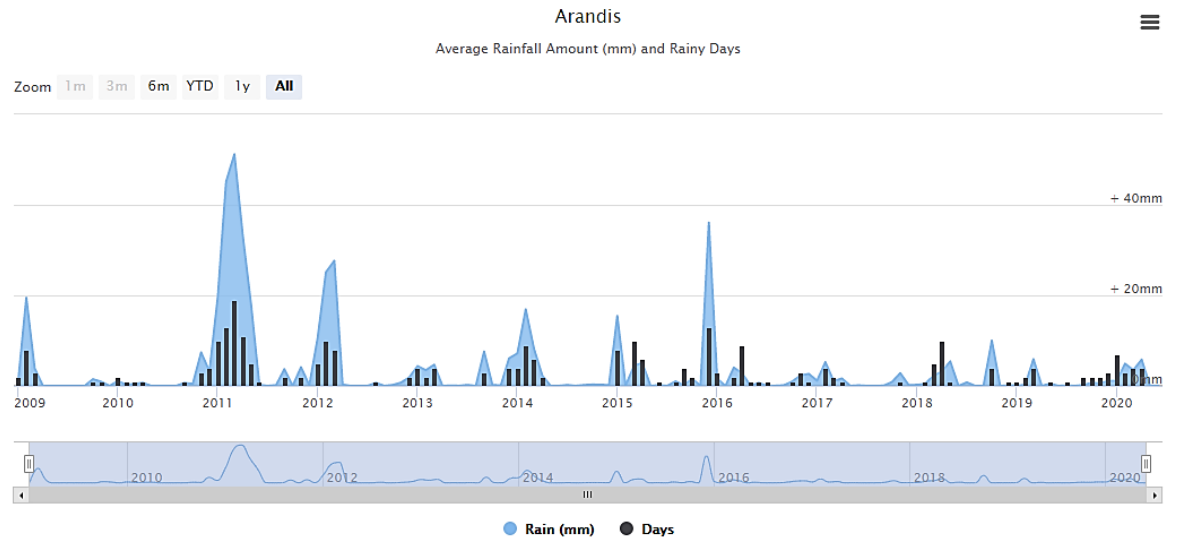


*Figure 5: The rainfall patterns around Arandis (after World Weather Online, 2020)*

Within the Erongo Region, fog can extend up to 110 km inland. Therefore, the project site is within the coastal fog belt and fog events provide an important source of moisture to the functionality of the ecosystem. The wind regime includes prominent southerly and south-westerly winds during the summer, and north-easterly winds in the winter that sometimes reach gale force and mobiles the entire desert surface (MME, 2010). The area also

experiences berg wind conditions that introduce hot air to the town and sometimes associated with dust storms. According to the spatial potential evaporation distribution map of Namibia by BGR (20005), the area falls in the range of 3 200 to 3 400mm/a, which could be accredited to high desert temperatures.

### *4.1.2 Geology and soils*

The project area is located within the southern Central Zone (sCZ) of the Neo-Proterozoic Damara Orogenic Belt. This area is underlain by the Abbabis Metamorphic Complex (AMB) characterised by basement dome structures and antiforms with northeast elongation exposed along the Swakop and Khan Rivers. The Abbabis Metamorphic Complex is overlain unconformably by the Damara Supergroup, which comprises mainly metasedimentary rocks deposited in the period from about 900 to 700 Ma (Miller, 1983a). The lower part of the Damara Supergroup is dominated by meta-arkoses and calc-silicate rocks of the Nosib Group, while the upper portion of the sequence consists of alternating marble, calc-silicate rock and schist (Swakop Group). The Swakop Group in the rea is represented by rocks of the Chuos (diamictites and boulder-bearing schists), Karibib (Calcitic marble, calc-silicate interlayers and schists), and Kuiseb (interbedded schist, arkosic quartzites and calc-silicate) Formations as seen in **Figure 6**. The area was later intruded by numerous syn- to post-tectonic granitic plutons, which include minor meta-gabbro, diorite and tonalite, abundant coarse-grained granite, leucogranite and pegmatite (Miller, 2008). Unconsolidated Quaternary sediments consisting mainly of elluvium, alluvium, fanglomerates and calcretes cover large parts of the area. The extremely dry and hot environment and associated formation of evaporates at shallow depths has resulted in the accumulation of salts within the soil profile.

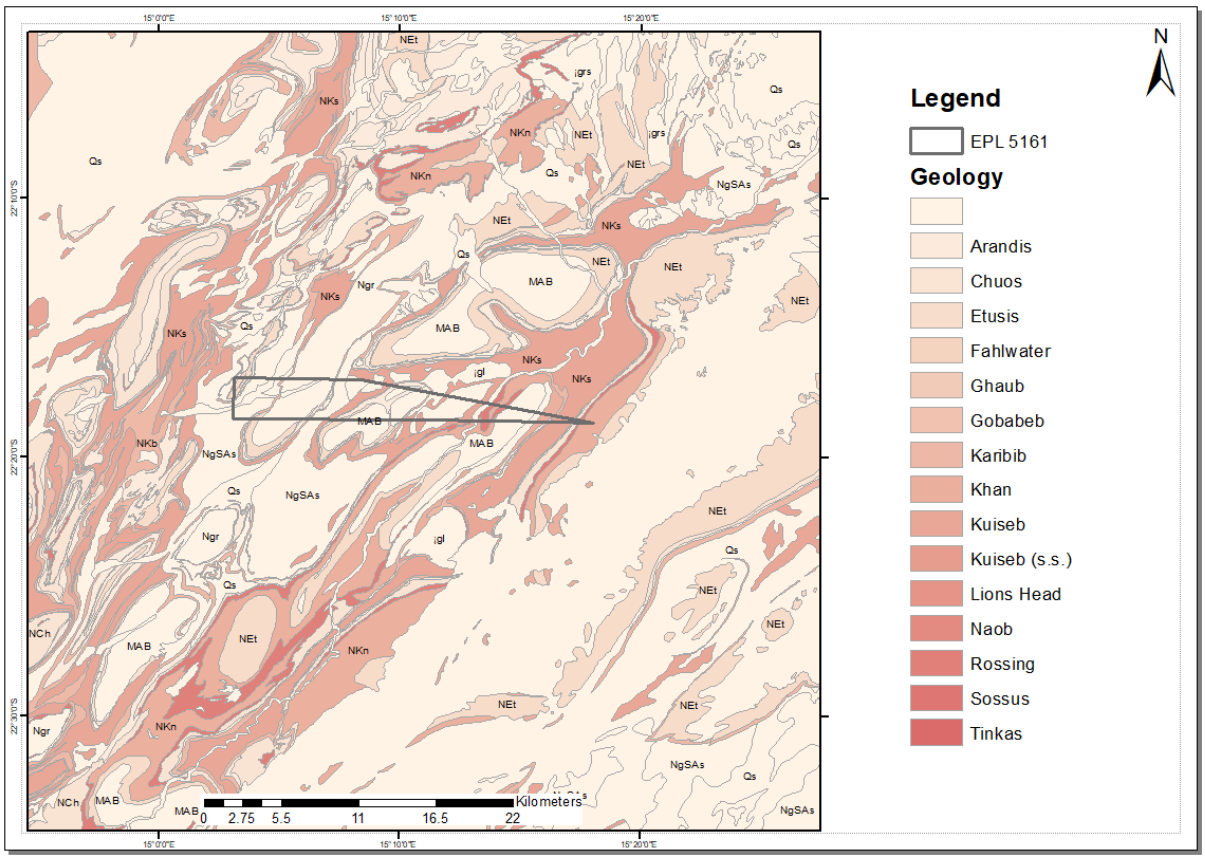


Figure 6: A geological map of the area.

The local geology of the area is characterized by relatively flat light-brown sand, rocky and gravel plains of the Namib Desert with outcrops of granite and quartzite (GCS Water and Environmental Consultants, 2017). The proposed site has undulating hills locally termed *koppies,* with dolerite dykes (of the Etendeka Formation) cross-cutting intercalated feldspathic granites and calc-silicate outcrops, and with windblown sand and gravels at the foot of the koppies as seen in **Figure 7**.

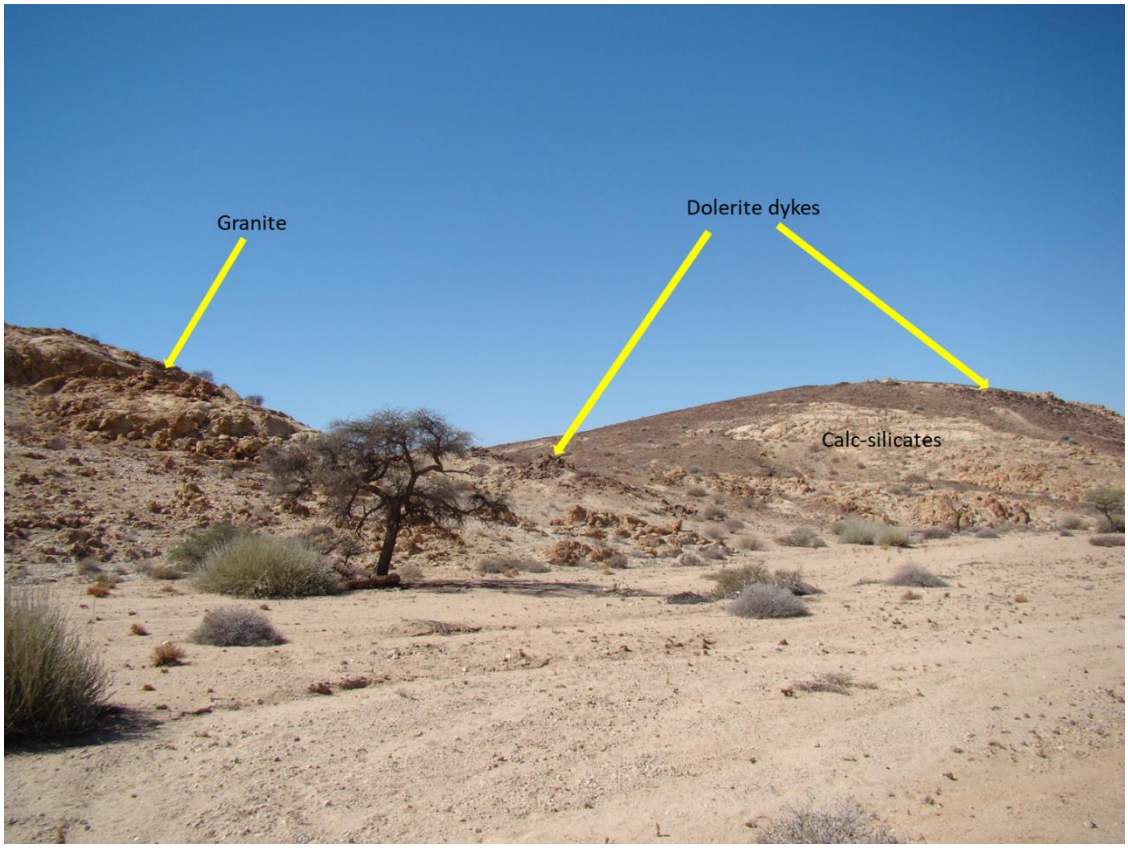

Figure 7: The local geology of the area.

### *4.1.3 Topography and Drainage of Area*

The general topography is such that there is a gradual decrease in altitude from east to west. The town of Arandis is located some 581 meters above mean sea level. The proposed site has a relatively flat topography, characterized by undulating and occasional hills locally termed *koppies*.

According to Africa Planning Forum (2019), the area does not have significant natural surface water bodies, except for the Khan River, which lies to the south east and east of the project area. The non-perennial Khan River occurs in a river canyon, beyond which the surrounding becomes mountainous. The Khan River flows to the south west where it joins the Swakop River, and the combined flow goes to the Atlantic Ocean.

The absence of surface water in the area was backed by Limpitlaw and Hoadley (2009), who stated that it only occurs during rare periods of exceptional rainfall but the major rivers in the region, such as the Swakop River usually flow less than five times in a decade. Occasional thunderstorms however do occur turning the small river courses into fast flowing rivulets and causing flashflood conditions (Speiser and Mulder, 2012).

### *4.1.4 Groundwater Resources*

The project area falls under the Central Namib-Windhoek Groundwater Basin. The area generally has low and limited potential for groundwater and the water is often of poor quality due to high salinity (Limpitlaw and Hoadley, 2009). Current water supply sources in the coastal areas of Erongo are the Omdel and Kuiseb Aquifers and the desalination plant built and owned by AREVA. Christelis and Struckmeier (2011) further noted that the limited quantities of groundwater in the area is partly due to the low rainfall and lack of recharge, and partly due to the generally unfavourable aquifer properties of Damara Sequence rocks. The latter is also reason why groundwater vulnerability is considered to be low in the area. Shagama (2020) indicated that vulnerability of groundwater to pollution in the project area ranges from rather low to moderate which could be explained by the geology of the site area that is mainly characterized by metamorphic rocks such as granites, dolerite, basalts, marbles, and schists. These rock units without any fractures/faults or joints are considered aquitards (rock units that restrict water flow or hardly transmit water from one rock unit to the other), which in in turn also restricts movement of pollutants in the aquifer system.

### *4.1.5 Biodiversity Baseline Information*

The project site falls within what Mendelsohn, Javis, Roberts, & Robertson (2002), call the Namib Desert Biome. The area is characterized by low rainfall with extreme temperatures and unique climatic factors influencing the natural environment and biodiversity.

#### *4.1.5.1 Flora*

The overall vegetation density ranges from sparse to moderate depending on local soil conditions. This can also be attributed to the predominantly low rainfall and extreme weather conditions in the area. Most of the plants are found within the washes and channels and these are predominantly grasses and thorn shrubs. The vegetation within the study area is sparsely distributed. The dominant plant occurrences observed during the site visit to the project area include Melkboom (a succulent), Camelthorn tress and shrubs, Fat Plant, Quiver trees and Elephant's Foot plant in decreasing order of abundance.

Table 4-1: A summary of observed vegetation.

| Plant name | Occurrence | Photograph |
|---|---|---|
| Melkboom (*Euphorbia damarana* shrubland) | This species of plants was by far the most dominant in the greater area, as well as in the proposed area especially the southern part of Farm Trekkopje. The bushes are very | |

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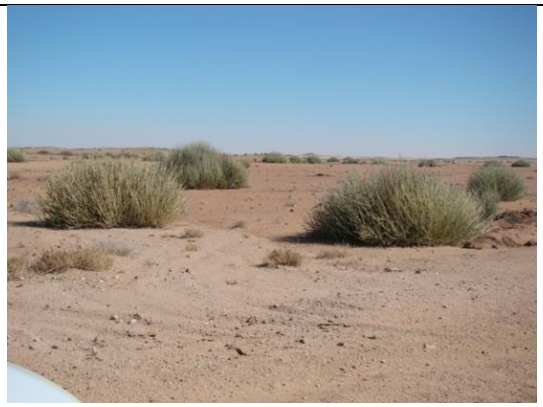
|---|---|---|
| | scattered. |  |
| Camelthorn (*Acacia erioloba*) | The Acacia trees were sparsely distributed on the flatter portion of the farm, with Acacia bushes found mostly along some Khan River tributaries. |  |
| Fat Plant | The Fat Plant had very limited occurrence, and seems to be confined to the mountaneous areas. |  |
| Quiver Tree | Very few seen in the area, confined to granite outcrops. |  |

| | | |
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| Elephant's foot plant (*Adenia pechuelli*) | This plant was seen to a limited extent |  |

Although the Melkboom was quite common in the area, they are an endemic specie, which according to Burke (2008)'s study on recovery potential and sensitivity of vegetation, have a low recovery.

*4.1.5.2 Fauna*

In terms of fauna, the general area is said to be a home, migratory and grazing site to wild animals. No animals were seen during the site visit, however according to the locals, some leopards (*Panthera pardus*) live in the caves of the Khan River mountains. The farmers also revealed that gemsbok, springbok and to a limited extend Kudus used to be dominant wildlife on the farms but these have since disappeared either due to drought, hunting and possibly migration triggered by scarcity of water. An occurrence of Berg Zebras, snake types such as Puff Adder, Zebra Snake and Yellow Cobra was noted by the locals.

The Strategic Environmental Impact Assessment (SEIA) for the Central Namib Uranium Rush (2010) classified the region into biodiversity 'red' and 'yellow' flag areas in terms of certain biodiversity, tourism and heritage hotspots. "Red Flag" status which means that the area is by default unavailable for mining and prospecting unless an extraordinary mineral deposit of national importance occurs in the area. Yellow Flag' status means mineral licence applications in these areas will be considered only after careful assessment. In terms of biodiversity, the map in **Figure 8** was proposed on the basis of the following guiding principles:

- Areas with high levels of endemicity and diversity;
- Conservation status of species;
- The extent to which habitats are threatened or vulnerable to disturbance; and
- Habitats or migration routes which are critical for species' survival

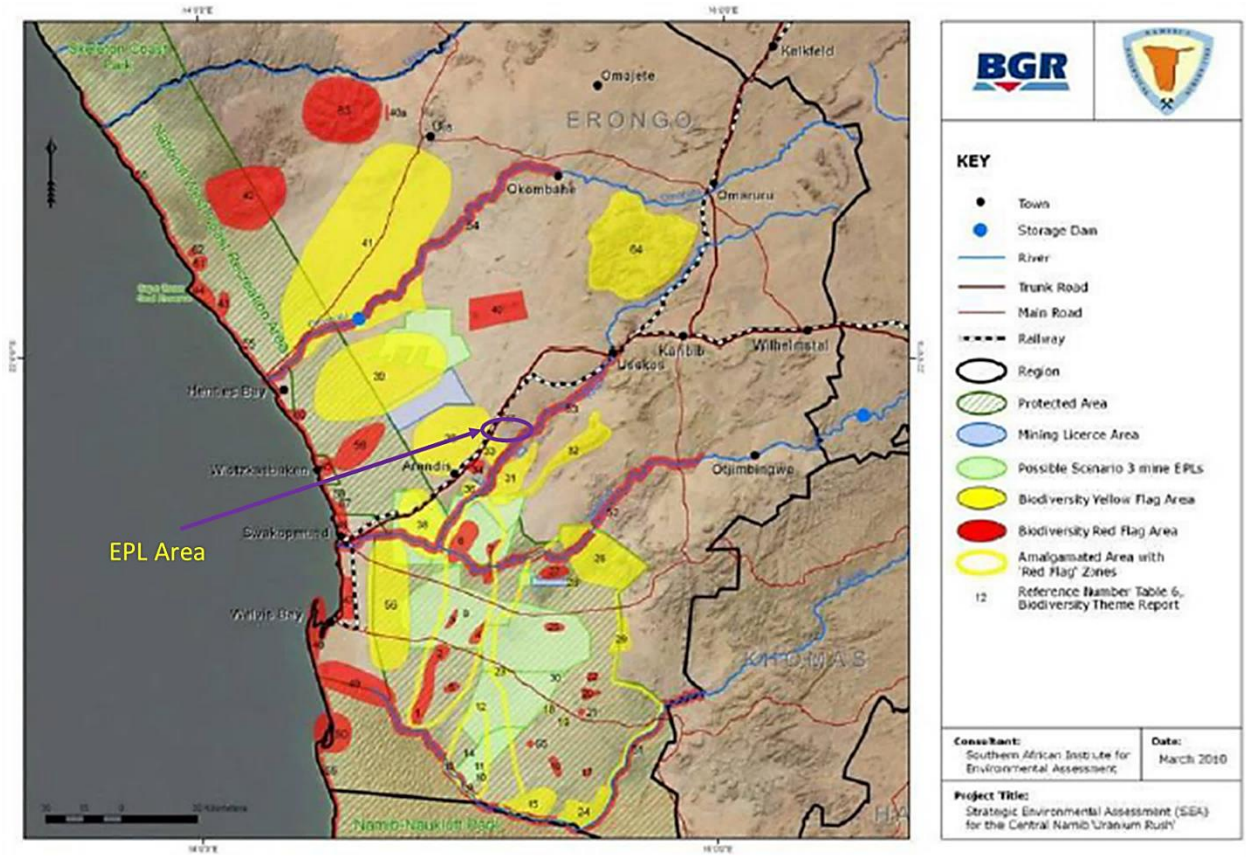


Figure 8: Areas of high biodiversity value in the central Namib in the context of the uranium rush (MME, 2010).

The intention of designating these areas is to highlight them as areas requiring greater protection and conservation than surrounding areas. As it can be seen in **Figure 8**, the EPL area has a yellow flag on the far west and a red flag on the far east. The yellow is termed Plains S of Trekkoppje, known for its relatively undisturbed gravel plains, wildlife concentrations (springbok, ostrich). Very large, dense field of *Sarcocaulon marlothii*, while the red is the Khan River, made sensitive by the fact that it is a linear oasis, riparian woodland, aquifer recharge, rich wildlife, bird flight paths (MME, 2010). However, the area of interest is falling in between these sensitivity classes.

### *4.1.6 Archaeology*

A burial site was observed on Farm Trekkopje (the Trekkopje Cemetery) during the site walk over, however it is well-preserved, fenced off and well documented by the Commonwealth War Graves Commission. It is known locally, and according to the local community, there are about 18 graves from the time of the German war and annual commemorations are usually held in celebration of their lives. It is well fenced off as seen in **Figure 9**. Apart from this cemetery, no other significant heritage, archaeological, religious, or historical importance were observed in the vicinity of the proposed project site or learned from the occupants of the farm. However, this does not rule out the presence of such sites in the project area.

The Uranium SEMP described the Lower Khan (in the east) to have dispersed archaeological sites with well-preserved evidence of the mid-Holocene re-colonisation of the Namib. Although this is not part of the targeted area, should sites of archaeological importance be discovered during the exploration undertaking, the management actions outlined in the EMP will be implemented.

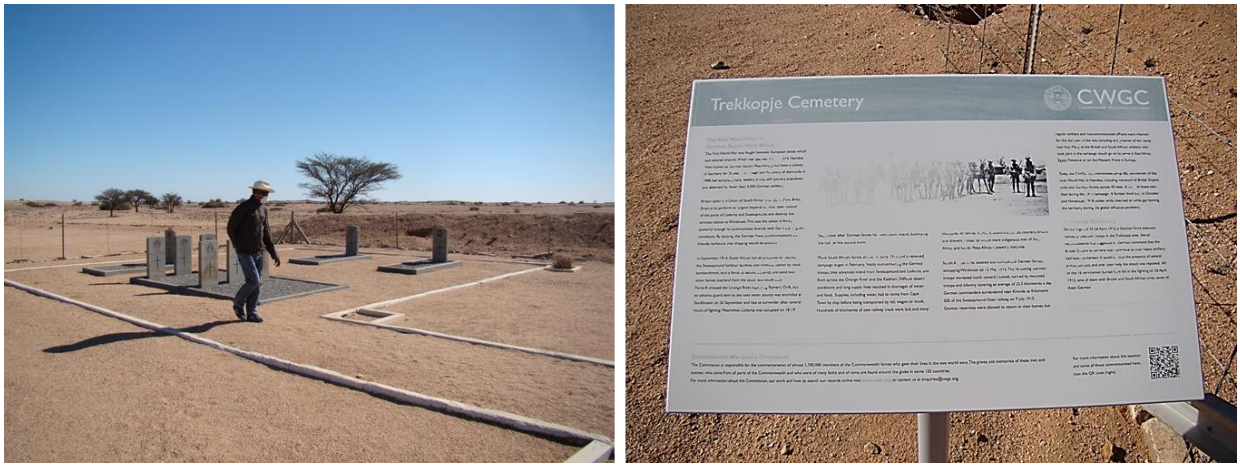


Figure 9: The cemetery area, seen to be well preserved and protected by the fencing.

## 4.2 The socio-economic environment

### *4.2.1 Population Density and Socio-economic Profile*

The 2011 Population and Housing Census indicated that the population of Erongo Region was 150 809, with an overall annual growth rate of 3.4%. The region's economic growth has been largely due to mining, habour operation and fishing industry, as well as tourism, giving the region the second highest per capita income after Khomas (MME, 2010).

The nearest town to the site proposed for this project is Arandis, which had a population of 5170 in 2011 (Population and Housing Census, 2011). According to Hoadley (2009) Arandis was established in 1976 to house employees of the Rössing Uranium Mine (RUL). It has always been very economically dependent on RUL as most residents either worked at the Rössing mine or were contractors for the mine. Other affected communities include Swakopmund and Karibib where the water will be sourced from and where the testing factories are located.

### *4.2.2 Current Land Use of the area*

Majority of Erongo Region forms part of the desert, most of which is state owned as protected areas under conservation management (MME, 2010). This includes the Namib-Naukluft Park, the Dorob National Park, National Coast Tourist Recreational Area, etc. managed by MEFT. Further inland is communal land, which is also under conservation management by conservancies such as ≠Gaingu (centred around Spitzkoppe); Tsiseb

(focused on Brandberg), Otjimboyo and Ohungu. Small stock farming is common in these areas. East of the communal land are commercial farms which are privately owned and practice mostly cattle ranching and ecotourism (particularly desert excursions). The arid nature of the landscape means that very little of the area has agricultural potential.

Farm Trekkopje is a communal farm, with only one occupant at the moment. He lived on the farm for 30 years, and he keeps cattle and sheep on a small scale. He indicated that it is difficult making a living on these surrounding farms due to water scarcity, therefore other farmers relocated to nearby towns and settlements such as Spitzkopje, Usakos, Arandis, Henties Bay and Karibib where some of them are employed. There are existing boreholes on the farm that were either hand dug or drilled by the government, however they yield saline water, which is only used for livestock. Water levels taken in these boreholes were all less than 15m. The farmer indicated that he gets water for domestic use by truck from AREVA as part of their social responsibility.

### *4.2.3 Nearby Mines*

There are a number of mining and mineral exploration activities happening in the region. Some large projects include: two operating uranium mines, Rössing and Swakop Uranium / Husab, and Langer Heinrich which is under care and maintenance due to a drop in uranium price. Other uranium ventures in the area include exploration works by Reptile Mining, Bannerman Resources, Areva Resources Namibia/Trekkopje and Norasa Group/Valencia. Other mining activities in the region include gold mining at Navachab Mine, dimension stones from numerous marble and granite quarries, salt at the Walvis Bay Salt Works, Swakopmund and Cape Cross, as well as mining of semi-precious stones by small scale miners in the Spitzkopje and surrounding.

The site visit revealed that the site is not inert, and there has been mining activities in the past. An abandoned quarry was discovered on the border of Farm Trekkopje and Vergenoeg. No rehabilitation has taken place and infrastructure is still partly in place. Although still on Farm Trekkopje, the abandoned site is outside the EPL area. The relative positions of items observed during the field visit are shown in **Figure 10**.

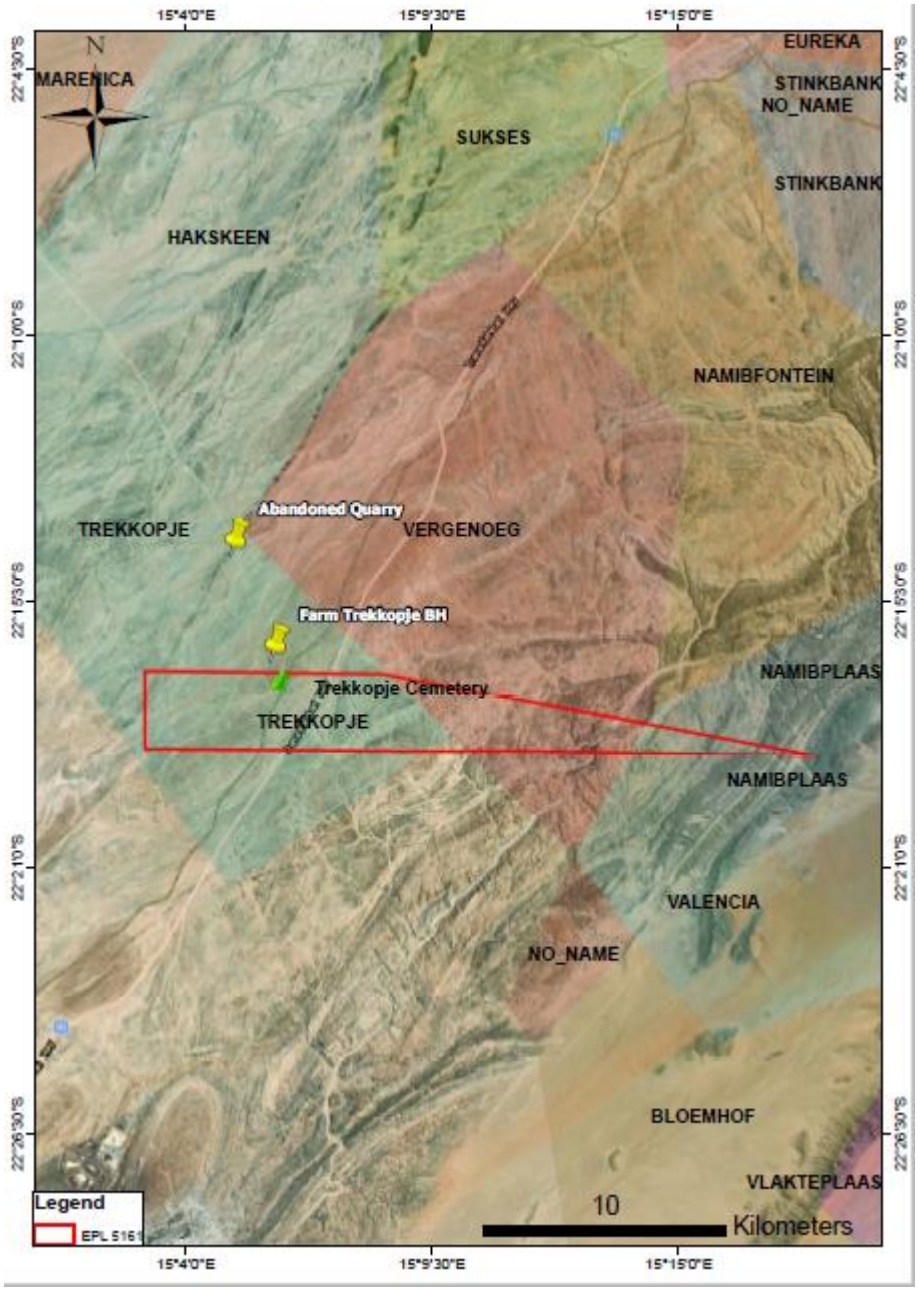


Figure 10: Location of items observed on Farm Trekkopje during the site visit, including the boreholes, cemetery and abandoned quarry.

### *4.2.4 Air quality and Noise levels*

The existing mining activities in the region, are a source of gaseous and particulate emissions. Fugitive dust sources associated with mining activities include drilling and blasting operations, materials handling activities, vehicle-entrainment by haul vehicles and wind-blown dust from tailings impoundments and stockpiles. Although no ambient air quality data is available for the area, the Erongo SEA study indicate exceedances of the selected air quality evaluation criteria, which according to Liebenberg-Enslin et. al., (2010) is due to the windblown dust from east-wind conditions. The B2 main road that links central Namibia to the coast

contributes to gaseous emissions such as CO2, CO, hydrocarbons (HCs), SO2, NOx, particulates and lead.

In addition to air quality, these activities are also great contributors to noise levels. This includes vehicle movement on the public road network, rail transport activities, aircrafts flying to local airports, etc. Potential receptors of noise are the residents of the nearby farms, the town of Arandis and tourists that frequently visit the various attractions in the surrounding area, as well as fauna.

#### *4.2.5 Existing infrastructure*

The project site has access to the national B2 road which links it to the neighbouring Walvis Bay and Swakopmund going west and Karibib to the east. Additionally, the Trans-Kalahari Highway runs through the EPL and parallel to the B2 road. There is also powerlines that run through the farm and EPL (as seen in **Figure 11**), known to supply power to both Husab and Rossing operations and Swakopmund.

Figure 11: Powerlines passing through the EPL and Farm Trekkopje.

## 4.3 Key impacts identified

In order to have an impact, there needs to be a source, a pathway and a receptor. In this context, a number of impacts could potentially be generated from the proposed exploration activities, in which case the activities would be the source. Different components of the receiving environment become receptors. Therefore, with this in mind, different impacts were identified and listed below:

- Impact on the physical environment
- Impact on soils
- Impact on water resources (ground and surface water)
- Impact on biodiversity (fauna and flora)
- Impact on air quality
- Impact on archaeology
- Impact on traffic
- Impact on health and safety
- Impact from noise
- Impact on socio-economic standings

# 5 THE PUBLIC PARTICIPATION PROCESS

The public participation process (PPP) forms an important part of this scoping report, as it provides all persons or organizations an opportunity to comment on the proposed activity and register their views and concerns. This was done in accordance with both the EMA and its EIA Regulations.

## 5.1 Interested and Affected Parties (I&APs)

OMAVI identified stakeholders who were considered to be relevant to the proposed activity including applicable organs of state (national, regional and local). Thereafter, notices regarding the project were placed in widely circulated national newspapers inviting members of the public to register as interested and/or affected parties (I&APs), who were contacted and added to the stakeholders list. These contacts formed part of the mailing list for all communications pertaining to the proposed project. A summary of I&APs identified are presented below and the complete stakeholders list is provided in **Appendix B**.

- Key Ministries
- Regional governance
- Traditional and local authorities
- Service providers (NGOs and SEOs)
- Farm owners
- Members of the public

## 5.2 The Public Consultation Process

Regulation 21 of the EIA Regulations details steps to be taken during a given public consultation process and these have been used in guiding this process. Communication with I&APs about the proposed development was facilitated through the following means and in this order:

- A Background Information Document (BID) containing descriptive information about the proposed exploration activities was compiled and sent out to all identified and registered I&APs;

### *5.2.1 Notices*

- Notices were placed in The Namibian Sun, Allgemeine Zeitung and Die Republikein newspapers, briefly explaining the activity and its locality and inviting members of the public to register as I&APs. First adverts were run on 19 June 2020 but due to the Covid-19 pandemic the Region was put on stage one lockdown with immediate effect of the stage of emergency. This led to the decision to only run the second advertisements on 20 July 2020 once the region's movement and activities were moved to stage three of the state of emergency. These are included in **Appendix C**;
- Notice boards were fixed at visible locations in the Erongo Regional Office as well as at the Arandis Town Council office notice boards (**Figure 12**).


Figure 12: A site notice placed on Erongo Regional Council notice board.

### *5.2.2 Meetings*

- A meeting with Local Authority was arranged for the 9th July 2020 10h00 and was done virtually via Zoom due Covid-19 and resulting lockdown regulations imposed on the Erongo Region. Minutes for this meeting were emailed to all identified authority on 21st July 2020 and are included in **Appendix D**.
- A public consultation meeting was carried out 25 July 2020, 14h00 at the water point on Farm Hakskeen. A radio announcement was done on a local radio station by the Head of Traditional Authority, inviting the public to the meeting. At the public meeting, a presentation was given by OMAVI (with the assistance of a local translator between English and both Afrikaans and Damara-Nama), and the attendees were requested to fill in an attendance register attached as an **Appendix E**. Minutes for this

meeting were emailed to all the registered interested and affected parties who had e-mail addresses in July 2020 and can be found in **Appendix D**, together with the minutes for the authority meeting.

Figure 13: Pictures from the public meeting held on Farm Hakskeen.

## 5.3 Key issues raised

### *5.3.1 First round of public consultation*

A number of issues and concerns were raised during the public participation period, some of which were registered via email and others during the public consultation meeting. These are summarized in **Table 5-1** below. Comments registered via email are furnished in the Issues and Response Trail presented in **Appendix F** and the proof of communication is presented in **Appendix G.**

**Table 5-1: A summary of key issues received.**

| Environmental component | Concern | Response |
|---|---|---|
| Groundwater | Limited groundwater in the area and low rainfall | Refer to Groundwater specialist study report in Appendix I of the Scoping Report. Additionally, no water will be sourced from the area. It will be imported from elsewhere and recycled. |
| Biodiversity | Area might have environmentally sensitive | This impact has been assessed under |

| | | |
|---|---|---|
| | habitats for botany, invertebrates, reptiles and mammals | section 6.3 of the environmental scoping assessment (ESA) report. Measures towards preservation of fauna and flora in the area have been outlined in the EMP |
| Aesthetics | Potential visual impact and altering of landscape from the mine quarry as well as the campsite | This impact is anticipated to be low considering that no quarrying for mining purposes will take place. Only rather extraction of selected blocks for testing. Measures to minimize this impact are outlined in the section 6.3 of the ESA report and the EMP. |
| Air Quality | Potential dust and airborne emissions resulting from the proposed excavation, drilling, stone cutting and related activities | The impact assessment for this component has been done in Chapter 6 of the ESA report and mitigation measures are outlined in the EMP. |
| Soil and water | Risk of hydrocarbon spillages | This impact has been assessed under section 6.3 of the ESA report. Measures towards prevention, containment, and clean up of hydrocarbon spills have been outlined under mitigations as well as in the EMP |
| Noise | Noise from vehicles, drilling and cutting machinery | Measures were recommended to keep the noise to an acceptable level. Refer to sections 6.3.2.5 and 6.3.3.5 as well as the EMP. |
| Traffic and roads infrastructure | Deterioration of roads infrastructure due to exploration | Best Cheer should operate within the Roads Act and be subjected to weigh bridges and necessary fees. |
| Licencing | Is the work only with respect to exploration or includes mining? | The present ESA is only for exploration activities. If this process yields positive results, an application for a mining licence will be launched with MME, accompanied by a separate EIA to assess impacts of mining. |
| Socio-economic | - Concerns of employment as community requests for transparency | Communication forwarded to Best Cheer Investments Namibia (Pty) Ltd |

| | | |
|---|---|---|
| | from the proponent and honouring of their commitment.<br>- Capacity building must involve transfer of more sophisticated skills as opposed to driving trucks and shovelling. | |
| Animal safety during mining | Potential for animals to fall into mined areas | This impact will be minimal, as no actual mining will be taking place. Sites from which testing blocks will be extracted will be fenced off until they are reinstated. |
| Communication and Accountability | How the community can hold the proponent accountable and communicate effectively with the proponent | A suggestion was made for the community, the proponent and the consultant to establish a structure or channel of communication. The EMP will also be binding for the proponent to uphold their obligations. |

#### *5.3.2 Second round of public consultation*

The comments received in the first round of public consultation were included in the draft environmental scoping assessment (ESA) report, which was circulated to all I&APs for review. This was done via email and hard copies of the report were also couriered to the central offices for the local community to comment and give feedback as part of the second round of public consultation. No further comments or feedback was received from the second stage, therefore the draft ESA report was finalised for submission and evaluation by the DEA at MEFT.

# 6 IMPACT ASSESSMENT

By considering the potential risk areas associated with the receiving biophysical and social environment as well as the issues raised during the public consultation process, the following key impacts have been highlighted for consideration.

## 6.1 Key impacts identified and their sources per project phase

A number of impacts could potentially be generated from the proposed exploration activities as documented in this section as well as their sources. It is important to realize that the type and scale of these impacts will differ between different phases of the exploration project. The potential sources of impact associated with the different project phases are described below, and an assessment of impacts identified are discussed in the subsequent subchapters.

### *6.1.1 Desktop study*

This phase will have no impact on the environment as it is primarily office based and involves review of geological maps and historical drilling and/ or quarrying data for the area.

**Table 6-1: Impacts identified desktop study**

| Feature | Description of Project Activity | Potential Impact |
|---|---|---|
| **Positive** | | |
| Employment | Appointment of a project geologist to do desktop studies. | Employment opportunity for a local graduate |
| **Negative** | | |
| None | | |

### *6.1.2 Impacts identified for Field evaluation*

The potential impacts associated with field evaluation will be minimal as this phase will employ non-invasive / destructive techniques. It strictly entails walking the area to map out outcrops and delineate potential granite intrusions to produce a geological map. Thereafter, the intrusions will be ranked in terms of size, colour, texture, patterns and presence of discontinuities as mapped. Additionally, hand samples (about 30 $cm^3$ in dimension) will be collected during this stage and will be taken for hardness testing as well as polishing trials. This stage will primarily involve personnel walking the site and minimal driving in a 4x4 vehicle. Therefore, the impacts identified at this stage will primarily result from the following facets:

**Table 6-2: Impacts identified for field evaluation**

| Feature | Description of Project Activity | Potential Impact |
|---|---|---|
| **Positive** | | |
| Employment | Appointment of technical or field assistants to the project geologist to assist with mapping. | Employment opportunity for local graduates |
| **Negative** | | |
| Soil | Petrochemical spills from exploration vehicles<br>Clearing of pathways for exploration vehicles and setting up of exploration camp during field evaluation | Potential soil disturbance and pollution |

| Feature | Description of Project Activity | Potential Impact |
|---|---|---|
| Surface and groundwater | Petrochemical spills from exploration vehicles | Potential contamination of surface and groundwater |
| Biodiversity | Clearing of pathways for exploration vehicles and setting up of exploration camp during field evaluation<br>Habitat destruction of fauna | Loss of vegetation |
| Air quality | Potential gas and dust generation by exploration vehicles | Short-term decrease in surrounding air quality |

### *6.1.3 Impacts identified for Detailed exploration*

This phase will employ invasive techniques such as diamond core drilling, to permit a better understanding of vertical extent of the formation, colour and texture as well as joint spacing or possible defects at depth. It is anticipated that drilling activities will require small, tracked access roads to gain entry to the actual drilling sites by the air compressor and water truck. Therefore, the impacts identified at this stage can be summarized as follows:

**Table 6-3: Impacts identified for Detailed exploration**

| Feature | Description of Project Activity | Potential Impact |
|---|---|---|
| **Positive** | | |
| Employment | This stage will require both technical and non-technical personnel to assist with drilling activities and operate machinery. Therefore, in addition to the geology team, operators will be sourced from the local community.<br>Procurement of consumable project needs such as PPE, spare parts for machinery and lubricants from local businesses | Employment opportunity for 5 local non-technical personnel |
| Local and regional economy | | Positive contribution to the general economy of the Erongo Region. |
| Skills and knowledge | Through skills transfer, training and certification of local communities | Local community empowerment |
| **Negative** | | |

| Feature | Description of Project Activity | Potential Impact |
|---|---|---|
| Soil | Petrochemical spills from vehicles and diesel operated machinery<br>Widening of pathways for vehicles, air compressor and water trucks.<br>Removal of top soil over the footprints of mapping transverses | Potential soil disturbance and pollution |
| Surface and groundwater | Mishandling and improper disposal of petrochemicals, spills from vehicles and diesel operated machinery | Potential contamination of surface and groundwater |
| Biodiversity | The potential removal of small shrubs within the project footprint to widen pathways for vehicles, air compressor and water trucks as well as for mapping transverses | Loss of vegetation |
| Traffic | Increased traffic and presence of heavy equipment on site | Short-term increase of traffic in the area. |
| Air quality | Potential gas emission from diesel powered machinery.<br>Dust generation by moving vehicles | Short-term decrease in surrounding air quality |
| Noise | Exploration equipment will inevitably produce noise. | Noise impact |
| Wildlife | The introduction of activities such as drilling has potential to drive away wildlife from their habitat due to noise and constant movement. Presence of people may lead to hunting of wild animals | Habitat disturbance and Potential poaching of wildlife |
| Health and Safety | Improper handling of equipment and machinery may compromise the health and safety of the employees<br>Contracting of diseases | Potential health and safety risk |

### *6.1.4 Impacts identified for Feasibility study*

This activity will only be undertaken if the detailed exploration yields positive results, and will target areas with good potential. The techniques will include butterfly cutting and extraction of blocks for evaluation. These are invasive techniques, therefore impact will come from the features summarized in **Table 6-4**:

**Table 6-4: Impacts identified for Feasibility study**

| Feature | Description of Project Activity | Potential Impact |
|---|---|---|
| **Positive** | | |
| Employment | This stage will require both technical and non-technical personnel to assist with drilling activities and operate machinery. Therefore, in addition to the geology team, operators will be sourced from the local community.<br>Procurement of consumable project needs such as PPE, spare parts for machinery and lubricants from local businesses | Employment opportunity for 5 local non-technical personnel |
| Local and regional economy | | Positive contribution to the general economy of the Erongo Region. |
| Skills and knowledge | Through skills transfer, training and certification of local communities | Local community empowerment |
| **Negative** | | |
| Soil | Petrochemical spills from vehicles and diesel operated machinery<br>Scrapping of overburden and air compressing rock surfaces to clean and better expose them. | Potential soil disturbance and pollution |
| Surface and groundwater | Mishandling and improper disposal of petrochemicals, spills from vehicles and diesel operated machinery | Potential contamination of surface and groundwater |
| Biodiversity | The potential removal of vegetation scrapping of overburden to better expose target rock | Loss of vegetation |

| Feature | Description of Project Activity | Potential Impact |
|---|---|---|
| Wildlife | Activities such as drilling and cutting has potential to drive away wildlife from their habitat due to noise and constant movement.<br>Loss of habitat for some animals that reside on these koppies<br>Presence of people may lead to hunting of wild animals | Habitat disturbance<br>Potential poaching of wildlife |
| Traffic | Increased traffic and presence of heavy equipment on site | Short-term increase of traffic in the area. |
| Air quality | Potential gas emission from diesel powered machinery.<br>Dust generation by moving vehicles, from air compressing and cleaning of rock surfaces and the cutting of blocks. | Short-term decrease in surrounding air quality |
| Noise | Drilling and cutting equipment will inevitably produce noise. | Noise impact |
| Health and Safety | Improper handling of equipment and machinery may compromise the health and safety of the employees<br>Contracting of diseases | Potential health and safety risk |
| Visual | Removal of blocks can lead to compromised natural beauty and deterioration in sense of place.<br>Littering by exploration staff. | Small scale visual impacts |
| Archaeology | Removal of blocks that could contain archaeological evidence | Disturbance of heritage or archaeology |

The purpose of impact assessment is to identify and evaluate the significance that these impacts can have on identified receptors and resources, and come up with measures to minimise or prevent them all together. The identified potential impacts were assessed according to defined assessment criteria discussed below.

## 6.2 Impact Assessment Methodology

The potential impacts pertaining to the exploration activities were assessed in terms of probability (likelihood of occurring), scale/extent (spatial scale), magnitude (severity) and duration (temporal scale) as presented in **Table 6-5**, **Table 6-6**, **Table 6-7** and **Table 6-8**. To enable a scientific approach to the determination of the environmental significance, a numerical value is linked to each rating scale. This methodology ensures uniformity and comparability over a wide range of impacts.

It is assumed that an assessment of the significance of a potential impact is a good indicator of the risk associated with such an impact. The following criteria will be applied to each potential impact to determine its significance.

### *6.2.1 Extent (spatial scale)*

Extent is an indication of the physical and spatial scale of the impact**. Table 6-5** shows rating of impact in terms of extent of spatial scale.

Table 6-5: Extent or spatial impact rating

| Low (1) | Low/Medium (2) | Medium (3) | Medium/High (4) | High (5) |
|---|---|---|---|---|
| Impact is localised within the site boundary: Site only | Impact is beyond the site boundary: Local | Impacts felt within adjacent biophysical and social environments: Regional | Impact widespread far beyond site boundary: Regional | Impact extend National or over international boundaries |

### *6.2.2 Duration*

Duration refers to the timeframe over which the impact is expected to occur, measured in relation to the lifetime of the project. **Table 6-6** shows the rating of impact in terms of duration.

Table 6-6: Duration impact rating

| Low (1) | Low/Medium (2) | Medium (3) | Medium/High (4) | High (5) |
|---|---|---|---|---|
| Immediate mitigating measures, immediate progress | Impact is quickly reversible, short term impacts (0-5 years) | Reversible over time; medium term (5-15 years) | Impact is long-term | Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources |

### *6.2.3 Intensity, Magnitude / severity*

Intensity refers to the degree or magnitude to which the impact alters the functioning of an element of the environment. The magnitude of alteration can either be positive or negative. These were also taken into consideration during the assessment of severity. **Table 6-7** shows the rating of impact in terms of intensity, magnitude or severity.

Table 6-7: Intensity, magnitude or severity impact rating

| **Type of criteria** | **Negative** | | | | |
|---|---|---|---|---|---|
| | **H- (10)** | **M/H- (8)** | **M- (6)** | **M/L- (4)** | **L- (2)** |
| **Qualitative** | Very high | Substantial | Moderate | Low | Minor |

| | | | | | |
|---|---|---|---|---|---|
| | deterioration, high quantity of deaths, injury of illness / total loss of habitat, total alteration of ecological processes, extinction of rare species | deterioration, death, illness or injury, loss of habitat / diversity or resource, severe alteration or disturbance of important processes | deterioration, discomfort, partial loss of habitat / biodiversity or resource, moderate alteration | deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers | deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration. |

### *6.2.4 Probability of occurrence*

Probability describes the likelihood of the impacts actually occurring. This determination is based on previous experience with similar projects and/or based on professional judgment. See **Table 6-8** for impact rating in terms of probability of occurrence.

Table 6-8: Probability of occurrence impact rating

| Low (1) | Medium/Low (2) | Medium (3) | Medium/High (4) | High (5) |
|---|---|---|---|---|
| Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards. | Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards | Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards. | Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards. | Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards. |

### *6.2.5 Significance*

Impact significance is determined through a synthesis of the above impact characteristics. The significance of the impact "without mitigation" is the main determinant of the nature and degree of mitigation required. As stated in the introduction to this chapter, for this assessment, the significance of the impact without prescribed mitigation actions was measured.

Once the above factors (**Table 6-5, Table 6-6, Table 6-7** and **Table 6-8**) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

**SP = (magnitude + duration + scale) x probability**

The maximum value per potential impact is 100 significance points (SP). Potential impacts were rated as high, moderate or low significance, based on the following significance rating scale (**Table 6-9**).

Table 6-9: Significance rating scale

| *SIGNIFICANCE* | *ENVIRONMENTAL SIGNIFICANCE POINTS* | *COLOUR CODE* |
|---|---|---|
| High (positive) | >60 | H |
| Medium (positive) | 30 to 60 | M |

| | | |
|---|---|---|
| Low (positive) | <30 | L |
| Neutral | 0 | N |
| Low (negative) | >-30 | L |
| Medium (negative) | -30 to -60 | M |
| High (negative) | >-60 | H |

For an impact with a significance rating of high, mitigation measures are recommended to reduce the impact to a low or medium significance rating, provided that the impact with a medium significance rating can be sufficiently controlled with the recommended mitigation measures. To maintain a low or medium significance rating, monitoring is recommended for a period of time to enable the confirmation of this significance and to ensure it is under control.

The potential impacts associated with the proposed project and their assessments are described in the subsequent subchapters.

## 6.3 Impact assessment

The potential impacts associated with the different project phases (Field evaluation, detailed exploration and feasibility stage) are described and assessed in the following subchapters. For each impact evaluated or assessed, it is assumed that the significance of that potential impact is a good indicator of the risk associated with such an impact. Therefore, for each potential impact:

- a brief explanation is given;
- A significance rating is given for pre- and post-mitigation of the impact; and
- The recommended mitigation measures are given.

The recommended mitigation measures prescribed for each of the potential impacts contribute towards the attainment of environmentally sustainable operational conditions of the project for various features of the biophysical and social environment.

### *6.3.1 Field evaluation*

*6.3.1.1 Impact on soils*

At this stage the potential sources of soil pollution would be spills of petrochemicals from exploration vehicles during field evaluation.

Table 6-10: Assessment of the impacts of field evaluation on soil pollution

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L-/M - 2 | L – 1 | M/L - 4 | L/M - 2 | L – 14 |

| | | | | | |
|---|---|---|---|---|---|
| **Post-mitigation** | L- 1 | L – 1 | L - 2 | L/M - 2 | L – 8 |

*6.3.1.1.1 Mitigations and recommendation to soil pollution*

- Contamination control measures should be put in place to manage soil pollution.
- The Project Environmental Officer or Proponent should ensure that a sufficient number of drip trays are available on-site and that these are utilised in the event of leakage from vehicles.
- Contaminated soils that may have resulted from leakage/spillage from exploration bakkies should be removed to a depth dependent on the size of the spill
- The contaminated soils should completely be removed and treated or disposed off in accordance to municipal wastewater discharge standards thereafter replaced with clean soil.
- Drip trays must be used when exploration bakkies are idle to contain any potential spillages. This measure is to prevent pollutants from reaching to surrounding soils.
- The proponent should appoint an Environmental officer to monitor soil contamination on site on a weekly basis.

Soil disturbance would most likely come from creation of access roads and setting up of temporary camps as assessed below.

Table 6-11: Assessment of the impacts of field evaluation on soil disturbance

| | **Extent** | **Duration** | **Intensity** | **Probability** | **Significance** |
|---|---|---|---|---|---|
| **Pre-mitigation** | L-/M - 2 | M - 3 | M/L – 4 | L/M - 2 | L - 18 |
| **Post-mitigation** | L - 1 | L/M - 2 | L - 2 | L/M - 2 | L - 10 |

*6.3.1.1.2 Mitigations and recommendation to soil disturbance*

- Topsoil should be removed and stockpiled for putting back during restoration and reclamation works to help minimise erosion and run-off on the smooth surfaces.
- Use of existing roads as much as possible and restrict vehicles to only use created access roads to prevent further disturbance

*6.3.1.2 Impact on biodiversity and habitat destruction*

About 80% of the project footprint is open space i.e. no vegetation. There is few vegetation on the project site and it is quite scattered. The removal of vegetation for creating access routes and setting up a campsite might not be necessary, which reduces the significance of impact.

Table 6-12: Assessment of the impacts of field evaluation on biodiversity (flora)

| | **Extent** | **Duration** | **Intensity** | **Probability** | **Significance** |
|---|---|---|---|---|---|
| **Pre-mitigation** | L/M - 2 | M - 3 | M/L – 4 | M - 3 | L - 18 |
| **Post-mitigation** | L - 1 | L/M - 2 | L - 2 | L/M - 2 | L - 10 |

*6.3.1.2.1 Mitigations and recommendation to biodiversity (flora)*

- The exploration camp should be set up in an open space that will not require removal of vegetation.
- Existing roads must be utilised as much as possible to avoid creating new ones where possible.
- Minimize driving especially to access outcrops. The mapping team must access these by walking to reduce the extent of impact.
- New access routes must go around the sparse vegetation in order to preserve it. Work together with the National Botanical Gardens (NBG) in plant rescue and relocation.
- Stockpiling of the top soils will create a seed bank which helps to restore the environment during reclamation.

In terms of animals, the movement of exploration team in the area might temporarily drive away animals. Another impact could result from the incoming of people who might take advantage of their access to the project area to hunt wild animals. Fatalities of fauna may occur from collision with vehicles and earth moving equipment.

Table 6-13: Assessment of the impacts of field evaluation on biodiversity (fauna)

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L-/M - 2 | L - 1 | M/L - 4 | L/M - 2 | L - 14 |
| **Post-mitigation** | L- 1 | L - 1 | L - 2 | L/M - 2 | L - 8 |

*6.3.1.2.2 Mitigations and recommendation to biodiversity (fauna)*

- Minimize driving especially to access outcrops. The mapping team must access these by walking to reduce the potential of driving away animals.
- Discourage indiscriminate killing of perceived dangerous species (e.g. snakes and scorpions)
- Remove and relocate perceived dangerous species (e.g. snakes) to similar undisturbed habitats in the general area.
- A speed limit of 60km/h for light vehicles and 30km/h for heavy vehicles must be maintained onsite to prevent fatalities of fauna that may manifest from collisions with vehicles and earth moving equipment
- The Proponent should implement a severe penalty system for any worker who will be found hunting wild animals in the area.
- Local people should be employed to prevent poaching as the locals will be inclined to protecting their wildlife.

*6.3.1.3 Impact on water resources*

Spills of petrochemicals from exploration vehicles have the potential to contaminate surface water bodies or seep into the ground and contaminate groundwater. The assessment of this impact is presented in

Table 6-14: Assessment of the impacts of field evaluation on water quality

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L-/M - 2 | L - 1 | L - 4 | L/M - 2 | L - 14 |
| **Post-mitigation** | L-/M - 2 | L - 1 | L - 2 | L - 1 | L - 5 |

*6.3.1.3.1 Mitigations and recommendation to water pollution*

- The Project Environmental Officer or Proponent should ensure that a sufficient number of drip trays are available to be utilised in an event of leakage from vehicles. Drip trays must be used when exploration bakkies are idle
- Contaminated soils that may have resulted from leakage/spillage from exploration bakkies should be removed to a depth dependent on the size of the spill to prevent pollutants from leaching into the ground to contaminate groundwater.
- Spillages must be completely be removed and treated or disposed off in accordance to municipal wastewater discharge standards.

*6.3.1.4 Impact on air quality*

The current possible source of air pollution at this stage would be the dust and fumes generated by exploration vehicles. However, this impact is of low significance due to the fact that the impact will be temporary i.e. impacts lasts only for a few weeks of field assessment. The assessment of this impact is presented in

Table 6-15: Assessment of the impacts of field assessment on air quality

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L-/M - 2 | L-/M - 2 | M /L - 4 | L/M - 2 | L - 16 |
| **Post-mitigation** | L - 1 | L - 1 | L - 2 | L/M - 2 | L - 8 |

*6.3.1.4.1 Mitigations and recommendation to air pollution*

- Dust generation should be kept at an acceptable level, by using existing roads and avoiding driving where possible.
- A speed limit of 60km/h for exploration vehicles must be maintained onsite to minimise the dust generated by vehicles
- Exploration vehicles must not be left idling on site when not in use, to minimize gas emissions.
- The Proponent must ensure that the exploration vehicles are properly serviced so that they do not give off harmful gases.
- The proponent should appoint an Environmental officer to monitor dust and gas on site on a weekly basis during this phase.

### *6.3.2 Detailed exploration*

*6.3.2.1 Impact on soils*

At this stage the potential sources of hydrocarbon spills will include vehicles (bakkies), water trucks, as well as the drill rig.

Table 6-16: Assessment of the impacts of field evaluation on soil pollution

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L-/M - 2 | L/M - 2 | M/L - 4 | L/M - 2 | L - 16 |
| **Post-mitigation** | L- 1 | L/M - 2 | L - 2 | L/M - 2 | L - 10 |

*6.3.2.1.1 Mitigations and recommendation to soil pollution*

- Contamination control measures should be put in place to manage soil pollution.
- The Project Environmental Officer or Proponent should ensure that a sufficient number of drip trays are available on-site and must be used at all times when vehicles, trucks are idle as well as under the diesel trailer to contain any potential spillages.
- Contaminated soils that may have resulted from leakage/spillage from vehicles or machinery should be removed to a depth dependent on the size of the spill
- The contaminated soils should completely be removed and treated or disposed off in accordance to municipal wastewater discharge standards thereafter replaced with clean soil.
- The trailer with a diesel tank must have designated parking on site, which must be lined ground to prevent pollutants from reaching the soil.
- Chemical used for drilling activities (in the drilling mud) should be non-hazardous and biodegradable.
- The proponent should appoint an Environmental officer to monitor soil contamination on site on a weekly basis.

In terms of soil disturbance, not much will be done at this stage as the access roads created during field assessment will be used, and the temporary camps will already be. However, where necessary, roads will be expanded with high consideration of the environment.

Table 6-17: Assessment of the impacts of field evaluation on soil disturbance

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L/M - 2 | L/M - 2 | M/L – 4 | L/M - 2 | L - 16 |
| **Post-mitigation** | L - 1 | L/M - 2 | L - 2 | L/M - 2 | L - 10 |

*6.3.2.1.2 Mitigations and recommendation to soil disturbance*

- Existing campsite should be used to avoid erecting temporary infrastructure in a different place.
- Existing roads must be utilised as much as possible to avoid creating new ones where possible.
- Where necessary, roads must be expanded with highest consideration of the environment.

6.3.2.2 *Impact on biodiversity and habitat destruction*

The removal of vegetation will be minimal at this stage as the access roads created during field assessment will be used, and the temporary camps will already be setup. Where expansion of access roads will be necessary, care will be taken for maximum preservation of plant species.

Table 6-18: Assessment of the impacts of field evaluation on biodiversity (flora)

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L/M - 2 | L/M - 2 | M/L – 4 | M - 3 | L - 24 |
| **Post-mitigation** | L - 1 | L/M - 2 | L - 2 | L/M - 2 | L - 10 |

6.3.2.2.1 *Mitigations and recommendation to biodiversity (flora)*

- Existing campsite should be used to avoid erecting temporary infrastructure in a different place.
- Existing roads must be utilised as much as possible to avoid creating new ones where possible.
- Where necessary, roads must be expanded with highest consideration of the environment.
- Stockpiling of the topsoils will create a seed bank which helps to restore the environment during reclamation.
- Where possible, plants must be carefully removed and transplanted. Work together with the National Botanical Gardens (NBG) in plant rescue and relocation.

In terms of animals, movement of vehicles around the project area will now be narrowed down to a localised site where drilling equipment will be set up. Animals will have the freedom to roam around in other areas of the project that are excluded from drilling. Therefore, this brings down the spatial extend of impact, thereby reducing the impact significance as assessed in table. Probability remains high as there will now be more vehicles which increases chances of collision.

Table 6-19: Assessment of the impacts of field evaluation on biodiversity (fauna)

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L/M - 2 | L/M - 2 | M/L – 4 | M - 3 | L - 24 |
| **Post-mitigation** | L - 1 | L/M - 2 | L - 2 | M - 3 | L - 15 |

6.3.2.2.2 *Mitigations and recommendation to biodiversity (fauna)*

- Minimize driving especially to access areas that are excluded from drilling to reduce the potential of driving away animals.
- Existing roads must be utilised as much as possible to avoid creating new ones where possible.
- Discourage indiscriminate killing of perceived dangerous species (e.g. snakes and skorpions)
- Remove and relocate perceived dangerous species (e.g. snakes) to similar undisturbed habitats in the general area.

- A speed limit of 60km/h for exploration vehicles must be maintained onsite to prevent fatalities of fauna that may manifest from collisions with vehicles and earth moving equipment
- The Proponent should implement a severe penalty system for any worker who will be found hunting wild animals in the area.
- Local people should be employed to prevent poaching as the locals will be inclined to protecting their wildlife.

*6.3.2.3 Impact on water resources*

Spills of hydrocarbons from vehicles (bakkies), water trucks, the drill rig have the potential to contaminate surface water bodies or seep into the ground and contaminate groundwater.

Table 6-20: Assessment of the impacts of field evaluation on water quality

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L-/M - 2 | L-/M - 2 | M - 6 | M - 3 | L - 30 |
| **Post-mitigation** | L - 1 | L-/M - 2 | L - 4 | L/M - 2 | L - 10 |

*6.3.2.3.1 Mitigations and recommendation to water pollution*

- The Project Environmental Officer or Proponent should ensure that a sufficient number of drip trays are available on-site and must be used at all times when vehicles, trucks are idle as well as under the diesel trailer to contain any potential spillages.
- Contaminated soils that may have resulted from leakage/spillage from vehicles or machinery should be removed to a depth dependent on the size of the spill to prevent pollutants from leaching into the ground to contaminate groundwater.
- The contaminated soils should completely be removed and treated or disposed off in accordance to municipal wastewater discharge standards thereafter replaced with clean soil.
- The trailer with a diesel tank must have designated parking on site, which must be lined ground to prevent pollutants from leaching into the ground and potentially contaminating groundwater.
- Spillages must be completely be removed and treated or disposed off in accordance to municipal wastewater discharge standards.
- Personnel must use the toilet facilities provided onsite to prevent potential contamination of water resources.

*6.3.2.4 Impact on air quality*

T The possible source of air pollution at this stage would be the dust and fumes generated by general vehicles and trucks, diesel powered machinery, as well as minor drilling dust.

Table 6-21: Assessment of the impacts of field assessment on air quality

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | M - 3 | L-/M - 2 | M - 6 | L/M - 2 | L - 22 |
| **Post-mitigation** | L - 2 | L-/M - 2 | L - 4 | L/M - 2 | L - 16 |

*6.3.2.4.1 Mitigations and recommendation to air pollution*

- Dust generation should be kept at an acceptable level, by using existing roads and avoiding driving where possible.
- Water must be used during drilling to suppress the dust generated.
- Dust collectors must be used to catch the dust created from drilling
- A speed limit of 60km/h for light vehicles and 30km/h for heavy vehicles must be maintained onsite to minimise the dust generated by vehicles
- Exploration vehicles and trucks must not be left idling on site when not in use, to minimize gas emissions.
- The Proponent must ensure that all vehicles are properly serviced so that they do not give off harmful gases.
- Drill equipment should be regularly maintained to ensure drilling efficiency and so reduce dust generation.

*6.3.2.5 Impact of Noise*

The noise produced by the drill rig and diesel generator may be a nuisance to the employees and the neighbouring locals.

Table 6-22: Assessment of the noise impact from the detailed exploration activities

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L - 1 | L - 1 | M/L - 4 | L/M - 2 | L - 12 |
| **Post-mitigation** | L - 1 | L - 1 | L - 2 | L/M - 2 | L - 8 |

*6.3.2.5.1 Mitigations and recommendation to noise*

- Noise from general vehicles and equipment should be reduced to an acceptable level.
- Noisy equipment such as drill rigs should be shut down when they are not in use (when not needed) to avoid unnecessary noise on site.
- Workers performing noisy tasks should be rotated regularly (work on shifts) to avoid exposing them to excessive noise for a long period of time in a day.
- Workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure.
- Vehicles and machinery must be well serviced and lubricated to reduce noise
- In order to limit the noise from drilling equipment and the movement of vehicles, exploration works should be limited to or only be done between 08h00 and 17h00.

*6.3.2.6 Impact on traffic*

Impact on traffic safety when the drill rigs are brought to the area, which can result in slow moving traffic. Additionally, the weekly delivery of water tankers by water trucks from Swakopmund or Karibib can cause an increase in traffic. However, these will not go on for extended periods and will as such reduce the duration of impact.

Table 6-23: Assessment of the impacts of the detailed exploration on traffic (vehicular) safety

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L/M - 2 | L - 1 | M/L - 4 | L/M - 2 | L - 14 |

| | | | | | |
|---|---|---|---|---|---|
| **Post-mitigation** | L/M - 2 | L - 1 | L - 2 | L/M - 2 | L - 10 |

*6.3.2.6.1 Mitigations and recommendation to traffic safety*

- Trucks delivering water to the exploration site must have a scheduled time for travelling to and from site so that they do not interfere with daily traffic in the area
- Abnormal vehicles carrying drilling equipment must be well signaged to caution other drivers.
- All drivers of the project vehicles should be in possession of valid and appropriate driving licenses to operate such vehicles.
- Project vehicles should be in a road worthy condition and serviced regularly in order to avoid accidents as a result of mechanical faults of vehicles
- Best Cheer should operate within the Roads Act and be subjected to weigh bridges and necessary fees for road maintenance

*6.3.2.7 Impact on health and safety*

The general safety of workers onsite must be emphasized to comply with the Public Health Act (Act no. 36 of 1919) as well as the Labour Act. Therefore, handling of equipment and use of machinery onsite must not compromise the health and safety of employees.

Table 6-24: Assessment of the impacts of the detailed exploration on health and safety

| | **Extent** | **Duration** | **Intensity** | **Probability** | **Significance** |
|---|---|---|---|---|---|
| **Pre-mitigation** | L - 1 | L - 1 | M/H - 8 | L/M - 2 | L - 20 |
| **Post-mitigation** | L - 1 | L - 1 | L - 2 | L/M - 2 | L - 8 |

*6.3.2.7.1 Mitigations and recommendation for health and safety*

- Workers must be equipped with personal protective equipment PPE such as coveralls, gloves, safety boots, safety glasses and hard hats at all times at all times on work sites.
- Workers must be provided with sufficient training on how to handle different machinery and equipment. personnel should be trained in/sensitised to the potential health and safety risks associated with their respective jobs
- Workers must only operate within their designated areas and only operate machinery they have been trained to use
- No workers should be allowed to drink alcohol during working hours.
- No workers should be allowed on site if under the influence of alcohol.
- General vehicles should have designated parking, well away from the rigs.
- Drilled holes that are no longer be in use or will not be used later should be properly marked for visibility and capped/closed off.
- Employees should be sourced locally, to avoid transmission of infectious diseases.
- An emergency preparedness plan should be compiled and all personnel appropriately trained.
- Equip site with firefighting equipment (such as fire extinguishers) so that they are readily available for use in case of a fire.

### *6.3.3 Feasibility stage*

*6.3.3.1 Impact on soils*

At this stage the potential sources of soil contamination include petrochemical spills from vehicles (bakkies), water trucks, the drill rig, diesel operated generator as well as the trailer mounted diesel tank for fuel storage. The use of diamond wire cutting to obtain bulk samples has reduced the use of explosives in obtaining the blocks, which reduces the potential contamination of soils.

Table 6-25: Assessment of the impacts of field evaluation on soil pollution

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L/M - 2 | L/M - 2 | M – 6 | M - 3 | L - 30 |
| **Post-mitigation** | L - 1 | L/M - 2 | L - 2 | M - 3 | L - 15 |

*6.3.3.1.1 Mitigations and recommendation to soil pollution*

- Contamination control measures should be put in place to manage soil pollution.
- The Project Environmental Officer or Proponent should ensure that a sufficient number of drip trays are available on-site and must be used at all times when vehicles, trucks are idle as well as under the diesel trailer to contain any potential spillages.
- Contaminated soils that may have resulted from leakage/spillage from vehicles or machinery should be removed to a depth dependent on the size of the spill
- The contaminated soils should completely be removed and treated or disposed off in accordance to municipal wastewater discharge standards thereafter replaced with clean soil.
- The trailer with a diesel tank must have designated parking on site, which must be lined ground to prevent pollutants from reaching the soil.
- The proponent should appoint an Environmental officer to monitor soil contamination on site on a weekly basis.

In terms of soil disturbance, not much will be done at this stage as the access roads created during field assessment will be used, and the temporary camps will already be set up. However, a new source of disturbance would be the scrapping of overburden to expose rocks for drilling and cutting. However, this will only be done in selected areas and the impact of this is likely to be small as the rocks in the area are generally exposed with little to no soil cover. Therefore the impact will be over a limited area.

Table 6-26: Assessment of the impacts of field evaluation on soil disturbance

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L/M - 2 | L/M - 2 | M/L – 4 | M/L - 4 | M - 32 |
| **Post-mitigation** | L - 1 | L/M - 2 | L - 2 | L/M - 2 | L - 10 |

*6.3.3.1.2 Mitigations and recommendation to soil disturbance*

- Existing campsite should be used to avoid erecting temporary infrastructure in a different place.

- Existing roads must be utilised as much as possible to avoid creating new ones where possible.
- Rehabilitation of openings create by removal of blocks, should the project not be feasible such that there is no need to apply for a mining licence.
- Stockpile the topsoils to have a seedbank for reclamation works

#### 6.3.3.2 *Impact on biodiversity and habitat destruction*

The removal of vegetation will be minimal at this stage as the access roads created during field assessment will be used, and the temporary camps will already be setup. However, the scrapping of overburden to expose rocks for drilling and cutting might result in habitat disturbance. However this will have minimal impact because most of the targeted rocks are already exposed or outcropping.

Table 6-27: Assessment of the impacts of field evaluation on biodiversity (flora)

| | **Extent** | **Duration** | **Intensity** | **Probability** | **Significance** |
|---|---|---|---|---|---|
| **Pre-mitigation** | L/M - 2 | L/M - 2 | M - 6 | M/H - 4 | M - 40 |
| **Post-mitigation** | L - 1 | L/M - 2 | M/L - 4 | M - 3 | L - 21 |

#### 6.3.3.2.1 *Mitigations and recommendation to biodiversity (flora)*

- Existing campsite should be used to avoid erecting temporary infrastructure in a different place.
- Existing roads must be utilised as much as possible to avoid creating new ones where possible. Where necessary, roads must be expanded with highest consideration of the environment.
- Where possible, plants must be carefully removed and transplanted. Work together with the National Botanical Gardens (NBG) in plant rescue and relocation.
- Harvesting of seeds for replanting during reclamation
- Stockpile the topsoils to have a seedbank for reclamation works

In terms of animals, movement of vehicles around the project area will now be narrowed down to a localised site where drilling and cutting will be taking place. Animals will have the freedom to roam around in other areas of the project that are excluded from test mining. Therefore, this brings down the spatial extend of impact, thereby reducing the impact significance. For small mammals and reptiles that might be living on the areas selected for cutting out blocks, their habitat might be disturbed. However, this will be a limited area.

Table 6-28: Assessment of the impacts of field evaluation on biodiversity (fauna)

| | **Extent** | **Duration** | **Intensity** | **Probability** | **Significance** |
|---|---|---|---|---|---|
| **Pre-mitigation** | M - 3 | L/M - 2 | M – 6 | M - 3 | M - 33 |
| **Post-mitigation** | M - 3 | L/M - 2 | M/L - 4 | M - 3 | L - 21 |

#### 6.3.3.2.2 *Mitigations and recommendation to biodiversity (fauna)*

- Minimize driving especially to access areas that were excluded from drilling to reduce the potential of driving away animals.

- Existing roads must be utilised as much as possible to avoid creating new ones where possible.
- Discourage indiscriminate killing of perceived dangerous species (e.g. snakes and scorpions)
- Remove and relocate perceived dangerous species (e.g. snakes) to similar undisturbed habitats in the general area.
- The Proponent should implement a severe penalty system for any worker who will be found hunting wild animals in the area.
- Worked out areas must be demarcated and fenced off to keep animals out until they can be rehabilitated
- A speed limit of 60km/h for light vehicles and 30km/h for heavy must be maintained onsite to prevent fatalities of fauna that may manifest from collisions with vehicles and earth moving equipment

#### *6.3.3.3 Impact on water resources*

The potential impact relating to water that would be a concern is the possible lowering of the groundwater table as a result of abstraction. However, the exploration activities will not use water from boreholes in the area. Water tankers will be brought to site on a weekly basis, therefore no pressure on the local water resources. Unlike in the metal extraction industry, the mining and refining process of dimension stones does not require addition of chemicals in to concentrate and extract from an ore, neither does it output chemicals. The product is rather left in its inert state. Therefore, this reduces the potential of polluting or contaminating groundwater. Additionally, the use of diamond wire cutting has reduced the use of explosives in obtaining the blocks, which reduces the potential contamination of water. For this reason it can be said that the potential sources of pollution in this case can be spills of petrochemicals from vehicles (bakkies), water trucks, the drill rig as well as the trailer mounted diesel tank for fuel storage.

Table 6-29: Assessment of the impacts of field evaluation on water quality

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | M - 3 | L-/M - 2 | M - 6 | M - 3 | M - 33 |
| **Post-mitigation** | L-/M - 2 | L-/M - 2 | L - 4 | L/M - 2 | L - 16 |

##### *6.3.3.3.1 Mitigations and recommendation to water pollution*

- The Project Environmental Officer or Proponent should ensure that a sufficient number of drip trays are available on-site and must be used at all times when vehicles, trucks are idle as well as under the diesel trailer to contain any potential spillages.
- Contaminated soils that may have resulted from leakage/spillage from vehicles or machinery should be removed to a depth dependent on the size of the spill to prevent pollutants from leaching into the ground to contaminate groundwater.

- The contaminated soils should completely be removed and treated or disposed off in accordance to municipal wastewater discharge standards thereafter replaced with clean soil.
- The trailer with a diesel tank must have designated parking on site, which must be lined ground to prevent pollutants from leaching into the ground and potentially contaminating groundwater.
- Spillages must be completely be removed and treated or disposed off in accordance to municipal wastewater discharge standards.
- The use of diamond wire cutting in obtaining the blocks, to reduce the use of explosives which reduces the potential contamination of water
- Personnel must use the toilet facilities provided onsite to prevent potential contamination of water resources.

#### *6.3.3.4 Impact on air quality*

The possible source of air pollution at this stage would be the dust and fumes generated by general vehicles and trucks, diesel powered machinery, as well as dust from drilling and cutting. The assessment of this impact is presented in

Table 6-30: Assessment of the impacts of field assessment on air quality

| | **Extent** | **Duration** | **Intensity** | **Probability** | **Significance** |
|---|---|---|---|---|---|
| **Pre-mitigation** | M - 3 | L-/M - 2 | M /H - 8 | M/H - 4 | M - 52 |
| **Post-mitigation** | L - 2 | L-/M - 2 | L - 4 | L/M - 2 | L - 16 |

##### *6.3.3.4.1 Mitigations and recommendation to air pollution*

- Dust generation should be kept at an acceptable level, by using existing roads and avoiding driving where possible.
- Water must be used during drilling to suppress the dust generated.
- Dust collectors or buckets must be used to capture some of the dust generated by cutting and drilling
- Exploration vehicles and trucks must not be left idling on site when not in use, to minimize gas emissions.
- The Proponent must ensure that all vehicles are properly serviced so that they do not give off harmful gases.
- Drill equipment should be regularly maintained to ensure drilling efficiency and so reduce dust generation.
- The proponent should appoint an Environmental officer to monitor dust and gas on site on a weekly basis during this phase.
- A speed limit of 60km/h for light vehicles and 30km/h for heavy vehicles must be maintained onsite to minimise the dust generated by vehicles

*6.3.3.5 Impact of Noise*

The possible sources of noise include the drill rig, the diamond wire cutter and diesel generator, which may be a nuisance to the employees, the neighbouring locals and animals.

Table 6-31: Assessment of the noise impact from the detailed exploration activities

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L /M - 2 | L - 1 | M/L - 4 | L/M - 2 | L - 14 |
| **Post-mitigation** | L /M - 2 | L - 1 | L - 2 | L/M - 2 | L - 10 |

*6.3.3.5.1 Mitigations and recommendation to noise*

- Noise from general vehicles and equipment should be reduced to an acceptable level.
- Noisy equipment such as drill rigs should be shut down when they are not in use (when not needed) to avoid unnecessary noise on site.
- Workers performing noisy tasks should be rotated regularly (work on shifts) to avoid exposing them to excessive noise for a long period of time in a day.
- Workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure.
- Vehicles and machinery must be well serviced and lubricated to reduce noise
- In order to limit the noise from vehicles, drilling and cutting equipment as well as the movement of vehicles, test mining works should be limited to or only be done between 08h00 and 17h00.

*6.3.3.6 Impact on traffic*

Impact on traffic safety includes having heavy trucks on the road for drill rigs as well as for transporting mined blocks from site to the factories for testing. This can result in slow moving traffic. Additionally, the weekly delivery of water tankers by water trucks from Swakopmund or Karibib can cause an increase in traffic. However, these will not go on for extended periods and will as such reduce the duration of impact.

Table 6-32: Assessment of the impacts of the detailed exploration on traffic (vehicular) safety

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | M - 3 | L - 1 | M/L - 4 | L/M - 2 | L - 16 |
| **Post-mitigation** | M - 3 | L - 1 | L - 2 | L/M - 2 | L - 12 |

*6.3.3.6.1 Mitigations and recommendation to traffic safety*

- Trucks delivering water to the exploration site must have a scheduled time for travelling to and from site so that they do not interfere with daily traffic in the area
- Abnormal vehicles carrying drilling equipment or granite blocks must be well signaged to caution other drivers.
- All drivers of the project vehicles should be in possession of valid and appropriate driving licenses to operate such vehicles.
- Project vehicles should be in a road worthy condition and serviced regularly in order to avoid accidents as a result of mechanical faults of vehicles

- Best Cheer should operate within the Roads Act and be subjected to weigh bridges and necessary fees for road maintenance

*6.3.3.7 Impact on health and safety*

The general safety of workers onsite must be emphasized to comply with the Public Health Act (Act no. 36 of 1919) as well as the Labour Act. Therefore handling of equipment and use of machinery onsite must not compromise the health and safety of employees. Another health hazard could be transmission of diseases including HIV/AIDS, however this would only be a concern if there was an influx of workers from elsewhere. This is reduced by the fact that local people will be prioritized for employment.

Table 6-33: Assessment of the impacts of the detailed exploration on health and safety

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L/M - 2 | L - 1 | M/H - 8 | L/M - 2 | L - 22 |
| **Post-mitigation** | L/M - 2 | L - 1 | L - 2 | L/M - 2 | L - 10 |

*6.3.3.7.1 Mitigations and recommendation on health and safety*

- Workers must be equipped with personal protective equipment PPE such as coveralls, gloves, safety boots, safety glasses and hard hats at all times at all times on work sites.
- Workers must be provided with sufficient training on how to handle different machinery and equipment.
- Workers must only operate within their designated areas and only operate machinery they have been trained to use
- No workers should be allowed to drink alcohol during working hours.
- No workers should be allowed on site if under the influence of alcohol.
- General vehicles should have designated parking, well away from the rigs
- Employees should be sourced locally, to avoid transmission of infectious diseases.
- An emergency preparedness plan should be compiled and all personnel appropriately trained.
- Equip site with firefighting equipment (such as fire extinguishers) so that they are readily available for use in case of a fire.
- Worked out areas must be demarcated and fenced off to keep people out until they can be rehabilitated
- All employees must be aware of the assembly point in case of emergency.
- Fires and cooking places must be well away from the diesel storage trailers.

*6.3.3.8 Visual Impact*

Since the targeted rock mass stands out due to its high relief, the proposed project is anticipated to potentially cause visual impact on the landscape, which takes away from the sense of the place and could potentially affect tourism. This is because scars of test mining working areas may be visible from long distances. However, this will only be the case if land reclamation and restoration is not properly executed. Additionally, this will only be restricted

to the period of test mining, and unlike actual mining, it will only aim for certain parts of the targeted outcrops, therefore the spatial extent of impact will be low.

Table 6-34: Assessment of visual impact during feasibility stage

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L-/M - 2 | M/H - 4 | M/L - 4 | M/H - 4 | M - 40 |
| **Post-mitigation** | L - 1 | L-/M - 2 | L - 2 | M/L - 2 | L - 10 |

*6.3.3.8.1 Mitigations and recommendation to visual impact*

- Rehabilitation by backfilling of openings create by removal of blocks, should the project not be feasible such that there is no need to apply for a mining licence.
- Rock shading to temporarily reduce visual impact before rehabilitation

*6.3.3.9 Impact on Archaeology*

Destruction of archaeological sites might occur during excavation and test mining using a butterfly cutter. However the likelihood or probability of this happening is minimal as there are no known archaeological sites or sites of heritage importance known in the project area.

Table 6-35: Assessment of archaeological impact during feasibility stage

| | Extent | Duration | Intensity | Probability | Significance |
|---|---|---|---|---|---|
| **Pre-mitigation** | L - 1 | H - 5 | M/H - 8 | M/H - 4 | M - 56 |
| **Post-mitigation** | L - 1 | L - 1 | L - 2 | L - 1 | L - 4 |

*6.3.3.9.1 Mitigations and recommendation to archaeological*

- Personnel should be informed not to destroy, damage, remove or throw away any unknown objects found/discovered on site during operations,
- If any archaeological materials are found, the National Heritage Council's Chance Find Procedures should be followed. Furthermore, the worksite manager should be notified and all on-site activities stopped immediately.

### *6.3.4 Cumulative Impacts*

Cumulative impacts are defined as "those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as "developments") when added to other existing, planned, and/or reasonably anticipated future ones" (International Finance Corporation, 2013).

One cumulative impact to which can result from the proposed project is the impact on air quality from gases and dust generated during the different stages of exploration. These contribute to the general gas and dust emissions from other sources in the region. The proposed exploration activity also contributes cumulatively to various activities such as noise and traffic. The contribution of the proposed project to these cumulative impacts is however not considered significant given that mineral exploration activities will take place on a small area (spatial scale) and it will go on for a short period (duration).

# 7 CONCLUSIONS AND RECOMMENDATIONS

The aim of this environmental scoping assessment was to identify the potential impacts associated with the proposed exploration activities on the EPL 5161, assess and recommend practical mitigation measures. The public was consulted as required by the EMA and its 2012 EIA Regulations (Section 21 to 24). The public was informed via the three newspapers used for this assessment; site/public notices placed in the project site area, relevant local and regional offices notice boards. For consultation meetings, the public meeting was held in person for the local community and a virtual meeting for the national authorities. The interested and affected parties raised their comments and concerns on the proposed project activities, which formed the basis for this report as well as the EMP.

This environmental scoping assessment permitted for key potential impacts related to the proposed exploration project to be identified and assessed. All impacts had a relatively low rating and suitable mitigation measures (where required and possible) were recommended to minimise them further. Based on the findings of this impact assessment the impacts identified can be summarised as follows:

- **Impact on Soils** – was divided into soil pollution and soil disturbance. Potential sources of soil pollution include petrochemical spills from vehicles (bakkies), water trucks, the drill rig, diesel operated generator as well as the trailer mounted diesel tank for fuel storage. In terms of soil disturbance, most of it is anticipated during the early stages of the project, whereby roads will need to be created, exploration camp to be erected and clearing of selected areas for detailed mapping traverses.
- **Impact on air quality** - The possible source of air pollution would be the dust and fumes generated by project vehicles and trucks, diesel powered machinery, as well as dust from drilling and cutting.
- **Impact on biodiversity and habitat destruction** – could potentially result from the removal of vegetation to create access roads and erect temporary exploration camps onsite during field evaluation. The scrapping of overburden to expose rocks for drilling and cutting might result in habitat disturbance.
- **Impact on surface and groundwater resources** – it was established that there is no surface water in the area as it seldom receives rainfall, and communities rely on groundwater. Therefore, to avoid putting pressure on this resource, the project will source water offsite and transport it in water tankers on a weekly basis. This takes away possible lowering of the groundwater table as a result of abstraction. In terms of water quality, potential sources of pollution can be spills of petrochemicals from vehicles (bakkies), water trucks, the drill rig as well as the trailer mounted diesel tank for fuel storage.

- **Visual impact** – this is a potential impact during the feasibility stage where blocks of rock will be taken or cut from selected areas for testing. However, the significance of this impact is lowered by the fact that test mining will only cover selected areas, which reduces the spatial extent of impact. Additionally, if test mining does not yield positive results, such that there will be a need to apply for a mining licence, the testing blocks will be put back and the area will be rehabilitated.
- **Noise impact**: There is an inconvenient impact of noise to neighbouring locals associated with exploration vehicles, trucks and equipment. The noise from machinery may also pose a health risk to workers that operate them or the ones working directly in noisy areas.
- **Impact on vehicular traffic safety** - having water trucks, heavy trucks on the road for drill rigs as well as those transporting mined blocks from site to the factories for testing may impact traffic safety.
- **Impact on archaeology -** Destruction of archaeological sites might occur during excavation and test mining using a butterfly cutter. However, the likelihood or probability of this happening is minimal as there are no other known archaeological sites or sites of heritage importance known in the project area, except the ones considered in this assessment.
- **Impacts the health and safety of workers** – from the handling of equipment and use of machinery as well as potentially contracting diseases.

All these impacts can be adequately addressed by the recommendations given under subchapter 6.3 together with management actions given in the EMP (**Appendix H).** Some positive impacts were also identified, which include creation of temporary employment, skills transfer, training and certification of local communities which results in community empowerment.

Based on the findings of this assessment and on the information provided in this report, OMAVI Geotechnical & Geo-Environmental Consultants CC is confident the identified risks associated with the proposed exploration project can be reduced to acceptable levels by implementation of the measures recommended in the EMP. It is therefore recommended that the project receives Environmental Clearance, provided that the EMP be implemented.

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**A3 INSERTS OF SITE AND REGIONAL MAPS**

**APPENDIX A –CV OF EAP**

**APPENDIX B — INTERESTED AND AFFECTED PARTY DATABASE**
Table of identified and registered I &APs

**APPENDIX C – NEWSPAPER ADVERTISEMENTS**
Photos of newspaper adverts

**APPENDIX D – AUTHORITY AND PUBLIC MEETING MINUTES**

**APPENDIX E - PUBLIC MEETING ATTENDANCE REGISTER**

**APPENDIX F – ISSUES AND RESPONSE TRAIL**

**APPENDIX G – PROOF OF COMMUNICATION**

**APPENDIX H – ENVIRONMENTAL MANAGEMENT PLAN (EMP)**

**APPENDIX I – GROUNDWATER STUDY REPORT FOR EPL 5161**