



Environmental Scoping Assessment (ESA) Report for the:

**Proposed Exploration and Quarrying of Dimension Stone on Mining Claim 68945,
 Daures Constituency, Erongo Region, Namibia**

MEFT APPLICATION NO.:	APP- 003576
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EXECUTIVE SUMMARY

Mr. Jacobus Zandberg (hereinafter referred to as the Proponent), the sole holder of Mining Claim 68945 intends to undertake prospecting and small to medium-scale quarrying for dimension stones on the mining claim and eventually mine the economically confirmed portions of the site. The Mining Claim 68945 is located within the #Gaingu Communal Conservancy in the Daures Constituency, about 80 km northeast of Swakopmund, 50 km southeast of Henties Bay, approximately 65 km northwest of Arandis and about 20 km northwest of the Trekkopje Mine.

The proposed exploration and mining works are among the listed activities in the Environmental Management Act (EMA) No. 7 of 2007 and its 2012 Environmental Impact Assessment (EIA) Regulations that may not be undertaken without getting the environmental clearance certificate (ECC). Consequently, Mr. Jacobus Zandberg appointed OMAVI Geotechnical & Geo-Environmental Consultants CC (hereinafter referred to as OMAVI Consultants) to undertake the required Environmental Scoping Assessment process and apply for the ECC for the proposed project activities.

It is for this reason, that this Environmental Scoping Assessment (ESA) Report was compiled. The Report contains all the information that was gathered from the environmental assessment process. This includes description of the proposed project activities and alternatives, legal requirements, the pre-project environmental conditions, public consultation means, identified potential impacts (both by the Consultants and registered interested and affected parties), their assessment and provision of the necessary practical measures to manage avoid and or minimize each impact' significance.

Public consultation, Key issues Raised and Identified Potential Impacts

The public consultation process took place from the 8th of March 2022 to 9th April 2022. The public was informed of the ESA process and consulted through the following means:

- Newspaper adverts (on 8 and 14 March 2022 through *Die Republikein*, *Namibian Sun* and *Allgemeine Zeitung* newspapers).
- Email notifications sent to all pre-identified Interested & Affected Parties (I&APs) on 31 March 2022.
- Site notices placed at the !Oe#Gan Traditional Authority Office in Spitzkoppe Village, and at the B2 turn off to Spitzkoppe village
- The public consultation meeting was held at the !Oe#Gan Traditional Authority Office, on the 9th of April 2022, starting with the Conservancy and Traditional Authority Leadership at 11h00 and later with the general community at 14h00.

Issues and concerns to the proposed project: Public (I&APs) Feedback

The main issues (potential negative impacts) that were raised during the public consultation process are as follows:

1. Potential impacts on biodiversity (particularly the safety of animals)
2. Impact of operations on water (water demand and availability)
3. Impacts on local roads linked to the project activities /vehicular traffic
4. Surety of rehabilitation post exploration and quarrying
5. Environmental pollution (of water, soils, the general environment) by waste generated by the project
6. Occupational health risks (dust, noise)
7. Social issues raised as summarized below:
 - o Provision of sufficient information to affected landowners/occupiers of land to be able to understand the potential current and future impacts associated with the proposed projects to be able raise concerns and make well-informed decisions.
 - o Emphasis on the importance of public participation process with local and affected communities to avoid future conflicts.
 - o Circulation of project documents to the community, particularly the Environmental Management Plan (EMP).
 - o Timely liaison and consultation of landowners or occupiers of land (through their traditional authority) regarding signing of land use agreements prior to commencement of exploration and quarrying activities.

Potential identified impacts (Positive and negative):

Potential positive impacts:

- Socio-economic development through employment creation and skills transfer (during exploration, mining and processing)
- Increased support for local businesses through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, etc.
- Once proved to be economical in the exploration phase, the mining and sale of the processed dimension stone (off site) will result in the payment of national taxes and royalties to the responsible institutions of the Government of the Republic of Namibia
- Improved geological understanding of the site area regarding dimension stones.

Potential negative impacts:

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 in combination with issues raised during the public consultation process. The key impacts considered are as follows:

- **Physical land / soil disturbance:** anticipated to come from invasive exploration techniques and mining, clearing of land to erect camps, driving of project of vehicles which loosen the soils, making it more vulnerable to erosion.
- **Soil pollution** –Potential sources of soil pollution include petrochemical or hydrocarbon spills from vehicles (bakkies), water trucks, the drill rig, diesel operated generator as well as the trailer mounted diesel tank for fuel storage.
- **Impact on air quality** - The possible source of air pollution would be potential dust generated by excavation, drilling and diamond wire saw cutting, coupled with fumes generated by project vehicles and trucks, diesel powered machinery.
- **Impact on biodiversity and habitat destruction** – could potentially result from the removal of vegetation to create access roads and erect temporary camps onsite during life of the project. Temporary occupation of the area could potentially affect habitat and migration of animals. The scrapping of overburden to expose rocks for drilling and cutting might result in habitat disturbance.
- **Impact on surface and groundwater resources** – drilling of a borehole could compromise the quality of groundwater in the area from potential over abstraction. Another concern when it comes to groundwater is potential pollution by hydrocarbon spills from vehicles (bakkies), water trucks, the drill rig as well as the trailer mounted diesel tank for fuel storage.
- **Visual impact** – this potential impact is anticipated during feasibility stage where blocks of rock will be cut from selected areas (limited spatial extend) for testing (test quarrying). It can also be expected, if exploration yields positive results, in which case actual mining and extraction of blocks will then commence.
- **Noise impact:** The drilling and quarrying activities as well as movements of heavy equipment and vehicles associated with the project may lead to elevated noise levels, which can be a nuisance to the hosting community and immediate neighbours. This impact could also be a health risk to workers operating directly in noisy areas.

- **Impact on vehicular traffic:** heavy vehicles associated with the project will obtain access to the site from the B2 national road via the D1918 that connects the mining claim to the service providers (water carting, exploration machinery, equipment, and others). Other vehicles that may impact traffic safety include trucks transporting mined blocks from site to the factories in Karibib and /or Walvis Bay for testing and processing.
- **Impact on archaeology** - Destruction of archaeological sites might occur during invasive exploration and mining techniques such as drilling, excavation and cutting..
- **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 were found to be of medium significance. Mitigation measures were recommended in the scoping report so that the significance of impacts that cannot be avoided is reduced from medium to low rating. The mitigation measures are outlined in the EMP for implementation by respective parties to manage these impacts.

Conclusions and recommendations

Based on this assessment and the information provided in this report, OMAVI is confident that the identified risks associated with the project can be reduced to acceptable levels, if the measures recommended in the EMP are implemented. However, to maintain a low significance rating, monitoring of the potential impacts by the Proponent (an Environmental Control Officer (ECO)) is highly recommended. **Monitoring will not only be carried out to maintain the low rating of impacts' significance but also to ensure that new potential impacts that might arise during project implementation are well identified in time, properly addressed and that suitable mitigation measures are provided and implemented. An inventory of baseline data for must be kept on site for various key environmental receptors as part of monitoring.**

It is therefore recommended that an Environmental Clearance Certificate be issued for the proposed exploration on MC 68745, provided that the EMP be implemented and subject to the following recommendations:

- All required permits, licenses and approvals for the proposed activities should be obtained as required (please refer to the Permitting and Licensing Table in the Environmental Management Plan (**Appendix B**). These include permits and licenses for land/farm access agreements to explore and ensuring compliance with these specific legal requirements.

- The Proponent complies with the legal requirements governing this type of project and its associated activities.
- All mitigations provided in this ESA Report and the management action plans in the EMP should be implemented and monitoring conducted as recommended.
- All the necessary environmental and social (occupational health and safety) precautions provided should be adhered to.
- Site areas where exploration and quarrying activities have ceased should be rehabilitated, as far as practicable, to their original state.
- The monitoring of the implementation of mitigation measures should be conducted, applicable impact's actions taken, reporting done and recorded as recommended in the Draft EMP.

In conclusion, the proposed project activities will have a significant negative impact on the biophysical and social environments in the project area if the proposed impact management measures are not effectively implemented. Therefore, it is vital for the Proponent and their contractors (if any) to effectively implement and monitor the recommended management measures to protect the environment and promote environmental sustainability. Furthermore, the Office of the Environmental Commissioner is encouraged to enforce the proposed impact management measures through its Environmental Inspectors in order to ensure compliance.

CONTENTS PAGE

1	INTRODUCTION	1
1.1	PROJECT BACKGROUND	1
1.2	OWNERSHIP OF MINING CLAIM 68945	5
1.3	PROJECT JUSTIFICATION.....	5
1.4	THE NEED FOR ENVIRONMENTAL SCOPING ASSESSMENT.....	6
1.5	APPOINTED ENVIRONMENTAL ASSESSMENT PRACTITIONER.....	6
1.6	THE ENVIRONMENTAL SCOPING ASSESSMENT PROCESS.....	7
1.7	LIMITATIONS OF THE STUDY	8
2	PROJECT DESCRIPTION	9
2.1	PLANNED ACTIVITIES: PROPOSED EXPLORATION METHODS.....	9
2.1.1	<i>Desktop Study</i>	10
2.1.2	<i>Field evaluation</i>	10
2.1.3	<i>Detailed exploration</i>	10
2.1.4	<i>Feasibility study: Test Quarrying</i>	10
2.2	PLANNED ACTIVITIES: PROPOSED MINING TECHNOLOGIES	11
2.2.1	<i>Quarry development</i>	11
2.2.2	<i>Block mining and handling</i>	11
2.3	REHABILITATION OF EXPLORED SITES AND DECOMMISSIONING	12
2.4	PROJECT INPUTS AND ASSOCIATED INFRASTRUCTURE	13
2.4.1	<i>Temporary shelter / accommodation</i>	13
2.4.2	<i>Vehicles, Machinery and Equipment</i>	13
2.4.3	<i>Power Requirements (for vehicles, machinery and domestic use)</i>	13
2.4.4	<i>Water supply</i>	14
2.4.5	<i>Roads</i>	15
2.4.6	<i>Waste production and sanitation</i>	15
2.4.7	<i>Personnel and site safety</i>	15
2.5	PROJECT ALTERNATIVES	16
2.5.1	<i>Project location alternative</i>	16
2.5.2	<i>Alternative Exploration and Mining methods (techniques)</i>	16
2.5.3	<i>Alternative supporting infrastructure</i>	17
2.5.4	<i>No-go alternative</i>	18
3	LEGAL REQUIREMENTS.....	19
3.1	APPLICABLE LEGISLATIONS AND COMPLIANCE STATUS.....	19
3.2	RELEVANT LISTED ACTIVITIES IN TERMS OF EMA.....	32
3.3	INTERNATIONAL POLICIES, PRINCIPLES, STANDARDS, TREATIES AND CONVENTIONS	33
4	THE RECEIVING ENVIRONMENT	38
4.1	BIOPHYSICAL ENVIRONMENT	38
4.1.1	<i>Climatic Conditions</i>	38
4.1.2	<i>Geology and soils in the area</i>	40
4.1.3	<i>Topography and Drainage of the area</i>	43
4.1.4	<i>Groundwater Resources</i>	46
4.1.5	<i>Biodiversity Baseline Information</i>	47
4.2	THE SOCIO-ECONOMIC ENVIRONMENT	53
4.2.1	<i>Population Density and Socio-economic Profile</i>	53
4.2.2	<i>Current Land Use of the area</i>	53
4.2.3	<i>Existing infrastructure</i>	55
4.2.4	<i>Air quality and Noise levels</i>	56
4.2.5	<i>Archaeology and Heritage Resources</i>	56
5	THE PUBLIC PARTICIPATION PROCESS	60
5.1	STAKEHOLDERS AND INTERESTED & AFFECTED PARTIES (I&APs)	60

5.2	THE PUBLIC CONSULTATION PROCESS	61
5.2.1	<i>Background Information Document (BID)</i>	61
5.2.2	<i>Project notices</i>	61
5.2.3	<i>Public consultation meeting</i>	62
5.3	KEY ISSUES RAISED	63
6	IMPACT IDENTIFICATION AND ASSESSMENT	66
6.1	IMPACT ASSESSMENT METHODOLOGY	67
6.1.1	<i>Impact Assessment Screening</i>	67
6.1.2	<i>Impact Assessment Criteria</i>	68
6.1.3	<i>Impact Significance</i>	70
6.2	POSITIVE IMPACTS: DESCRIPTION AND ASSESSMENT	71
6.2.1	<i>Socio-economic development (Employment and Social Responsibilities)</i>	71
6.2.2	<i>Socio-economic development (Value Added Taxes and Royalty)</i>	72
6.2.3	<i>Improved geological understanding of the site</i>	72
6.3	NEGATIVE IMPACTS: DESCRIPTION AND ASSESSMENT	72
6.3.1	<i>Impact on Groundwater Quantity (Over-abstraction)</i>	73
6.3.2	<i>Impact on Soils (Physical Land Disturbance)</i>	75
6.3.3	<i>Soils and Water Resources Pollution</i>	76
6.3.4	<i>Impact on Biodiversity (Fauna and Flora)</i>	78
6.3.5	<i>Visual impact</i>	79
6.3.6	<i>Noise</i>	80
6.3.7	<i>Vehicular Traffic</i>	81
6.3.8	<i>Impact on Surrounding Air Pollution (Dust)</i>	83
6.3.9	<i>Impact of Poor Communication (Proper Liaison): Proponent and Landowners</i>	84
6.3.10	<i>Impact on local services and infrastructure (roads, fence, and pipelines)</i>	85
6.3.11	<i>Health and Safety</i>	85
6.3.12	<i>Archaeological impact</i>	87
6.3.13	<i>Waste Generation</i>	89
6.3.14	<i>Social Nuisance: Job seeking and Differing Norms, Culture and Values</i>	90
6.3.15	<i>Social Nuisance: Property intrusion and Disturbance or Damage</i>	91
6.4	CUMULATIVE IMPACTS.....	91
6.5	DECOMMISSIONING (CESSATION OF EXPLORATION AND MINING ACTIVITIES)	93
6.5.1	<i>Loss of Employment, Revenue and Royalties</i>	93
6.6	SITE REHABILITATION.....	94
7	RECOMMENDATIONS AND CONCLUSIONS	95
7.1	RECOMMENDATIONS.....	95
7.2	CONCLUSIONS.....	96
8	REFERENCES	97

List of Figures

Figure 1-1: The location of Mining Claim 68945, relative to neighbouring major towns of Swakopmund, Henties Bay, and Arandis in the Erongo Region	2
Figure 1-2: The location of MC 68945 on communal land, within the #Gaingu Communal Conservancy in the Daures Constituency, about 20 km northwest of the Trekkopje Mine and Solar Farm.....	3
Figure 1-3: The location of MC-68945 relative to the closest farms and communities.	4
Figure 1-4: Details of Mining Claim (MC) 68945 as displayed on the Namibia Mining Portal (As accessed on 03 June 2022 via: https://portals.landfolio.com/namibia/). The location of Trekkopje Mine has been added for orientation.	5
Figure 1-5: Schematic process flow of Namibia's Environmental Assessment Procedure	8
Figure 2-1: Typical mining and quarrying by diamond wire technology (Ashmole and Motloun, 2008); an example of a front-end block loader removing extracted blocks from an active quarry; and loading of saleable blocks for long-distance haulage.	12
Figure 2-2: An example of a fixed fuel storage tank, installed on paved ground to minimise the risk of pollution.	14
Figure 4-1: The climatic zones of Erongo Region, showing associated mean annual rainfalls. (Modified after Mendelsohn et al. 2002, to show the approximate position of MC 68945).	39
Figure 4-2: The maximum, minimum and average temperature for the Arandis area (World Weather Online, 2022).	39
Figure 4-3: The rainfall patterns around Arandis (after World Weather Online, 2022).	40
Figure 4-4: The geology of the area around the Mining Claim 68945.	42
Figure 4-5: One of the locations where the targeted dolerite was observed, with residual soils from the weathering of surrounding rocks.....	43
Figure 4-6: The general terrain around MC 68945, with undulating plains and occasional "koppies".....	44
Figure 4-7: A map showing the location of the Mining Claim 68945, relative to topography and drainage.	45
Figure 4-8: The general water quality of the area.	47
Figure 4-9: Areas of high biodiversity value in the central Namib in the context of the uranium rush (edited after MME, 2010 to show approximate location of MC 68945).....	48
Figure 4-10: The distribution of vegetation relative to topography and climate.	49
Figure 4-11: The location of MC 68945 and other mineral licensed areas.....	55
Figure 4-12: A and B stone artifacts found on the project area, and C – the iron remains found outside the project area. (Source: Mushi, 2022).	59
Figure 4-13: Location of sites where the iron remains were found as well as the position of Grootspitzkop relative to the Mining Claim area. (Source: Mushi, 2022).	60
Figure 5-1: Site notices placed at (A) the !Oe#Gan Traditional Authority Office in Spitzkoppe Village, and at (B) the B2 turn off to Spitzkoppe village.....	62
Figure 5-2: Top photos are from the meeting with Leadership of !Oe#Gan Traditional Authority and the #Gaingu Communal Conservancy while the bottom photos are from the meeting with the general community of Spitzkoppe village and nearby villages.	63
Figure 6-1: Screening process for determining key impacts (source: Resilient Environmental Solutions, 2019)	68

List of Tables

Table 1-1: Approximate GPS Coordinates of corners Mining Claim 68945.	1
Table 2-1: A summary of the alternative infrastructure considered for the project.	17
Table 3-1: Summary of relevant Acts and their applicability to the proposed project.....	21
Table 3-2: Applicable listed activities in terms of the EMA EIA Regulations of 2012.....	32
Table 3-3: Applicable International Policies, Principles, Standards, Treaties and Convention .	34
Table 4-1: A summary of observed vegetation and their conservation status according to the Burke (2008) and Namibia Biodiversity Database.	50
Table 5-1: A summary of key issues received.	63
Table 6-1: Impact Assessment Criteria employed to assess the potential negative impacts ..	69
Table 6-2: Impact significance rating scale.....	70
Table 6-3: Assessment of the project impact on water resources abstraction (quantity)	73
Table 6-4: Impact assessment of project activities on soils (physical disturbance)	75
Table 6-5: Assessment of the project impact on soils and water resources (quality)	76
Table 6-6: Impact assessment of project activities on biodiversity.	79
Table 6-7: Visual impact assessment	80
Table 6-8: Noise impact assessment	81
Table 6-9: Vehicular traffic impact assessment	82
Table 6-10: Air quality impact assessment.....	83
Table 6-11: Impact of poor communication between the Proponent and landowners (occupies)	84
Table 6-12: Assessment of impacts on local (farms) infrastructure	85
Table 6-13: Health and Safety impact assessment	86
Table 6-14: Archaeological impact assessment	88
Table 6-15: Impact assessment of waste generation on the environment.....	89
Table 6-16: Social impact assessment of outsiders' influx into the area (job seeking)	90
Table 6-17: Social impact assessment of outsiders' influx into the area (locals' properties)	91
Table 18: Impact assessment of project activities closure on employment	93

ABBREVIATIONS

DEAF	Department of Environmental Affairs and Forestry
DTH	Down-The-Hole drilling
DWA	Department of Water Affairs
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
GWAUP	Groundwater Abstraction and Use Permit
I&APs	Interested and Affected Parties
MEAC	Ministry of Education, Arts and Culture
MAWLR	Ministry of Agriculture, Water & Land Reform
MC	Mining Claim
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
NHC	National Heritage Council of Namibia
NBG	National Botanical Gardens
TA	Traditional Authority(s)

1 INTRODUCTION

1.1 Project background

Mr. Jacobus Zandberg (hereinafter referred to as the Proponent), is the sole holder of Mining Claim 68945 and intends to undertake prospecting and eventual mining or quarrying of dimension stones (dolerites, red granites and marbles – herein referred to as units of interest or targeted units)) on a small to medium scale. The Mining Claim (MC) 68945 is located about 80 km northeast of Swakopmund, 50 km southeast of Henties Bay, approximately 65 km northwest of Arandis (**Figure 1-1**). It lies on communal land, within the #Gaingu Communal Conservancy in the Daures Constituency, and about 20 km northwest of the Trekkopje Mine as seen in **Figure 1-2**. The approximate corner coordinates of the mining claim are shown in **Table 1-1**.

Table 1-1: Approximate GPS Coordinates of corners Mining Claim 68945.

Mining Claim	Latitude	Longitude
68945	-22.022863°	14.717340°
	-22.018967°	14.722520°
	-22.020849°	14.724181°
	-22.024582°	14.720124°

The mining claim is on the part of the constituency which has no human occupation. The closest community is in Marenica, located about 20 km to the east, and the Farms Hakskeen, Sukses and Trekkopje all in excess of 20 km as seen in in **Figure 1-3**. The area is under the leadership of the Oe#Gan Traditional Authority.

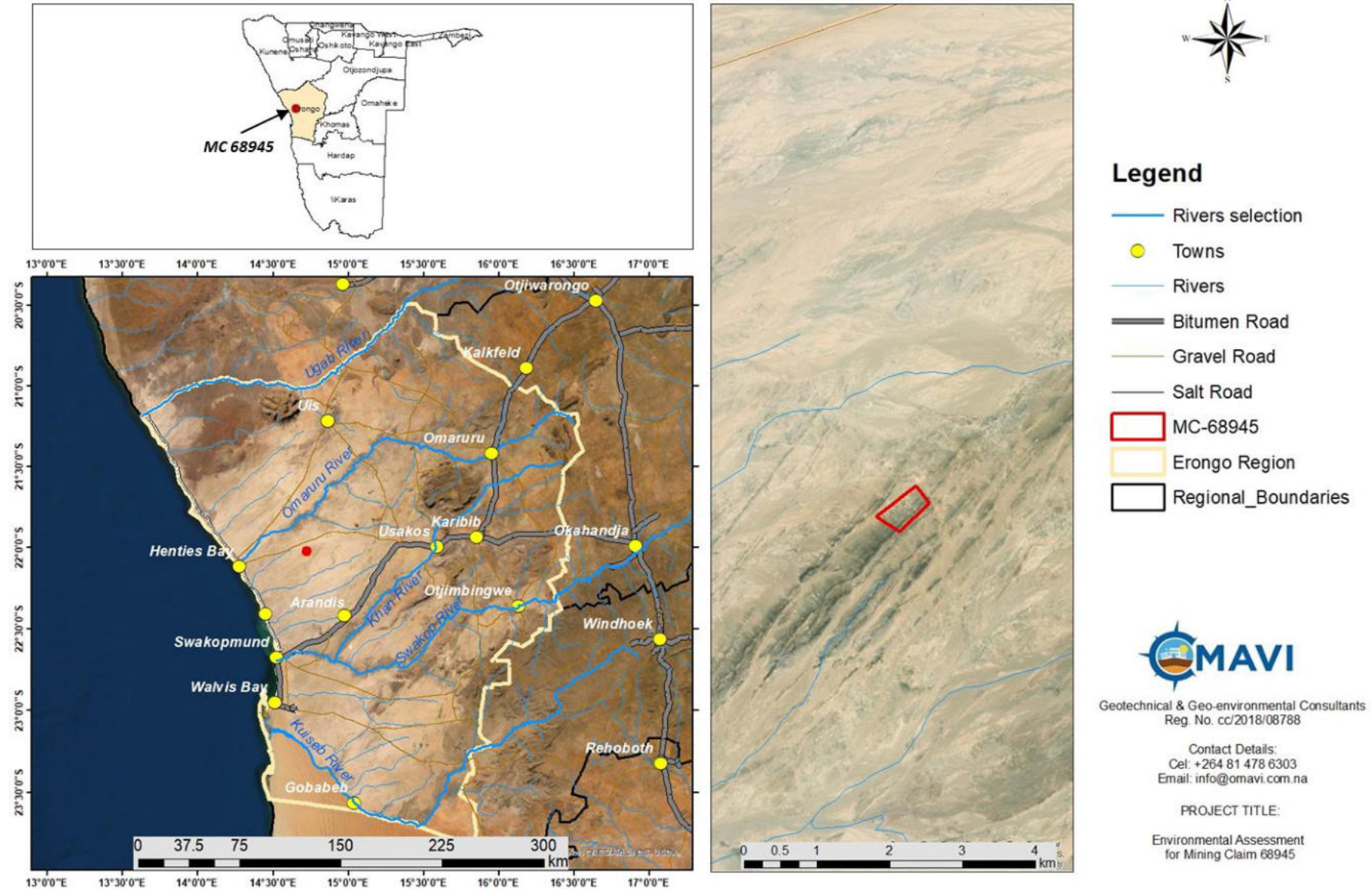


Figure 1-1: The location of Mining Claim 68945, relative to neighbouring major towns of Swakopmund, Henties Bay, and Arandis in the Erongo Region

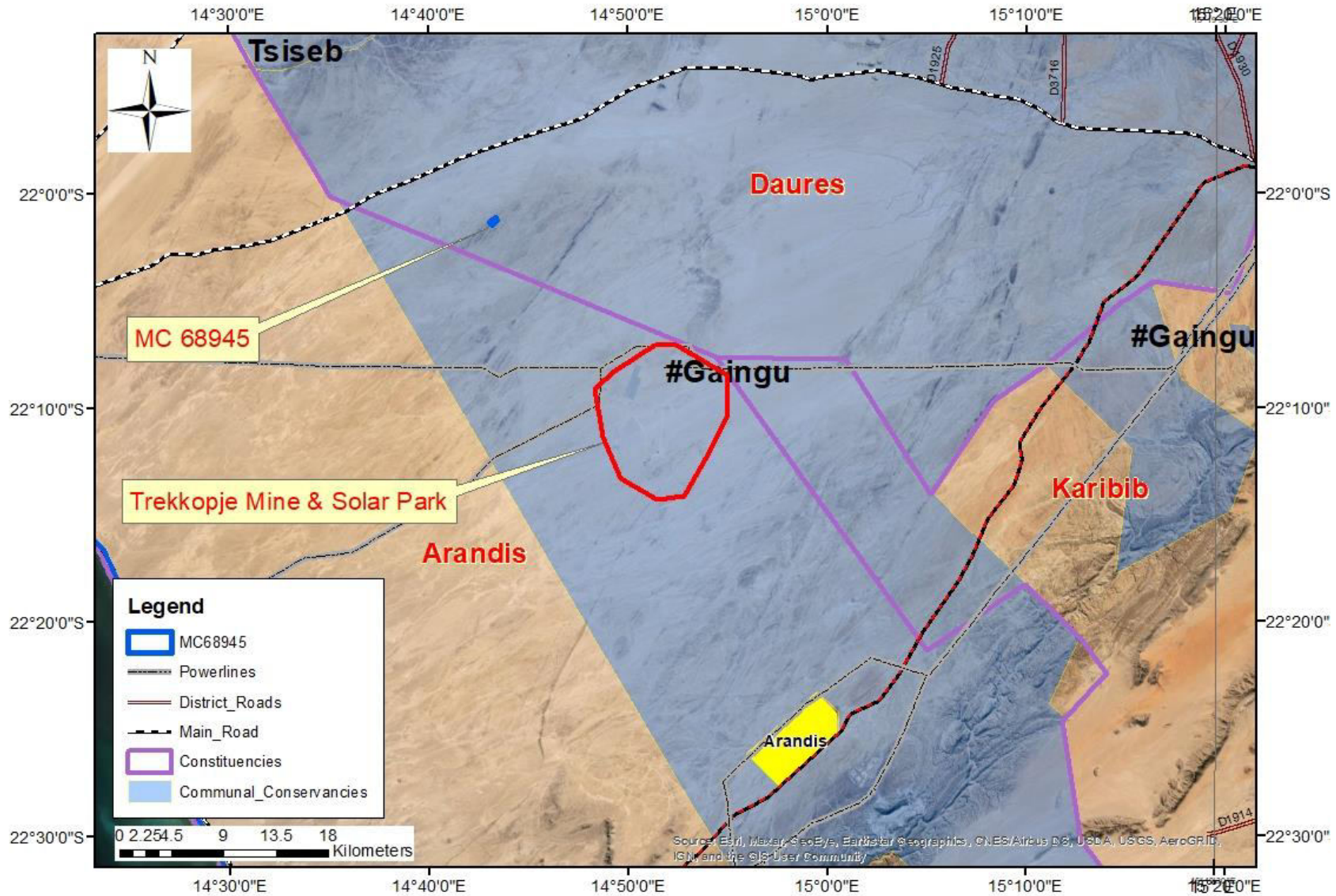


Figure 1-2: The location of MC 68945 on communal land, within the #Gaingu Communal Conservancy in the Daures Constituency, about 20 km northwest of the Trekkopje Mine and Solar Farm.

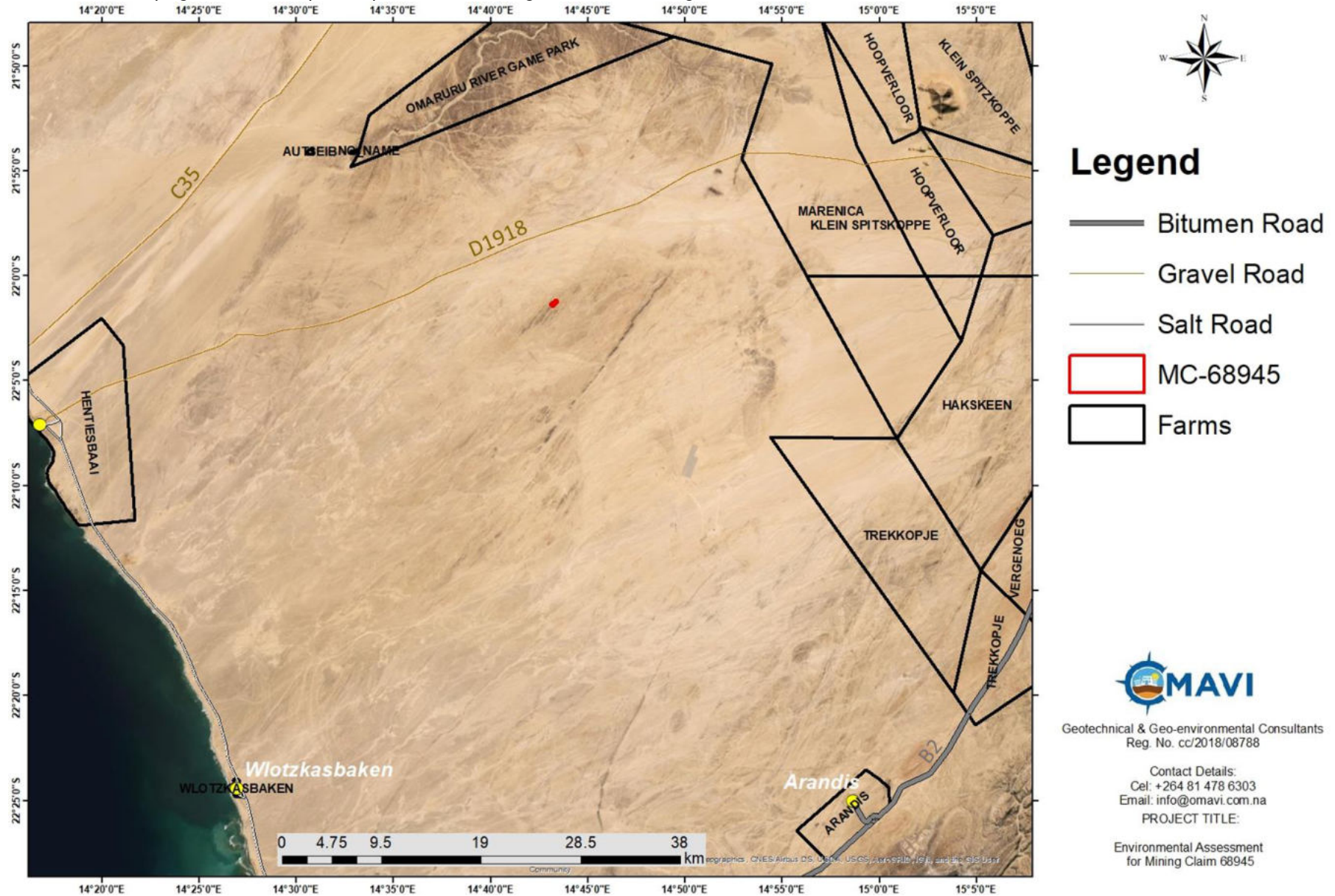


Figure 1-3: The location of MC-68945 relative to the closest farms and communities.

1.2 Ownership of Mining Claim 68945

The Mining Claim (MC) 68945 on which the exploration and quarrying activities are proposed to be undertaken is solely owned by Mr. Jacobus Zandberg, who holds several other prospecting and mining rights and has vast experience in the prospecting and quarrying of dimension stone. The licence was granted by the Ministry of Mines and Energy (MME) for the exploration of dimension stones in 2013, however, no intrusive work was done on this mining claim due to low market demands for the target commodities until the tenure ran out in 2016. Therefore, the current status of this licence is pending renewal, which is subject to the issuance of an environmental clearance certificate (ECC) by the Ministry of Environment, Forestry and Tourism (MEFT), hence the present environmental scoping assessment.

The status of Mining Claim (MC) 68945 is shown in **Figure 1-4** below as accessed on 23 June 2022 on the Namibia Mining Cadastral Portal (upon searching) on this link <https://portals.landfolio.com/namibia/>.

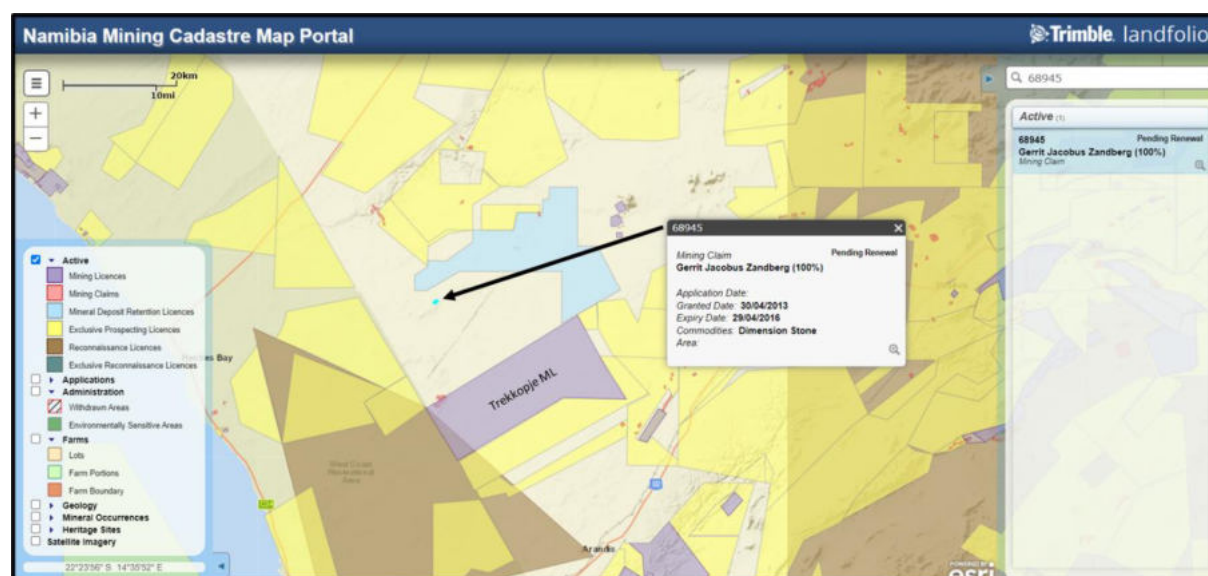


Figure 1-4: Details of Mining Claim (MC) 68945 as displayed on the Namibia Mining Portal (As accessed on 03 June 2022 via: <https://portals.landfolio.com/namibia/>). The location of Trekkopje Mine has been added for orientation.

1.3 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.

To meet the demand and consumption needs of both the local and international markets, it is important that the exploration and mining of dimension stones continues in Namibia. This will supplement the already operational dimension stone quarries in the region, whose resources are depleting, and will help to sustain the local processing factories. It is partly on these grounds that Mr. Jacobus Zandberg decided to pursue the project under review.

This exploration project will equip the local communities with technical skills as well as create job opportunities, which in turn can improve the socio-economic standing of the region. Additionally, where this exploration program yields positive results, subsequent medium-scale quarrying for dimension stones will commence, which can potentially advance to mining works in Erongo Region, and contribute to the Namibian economy.

1.4 The need for Environmental Scoping Assessment

The Environmental Management Act (Act No. 7 of 2007) (EMA) and its 2012 EIA Regulations lists activities that must not be undertaken without an Environmental Clearance Certificate (ECC). The following sections are relevant to the proposed exploration works:

- *"3.1 The construction of facilities for any process or activities which requires a license, right of other forms of authorization, and the renewal of a license, right or other form of authorization, in terms of the Minerals (Prospecting and Mining Act, 1992).*
- *3.2 other forms of mining or extraction of any natural resources whether regulated by law or not.*
- *3.3 Resource extraction, manipulation, conservation, and related activities."*

To satisfy these conditions and to inform the ECC decision, an Environmental Scoping, or Impact Assessment (ESA/EIA) must be conducted, as per the requirements of the EMA (Act No. 7 of 2007) and its 2012 EIA Regulations. It was in line with these requirements that Mr. Jacobus Zandberg, appointed an Environmental Assessment Practitioner (EAP) to carry out this assessment.

1.5 Appointed Environmental Assessment Practitioner

Mr. Jacobus Zandberg, (*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 and quarrying activities. The findings of the scoping assessment are aimed at providing the Ministry of Environment, Forestry and Tourism's (MEFT) Department of Environmental Affairs and Forestry (DEAF) with sufficient information to make an informed decision on the granting of an ECC for the proposed activities.

OMAVI Geotechnical & Geo-environmental Consultants is a specialist environmental management consulting entity, with considerable experience in biophysical and socio-economic impact assessments, best practice environmental assessment and management reporting, Waste Management Planning, drafting of project-specific Environmental Management and Rehabilitation Plans (EMRPs), stakeholder engagement and participation coordination, and the management and co-ordination of all aspects of the Environmental Impact Assessment (EIA) process including the sourcing of competent specialists. OMAVI has been active in the above-mentioned fields, and in so doing has made a positive contribution towards the achievement of environmental management and sustainable development objectives in Namibia. The public consultation process was facilitated by a trained and experienced assessment practitioner who also compiled the ESA Report and EMP, and their CV is attached hereto in **Appendix A**.

1.6 The Environmental Scoping Assessment Process

The environmental scoping assessment process followed for the current project is summarised below:

1. Project screening process.
2. Preparation of the Background Information Document (BID) and ECC Application and their submission to the Office of the Executive Director in the Ministry of Mines and Energy (MME) (Competent Authorities on the 14th of September 2020) for notification and recommendations. The date stamped copy of the ECC Application from the MME was uploaded to the MEFT's EIA online portal for registration (**Application APP- 003576**) and notification of the commencement of the ESA. The copy of the ECC application is attached as Appendix B.
3. Invitation to stakeholders (I&APs) and the public to participate in environmental scoping assessment process. This invitation was extended in the form of advertisements in local newspaper, notices on selected sites as well as via direct emails communications to key authoritative institutions such as Line Ministries, Regional and Local Governments (authorities), farm/landowners or occupiers of land.
4. The public consultation process which includes meetings and engagements with I&APs. **A face-to-face public consultation meeting was carried out on the 9th of April 2022 at the !Oe#Gan Traditional Authority Office, Spitzkoppe.**
5. A site walk-over and undertaking of an Archaeological specialist site assessment on the 9th and 10th of April 2022.
6. Compilation of the Draft environmental scoping assessment (ESA) Report (consolidating all findings in terms of impacts identified as well as comments and concerns raised from the I&APs/public consultation), and a draft Environmental Management Plan (EMP) (which outlines impact mitigation measures). Compilation of

the Heritage/ Archaeological Impact Assessment report by the specialist, submission for review by the NHC and issuance of the NHC consent letter.

7. Finalization of the ESA and draft EMP and further inclusion of comments from the second round of engagements.
8. Submission of the final ESA report (and EMP including all appendices to the report) to the Department of Environmental Affairs and Forestry in fulfilment of all the requirements of the Environmental Impact Assessment (EIA) Regulations No. 30 of 2012 and the Environmental Management Act, (EMA), 2007, (Act No. 7 of 2007) for application of the Environmental Clearance Certificate (ECC) for the proposed project.

A summary of the process followed is provided in **Figure 1-5** below.

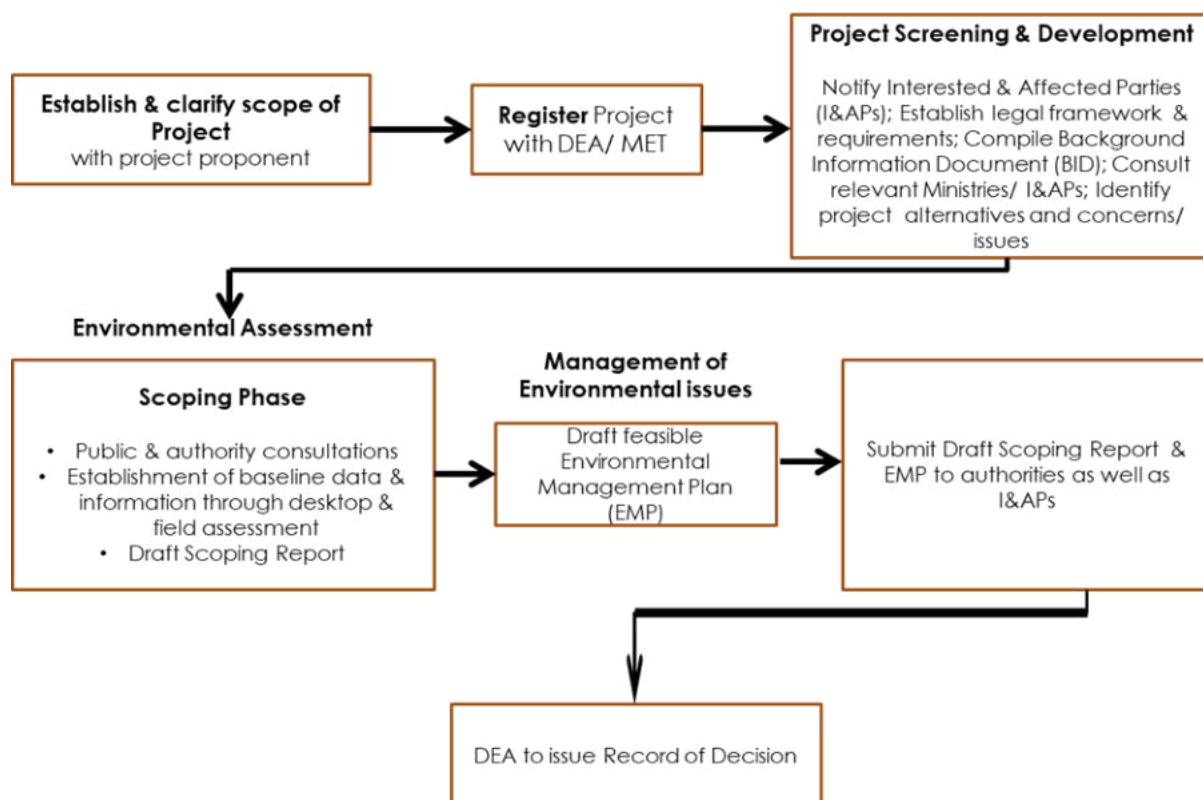


Figure 1-5: Schematic process flow of Namibia's Environmental Assessment Procedure

During the scoping phase, potential impacts were identified and assessed for the entire life cycle of the project, inclusive of the different stages, namely: the exploration phase, the developmental phase, the mining or extraction phase and decommissioning or closure phase.

1.7 Limitations of the Study

The following assumptions apply to this scoping assessment and its report (this document):

- This report has been compiled on a scoping level with only the Archaeological Specialist Study that has been undertaken for it, i.e., no other specialist studies were done as part of this scoping assessment.
- The project specific information used in this document is as provided by the Proponent, site observations, OMAVI Consultants experience and relevant literature reviewed/research as well as the project specialist (the Archaeologist).
- OMAVI Consultants assumes that all the project technical information and data that is relevant to the scope of the environmental scoping assessment process provided by the Proponent is correct and accurate, and that all necessary information has been disclosed.
- It is also assumed that the relevant information obtained from different literature consulted is accurate; and
- This environmental scoping report has been compiled on an assumption that there will be no significant changes to the proposed project activities or the affected biophysical and social environment between the time of compiling this report and implementation of the proposed project that could substantially influence findings of this document. **New potential impacts that may arise during the project life cycle would need to be addressed as soon as they are identified, and mitigation measures thereof provided (hence the emphasis on monitoring in the Draft EMP – Appendix C of this document);** and
- It is also assumed that there will be no significant changes to the project activities that could substantially influence the mitigation measures given and recommendations made for the management and protection of the host environment.

2 PROJECT DESCRIPTION

As part of exploration, works on MC 68945 will adopt a systematic prospecting approach in search for dimension stones, particularly dolerites, red granites and marbles. This section discusses the activities to be undertaken for both exploration and mining stages as well as the required and associated infrastructure. It must be noted that these proposed activities are only to be undertaken once the ECC has been granted by the Environmental Commissioner.

2.1 Planned Activities: Proposed Exploration Methods

The exploration techniques to be applied can be classified as invasive or non-invasive depending on the impact they can have on the environment. Exploration works will be undertaken as per the following phases:

2.1.1 Desktop Study

The exploration program will commence with a review of geological maps as well as historical drilling and / or quarrying data for the area. This is a non-invasive technique aimed at establishing an environmental baseline.

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 targeted units (i.e. dolerite, red granite and marble units). These rock units, once identified will be ranked in order of priority for follow up exploration based on various factors such as:

- Lateral extent of outcrops of the targeted units and general soundness of the rock units,
- Appearance - patterns and colour of the targeted units and
- Presence and frequency (spacing) of joints and other discontinuities.

At this stage, small hand samples (of about 30 cm³ in dimension) will be taken for cutting and polishing to provide insight on hardness of the stone and whether the stone can be polished to an acceptable finish. As a 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 quarrying.

2.1.3 Detailed exploration

At this stage, down the hole (DTH) drilling will be undertaken in predetermined areas to establish the following:

- Vertical extent of the targeted units.
- Color and texture.
- Joint spacing or
- Possible defects at depth.

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. It is anticipated that drilling activities will require a small (6m wide) tracked access roads to gain access to the actual drilling sites for the air compressor and water truck.

2.1.4 Feasibility study: Test Quarrying

Where drilling yields positive results, test quarrying by means of butterfly cutting will be conducted to fully evaluate the recovery of saleable blocks (approximately 3m by 3m by 2m in dimension), and better optimize the extraction methods, production rates and operational costs. This test quarrying will only be carried out in selected areas and shall be performed on as small an area as possible to minimize environmental impacts. Topsoil will be stripped and stockpiled in designated fenced off areas for future restoration works.

It is important to note that the test quarrying referred to above is a component of exploration activities, to be done at a small-scale level on targeted sites of the Mining Claim. This will enable the Proponent to get sufficient and reliable data about the rocks. Areas found to comprise good quality rocks in economical volumes will then be delineated, and the proponent will prepare for mining, guided by the Environmental Management Plan (EMP). If no viable resource is found at exploration stage, works will proceed to rehabilitation and decommissioning phase discussed in Section 2.3 to reinstate disturbed sites.

2.2 Planned activities: Proposed Mining Technologies

According to Ashmole and Motloug (2008), dimension stone mining methods themselves generally have a low impact on the surrounding environment due to the need to carefully extract large blocks or slabs without damage to the stone. Recent advances in dimension stone mining technology have also had the effect of reducing environmental impacts.

2.2.1 Quarry development

It is envisaged that quarrying will be conducted using a combination of best practice non-explosive technologies encompassing Down-the-Hole (DTH) rotary air blast drilling, diamond wire-saw cutting and most likely plugs and feathers splitting. This generally will entail loosening of large volumes of the bedrock by means of primary cutting, and subsequent stepwise division into smaller pieces until blocks of a commercial size are obtained, stockpiling waste rock as the process is performed.

The quarry will be developed with a low point, to create a gradient for waterflow, so that water can pond at this low point to allow recycling and re-using of this precious resource.

2.2.2 Block mining and handling

For block recovery, diamond wire saw cutting will be employed. It involves drilling of two intersecting holes, and subsequent passing of the diamond wire through these holes. The diamond wire through the two holes is then joined to form a continuous loop, which is placed over the flywheel of the saw that rotates, driving the diamond wire through the stone. The saw moves backwards along a track to maintain sufficient tension in the wire. This cutting technology has the advantage that it is associated with low noise and dust generation (Chatterjee et al. 2005).

The mined blocks will be transported by flat deck interlink trucks to natural stone processing facilities either in Karibib or Walvis Bay for value addition. Therefore, no processing of the dimension stone blocks will be done onsite.

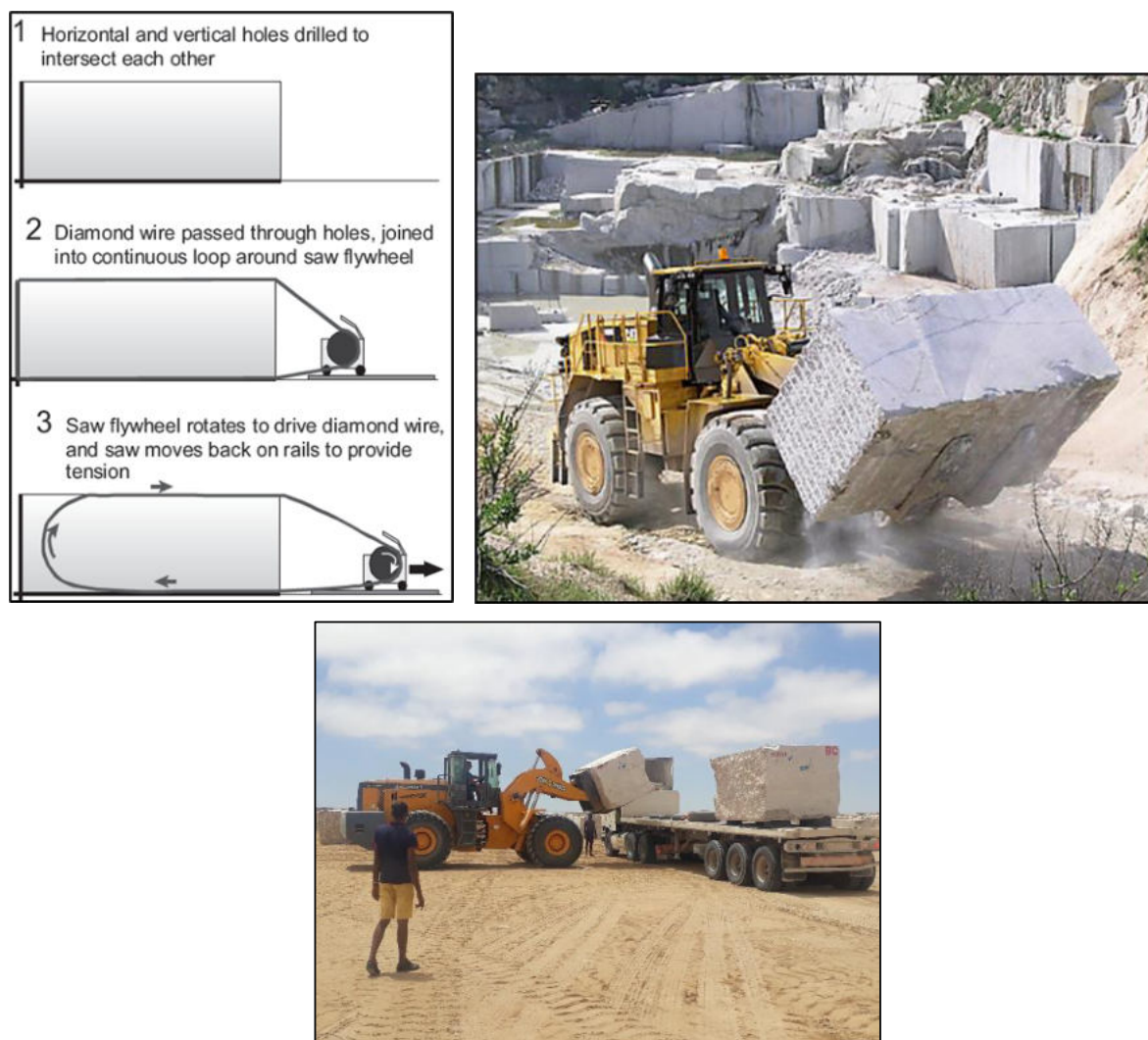


Figure 2-1: Typical mining and quarrying by diamond wire technology (Ashmole and Motloung, 2008); an example of a front-end block loader removing extracted blocks from an active quarry; and loading of saleable blocks for long-distance haulage.

The annual production figures cannot be established at this stage, only after exploration and deposit evaluation. However, once this information (deposit reserves, annual production planned for mining and ESA/EMP updates) becomes available, it will be communicated to all the registered interested and affected parties of this project. **It must also be noted that once the reserves have been confirmed, a review and update will be done on the current ESA Report and EMP.**

2.3 Rehabilitation of Explored Sites and Decommissioning

The impact on the physical environment can be lessened by implementation of progressive / ongoing rehabilitation to be carried out by the Proponent. This will entail for instance rock shading, and partial backfilling with stockpiled topsoil, to ensure that the disturbed sites are reinstated and restored to their pre-exploration state.

Once mining is completed, following the depletion of the quality dolerite and granite deposit, the activities will be decommissioned, and the sites will be rehabilitated to their pre-quarrying activities as much as possible. This will also entail the dismantling and removal of campsites, and associated structures from the project sites and area.

2.4 Project inputs and Associated Infrastructure

2.4.1 Temporary shelter / accommodation

The exploration team will comprise about ten (10) people, including skilled, semi-skilled and unskilled, personnel, and this number is expected to increase in the mining phase to about twenty (20) people. Priority for employment will be given to the locals and only specialized skills will be imported.

At both exploration and mining, temporary camps will be set up to accommodate the team onsite. It will primarily be an erection of tented facilities or prefabricated structures, with an option to lease farm infrastructure. Other temporary structures would be for office and storage space. All this will take place subject to approval by the farmer or landowners. **Therefore, the proponent and the landowners through their leadership (!Oe#Gan Traditional Authority) will need to have agreements in place prior to the commencement of the exploration phase of the project.**

2.4.2 Vehicles, Machinery and Equipment

Exploration and mining: These will include 4 x 4 bakkies, front-end loader pickup and dump trucks, Down-The-Hole (DTH) drill rig, air compressor machine, butterfly cutter, trucks, diamond wire-saw cutter and coring, excavator / front-end loader to scoop up sandy overburden, dozers (to clear land along planned drilling and mining site access roads).

Supporting equipment: Water tanker to cart water to site for exploration and mining works, diesel bowser / tank (bundled) of about 30 000 litres, diesel generator, camping tents, prefabricated office structures, shade structure for near working areas, two-way radios (for communication).

All equipment, machinery and vehicles will be stored at a designated area near the temporary accommodation on site.

2.4.3 Power Requirements (for vehicles, machinery and domestic use)

At exploration and mining stage: It is anticipated that onsite machinery will be diesel powered. A trailer mounted diesel tank of about 2500 to 3000 litres will be kept onsite during exploration. During the quarrying phase, at least two (2) 10 000 litres fixed tanks will be installed on site near the workshop area as shown in Error! Reference source not found. below. Such tanks shall be constructed or installed in accordance with the South African Bureau of

Standards (SABS). This fuel/diesel will mainly be used in powering the compressors for surface cleaning, drilling and for cutting machinery as well as vehicles. A diesel bowser truck will be filling the onsite tank, as and when required.



Figure 2-2: An example of a fixed fuel storage tank, installed on paved ground to minimise the risk of pollution.

Power for domestic use will be sourced from photovoltaic rooftop solar panels provided by the proponent. Firewood may also be used, which will be provided by the proponent from an approved firewood supplier, therefore no firewood will be collected onsite or from nearby farms without landowners' or occupiers' permission. **Therefore, no connection will be made to the national power grid.**

2.4.4 Water supply

At exploration stage, a low water demand of about 10 000 litres per week will be required at drilling phase while 20 000 to 30 000 litres per week will be required during the test quarrying phase. This amount is anticipated to increase to about 50 000 to 60 000 litres per week at mining stage. This water will mainly be used support the exploration and mining processes such as down-the-hole drilling, butterfly cutting during exploration, diamond wire saw, cleaning and cooling off exploration and mining equipment.

As a first consideration, an attempt will be made to site and drill a borehole within the mining claim area to meet the water needs of the project. For this, a comprehensive groundwater study for the area will be conducted upon granting of the ECC and prior to the project commencement, to assess the aquifer potential and advise the siting of the borehole. Once drilled pump testing will be carried out to determine the yields and water quality. The

proponent will ensure that all necessary permitting (Groundwater Abstraction and Use Permit (GWAUP) by the Department of Water Affairs (DWA) at the Ministry of Agriculture, Water and Land Reform (MAWLR)) will be obtained prior to the use of such borehole. However, should poor water strikes be encountered (i.e. no borehole with reasonable yields of at least 2 to 3 m³ per hour), then alternative water supply options will be considered. One of these options is the carting of water by means of water bowser, either from the Trekkopje Mine (subject to an agreement being reached with the mine operator), or from nearby towns of Arandis/ Usakos or Henties Bay (subject to consent from the relevant town council).

For both exploration and mining, water will be recycled and re-used as an attempt to conserve water. This approach might see a reduction in the amount of water requirements, which will mean lesser amounts to be abstracted or carted.

2.4.5 Roads

The project area (MC 68945) can be accessed from the B2 highway via the D1918 gravel road up to the Trekkopje Mine and thereafter by several small access roads. The project will utilize existing roads and where necessary, temporary informal access routes will be created to gain access to the actual targeted sites. The Proponent may need to do some upgrade on the access roads to ensure that it is fit to accommodate project related vehicles, such as heavy trucks and erect temporary road signs for the duration of the project.

2.4.6 Waste production and sanitation

Domestic Waste: Different waste containers will be provided onsite for waste sorting and safe disposal of waste generated onsite. These will be collected on a monthly basis and sent to nearest approved waste management facility in the area.

Mine Waste: waste from mining will mainly be in the form of waste rock from off-cuts and unshaped blocks, and to a lesser extent in the form of sludge from crushed slabs. Waste rock stockpiled for use in the backfilling of worked areas, as part of ongoing rehabilitation and in the paving of roads in the quarry. Sludge and saw dust are typically used in the production of ceramics, stone products and paints (Jalalian *et al.*, 2021), however it is usually in significant amounts at processing stage, therefore it will be minimal at mining. Adequate geological studies will be done during exploration to ensure reduced material loss during the extraction.

Sanitation: Movable ablution facilities with septic tanks will be put up for sanitation purposes for the exploration and mining teams and will be emptied in good time according to manufacturers' instructions.

2.4.7 Personnel and site safety

All workers will be equipped with adequate and appropriate personal protective equipment (PPE), that will be replaced or repaired to ensure that workers' occupational health and safety is not compromised. A minimum of two first aid kits will be readily available on site to attend to potential minor injuries.

For safety and security reasons, the localized high-risk working sites will be demarcated and temporarily fenced off. Project vehicles will also be equipped with fire extinguisher as well as at the working sites in case of fire outbreaks.

2.5 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 proposed project, either through enhancing the environmental benefits of the proposed activity, and/ or through reducing or avoiding potentially significant negative impacts. The concept of considering alternatives thus ensures that the environmental assessment is not reduced to the defense of a single project proposal that is the desire of the proponent, and therefore, provides an opportunity for unbiased considerations of options, to determine the most optimal course of action.

The alternatives weighed and considered for this project are with regards to:

- Project location,
- Exploration and mining methods (techniques),
- Supporting infrastructure during different stages of the project, and
- The “No-go” alternative option

2.5.1 Project location alternative

The allocation of a mineral licence is determined by the mineral potential of the area, and by the preference of the applicant (individual or company). In this case the proponent is in search for dimension stones, and although these rocks are found elsewhere in Namibia; the pursuit of such a resource is subject to licencing. Which means the applicant may only prospect for desired minerals within the confines of his/her licence. For this reason, alternative localities of dimension stones have not been considered. Information pertaining to Mining Claim 68945 is available on the Namibia Mining Cadastral Map (<https://portals.landfolio.com/namibia/>).

2.5.2 Alternative Exploration and Mining methods (techniques)

Roads clearing technique: For the creation of simple and narrow access roads shallow excavation with the front-end loader bucket is deemed to be most economically and environmentally feasible option. Where the ground is flat this method would basically entail dragging the front-end loader's bucket across the envisaged footprint of the road, thus creating a pathway that can be used by small and large vehicles. Unlike in conventional road construction where the subgrade is ripped and re-compacted, this method ensures less modification of the soil's structure.

Roads for accessing the dolerite, red granite and marble unit hills will involve dozing of surficial rubble into gently sloping access ramps, placing borrowed sandy material on top of such

rubble, and ultimately, compacting the sandy material on those access ramps. The sand material will be borrowed along trenches at the toe of these hills particularly targeting patches that are free of vegetation.

Once the surficial overburden rubble has been removed, the underlying rock surfaces shall be exposed using air compressors. From an efficiency and effectiveness point of view air compressor technology is deemed to be most suitable compared to other traditional methods such as sweeping.

Drilling methods: Down-the-hole rotary air blast drilling was selected as the preferred method for both block splitting and creation of holes for the diamond wire sawing cutting process. This is because in comparison to other drilling methods such as percussion drilling and diamond core drilling it is quick and relatively inexpensive, and therefore works well for block splitting purposes which typically require high drilling densities. Although the method typically produces debris and dust the rig to be used is fitted with a cyclone that prevents most dust from escaping.

Mining techniques: For test quarrying, butterfly and diamond saw wire cutting techniques were selected as the most favourable extraction methods for separating, cutting, and splitting blocks due to the following reasons:

- Diamond wire sawing permits efficient cutting through the hardest of materials, and is thus deemed suitable for this project because the targeted host rock is hard
- Both butterfly and diamond wire saw cutting are associated with low noise levels and low dust generation compared to other block splitting technologies such as controlled blasting.
- Cutting is more accurate thereby enhancing recovery and minimizing generation of waste rock.

2.5.3 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).

Table 2-1: A summary of the alternative infrastructure considered for the project.

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	
	Use existing farm boreholes	A new borehole (BH) will be drilled to meet the water needs of the project.
	Drill own new borehole	

Water supply	Bring water from elsewhere	However, if the BH does not have sufficient yields, carting of water from Trekkopje Mine or neighbouring towns will be considered, subject to necessary approvals.
Water quality improvement	Build a small treatment plant to improve the saline water for domestic consumption.	Carting water to site for domestic use was chosen, as it is the most economical.
	Cart water to site for domestic use.	
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 quarrying phase. Fuel for domestic use will mainly be firewood, which will be provided by the proponent from an approved firewood supplier, therefore no firewood will be collected onsite or from nearby farms without landowners' or occupiers' permission. Option likely to be considered for long-term operations if economic deposit with high life of mine is found.
	Install photovoltaic panels	
	Use of firewood	
Offices, accommodation	Erect dis-mountable prefabricated units	Favoured during field exploration phase due to: <ul style="list-style-type: none"> - Ease of installation - Low installation costs - 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.

2.5.4 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 **Chapter 6** 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
- Loss of support to local businesses through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, etc.
- 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.

Considering the above losses, the 'no-go' option was not considered a preferred alternative.

The project activities described above are governed by certain legislations, which should be complied with throughout the project life cycle. The applicable/relevant legislations, policies and guidelines are presented under the next chapter.

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 governing acts, relevant and applicable legislation, policies and guidelines are given in this chapter, with consideration of local (national) and where necessary international legislation. These were considered when undertaking this ESA process, however they serve to inform the project Proponent, Interested and Affected Parties and the decision makers at the DEAF of the requirements and expectations, as laid out in terms of these instruments, to be fulfilled for them to carry out the proposed exploration activities. for are host of legal and policy documents and guidelines to mining projects as indicated Table 3-1.

Table 3-1: Summary of relevant Acts and their applicability to the proposed project.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
The Constitution of the Republic of Namibia (1990)	Government of the Republic of Namibia	<p>The Namibian government has adopted several policies that promote sustainable development. Most of 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:</p> <ul style="list-style-type: none"> • Guarding against over-utilisation of biological natural resources. • Pursuing sustainable natural resource use • Limiting over-exploitation of non-renewable resources. • Maintaining biological diversity • Ensuring ecosystem functionality. • Protecting Namibia's sense of place and character. <p>Through implementation of the mitigation measures set out in this Scoping Report (ESA) and Environmental Management Plan (EMP), the owner of the ECC shall be advocating for sound environmental management as set out in the Constitution.</p>
Environmental Management Act No. 7 of 2007 and its 2012 EIA	Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs and Forestry	<p>Part 2 of the Act sets out 12 principles of environmental management, summarized as follows:</p> <ul style="list-style-type: none"> • Community involvement in natural resources management, must be promoted and facilitated.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
Regulations Government Notice 28-30 (Government Gazette 4878		<ul style="list-style-type: none"> • The participation of all I&APs must be promoted and decisions must consider the interest, needs and values of I&APs. • Equitable access to environmental resources must be promoted and the functional integrity of ecological systems must be considered to ensure sustainable systems. • Assessments must be undertaken for activities which may have significant effects on the environment or the use of natural resources. • Sustainable development must be promoted in all aspects relating to the environment. • Namibia's cultural and natural heritage including, its biological diversity, must be protected and respected. • The option that provides the most benefit or causes the least damage to the environment, at a cost acceptable to society must be adopted to reduce the generation of waste and polluting substances at source. • The reduction, re-use and recycling of waste must be promoted. • 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 the pollution. • 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 • Damage to the environment must be prevented and activities which cause such damage must be reduced, limited, or controlled.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		<p>The Proponent has the responsibility to ensure that the proposed activity, as well as the ESA process, conforms to the principles of this Act. In developing the ESA process, OGGC has been cognizant of these requirements, and accordingly the ESA process has been undertaken in conformance with this Act and the EIA Regulations (2012). Several listed activities in terms of the Act, are triggered by the proposed activities.</p>
<p>Mineral Prospecting & Mining Act (Act no. 33 of 1992)</p>	<p>Ministry of Mines and Energy</p>	<p>Sections 50, 52, 54, 57 and 130 of this Act sets out provisions for environmental management for activities arising from mineral exploration as follows:</p> <p>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</p> <p>that the mining license holder is liable to pay compensation where in course of the exploration operations; any damage is done to the surface of land, water source, cultivation, building or any other structure</p> <p>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</p> <p>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</p> <p>that the mineral or mining license holder shall report pollution in course prospecting operations and take remedial measures for such.</p>

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		<p>The abovementioned provisions are all relevant to the proposed activities and were thus considered in the ESA process and drafting of the EMP.</p>
<p>Pollution Control & Waste Management Bill</p>	<p>Ministry of Environment, Forestry and Tourism and others</p>	<p>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 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.</p> <p>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 operations.</p>
<p>Water Act (No. 54 of 1956)</p>	<p>Ministry of Agriculture, Water and Land Reform: Department of Water Affairs</p>	<p>Makes provision for several functions pertaining to the management, control and use of water resources, water supply and the protection of water resources.</p> <p>The Proponent should prevent any potential pollution of groundwater. Water should be used in a sustainable way. Water abstraction and use should be done in a responsible and sustainable manner.</p>

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
Water Resources Management Act (Act No. 11 of 2013)		<p>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.</p> <p>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</p>
Nature Conservation Ordinance (Act No. of 1996)	Ministry of Environment, Forestry and Tourism	<p>The Nature Conservation Amendment of 1996 (section 73.1) 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.</p> <p>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.</p>
Forestry Act (Act No. 12 of 2001)	Ministry of Environment, Forestry and Tourism	The Act provides for the management and use of forests and forest products.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		<p>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."</p> <p>The proponent will apply for the relevant permit under this Act if it becomes necessary.</p>
Soil Conservation Act (Act No. 76 of 1969)	Ministry of Agriculture, Water and Land Reform	<p>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 and resources, through directives declared by the Minister.</p> <p>This Act is applicable since stripping of topsoil will take place to expose the targeted rock units. Mitigation measures are included in the EMP to preserve topsoil and reduce impacts on topsoil.</p>
Regional Councils Act (Act No. 22 of 1992)	Ministry of Urban and Rural Development	<p>The Regional Councils Act legislates the establishment of Regional Councils that are responsible for the planning and coordination of regional policies and development.</p> <p>The main objective of this Act is to initiate, supervise, manage, and evaluate development in the regions.</p>

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		The relevant Regional Council for this project is the Erongo Regional Council which is an I&AP and has been provided with the opportunity to comment on the proposed project.
Petroleum Products and Energy Act (No. 13 of 1990) Regulations (2001)	Ministry of Mines and Energy: Petroleum Affairs Division	Regulation 3(2)(b) states that "No person shall possess or store any fuel except under authority of a licence or a certificate, excluding a person who possesses or stores such fuel in a quantity of 600 litres or less in any container kept at a place outside a local authority area. The Proponent should obtain the necessary authorization from the MME for the storage of fuel on-site.
The Road Traffic and Transport Act (No. 22 of 1999)	Ministry of Work and Transport: Roads Authority	The Act provides for the establishment of the Transportation Commission of Namibia; for the control of traffic on public roads, the licensing of drivers, the registration and licensing of vehicles, the control and regulation of road transport across Namibia's borders; and for matters incidental thereto. Should the proponent wish to undertake activities involving road transportation or access onto existing roads, the relevant permits will be required.
Traditional Authority Act (Act No. 25 of 2000)	Ministry of Urban and Rural Development	Namibian legislation recognizes both statutory and customary forms of governance. The Traditional Authorities Act recognizes Traditional Authorities (TAs), as the customary leadership of traditional communities as legal entities.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		<p>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.</p> <p>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 designated area.</p> <p>The Mining Claim 68945 is located within the #Gaingu Communal Conservancy in the Daures Constituency, therefore, the proponent must ensure thorough involvement of the leadership of #Gaingu Traditional Authority. Land occupiers should also be consulted and afforded an opportunity to comment on the proposed project activities through their leadership.</p>
National Heritage Act (Act No. 27 of 2004)	Ministry of Education, Arts and Culture: National Heritage Council of Namibia	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 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. Section 51 (3) sets out the requirements for impact assessment.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		<p>No objects of heritage concern were noted onsite. However, should any objects of heritage significance be identified during exploration, the work must cease immediately in the affected sites and the necessary steps taken to seek authorisation from the National Heritage Council of Namibia.</p>
Public Health Act (Act No. 36 of 1919)	Ministry of Health and Social Services: 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.
Public and Environmental Health Act No. 1 of 2015	Ministry of Health and Social Services	<p>The Proponent should ensure that the project infrastructure, vehicles, equipment, and machinery are 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.</p> <p>The Proponent should ensure that the public as well as the environmental health is preserved and remain uncompromised.</p>
Labour Act No 11 of 2007	Ministry of Labour, Industrial and Employment Creation	<p>Sections 3, 4, 5, 11, 16, 23-27, 44 and 135 make provision for the following:</p> <ul style="list-style-type: none"> • That a person may not employ a child under the age of 14years • That children are prohibited for employment in a mine and other dangerous circumstances • That forced employment of persons is prohibited

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		<ul style="list-style-type: none"> • That an employee is entitled to monetary remuneration daily, weekly, fortnightly, or monthly in cash, cheque, and direct deposit into a bank account • 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 • That employees are entitled to (a) annual leave based on the average number of days worked over the year, (b) a day's sick leave for every 26 days worked, (c) compassionate leave for a period of 5 days in 12 months which is fully paid, and (d) leave on public holidays, • 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 • 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 <p>The Proponent is expected to be compliant with the above provisions and as such the above provisions were accounted for in the ESA report and EMP.</p>
Relevant Policies and Regulations		
Environmental Assessment Policy (1994)	Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs and Forestry	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

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
		undertaking. <u>Please see Table 3-2 for a summary of the activities that would require authorisation for the proposed exploration of dimension stone.</u>
Mine Health & Safety Regulations (under section 138A of the Mining Act, 1992)	Ministry of Mines and Energy: Mine Safety & Services Division Ministry of Health and Social Services: 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: <ul style="list-style-type: none"> • Employee's right to leave unsafe working places • Obligation of a mine manager to provide for all safety measures in a working area. • Reporting of accidents to the chief inspector and keeping a record of such accidents • Requirements for the mine manager to provide occupational health services at area of exploration activity • Requirements for stability of excavations; provision of waiting areas; provision of fencing and gates; schemes for working in vicinity of water body. • Provision for exploration dump facility • Ensuring that all parts of a mine are well ventilated with minimum standards of air quality • The mine manager's responsibility to formulate a scheme for safe movement of vehicles being use for the exploration activities. • The exploration manager's responsibility to formulate a scheme for identifying hazards at the area of exploration activities and provision of appropriate protective equipment • Ensure that the mine manager provides first aid and firefighting equipment and procedures where exploration activities are being conducted All the above-mentioned provisions are relevant to this project and were thus considered in the ESA process and EMP.

LEGISLATION CONSIDERED	CUSTODIAN ORGAN OF STATE	ASPECT OF PROJECT
Relevant Acts		
Atmospheric Pollution Prevention Ordinance (1976)	Ministry of Health and Social Services	This ordinance provides for the prevention of air pollution and is affected by the Health Act 21 of 1988. Under this ordinance, the entire area of Namibia, apart from East Caprivi, is proclaimed as a controlled area for the purposes of section 4(1) (a) of the ordinance.
Hazardous Substance Ordinance, No. 14 of 1974	Ministry of Health and Social Services	The ordinance provides for the control of toxic substances. It covers manufacture, sale, use, disposal and dumping as well as import and export. Although the environmental aspects are not explicitly stated, the ordinance provides for the importing, storage, and handling.
Road Ordinance 1972 (Ordinance 17 of 1972)	Ministry of Works and Transport: Roads Authority	Width of proclaimed roads and road reserve boundaries (§3.1) Control of traffic on urban trunk and main roads (§27.1) Infringements and obstructions on and interference with proclaimed roads. (§37.1)

3.2 Relevant Listed Activities in terms of EMA

Some of the project activities as distinctively listed in the EIA Regulations will require authorizations (permit or license) prior to commencement. The activities are presented below (Table 3-2), and the specific permits or license required will be provided in the EMP for implementation.

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 topsoil stripped off to access the targeted rock unit
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, both of which require environmental clearance and prospecting permitting 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 surface clearing and excavation over the footprint of the targeted rock unit, followed by subsequent butterfly cutting & splitting of the targeted bedrock (during exploration) and finish diamond wire-saw cutting (for exploration test quarrying of dimension stone blocks).
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 (30 000 litres) at any one location	It is anticipated that a portable diesel generator will initially be used for power generation for both domestic and industrial use at the site. Therefore, a permit to store fuel (petroleum products) on site should be applied for and obtained from the Ministry of Mines and Energy.
Activity No. 10.1 (b)	The construction of – public roads	The proposed project may not necessarily include the construction of access roads for access to the sites, but road upgrade may be required and erection of road signs.

3.3 International Policies, Principles, Standards, Treaties and Conventions

The international policies, principles, standards, treaties, and conventions applicable to the project are as listed in Table 3-3 below.

Table 3-3: Applicable International Policies, Principles, Standards, Treaties and Convention

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
Equator Principles	<p>A financial industry benchmark for determining, assessing, and managing environmental and social risk in projects (August 2013). The Equator Principles have been developed in conjunction with the International Finance Corporation (IFC), to establish an International Standard with which companies must comply with to apply for approved funding by Equator Principles Financial Institutions (EPFIs). The Principles apply to all new project financings globally across all sectors.</p> <p>Principle 1: Review and Categorization</p> <p>Principle 2: Environmental and Social Assessment</p> <p>Principle 3: Applicable Environmental and Social Standards</p> <p>Principle 4: Environmental and Social Management System and Equator Principles Action Plan</p> <p>Principle 5: Stakeholder Engagement</p> <p>Principle 6: Grievance Mechanism</p> <p>Principle 7: Independent Review</p> <p>Principle 8: Covenants</p> <p>Principle 9: Independent Monitoring and Reporting</p> <p>Principle 10: Reporting and Transparency</p>	<p>These principles are an attempt to: ‘...encourage the development of socially responsible projects, which subscribe to appropriately responsible environmental management practices with a minimum negative impact on project-affected ecosystems and community-based upliftment and empowering interactions.’</p>

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
<p>The International Finance Corporation (IFC) Performance Standards</p>	<p>The International Finance Corporation's (IFC) Sustainability Framework articulates the Corporation's strategic commitment to sustainable development and is an integral part of IFC's approach to risk management. The Sustainability Framework comprises IFC's Policy and Performance Standards on Environmental and Social Sustainability, and IFC's Access to Information Policy. The Policy on Environmental and Social Sustainability describes IFC's commitments, roles, and responsibilities related to environmental and social sustainability.</p> <p>As of 28 October 2018, there are ten (10) Performance Standards (Performance Standards on Environmental and Social Sustainability) that the IFC requires a project Proponents to meet throughout the life of an investment. These standard requirements are briefly described below.</p> <p>Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts</p> <p>Performance Standard 2: Labour and Working Conditions</p> <p>Performance Standard 3: Resource Efficient and Pollution Prevention and Management</p> <p>Performance Standard 4: Community Health and Safety</p> <p>Performance Standard 5: Land Acquisition, Restrictions on Land Use, and Involuntary Resettlement</p>	<p>The Performance Standards are directed towards clients, providing guidance on how to identify risks and impacts, and are designed to help avoid, mitigate, and manage risks and impacts as a way of doing business in a sustainable way, including stakeholder engagement and disclosure obligations of the Client (Borrower) in relation to project-level activities. In the case of its direct investments (including project and corporate finance provided through financial intermediaries), IFC requires its clients to apply the Performance Standards to manage environmental and social risks and impacts so that development opportunities are enhanced. IFC uses the Sustainability Framework along with other strategies, policies, and initiatives to direct the business activities of the Corporation to achieve its overall development objectives.</p>

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
	<p>Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</p> <p>Performance Standard 7: Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities</p> <p>Performance Standard 8: Cultural Heritage</p> <p>Performance Standard 9: Financial Intermediaries (FIs)</p> <p>Performance Standard 10: Stakeholder Engagement and Information</p> <p>A full description of the IFC Standards can be obtained from http://www.worldbank.org/en/projects-operations/environmental-and-social-framework/brief/environmental-and-social-standards?cq_ck=1522164538151#ess1</p>	
<p>The United Nations Convention to Combat Desertification (UNCCD)</p>	<p>Addresses land degradation in arid regions with the purpose to contribute to the conservation and sustainable use of biodiversity and the mitigation of climate change</p>	<p>The project activities should not be such that they contribute to desertification.</p>
<p>Convention on Biological Diversity 1992</p>	<p>Regulate or manage biological resources important for the conservation of biological diversity whether within or outside protected areas, with a view to ensuring their conservation and sustainable use.</p>	<p>Removal of vegetation cover and destruction of natural habitats should be avoided and where not possible minimised</p>

STATUTE	PROVISIONS	PROJECT IMPLICATIONS
	Promote the protection of ecosystems, natural habitats, and the maintenance of viable populations of species in natural surroundings	
Stockholm Declaration on the Human Environment, Stockholm (1972)	It recognizes the need for: "a common outlook and common principles to inspire and guide the people of the world in the preservation and enhancement of the human environment.	Protection of natural resources and prevention of any form of pollution.

The proposed project and its activities will be undertaken in a specific biophysical and social environment. Therefore, to understand the baseline environment with regards to the potential impacts stemming from the proposed project, the affected environmental components and features are presented under the next chapter.

4 THE RECEIVING ENVIRONMENT

An understanding of the existing or receiving environment can inform the management of potential impacts. This chapter provides an overview of the baseline biophysical and social environmental conditions, with which the proposed project will interact. It discusses the receiving environment from literature, existing online datasets, previous reports of work done in the area. This information was also supplemented by an on the ground assessment by the environmental practitioner during a site visit which was undertaken on the 9th of April 2022, in combination with the Archaeological specialist site visit. The site visit was led by Mr Benjamin Naruseb, the headman of the Spitzkoppe and Marenica areas and member of the Oe#Gan Traditional Authority, and Mr. Isak Ouseb from the Spitzkoppe area. Additional information was obtained through verbal communication with the Traditional Authority and landowners.

4.1 Biophysical environment

4.1.1 Climatic Conditions

The proposed project area is located in the Daures Constituency in Central Namib, about 80 km northeast of Swakopmund, 50 km southeast of Henties Bay, approximately 65 km northwest of Arandis. The climate of central Namib is divided by Mendelsohn *et al.* (2002) into zones that run roughly parallel to the coast as seen in **Figure 4-1**. The site falls within the Middle Zone, which is known to experience average fog precipitation that is roughly in the same range as rain precipitation. This zone is also known to have the most extreme aridity. 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). Although geographically Henties Bay is the closest town to the site, reference was made to the Arandis weather information, given that they are in the same coastal zone.

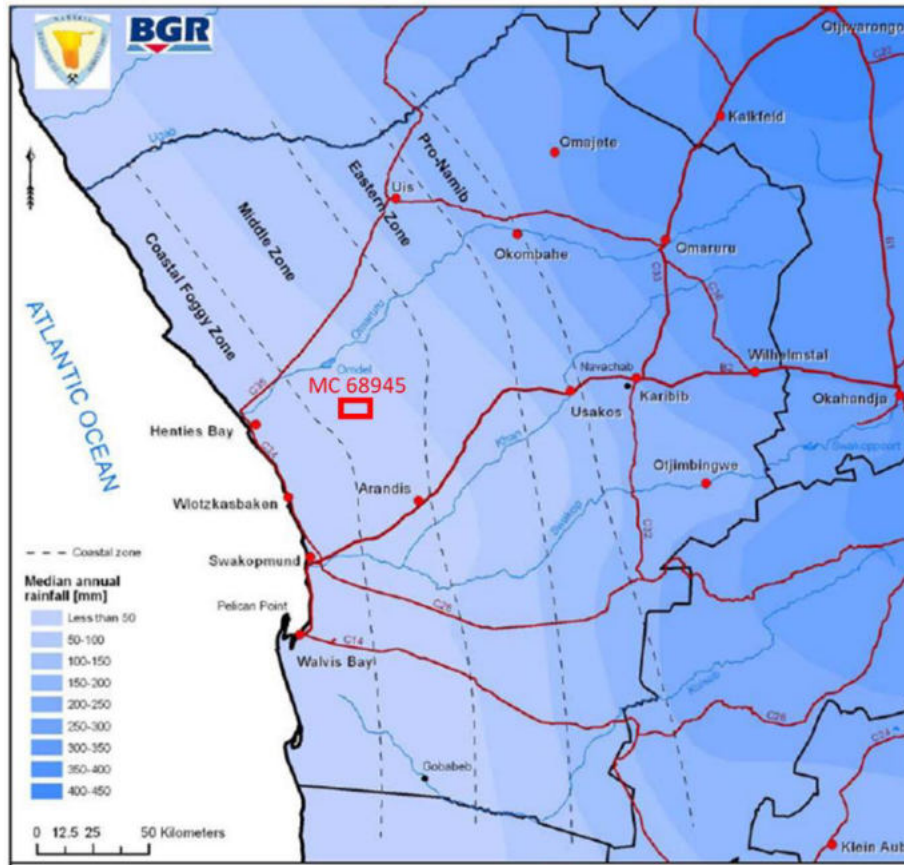


Figure 4-1: The climatic zones of Erongo Region, showing associated mean annual rainfalls. (Modified after Mendelsohn et al. 2002, to show the approximate position of MC 68945).

The town of Arandis 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 13 years according to World Weather online (2020) in **Figure 4-2**.

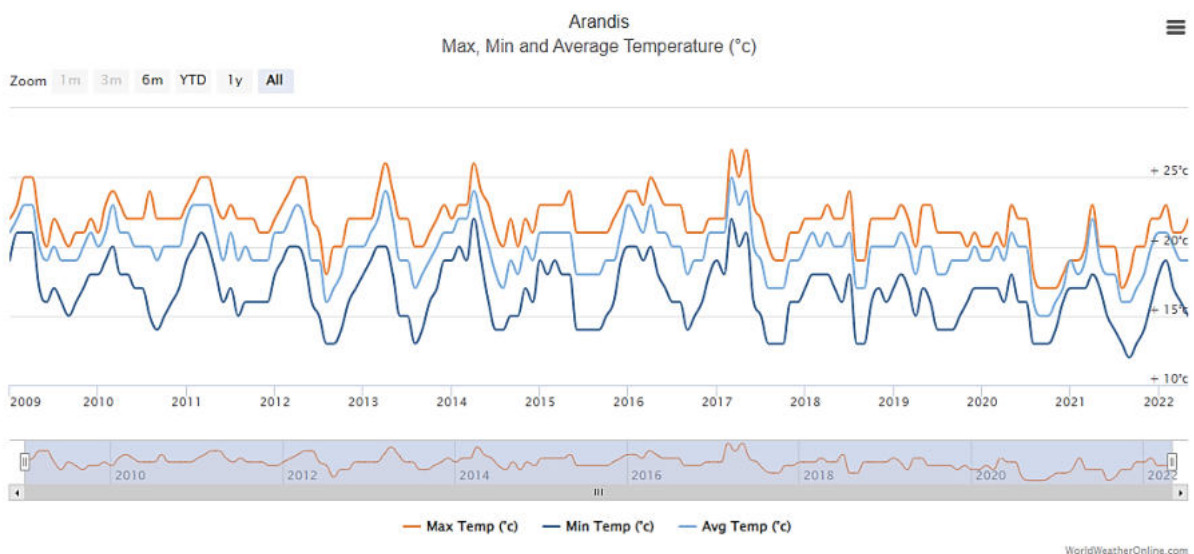


Figure 4-2: The maximum, minimum and average temperature for the Arandis area (World Weather Online, 2022).

In terms of rainfall, it is noted that annual rainfall in the Erongo Region generally increases with distance from the coast as it can also be seen in **Figure 4-1**. The project site is situated in a belt that receives average rainfalls of less than 100mm of per annum (Mendelsohn *et al.* 2002). The recorded rainfall data for Arandis indicates that rainfall events are uncommon, with the chance of rain on any given day being calculated at less than 5%, with an annual rainfall of approximately 44mm (ClimateData.org). A summary of the average annual rainfall figures is depicted in **Figure 4-3**.

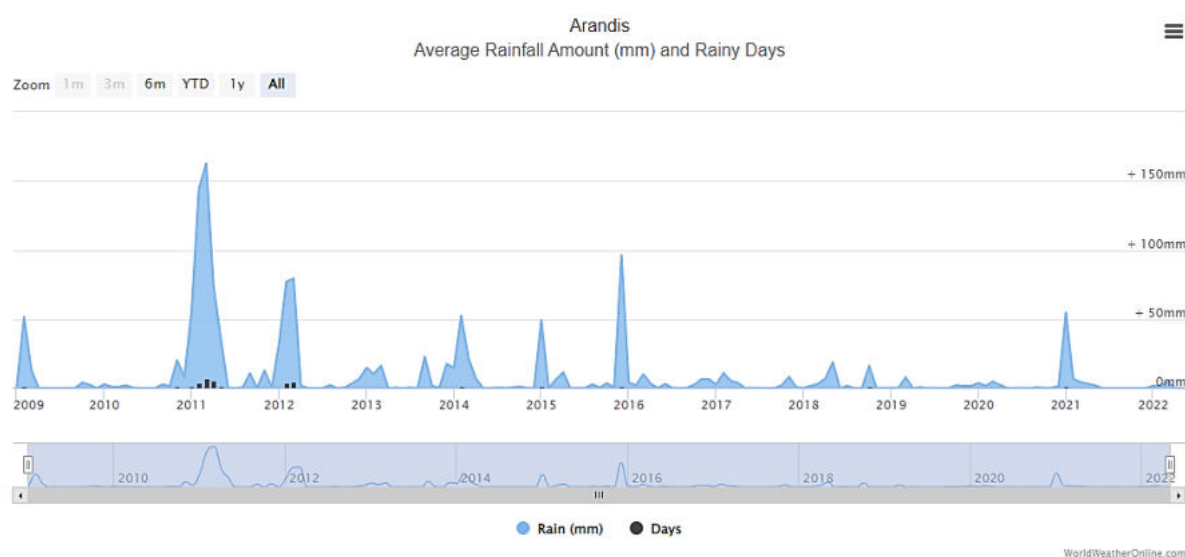


Figure 4-3: The rainfall patterns around Arandis (after World Weather Online, 2022).

Other forms of precipitation in the region include fog, which is known to 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 mobilise 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 (2005), 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 in the area

The project area is located within the southern Central Zone (sCZ) of the Neo-Proterozoic Damara Orogenic Belt. This zone 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 rocks are common in the area, represented by rocks of the Karibib (Calcitic marble, calc-silicate interlayers and schists), and Kuiseb (interbedded schist, arkosic quartzites and calc-silicate) Formations. 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 the north and northwestern parts of the area as seen in **Figure 4-4**.

Of interest to the present project are the black Cretaceous dolerite sills and dykes (Kdo) in the area as well as the red granites that are intruded by these dykes as seen in **Figure 4-4**. Marble units of Arises River Formation found in the southeastern corner of the mining claim will also be evaluated.

The soil occurrences in the area were predominantly unconsolidated Quaternary sediments comprising of soils, gravels, rock fragments and exfoliation chips that formed as a result of mechanical weathering of underlying rocks. The extremely dry and hot environment also cause the formation of Gypsisols, which are common in level or hilly land and depression areas in arid regions. It is expected that the soil cover is not thick, as the weathered units are rather shallow. **Figure 4-5** shows one of the localities where the dolerite dykes are exposed in the field, with some residual soils occurring together with windblown soils at the foot of the dolerite ridges.

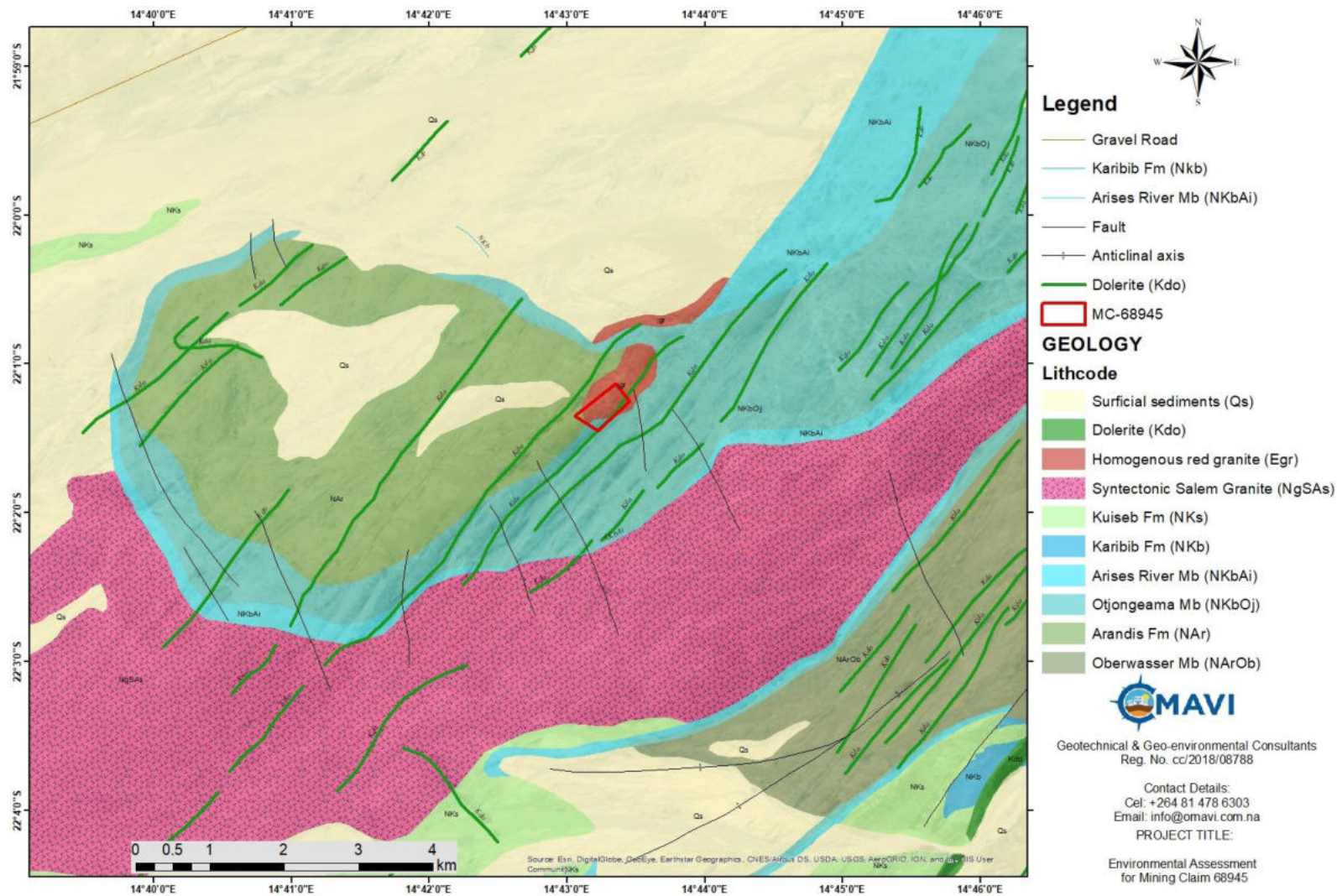


Figure 4-4: The geology of the area around the Mining Claim 68945.



Figure 4-5: One of the locations where the targeted dolerite was observed, with residual soils from the weathering of surrounding rocks.

4.1.3 Topography and Drainage of the area

The general topography of the Erongo Region 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 (amsl). The Namib Desert land surface is mostly flat to undulating gravel plains, punctuated with occasional ridges and isolated 'inselberg' hills and mountains (Southern African Institute for Environmental Assessment (SAIEA), 2011).

The proposed site has a relatively flat topography, characterized by undulating terrain and occasional hills locally termed "koppies" as seen in **Figure 4-6**. The area has elevations of about 500m amsl with occasional dolerite ridges at different elevations.



Figure 4-6: The general terrain around MC 68945, with undulating plains and occasional “koppies”.

The surface water flow or hydrology of the area is governed by the topography and terrain. For this reason, the surface water in the area has an overall westward flow direction, from highlands to the Atlantic in the west. The Namib plain is incised by four main ephemeral rivers namely the Omaruru, Swakop (including its main tributary the Khan), Kuiseb and Ugab Rivers, which run seawards from wetter parts of their catchments further inland (MME, 2010). All these rivers represent linear oases through the desert and support a multitude of life forms.

Of these rivers, the closest one to the project site is the Omaruru River, which lies about 20 km north and northwest of the project area. The Omaruru River is known to only flow after every two years (reaching Omaruru River Delta (Omdel) Dam), and has mean annual runoffs of about 40 million cubic metres per annum (MME, 2010).

Although the project site lies within the catchment of the Omaruru River, no tributaries are passing through the Mining Claim (see **Figure 4-7**). Therefore, it can be said that the area does not have significant natural surface water bodies.

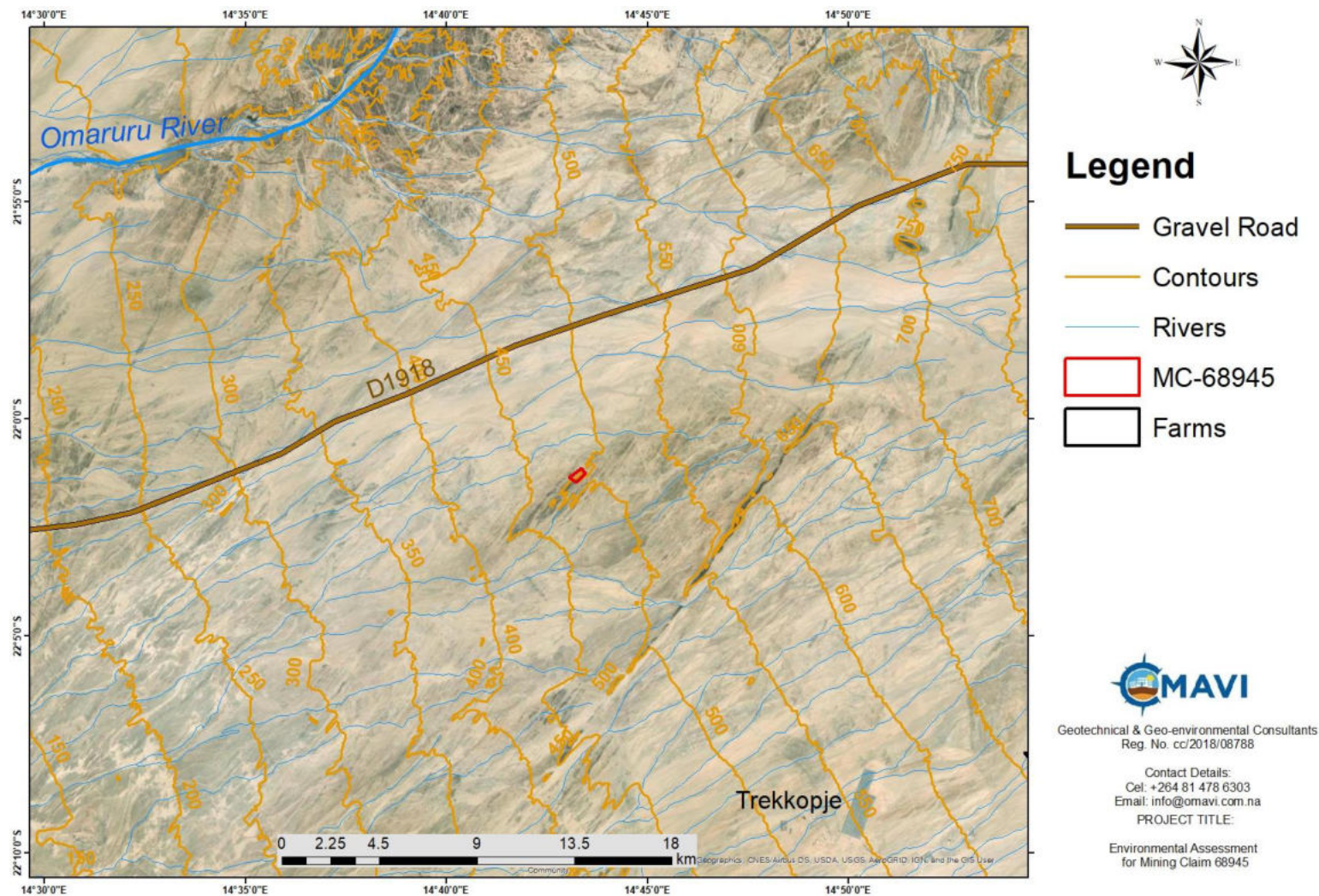


Figure 4-7: A map showing the location of the Mining Claim 68945, relative to topography and drainage.

4.1.4 Groundwater Resources

4.1.4.1 Water potential

The project area falls within the Central Namib-Windhoek Groundwater Basin which generally has low and limited groundwater potential. This is partly due to the low rainfalls in the area, which means lack of recharge, coupled with the generally unfavourable aquifer properties of Damara Sequence rocks (Christelis and Struckmeier, 2011). The Damara Supergroup rocks have poor primary porosity, therefore secondary porosity developed by faulting and karstification are usually the main sources of groundwater. This is especially the case for intact granites, quartzites, schists, calcsilicate as well as gneisses and other metamorphic rocks. However, the carbonates (dolomite, limestones, and marbles) are said to have moderate potential and at properly selected targets like fracture zones and karstified contact zones, high yields can be found depending on the amount of rainfall and associated weathering and recharge.

As established, the surface water flows in the area are seldom and often short-lived. Therefore, the real value of the rivers lies in their alluvial aquifers (Heyns & van Vuuren, 2009). Groundwater reserves in the region are limited to the Kuiseb, Swakop, and Omaruru alluvial bed aquifers of the Erongo groundwater basin, which supply Henties Bay, Swakopmund and Walvis Bay as well as Arandis, and historically Rössing Uranium and Langer Heinrich Mines (Aurecon Environment and SLR Environmental Consulting, 2014). The Omaruru River system is the closest to the project site.

The occasional ephemeral run-off of the Omaruru River (usually experienced after every two years) is responsible for recharging the groundwater in the Omdel Aquifer. This aquifer has palaeochannels, which are an important domestic and industrial water source for the central Namib community. Several boreholes have been drilled in this aquifer to provide portable water. **During the site visit, it was observed that there were no boreholes in the area, probably because the land is unoccupied. The only boreholes noted are those on Farms Trekkopje, Hakskeen, Marenica and Spitzkopje which are used by the community in the conservancy and were described to be low to moderate yielding boreholes.**

4.1.4.2 Water quality

The project area lies in an area that generally has saline groundwater (**Figure 4-8**). According to Christelis and Struckmeier (2011), groundwater in fractured aquifers between the coast and 20-150 km inland is mostly saline. The salinity of groundwater in the Erongo is said to be caused by evapotranspiration and groundwater evaporation. Matengu (2020) also noted that an increase in drawdown as a result of abstraction usually causes salinization in coastal aquifers. Given the quality of water in the area, water for domestic consumption will be carted to site.

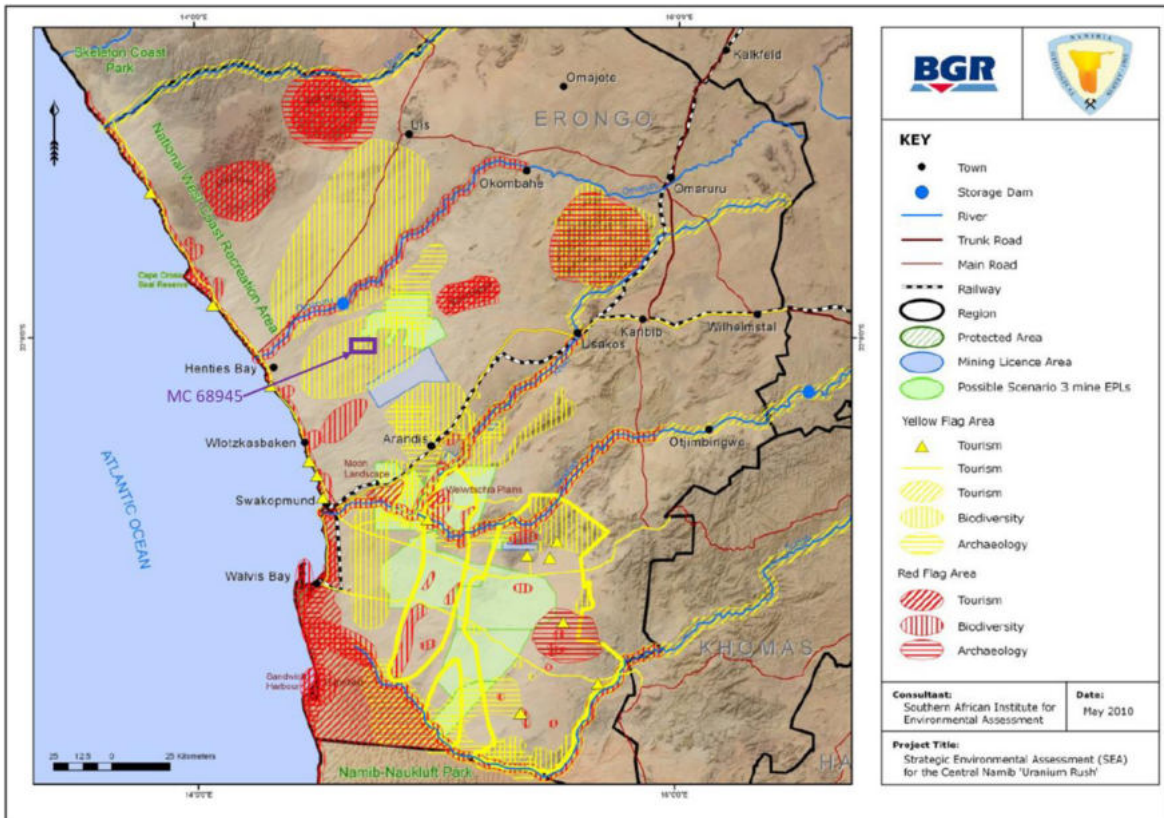


Figure 4-9: Areas of high biodiversity value in the central Namib in the context of the uranium rush (edited after MME, 2010 to show approximate location of MC 68945).

As it can be seen in **Figure 4-9** above, the project area (indicated with a purple block) is falling within a yellow flagged area in terms of biodiversity. This area is called Plains North of Trekkopje, which according to MME (2010), is made sensitive by the fact that it has relatively undisturbed gravel plains and wildlife concentrations (springbok, ostrich). Therefore, care must be taken to preserve this environment as much as possible during the different phases of this project. The different fauna and flora found in the area are described in the subsequent section.

4.1.5.1 Flora

The presence of vegetation in Namibia is largely influenced by rainfall, resulting in sparse and short vegetation in the arid west and southern parts of the country, in contrast to the tall and lush plants in the northeast. The project site falls within the transition between Namib Desert and Nama Karoo biomes (Giess, 1981). The area is characterized by low rainfall with extreme temperatures and unique climatic factors influencing the natural environment and biodiversity. The vegetation in this area is also supported by the frequent coastal fog which is a significant source of moisture and supports a unique terrestrial ecology.



During a site walk over conducted for Mining Claim 68945, the area was found to have a low plant diversity with no more than 50 species identified. The area is generally covered in annual grasses (given that the visit was after a rain period) and some sparsely distributed perennial *Stipagrostis* species (*Stipagrostis uniplumis/ Stipagrostis obtuse*), with occasional dwarf bushes as seen in **Figure 4-10**. Dwarf bushes include drought resistant succulents such as the Dollar Bush (*Zygophyllum stapffii*) widely spaced on extensive gravel plains within calcareous crusty soils and the Pencil Bush (*Arthraerua leubnitziae*) which were allied to the dolerite ridges. Occasional specimens of Bushmans's Candle (*Sarcocaulon marlothii*), occur, often in patches in the lower lying areas.





Figure 4-10: The distribution of vegetation relative to topography and climate.

Escarpments, mountains, and inselbergs are generally considered as sites of special ecological importance with granite domes (Karibib & Omaruru districts) high in biotic richness and endemism (Curtis and Barnard 1998). The dolerite outcrops of various heights and extent exist in the area, and they provide a habitat for vegetation. The soils derived from weathering of the dolerite are relatively more fertile and tend to support various plant life, which provide forage for the close to non-existent livestock and wildlife. Burke (2008) reports that this vegetation zone has high sensitivity and a low recovery potential. The common plant species observed in the area are presented in **Table 4-1**.

Table 4-1: A summary of observed vegetation and their conservation status according to the Burke (2008) and Namibia Biodiversity Database.

Plant name and conservation status	Occurrence	Photograph
<p>The Dollar Bush (<i>Zygophyllum stapffii</i>)</p> <p>Endemism: Endemic</p> <p>Status: not evaluated</p>	<p>Observed to be sparsely distributed overall plain and at the foot of the dolerite dyke.</p>	
<p>Pencil Bush (<i>Arthroaerua leubnitziae</i>)</p> <p>Endemism: Endemic</p> <p>Status: not evaluated</p>	<p>Rare occurrences in the vicinity of the dolerite dyke.</p>	

<p><i>Bushmans's candle</i> (<i>Sarcocaulon marlothii</i>)</p> <p>Endemism: Endemic</p> <p>Status: not evaluated</p>	<p>Occasionally present in patches in the lower lying areas and in the vicinity of the dolerite dyke.</p>	
<p><i>Stipagrostis uniplumis</i></p> <p>Endemism: Widespread</p> <p>Status: not evaluated</p>	<p>Forming thick grass cover over a vast stretch of the entire area.</p>	

4.1.5.2 Fauna

In terms of fauna, the determinants of diversity include favourable habitats and breeding sites, migratory routes as well as availability of food and water, grazing site to wild animals. No animals were seen during the site visit, however, this does not mean they do not exist in the area.

4.1.5.2.1 Mammals

At least 43 species of mammals are known/expected to occur in the general central Namib around the Rössing and Arandis areas (Pallett et al, 2008). This reflects medium diversity, which is typical of the Central Namib. Large mammals that are conspicuous and quickly recognized by lay people occur in the area - herbivores such as kudus and baboons and large carnivores such as leopards. The mammals list includes 6 hoofed

mammals, 9 carnivores, 11 bat species and 16 small terrestrial mammals including rodents and one each of shrew, sengi (elephant shrew), hare, dassie and hedgehog. Many of these, particularly the carnivores, are naturally uncommon to rare, while a few others, such as hedgehog and fruitbats, are likely to occur only very rarely as vagrants linked to the Khan River linear oasis.

No mammals were seen during the site visit, however, according to the locals, mammals such as springboks (*Antidorcas marsupialis*), Gemsbok (*Oryx gazella*), Kudus are seen around in the area after good rainy seasons. **The long dry seasons (lack of drinking water) coupled with farm resettlements might have contributed to the drastic reduction in the number of these mammals.**

4.1.5.2.2 Reptiles and Amphibians

Reptile diversity is high in the Namib Desert. Generally there is a high percentage of endemic reptile species (45%) associated with the rocky escarpment region of central western Namibia, which underscores the importance of this area without formal state protection. The most important species expected to occur in the general area are viewed as tortoises *Stigmochelys pardalis* and *Psammobates oculiferus*; pythons – *P. anchietae* and *P. natalensi*). According to the locals, snake types such as Puff Adder, Zebra Snake and Yellow Cobra are occasionally seen in the area.

Most amphibians prefer water to breed and are therefore associated with the permanent water bodies, mainly in northeast Namibia. Given that there are no open permanent surface water bodies on the mining claim, amphibian occurrence might be limited, with diversity expected in the moister areas such as the Omaruru River and its tributaries.

4.1.5.2.3 Birds: avifauna

Arandis is not considered an Important Birding Area (IBA) in Namibia (Simmons, 1998a), however the closest such sites are located to the west at the coast – i.e. Walvis Bay, Sandwich and Mile 4 Saltworks – while the closest inland IBA's are Brandberg and Naukluft. However, generally for the region, species of concern are those classified as endangered (violet wood-hoopoe, Ludwig's bustard, white-backed vulture, black harrier, tawny eagle, booted eagle, martial eagle, black stork), vulnerable (lappet-faced vulture, secretary bird) and near threatened (Ruppel's parrot, kori bustard, Verreaux's eagle, peregrine falcon, and marabou stork) (Risk-Based Solutions, 2020).

During the site visit, some birds could be seen flying over the site area from time to time. However, these could not be identified nor confirmed to what category of above-listed species they could belong.

4.2 The socio-economic environment

4.2.1 Population Density and Socio-economic Profile

The proposed project area is in the Dâures Constituency in Erongo Region, which has a total population of 150 809, with an annual population growth rate estimated at 3.4% (National Population and Housing Census, 2011). The region also recorded the highest net immigration than any other regions between 2010 and 2011 (Republic of Namibia, 2014a). This resulted in a mixed population with diverse languages, with Oshiwambo languages reported in most of the households (38.8%), Afrikaans in 20.4% of households, Nama/Damara 18.8 %, Otjiherero Languages 9.4%, English 5.3% while San, Setswana and Asian languages each were reported as spoken in only about 0.1% of the households.

The region's economic growth has been largely due to mining, harbour operation and fishing industry, as well as tourism, giving the region the second highest per capita income after Khomas (MME, 2010). It was also noted that 60% of the Erongo Region population are in working-age (between 15-59 years of age) and 33% are young people in age group of 0 to 14 years. 13% are children from 0 to 4 years old and 20% are youth from 5 to 14 years old (Republic of Namibia, 2014b). The main sources of income for households in Erongo are from farming (3%), wages and salaries (73%), cash remittance (5%), business and non-farming (9%) and pension (8%) (Namibia Statistics Agency, 2011a). In terms of mining, Erongo Region accommodates the mining of commodities such as gold, marble, granite, salt, and semi-precious stones (Erongo Regional Council, 2015).

The Dâures Constituency has approximately 12000 inhabitants with about 5 309 females and 6 041 males (Namibia Statistics Agency, 2011b). Majority of this population is dependent on communal subsistence farming for their livelihood. Some have moved to nearby major towns in search for employment opportunities and provision of basic services such as schools, clinics, etc. Other affected communities include Swakopmund and Karibib where the water will be sourced from and where the testing factories are located, as well as Arandis and Henties Bay which are targeted as potential towns for housing project staff.

4.2.2 Current Land Use of the area

4.2.2.1 Farming and conservancies

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. Most of the

population currently residing within the conservancies or on communal land is dependent on small stock farming and small-scale mining. East of the communal land are commercial farms which are privately owned and practice mostly large stock farming (cattle, horses), small stock farming (sheep and goats), game ranching (hunting farms) and ecotourism (particularly desert excursions). The arid nature of the landscape means that very little of the area has agricultural potential and according to Van der Merwe (1983) sheep farming takes up about 70-80% of stock farmed with, and the remaining 20-30% is goats and cattle.

The Mining Claim 68945 lies on communal land, within the #Gaingu Communal Conservancy in the Daures Constituency. There is no human occupation in the immediate vicinity of the mining claim, however there are communities on neighboring farms. According to personal communication with the headman, most residents are farming with small stock, mainly sheep and goats and some few donkeys. He indicated that farming is made difficult by water scarcity, therefore some residents relocated to nearby towns and settlements such as Spitzkopje, Usakos, Arandis, Henties Bay and Karibib where some of them are employed.

4.2.2.2 *Mining*

There are several 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 mining activities in the region include salt mining 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. Other mining activities inland include the gold mining at Navachab Mine and several dimension stones quarries such as Okatji Marble Mine.

The Mining Claim 68945 is located about 20 km northwest of the Trekkopje Mine which is currently on care and maintenance (awaiting improvement in the uranium market) and a Solar PV Plant on site. There are also other mineral licensed areas around as seen in **Figure 4-11**. According to the headman, extensive exploration drilling has been undertaken on EPLs north and northeast of the mining claim.

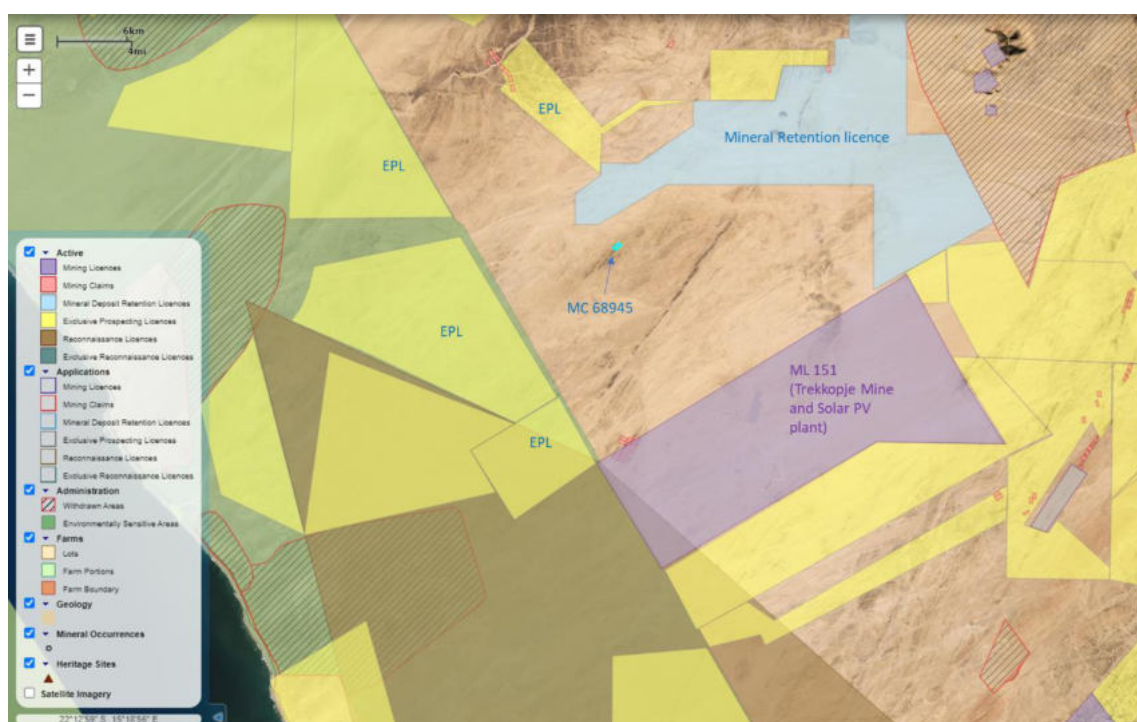


Figure 4-11: The location of MC 68945 and other mineral licensed areas.

4.2.3 Existing infrastructure

Transport infrastructure: The project site (MC 68945) is connected to the neighbouring urban centres by the B2 road which links it to Swakopmund and Walvis Bay going west and to Karibib, Windhoek going south. It can be accessed from the B2 highway via the D1918 gravel road up to the Trekopje Mine and thereafter by several small local access roads can be used. Additionally, the Trans-Namib Railway runs parallel to the B2 to major towns. No transport infrastructure are going through the mining claim.

Power infrastructure: The town of Arandis is connected to the national power grid, with powerlines running parallel to the main road. Power distributors include NamPower and ErongoRed. The Trekopje mine site has a PV solar plant. Residents near the project site are in a rural set up where majority of them rely on other sources of energy like domestic solar and generators. Domestic power supply will come from photovoltaic rooftop solar panels, supplemented by firewood, all to be provided by the proponent. Diesel fuels will be used to power project machinery and vehicles.

Water: The Erongo Regional bulk water supply is done by NamWater supplied in bulk to industries, municipalities by (the bulk water supplier). NamWater abstracts water from the large Kuiseb River and Omaruru delta (Omdel) aquifers, which is then pumped to several reservoirs that provide water to towns in the Region such as Walvis Bay, Swakopmund, Henties Bay, Arandis, Karibib and the mining industry. The desalination plant built and owned by AREVA as well as the Swakopoort Dam which is located about 80km southeast of Karibib also supplement this supply. Water in areas outside the urban

centres is either supplied by the Directorate of Rural Water Supply or sourced from privately owned boreholes on farms.

It was observed during the site visit that there were no boreholes in the area, probably because the land is unoccupied. The only boreholes noted are those on Farms Trekkopje, Hakskeen, Marenica and Spitzkkopje which are used by the community in the conservancy and were described to be low to moderate yielding boreholes. A new borehole will be drilled to meet the water needs of the project. For this, a comprehensive groundwater study for the area will be conducted upon granting of the ECC, to assess the aquifer potential and advise the siting of boreholes. If poor water strikes are encountered, the proponent envisages to cart water either from the Trekkopje Mine (subject to an agreement being reached with the mine operator), or from nearby towns of Arandis/ Usakos or Henties Bay (subject to consent from the relevant town council).

Health and Educational Facilities: there is one state health facility (clinic) and one private clinic in Arandis. Schools in the town include Arandis Primary School, Kolin Foundation, Urbanus B Dax Senior Primary School, the Rössing Foundation and the Namibian Institute of Mining and Technology (NIMT) which offers vocational training.

4.2.4 Air quality and Noise levels

The overall quality of air in the Erongo Region is influenced by its climatic conditions as well as the activities in the region. In terms of climate, the region experiences episodic or even sporadic dust storms, which are mostly more pronounced during Winter when strong easterly winds are prevalent (Liebenberg-Ensli et al. 2006). The high wind speeds coupled with mining operations and unpaved roads were seen to contribute to dust emission in the region. Fugitive dust sources associated with quarrying activities include drilling and blasting operations, materials handling activities, vehicle-entrainment by haul vehicles and wind-blown dust from tailings impoundments and stockpiles. In addition to dust, gaseous and particulate emissions contributed by vehicles and ore processing activities also impact air quality.

Contributors to noise levels in the region include vehicle movement on the public road network, rail transport activities with potential receptors of noise including the residents and tourists that frequently visit the various attractions in the surrounding area, as well as fauna.

4.2.5 Archaeology and Heritage Resources

Sites of heritage and archeological importance are common in Namibia and are important as an independent material record of past events. The remains of indigenous settlements, wells, burial grounds and other sites are valuable material evidence of

indigenous land ownership and can provide crucial support for land claims. These sites range from large and easily recognizable ones such as, natural rock shelters with evidence of occupation, including rock art, and stone features such as hut circles, hunting blinds and larger grave cairns, to smaller rock paintings and stone artefacts. All this evidence, including its landscape setting, is accorded protection under the National Heritage Act (No. 27 of 2004).

For their preservation, the National Heritage Council of Namibia (NHC) made Archaeological Impact Assessments a mandatory requirement for all environmental assessments of exploration and mining projects, with works subject to issuance of a Consent Letter by the NHC. This letter is one of the required documents when submitting environmental assessment report to the Ministry of Environment, Forestry and Tourism for evaluation and consideration of the ECC. For this reason, an archaeological survey was conducted on the 9th of April 2022 and the findings are presented below. The detailed **Archaeological Assessment Report** has been submitted to NHC for evaluation and a consent letter was issued. Both the report and consent letter have been appended to this report together with proof of submission in **Appendix D**.

4.2.5.1 Archaeological background

The Erongo Region has been the focus of several archaeological surveys and assessments during the last two decades, which resulted in a good understanding the archaeological sequence as well as the relationship between these sites and the terrains in which they are found (Kinahan, 2020). Although this is the case, the past archaeological surveys have proven that archaeology of a specific localized area does not as a rule reflect the wider archaeology of the entire spatial area that shares similar topography and geologic composition characteristics. For this reason, a site-specific survey was conducted.

4.2.5.2 Site specific archaeology

An archaeological survey for the proposed project area was conducted on the 9th of April 2022 by a qualified and experienced Archaeologist. The aim was to inspect the subject lands for unknown visible potential archaeological and heritage resources in the area and assess the likely impact of the proposed exploration and quarrying activities on these resources.

According to Mushi (2022), the archaeological survey done within the proposed project area and surrounding only found stone artifacts. These were found to be lithic implements of dolerite and quartz material, which were rather scattered. They are considered to be of low significance and their presence has been noted in the submission to NHC as required by the National Heritage Act (No. 27 of 2004). These

artifacts are shown in **Figure 4-12**, together with an iron remain material which was found outside of the Mining Claim.

Aside from these, the site visit did not find or reveal any traces of significant archaeological materials or features, there was neither graves, nor historical feature/structure or significant archaeological objects located in the surveyed area (Mushi, 2022). The only significant and notable heritage site that is somewhat within the same landscape as the Mining Claims 68945, and which is of national significance is Grootspitzkop mountain, located about 50+ km northeast of the project site (Mushi, 2022) as shown in **Figure 4-13**. Therefore, it is unlikely that it will be impacted by the proposed project.

Therefore, it can be said that the general impact of these activities on these sites will be very minimal to none. While there is no expected direct impact on the surface archaeological materials or objects within the environs of the subject lands, as yet unknown archaeological materials may be impacted upon during large-scale topsoil removal (Mushi, 2022). Subsurface remains may be exposed during project activities, therefore it is recommended that the proponent adheres to the Chance Find Procedure Guidelines to prevent accidental loss or damage of these finds.



Figure 4-12: A and B stone artifacts found on the project area, and C – the iron remains found outside the project area. (Source: Mushi, 2022).

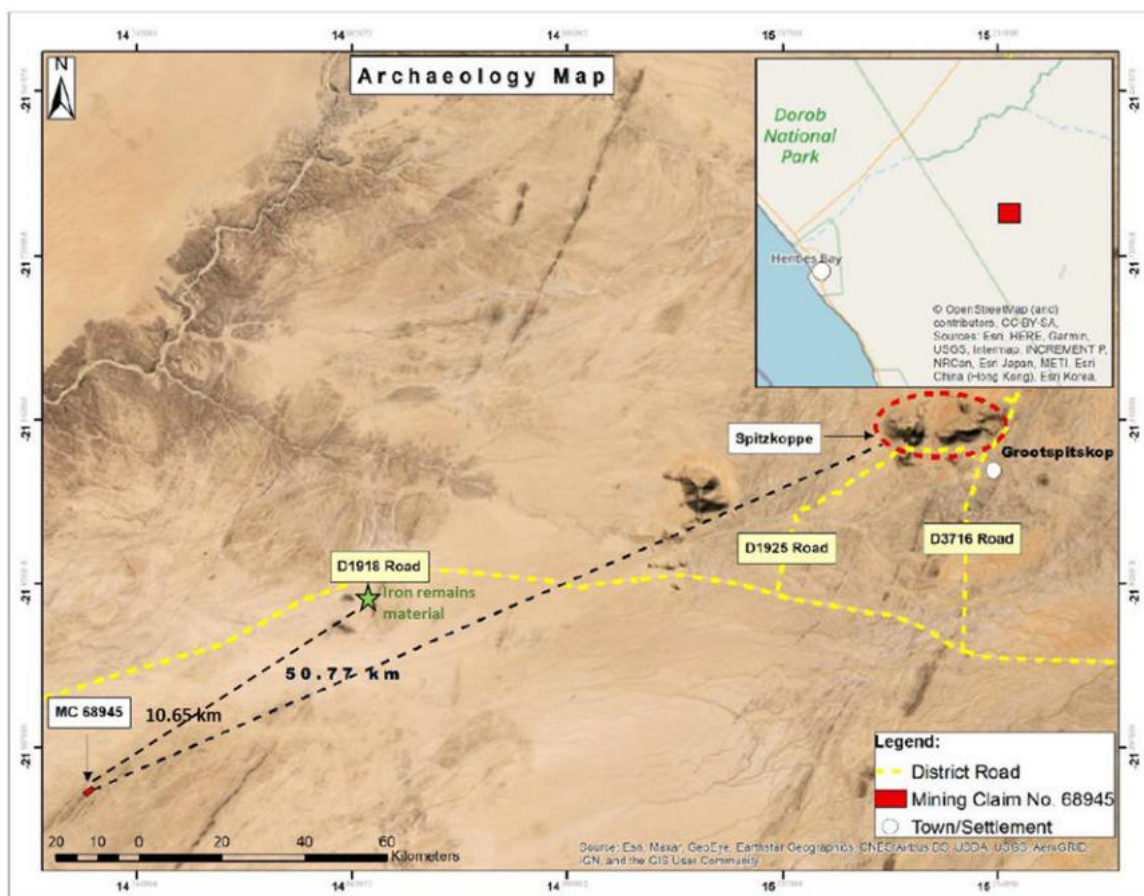


Figure 4-13: Location of sites where the iron remains were found as well as the position of Grootspitzkop relative to the Mining Claim area. (Source: Mushi, 2022).

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 (interested and affected parties (I&APs) 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 2012 EIA Regulations.

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

OMAVI identified stakeholders from national, regional and local organs of state as well as other members of the public, i.e., interested and affected parties (I&APs) who were deemed relevant to the proposed activity, to form the initial stakeholder / I&APs' List. This list was constantly updated by adding names of other members of the public who reached out in response to the public notices as well as those who attended the public consultation meeting. A summary of I&APs identified are presented below and the complete stakeholders list is provided in Appendix E.

- **Key Ministries:** Ministry of Environment, Forestry & Tourism, Ministry of Mines & Energy, Ministry of Works & Transport, Ministry of Agriculture & Land Reform,

Ministry of Urban & Rural Development, National Heritage Council of Namibia (under the Ministry of Education, Arts & Culture).

- **Regional governance:** Erongo Regional Council and Daures Constituency
- **Local authorities:** Arandis Town Council and #Gaingu Traditional Authority
- **Parastatals:** NamWater and Roads Authority
- **Service providers (NGOs and SEOs):** Namibian Chambers of Mine, Botanical Society
- **Members of the public:** Residents of the Daures Constituency particularly #Gaingu Conservancy.

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:

5.2.1 Background Information Document (BID)

- A Background Information Document (BID) containing descriptive information about the proposed exploration activities was compiled in the initial stages of the environmental scoping assessment (ESA) process and sent out to all pre-identified stakeholders via email. Printed copies of this document were also couriered to stakeholders who were not reachable via email, and some copies were distributed to the attendees of the public consultation meeting on the 9th of April 2022. Proof of sharing this document is included in **Appendix F**.

5.2.2 Project notices

- For the project information to reach a bigger public audience, newspaper advertisements were placed in three (3) widely circulated newspapers in the area namely, *The Namibian Sun*, *Allgemeine Zeitung* and *Die Republikein*. The adverts briefly explained the proposed activity, its locality and invited members of the public to register as I&APs. As per the EMA requirements, the adverts were placed in these papers for two consecutive weeks on 8 and 14 March 2022. These adverts are included in **Appendix G**.
- Site notices were printed in A3 size and were placed at visible locations at the #Gan Traditional Authority Office in Spitzkoppe Village, and at the B2 turn off to Spitzkoppe village as seen in **Figure 5-1**).



Figure 5-1: Site notices placed at (A) the !Oe#Gan Traditional Authority Office in Spitzkoppe Village, and at (B) the B2 turn off to Spitzkoppe village.

5.2.3 Public consultation meeting

- A face-to-face public meeting was arranged, and invitation sent out to the Traditional Authority (on 31 March 2022) for local community announcement and on the same day to the registered I&APs with email addressed (**Appendix H**). Although the meeting invitation notice was only sent out on 31 March 2022 the public was already informed in the newspaper adverts (on 8 and 14 March 2022) that a public meeting would be held once the date had been finalized.
- The public consultation meeting was held on the 9th of April 2022, starting with the Traditional Authority and Communal Conservancy Leadership at 11h00 and later with the general community at 14h00. It was held at the !Oe#Gan Traditional Authority Office and some photos from the two meetings are shown in **Figure 5-2**.
- During the meeting, a short presentation was given by OMAVI, with the assistance of two members of the community who translated to Afrikaans and Damara-Nama. The presentations entailed a description of the proposed project, the environmental assessment process and the main potential impacts identified. The meeting was attended by forty-eight (48) people, including two (2) OMAVI Consultants. The attendees were requested to complete an attendance register found in **Appendix I** together with the meeting minutes.
- The attendees voiced their comments and concerns during the meeting, some of which were responded to immediately, and others were noted down to be addressed in the ESA report. The community was also encouraged to send

additional comments after the meeting by e-mail or short message service (SMS), either individually or through their representative at the !Oe#Gan Traditional Authority.

- Minutes for these meetings can be found in **Appendix I** together with the attendance register. All the issues and concerns raised in the meeting were summarized and presented under the following subsection (5.3).



Figure 5-2: Top photos are from the meeting with Leadership of !Oe#Gan Traditional Authority and the #Gaingu Communal Conservancy while the bottom photos are from the meeting with the general community of Spitzkoppe village and nearby villages.

5.3 Key issues raised

A few issues and concerns were raised during the public participation period, some of which were registered via email and others during the public consultation meeting as well as during the comments period provided for during the environmental scoping assessment process. These are summarized in Table 5-1 below.

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

Environmental component	Concern	Response
Road infrastructure	Maintenance of the road is already poor- will the trucks carrying big blocks	Recommendations on measures to be implemented to maintain the road will be

	of rocks not worsen the road conditions?	detailed in the Environmental Management and Rehabilitation Plan.
Animal safety during and after mining	How will the rehabilitation of the exploration and quarry sites be implemented? Concerns of animals falling in. Given the high activity of wildlife in the area, how will illegal hunting and poaching be avoided and prevented?	Quarry areas will be fenced off until they are reinstated, and rehabilitation will be done as an ongoing process during mining. Recommendation measures to minimise this impact will be detailed in the Environmental Management Plan (EMP).
Groundwater	Water resources are limited in the area, will the proponent drill his own borehole?	The proponent will attend to drill a water supply borehole within the mining claim. If good strikes are encountered the borehole will supply water for operations and may be shared with the community. For this a separate water study will be conducted upon granting of the ECC and prior to project commencement. If the borehole yields are not satisfactory, the proponent envisages to cart water either from the Trekkopje Mine (subject to an agreement with the mine operator), or from nearby towns of Arandis/ Usakos or Henties Bay (subject to consent from the relevant town council).
Waste Management	There are concerns around waste management, possible	This impact will be assessed and details on how project waste will be managed as well as measures to minimize

	pollution and possible harm to the environment.	pollution will be provided in the EMP.
Occupational health	Health risk from dust	Workers will be provided with adequate and suitable PPE. Other dust suppression measures and environmental protection will be outlined in the EMP.
Benefits to the community	How will the community benefit from the said project, especially women, the youth and disabled citizens	The exact details of the benefits to be realized will be agreed upon between the license holder and the community through their leadership during the compensation agreement stage. However, the Labour Law makes provision for locals to be prioritised for employment.

The above listed issues and concerns were raised mostly during the consultation meetings and have been responded to and in addition, addressed as part of the impact assessment process under Chapter 6.

There were no further comments submitted whether via communication directly to OMAVI or via the !Oe#Gan Traditional Authority. However, a request was made that a copy of the EMP be made available to the Traditional Authorities. For this reason, the ESA Report was finalised for submission to the Ministry of Environment, Forestry and Tourism: Department of Environmental Affairs and Forestry (MEFT: DEAF) for environmental clearance.

The proposed exploration activities have the potential to impact the immediate and surrounding socio-economic and biophysical environment. Understanding these impacts, especially the negative ones and their significance will aid the provision of suitable mitigation measures. The recommended measures can then be implemented to minimize the impacts' significance, and where possible, avoid these impacts all together. Some impacts might be insignificant while others might need special attention or even further investigation.

The subsequent chapter presents the positive and negative impacts that are anticipated from the project activities, their description, assessment, and mitigations thereof.

6 IMPACT IDENTIFICATION AND ASSESSMENT

The proposed project activities are associated with different environmental impacts, whether positive or negative. The general aim of an environmental assessment is to assess these impacts, mainly the negative ones as they are likely to cause more damage to the environment if measures are not properly implemented. This is done to ensure that the potential negative impacts are adequately addressed, so that impact significance is brought under control, while maximizing the positive impacts.

The potential positive and negative impacts that have been identified from the proposed exploration activities are as follows:

Potential positive impacts:

- Socio-economic development through employment creation and skills transfer.
- Increased support for local businesses through the procurement of consumable items such as Personal Protective Equipment (PPE), machinery spare parts, lubricants, etc.
- Contribution towards national economy through the payment of taxes and royalties to the Government (through the Ministry of Mines and Energy).
- Improved geological understanding of the site area regarding dimension stones.

Potential negative impacts:

- **Physical land / soil disturbance:** The invasive exploration techniques and quarrying activities could potentially lead to site soils or land disturbance.
- **Air quality issue:** potential dust generated from surface excavation, drilling, diamond wire sawing and mining could compromise the surrounding air quality.
- **Impact on local biodiversity (fauna and flora):** the removal of vegetation that may be found within the project footprints (for both exploration and mining). The moving of some site rocks may lead to loss of habitats for small animal species like reptiles that live under these rocks. Movement of heavy project vehicles may disturb the local livestock and wildlife around the project site.
- **Noise:** potential increase in noise levels from project vehicles and machinery may be a nuisance to locals.
- **Environmental pollution** through different types of waste generated on the site due to improper management and disposal.

- **Impact on service infrastructure such as local roads:** the temporary potential increase in vehicular traffic during exploration may exert additional pressure on the local roads, especially by heavy vehicles such as trucks carrying project materials, equipment (drilling rig) and mined blocks.
- **Visual / aesthetic impact:** the mined-out areas on the project sites may pose as an eyesore to travellers (including tourists).
- **Archaeological or cultural heritage** impact through unintentional uncovering of unknown archaeological objects or sites by certain project activities.
- **Soil and water resources pollution:** the potential risk of hydrocarbon spillages and wastewater in the working areas and workshops if not properly managed may contaminate the site soils and eventually reach groundwater systems.
- **Health and safety hazards** to personnel associated with the movement / operating of machinery. Not only to project personnel but also residents (locals) in the affected area.
- **General social nuisance to landowners:** The project personnel might invade private areas such as houses. Poor communication between the Proponent and the occupier of land with regards to the project activities could result in long-terms unresolved conflicts.

6.1 Impact Assessment Methodology

The methodology used to assess and determine the significance of the above-listed potential project impacts on the biophysical and social environmental components is as explained below.

6.1.1 Impact Assessment Screening

The potential impacts identified by Interested and Affected Parties (I&APs), presented as issues during public consultation period and by OMAVI Consultants based on professional experience was screened according to a set of questions (**Figure 6-1**). This resulted in highlighting the key impacts requiring further detailed assessment of each impact in the respective sections of this chapter.

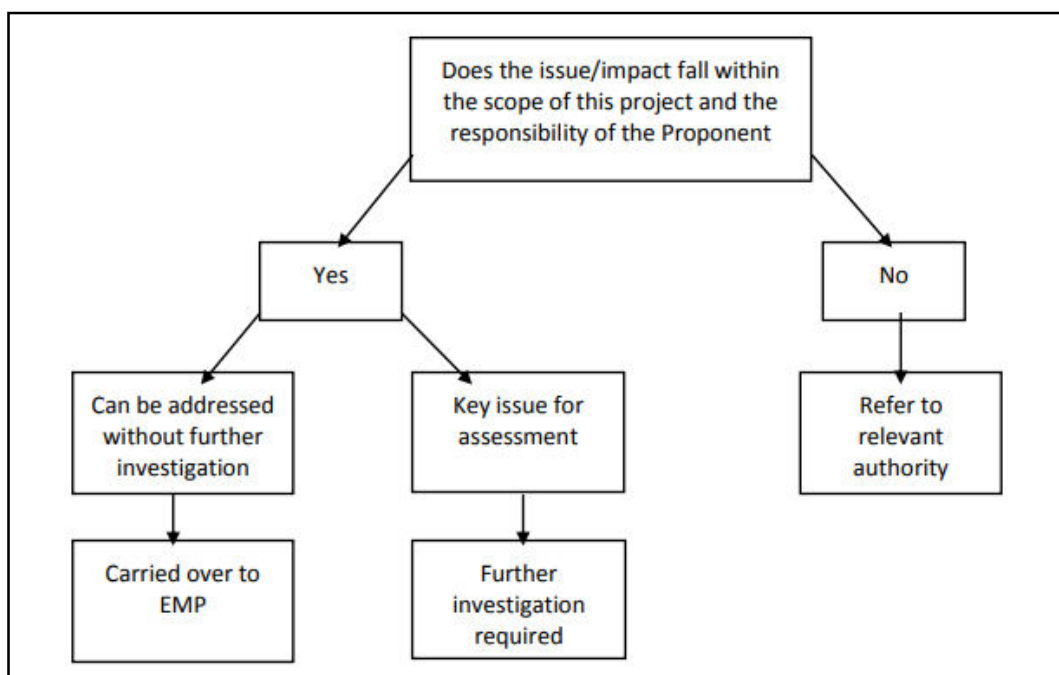


Figure 6-1: Screening process for determining key impacts (source: Resilient Environmental Solutions, 2019)

6.1.2 Impact Assessment Criteria

The methodology employed for this assessment was adopted from other environmental assessment reports based on research and analysis of other consultants' reports (GCS Water & Environmental Consultants, 2017a) on the suitable project impacts' assessment methodology.

The proposed exploration activities will likely to some scale/extent (spatial scale), magnitude (severity) and duration (temporal scale) have impacts on certain biophysical and social components. The potential impacts were assessed as per criteria presented in Table 6-1. 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 that potential impacts can be addressed in a standard manner so that a wide range of impacts are comparable.

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 process will be applied to each potential impact:

- Provision of a brief explanation of the impact.
- Assessment of the pre-mitigation significance of the impact; and
- Description of recommended mitigation measures.

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.

Table 6-1: Impact Assessment Criteria employed to assess the potential negative impacts

Nature	Description	Rating
Extent (Spatial scale)	An indication of the physical and spatial scale of the impact.	<p>Low (1): Impact is localized within the site boundary: Site only.</p> <p>Low/Medium (2): Impact is beyond the site boundary: Local.</p> <p>Medium (3): Impacts felt within adjacent biophysical and social environments: Regional.</p> <p>Medium/High (4): Impact widespread far beyond site boundary: Regional</p> <p>High (5): Impact extend National or over international boundaries.</p>
Duration	The timeframe, over which the impact is expected to occur, measured in relation to the lifetime of the project.	<p>Low (1): Immediate mitigating measures, immediate progress</p> <p>Low/Medium (2): Impact is quickly reversible, short-term impacts (0-5 years)</p> <p>Medium (3): Reversible over time; medium term (5-15 years).</p> <p>Medium/High (4): Impact is long-term.</p> <p>High (5): Long term; beyond closure; permanent; irreplaceable or irretrievable commitment of resources</p>
Intensity, Magnitude / Severity (Qualitative criteria)	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	<p>Medium/low (4): Low deterioration, slight noticeable alteration in habitat and biodiversity. Little loss in species numbers.</p> <p>Low (2): Minor deterioration, nuisance or irritation, minor change in species / habitat / diversity or resource, no or very little quality deterioration.</p>
Probability of occurrence	Probability describes the likelihood of the impacts occurring. This determination is based on previous experience with similar projects and/or based on professional judgment	<p>Low (1): Improbable; low likelihood; seldom. No known risk or vulnerability to natural or induced hazards.</p> <p>Medium/low (2): Likely to occur from time to time. Low risk or vulnerability to natural or induced hazards.</p>

Nature	Description	Rating
		<p>Medium (3): Possible, distinct possibility, frequent. Low to medium risk or vulnerability to natural or induced hazards.</p> <p>Medium/High (4): Probable if mitigating measures are not implemented. Medium risk of vulnerability to natural or induced hazards.</p> <p>High (5): Definite (regardless of preventative measures), highly likely, continuous. High risk or vulnerability to natural or induced hazards.</p>

6.1.3 Impact Significance

This is determined through a synthesis of the above impact characteristics (in Table 6-1 above). 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 6-1) have been ranked for each potential impact, the impact significance of each is assessed using the following formula:

$$SP = (\text{magnitude} + \text{duration} + \text{scale}) \times \text{probability}$$

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 6-2).

Table 6-2: Impact 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 to enable the confirmation of the significance of the impact as low or medium and under control.

The assessment of the project impacts is done for both pre-mitigation (before implementing any mitigation) and post-mitigation (after mitigations are effectively implemented). The potential impacts listed under section 6.1 above are described and assessed under the subsequent sections.

6.2 Positive Impacts: Description and Assessment

6.2.1 Socio-economic development (Employment and Social Responsibilities)

The exploration activities will create some temporary job opportunities for the locals (both skilled, semi and unskilled), resulting in socio-economic development through employment creation and skills transfer. If an economical resource is found, the project will go into mining phase, and the number employees and skill transfers will increase. The skills transferred to these workers (exploration and mining teams) will ensure improved employability for those workers in the industry or at other similar project operations in future. The income earned by the employed locals (workers) will positively impact their lives, individually and that of their households (families). This impact is assessed as follows.

- **Impact type:** positive
- **Extent:** Local to regional
- **Duration:** short-term for exploration, but since the same employees are likely to be kept and continue into the mining phase (should exploration yield favorable results), it would turn into long-term
- **Probability:** Probable
- **Significance (no mitigation):** Low, **Significance (post-mitigation):** medium
- **Mitigation measures:** Namibian citizens and permanent residents from the area should be employed for the unskilled labour preferentially to out-of-area people (outsiders) where possible. Out-of-area employment should be justified, for example by the unavailability of local skills only.
 - Equal opportunities should be provided for both men and women, the youth and people living with disability when and where possible.

6.2.2 Socio-economic development (Value Added Taxes and Royalty)

Once proved to be economical in the exploration phase, the mining and sale of the processed dimension stone (off site) will result in the payment of national taxes and royalties to the responsible institutions of the Government of the Republic of Namibia. This will contribute towards national economy from the mining sector. The impact assessment is as follows:

- **Impact type:** positive
- **Extent:** national
- **Duration:** Long-term
- **Probability:** Probable
- **Significance:** medium
- **Mitigation measures:** The Proponent to ensure compliance with their project's requirements by the National Tax Agency (Inland Revenue) and Ministry of Mines and Energy on payment of taxes and royalties, respectively.

6.2.3 Improved geological understanding of the site

The geological information reviewed and gathered during the exploration phase and eventual mining will be made available to the Ministry of Mines and Energy. The Ministry would then consolidate the information as a public institution for archiving and future use as a baseline for projects or educational research. This impact is assessed as follows:

- **Impact type:** positive
- **Extent:** Local to national
- **Duration:** Long-term
- **Probability:** Probable
- **Significance:** medium
- **Mitigation measures:** The Proponent to ensure quarterly reporting for availability and accessibility of exploration findings to the Ministry of Mines and Energy (Mines Department) and possibly Geological Survey of Namibia for archiving.

6.3 Negative Impacts: Description and Assessment

The potential negative impacts have been described and assessed. The mitigation measures have also been provided under each assessed impact. These measures are then "translated" into management plan actions in the project's Environmental Management Plan (EMP).

6.3.1 Impact on Groundwater Quantity (Over-abstraction)

Groundwater resources can be impacted by project activities in two ways, namely through pollution (water quality) or over-abstraction (water quantity) or at times both. The abstraction of more water than it can be replenished (given the low rainfalls in the area) would result in low yielding community boreholes and could also compromise the quality of the water by increasing its salinity.

The impact of the project activities on the resource would be dependent on the water volumes required by each project activity. At exploration stage, a low water demand of about 10 000 litres per week will be required at drilling phase while 20 000 to 30 000 litres per week will be required during the test quarrying phase. This amount is anticipated to increase to about 50 000 to 60 000 litres per week at mining stage. This water will mainly be used to support the exploration and mining processes such as down-the-hole drilling, butterfly cutting during exploration, diamond wire saw, cleaning and cooling off exploration and mining equipment.

As a first consideration, an attempt will be made to site and drill a borehole within the mining claim area to meet the water needs of the project. **For this, a comprehensive groundwater study for the area will be conducted upon granting of the ECC and prior to the project commencement, to assess the aquifer potential and advise the siting of the borehole.** Once drilled pump testing will be carried out to determine the yields and water quality. The proponent will ensure that all necessary permitting (Groundwater Abstraction and Use Permit (GWAUP) by the Department of Water Affairs (DWA) at the Ministry of Agriculture, Water and Land Reform (MAWLR)) will be obtained prior to the use of such borehole. However, should poor water strikes be encountered (i.e. no borehole with reasonable yields of at least 2 to 3 m³ per hour), then alternative water supply options will be considered. One of these options is the carting of water by means of water bowser, either from the Trekkopje Mine (subject to an agreement being reached with the mine operator), or from nearby towns of Arandis/ Usakos or Henties Bay (subject to consent from the relevant town council).

Additionally, water will be recycled and re-used as an attempt to conserve water. This approach might see a reduction in the amount of water requirements, which will mean lesser amounts to be abstracted or carted.

Without the implementation of any mitigation measures, the impact can be rated as medium, but upon effective implementation of the recommended measures, the impact significance would be reduced to low as presented in the Table 6-3 below.

Table 6-3: Assessment of the project impact on water resources abstraction (quantity)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M - 3	M - 36

Post mitigation	L - 1	L/M - 2	L - 2	L/M -2	L - 10
Mitigation measures					
<ul style="list-style-type: none"> • A comprehensive groundwater study must be done for the area to assess the aquifer potential and advise the siting of the borehole. The borehole should be carefully sited, drilled, installed and a sustainable yield determined during the aquifer test (pumping test) by a qualified and experienced hydrogeologist. The hydrogeologist will then recommend a safe (sustainable) abstraction yield for the site to the Proponent to ensure that the local aquifers are not stressed, i.e. not negatively impacted by this local abstraction. • The groundwater abstraction and use should be controlled by the Water Act which states that all activities that use water for commercial purposes, requires a Water Abstraction and Use Permit from the Department of Water Affairs' Directorate of Water Resources Management. The Proponent will be required comply with the conditions set out in the Permit. With regards to the two project activities, the specifications are as follows: <ul style="list-style-type: none"> ○ Exploration: A comprehensive groundwater study must be done for the area to assess the aquifer potential and advise the siting of borehole. The Proponent will have to apply for the Groundwater Abstraction and Use Permit (GWAUP) prior to commencing with quarrying activities. <u>This permit must be applied for and obtained from the national Department of Water Affairs (DWA) at the Ministry of Agriculture, Water and Land Reform (MAWLR) to regulate and manage water abstracted from the borehole for the project.</u> In the Permit, the Water Regulatory Authority would set objectives (abstraction targets), conditions, annual abstraction threshold, monitoring requirements and enforce compliance by the Proponent. It is important that the Proponent strictly adhere to the abstraction volumes given in their water permit and if possible, use less water. ○ Mining: It is anticipated that the required amount of water will increase from exploration to mining. Therefore, at mining phase, the GWAUP from exploration phase must be updated, to accommodate the changes due to added activities. • As part of the commercial water user's responsibilities, an annual report that includes water returns and any new changes to the water use should be prepared and submitted to the responsible unit of the DWA. Reporting will be used as a tool by the Regulatory Authority to ensure that monitoring implementation is effective, and that the Proponent commits and complies with the water resources management legislation. This action also enables the Authority to make further informed decisions on groundwater management and protection. • However, given the low potential of local aquifers and should it come to light that the drilled borehole cannot supply the Us volumes required, then the Proponent will cart water to site for use throughout the life of the project (at both exploration and mining phases). This water will either come from the Trekkopje Mine or from nearby towns of Arandis/ Usakos or Henties Bay. Necessary permissions should be obtained from the mine operator and the relevant town councils respectively. • Water reuse/recycling methods should be implemented as far as practicable such that the water used to cool off exploration equipment should be captured and used for the cleaning of project equipment, where possible. • Water storage tanks should be inspected daily to ensure that there is no leakage, resulting in wasted water on site. 					

- Water conservation awareness and saving measures training should be provided to all the project workers in both phases so that they understand the importance of conserving water and become accountable.
- **Groundwater Monitoring:** please refer to the EMP and Groundwater Assessment Report for monitoring exercises recommended during the mining phase.

6.3.2 Impact on Soils (Physical Land Disturbance)

The exploration and quarrying activities such as excavations and land clearing to enable siting of project structures and equipment will potentially result in soil disturbance which will leave the site soils exposed to erosion. This impact would be probable at site given that it is covered primarily by grass with occasional dwarf shrubs. Therefore, soil vulnerability to erosion impact is minimal. The impact can be rated as medium if no mitigation measures are implemented. However, with the effective implementation of mitigation measures and monitoring, the impact significance can be reduced to low. The impact is assessed in Table 6-4.

Table 6-4: Impact assessment of project activities on soils (physical disturbance)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	L/M - 4	M/H - 4	M - 44
Post mitigation	L/M - 2	M - 3	L - 2	L/M - 3	L - 21
Mitigation measures					
<ul style="list-style-type: none"> • Overburden should be handled more efficiently during exploration works to avoid erosion when subjected erosional processes. • Prevent creation of huge piles of waste rocks by performing sequential backfilling. • Stockpiled topsoil and overburden waste rocks should be used to backfill the explored and disturbed site areas/spots. • Soils that are not within the intended and targeted footprints of the site areas should be left undisturbed and soil conservation implemented as far as possible. • Project vehicles/machinery should stick to access roads provide and or meant for the project operations but not to unnecessarily create further tracks on site by driving everywhere resulting in loosening of soil. 					

6.3.3 Soils and Water Resources Pollution

The anticipated potential source of soil and groundwater pollution are project activities such as hydrocarbons fuels from project vehicles, machinery, and equipment as well as potential wastewater/effluent from exploration and mining works. The spills from these machinery, vehicles and equipment (depending on volumes spilled on the soils) could infiltrate into the ground and pollute the fractured or faulted aquifers on site, and with time could travel to reach further groundwater systems in the area. This will only occur if there is improper storage and handling of hydrocarbons (fuel) which could result in spills, or wet waste such as effluents on project sites. And as highlighted in the previous section, groundwater quality can also arise from low and prolonged periods of no recharge, which results in increased concentrations of chemical constituents (increased TDS, salinity, etc). However, this will not be an impact for this project, as no water will be abstracted from local boreholes for operations.

The Groundwater Resources Vulnerability Map of Namibia shows that the vulnerability of groundwater to pollution in the project area is moderate. The main concern regarding groundwater pollution would be on areas that are underlain by fractured/faulted rock units that could act as conduits to potentially contaminate the nearby OMDEL aquifer. However, given the intact nature of underlying rocks, this impact is anticipated to be low. Additionally, the low rainfalls in the area and consequent lack of recharge could mean prolonged periods of no flow, hence immobile contaminants will be localized.

From the above description of the impact, it can be concluded that without implementing any measures to avoid or minimize the impact, the impact significance will be moderate and once the recommended mitigation measures have been implemented, the significance will be reduced to low. The assessment also presented in Table 6-5 below.

Table 6-5: Assessment of the project impact on soils and water resources (quality)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	L/M - 4	M/H - 4	M - 44
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12
Mitigation measures					
<ul style="list-style-type: none"> • Spill control preventive measures should be in place on site to management soil contamination, thus preventing and or minimizing the contamination from reaching groundwater bodies. Some of the soil control preventive measures are: <ul style="list-style-type: none"> ✓ Identification of oil storage and use locations on site and allocate drip trays and polluted soil removal tools suitable for that specific surface (soil or hard rock cover) on the sites. ✓ Maintain equipment and fuel storage tanks to ensure that they are in good condition thus preventing leaks and spills. ✓ The oil storage and use locations should be visually inspected for container or tank condition and spills. 					

- ✓ Maintain a fully provisioned, easily accessed spill kit. Spill kits should be located throughout the active project sites contain the floor dry absorbent material and absorbent booms, pads, mats. These would be suitable for ground surface areas that are covered mainly by hard rocks.
- ✓ All project employees should be sensitized about the impacts of soil pollution and advised to follow appropriate fuel delivery and handling procedures.
- ✓ The Proponent should develop and prepare countermeasures to contain, clean up, and mitigate the effects of an oil spill. This includes keeping spill response procedures and a well-stocked cache of supplies easily accessible.
- ✓ Ensure employees receive basic Spill Prevention, Control, and Countermeasure (SPCC) Plan training and mentor new workers as they get hired.
- Exploration site areas where hydrocarbons will be utilized, the surface should be covered with an impermeable plastic liner (e.g., an HDPE liner), carefully placed to minimize risk of puncturing, to prevent any spillages from getting into direct contact with the soils and prevent eventual infiltration into the ground.
- Project machines and equipment should be equipped with drip trays to contain possible oil spills when operated on site.
- All wastewater and hydrocarbon substances and other potential pollutants associated with the project activities should be contained in designated containers on site and later disposed of at nearby approved waste sites in accordance with MAWLR's Water Environment Division standards on waste discharge into the environment. This is to ensure that these hazardous substances do not infiltrate into the ground and affect the local groundwater quality.
- In cases of accidental fuel or oil spills on the soils from site vehicles, machinery and equipment, the polluted soil should be removed immediately and put in a designate waste type container for later disposal as per the preceding bullet point. The removed polluted soil should either be completely disposed of or cleaned and returned to where it was taken from on site or can be replaced with a cleaner soil. This is to ensure that the pollutants contained into the soil does not infiltrate into the site soils and eventually reach to groundwater.
- Although fuel (diesel) required for exploration equipment will be stored in a tank mounted on a mobile trailer, drip trays must be readily available on this trailer and monitored to ensure that accidental fuel spills along the tank trailer path/route around the exploration sites are cleaned on time (soon after the spill has happened).
- Polluted soil must be collected and transported away from the site to an approved and appropriately classified hazardous waste treatment facility.
- Washing of equipment contaminated hydrocarbons, as well as the washing and servicing of vehicles should take place at a dedicated area, where contaminants are prevented from contaminating soil or water resources.
- Toilet water should be treated using one of the following methods:
 - ✓ Discharged into chemical toilets and periodically emptied out before reaching capacity and transported to a wastewater treatment facility.
 - ✓ A type of pit latrine (where excreta in the pit is treated to prevent the waste from being a water pollution risk).

6.3.4 Impact on Biodiversity (Fauna and Flora)

The proposed activities have the potential to impact both surrounding fauna (animals) and flora (vegetation) and these are described below.

6.3.4.1 Fauna

The project site is on communal land where the community relies majorly on small stock (goats and sheep) farming. Although this is the case, these communities are well away from the project site (more than 20 km to the east). Their domesticated animals do not graze too far from their homesteads, therefore they may not make it to the proposed project site. Thus, the impact of movement of heavy project vehicles on the livestock and their local grazing areas is minimal.

Project personnel and vehicles may also scare away the wild animals such as springboks, gemsboks and kudus. However, it has been established that there is very little left of this wildlife in the area due to lack of water, with only few animals coming around after the rainy season. For this reason, the impact on wildlife is expected to be low. Additionally, operations will be limited to working hours of the day only, and this will allow minimal disturbance of animals at night

Another potential impact of the project activities is the faunal habitat loss especially for reptiles and small mammals that live under the targeted rock units on the mining claim. Although this impact may not be entirely avoidable, the workers will need to be educated on the importance of conserving faunal biodiversity by not killing any of the small mammals or reptiles encountered while performing their tasks. These animals may be trying to migrate from the targeted and disturbed rock outcrops to seek shelter and habitat elsewhere, therefore, the workers (project personnel) will be sensitized to not harm them in any way.

6.3.4.2 Flora

This impact is anticipated through the clearing of land to create access roads for movement of vehicles and machinery and to clear the site for exploration and quarrying activities. This will require removal of vegetation that may be found within the project footprints (target site areas). The moving and displacement of some site rocks may lead to loss of habitats for vegetation. The movement of project vehicles may also destroy the vegetation within project site tracks, especially small shrubs, if care is not taken.

All these actions will potentially lead to the destruction of animal and plant species within the targeted exploration and mining sites within the mining claim. Thus, resulting in the loss of such species and eventual loss of biodiversity in the area. However, the project site area is already poorly vegetated, covered primarily by grass with occasional dwarf shrubs, thus minimizing the need to remove vegetation.

Consequently, the impact on flora would be of slightly medium significance with no mitigation measures in place for implementation to protect the existing vegetation. This conclusion would also apply to the existing fauna (both farm livestock and site rock animal species). Therefore, to reduce the pre-mitigation impact significance from medium to low, the recommended measures in Table 6-6 below will need to be effectively implemented.

Table 6-6: Impact assessment of project activities on biodiversity.

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 4	L/M - 4	M - 3	M - 33
Post mitigation	L/M - 2	L/M - 2	L - 2	L/M - 2	L - 12
Mitigation measures					
Flora					
<ul style="list-style-type: none"> The Proponent should avoid unnecessary removal of vegetation, thus promoting a balance between biodiversity and their operations. Vegetation found on the site, but not in the targeted mining areas should not be removed but left to preserve biodiversity on the site. The proponent must explore the possibility of transplanting or relocating vegetation found on the targeted rock units. The movement of vehicles and machinery should be restricted to existing roads and if necessary, newly established tracks only to prevent unnecessary damage to the site vegetation. No onsite vegetation should be cut or used for firewood related to the project's operations. The Proponent should provide firewood for his onsite camping workers from authorized firewood producer or seller. Even if a certain shrub or tree is found along exploration and mining sites, this does not mean that it should be removed. Therefore, care should be taken when exploring and mining without destroying the site vegetation. 					
Fauna					
<ul style="list-style-type: none"> Workers should refrain from killing species (big or small and all types) that may be found on and around the site. Workers should refrain from disturbing, killing or stealing locals' animals and killing small soil and rock outcrops' species found on sites. This prohibition also applies to future re-appearance of wild animals in the area during good rain seasons. Environmental awareness on the importance of biodiversity preservation should be provided to the workers. 					

6.3.5 Visual impact

Surface mining of dimension stones usually leaves scars on the local landscape, depending on the site characteristics, exploration method and intensity of such activities. If the worked sites are located close to or along roads or frequently used areas, these scars in many cases contrasts with the surrounding landscape and thus may potentially become a visual nuisance.

The rocks of interest in this case are red granites and dolerites, whose colours are dark and may not leave such a huge contrast between the environment and the explored/mined-out areas. The mining claim is also small in size (about 18Ha), which makes the footprint of the project significantly small. Progressive backfilling during and after exploration and quarrying activities may further reduce the significance of visual impact.

Without any mitigation measures, the impact will be of slightly medium significant, but after implementing the measures, the significance will be low as assessed in Table 6-7.

Table 6-7: Visual impact assessment

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	M - 6	M - 3	M - 39
Post mitigation	L - 1	L /M- 2	L /M- 3	L/M - 2	L - 12
Mitigation measures					
<ul style="list-style-type: none"> The Proponent should consider the implementation of continuous rehabilitation programme, by using overburden waste rocks from exploration works. The Proponent to utilize waste rubble to rock blind exposed rock faces and stockpiled topsoil to partially back fill site areas used for test quarrying. The Proponent should carry out progressive working and restoration/rehabilitation over the shortest timescale possible, to avoid excessive areas of disturbance. Consider a phased exploration and direct placement of overburden (topsoil and waste rocks) and other site-derived materials to allow progressive restoration around the margins of the explored-out site areas. 					

6.3.6 Noise

The drilling and quarrying activities as well as movements of heavy equipment and vehicles associated with the project may lead to elevated noise levels, which can be a nuisance to the hosting community and immediate neighbours. High levels of noise may also pose a health risk to workers that are working within proximity to noisy equipment and machinery. Noise can also be a nuisance to wild animals especially those that use sound to navigate, to find food, mate or avoid predators. Therefore, this impact could interfere with the normal survival of wildlife.

Drilling and quarrying activities which are considered the main sources of noise pollution will be limited to the boundaries of the Mining Claim. Additionally, these and other activities of the project will be limited to working hours of the day only and five days in a week. With that said, noise level will be limited to the active worked sites only for the duration of the works on the sites, and therefore, the impact likelihood is minimal. The nearest receptors of noise to the mining claim are the people who reside in the communal land, with the closest household found in excess of 20 km.

With regards to project workers working with or operating noisy machines, they will be provided with appropriate personal protective equipment (PPE) during working hours and while onsite.

In terms of animals, this impact can be considered to be low, given that there is limited wildlife in the area due to lack of water, with only few animals coming around after the rainy season. Additionally, operations will be limited to working hours of the day only, and this will allow minimal disturbance of animals at night.

Without any mitigation measures being implemented, the impact is rated as of medium significance. To change the impact significance from the pre-mitigation significance to low rating, the mitigation measures have been provided for this. The impact is assessed in Table 6-8 below.

Table 6-8: Noise impact assessment

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	L/M - 4	M/H - 4	M - 44
Post mitigation	L - 1	L/M - 2	L - 2	L/M - 2	L - 10
Mitigation measures					
<ul style="list-style-type: none"> The transportation of exploration and mining materials, equipment and machinery should be limited to once or twice a week only, but not every day to limit exposure to noise. Noise from project vehicles and equipment on site should be reduced to acceptable levels. The exploration and mining times should be set such that, no such activities are carried out during the night or very early in the mornings (to be limited between 8am and 5pm on weekdays). Project hours (exploration and mining) should be restricted to between 8am and 5pm to avoid noise generated by project equipment and the movement of vehicles before or after hours. When operating the blasting and drilling machinery onsite, workers should be equipped with personal protective equipment (PPE) such as earplugs to reduce noise exposure. Target exploration sites that may be found to be within less than 1 km from the residence should be avoided at all costs. This is done to preserve some tranquillity for the residents. If the Proponent does not already have a blasting expert or the experience, an experienced blasting contractor for test quarrying should be hired to carry out exploration activities in a professional manner such that noise is kept at minimum due to very good "know-how" with the utilized blasting machinery and equipment. 					

6.3.7 Vehicular Traffic

The main road B2 is the main transportation route for all vehicular movement that links Arandis to Karibib and Walvis Bay (and the towns and settlements in between). Project associated heavy vehicles will obtain access to the site from the B2 road via the D1918 that connect the mining claim to the service providers (water carting, exploration machinery, equipment, and others).

At exploration stage, water trucks will be frequenting the area once or twice weekly to cart water to the site. At mining stage, additional traffic for carrying mining equipment and for transportation of mined dimension stones to processing facilities in Karibib and Walvis will be required. These activities will potentially increase slow moving heavy vehicular traffic along the B2 and D1918, and this would add additional pressure on the roads.

However, only so many times a week or even monthly that the exploration related heavy trucks will be transporting materials and equipment from and to site for the period of 12 months. And the same goes for transporting mined blocks, especially given the size of the mining claim (resource). Therefore, the risk is anticipated to be short-term, not frequent, and therefore of medium significance.

Pre-mitigation, the impact can be rated medium and with the implementation of mitigation measures, the significance will be low as assessed in Table 6-9 below.

Table 6-9: Vehicular traffic impact assessment

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	L/M - 4	M/H - 4	M - 44
Post mitigation	L/M-2	L/M - 2	L - 2	L/M - 2	L - 12
Mitigation measures					
<ul style="list-style-type: none"> • The transportation of exploration materials, equipment and machinery should be limited to once or twice a week only, but not every day. • The heavy truck loads should comply with the maximum allowed limit while transporting materials and equipment/machinery on the public and access roads. • The carted water into the area (from other source of water supply) should be done once or twice a week in container that can supply and store water for most of the week, thus reducing the number of trucks on the road daily. • Drivers of all project phases' vehicles should be in possession of valid and appropriate driving licenses. • Vehicle drivers should adhere to the road safety rules. • Drivers should drive slowly (40km/hour or less), and on the lookout for livestock and wildlife. • The Proponent should ensure that the site access roads are well equipped with temporary road signs condition to cater for vehicles travelling to and from site throughout the project's life cycle • Project vehicles should be in a road worthy condition and serviced regularly to avoid accidents because of mechanical faults of vehicles. • Vehicle drivers should only make use of designated site access roads provided. • Vehicles drivers should not be allowed to operate vehicles while under the influence of alcohol. • Sufficient parking area for all project vehicles should be provided for and clearly demarcated son sites. • The Proponent should make provision for safe materials and equipment offloading and loading areas on sites. 					

- No heavy trucks or project related vehicles should be parked outside the project site boundary or demarcated areas for such purpose.
- Truck movements, frequency, times, and routes should be carefully planned and scheduled – please refer to the next point.
- To control traffic movement on site, deliveries from and to site should be carefully scheduled. This should optimally be during weekdays and between the hours of 8am and 5pm.
- The site access road(s) should be upgraded to an unacceptable standard to be able to accommodate project related vehicles and access permits obtained from the Roads Authority.
- The site access road(s) should be provided for in such ways that they do not interfere with other traffic movement and/or compromise traffic safety on the host farms.

6.3.8 Impact on Surrounding Air Pollution (Dust)

The project activities and vehicles may potentially generate dust and gas emissions from vehicles (due to unpaved access roads, including the D1918). Dust emanating from unpaved roads when transporting project equipment and supply (water) to and from site (time-to-time) and excavation/drilling works may compromise the air quality in the area. This is likely at site areas with little to no vegetation cover and dry conditions of the project area.

The dust generated from operating the geological drill rigs and mining equipment could result in the production of respirable dust (particulate matter smaller than 50 µm or even 10 µm in size). This could lead to respiratory diseases such as pneumoconiosis (which includes silicosis, asbestosis, and coal miner's pneumoconiosis), and cancer (including bronchogenic carcinoma and malignant mesothelioma) in the workers.

The dust produced might also settle on nearby vegetation and may affect rates of photosynthesis and transpiration. The settled dust on plant leaves may not only affect the vegetation's functionality but animals that feed on the vegetation (i.e., browsing) too (Resilient Environmental Solutions, 2019).

Given the scale (i.e. on a small area) and nature of the activities (i.e. use of water in drilling and cutting), the impact of dust can be minimized. The impact can be rated as medium (significance) if no mitigation measures are implemented. However, once this is done, the impact significance can be reduced to low - please refer to the assessment below (Table 6-10).

Table 6-10: Air quality impact assessment

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	M - 6	M - 3	M - 39
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8
Mitigation measures					

- Drill and excavating equipment should be regularly maintained to ensure drilling and excavation efficiency and reduce dust generation.
- Dust masks, eye protective glasses and other respiratory PPE accessories should be provided to the workers on site, specifically the ones exposed to dusty site area and activities.
- The impact mitigation measures should be covered in the relevant farm access agreement as required for commercial and resettled farms.
- The Proponent should ensure that the project activities schedules are limited to the given number of days of the week, but not every day. This will keep the vehicle-related dust level minimal in the area.
- In extremely windy days, a reasonable amount of water should be used to suppress the dust that may be emanating from certain exploration areas at the sites. In other words, Dry dust suppression methods such as reasonable amount of water should be employed to minimise onsite dust generation.
- The transportation of exploration materials, equipment and machinery should be limited to certain days of the week only as so to reduce dust generated by heavy vehicles in the area.

6.3.9 Impact of Poor Communication (Proper Liaison): Proponent and Landowners

A temporary residence of “outsiders” on farmland will be required (campsite) and because of this, some of the project workers may behave contrary to the wishes of the farmers/landowners or occupiers of land. Not only the workers' potential unacceptable behaviors but other inconveniences to the landowners biophysical and social aspects related to the project activities. If not managed effectively, these have the potential to result in destructive conflicts between the Proponent and the affected owners or occupiers of land.

Without any mitigation measures and their effective implementation (for example an appointment of a project Liaison/Public Relations Officer), this impact is rated as medium significant. However, upon implementation of the provided measures, the significance would be reduced to low. This potential impact is assessed below (Table 6-11).

Table 6-11: Impact of poor communication between the Proponent and landowners (occupies)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	L/M - 4	M/H - 4	M - 44
Post mitigation	L - 1	L/M - 2	L - 2	L/M -2	L - 10
Mitigation measures					
<ul style="list-style-type: none"> • The community and conservancy leadership must take custodianship in managing relationships with the license holder. • A Public Relation Officer (PRO) should be appointed for the project. They will be responsible for ongoing consultations (liaising) with the affected farmers/landowners as well as handling potential grievances related to the project activities, as and when required. • The PRO should be introduced to the farm/landowners and his or her contact details provided to them prior to undertaking activities for easy communication during the exploration activities. 					

- The Proponent should compile a clear communication procedure/plan which should include a grievance and response mechanism.

6.3.10 Impact on local services and infrastructure (roads, fence, and pipelines)

The movement of vehicles such as heavy truck around communal/public farms may lead to the destruction / damaging of buried farm or even public water pipelines and or power supply cables. This is likely to happen; especially during rainy seasons when the buried pipes get compacted or deformed once driven over by heavy vehicles.

Other impacts on farm infrastructure include farm gates being left open and heavy exploration machinery or equipment damaging farm fences if extensive work is done too close to the fences. This impact is assessed as follows in Table 6-12.

Without any implementation of the mitigation measures provided, the potential impact' significance will be rated medium. However, upon effective implementation of these measures, the impact significance will be reduced to low.

Table 6-12: Assessment of impacts on local (farms) infrastructure

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M - 3	M - 36
Post mitigation	L/M - 2	L/M - 2	L/M - 4	L/M -2	L - 16
Mitigation measures					
<ul style="list-style-type: none"> • A Public Relation Officer (PRO) should consult with the farmers to help in locating possible buried cables and pipelines on their properties (farms) to avoid damages to buried services such as water and power supply lines and cables. • If possible, heavy trucks should avoid driving over farm areas that are known to have pipelines or any related infrastructure buried. • The project personnel should be informed not to leave the farms' gates open, but close or lock them as instructed by the landowners. • Project equipment and machinery should not be left leaning on the farm fences (using the fences as support). • Agreement and continued engagement with landowners / farm owners on use and maintenance of farm infrastructure (roads, fences, gates, boreholes, etc.) should be implemented and maintained. 					

6.3.11 Health and Safety

Project personnel (workers) involved in the exploration and quarrying activities may be exposed to health and safety risks. These are in terms of accidental injury, owing to either minor (i.e., superficial physical injury) or major (i.e., involving heavy machinery or vehicles) accidents. The site safety of all personnel will be the Proponent's responsibility and should be adhered to as per the requirements of the Labour Act (No 11 of 2007) and the Public Health Act (No. 36 of 1919).

The use of heavy equipment, especially during excavation, drilling and the presence of hydrocarbons on sites may result in accidental fire outbreaks. This could pose a safety risk to the project personnel, equipment, and vehicles too, especially considering that the area is covered in grass, which can speed up the spread of fire.

If machinery and equipment are not properly stored and packed, the safety risk may not only be a concern for project workers but residents too, especially children, given their curiosity and that they may try to access the active project sites and play with dangerous materials and equipment.

Another potential health risk stemming from the proposed project activities is the handling of project hazardous waste on site in relation to the local community. The impact is likely because some of the unsuspecting and unformed local people may be wandering around and if they see improperly stored or kept empty hazardous containers on site, they may be tempted to take these containers without the site workers or Proponent's knowledge. The locals may then use the containers for domestic use like water and/or food storage without proper container treatment or cleaning. The storage of and eventual consumption of water and/or food from such containers may lead to serious health risks to the locals.

The impact can be rated as medium to slightly high to medium significant if no mitigation measures are implemented, but upon implementation, the impact will be of low significance (as per Table 6-13 below).

Table 6-13: Health and Safety impact assessment

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M/H - 8	M/H - 4	M - 56
Post mitigation	L/M - 2	M - 3	L - 2	L/M - 3	L - 21
Mitigation measures					
<ul style="list-style-type: none"> The Labour Act's Health and Safety Regulations should be complied with. As part of their induction, the project workers should be provided with an awareness training of the risks of mishandling equipment and materials on site as well as health and safety risk associated with their respective jobs. When working on site, employees should be properly equipped with adequate personal protective equipment (PPE) such as coveralls, gloves, safety boots, earplugs, dust masks, safety glasses, etc. Heavy vehicle, equipment and fuel storage site should be properly secured, and appropriate warning signage placed where visible. Drilled holes that will no longer be in use or to be used later after being drilled should be properly marked for visibility and capped/closed off. Ensure that after completion of exploration holes, drill cuttings are put back into the hole and the holes filled and levelled. An emergency preparedness plan should be compiled, and all personnel appropriately trained. 					

- Workers should not be allowed to drink alcohol prior to and during working hours as this may lead to mishandling of equipment which results into injuries and other health and safety risks.
- Workers should not be allowed on site if under the influence of alcohol.
- The site to be equipped with "danger" or "cautionary" signs for any potential danger or risk area identified on site.
- Temporary enclosed boundaries should be erected around high-risk area sites for the duration of project activities at that specific site area. This is done to control access to the site, in such a way that the public, especially children do not access the site and play with equipment and machinery on days when no work is done.
- A security guard or guards should be part of the team so that they can look after the project equipment and vehicles that would be left on site in weekends or public holidays (when no work is done) to ensure that no unauthorized person enters the area.
- To discourage the unsuspecting and uninformed local community from eyeing the empty hazardous containers, the site workers should, if possible, drill holes in these containers while kept on site (before transporting the containers to the waste site).
- All employees and contractors (personnel) to be trained on environmental awareness, the Proponent's internal Environmental Health and Safety Policy, Environmental Management Plan, and engagement with key stakeholders, specifically the key government ministries and farmers.
- With regards to accidental fire outbreaks, the following should be implemented:
 - ✓ Portable fire extinguishers should be provided on sites (per vehicle and working site).
 - ✓ No open fires should be created by exploration personnel.
 - ✓ Potential flammable areas and structures such as fuel storage tanks should be marked as such with clearly visible signage.

6.3.12 Archaeological impact

According to Mushi (2022), the archaeological survey done within the proposed project area and surrounding only found stone artifacts. These were found to be lithic implements of dolerite and quartz material, which were rather scattered. These are considered to be of low significance and their presence has been noted in the submission to NHC as required by the National Heritage Act (No. 27 of 2004). There was also an iron remain material which was found some 10 km northeast of the Mining Claim.

Aside from these, the site visit did not find or reveal any traces of significant archaeological materials or features, there was neither graves, nor historical feature/structure or significant archaeological objects located in the surveyed area (Mushi, 2022). There was neither graves, nor historical feature/structure or significant archaeological objects located in the surveyed area (Mushi, 2022).

Mushi (2022) also stated that the only significant and notable heritage site that is somewhat within the same landscape as the Mining Claims 68945, and which is of national significance is Grootspitzkop mountain, located about 50+ km northeast of the project site (Mushi, 2022). Therefore, it is unlikely that it will be impacted by the proposed project.

It was also disclaimed that the absence of archeological/historical or heritage resources in the study area do not equate the absence of the potential of archaeological or heritage materials within the project area (Mushi, 2022). Subsurface remains may be exposed during explorations and/or mining within the confines of MC 68945 and it is therefore recommended that the proponent adheres to the Chance Find Procedure Guidelines.

With that said, the potential impact significance is slightly medium if no mitigation measures, are implemented. However, after the implementation of the measures provided below, this impact significance will be low. The assessment of the impact is shown in Table 6-14 below.

Table 6-14: Archaeological impact assessment

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M - 3	M - 36
Post mitigation	L - 1	L - 1	L - 2	L/M - 2	L - 8
General Mitigation measures					
<ul style="list-style-type: none"> The presence of stone artifacts should be noted as required by the National Heritage Act (No. 27 of 2004). Caution should be exercised when carrying out excavations associated with the exploration activities if archaeological/heritage remains are discovered. Workers should be educated to not destroy or throw away but report (to the Environmental/Safety officer) of any unknown object found/discovered on site. Identified archaeologically significant objects on the site should not be disturbed but are to be reported to the project Environmental/Safety officer or National Heritage Council offices for further instructions and actions. The Proponent should familiarise themselves with the National Heritage Council's Chance Finds Procedure (CFP) and if uncertain about the procedure should receive training by a suitably qualified archaeologist with respect to the identification of archaeological/heritage remains and the procedures to follow if such remains are discovered throughout the project activities' duration. The Chance and Finds Procedure is attached to the EMP. Emphasis: sub-surface materials may still be lying hidden from surface surveys. Therefore, absence (during surface survey) is not evidence of absence all together. The recommended and necessary measures, monitoring and reporting procedures must be followed in the event of a chance find, to ensure compliance with heritage laws and policies for best practice Once finalized and become available, the layout of access tracks (roads), waste rock dumps, field camps and other related infrastructure should be submitted to the NHC to verify the possible presence of archaeological objects or sites near these infrastructures. 					

- A "No-Go-Area" should be put in place where there is evidence of sub-surface archaeological materials, archaeological site, historical, rock paintings, cave/rock shelter or past human dwellings. It can be a demarcation by fencing off or avoiding the site completely by not working closely or near the known site. The 'No-Go Option' might have a NEUTRAL impact significance.

6.3.13 Waste Generation

Exploration activities are associated with generation of waste of all kinds (domestic, hazardous, and general). Improper handling, storage and disposal of wastes may lead to environmental degradation/pollution. If not handled, store and disposed of properly, the waste may scatter around the project site and pollute the immediate project area.

Without any mitigation measures, the impact significance is rated as medium, but implementation of the recommended measures, the significance will be reduced to low. This assessment is presented below (Table 6-15).

Table 6-15: Impact assessment of waste generation on the environment

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M/H - 4	L/M - 4	M/H - 4	M - 44
Post mitigation	L/M - 2	L/M - 2	L/M - 4	L/M - 2	L - 16
Mitigation measures					
<ul style="list-style-type: none"> • Project workers should be sensitized to dispose of waste in a responsible manner and not to litter. • After each daily works, there should not be waste left scattered on site, but rather be disposed of in allocated site waste containers. • No waste may be buried or burned on site or anywhere else throughout the project lifecycle. • All domestic and general waste produced daily should be contained until such that time it will be transported to designated waste sites on a weekly basis. • The sites should be equipped with separate waste bins for hazardous and general waste/domestic. • Hazardous waste, including emptied chemical containers should be safely stored on site where they cannot be accessed and used by uniformed locals for personal use. These containers can then be transported to the nearby approved hazardous waste sites for safe disposal. No waste should be improperly disposed of on site or in the surroundings, i.e., unapproved waste sites. • As an emphasis on the preceding point, empty hazardous substance containers should not be disposed of anywhere on the project site or its surrounding, but instead they should be kept at a designated storing place on site until such time that they can be safely taken to the nearest approved hazardous waste sites. • A penalty system for irresponsible disposal of waste on site and anywhere in the area should be implemented. 					

6.3.14 Social Nuisance: Job seeking and Differing Norms, Culture and Values

Like any new development for project in an area, the proposed project activities may attract a potential influx of people from outside the project area in search of job opportunities. Such influxes may lead to social annoyance and conflicts. This is generally considered a concern given the current unemployment rate of youth in Namibia, that people from other areas in different regions may hear about the project intentions (especially from the ESA newspaper adverts) and be forced to go look for work opportunities in the project area. Different people may come with different ways of living to the area, which could interfere with the local norms, culture, and values. This could potentially lead to social crashes between the locals and outsiders.

The influx of people into the project area may also lead to sexual relations between these out-of-area workers and the locals. This would lead to the spreading of sexual transmitted diseases (i.e., HIV/AIDS) when engaging in unprotected sexual intercourse.

Pre-implementation of mitigation measures, the impact is rated as of slightly high to medium significance. However, upon mitigation (post-mitigation) – see mitigation measures below, the significance will change from medium to low rating. The impact is assessed in Table 6-16 below.

Table 6-16: Social impact assessment of outsiders' influx into the area (job seeking)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M/H - 8	M/H - 4	M - 56
Post mitigation	L/M - 2	L/M - 2	M - 6	L/M - 2	L - 20
Mitigation measures					
<ul style="list-style-type: none"> The Proponent should prioritize the employment of local people, and only if necessary and due to lack of skills in the area, out-of-area people can be given some of the work. This is to avoid the influx of outsiders into the area. The locals to be employed during the project phases should be provided with the necessary training of skills required for the project to avoid bringing in many out-of-area employees. The workers should be engaged in health talks and training about the dangers of engaging in unprotected sexual relations which results in contracting HIV/AIDS and other sexual related infections. Out-of-area workers that may be employed (due to their unique work skills) on site should be sensitized on the importance of respecting the local values and norms, so that they can co-live-in harmony with the local communities during the duration of their employment on site. 					

6.3.15 Social Nuisance: Property intrusion and Disturbance or Damage

The presence of some out-of-area workers may lead to social annoyance to the local community, particularly when they or some of those workers enter or damage properties of the locals. The locals' private properties could be homes, yards/fences, vegetation, or animals (livestock and wildlife) or any properties of value to the farm owners or occupiers of the land. The damage or disturbance to properties may not only be private but community properties. The unpermitted and unauthorized entry to private properties may cause social crashes between the local community (affected property owners) and the Proponent (being responsible for the overall project activities).

Pre-implementation of mitigation measures, the impact is rated as of medium significance. However, upon mitigation (post-mitigation), the significance will change from medium to low rating. The impact is assessed below (Table 6-17).

Table 6-17: Social impact assessment of outsiders' influx into the area (locals' properties)

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	M - 3	M - 6	M - 3	M - 36
Post mitigation	L/M - 2	L/M - 2	L/M - 4	L/M - 2	L - 16
Mitigation measures					
<ul style="list-style-type: none"> The Proponent should inform their workers on the importance of respecting the locals' properties by not intruding or damage their homes, fences or snaring and killing their livestock. Any workers or site employees that will be found guilty of intruding peoples 'privately owned properties should be called in for disciplinary hearing and/or dealt with as per their employer' (Proponent)'s code of employment conduct Site workers should be advised to respect the community and local's private properties, values, and norms. No worker should be allowed to wander in people's private yards or fences without permission. Site workers are not allowed to kill or in any way disturb local livestock. No worker should be allowed to, without permission cut down or damage trees belonging either the farm owner, the neighbouring farms. 					

6.4 Cumulative Impacts

According to the International Finance Corporation (2013), 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”.

The cumulative impacts to which the project would contributes are listed below:.

- **Groundwater:** The area has a low groundwater potential and the water quality is also said to be poor, with high salinity. There are boreholes on neighbouring farms and in the Omaruru River. Additional boreholes have the potential to add pressure on the aquifer. Therefore, a thorough groundwater study will be undertaken by a qualified and experienced Hydrogeologist to ensure that safe yields are established. If no safe and sustainable yields are found, the Proponent will consider the option to cart water to site.
- **Fauna:** There is already existing behavioral impact in wild animals, which might have been driven away by the settlement of people in the area. Therefore, the exploration and mining vehicles and other equipment movement may also contribute to animals fearing for their lives. Operations will be limited to daylight hours only, to reduce disturbance of animals at night. Noise levels will also be kept at permissible levels.
- **Road infrastructure** (vehicular traffic): The proposed exploration activities eventual mining will contribute cumulatively to various activities such as commuting, farming activities, and travelling associated with tourism and existing mining activities in the Erongo Region. The B2 national road is already under pressure as a connecting route for transporting various products for business and service delivery to different destinations in the regions. These activities relying on the B2 road infrastructure by other users and for different operations will be beyond the Proponent's control. Therefore, to ensure that the Proponent do their part to reduce this impact with regards to their project operations (heavy vehicle loads and frequency on the roads), they will implement the provided management (mitigation) measures and comply with the legal obligations and requirements as set out by the Roads Authority.
- **Archaeology:** Mushi (2022) noted that the project area might have already been altered by the past small-scale mining activities and might undergo some new changes as far as the proposed project is concerned (the possibilities of new access roads, establishing of camping sites, sitting of equipment, laying down of infrastructures) that may obliterate surface indicators of heritage resources if any ever occurred in the study area. Therefore, the recommended measures herein and, in the Draft, EMP must be implemented to mitigate these impacts.

- **Visual:** There are currently visual concerns of active mining sites and the abandoned mines in the Erongo Region, and this site is specifically close to other mining operations such as Marenica and Trekkopje. Although minimally (given the natural colour of the targeted site mountains/hills and the dolerite), the proposed project activities will contribute to this overall impact for the region. For this reason, the Proponent will be required to do their part (not to worsen the visual impact) by implementing the provided mitigation measures.

6.5 Decommissioning (Cessation of Exploration and Mining Activities)

Impacts pertaining to the closure of the quarrying activities have been identified. The impacts are loss of employment by workers at the project site and contribution to the national economy (revenue and royalties). Another concern that stems from mine closure is the rehabilitation of the site (discussed under section 6.7).

6.5.1 Loss of Employment, Revenue and Royalties

Should the quarrying activities cease, workers that are employed by the mine sites will lose their jobs and source of income. The quality dimension stone mined would eventually run out or become difficult to mine and this would mean that the mining works will end, leading to loss of employment. This will also mean that there will be no more revenue and royalties paid to the government from this project.

This impact can be rated as of medium significance and only so much can be done by the Proponent to assist the workers in this regard. Regarding the national revenue and royalties' payment, there will be unfortunately nothing that the Proponent would do to mitigate this. The impact significance of unemployment can be reduced from medium to low by implementing mitigation measures. The impact assessed in **Table 24** below is that of employment loss only.

Table 18: Impact assessment of project activities closure on employment

Mitigation Status	Extent	Duration	Intensity	Probability	Significance
Pre mitigation	M - 3	L/M - 2	M - 6	M/H - 4	M - 44
Post mitigation	L/M - 2	L/M - 2	L/M - 4	L/M - 2	L - 16
Mitigation measures					
<ul style="list-style-type: none"> • The Proponent should inform the employees/workers on time, of the intentions to cease the project works and the expected date of such closure. This will provide the employees with enough time to search for work elsewhere. • The Proponent should raise awareness of the possibilities for work in a similar or other industrial sector. • The workers should be fairly laid off with reasonable severance packages to allow them to survive the few first months of job hunting, and in accordance with the national Labour Law regarding retrenchment. 					

6.6 Site Rehabilitation

One of the main challenges faced by the mining industry, which includes small-to-medium scale miners in Namibia and worldwide, is the rehabilitation of mined-out areas.

Successful rehabilitation requires careful consideration of the local ecological context in combination with rehabilitation goals. The most important steps in undertaking a successful rehabilitation are planning and environmental awareness (environmental education) on the importance of progressive rehabilitation (or post-activity rehabilitation) and its importance to the environment. Furthermore, to successfully implement the planned rehabilitation, practically, this will depend on a few factors, namely the rehabilitation program, characteristics of an activity, nature of disturbance, rehabilitation methods, as well as resources availability.

Regardless, the following measures are recommended for consideration by the end of the exploration works:

1. After planning for rehabilitation of explored site areas, the first step is to clean up and make the area to be rehabilitated, safe. This involves the following:
 - a) Removal of infrastructure and unused or unwanted equipment. No facilities or equipment should remain on site unless with the written approval of the landowner/occupier of land or relevant authority.
 - b) Removal of rubbish for disposal at approved waste sites. Care is required with regards to residual toxic or hazardous materials including contaminated packaging and containers.
 - c) Removal of all services.
 - d) Removal or burial of concrete slabs, footings (if any), etc.
 - e) Backfilling or securely and permanently covering any boreholes, pits, or similar excavations.
 - f) Restricting or preventing public access by removal or closure of access roads and tracks leading to high-risk explored areas until such a time that the area is clear of exploration activities induced 'risk or danger'.

Conclusion on the impact assessment: it is found that the impact significance rating is average. Therefore, to reduce the significance from medium to low, it is recommended that the Proponent effectively implement mitigation measures. Furthermore, to maintain low significance, the implementation of measures will need to be continuously monitored.

7 RECOMMENDATIONS AND CONCLUSIONS

The aim of this environmental scoping assessment was to identify the potential impacts associated with the proposed exploration activities on the Mining Claim 68945, 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 newspapers (*Die Republikein*, *Namibian Sun* and *Allgemeine Zeitung* for two consecutive weeks on 8 and 14 March 2022) and site/public notices placed at the !Oe#Gan Traditional Authority Office in Spitzkoppe Village, and at the B2 turn off to Spitzkoppe village.

The public consultation meeting was held on the 9th of April 2022, starting with the Conservancy Leadership at 11h00 and later with the general community at 14h00 at the !Oe#Gan Traditional Authority Office. The interested and affected parties raised their comments and concerns on the proposed project activities and these were noted down during the meeting. The concerns and comments received from the public and the local community members formed the basis for this report and development of the Draft EMP.

The conclusions reached and recommendations provided are presented below.

7.1 Recommendations

It is therefore recommended that an Environmental Clearance Certificate be issued for the proposed exploration and mining on Mining Claim 68945, subject to the following recommendations:

- All required permits, licenses and approvals for the proposed activities should be obtained as required (please refer to the Permitting and Licensing Table in the Environmental Management Plan (Appendix C). These include permits and licenses for land/farm access agreements to explore and ensuring compliance with these specific legal requirements.
- The Proponent complies with the legal requirements governing this type of project and its associated activities.
- All mitigations provided in this ESA Report and the management action plans in the EMP should be implemented and monitoring conducted as recommended.
- All the necessary environmental and social (occupational health and safety) precautions provided should be adhered to.
- Site areas where exploration activities have ceased should be rehabilitated, as far as practicable, to their original state.

- The monitoring of the implementation of mitigation measures should be conducted, applicable impact's actions taken, reporting done and recorded as recommended in the Draft EMP.

7.2 Conclusions

The potential (positive and negative) impacts stemming from the proposed exploration activities were identified. The two impact types were described, assessed and mitigation measures where provide (where necessary).

As main potential impacts of concern, the negative impacts were carefully described, assessed, and mitigation measures provided thereof to avoid and/or minimize their significance on the environment. These impacts were found to be of medium significance. The effective implementation of the recommended management actions (mitigation measures) will see the significance reduction in impacts (that cannot be avoided) from medium to low rating. However, to maintain a low significance rating, monitoring of the potential impacts by the Proponent (an Environmental Control Officer (ECO)) is highly recommended. **Monitoring will not only be carried out to maintain the low rating of impacts' significance but to also ensure that new potential impacts that might arise during project implementation are well identified in time, properly addressed and that suitable mitigation measures are provided and implemented.**

Based on the assessment from experience, research information, inputs by the public, and technical information provided by the Proponent, it can be concluded that that the proposed activities may be granted an Environmental Clearance Certificate. The ECC issuance will be on condition that the recommendations and impact mitigation measures in this report and all the provisions in the EMP are adhered to.

In conclusion, it is unlikely that the proposed project activities will have a high significant of negative impact on the biophysical and social environments in the project area. Therefore, it is vital for the Proponent and their contractors (if any) to effectively implement and monitor the recommended management measures to protect the environment and promote environmental sustainability.

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APPENDIX A –CV OF EAP

APPENDIX B — ECC APPLICATION (PROJECT REGISTRATION WITH MEFT)

APPENDIX C – ENVIRONMENTAL MANAGEMENT PLAN (EMP)

APPENDIX D – CONSENT LETTER AND ARCHAEOLOGICAL ASSESSMENT REPORT

APPENDIX E – STAKEHOLDERS LIST (INTERESTED AND AFFECTED PARTY DATABASE)

APPENDIX F – PROOF OF COMMUNICATION

APPENDIX G – NEWSPAPER ADVERTISEMENTS

APPENDIX H – PUBLIC MEETING INVITATION

APPENDIX I – PUBLIC MEETING MINUTES AND ATTENDANCE REGISTER